

Grise Fiord Community Harbour

Project Specific Information Requirements (PSIR) Report

Revision Date: 26 March 2025

Document Number: REP-WRL-07-Grise Fiord Community HBR PSIR-0003-24.R6

Produced By:

Dynamic Ocean Consulting Ltd.
2901 Murray Street
Port Moody, BC V3H 1X3

Produced For:

Government of Nunavut – Community & Government Services
PO Box 1000 Station 200
Iqaluit, NU X0A 0H0

Worley Canada Services Ltd.
Suite 200-2930 Virtual Way
Vancouver, BC V5M 4X6

Rev	Date	Reason for Issue
6	26-Mar-25	For Use
5	12-Mar-25	For Use
4	03-Mar-25	For Use
3	07-Feb-25	For Client Review
2	05-Feb-25	For Client Review
1	03-Feb-25	For Client Review
0	27-Jan-25	For Client Review
A	16-Jan-25	For Internal Review

Written By			
Dynamic Ocean			
			
Stefani Giacomelli Senior Marine Biologist	Laura Borden Marine Science Director	Danielle Mac Rae Junior Marine Scientist	Sam Sweeney Intermediate Marine Scientist
Worley Consulting			
			
Diane Pinto Senior Engagement Specialist	Lucas Pittman Senior Terrestrial Biologist	Jeff Gibson Senior Engineering Geologist	

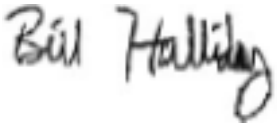
Reviewed & Approved By			
Dynamic Ocean		**Worley Consulting**	
			
Dr William Halliday Senior Marine Mammal Scientist	Victoria Burdett-Coutts Senior Regulatory Specialist	Chris Meisl Project Manager, Marine Engineering Lead	Panos Berdousis Principal Geotechnical Engineer

Table of Contents

Disclaimer & Limitations of the Report x

Executive Summary xi

Table of Concordance xiii

Acronyms and Abbreviations xxxviii

1 General Project Information Requirements 1

1.1 Project Location 1

1.2 Project Overview 2

1.3 Existing Infrastructure 5

1.4 Community Harbour Purpose and Vessels (New and Existing) 8

1.5 Community Benefits 8

1.6 Project Alternatives & Selected Options 8

1.6.1 Community Harbour 9

1.6.2 Quarry (Borrow Pits) 9

1.6.3 Haul Road 10

1.7 Land Tenure 13

1.8 Facility Life 13

1.9 Public Access 13

1.10 Climate Change and Harbour Design 13

1.11 Construction Activities 16

1.12 Project Schedule 16

1.13 Transportation (Mobilization and Demobilization) 17

1.14 Water Sources and Consumption 18

1.15 Waste Management 18

1.15.1 Wastewater 18

1.15.2 Solid Waste 19

1.16 Materials Use 19

1.16.1 Equipment 19

1.16.2 Fuel 21

1.16.3 Chemicals and Hazardous Materials 22

1.17 Nearby Communities and Protected Areas 24

1.18 Workforce and Human Resources 26
1.19 Proponent Information 27
2 Project Specific Information (Works, Undertakings and Activities) 28
2.1 Community Harbour (Offshore Infrastructure) 28
2.1.1 Components 28
2.1.2 Construction Activities 29
2.1.3 Area lighting and Electrical 31
2.1.4 Operations 31
2.1.5 Decommissioning 32
2.2 Other Components 32
2.2.1 Quarry and Borrow Pits 32
2.2.2 Haul Road 33
2.2.3 Contractor Laydown Area 34
2.2.4 Temporary Rock Platforms 35
2.2.5 Materials and Quantities 35
2.2.6 Site Services 35
2.2.7 Site Offices and other Temporary Structures 36
2.2.8 Accommodations 36
3 Community Consultation 37
3.1 Objectives 37
3.2 Communities, Groups and Organizations 37
3.3 Overview of Consultation Program 38
3.4 Concerns Expressed and Strategies to Address 42
3.5 Future Consultation 48
4 Inuit Quajimajatuqanjit 49
5 Regulatory Compliance 52
5.1 Institutions of Public Government 52
5.1.1 Nunavut Planning Commission 52
5.1.2 Nunavut Impact Review Board 52
5.1.3 Nunavut Water Board 52
5.1.4 Nunavut Wildlife Management Board 53
5.2 Designated Inuit Organizations 53
5.2.1 Qikiqtani Inuit Association 53

5.2.2 Nunavut Tunngavik Incorporated 53
5.3 Land Tenure 54
5.3.1 Community and Government Services 54
5.3.2 Crown-Indigenous Relations and Northern Affairs Canada 54
5.3.3 Qikiqtani Inuit Association 54
5.4 Government of Nunavut Departments 56
5.4.1 Culture and Heritage 56
5.4.2 Department of Environment 56
5.5 Hamlet 56
5.6 Federal Agencies 57
5.6.1 Fisheries and Oceans Canada – Fish and Fish Habitat Protection Program 57
5.6.2 Transport Canada 57
5.6.3 Environment and Climate Change Canada 57
5.6.4 Natural Resources Canada 58
5.6.5 Canadian Coast Guard and Nav Canada 58
5.7 Nunavut Marine Council 58
5.8 Regional Wildlife Organizations 58
5.8.1 Qikiqtaaluk Wildlife Board 58
5.9 Expected Permits 59
6 Description of the Existing Environment & Socio-Economic Conditions 64
6.1 Valued Ecosystem Component and Valued Socio-Economic Components 64
6.2 Study Area 65
6.3 Physical Conditions 67
6.3.1 Designated Environmental Areas 67
6.3.2 Geological Site Conditions 69
6.3.3 Surface Features 72
6.3.4 Ground Stability and Permafrost 72
6.3.5 Hydrology 73
6.3.6 Air Quality 75
6.3.7 Noise 76
6.3.8 Climate Conditions 76
6.3.9 Marine Water and Sediment Quality 77
6.3.10 Coastal Morphology 78
6.3.11 Bathymetry 78

6.3.12 Tides and Currents 80
6.4 Biological Conditions 80
6.4.1 Terrestrial Vegetation (Including Rare Plants) 80
6.4.2 Terrestrial Wildlife (including Habitat and Migratory Patterns) 81
6.4.3 Migratory and Marine Birds (including Habitat and Migratory Patterns) 82
6.4.4 Fish Habitat (including Marine Vegetation) 83
6.4.5 Fish and Marine Mammals 83
6.4.6 Species at Risk 87
6.5 Socioeconomic Conditions 88
6.5.1 Population, Education and Language 88
6.5.2 Employment and Economic Activity 88
6.5.3 Land and Resource Use 89
6.5.4 Local and Regional Traffic Patterns 92
6.5.5 Human Health and Community Wellness 92
6.5.6 Housing and Community Infrastructure and Services 93
6.5.7 Archaeological and Culturally Significant Sites 94
7 Potential Impacts and Proposed Mitigation 96
7.1 Construction Phase Impacts and Mitigation 99
7.1.1 Physical Components 99
7.1.2 Biological Components 105
7.1.3 Socio-Economic Components 113
7.2 Operations Phase Impacts and Mitigations 119
7.2.1 Physical Components 119
7.2.2 Biological Components 121
7.2.3 Socioeconomic Conditions 122
7.3 Residual Effects 123
7.4 Cumulative Effects 123
7.5 Assessment of Transboundary Effects 125
8 Environmental Management and Monitoring Plans 126
8.1 Best Management Practices 126
8.2 Construction Environmental Management Plan 126
8.3 Construction Work Plans 126
8.3.1 Contractors Construction Environmental Management Plan 126
8.3.2 Marine Safety Plan 126

8.3.3 Traffic Management Plan 127
8.3.4 Spill Prevention and Response Plan 127
8.3.5 Quarry and Blasting Management Plan 127
8.3.6 Health and Safety and Emergency Response Plan 127
8.4 Operations Environmental Management Plan 127
9 References 129

List of Tables

Table 1-1: Construction Activities Associated with the Community Harbour 16
Table 1-2: Anticipated Schedule for the Project 16
Table 1-3: Estimated Solid Waste Production 19
Table 1-4: Anticipated Construction Equipment 20
Table 1-5: Estimated Fuel Consumption During Construction 22
Table 1-6: Chemicals and Hazardous Materials Expected to be Required During Construction 23
Table 1-7: Personnel Numbers per Construction Season and Total for Project 26
Table 1-8: Project Contact Details 27
Table 2-1: Potential Contractor Laydown Areas and Uses 35
Table 3-1: Consultation Overview 39
Table 3-2: Summary of Concerns Expressed and Strategies to Address 44
Table 5-1: Summary of Federal, Territorial and Municipal Permitting Requirements 60
Table 6-1: Definition of Valued Ecosystem Component and Valued Socio-Economic Components as by Nunavut Impact Review Board 65
Table 6-2: Project Study Area Pertinent to Valued Ecosystem Component and Valued Socio-Economic Components 66
Table 6-3: Designated Areas in Proximity to Grise Fiord 68
Table 6-4: Standards for Air Quality Objectives in Nunavut 76

Table 6-5: Tide Levels at Grise Fiord 80

Table 6-6: Occurrence of Marine Focal Species 83

Table 6-7: Bulk Fuel Storage Capacity for Grise Fiord 94

Table 7-1: Screening Assessment Categories 97

Table 7-2: Project Specific Information Requirement Environmental Effects Table 98

Table 7-3: Grise Fiord Projects and Cumulative Effects Considerations 124

List of Figures

Figure 1-1: Project Location, Components, and Study Area 3

Figure 1-2: Community Harbour Options Assessment. Option 1 is the Chosen Design for the Community Harbour 11

Figure 1-3: 30-Year Ice a) Break-up; b) Freeze-up 15

Figure 1-4: Grise Fiord, Nearby Communities and Pertinent Water Bodies 25

Figure 4-1: Land Use and Occupancy Plan 51

Figure 6-1: Grise Fiord – Bedrock Geology 71

Figure 6-2: Distribution of Permafrost in Canada 73

Figure 6-3: Water Courses in Proximity to Project Study Area 74

Figure 6-4: Grise Fiord Foreshore Bathymetry 79

Figure 7-1: National and International Boundaries 125

List of Drawings

Drawing 1-1: Grise Fiord Community Harbour General Arrangement 4

Drawing 5-1: Land Tenure and Administrative Control Area 55

List of Photos

Photo 1-1: Existing Mooring Basin on West Shore of Grise Fiord 6

Photo 1-2: Demonstrative Photos of Grise Fiord a) Shoreline of Grise Fiord at mooring basin; b) Culvert Upstream of Mooring Basin; c) Grise Fiord southeast shoreline; d) Shacks along southeast shoreline 7

Photo 1-3: Demonstrative Photos of Quarry (Borrow Pits) Options a) Overview Quarry Locations; b) Quarry Location 2A; c) Quarry Location 2B; d) Quarry Location 2C; e) Quarry Location 2D 12

Photo 1-4: Representative Construction Equipment a) Drill Rig; b) Excavator; c) Rock Truck; d) Crusher 21

List of Appendices

Appendix A: Consultation Log

Disclaimer & Limitations of the Report

The information presented in this document was compiled and interpreted exclusively for the purposes permitting requirements for the Grise Fiord Community Harbour. Dynamic Ocean Consulting Ltd. (Dynamic Ocean) in collaboration with Worley Canada Services Ltd. (operating as Worley Consulting) provided this report for the Government of Nunavut – Community and Government Services / Economic Development and Transportation (GN-CGS/EDT) solely for the purpose noted above.

Dynamic Ocean and Worley Consulting has exercised reasonable skill, care, and diligence to assess the information acquired during the preparation of this report but makes no guarantees or warranties as to the accuracy or completeness of this information when used outside of the context of its intended purpose. While every effort has been made to ensure the accuracy and reliability of the information contained in this report, conditions are subject to change over time. The findings and conclusions presented herein are based on the best available data and professional judgment at the time of preparation. Dynamic Ocean and Worley Consulting have adhered to relevant professional standards, guidelines, and best practices in preparing this report, including those set forth by appropriate regulatory bodies or professional associations, and relevant provincial and federal regulations.

Dynamic Ocean and Worley Consulting do not accept any responsibility for the use of this report for any purpose by any other party than the GN-CGS/EDT (and specific to the Grise Fiord Community Harbour) and does not accept responsibility to any third party for the use in whole or in part of the contents of this report. Any alternative use, including that by a third party, or any reliance on, or decisions based on this document, is the responsibility of the alternative user or third party.

No part of this publication may be reproduced, stored in a retrieval system, or transmitted, in any form or by any means, electronic, mechanical, photocopying, recording, or otherwise, without the prior permission of Dynamic Ocean and Worley Consulting.

Any questions concerning the information or its interpretation should be directed to Victoria Burdett-Coutts (Dynamic Ocean) or Chris Meisl (Worley Consulting).

Executive Summary

Worley Canada Services Ltd., operating as Worley Consulting, has been retained by two departments with the Government of Nunavut (GN), Community and Government Services (GN-CGS) and Economic Development and Transportation (GN-EDT), to support the detailed design of a community harbour in Grise Fiord, Nunavut. Dynamic Ocean Consulting Ltd. (Dynamic Ocean) is supporting Worley Consulting on the permitting requirements for the Project. The Grise Fiord Community Harbour was a component of an earlier feasibility study, completed by Fisheries and Oceans Canada (DFO) – Small Craft Harbour (SCH) in 2019. This is the Project Specific Information Requirement (PSIR) Report and has been developed to support the screening by the Nunavut Impact Review Board (NIRB) and is supported by the Environmental and Socio-Economic Baseline (ESEB) Report and Construction Environmental Management Plan (CEMP). Other municipal, territorial, and federal Authorities Having Jurisdiction (AHJs) will be engaged as required based on planned construction activities and their respective mandates.

The Grise Fiord Community Harbour Project (the Project) is located in the community of Grise Fiord, which is approximately 1,100 km north of the Arctic Circle (76° 25.001'N, 82° 54.935'W), on the southern shore of Ellesmere Island in Jones Sound. Grise Fiord is in the Qikiqtaaluk Region of Nunavut, and conforms with the North Baffin Regional Land Use Plan (NBRLUP) (NPC, 2000). While Grise Fiord is within the NBRLUP, the Recommended Nunavut Land Use Plan (RNLUP) (NPC, 2023c) will replace the NBRLUP once it is approved. The Project components are both temporary (supporting activities) and permanent (community harbour) components, which are marine and terrestrial in nature. Temporary components are terrestrial and include a quarry (borrow pits) and haul road; the borrow pits to supply rock for construction, and a haul road to transport rock from the quarry (borrow pits) to the community harbour. The permanent component is the community harbour and is primarily marine with small portions that are terrestrial.

Assessment of the existing conditions and effects determination of the environmental and socio-economic conditions in Grise Fiord was undertaken through a combination of desktop review, field surveys and Inuit Quajimajatuqanjit (IQ). Project specific workshops were held with local knowledge holders to identify existing conditions of important environmental and socio-economic resources in and around Grise Fiord. Integrating Inuit and scientific knowledge advances the understanding of the biological and socio-economic conditions providing a baseline that is not only scientifically sound, but also connected to local values, needs, and priorities. Project Study Area were defined for each of the Project components where the habitat values were generally low to moderate in the marine portions and low in the terrestrial portions. Several Species at Risk (SAR) organisms have the potential to be present in the Study Area, but the Study Area do not provide critical habitat requirements for these species. Overall, environmental effects are considered to be minimal where residual effects are not likely subsequent to the implementation of mitigation and monitoring measures. Overall, socioeconomic impacts are considered positive, as there will be a safer location for locals to access and utilize their existing small craft vessels.

The GN-CGS/EDT are conducting a comprehensive consultation program to design the Project to serve the top priorities of the community including hunters, fishers, recreational users, residents, and businesses. The consultation program has been designed to include input from hunters, trappers, fishers, residents, and other community groups and organizations obtained through a variety of

methods and materials. The consultation program has been successful in gathering input from community residents, hunters, fishers, and other users of the community harbour. The input received resulted in design modifications to meet the needs and priorities of the community. The GN-CGS/EDT will continue to engage with the community to maintain the positive rapport and collaborative relationship they have built with the community. The community harbour is a much-needed infrastructure improvement for Grise Fiord as there is currently no adequate location for moorage to existing small craft vessels. Construction is planned to start in the 2026 open-water season and will be operation for the open-water season of 2030.

Table of Concordance

This table concordance has been developed to support the screening by the Nunavut Impact Review Board (NIRB) and is informed by this Project Specific Information Requirement (PSIR) report, as well as the Project's Environmental and Socio-Economic Baseline (ESEB) Report and Construction Environmental Management Plan (CEMP).

General Project Information Requirements	Report	Section	Comment
Project Coordinates and Maps			
1. The preferred method for submitting project coordinates information is through the use of a Geographic Information System (GIS) compatible digital file. Although an ESRI ArcView 3.x shape file (in decimal degrees) is the preferred interchange format, NIRB has the capacity to receive over 100 GIS and Computer-Aided Design (CAD) related formats, including MapInfo and AutoCAD, provided proper format and projection metadata is also submitted. The NIRB requires coordinates for the project proposal which reflect the entire project area as defined by: a. Area/sites of investigation; b. Boundaries of the foreseen Land Use Permit (LUP)/right-of-way area(s) to be applied for; c. Location of any proposed infrastructure or activity(s); and d. Boundaries of the mineral claim block(s) where proposed activities will be undertaken.	PSIR	Sections 1.1, 6.2 (Study Aeras), Figure 1-1	.kml files has been uploaded to the NIRB portal which depicts the community harbour, haul road, and quarry (borrow pits) boundaries.
	ESEB (Dynamic Ocean & Worley Consulting, 2025b), CEMP (Dynamic Ocean & Worley Consulting, 2025a)	Figure 1-1	
2. Map of the Project site within a regional context indicating the distance to the closest communities.	PSIR	Sections 1.1, 1.17, Figure 1-4	The closest communities to Grise Fiord are Arctic Bay and Resolute Bay which are approximately 382 km south and 383 km southwest, respectively.
3. Map of any camp site including locations of camp facilities.	PSIR	Section 2.2.8	Due to limited available local accommodations, non-local Project personnel may be housed in a combination of local

General Project Information Requirements	Report	Section	Comment
			accommodations and a construction camp for up to 30 people. Prefabricated modular accommodation is expected to be brought into the community by the contractor to establish the camp. The location of the construction camp will be determined by the contractor in consultation with the Hamlet and will be within municipal boundaries.
4. Map of the Project site indicating existing and/or proposed infrastructure, proximity to water bodies and proximity to wildlife and wildlife habitat.	PSIR	Drawing 1-1 (schematic layout), Figure 1-4 (marine water bodies), Figure 4-1 (land use), Figure 6-3 (freshwater courses)	The Project site is not located near sensitive wildlife or wildlife habitat. Fresh water bodies in proximity to the Project site includes a non-fish-bearing river named Kuuraaluk. Marine water bodies in proximity to the Project site is Jones Sound.
	ESEB (Dynamic Ocean & Worley Consulting, 2025b)	Figure 1-2 (marine water bodies), Figure 2-1 (land use), Figure 7-8 (community harbour habitat map),	

General Project Information Requirements	Report	Section	Comment
		Figure 7-10 (freshwater courses), Figure 8-2 (vegetation communities within the HRQ Study Area), Figure 9-3 (wildlife and wildlife features observed or detected during field survey)	
Project General Information			
5. Discuss the need and purpose of the proposed Project.	PSIR	Section 1.4	The community of Grise Fiord currently does not have a sufficient harbour to provide appropriate moorage to existing small craft vessels.
6. Discuss alternatives to the Project and alternative methods of carrying out the Project, including the no-go alternative. Provide justification for the chosen option(s).	PSIR	Section 1.6, Figure 1-2	The Project is being constructed in a naturally sheltered bay and there is strong community support for this location.
7. Provide a schedule for all Project activities.	PSIR	Section1.12, Table 1-2	Construction is planned to start in the 2026 open-water season and will be operation for the open-water season of 2030.

General Project Information Requirements	Report	Section	Comment
	CEMP (Dynamic Ocean & Worley Consulting, 2025a)	Section 3.3, Table 3-4	
8. List the acts, regulations and guidelines that apply to Project activities.	PSIR	Section 5.9, Table 5-1	Construction of the community harbour will require federal, territorial, and municipal government permits. The Project has engaged with Authorities Having Jurisdiction (AHJ), Inuit boards and the Qikiqtani Inuit Association (QIA) to confirm compliance with relevant legislation, regulation and Best Management Practices (BMP).
	CEMP (Dynamic Ocean & Worley Consulting, 2025a)	Sections 2.1, Table 2-1	
9. List the approvals, permits and licenses required to conduct the Project.	PSIR	Section 5.9, Table 5-1	All Project permits and approvals will be in place prior to the start of construction.
	CEMP (Dynamic Ocean & Worley Consulting, 2025a)	Section 2.2, Table 2-1	
Transportation			
10. Describe how the Project site will be accessed and how supplies will be brought to site. Provide a map showing access route(s).	PSIR	Section 1.13	It is expected that all supplies will arrive by existing sealift deliveries, and therefore a figure of the transit route has not been provided.
11. If a previous airstrip is being used, provide a description of the type of airstrip (ice-strip/all-weather), including its location. Describe dust management procedures (if applicable) and provide a map showing location of airstrip.	N/A	N/A	This is not appliable to the Project. Charter flights used to transport Project personnel or materials, will use the Grise Fiord airport.
12. Describe expected flight altitudes, frequency of flights and anticipated flight routes.	N/A	N/A	
Equipment			

General Project Information Requirements	Report	Section	Comment
13. Provide a list of equipment required for the Project and discuss the uses for the equipment.	PSIR	Section 1.16.1, Table 1-4	Construction is expected to be performed with land-based equipment, with the potential for marine-based equipment to be determined by the contractor.
	CEMP (Dynamic Ocean & Worley Consulting, 2025a)	Section 3.5, Table 3-5	
14. If possible, provide digital photos of equipment.	PSIR	Photo 1-4	Construction is expected to be performed with land-based equipment, with the potential for marine-based equipment to be determined by the contractor.
Water			
15. Describe the location of water source(s), the water intake methods, and all methods employed to prevent fish entrapment. Provide a map showing the water intake locations.	PSIR	Section 1.14	No water withdrawal is planned, as water for construction will be obtained from the existing municipal supply. Should that change, the contractor will be responsible for obtaining the Nunavut Water Board (NWB) authorization.
16. Describe the estimated rate of water consumption (m^3/day).	PSIR	Section 1.14	Water consumption is estimated to be 5 m^3 per day, for approximately 120 days (per construction season).
17. Describe how wastewater will be managed. If relevant, provide detail regarding location of sumps, including capacity of sumps and monitoring.	PSIR	Section 1.15.1	Wastewater will be managed through holding tanks in the in-site sanitary facilities and transported for disposal in the Hamlet's existing sewage lagoon.
18. If applicable, discuss how surface water and underground water will be managed and monitored.	N/A	N/A	This is not applicable to the Project.
Waste Water (Grey water, Sewage, Other)			
19. Describe the quantities, treatment, storage, transportation, and disposal methods for the following (where relevant): • Sewage	PSIR	Section 1.15, Table 1-3 (waste)	Estimated quantities of waste are provided in the relevant report sections. Waste will be managed through the Hamlet or stored for appropriate transport to the south.

General Project Information Requirements	Report	Section	Comment
• Camp grey water • Combustible solid waste • Non-combustible solid waste, including bulky items/scrap metal • Hazardous waste or oil • Contaminated soils/snow • Empty barrels/fuel drums • Any other waste produced		Section 1.16.3, Table 1-6 (Chemicals and Hazardous materials)	
20. If the Project proposal includes a landfill or landfarm, indicate the locations on a map, provide the conceptual design parameters, and discuss waste management and contact-water management procedures.	N/A	N/A	This is not applicable to the Project. Waste will be managed through the Hamlet or stored for appropriate transport to the south.
Fuel			
21. Describe the types of fuel, quantities (number of containers, type of containers and capacity of containers), method of storage and containment. Indicate the location on a map where fuel is to be stored, and method of transportation of fuel to Project site.	PSIR	Section 1.16.2, Table 1-5 (fuel) Section 1.15.2, Table 1-3 (solid waste) Section 8.3.4 (Contractors Spill Prevention and	Appropriate measures for the storage and handling of fuel shall be implemented by the contractor. The location for fuel storage will be provided by the contractor.

General Project Information Requirements	Report	Section	Comment
		Response Plan [CSPRP])	
	CEMP (Dynamic Ocean & Worley Consulting, 2025a)	Section 5.4.22 (Hazardous material)	
		Section 5.4.23 (waste management)	
		Section 5.4.24 (CSPRP)	
22. Describe the method of fuel transfer and the method of refuelling.	PSIR	Sections 1.16.2, 8.3.4 (CSPRP)	Appropriate measures will be in place to confirm that fuelling is performed safely. Fuelling near, on and over water may be required depending on the type of equipment used and ocean conditions (e.g., iced ocean).
	CEMP (Dynamic Ocean & Worley Consulting, 2025a)	Sections 5.3.4 (CSPRP), 5.4.22 (Table 5-24), 5.4.23 (Table 5-25), 5.4.24 (Table 5-26)	
23. Describe spill control measures in place.	PSIR	Section 8.3.4 (CSPRP)	Minimum spill response measures are described in the CEMP, which will form the basis for the CSPRP. Appropriate reporting to pertinent AHJs (e.g., Government of Nunavut Department of Environment [GN-DoE]) be undertaken by the contractor's Environmental Monitor (EM).
	CEMP (Dynamic Ocean & Worley Consulting, 2025a)	Sections 5.3.4 (CSPRP), 5.4.22 (Table 5-24), 5.4.23 (Table 5-25), 5.4.24 (Table	

General Project Information Requirements	Report	Section	Comment
		5-26), 5.10.2 (reportable incidents)	
Chemical and Hazardous Materials			
24. Describe the types, quantities (number of containers, the type of container and capacity of containers), method of storage and containment. Indicate the location on a map where material is to be stored, and method of transportation of materials to Project site.	PSIR	Section 1.16.2, Table 1-5 (fuel) Section 1.16.3, Table 1-6 (chemicals and hazardous materials)	Estimated quantities of waste are provided in the relevant report sections. Waste will be managed through the Hamlet or stored for appropriate transport to the south.
25. Describe any secondary containment measures to be employed, including the type of material or system used.	PSIR	Section 1.16.2	Fuelling will be required near the marine environment during construction, but appropriate measures, including secondary containment, will be in place.
	CEMP (Dynamic Ocean & Worley Consulting, 2025a)	Section 5.4.24 (Table 5-26)	
26. Describe the method of chemical transfer.	PSIR	Section 1.16.2, Table 1-5 (fuel), Section 1.16.3, Table 1-6 (chemicals and hazardous materials), Sections 8.3.1 (CCEMP), 8.3.4 (CSPRP)	The contractor will confirm chemicals and quantities that are required, but estimates have been provided in this PSIR. The contractor will provide appropriate storage for the chemicals and will describe transfer methods in the Contractors Construction Environmental Management Plan (CCEMP) (see Section 8.3.1).

General Project Information Requirements	Report	Section	Comment
27. Describe spill control measures in place.	PSIR	Section 8.3.4 (CSPRP)	Minimum spill response measures are described in the CEMP, which will form the basis for the CSPRP. Appropriate reporting to pertinent AHJs (e.g., GN-DoE) be undertaken by the contractor's EM.
	CEMP (Dynamic Ocean & Worley Consulting, 2025a)	Section 5.3.4 (CSPRP), 5.4.24 (Table 5-26)	
Workforce and Human Resources/Socio-Economic Impacts			
28. Discuss opportunities for training and employment of local Inuit beneficiaries.	PSIR	Sections 1.18, Table 3-2 (employment and training opportunities), 7.1.3.1	The Project has provided Inuit Project personnel from Grise Fiord with employment and training opportunities as wildlife monitors, field technicians, ice monitoring specialists, and interpreters/translators since the start of the feasibility phase in 2019. The Project anticipates the community will see further economic benefits and training opportunities with the hiring of local labour, as well as secondary economic benefits through the Project's expenditures in local businesses.
	CEMP (Dynamic Ocean & Worley Consulting, 2025a)	Sections 5.4.19 (Table 5-19), 5.12	
29. Discuss workforce mobilization and schedule, including the duration of work and rotation length, and the transportation of Project personnel to site.	PSIR	Sections 1.12, 1.18, Table 1-2	Mobilization to site is planned for the first sealift of the 2026 open water season. The workday will be restricted to 12-hour workdays. It is expected that construction will be completed in three years, with approximately 120 days per season. The Project personnel rotation schedule will be determined by the contractor.
	CEMP (Dynamic Ocean & Worley Consulting, 2025a)	Sections 3.3, 3.4, Table 3-4	
30. Discuss, where relevant, any specific hiring policies for Inuit beneficiaries.	PSIR	Sections 1.18, 1.1, Table 3-2 (employment and	The Project will comply fully with the GN's Nunavummi Nangminiqaqtunik Ikajuuti (NNI) Policy (01-Apr-17) and will aim to

General Project Information Requirements	Report	Section	Comment
		training opportunities)	maximize participation of Inuit labour, training and Inuit-owned businesses on the Project (GN, 2017).
Public Involvement / Traditional Knowledge			
31. Indicate which communities, groups, or organizations would be affected by this Project proposal.	PSIR	Section 3.2	The Government of Nunavut – Community and Government Services (GN-CGS) and Economic Development and Transportation (GN-EDT) are conducting a comprehensive consultation program to design the Project to serve the top priorities of the community including hunters, fishers, recreational users, residents, and businesses. The consultation program has been designed to include input from hunters, trappers, fishers, residents, and other community groups and organizations obtained through a variety of methods and materials. The consultation program has been successful in gathering input from community residents, hunters, fishers, and other users of the community harbour. The input received resulted in design modifications to meet the needs and priorities of the community. The GN-CGS/EDT will continue to engage with the community to maintain the positive rapport and collaborative relationship they have built with the community.
32. Describe any consultation with interested Parties that has occurred regarding the development of the Project proposal.	PSIR	Section 3.3	
33. Provide a summary of public involvement measures, a summary of concerns expressed, and strategies employed to address any concerns.	PSIR	Section 3.3, 1.1	
34. Describe how traditional knowledge was obtained, and how it has been integrated into the Project.	PSIR	Sections 2.2.8, 4	
35. Discuss future consultation plans.	PSIR	Section 3.5	
Section 2: Project Specific Information			
36. The following table identifies the project types identified in Section 3 of the NIRB, Part 1 Form. Please complete all relevant sections. • It is the proponent's responsibility to review all sections in addition to the required sections to ensure a complete application form.			

Section 2, Table 1: Project Type and Information Required

Project Type	Type of Project Proposal	Information Request
1	All-Weather Road/Access Trail	Section A-1 and Section A-2
6	Pits and Quarries	Section C
7	Offshore Infrastructure (port, break water, dock)	Section D

Section	Report	Section	Comment
Section A: Roads/Trails			
A.1: Project Information			
1. Describe any field investigations and the results of field investigations used in selecting the proposed route (e.g., geotechnical, snowpack).	ESEB (Dynamic Ocean & Worley Consulting, 2025b)	Sections 5 to 10	Field programs were conducted during the feasibility (2019: terrestrial, marine, geology, archaeology, and topographical) and detailed design (2024: marine, geology, archaeology, and topographical) phases of the Project.
2. Provide a conceptual plan of the road, including example road cross-sections and water crossings.	PSIR	Section 2.2.2, Figure 1-1	The haul road will be an existing road with upgrades as required to facilitate the rock trucks. The installation of culverts, if they are required will be the responsibility of the contractor and will be permitted by the NWB.
	CEMP (Dynamic Ocean & Worley Consulting, 2025a)	Section 3.2, Figure 1-1	
	ESEB (Dynamic Ocean & Worley Consulting, 2025b)	Section 1.3.2, Figure 1-1	

Section	Report	Section	Comment
3. Discuss the type and volume of traffic using the road/trail (i.e., type of vehicles and cargo and number of trips annually).	PSIR	Sections 2.2.2, 7.1.3.3	The haul road is an existing road and Project related use will largely be haul trucks moving material from the borrow pits to the community harbour.
4. Discuss public access to the road.	PSIR	Sections 2.2.2, 1.1, Table 3-2	The haul road is an existing road and there will be minimal interruptions to public access. The exception to this is the short durations when there is blasting.
5. Describe maintenance procedures.	PSIR	Section 2.2.2 (haul road)	The contractor will be responsible for the maintenance of the haul road during construction.
6. Describe whether any portion of the road will be located outside of the Nunavut Settlement Area and whether any other regulatory requirements must be met (e.g., *Impact Assessment Act* [IAA]).	N/A	N/A	The Project is exclusively located in Grise Fiord.

Section	Report	Section	Comment
A.2: All-Weather Road/Access Trail			
7. Discuss road design considerations for permafrost.	PSIR	Section 2.2.2	The haul road is an existing road which will have minor localized improvements to accommodate construction traffic. There are no concerns for permafrost.
8. Describe the construction materials (type and sources for materials), and the Acid Rock Drainage (ARD) and Metal Leaching (ML) characteristics of the construction materials.	PSIR	Section 2.2.1	The haul road is an existing road with minor improvements expected materials for which will be sourced from existing or the new borrow pits. ARD for the borrow pits is addressed in Section C No. 16 of this Table of Concordance (TOC).
9. Discuss construction techniques, including timing for construction activities.	PSIR	Sections 1.12, 2.2.2, Table 1-2	Upgrades to the road in the form of a locally widened surface will be required prior to the start of construction and are expected to occur in 2026.
	CEMP (Dynamic Ocean & Worley Consulting, 2025a)	Sections 3.3, 5.3, Table 3-4	
10. Indicate on a map the locations of designated refuelling areas, water crossings, culverts, and quarries/borrow sources.	PSIR	Section 8.3.4 (CSPRP)	The haul route is very short (~2 km) and fueling on the route will not be required. The contractor will be responsible for determining the location for refueling, and water crossings/culverts, should that be required. Refuelling of equipment will occur at the community harbour, borrow pits and contractor laydown area.
11. Identify the proposed traffic speed and measures employed to ensure public safety.	PSIR	Section 7.1.3.3and 8.3.3 (Contractors Traffic Management Plan [CTMP])	A speed limit of 20 km/h will be enforced for the Haul Road and traffic management measures will be in place for public safety.
	CEMP (Dynamic Ocean & Worley Consulting, 2025a)	Section 5.4.20 (Table 5-20)	
12. Describe dust management procedures.	PSIR	Section 8.3.1 (CCEMP)	

Section	Report	Section	Comment
	CEMP (Dynamic Ocean & Worley Consulting, 2025a)	Section 5.4.20.2 (Table 5-21)	The contractor will be responsible for developing a Sediment and Erosion Control (SEC) Plan as part of the CCEMP and will include dust mitigation measures.
Section C: Pits and Quarries			
1. Describe all activities included in this Project. • Pitting • Quarrying • Overburden removal • Road use and/or construction (please complete Section A) • Explosives transportation and storage • Work within navigable waters • Blasting • Stockpiling • Crushing • Washing • Other	PSIR	Section 2.2.1 (quarry and borrow pits), Section 2.2.1.1 (drilling and blasting, crushing and screening and stockpiling)	Construction activities for the permanent components of the Project will include infill, dredging and pile driving. Temporary construction activities will include drilling, blasting, crushing and stockpiling from the borrow pits.
	CEMP (Dynamic Ocean & Worley Consulting, 2025a)	Section 3.2, Table 3-2	
2. Describe any field investigations and the results of field investigations used in determining new extraction sites.	ESEB (Dynamic Ocean & Worley Consulting, 2025b)	Sections 5 – 10	Field programs were conducted during the feasibility (2019: terrestrial, marine, geology, archaeology, and topographical) and detailed design (2024: marine, geology, archaeology, and topographical) phases of the Project.
3. Identify any carving stone deposits.	PSIR	Section 1.1, Table 3-2, Figure 4-1	The contractor will be required to stockpile sufficient carving stone for local residents to use if discovered.
4. Provide a conceptual design including footprint.	PSIR	Section 2.2.1, Drawing 1-1	

Section	Report	Section	Comment
	CEMP (Dynamic Ocean & Worley Consulting, 2025a)	Drawing 1-1	The GN-CGS/EDT are in the planning phase for the development of a Quarry Administration Agreement (QAA) with the Hamlet.
	ESEB (Dynamic Ocean & Worley Consulting, 2025b)	Drawing 1-1	
5. Describe the type and volume of material to be extracted.	PSIR	Section 2.2.1 (pits and quarries), Section 2.1.2.1 (aggregates)	A volume of approximately 100,000 m^3 of rock and granular material, over an area of approximately 7 ha., will need to be borrowed/blasted to support construction of the community harbour.
6. Describe the depth of overburden.	PSIR	Section 6.3.2	Negligible. The borrow pits are exposed bedrock.
7. Describe any existing and potential for thermokarst development and any thermokarst prevention measures.	PSIR	Section 6.3.3 (surface features), Section 6.3.4 (ground stability and permafrost)	The proposed quarry (borrow pits) has the potential for thermokarst development due to the disturbance of surficial soils leading to ice degradation. The contractor will be required to adequately stockpile materials and drain disturbed areas.
8. Describe any existing or potential for flooding and any flood control measures.	PSIR	Sections 6.3.5, 7.1.1.5	There are no concerns for flooding. The area is positively sloped and well draining.
9. Describe any existing or potential for erosion and any erosion control measures.	PSIR	Sections 7.1.1.5, 7.1.1.6, 7.1.1.9, 8.3.1 (CCEMP)	The contractor will be responsible for the implementation of an appropriate SEC program.
	CEMP (Dynamic Ocean & Worley Consulting, 2025a)	Section 5.4.9 (Table 5-9)	

Section	Report	Section	Comment
10. Describe any existing or potential for sedimentation and any sedimentation control measures.	PSIR	Sections 7.1.1.2, 7.1.1.9	The contractor will confirm that appropriate measures are in place for in stockpile, blasting and crushing areas.
11. Describe any existing or potential for slumping and any slump control measures.	PSIR	Section 6.3.2, 6.3.4	The contractor will be required to stockpile materials and adequately drain to minimize the potential for slumping.
12. Describe the moisture content of the ground.	PSIR	Section 6.3.3, 6.3.5	Based on surficial mapping, the quarry (borrow pit) will likely contain ice-rich permafrost.
13. Describe any evidence of ice lenses.	PSIR	Sections 6.3.2, 6.3.3	No direct observations of ice lenses were noted during the site reconnaissance. However, ice lenses are possible in ice-rich permafrost.
14. If blasting, describe methods employed.	CEMP (Dynamic Ocean & Worley Consulting, 2025a)	Section 3.1, Table 3-2	Not yet known, however appropriate permits will be in place, and measures to protect the environment are outlined in the CEMP. Methodology will be determined by the contractor.
15. Describe the explosive type(s), hazard class, volumes, uses, location of storage (show on map), and method of storage.	PSIR	Section 8.3.5 (Contractors Quarry and Blast Management Plan (CQBMP)	The contractor will be responsible for developing and CQBMP.
16. Discuss methods used to determine ARD and ML potential and results.	PSIR	Sections 6.3.2	Surface samples were collected during the feasibility phase (2019) of the Project and from drill cores during the geotechnical drilling program. Lab results confirm that aggregates are not potentially acid generating.
17. Discuss safety measures for the workforce and the public.	PSIR	Section 1.1, Table 3-2 Sections 8.3.2 (Contractors Marine Safety Plan, [CMSP]), 8.3.3 (CTMP), 8.3.6 (Contractors Health, Safety and Emergency Response Plan (CHSERP)	Appropriate safety measures will be in place during Project construction.

Section	Report	Section	Comment
Section D: Offshore Infrastructure			
D.1 Mill (this section refers to the community harbour)			
1. Describe any field investigations and the results of field investigations used in selecting the site (i.e., aerial surveys, bathymetric surveys, tidal processes, shoreline erosion processes, and geotechnical foundation conditions).	ESEB (Dynamic Ocean & Worley Consulting, 2025b)	Section 5 – 7 (marine) Section 8 – 10 (terrestrial)	Field surveys were conducted in 2019 and 2024 (terrestrial, marine, geology, archaeology, and topographical).
2. Provide a conceptual plan, profile description and drawing(s) a) indicating shoreline, b) facility footprint, c) tidal variations, d) required vessel draft, e) keel offset, f) deck height freeboard.	PSIR	a) and b) Section 2.1, Figure 1-1, Drawing 1-1	The community harbour encompasses a permanent footprint that is approximately 40,000 m^2. The seaward extent is approximately 210 m from shore (perpendicular) to a depth range of approximately 0.5 m Chart Datum (CD)
		c) Section 6.3.12	
		d) Section 1.4	
		e) and f) N/A	
3. Discuss how anticipated loads on the seabed foundation and on the offloading platform will be incorporated into the design.	PSIR	Section 2.1.2.2	An area underneath the breakwater will be pre-dredged to increase slope stability if required
4. Describe how small craft vessels will manoeuvre around the facility (e.g., pull alongside or in front).	PSIR	Section 1.5	The Project has been designed to consider the specific needs of marine users.
5. Discuss the anticipated life of the facility.	PSIR	Section 1.8	The community harbour is expected to be a permanent facility in Grise Fiord with a realistic lifespan of greater than 50 years.
6. Describe whether part of the facility or Project will be located outside of the Nunavut Settlement Area and whether any other regulatory requirements must be met (e.g., Impact Assessment Act [IAA]).	N/A	N/A	The community harbour is located in Grise Fiord.
D.2 Facility Construction			

Section	Report	Section	Comment
7. Describe the types of material used for construction (i.e., granular or rock, steel piling or sheet piling, concrete). If material is granular, consider ARD potential, ML potential, percentage of fines, size.	PSIR	Sections 2.2.1, 0	The construction of the community harbour is expected to require typical harbour materials required for its construction including rocks, steel and electrical components. All materials will be brought from outside of Nunavut, except for the rock that will be sourced from the borrow pits.
8. Describe dredging activities.	PSIR	Section 2.1.2.2	The community harbour includes dredging the entrance channel and inner harbour to an elevation of 1.5 m CD. The float area will be dredged to an elevation of 2.5 m CD.
9. Indicate source of granular or rock material used in construction.	PSIR	Figure 1-1 Section 2.2.1, Figure 1-1	Rock will be obtained from the quarry (borrow pit).
10. List quantities of the various types of material used in construction.	PSIR	Section 1.16	Estimates of materials required are provided. However, final quantities will be decided by the contractor.
11. Describe construction method(s).	PSIR	Section 2.1.2	It is expected that construction will be completed using land-based equipment. However, the Contractor may decide to support with marine-based equipment.
	CEMP (Dynamic Ocean & Worley Consulting, 2025a)	Section 3.1, Table 3-1, Table 3-2	
12. Indicate whether a site engineer will be on-site to inspect construction.	-	-	A full-time engineer will be on-site throughout construction.
13. If the proposed construction method involves dumping of fill into water, discuss measures for mitigating the release of suspended solids.	CEMP	Sections 5.4.8 (Table 5-8) (sediment and water quality), 5.5.5 (Table 5-27) (turbidity)	Infill activity will be performed to support Project construction, and appropriate measures will be in place to manage for potentially negative environmental effects such as turbidity.
D.3: Facility Operation			
	PSIR	Section 2.1.4, 8.4	

Section	Report	Section	Comment
14. Describe maintenance activities associated with the facility (e.g., dredging, maintenance to account for potential settlement of facility).	CEMP (Dynamic Ocean & Worley Consulting, 2025a)	Sections 3.7, 3.8	The GN-EDT will be responsible for the operations of the community harbour and will develop and implement plans for all aspects of the harbour operations and maintenance.
15. Discuss whether the public will have access to the facility(s) and describe public safety measures.	PSIR	Section 1.9	The community harbour is a public facility and will not have access restrictions.
16. Describe cargo and container handling, transfer and storage facilities.	N/A	N/A	The community harbour will not be used for sealift delivery. The facility does not have any cargo and/or container handling areas.
17. Indicate whether fuel will be transferred from barges at this site and describe the method of that fuel transfer.	PSIR	Section 1.16.2, Table 1-5	Barges will not use the harbour.
18. Discuss frequency of use.	PSIR	Section 1.4	The community harbour will be used throughout the open-water season.
D.4: Vessel Use in Offshore Infrastructure			
19. Please complete Section H.			
Section 4.0: Description of the Existing Environment			
38. Describe the existing environment, including physical, biological and socioeconomic aspects. Where appropriate, identify Local Study Area (LSA) and Regional Study Area (RSA). a. Please note that the detail provided in the description of the existing environment should be appropriate for the type of Project proposal and its scope. b. The following is intended as a guide only.	PSIR	Section 6, Figure 1-1	No RSA was developed for the Project, as it is expected to be reviewed by the NIRB as a Part 4 Screening, not a Part 5 Environmental Assessment. The LSA is considered to be the Study Area developed for the Project. There are no impacts outside of the LSA as shipping is not an activity.
Physical Environment			
	PSIR	Section 6.3	

Section	Report	Section	Comment
39. Please note that a description of the physical environment is intended to cover all components of a project, including roads/trails, marine routes, etc. that are in existence at present time. a. Proximity to protected areas, including: i. designated environmental areas, including parks; ii. heritage sites; iii. sensitive areas, including all sensitive marine habitat areas; iv. recreational areas; v. sport and commercial fishing areas; vi. breeding, spawning and nursery areas; vii. known migration routes of terrestrial and marine species; viii. marine resources; ix. areas of natural beauty, cultural or historical history; x. protected wildlife areas; and xi. other protected areas. b. Eskers and other unique landscapes (e.g. sand hills, marshes, wetlands, floodplains). c. Evidence of ground, slope or rock instability, seismicity. d. Evidence of thermokarsts. e. Evidence of ice lenses. f. Surface and bedrock geology. g. Topography. h. Permafrost (e.g., stability, depth, thickness, continuity, taliks).	ESEB (Dynamic Ocean & Worley Consulting, 2025b)	Section 3.2 (designated areas) Section 4.9 – 4.10 (oceanography, ice and weather) Section 5 (water and sediment quality)	Grise Fiord is in close proximity to the Tallurutiup Imanga (TI) National Marine Conservation Area (approximately 55 km to the southeast).

Section	Report	Section	Comment
i. Sediment and soil quality. j. Hydrology/limnology (e.g., watershed boundaries, lakes, streams, sediment geochemistry, surface water flow, groundwater flow, flood zones). k. Tidal processes and bathymetry in the Project area (if applicable). l. Water quality and quantity. m. Air quality. n. Climate conditions and predicted future climate trends. o. Noise levels. p. Other physical Valued Ecosystem Components (VEC) as determined through community consultation and/or literature review.			
Biological Environment			
• Vegetation (terrestrial as well as freshwater and marine where applicable). • Wildlife, including habitat and migration patterns. • Birds, including habitat and migration patterns. • Species of concern as identified by federal or territorial agencies, including any wildlife species listed under the Species at Risk Act (SARA), its critical habitat or the residences of individuals of the species. • Aquatic (freshwater and marine) species, including habitat and migration/spawning patterns. • Other biological VEC as determined through community consultation and/or literature review.	PSIR ESEB (Dynamic Ocean & Worley Consulting, 2025b)	Section 6.4 Sections 3.1, Table 3-2 (Species at Risk [SAR]), 6 – 7 (fish and fish habitat, marine mammals), 8 – 10 (terrestrial vegetation and wildlife, migratory birds)	The habitat values within the Project Study Area were generally low to moderate in the marine portions and low in the terrestrial portions. Several Species at Risk (SAR) have the potential to be present in the Study Area, but the Study Area does not provide critical habitat requirements for these species.

Section	Report	Section	Comment
Socio-economic Environment			
• Proximity to communities. • Archaeological and culturally significant sites (e.g., pingos, soap stone quarries) in the Project (LSA) and adjacent area (RSA). • Paleontological component of surface and bedrock geology. • Land and resource use in the area, including subsistence harvesting, tourism, trapping and guiding operations. • Local and regional traffic patterns. • Human Health, broadly defined as a complete state of wellbeing (including physical, social, psychological, and spiritual aspects). • Other Valued Socioeconomic Components (VSEC) as determined through community consultation and/or literature review.	PSIR	Section 6.5	There are no archaeologically, paleontologically or culturally significant sites near the Project. Harvesting in Grise Fiord includes of shoreline clam beds and kelp.
	ESEB (Dynamic Ocean & Worley Consulting, 2025b)	Section 11 (socio-economic environment)	
Section 5.0: Identification of Impacts and Proposed Mitigation Measures			
40. Please complete the attached Table 1 - Identification of Environmental Impacts, taking into consideration the components/activities and Project phase(s) identified in Section 4 of this document. Identify impacts in Table 1 as either Positive (P), Negative and Mitigable (M), Negative and Non-mitigable (N), or Unknown (U).	PSIR	Table 7-1 (assessment categories), Table 7-2(effects assessment)	With the exception of the loss of seabed footprint due to the construction of the community harbour, there are no residual effects expected subsequent to the implementation of Project mitigation and monitoring measures. A CEMP (Dynamic Ocean & Worley Consulting, 2025a) has been developed that details measure to be implemented to minimize negative environmental and socio-economic effects associated with the construction phase of the Project. While residual effects to the marine environment are not expected this will be further confirmed with Fisheries and Oceans Canada – Fish and Fish Habitat
	CEMP (Dynamic Ocean & Worley Consulting, 2025a)	Section 4, Table 4-1, Appendix B (Table B-1)	
41. Discuss the impacts identified in the above table.	PSIR	Section 7.1.1 (physical), 7.1.2 (biological), 7.1.3 (socioeconomic)	

Section	Report	Section	Comment
		7.2 (operations)	Program (DFO-FFHPP) during the Request for Review (RFR) process.
42. Discuss potential socioeconomic impacts, including human health.	PSIR	Section 7.1.3	
43. Discuss potential for transboundary effects related to the Project.	PSIR	Section 7.5	
44. Identify any potentially adverse effects of the Project proposal on species listed under the SARA and their critical habitats or residences, what measures will be taken to avoid or lessen those effects and how the effects will be monitored.	PSIR	Sections 7.1.2.6 (construction), 7.2.2.6 (operations)	
45. Discuss proposed measures to mitigate all identified negative impacts.	PSIR	Section 7	
	CEMP (Dynamic Ocean & Worley Consulting, 2025a)	Sections 5.4 (mitigation), Section 5.5 (monitoring)	

Section	Report	Section	Comment
Section 6.0: Cumulative Effects			
46. A cumulative impact (or effect) can be defined as the impact on the environment that results from the incremental impact of the action when added to other past, present and reasonably foreseeable future actions. Cumulative impacts can also result from individually minor but collectively significant actions taking place over a period of time. • Discuss how the effects of this Project interact with the effects of relevant past, present and reasonably foreseeable projects in a regional context.	PSIR	Section 7.4 (Table 7-3)	The GN-CGS is the proponent for three hamlet infrastructure improvement projects, one of which is this Project. The other two are as below: • Water Treatment Facility (NPC No. 150165, NIRB No. 23XNO69)(NPC, 2023a). • Solid Waste Facility (NPC No. 150230, NIRB No. 25XNO06) (NPC, 2024a). The main impact of these three projects would be for camp requirements if there was construction schedule overlap. Since these are all GN-CGS projects, the GN will collaborate internally to address this issue and work with the hamlet of Grise Fiord to minimize negative impacts to the community. A fourth project, the Grise Fiord Power Plant (NPC No. 125042, NIRB No. 17XN001) occurred within Grise Fiord. However project construction is complete and the facility has been operational since Oct-22 (CIRNAC, 2022), therefore there will no cumulative effects between the projects.
Section 7.0: Supporting Documents			
47. Supporting Documents: • CEMP. • ESEB Report.	N/A	N/A	Several documents have been developed to support the detailed design and permitting phase to support the construction and operation of the Grise Fiord Community Harbour.

Section	Report	Section	Comment
• Grise Fiord Harbour Development – Community Consultations (First and Second reports). • Archaeological Impact Assessment (AIA). • Grise Fiord Community Harbour Development – First and Second Consultation Summary Reports. • Community and Stakeholder Consultation Log.			

Acronyms and Abbreviations

Acronyms / Abbreviation	Definition
AFA	Arctic Fisheries Alliance
AHJ	Authorities Having Jurisdiction
AIA	Archaeological Impact Assessment
AIS	Automatic Identification System
ARD	Acid Rock Drainage
ATV	All-Terrain Vehicle
BMP	Best Management Practices
CAAQS	Canadian Ambient Air Quality Standards
CAD	Computer-Aided Design
CCEMP	Contractors Construction Environmental Management Plan
CCG	Canadian Coast Guard
CCME	Canadian Council of Ministers of the Environment
CD	Chart Datum
CEMP	Construction Environmental Management Plan
CEPA	Canadian Environmental Protection Act
CHSERP	Contractors Health and Safety and Emergency Response Plan
CIRNAC	Crown-Indigenous Relations and Northern Affairs Canada
CMSP	Contractors Marine Safety Plan
CNWA	*Canadian Navigable Waters Act*
COSEWIC	Committee on the Status of Endangered Wildlife in Canada
CSPRP	Contractors Spill Prevention and Response Plan
CTMP	Contractors Traffic Management Plan
CQBMP	Contractors Quarry and Blast Management Plan
CWP	Construction Work Plans
CWS	Canadian Wildlife Services
DAS	Disposal at Sea
DFO	Fisheries and Oceans Canada
DFCA	Disko Fan Conservation Area
DFO-FFHPP	DFO-Fish and Fish Habitat Protection Program
DFO-SCH	DFO-Small Craft Harbours
DIO	Designated Inuit Organization
DoF	Death of Fish
DSCA	Davis Strait Conservation Area
Dynamic Ocean	Dynamic Ocean Consulting Ltd.

Acronyms / Abbreviation	Definition
EA	Environmental Assessment
ECCC	Environment and Climate Change Canada
ELC	Ecological Land Classification
EM	Environmental Monitor
ESBA	Ecologically and Biologically Significant Area
ESEB	Environmental and Socio-Economic Baseline
ESWG	Ecological Stratification Working Group
EZ	Exclusion Zone
FAA	*Fisheries Act* Authorization
Frontier	Frontier Geosciences Inc.
GBF	Global Biodiversity Framework
GIS	Geographic Information System
GN	Government of Nunavut
GN-C&H	GN-Department of Culture and Heritage
GN-CGS	GN-Community and Government Services
GN- DoE	GN- Department of Environment
GN-EDT	GN-Economic Development and Transportation
GN-TIN	GN-Departments of Transportation and Infrastructure
HADD	Harmful alteration, disruption or destruction
HHWLT	Higher High Water Large Tide
HHWMT	Higher High Water Mean Tide
HRQ	Haul Road Quarry
HTA	Hunters and Trappers' Association
HTO	Hunters and Trappers' Organization
HWL	High Water Line
IAA	*Impact Assessment Act*
IBA	Important Bird Area
IIBA	Inuit Impact and Benefit Agreement
INAC	Indigenous and Northern Affairs Canada
IOL	Inuit Owned Land
IPCC	Intergovernmental Panel on Climate Change
IQ	Inuit Qaujimajatuqangit
IR	Information Request
IUCN	International Union for Conservation of Nature
LLWLT	Lower Low Water Large Tide
LLWMT	Lower Low Water Mean Tide

Acronyms / Abbreviation	Definition
LOA	Letter of Advice
LSA	Local Study Area
LUP	Land Use Permit
MBS	Migratory Bird Sanctuaries
MCTS	Marine Communications and Traffic Services
ML	Metal leaching
MMO	Marine Mammal Observers
MoU	Memorandum of Understanding
MPA	Marine Protected Area
MWL	Mean Water Level
NAAQS	Nunavut Ambient Air Quality Standards
NAPS	National Air Pollutant Surveillance
Nauttiqsuqtiit	The Guardians
NavCan	NavCanada
NAVWARNs	Navigational Warnings
NBRLUP	North Baffin Regional Land Use Plan
NCRI	Nunavut Coastal Resource Inventory
NEAS	Nunavut Eastern Arctic Shipping
NGMP	Nunavut General Monitoring Plan
NHC	Nunavut Housing Corporation
NIRB	Nunavut Impact Review Board
NLCA	Nunavut Land Claims Agreement
NMC	Nunavut Marine Council
NNI Policy	Nunavummi Nangminiqaqtunik Ikajuuti Policy
NO_2	Nitrogen Dioxide
NOAA	National Oceanic and Atmospheric Administration
NOTAM	Notice to Airmen
NoW	Notice of Works
NOx	Nitrogen Oxide
NPC	Nunavut Planning Commission
NPP	Navigation Protection Program
NRCan	Natural Resources Canada
NSA	Nunavut Settlement Agreement
NSIDC	National Snow & Ice Data Center
NSSI	Nunavut Sealink and Supply Inc.
NTI	Nunavut Tunngavik Incorporated

Acronyms / Abbreviation	Definition
NuPPAA	*Nunavut Planning and Project Assessment Act*
NWA	Nunavut Wildlife Area
NWB	Nunavut Water Board
NWHS	Nunavut Wildlife Harvest Study
NWMB	Nunavut Wildlife Management Board
NWNSRTA	*Nunavut Waters and Nunavut Surface Rights Tribunal Act*
NWT	Northwest Territories
O_3	Ozone
OEMP	Operations Environmental Management Plan
OHWM	Ordinary High-Water Mark
PAG	Potential for Acid Generation
PAH	Polycyclic Aromatic Hydrocarbon
PCB	Polychlorinated Biphenyl
PM_{10}	Particulate matter 10 micrometres or less
$PM_{2.5}$	Particulate matter less than 2.5 µm
PPD	Petroleum Products Division
PSIR	Project Specific Information Requirement
PSPC	Public Services and Procurement
QAA	Quarry Administration Agreement
QEC	Qulliq Energy Corporation
QIA	Qikiqtani Inuit Association
QWB	Qikiqtaaluk Wildlife Board
RCMP	Royal Canadian Mounted Police
RDL	Reportable detection limit
RFR	Request for Review
RIA	Regional Inuit Associations
RNLUP	Recommended Nunavut Land Use Plan
ROV	Remote Operated Vehicle
RSA	Regional Study Area
SAR	Species at Risk
SARA	*Species at Risk Act*
SCF	Small Communities Fund
SDR	Screening Decision Report
SEC	Sediment and erosion control
SO_2	Sulphur Dioxide
SRP	Standard Response Protocol

Acronyms / Abbreviation	Definition
TC	Transport Canada
TOC	Table of Concordance
The Project	Grise Fiord Community Harbour
TI NMCA	Tallurutiup Imanga National Marine Conservation Area
TSP	Total Suspended Particles
TSS	Total Suspended Solids
VEC	Valued Ecosystem Component
VHF	Very High Frequency
VSEC	Valued Socio-Economic Component
WSCC	Workers' Safety and Compensation Commission

1 General Project Information Requirements

This document is the Project Specific Information Requirement (PSIR) supplementary report for the Grise Fiord Community Harbour Project (the Project). The purpose is to support the Nunavut Impact Review Board (NIRB) Screening.

The Tallurutiup Imanga National Marine Conservation Area (TI NMCA) is an important designated area located in the Canadian Arctic, specifically in Lancaster Sound (Tallurutiup Imanga) and its adjacent waterways. This conservation area was established to protect and preserve the unique and ecologically important marine environment for Inuit and all Canadians. Establishment of protected areas within Canada's high Arctic basin, such as the TI NMCA, is a requirement of the Inuit Impact and Benefit Agreement (IIBA). A Memorandum of Understanding (MoU) between the Qikiqtani Inuit Association (QIA), the Government of Nunavut (GN), and the Government of Canada has resulted from the creation of the TI NMCA and was signed in the summer of 2021. The purpose of this agreement is to recognize that marine infrastructure is connected to community wellbeing as well as economic and social development, and to address the marine infrastructure deficit in several communities, including Grise Fiord and Resolute Bay. A portion of the waterfront within the several communities (such as Grise Fiord) that are within the TI NMCA is excluded through Article 4 of the IIBA (IIBA, 2019) to allow for the development of marine infrastructure. This will be accomplished with funding from the Government of Canada for a community harbour in both Grise Fiord and Resolute Bay.

The Project is being managed by the GN, where GN-Community and Government Services (CGS) is the proponent during the construction stage, and ownership will transfer to GN – Economic Development and Transportation (GN-EDT) during the operations stage. The two GN departments are working collaboratively on the Project and are collectively referred to as GN-CGS/EDT as the proponent for the permitting of the Grise Fiord community harbour. Effective 01 April 2025, GN-CGS and GN-EDT, will be merged and referred to as the Departments of Transportation and Infrastructure (GN-TIN) (GN, 2024b).

Worley Canada Services Ltd., operating as Worley Consulting, has been retained by the GN-CGS/EDT to support the detailed design of a community harbour in Grise Fiord, Nunavut (see Figure 1-1). Dynamic Ocean Consulting Ltd. (Dynamic Ocean) is supporting Worley Consulting on the permitting requirements for the Project. The Grise Fiord community harbour was a component of an earlier feasibility study, completed by Fisheries and Oceans Canada - Small Craft Harbour (DFO-SCH) in 2019.

1.1 Project Location

The Project is located in the community of Grise Fiord, which is approximately 1,100 km north of the Arctic Circle (76° 25.001'N, 82° 54.935'W, see Figure 1-1). The community is located on the southern shore of Ellesmere Island in Jones Sound in the Qikiqtaaluk Region of Nunavut, and conforms with the North Baffin Regional Land Use Plan (NBRLUP) (Nunavut Planning Commission (NPC, 2000)). While Grise Fiord is within the NBRLUP, the Recommended Nunavut Land Use Plan (RNLUP) (NPC, 2023c) will replace the NBRLUP once it is approved.

1.2 Project Overview

The Project will improve safety and access to water, functionality of boating activities, and reduce the congestion and environmental risks associated with the current situation (see Section 1.3).

The permanent components of the Project include the construction of:

- Two new breakwaters (to create a protected harbour).
- Boat launch ramp.
- Two small craft floating docks to support mooring of small craft vessels.
- Laydown Area.
- Shoreline raised and graded to create a level driving surface.
- Navigational aids.
- Harbour lighting.

Dredging is required on the leeward side of the breakwater; there will be a dredged berth pocket and approach channel allowing all tide vessel access for small craft vessels (see Section 2.1.2.2 for details).

A General Arrangement of the community harbour is provided in Drawing 1-1. The final arrangement of the community harbour may change through the design development phase of the Project as GN-CGS/EDT plans to continue consulting with the community to refine the Project design; however, any design modifications that do occur, are not expected to change the predicted environmental effects discussed in this PSIR. Temporary components to support construction includes a quarry (borrow pits) and haul road, with the borrow pits required to supply rock for construction, and a haul road to transport rock from the borrow pits to the community harbour. Project components are further described in Section 2.1.1.

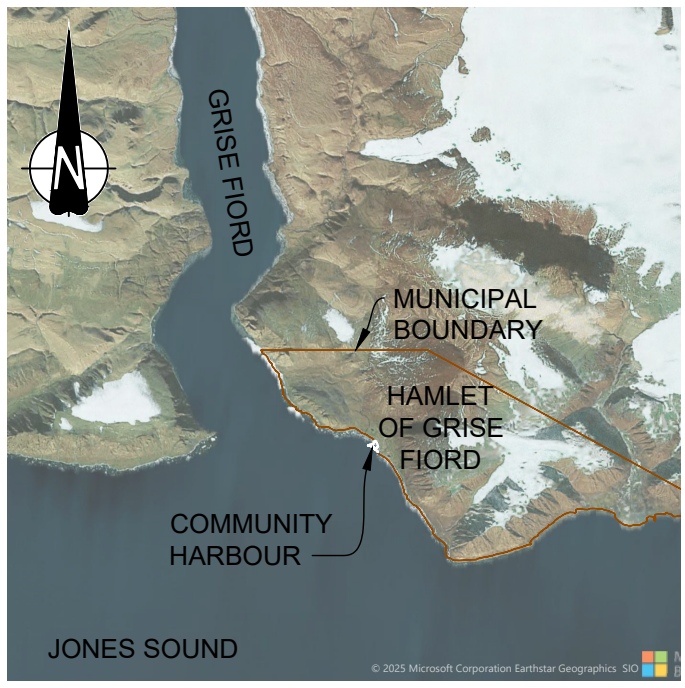
Construction is anticipated to require four years and is planned to occur from the open-water seasons of 2026 through to 2029.

During construction, the Project will use the existing scheduled sealift deliveries and chartered flights for cargo and construction crew, with limited use of scheduled flights. Potable water, sanitary and solid waste disposal are anticipated to be provided via existing facilities. Fuel supply may use existing facilities, if there is sufficient capacity and quantity. If the existing facilities are not adequate, the contractor will be required to install temporary fuel storage facilities and/or arrange additional fuel shipments. Construction crew accommodations will be provided by a construction camp to be established by the construction contractor.

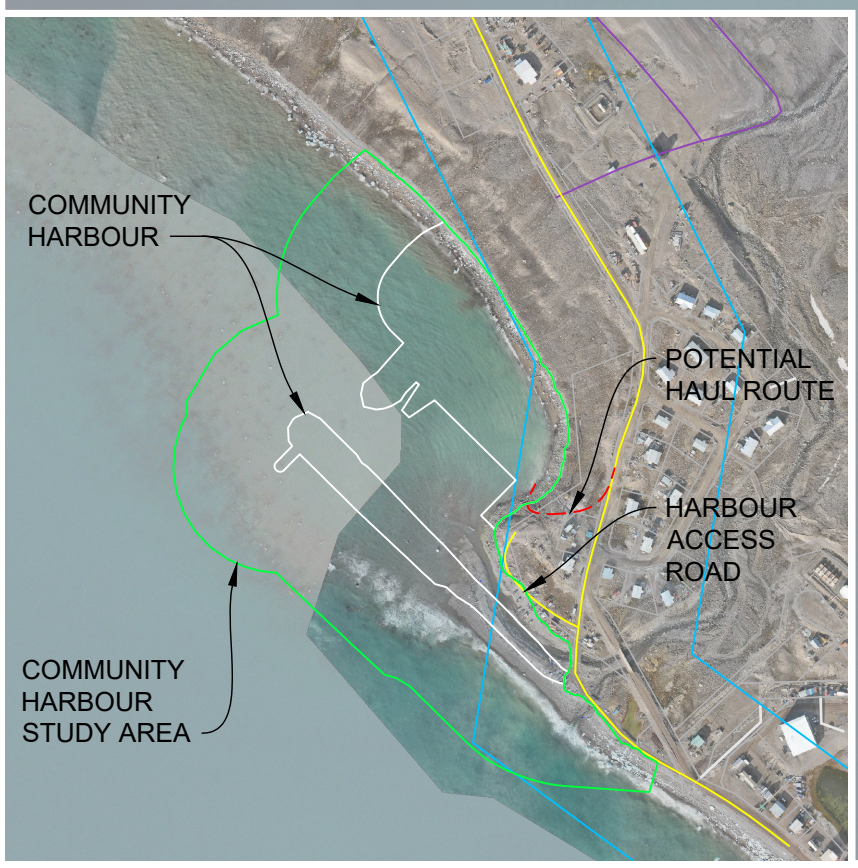
FILE LOCATION: U:\YVR\317086\54170_GON_GRISEFIORD\11_DRAWINGS\14_ENV_PLANNING\NIRB\2025\317086-54170-00-MA-FIG-NIRB2025.DWG

PLOT DATE & TIME: 3/4/2025 12:39:24 PM
SAVE DATE & TIME: 3/4/2025 12:38:53 PM
USER NAME: jennifer.coppendale
ISSUING OFFICE: VANCOUVER, B.C.

QUARRY LOCATION 2C
POTENTIAL ALTERNATE HAUL ROUTE
QUARRY LOCATION 2D
QUARRY LOCATION 2B
HAUL ROUTE
QUARRY LOCATION 2A
HAUL ROUTE
POTENTIAL STOCKPILE / LAYDOWN / AGGREGATE PRODUCTION AREAS
SEWAGE LAGOON
AIRPORT KUURAALUK
VALLEY CREEK
COMMUNITY HARBOUR
COMMUNITY HARBOUR STUDY AREA
HAMLET OF GRISE FIORD
KUURAALUK CREEK



KEY PLAN
1:300000



INSET PLAN
1:7500

PLAN
1:15000

LEGEND

- HAUL ROAD ON EXISTING ROAD/TRACK
- ALTERNATE/ADDITIONAL HAUL ROUTE
- COMMUNITY STUDY AREA
- QUARRIES STUDY AREA
- EXISTING ROAD STUDY AREA
- STOCKPILE/LAYDOWN AREA
- QUARRY

m 0 100 200 300 400 m
1:7500

m 0 100 500 1000m
1:15000

GOVERNMENT OF NUNAVUT
GRISE FIORD COMMUNITY
HARBOUR DEVELOPMENT

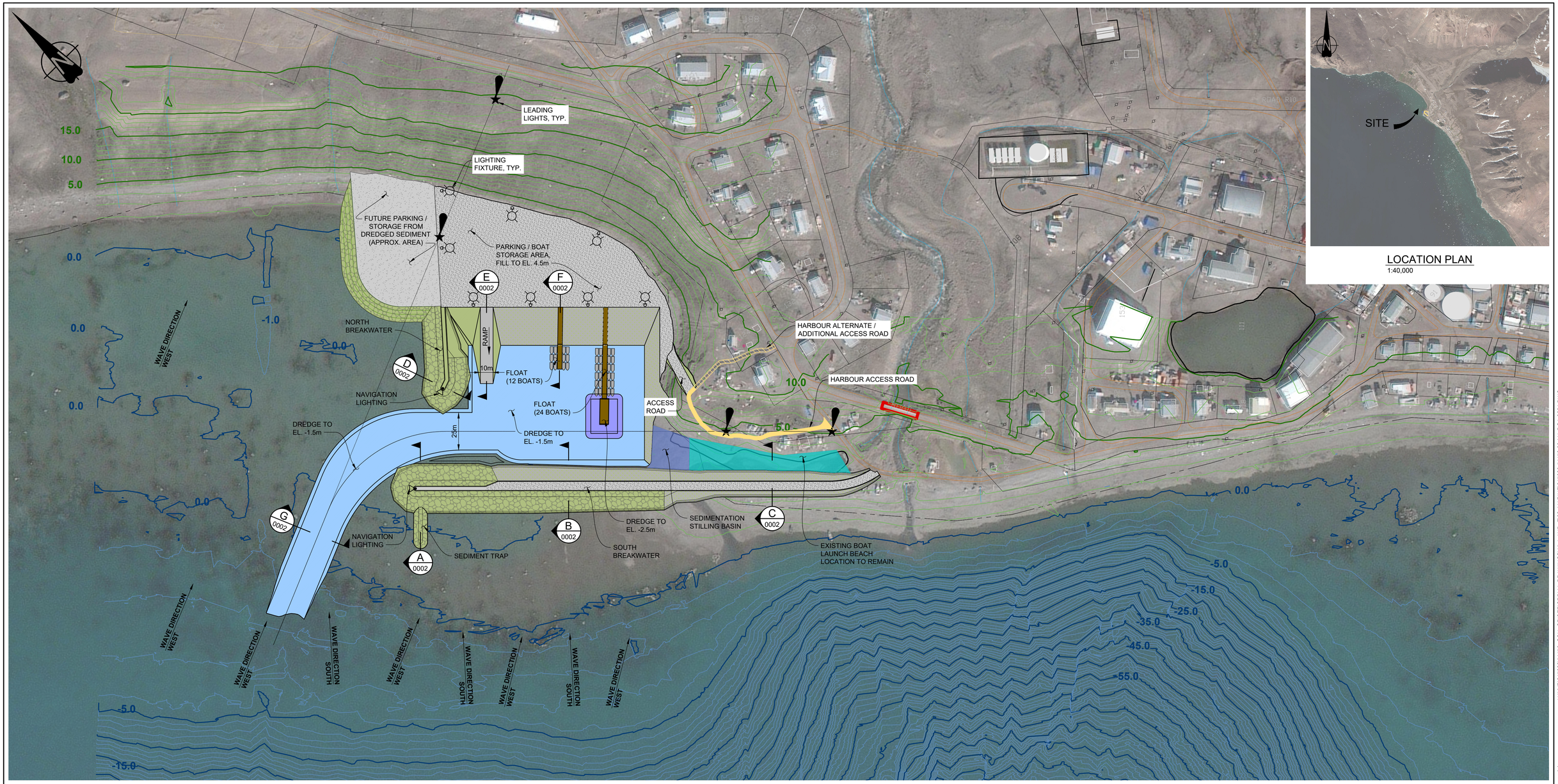
Figure 1-1 **PROJECT COMPONENTS (QUARRY, HAUL ROAD, COMMUNITY HARBOUR)**

Date:	Drawn by:	Edited by:	App'd by:
03-APR-25	JLC	JLC	CM

Worley Project Number: 317086-54170
DRG No: 1
REV: 1

This drawing is prepared for the use of the contractual customer of Worley Canada Services Ltd. and Worley Canada Services Ltd. assumes no liability to any other party for any representations contained in this drawing.

WPC_B_FSK



PLAN
1:1500

LOCATION PLAN
1:40,000

m 0 10 20 30 40 50 100 m

1:1500

NOTES:

1. WATER DEPTHS WITHIN THE SURVEY BOUNDARY PROVIDED BY FISHERIES AND OCEANS CANADA. SURVEY WAS PERFORMED ON SEPTEMBER 22, 2018 BY AQUATICS-ESI, PROJECT NO. 18S022002, DRAWING NO. A1, REVISION 2, DATED 19/01/07

REV	DATE (DD-MMM-YY)	REVISION DESCRIPTION	DRAWN	DRAFT CHK	DESIGNED	ENG CHK	APPROVED	QAR	REF DRAWING No	REFERENCE DRAWING TITLE
B	28-NOV-24	ISSUED FOR REVIEW	JLC	-	CM	DH	CM	-		
A	29-JUL-24	ISSUED FOR REVIEW	JLC	-	CM	DH	CM	-		

D SHEET | SCALE | SHOWN

WORLEY PROJECT No
317086-54170

ENGINEERING AND PERMIT STAMPS (As Required)

PRELIMINARY
DO NOT USE FOR CONSTRUCTION
Last Saved: Nov. 28/24 2:07pm

CUSTOMER

Nunavut
Building Nunavut Together
Nunavuliuqatigiingniq
Bâtir le Nunavut ensemble

"This drawing is prepared for the use of the contractual customer of Worley Canada Services Ltd. and Worley Canada Services Ltd. assumes no liability to any other party for any representations contained in this drawing."

worley consulting

Drawing 1-1

GRISE FIORD
COMMUNITY HARBOUR
PLAN

DRG No
317086-54170-00-MA-DGA-0001

REV
B

LOCATION: U:\YVR\317086\54170_GCN_GRISEFIORD\11_DRAWINGS\15_I_AND_E\02_MARINE\317086-54170-
USER NAME: jennifer.coppendale
PLOT DATE & TIME: 28/11/2024 2:08:21 PM
SAVE DATE & TIME: 28/11/2024 2:07:45 PM

1.3 Existing Infrastructure

The community of Grise Fiord does not currently have an established harbour. Some community members are mooring their small craft vessels in a rudimentary, tidally restricted mooring basin on the north-west side of the shoreline that fronts the community (see Photo 1-1) and others, dependent on access trailers, will store their small craft vessels along the full stretch of the shoreline. The mooring basin is in one of two arms of the mouth of the Kuuraaluk Creek. The creek is a non-fish bearing waterbody that runs through the centre of the community and is generally fed by glacial melt and rainwater. For most of the year, the water flows are low, except during the spring melt. The mooring basin is manmade; however, details related to its construction are not known. According to residents, the creek was partially diverted to direct partial discharge into the mooring basin via a group of culverts (Photo 1-2, panel a and b). Low tide access is challenging, whether small craft vessels are launched from the beach, or in the mooring basin. The mooring basin is intertidal, and there are large boulders along the shoreline, in combination with shallow nearshore water depths. Reportedly, the protecting berm of the mooring basin is being eroded from wave action and wash into the mooring basin arm of the creek, with the material being cleared by the Hamlet. The only other marine infrastructure consists of two mooring bollards for the fuel resupply tanker.

In 2010, the GN supplied the community with a large twin-pontoon float. The floats were found to be awkward to handle, given their weight and the exposed nature of the site, and were of limited use, as was the case with many communities where similar floats were provided. The community's only current use of the float is to carry lighter cargo from the Arctic Fisheries Alliance (AFA) vessel anchored offshore.

The southeast shoreline is lined with shacks used for storing sleds, snowmobiles, and small craft vessels (Photo 1-2, panel c and d). Small craft vessels in this area are launched with trailers directly from the beach. The shoreline is very low lying and is very close to high water level. Reportedly, the area floods and exhibits erosion during extreme storm events, which is not surprising given the elevation of the beach. The cause and impact are being investigated by university researchers. Residents have requested that this area of beach be protected by riprap armouring; however, this is not a scope of the Project.

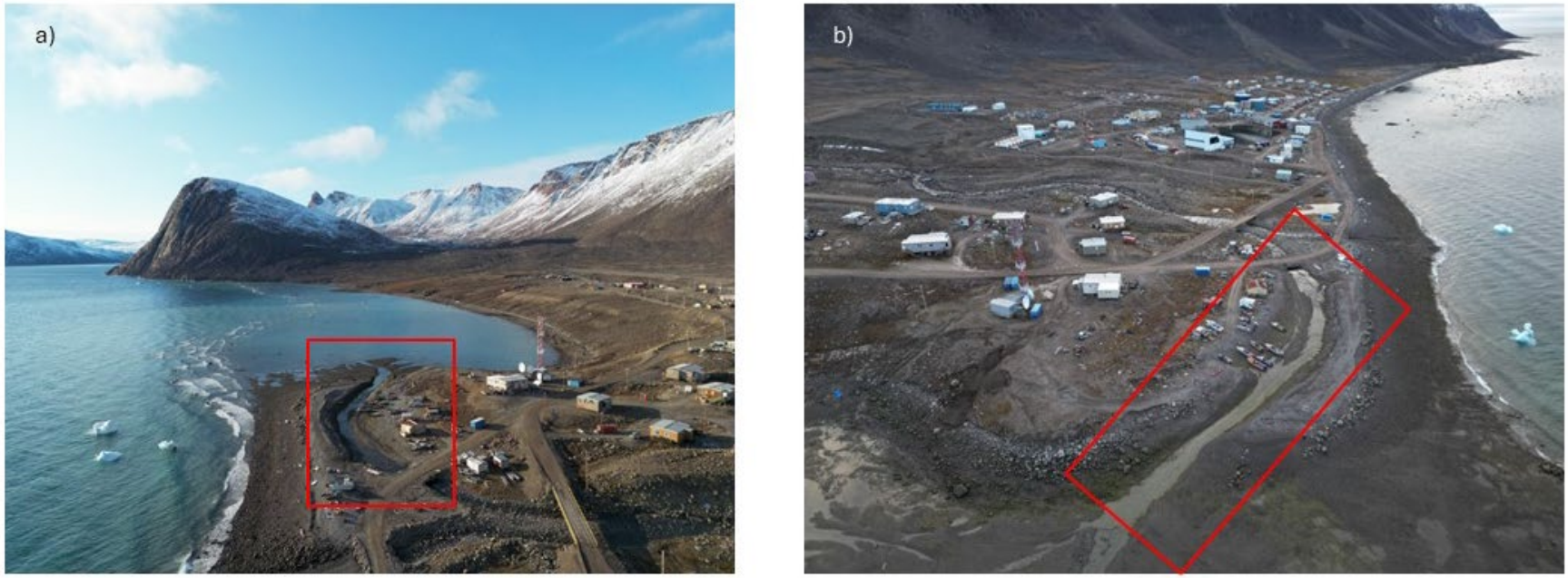


Photo 1-1: Existing Mooring Basin on West Shore of Grise Fiord

Source: Dynamic Ocean, 2024









Photo 1-2: Demonstrative Photos of Grise Fiord a) Shoreline of Grise Fiord at mooring basin; b) Culvert Upstream of Mooring Basin; c) Grise Fiord southeast shoreline; d) Shacks along southeast shoreline

Source: Dynamic Ocean and Worley Consulting, 2024

1.4 Community Harbour Purpose and Vessels (New and Existing)

The Project is designed to serve existing small boat users, such as hunters and fishers, outfitters, and recreational users, with the objective of improving access and safety for existing and future users. The community of Grise Fiord may also allow the facility to be used by other industries such as cruise ship tenders.

The construction of a community harbour in Grise Fiord is being proposed to support safe access to the land and sea in the context of rapid environmental changes in the Arctic and in support of community fish and marine mammal harvesting.

The type of vessels expected to use the facility are small crafts. Small craft vessels are intended to use floating docks located along the shoreline of the community harbour. The small craft floats will be designed based on the average size of local small craft vessels, which are approximately 8 m long with a beam of 3 m. The community harbour will have approximately 36 boat slips using two float strings (see Drawing 1-1).

A commercial fishery, should it be developed in the future, is not part of this NIRB screening application.

1.5 Community Benefits

The Project will improve safe access to water and the functionality of boating activities, address safety concerns and environmental risks associated with current boating operations, reduce congestion, and provide all tide access in the community. Small craft users, including hunters, fishers, outfitters, recreational users and potentially cruise ship tenders (if allowed by the community), will have safer and protected access to the water.

The new breakwaters will provide protection from winds and waves, which was a safety concern expressed during consultation with the community. The dredged community harbour basin and entrance channel will provide all-tide access. The new vessel launch will allow users to safely launch and retrieve small craft vessels in all tides. The Project will improve day-to-day operations and safety for users by establishing a laydown area adjacent to the shoreline. The laydown area will provide ample room for vehicle and boat trailer traffic, and parking for vehicles, small craft vessels and trailers. Further amenities of the design include an improved shoreline (grading and levelling to create a driving surface) and better lighting (navigation lights at the community harbour entrance). Vessel access to the west mouth of Kuuraaluk creek is planned to be maintained.

1.6 Project Alternatives & Selected Options

The Project components include temporary and permanent components, which are marine and terrestrial. Temporary components are terrestrial and include a quarry (borrow pits) and haul road; the borrow pits to supply rock for construction, and a haul road to transport rock from the borrow pits to the community harbour. The permanent component is the community harbour, and is primarily marine with small portions that are terrestrial (Figure 1-1 (community harbour location and components); Drawing

1-1 (general arrangement of community harbour)). Potential requirements for a contractor laydown area are discussed in Section 2.1.1.2**.**

The selected locations to be used for the Project components are discussed in this section. Site selection is determined by a variety of variables including harbour usage, environmental, regulatory, socio-economic, constructability, geological and engineering characteristics, cost, and future maintenance requirements.

1.6.1 Community Harbour

Three harbour location options were considered for Grise Fiord. These options had been conceptualized in collaboration with DFO-SCH in the early feasibility study in 2019. The generalized arrangements form the basis of this study and were developed based on the local knowledge and feedback received during community consultations in the feasibility (2018) and schematic alternative design (2024) phases. Option 1 (community harbour), located to the northwest, was the chosen design. Option 2 and 3 are southeast of Option 1. Option 1 was selected as the preferred option, since it was the best for working with the natural landscape (within a sheltered bay) and providing maximum protection from waves for small craft vessels (see Drawing 1-1), and better constructability. Option 1 was also the preferred choice through community consultation.

1.6.2 Quarry (Borrow Pits)

Initial quarry (borrow pits) locations were developed as part of the community consultations in the feasibility (2018). Based on community feedback of preferred locations, four borrow pit locations (surficial deposits) were identified (see Figure 1-1). The locations were selected through a review of aerial imagery, community consultations during the feasibility and design consultation programs, and the 2019 feasibility phase field program. These four borrow pits were investigated during the 2024 detailed design phase field program to determine the efficacy of suitable rock for construction of the community harbour. Demonstrative photos of the quarry (borrow pits) can bee seen in Photo 1-3. Due to potential variability in rock size, all four areas may be used by the contractor during construction.

- Location 2A contains smaller block sizes.
- Location 2B offers some appropriately sized material and features a chute or outwash channel with cleaner rock fill of variable sizes.
- Locations 2C and 2D are mainly composed of terminal moraine and feature suitably sized material.

The four borrow pits are between approximately 4 km and 2 km northwest of the community.

1.6.3 Haul Road

Requirements for a haul road to support the transportation of rock material from the quarry (borrow pits) to the community harbour, can largely be met through the utilization of an existing road. The existing haul road can access Borrow Pit Locations 2A, 2B and 2D. Should access to borrow pit 2C be required, a new haul road will need to be constructed that will be one of two options: extension (new road) of 250 m and 600 m (see Figure 1-1). The existing road will require upgrades to make it a suitable haul road; it extends 4.2 km. An additional 900 m of haul road may be constructed to provide access to the potential stockpile laydown area in proximity to the airport, this would largely use existing tracks to the Hamlets existing borrow pits located to the east of the airport. Both areas for the haul road extensions were assessed for terrestrial (wildlife, vegetation) and archaeological effects.



Figure 1-2: Community Harbour Options Assessment. Option 1 is the Chosen Design for the Community Harbour



Photo 1-3: Demonstrative Photos of Quarry (Borrow Pits) Options a) Overview Quarry Locations; b) Quarry Location 2A; c) Quarry Location 2B; d) Quarry Location 2C; e) Quarry Location 2D

Source: Worley Consulting, 2024

1.7 Land Tenure

The land ownership for what will be the community harbour currently occupies Crown (below High-Water Line [HWL]) and Commissioners Lands. Discussions are underway between the GN-CGS/EDT (proponent), and both the Crown-Indigenous Relations and Northern Affairs Canada (CIRNAC), and GN lands office for the transfer of administrative control.

On 18 January 2024, the Nunavut Lands and Resources Devolution Agreement was signed by the GN, NTI and the Government of Canada (Government of Canada, 2024b). This landmark agreement will transfer decision-making for land management from the Crown to the Commissioner. The transfer is planned to be complete by 01 January 2027; however, at the time of this report, there is no clear guidance on how the Land Use Permit (LUP) process will change, or if the process will resemble the current GN LUP process.

For the land tenure boundaries see Section 5.3.1 (Drawing 5-1).

1.8 Facility Life

The community harbour is expected to be a permanent facility in Grise Fiord with a realistic lifespan of over 50 years. Individual components of the facility will generally be based on services lives, from 40 to 75 years, with the exception of the float system, which is estimated 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 community harbour over its lifespan.

1.9 Public Access

The community harbour will be a public facility for the community and will not have access restrictions.

1.10 Climate Change and Harbour Design

Climate change has been considered in the design of the community harbour, including sea level rise, reduced ice cover, and increased storm intensity. Permafrost and its potential degradation are not expected to affect this facility (see Section 6.3.4).

According to climate models developed by the Intergovernmental Panel on Climate Change (IPCC) for the 6th Assessment Report (2023) (IPCC, 2023), global sea levels are anticipated to rise between 0.29 m and 1.1 m by the end of the 21st century. The primary source of uncertainty toward the end of the century is the behavior of ice sheets, particularly in Antarctica. Relative sea level change is a combination of sea level change and any vertical land motion (rebound or subsidence). (NRCan, 2016) The reviewed literature predicts a range of -0.57 m to 0.07 m using the Representative Concentration Pathways (RCP) 8.5 model. To mitigate long-term structural issues, projections at half the design life are used. The projected relative sea level change, based on the 95 percentile, is approximately 2 cm (Jones *et al.*, 2022) suggesting sea level rise will roughly match land rebound. Dredge and breakwater elevations will take into consideration the effects of climate change over the lifecycle of the Project.

Based on the 30-year average between 1991 to 2020, the typical break-up dates for Grise Fiord are the week of 30 July, and the freeze-up occurs the week of 24 September (Figure 1-3). It is noted that due to climate change, ice breakup is occurring early (approximately mid-July), and freeze-up is occurring latter (approximately early October).

The design incorporates climate change considerations by extending the open-water season to December, using a 1-in-50-year storm event for the design storm wave, and reflecting increased storm frequency and severity observed since 2000.

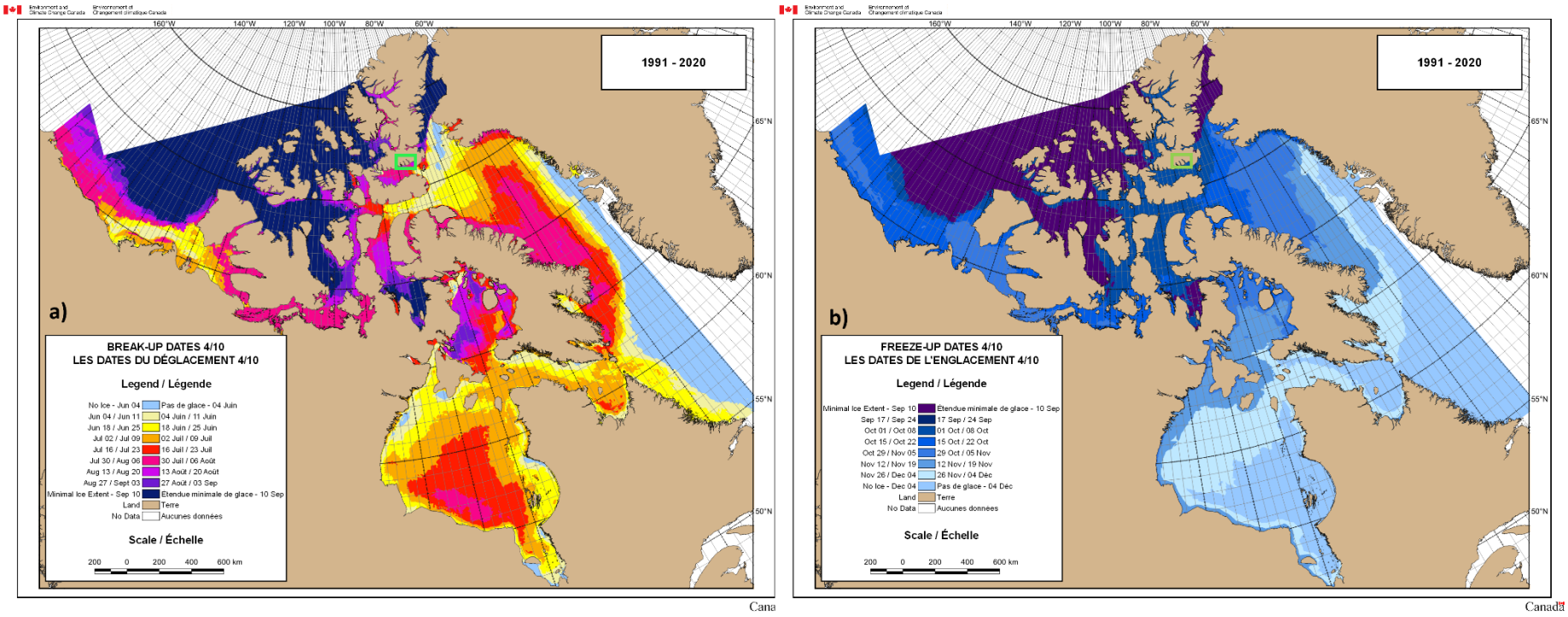


Figure 1-3: 30-Year Ice a) Break-up; b) Freeze-up

Source: Government of Canada (2021)
Note: Green square depicts Grise Fiord location

1.11 Construction Activities

Construction activities to be undertaken are summarized in Table 1-1.

Table 1-1: Construction Activities Associated with the Community Harbour

Community Harbour	Quarry (Borrow Pits)	Haul Road
Infill (laydown area, breakwater, boat launch ramp, shoreline)	Drilling and Blasting	Construction of new haul road
Installation of small craft floats	Crushing and Screening	Upgrades to existing road
Dredging	Stockpiling	Transportation of rocks
Stockpiling	Operation of equipment	Operation of equipment
Operation of equipment	-	Installation of culverts (potential)
Installation of navigation aids and harbour lighting	-	-

1.12 Project Schedule

Construction is scheduled to begin in 2026 and will conclude in 2029, with works largely occurring in the open-water season. The Project is expected to be operational in the open-water season of 2030.

In the absence of a noise by-law in Grise Fiord, timing restrictions will be agreed upon with the Hamlet. At this time, there will only be one 12-hour shift per day; however, the contractor may wish to complete some generally non-disruptive work at night. This may be limited to dredging, incidental low-tide work at the harbour and crushing and/or sorting of rock at the stockpiles/quarry (borrow pits). Such work extensions would proceed only after consulting with the community and obtaining approval from the Hamlet.

Table 1-2: Anticipated Schedule for the Project

Task	Timeline
Pre-Construction	
• Permitting, Baseline Surveys and Consultations	Aug-24 to Apr-26
• Schematic Design	Jun-24 to Aug-25
• Geotechnical Investigations	Spring 2025
• Detailed Design and Construction Documents Preparation	Summer 2025 to Dec-25
• Permitting Complete	Mar-26
• Construction Contract Tender Period	Winter 2025 / Spring 2026

Task	Timeline
• Award of Construction Contract	Spring 2026
Construction	
• Mobilization of equipment and supplies. • Set up construction camp and equipment maintenance facilities, as required. • Prepare quarry (borrow pits) and commence blasting for aggregate production and stockpile pads. • Set up crusher and complete test runs.	2026 construction season (Jun-26 to Oct-26)
• Prepare quarry (borrow pits) and commence blasting for aggregate production and stockpile pads. • Aggregate production. • Commence placement of breakwater core. • Dredging and onshore disposal.	2027 Construction season (Jun-27 to Oct-27)
• Aggregate production. • Breakwater core and armour placement. • Laydown/boat storage area and ramp fill placement • Dredging and onshore disposal. • Partial demobilization.	2028 Construction season (Jun-28 to Oct-28)
• Complete breakwater armour surfacing. • Electrical installations. • Community harbour floats, including installation and removal demonstration. • Final grading and compaction. • Remainder of demobilization.	2029 Construction season (Jun-29 to Oct-29)
Operations	
• Community harbour operations	Spring 2030

1.13 Transportation (Mobilization and Demobilization)

Mobilization to site will commence with the sealift of the 2026 season, which typically arrives in Grise Fiord at the end of August or early September. For the first year of construction, mobilization will include equipment mainly for quarrying and earthworks, construction camp and miscellaneous construction consumables. At the end of the construction seasons, the site will be prepped for overwintering, and the main construction equipment is expected to remain on site. Planning must take into consideration the timing of the sealifts, and the materials and equipment that will be needed for the upcoming construction seasons. As tasks are completed and equipment is no longer needed, equipment will be demobilized from site and returned to the south via sealift.

Equipment mobilization and demobilization will be undertaken by the contractor. Most 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).

Project personnel travelling to the site will use air travel and are expected to use chartered flights, with limited use of scheduled flights.

1.14 Water Sources and Consumption

Water for construction use will be obtained from the existing water supply infrastructure in Grise Fiord. It is anticipated that water will be delivered by a local contracted water truck, or the contractor's own water truck. If the local water supply is unable to meet the water needs of the community, the contractor will be responsible for the appropriate permitting from the Nunavut Water Board (NWB).

Estimated water use during construction is only 5 m^3 per day, for approximately 125 days (per season) during construction. Water for construction use is anticipated to be the following:

- Dust suppression.
- Drinking water and sanitary facilities.
- Earthworks (for compaction if necessary).
- Cleaning of equipment.

Water use for the construction camp will be managed by the contractor either through discussions with the Hamlet for provision from the municipal supply, or through a NWB authorization, if the contractor is required to obtain their own supply. On average, there is an additional 5 m^3 per day (approximately) of water usage that supports southern construction crews, whether in a camp, hotel, or local houses.

During operation of the community harbour, there will be no water supply facilities. Water usage by facility users is not expected to vary from the current operations.

1.15 Waste Management

Wastewater management estimated volumes consider the construction sites and the construction camp.

1.15.1 Wastewater

The anticipated total wastewater produced for the Project is expected to be approximately 1,000 m^3, including both sewage (human waste) and grey water. Wastewater will be managed through holding tanks in the sanitary facilities for the construction site(s) and construction. The Hamlet has expressed concern that the current sewage lagoon may not have the capacity to accommodate the Project's wastewater. The Project will coordinate closely with the Hamlet of Grise Fiord and the GN to assess the capacity of the sewage lagoon prior to mobilizing the construction workforce. If necessary, the contractor will implement appropriate measures to manage the wastewater generated by the Project.

Wastewater management by the contractor will ensure no strain is placed on the community's existing wastewater infrastructure, including the sewage lagoon and sewage truck.

During operation of the community harbour, there will be no wastewater reception. Users of the facility will manage wastewater on their vessels as per current operations.

1.15.2 Solid Waste

Solid waste generated during construction is anticipated to be disposed of using the existing municipal facility in the Hamlet. Table 1-3 presents the estimated solid waste generated during Project construction.

Table 1-3: Estimated Solid Waste Production

Type of waste	Anticipated Waste	Projected amount generated	Method of Disposal
Combustible wastes	Food waste, wood crating/packaging, cardboard and paper, plastics.	5 tons	Hamlet landfill.
Non-Combustible wastes	Scrap steel, glass.	1 ton	Hamlet landfill.
Overburden	Organic soil, unsuitable fill material.	Negligible	What little overburden exists at the quarry (borrow pits) will be set aside and stockpiled at the quarry (borrow pits) location.
Hazardous waste	Waste oil/grease, batteries, antifreeze, contaminated soils.	2,000 litres	Returned to south in sealed drums or lined bags, transported in 20' shipping containers and disposed in accordance with regulatory procedures.

1.16 Materials Use

1.16.1 Equipment

Construction is expected to be completed using land-based equipment; however, the contractor may decide to support with marine-based equipment. Equipment will arrive in Grise Fiord by sealift.

The anticipated construction equipment for the Project is as outlined in Table 1-4 with example equipment in Photo 1-4.

Table 1-4: Anticipated Construction Equipment

Equipment Type and Quantity	Size, Dimensions, Type	Proposed Use
Drills (2 to 3)	5 tons	Quarrying.
Excavators (3 to 5)	30 to 40 ton	Quarrying, handling armour stone, loading trucks, excavating, dredging, material placement.
Trucks (3 to 5)	35 to 40 ton articulating	Hauling quarried rock.
Front end loader (2 to 3)	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.
Spud barge/derrick (1)	20 m x 50 m deck with 150t crane	Dredging, moving/lifting materials and equipment.
Work boats (1 to 2)	Varies, 50 to 500 horsepower	Floating equipment movement and surveys.
Pickup truck (5)	Crew cab, ¾ ton	Crew and supplies 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 Grise Fiord and/or Contractor supplied fuel storage facilities.
Telehandler (1)	5 ton	Moving materials and equipment.
Rough terrain crane (1)	80 ton	Lifting materials.
Rock Crusher (1 to 2)	-	Crushing run of quarry (borrow pits) materials.



Photo 1-4: Representative Construction Equipment a) Drill Rig; b) Excavator; c) Rock Truck; d) Crusher

Source: Worley Consulting

1.16.2 Fuel

Based on recent conversations with the GN-PPD and the Hamlet, the community's current fuel storage capacity and/or fuel resupply schedule is likely insufficient to support the Project's construction fuel needs. The Project is engaging with GN-PPD to confirm if the Project's estimated fuel consumption can be met without impacting the communities fuel requirements. Initial assessments of current capacity and fuel surpluses indicate that there will likely be insufficient fuel to support the construction works. If this is the case, the Project will discuss with GN-PPD the possibility to coordinate multiple fuel shipments to support both community and construction requirements. If multiple fuel shipments become impractical, the contractor will be required to supply temporary code compliment fuel tanks, for Project fuel storage during construction.

A Construction Work Plan (CWP) will be in place for the use and storage of fuel, outlined in the Contractors Spill Prevention and Response Plan (CSPRP) (Section 8.3.4). Estimated fuel consumption during construction for the Project is outlined in Table 1-5. Designated fuelling areas will be established in the contractor laydown area. Fuelling will be required near the marine environment as the community harbour is constructed. If construction occurs in the iced season or with marine-based equipment, refuelling will be required on or over water.

Table 1-5: Estimated Fuel Consumption During Construction

Fuel	Number of Containers and Capacity	Total Amount of Fuel (in Litres)	Proposed Storage Methods	Proposed Use
Diesel	N/A	1.25 million	Fuel will be dispensed on a daily basis from existing facilities in Grise Fiord and/or contractor supplied fuel storage facilities	Mobile equipment; remote generators and heaters
Gasoline	N/A	13,000	Fuel will be dispensed on a daily basis from existing facilities in Grise Fiord and/or Contractor supplied fuel storage facilities	Pick-up trucks, small work boats, small generators, and All-terrain vehicle (ATVs)
Propane	20 - 50kg tanks	20 to 30 litres per tanks	Forklift-able metal cylinder rack	Heaters

1.16.3 Chemicals and Hazardous Materials

Anticipated chemical or hazardous materials required for the community harbour construction is provided in Table 1-6.

Table 1-6: Chemicals and Hazardous Materials Expected to be Required During Construction

Hazardous Materials and Chemicals	Number of Containers and Capacity	Total Amount of Hazardous Materials and Chemicals	Metric	Proposed Storage Methods	Proposed Use
Lube and oils	10 drums, and 10 5-gallon pails	2,000	Litres (L)	Drums on pallets, in lined storage area.	Maintenance of mobile equipment.
Oxy/Acetylene	10 each, 140 cu.ft. cylinders	-	-	Forklift-able metal cylinder rack.	Welding and cutting of steel.
Paint	10 1-gallon cans	20	L	Inside fireproof cabinets, stored inside heated enclosure.	Painting steel hardware and miscellaneous components.
Explosives	Standard explosives and magazines	40	Tonnes (t)	Certified explosives magazine.	Quarrying.

1.17 Nearby Communities and Protected Areas

The closest communities to Grise Fiord are Arctic Bay and Resolute Bay which are 382 km south and 383 km southwest, respectively (see Figure 1-4). Protected areas in proximity to Grise Fiord are discussed in Section 6.3.1.



Talluritiup Imanga NMCA



N

0 55 110 220 Km

Spatial Reference
GCS: GCS WGS 1984
Datum: WGS 1984
Projection: Stereographic North Pole
Scale: 1:5,466,762
Date Exported: 2025-04-02 11:40 AM
Drawn: C. Knight

Figure 1-4

Important Marine Water Bodies (Marine Corridors) Pertinent to the Project

1.18 Workforce and Human Resources

Approximately 30 Project personnel are expected to be required, and each construction season will be 125 days, with four construction seasons anticipated to complete the Project (see Table 1-7).

The workforce will be comprised of skilled and semi-skilled labour including the following: heavy equipment operator, truck driver, driller, blaster, crane operator, welder, mechanic, electrician, and general labourers. Work rotations for non-local labour are presently unknown but will be determined by the contractor, and will comply with all applicable Workers Safety and Compensation Commission (WSCC) regulations (WSCC, 2021).

The Project will comply fully with the GN's Nunavummi Nangminiqaqtunik Ikajuuti (NNI) Policy (01 April 2017) and will aim to maximize participation of Inuit labour, training and Inuit owned businesses on the Project (GN, 2017).

The Project has provided Inuit Project personnel from Grise Fiord with employment and training opportunities as wildlife monitors, field technicians, ice monitoring specialists, and interpreters/translators since the start of the feasibility phase in 2019.

The Project anticipates the community will see further economic benefits and training opportunities with the hiring of local labour during construction. In addition, there will be secondary economic benefits through the Project's expenditures in local businesses.

The Project is expected to use chartered flights, with limited use of scheduled flights to avoid the Project filling seats on flights that the community depends on. Due to limited available local accommodations, a construction camp will be required (see Section 2.2.8).

Table 1-7: Personnel Numbers per Construction Season and Total for Project

Shift Type	Total Number of Personnel	Total Number of Days on Site per Season	Total number of Person Days per Season	Number of Seasons	Total Number of Construction Days	Total number of Person days
12–hour	30	125	3750	4	500	15,000

1.19 Proponent Information

Contact information for the proponent and representative are provided in Table 1-8.

Table 1-8: Project Contact Details

Contact Category	Details
Proponent: Government of Nunavut	
Applicant's Name	Justin McDonell – Project Manager, Capital Projects
Address	PO Box 1000 Station 200 Community and Government Services Iqaluit, Nunavut X0A 0H0
Telephone / Fax	1-867-975-5114
Email	JMcDonell@gov.nu.ca
Applicant Representative: Dynamic Ocean Consulting Ltd.	
Name	Victoria Burdett-Coutts, MSc, RPBio Senior Marine Scientist and Regulatory Professional
Address	2901 Murray Street Port Moody, British Columbia V3H 1X3
Telephone / Fax	1-778-839-2372
Email	Victoria@dynamicocean.ca
Design Engineer: Worley Canada Services Ltd.	
Name	Chris Meisl Project Manager, Marine Engineer Lead
Address	Suite 200, 2930 Virtual Way Vancouver, British Columbia VM5 0A5
Telephone / Fax	1-418-730-2965
Email	Chris.Meisl@worley.com

2 Project Specific Information (Works, Undertakings and Activities)

2.1 Community Harbour (Offshore Infrastructure)

The final configuration of the community harbour may evolve during the Project's design development phase, with measurements and quantities subject to adjustment.

The community harbour has a permanent built footprint that is approximately 40,000 m^2 that includes the laydown area, shoreline, and breakwaters. The seaward extent is 210 m from shore (perpendicular) to a depth range of approximately 0.5 m Chart Datum (CD) (see General Arrangement in Drawing 1-1).

2.1.1 Components

2.1.1.1 Site Access

The site has two vehicle access points. One is located at the east end of the site where vehicles turn off the existing road onto the community harbour laydown area and boat launching ramp. The other access is to the south where the road gives direct access onto the breakwater. The shoreline between the north breakwater and the laydown area will be filled and graded to create a uniform and level driving surface above high water.

2.1.1.2 Laydown Area

The laydown area is on the landward (northern) extent of the community harbour and will be approximately 1.8 ha in size. During the operational phase, this area and will be used for parking, boat storage, cargo storage, float storage (in the winter), and sealift laydown (potential). The area will be constructed in part with dredgeate that is repurposed.

2.1.1.3 Breakwater

Two breakwaters, with the north and south breakwaters being approximately 80 m and 390 m respectively. The south breakwater will have a driving surface to allow for vehicle access along a section its length. A navigation light will be located at the offshore end of the breakwater.

2.1.1.4 Boat Launch Ramp

A boat launch ramp is located adjacent to the north breakwater and the laydown area. The ramp will allow for boat launching and retrieval at all tide levels with adequate space on shore for vehicle and trailer manoeuvrability.

2.1.1.5 Floating Docks

The community harbour allows for the moorage of approximately 36 small craft vessels on two strings of floating docks. The floating docks will be held in position with anchors and chains. The floats will be removed prior to freeze-up and stored in the laydown area.

2.1.1.6 Entrance Channel and Dredging

An entrance channel approximately 25 m wide is located on the west side of the Project site, between the north and south breakwater. The access channel and the inner harbour will be dredged to an elevation of 1.5 m CD. Another area (approximately 25 m x 30 m) beneath the end of the eastern float will be dredged to an elevation of 2.5 m CD to allow for larger draft vessels to moor in the community harbour at all tides.

2.1.1.7 Aids to Navigation

Aids to navigation will include two sets of navigational leads and navigational lighting on the ends of each breakwater.

2.1.2 Construction Activities

Construction activities for the community harbour are described in this section, with construction schedule described in Section 1.12 (Table 1-2).

Construction at the community harbour will be either be with land- or marine-based equipment, a decision of which will be made by the contractor. If construction is land-based, temporary platforms (see Section 2.2.4) will likely be required. Construction planned during the shoulder seasons will require ice management to confirm ice is not buried under the breakwater construction material.

2.1.2.1 Aggregates and Armour Stone

Aggregates will be produced from material obtained from the quarry (borrow pits) (see Section 1.6.2). The materials will include bulk fill, large diameter armour stone, and crushed aggregates for driving surfaces, subbase and filter layers.

2.1.2.1.1 Laydown area

The primary fill for the laydown area will be dredgeate (see Section 2.1.2.2). Prior to dredging, a containment berm will be constructed to contain the sediments.

The dredged sediments will be placed inside the bermed area, and a crushed granular road structure will be placed on top to provide a suitable driving surface.

2.1.2.1.2 Shoreline

The upland shoreline between the breakwater and the laydown area will be raised and graded to create a level driving surface. The driving surface will be composed of crushed granular aggregates. Along the community harbour basin edge, a coarser crushed aggregate/rockfill will be placed to gently slope towards the water to create a landing pad for the floating docks.

2.1.2.1.3 Breakwater

The breakwater core will be comprised of a coarse fill from the quarry (borrow pits) and the interior and exterior side slopes will be covered by rock armour. The road along the top of the structure will be finished with a crushed granular aggregate/rock driving surface.

2.1.2.1.4 Boat launch ramp

The boat launch ramp will be comprised of a fill from the quarry (borrow pit) and will be finished with a crushed coarse granular road surface.

2.1.2.2 Dredging

The community harbour includes dredging of the entrance channel, the inner harbour and the area beneath the larger floating dock. The entrance channel and inner harbour will be dredged to an elevation of 1.5 m CD, and deeper berth pocket at the end of one of the floats will be dredged to an elevation of 2.5m CD. An additional sedimentation stilling basin, to capture sediments from the river before entering the harbour, will be dredged near the mouth of Kuuraaluk creek to an elevation of approximately 2.5 m CD. This will result in the removal of approximately 35,000 m^3 to 40,000 m^3 of sediment. Dredgeate will be repurposed as fill for the laydown area.

Dredging will likely be conducted with land-based equipment, but the contractor will determine if some marine-based dredging is necessary. Based on the volume of dredging required and the location of the work, it is expected that dredging will be completed using conventional mechanical equipment such as excavators and a clamshell bucket. Material will be dredged from the seabed, raised to the surface and placed either into a rock truck if disposing of the dredgeate on land or onto a sealed scow and brought near shore for land disposal.

2.1.2.3 Installation of Small Craft Floating Docks

The floating docks will be standard float design assembled with the support of the community. The docks will be secured with a chain anchoring system with anchor blocks on the seabed and a recessed concrete abutment at the shoreline. The docks will be removed prior to freeze up and stored above high water, then redeployed for the open-water season following ice breakup and clearing of the community harbour.

2.1.2.4 Local Drainage

The Kuuraaluk Creek discharges into two arms. The southern arm will be unaffected by the community harbour. The northern arm will continue along its current general alignment and flow into the community harbour. A sedimentation stilling basin is planned to be installed near the interface of the community harbour basin and the northern arm to allow for collection of sediments from the creek, minimising maintenance dredging requirements (see Drawing 1-1 for location of sedimentation stilling basin).

Run-off from the adjacent slopes surrounding the laydown area will either drain directly onto the laydown area or via drainage ditches installed around the perimeter of the laydown and drain into the ocean.

2.1.3 Area lighting and Electrical

General area lighting will illuminate the laydown area, boat launch ramp (top only), and the access roads. The area lights and poles will be provided from Quilliq Energy Corporation (QEC).

Navigation lights (solar or hard-wired) will be located at the community harbour entrance, one on the north breakwater and one on the south breakwater, each supported on its own foundation. These lights are proposed to be LED, with a two nautical miles range. Transport Canada (TC) will confirm requirements in in the Notice of Works (NoW) Approval (see Table 5-1).

2.1.4 Operations

The Operations Plan of the community harbour will be developed by the GN-CGS/EDT in concert with the local community. The community harbour is owned and operated by the GN-CGS/EDT, but responsibility for ongoing maintenance and operations is yet to be determined by the GN-EDT and the community.

The general maintenance and operations activities of the community harbour are expected to include the following:

- Annual inspections of the harbour components.
- Spring clearing of culvert inlets and outlets of drifted snow.
- Deployment and recovery of the floating docks. It is expected that the floating docks will be stored on the laydown area adjacent to the launch ramp.
- Periodic sounding surveys to confirm there are no locations of accumulating sediments or boulders deposited by shifting ice.
- The regular maintenance is expected to be as follows:
  - Re-grading/compaction of the road surfaces and laydown areas.
  - Re-grading/compaction of the boat launch ramp.
  - Periodic replacement of float components, including chains, hinges, sleepers and deck.

- Periodic re-dressing of riprap surface where rocks may have been plucked by ice.
- Removal of creek-borne sediments captured in sedimentation stilling basin.

- Periodic removal of beach sediments accumulated in the sediment trap located on the south breakwater.

An Operations Environmental Management Plan (OEMP) will be prepared with further information provided in Section 8.4.

2.1.5 Decommissioning

The community harbour is considered a permanent structure with no plans for decommissioning.

2.2 Other Components

Other components of the Project include the quarry (borrow pits), the haul route planned for the trucking of aggregates from the quarry (borrow pits) to the community harbour, and locations of temporary storage and facilities. A description of the field activities undertaken at the quarry (borrow pits) and haul road is provided in the Grise Fiord Environmental and Socio-Economical Baseline (ESEB) Report (Dynamic Ocean & Worley Consulting, 2025b).

2.2.1 Quarry and Borrow Pits

Quarry (borrow pit) locations 2A through 2D may be used to obtain different rock sizes required for the construction of the community harbour. The contractor will gather material from the moraine deposits to create all the rock quantities for the Project. Drilling and blasting may be required if permafrost is present and/or to generate smaller rock block sizes. Required quantities and the size of the quarry (borrow pits) are discussed in Section 0. The rock will be sorted, crushed and/or screened and stockpiled to produce the various products. Drilling work and laboratory testing of samples confirm the rock is suitable and highly durable for use in breakwater construction and other uses and is absent of Acid Rock Drainage (ARD) potential.

All quarry (borrow pit) activities will be undertaken in accordance with WSCC of the Northwest Territories (NWT) and Nunavut Act and Regulations (WSCC, 2021). The contractor will be required to develop a Contractors Quarry and Blast Management Plan (CQBMP) (see Section 8.3.5). Permitting requirements that will be the responsibility of the contractor are described in Table 5-1 (see Section 5.5 for the Hamlet LUP, Section 5.6.4 for NRCan explosives storage).

2.2.1.1 Construction Activities

Planned quarry (borrow pit) activities are as follows:

- Overburden and vegetation removal (as required, this activity is expected to be limited).
- Drilling and blasting (if required).

- Sorting of bulk moraine material to produce bulk fill and riprap.
- Crushing/screening of run-of-quarry to produce finer, processed, granular products.

2.2.1.1.1 Drilling and Blasting

Drilling and blasting may be required to loosen moraine deposits that are subject to permafrost and/or to generate smaller rock block sizes.

Appropriate consultation and coordination planning will be conducted with the community to schedule road restrictions, if required. Restrictions will be well-communicated to the community and limited in duration.

2.2.1.1.2 Crushing and Screening

Crushing and screening of rock will be required to produce various granular products. This may occur at the quarry (borrow pit) locations, and/or at stockpile locations located to the east of the airport near the Hamlet's existing borrow pits.

2.2.1.1.3 Stockpiling

Stockpiling of aggregates will be required, and will largely be performed at the quarry (borrow pit) locations and at stockpile locations located to the east of the airport near the Hamlet's existing borrow pits. Smaller stockpiles of aggregates will be required at the community harbour, where the contractor will utilize a western portion of the laydown area. Details on the contractor laydown area are in Section 2.2.3.

2.2.1.2 Maintenance

The contractor will be responsible for maintenance requirements at the quarry (borrow pits) for the duration of construction, which will include safety and environmental protection measures. Safety measures will be described in the CQBMP (Section 8.3.5), and environmental measures will be included in the Contractors Construction Environmental Management Plan (CCEMP) (Section 8.3.1). This will include safety features during the off season before the Project is completed.

2.2.1.3 Decommissioning

If decommissioned, the contractor will include requirements in the CQBMP (see Section 8.3.5). However, it is possible that the quarry (borrow pits) will be maintained as a long-term asset by the Hamlet. In this case, the contractor will be responsible for securing the quarry (borrow pits) and ensuring public safety measures are in place prior to transfer to the Hamlet.

2.2.2 Haul Road

A haul road is required to transport aggregates from the quarry (borrow pits) to the community harbour and will use the existing roads and trails.

2.2.2.1 Construction

The length of the existing road used for hauling operations will be approximately 4.2 km with 250 m of new haul road required to reach the furthest quarry (borrow pit). Improvements to the road will be made to accommodate rock trucks and the combined traffic of local vehicles and construction vehicles. Additionally, 1.6 km of haul road may be installed as an alternative/supplementary route, and to provide access to the potential stockpile laydown area in proximity to the airport. Improvements to the existing road may include widening, alignment adjustment to suit truck traffic, pull outs, and grading. The number of pull outs and safety measures required will depend on their implementation plan, including traffic control measures (communications/flaggers), speed, size, and number of trucks.

All haul road activities will be undertaken in accordance with WSCC and Nunavut Acts and Regulations (WSCC, 2021). To manage interactions with the public, the contractor will be required to develop a Contractor Traffic Management Plan (CTMP) to confirm health and safety measures that will be undertaken during construction (see Section 8.3.3). The contractor will be required to submit the CTMP to the Hamlet and obtain their approval.

2.2.2.2 Maintenance

The contractor will be responsible for the maintenance of the haul road during active construction of the community harbour.

2.2.2.3 Decommissioning

The haul road in Grise Fiord is an existing road, and there are no plans for its decommissioning. Improvements made to the road during the Project to accommodate truck traffic will be transferred to the Hamlet and retained. The community has already begun construction to extend the haul road northwestward to reach the other side of the fiord. This road will be enhanced and preserved for continued community use.

2.2.3 Contractor Laydown Area

Construction materials and equipment for the Project will be stored in a contractor laydown area. The location of the contractor laydown area will be a contractor led decision; however, several options were considered to confirm compliance for necessary permits (e.g. archaeological). The contractor will be required to work with the Hamlet and potential GN-CGS (Land Administration Office, if LUPs are required). Three potential locations for a contractor laydown area have been considered and are described in Table 2-1. The contractor will use the laydown area to store construction materials and equipment for the duration of the Project. Stockpiling locations and other laydown areas may be approved by the Hamlet.

Table 2-1: Potential Contractor Laydown Areas and Uses

Contractor Laydown Area	Uses
Within the laydown area of the community harbour.	• Stockpiling. • Equipment and material storage.
Within one of the quarry (borrow pit) footprints.	• Sorting larger materials. • Stockpiling. • Crushing and Screening. • Equipment and material storage.
In proximity to the Airport.	• Stockpiling. • Crushing and screening.

2.2.4 Temporary Rock Platforms

Temporary rock platforms may be required to support construction if construction is performed with land-based equipment. Temporary infills, if required, are likely to be composed of a rock material and will be restricted to the dredge pocket footprints. Once removed, the fill will be repurposed, most likely to be used to complete the laydown area and other permanent components of the Project. The requirement for temporary infills, their composition, and where the fill is repurposed to will be a decision made by the contractor. Temporarily infills will be discussed with DFO - Fish and Fish habitat Protection Program (FFHPP) and will be required to stay within dredge pocket footprints.

2.2.5 Materials and Quantities

The construction of the community harbour is expected to require the following construction materials:

- 100,000 m^3 (200,000 tonnes) of rock (final quantities can potentially change by 25%).
- Small craft floating docks, including principle and finger floats.
- Electrical components including cables, junction boxes and enclosures, wiring devices, lights, and light poles.

All materials will be brought from outside of Nunavut other than the rock that will be sourced from the quarry (borrow pits).

2.2.6 Site Services

For construction, the contractor will require additional consumables and site services in the form of water, fuel, electricity, and waste removal. For water, waste removal, and fuel see Sections 1.13 (Water Sources and Consumption), 1.15 (Waste Management), and 1.16.2 (Fuel).

The contractor will require power at their laydown area and at the site to power site offices, maintenance outbuildings, and equipment. It is expected that the contractor will obtain temporary

power from the local grid, via QEC. If some facilities are removed from the Hamlet's grid, the contractor may elect to run generators.

2.2.7 Site Offices and other Temporary Structures

The contractor will require temporary structures to facilitate construction personnel and administrative duties. These will be in the forms of:

- Site offices.
- Garages for vehicle and equipment maintenance.

2.2.8 Accommodations

Due to limited available local accommodations, non-local Project personnel will be housed in a construction camp for up to 30 people. Prefabricated modular accommodation is expected to be brought into the community by the contractor to establish the camp. The location of a potential camp has not been selected but will likely require up to approximately 0.5 ha. The Hamlet has confirmed that there are existing areas in town suitable for establishing a construction camp. The location of the construction camp will be determined in consultation with the community and with approval from the Hamlet. If additional permits are required (e.g., NWB, GN-CGS (Land Administration Office)) in relation to the construction camp, these will be the responsibility of the contractor.

3 Community Consultation

The GN-CGS/EDT is conducting a comprehensive consultation program to design a community harbour that addresses the community's top priorities including those of hunters, fishers, recreational users, residents, and businesses.

3.1 Objectives

The consultation program was designed with the following objectives:

- Identify all potentially affected and interested parties as early as possible.
- Establish and maintain a positive relationship with residents, hunters, fishers, local businesses, community groups and others based on mutual respect.
- Provide timely and relevant information pertaining to the nature and scope of the Project, permitting process and engineering design.
- Provide meaningful opportunities for community members and stakeholders to review the proposed Project, ask questions and provide input into its planning and design.
- Collaborate with the community on Project design to meet the top needs of the community while staying within the allotted available funding.
- Integrate community input and mitigate concerns and issues through design modifications and improvements.
- Collaborate with the community to identify Valued Ecosystem Components (VEC) and Valued Socio-Economic Components (VSEC).
- Collaborate with the community to identify potential Project effects and mitigation measures to inform construction management plan procedures.
- Incorporate Inuit Qaujimajatuqangit (IQ) and local knowledge into the Project design, assessment and management planning.
- Confirm the Project doesn't impact Inuit Harvesting Rights.

3.2 Communities, Groups and Organizations

The following community groups and organizations have been identified as being potentially affected by the Project:

- Hamlet of Grise Fiord – Mayor and Council.
- Iviq Hunters and Trappers' Association (HTA).
- Nauttiqsuqtiit (the Guardians).
- Residents of Grise Fiord.

- QIA.
- Local businesses including stores and hotels.
- Grise Fiord Health Centre.
- Tourism operators (outfitters and cruise ships).
- Royal Canadian Mounted Police (RCMP).
- Sealift companies.
- Fuel carriers.

3.3 Overview of Consultation Program

The consultation program has been designed to ensure that hunters, trappers, fishers, residents, and other community groups and organizations are actively engaged using a variety of methods and materials. Consultations for the Project began during the feasibility study (Advisian, 2020a) and include consultations dating back to 2018. Consultations are on-going and will continue throughout the life of the Project.

The consultation program includes formal and informal meetings, semi-structured interviews, workshops, meetings with haul road residents and public open houses. The materials used include presentations, pamphlets, community notices, non-technical Project summaries, engineering design drawings, posters and maps. Materials are provided in English and Inuktitut and all meetings are supported by local interpreters, as required.

To date, the community has been very engaged in the Project and has provided valuable input into design and planning on numerous occasions. The input has been carefully considered, and design modifications have been made based on feedback from design workshops with the HTA, meetings with the Hamlet, residents, land use sessions with hunters and elders, and the community open houses. This collaborative approach has also led to determining Project effects and the joint development of mitigation and management measures that address the concerns of the community.

Table 3-1 outlines the key groups engaged as well as the method and dates of engagement.

Table 3-1: Consultation Overview

Group	Consultation Methodology	Dates
Hamlet of Grise Fiord	• Formal joint meetings with Mayor and Council, department leads, QIA community representatives, the Guardians, and the HTA. • Presentation of Project information, schedule, design concepts, options for quarry (borrow pit) locations and haul routes, environmental and geotechnical baseline data collection, field program results, local labour and employment opportunities, Project needs for community services (water, sewage, waste mgmt. fuel, etc.), potential effects and mitigation development and permitting including NIRB screening process, DFO-FFHPP and Transport Canada's Navigation Protection Program (TC-NPP). • All materials were translated, and interpretation was provided as required.	• Nov-18 • Jun-19 • Nov-19 • Dec-21 • May-22 • Aug-24 • Dec-24
HTA	• Initial introductory meetings, follow-up design workshops, IQ verification meetings, formal joint meetings with Hamlet, QIA and the Guardians, and drop-in discussions with board members and key personnel. • Materials used included maps, photos and engineering design drawings. • Discussions focused on design, quarry and haul route, community needs, potential effects and mitigation, permitting process including NIRB and sharing of local knowledge of site conditions and wildlife, such as: current use of the existing harbour, quarry (borrow pit) and haul route areas; boating activities; wind direction; waves and currents; observations of changes due to climate change; ice and water access and travel routes; fish and fish habitat; potential Disposal At Sea (DAS) sites if required; navigation lighting; cultural sites; carving stone; camps and recreational areas; parking; nesting sites; and marine mammals. • Discussions on DFO-FFHPP and potential offset ideas and TC-NPP.	• Nov-18 • Jun-19 • Nov-19 • Dec-21 • May-22 • Aug-24 • Dec-24

Group	Consultation Methodology	Dates
	• Consultation aimed to support the design of the community harbour to meet the top priorities and needs of hunters and fishers and to confirm that Inuit harvesting rights would not be affected by the Project. • All materials were translated, and interpretation was provided as required.	
Residents	• Two Open Houses. • Open Houses were advertised on Facebook, posters placed around town (Hamlet, co-op, health center etc.) and local radio broadcast. • Open House attended by 27 residents in May 2022 and by 22 residents in December 2024. • Presentation of Project information, schedule, design concepts, options for quarry (borrow pit) locations and haul routes, results from field programs, Project needs for community services (water, sewage, waste management. fuel, etc.), local labour and business opportunities, potential effects and mitigation development and permitting including NIRB screening process, DFO-FFHPP and TC-NPP. • Materials included translated slide show with photos of expected construction equipment and activities from other recent harbour projects in Nunavut, presentation slides, large posters of maps and drawings, one page project summary leaflet. • Interpretation was provided to support the presentation and discussions with residents during the Open House.	• May-22 • Dec-24
Haul Route Residents	• One-to-one meetings were held with residents along the haul route and shoreline to discuss the Project and, specifically, expected impacts from truck hauling including traffic safety management, dust, noise, etc. A Project summary leaflet was provided to residents that included contact info for the Project manager and the lead engineer should they have any concerns or further questions. Further consultations directly with haul route residents are planned for 2026 prior to the start of construction.	• Dec-24
QIA and the Guardians	• QIA local community representatives have been invited and participated in joint meetings with the HTA and the Hamlet since the beginning of the feasibility phase.	• Aug-24 • Dec-24

Group	Consultation Methodology	Dates
	• Recently formed Guardians crew has been invited to join meetings with the HTA and the Hamlet since the beginning of the detailed design and permitting phase. • Guardians' supervisor engaged directly in one-to-one meetings. • Presentation of Project information, schedule, design concepts, options for quarry (borrow pit) locations and haul routes, environmental and geotechnical baseline data collection, field program results, local labour and employment opportunities, Project needs for community services (water, sewage, waste mgmt. fuel, etc.), potential effects and mitigation development and permitting including NIRB screening process, DFO-FFHPP and TC-NPP. • All materials were translated, and interpretation was provided as required.	
RCMP	• Brief drop-in meetings were conducted to introduce and inform the RCMP of Project information, answer questions, and understand any needs or concerns.	• Nov-18 • Jun-19 • Dec-24
Local Businesses	• Brief drop-in meetings were conducted with outfitters and the Co-Op/hotel to provide Project information, answer questions, and understand any needs or concerns.	• Nov-18 • Nov-19 • Aug-24
Sealift Carriers	• Email exchanges to provide Project information, understand if there are any operational needs during construction, answer questions and understand any further needs or concerns.	• Feb-25
Fuel Carriers	• Email exchanges to provide Project information, answer questions and understand any needs or concerns.	• Feb-25
Cruise Ship Operators	• Email exchanges to provide Project information, understand if there are any operational needs of cruise ship operators during construction, answer questions and understand any further needs or concerns.	• Feb-25

3.4 Concerns Expressed and Strategies to Address

The consultation program has been successful in gathering input from community residents, hunters, fishers, and other users of the community harbour. The input received resulted in design modifications to meet the needs and priorities of the community. Further, the input received provided a basis for the development of mitigation measures to address concerns during construction and operation of the community harbour, including the development of the Construction Environmental Management Plan (CEMP) (Dynamic Ocean & Worley Consulting, 2025a), as described in Section 8.2.

The community is eagerly anticipating the Project as Grise Fiord currently lacks an established harbour. The absence of proper facilities has led to public safety risks and damage to small craft vessels and equipment. The only marine infrastructure in the community consists of two mooring bollards for the fuel re-supply tanker.

> "*The community is very excited about this harbour. It has taken too long to get it built. We've spent so many years waiting for this. Please just get it built*." – Hamlet Councillor

The Project has full support from the Hamlet, HTA, Guardians and residents who will benefit from improved safety and boat access from the community harbour.

> "*So many abandoned places down south have harbours but here in Nunavut there is hardly anything. The community depends on boating for our food, livelihoods, to harvest healthy country food for our kids and grandkids*." – Resident

The HTA members, Guardians, and residents do not anticipate any major effects on wildlife from noise and construction activities. They have observed that animals and marine life that avoid areas during construction return once projects are completed. The effects on wildlife from the Project will be minimal and temporary and no concerns regarding impacts to wildlife were expressed.

> *"As a long-time hunter, it is more important to me to get this harbour built to help with our boating safety than to be concerned with disturbing fish and marine mammals during construction. Of course there will be disturbance during construction, it's unavoidable though, and we need this harbour. The animals will return, I'm content with the plan as it is."* – HTA Board member.

> *"Belugas come at end of September, but we're not worried about this. They don't come in every year and even if they stay away during construction, they'll come back. They don't stay for very long either, we are not concerned."* –HTA Board member.

The community expressed no concerns over the loss of seabed due to construction of the community harbour. Impacts to fish and fish habitat have been discussed with the community several times since the feasibility study and no concerns have ever been expressed. There is very limited harvesting near the Project site and hunters do not anticipate that construction will have any significant impacts on wildlife or their ability to continue subsistence activities such as hunting, fishing, trapping and gathering.

"Placing boulders to build a wall in the water to protect our hunters and boats is needed and we're not at all concerned about that area of the ocean being impacted." – Guardian crew member

"Nobody fishes or harvests in the harbour area because of the sewage outfall, some rocks in the water is not a concern" – Guardian crew member.

"In terms of ideas for offsetting, we just don't understand why this is needed seeing as there's no fish, only sculpin here and cod some years. Putting rocks in the water is what fish actually like" – HTA board member.

A summary of the concerns expressed by the community during consultation to date and a summary of the strategies employed to address these concerns are provided in Table 3-2. A comprehensive record of all consultation events and feedback received to date is available in the initial Feasibility Study Consultation Summary Report for Grise Fiord (Worley Consulting, 2020) and subsequent Community Consultation Summary Reports (Worley Consulting, 2025). (Dynamic Ocean & Worley Consulting, 2025b; Worley Consulting, 2024). A consultation log detailing community feedback and Project responses since the start of the detailed design and permitting phase is also provided in Appendix A.

Table 3-2: Summary of Concerns Expressed and Strategies to Address

Topic	Concerns Expressed	Strategies to Address
Public Safety	• Concerns about public safety with the traffic. There are always children playing in the road and along the shoreline at all hours, especially in the summer.	• Given the volume of truck traffic expected and the fact that roads are shared by many users including ATVs, snow machines, trucks, cyclists, and pedestrians, a traffic management plan will be implemented by the contractor in order to minimize the risk of accidents. • Public safety measures will include: flag people/spotters at intersections and near any homes or buildings, limiting vehicle speeds to 20 km/h, ensuring all trucks have proper braking systems to handle the conditions of the road, equipment kept properly maintained to avoid accidents with equipment failure, community notices and a traffic awareness campaign concerning road safety, particularly for children and teens (e.g. traffic safety and awareness talks in local schools and public events/community centres, posters distributed and posted around town, radio shows etc.)
Community Harbour Location and Design	• The site is not centrally located, making it difficult for most boat owners to see their moored small craft vessels. • Concerns about theft and vandalism. Security measures or a monitoring system for the community harbour should be considered once it is built.	• The GN-CGS/EDT will collaborate with the Hamlet once the community harbour is complete to determine the most effective way to monitor and prevent vandalism and debris accumulation at the community harbour. • The community harbour includes a sediment trap that will be designed to contain sediments as much as possible to

Topic	Concerns Expressed	Strategies to Address
	• Strong winds often carry debris that accumulates in the community harbour area. • Concerns about sediments filling the community harbour.	minimize the frequency of maintenance dredging required.
Employment and Training Opportunities	• The community expects local labour and training to be maximized during construction of the Project.	• The Project will comply fully with the GN's NNI Policy (01-Apr-2017) and will aim to maximize participation of Inuit labour, training and Inuit owned businesses on the Project. • The Project has provided Inuit Project personnel from Grise Fiord with employment and training opportunities as wildlife monitors, field technicians, ice monitoring specialists, and interpreters/translators since the start of the feasibility phase in 2018.
Quarry (Borrow Pit) and Haul Road	• Concerns about the current condition of the road and improvements needed to manage creek crossing and muddiness.	• The haul road and creek crossing will be improved by the contractor to allow for safe travel of large rock trucks. The contractor will be responsible for maintaining the haul road in good condition.
Dust	• Concerns about increased dust caused by trucking and quarry (borrow pit) operations.	• As part of the CEMP, the contractor will be required to control for dust. The maximum speeds will be kept low (20 km/h) and dust suppression will be used (water or other approved dust suppressant).

Topic	Concerns Expressed	Strategies to Address
Construction Hours	• Residents along the haul road expressed concerns over the possibility of 24 h rock hauling.	• Hauling will be limited to 12 h per day. Construction hours will need approval by the community. Less disruptive activities such as work at the quarry (borrow pit), away from the community, could be permitted for 24 h given community consent.
Fuel Supply	• Fuel supply in the community is not likely to be sufficient to support construction needs without burdening the community's already strained supply.	• The Project is coordinating with PPD, who may arrange multiple fuel shipments to support both community and construction requirements. If this becomes impractical, the contractor will be required to bring in temporary code compliant fuel tanks for Project fuel storage during construction so as not to impact the community's fuel supply. The CSPRP will detail fueling practices (see Section 8.3.4)
Water and Ice Access	• Concerns were raised about maintaining access for small craft vessels during construction. There is an area in front of the RCMP that is currently used for launching that could be improved. It is often necessary to use tow trucks to pull small craft vessels up the shoreline there. It was suggested that this launch area be flattened and two small boulders cleared. Improving this area would provide an alternative for boat launching separate from construction activities.	• Access to ice and water will be maintained at all times during construction. • The Project will look at upgrading that area to make it more accessible during construction.

Topic	Concerns Expressed	Strategies to Address
	• Access to the ice is relatively easy along the shoreline. No concerns were expressed about the Project affecting ice access.	
Sewage Lagoon Capacity	• Concern that capacity of the sewage lagoon may be insufficient to handle the demand of incoming workforce.	• The Project will work with GN-CGS and the Hamlet to ensure that lagoon capacity is sufficient, following decanting, to handle construction wastewater. The contractor will be responsible for managing the Project's wastewater to prevent overburdening the community's infrastructure.
Community Food Supply	• Concern that the workforce could put a strain on the Co-op store's food and supplies	• The contractor will be responsible for bringing in food for the workforce and will not be permitted to impact the community's food supply.

3.5 Future Consultation

The GN-CGS/EDT will continue to engage with the Hamlet, the HTA, QIA, Guardians, residents and key stakeholders. The GN-CGS/EDT will provide Project updates and continue to maintain the positive rapport they have built with the community. Specifically, the GN-CGS/EDT will continue to solicit feedback and engage in collaborative problem solving with respect to:

- Engineering design.
- Permits, approvals, and licences.
- Construction schedule and sequencing of activities.
- Quarry (Borrow Pit) development and haul route.
- Environmental and socio-economic effects, including Project effects on fish and fish habitat, and marine mammals.
- Marine traffic and navigation.
- CCEMP and CTMP (see Sections 8.3.1, 8.3.5).
- Employment and training opportunities.
- Operations planning including maintenance of the floating docs and facilities.

Consultation will be ongoing throughout the life of the Project. Further community consultation visits are planned during the current phase of the Project, including a haul route residents meeting, information tables at the Co-op store and another community open house ahead of the start of construction.

Once a contractor is engaged to construct the community harbour, further consultation with the community will take place. This engagement will include timing and methodology of construction activities and traffic management as well as emergency response plans, community service delivery, security of the construction site, public safety, environmental management measures, construction communications (any blasting notices, road closures etc.) and equipment and material storage. Additionally, the contractor will work with the community to maximize local labour force and business opportunities.

4 Inuit Quajimajatuqanjit

Inuit Quajimajatuqanjit, although often translated as Inuit Traditional Knowledge, also includes important Inuit values, principles, cultural beliefs and behaviours. Its literal translation is, “that which has long been known by Inuit”. There are many different definitions of IQ that aim to describe its holistic nature. The QIA’s following description has guided our understanding of IQ (QIA, 2018):

> *“Inuit Qaujimajatuqangit is a morality that is the base for Inuit existence. It is the belief system at the core of Inuit identity and governs Inuit society. It is born through a collective effort to survive in extreme conditions where no one else could and there is no other way to do so but together. Within this ideal lives a great life-affirming admiration to the land and animals. It is about living through helping each other. It is the Inuit way.”*

Inuit Quajimajatuqanjit, as we understand it, is not merely a collection of information about the land and wildlife, but also an approach and set of principles to conducting research and project development that is based in respect and collaboration. The local knowledge holders we worked jointly with were also actively guiding decisions on the concept designs and early planning of the community harbour for Grise Fiord. Our IQ program therefore aimed to gather local Inuit knowledge of marine habitat, wildlife, land use, year-round access for harvesting, and areas of cultural value in and around the proposed Project to support early Project decision-making and planning; and, to inform the permitting process.

We are grateful to the residents of Grise Fiord who graciously shared their time, knowledge and thoughtful feedback during our workshops.

IQ was gathered during the feasibility phase of the Project during the following engagements:

- Five design meetings in November 2018, May 2019, November 2019, December 2021 and May 2022 with Mayor and Council, HTA board members and local hunters.
- One land use and wildlife focused workshop with active Inuit hunters and fishers (knowledge holders) in May 2019.
- Verification with knowledge holders in November 2019.

To date, IQ has been gathered during the detailed design and permitting phase of the Project during the following engagements:

- Two design meetings in August 2024 and December 2024 with Mayor and Council, HTA board members, and local hunters.
- One land use and wildlife focused workshop in August 2024 with the HTA and the Nauttiqsuqtiit (Guardians).
- Verification with knowledge holders in December 2024.

Local interpreters were hired as required to support workshops and interviews. Before the start of the IQ workshops and interviews, knowledge holders were asked to read a Project information sheet and

consent form and then complete and sign the form before the start of the meetings. The consent form was provided in English and Inuktitut and described the workshop's objectives, methods, and uses for the information, allowed the knowledge holder to specify where a copy of the transcript and map should be sent, and whether the knowledge holder wished to be acknowledged by name for their contribution. To better understand the potential interactions between harvesting rights and anticipated Project activities, discussions during the workshops and interviews focused on: current boating conditions; harvest locations; water and ice access; local site conditions such as winds, waves, currents, rivers and creeks, sedimentation etc.; fishing; marine and land mammals; birds and other wildlife; carving stone; camps and other culturally important areas; and the potential locations of the community harbour, quarry (borrow pit) and haul routes in relation to land use activities (e.g., fishing, hunting, gathering and trapping).

Land use and areas of cultural or ecological value were marked on maps and later digitized. Maps were verified by knowledge holders in December 2024 to confirm that the information gathered during the IQ program was interpreted and presented in the intended manner. All knowledge holders consented to their knowledge being shared with the team and for the purpose of informing the ESEB Report (Dynamic Ocean & Worley Consulting, 2025b), the archaeological assessment, and the overall Project design and construction planning. Consent was also provided by the knowledge holders to have their knowledge presented as noted in the Land Use and Occupancy map (Figure 4-1).

A review of existing and accessible IQ research relevant to the Project site was also conducted to provide valuable regional context to the baseline study. The Project team has attempted to join IQ with results from the scientific studies to allow the Project, in collaboration with community members, to make informed decisions on the design and construction planning of the community harbour that reflects local peoples' needs, priorities and values. However, the IQ findings are based on a small number of workshops and a selection of readily available literature, and do not represent the full intensity and extent of Inuit use and occupancy of either the Project Study Area or the surrounding region (see Section 6.5).

INUIT PLACE NAMES

NAME - ROMAN ORTHOGRAPHY	NAME	TYPE OF FEATURE	DESCRIPTION
UTAQQIUVITUQAQ	ᐅᑕᖅᑭᐅᕙᑎᑐᖅ	POINT	FURTHER THAN THE PLACE IN GRISE FIORD TO WAIT FOR SEA MAMMALS
PAURNGALIK	ᐸᐅᓐᖏᓪᓗᒃ	BAY	CLIFF FOLLOWS SHAPE OF SMALL BAY. BERRY-PICKING PLACE
NUVURULUK	ᓄᕙᕐᓗᓗᒃ	POINT	SMALL POINT

UTAQQIUVITUQAQ
ᐅᑕᖅᑭᐅᕙᑎᑐᖅ

PAURNGALIK
ᐸᐅᓐᖏᓪᓗᒃ

NUVURULUK
ᓄᕙᕐᓗᓗᒃ

PLAN
1:10000

LEGEND:

- FISHING (HOOKS - JIGGING)
- ARCTIC FOX PRESENCE
- DAY SPOT (RECREATIONAL)
- SEAL / MARINE MAMMAL WAITING AREA
- ARCTIC HARE PRESENCE
- PTARMIGAN (HUNTING)
- BERRY HARVESTING
- NARWHAL AND BELUGA
- BELUGA HARVESTED
- BELUGA WHALE
- THULE SITE
- ICE CRACK
- CLAM HARVESTING
- CLAMS (MINIMAL ABUNDANCE - LITTLE TO NO HARVESTING)
- SOURCE INUIT HERITAGE TRUST: PLACE NAMES PROGRAM. INUIT HERITAGE TRUST INCORPORATED. 2007
- SPRING ICE ACCESS (FROM MAY TO JUNE / JULY)
- POTENTIAL ARCHAEOLOGICAL SITE
- GLACIAL RUN-OFF STREAMS
- WATER SUPPLY RESERVOIR
- DOGS

m 0 100 200 300 400 500 m
1:10000

NOTES:

1. WATER DEPTHS WITHIN THE SURVEY BOUNDARY PROVIDED BY FISHERIES AND OCEANS CANADA. SURVEY WAS PERFORMED ON SEPTEMBER 22, 2018 BY AQUATICS-ESI, PROJECT NO. 18SO22002, DRAWING NO. A1, REVISION 2, DATED 19/01/07

REV	DATE (DD-MMM-YY)	REVISION DESCRIPTION	DRAWN	DRAFT CHK	DESIGNED	ENG CHK	APPROVED	CUSTOMER	REF DRAWING No	REFERENCE DRAWING TITLE
C	10-JAN-25	FOR DISCUSSION	JLC	-	DP	-	CM	-		
B	21-NOV-24	FOR DISCUSSION	JLC	-	DP	-	CM	-		
A	26-JUL-24	FOR DISCUSSION	JLC	-	DP	-	CM	-		

D SHEET | SCALE | SHOWN

OneWay to zero harm

WORLEYPARSONS PROJECT No
317086-54170

ENGINEERING AND PERMIT STAMPS (As Required)

PRELIMINARY
DO NOT USE FOR CONSTRUCTION
Last Saved: Jan. 10/25 12:15pm

CUSTOMER

Nunavut
Building Nunavut Together
Nunavut Iliuqatigiingniq
Bâtir le Nunavut ensemble

"This drawing is prepared for the use of the contractual customer of Worley Canada Services Ltd. and Worley Canada Services Ltd. assumes no liability to any other party for any representations contained in this drawing."

worley consulting

GRISE FIORD
LAND USE AND OCCUPANCY MAP

Figure 4-1

DRG No 317086-54170-00-CI-DSK-0001

REV C

LOCATION: U:\YVR\317086\54170_GDN_GRISEFIORD\1t_DRAWINGS\15_I_AND_E\02_MARINE\LAND USE MAPS\317086-54170-00-CI-DSK-0001.DWG
USER NAME: jennifer.coppendale
PLOT DATE & TIME 10/1/2025 12:19:35 PM
SAVE DATE & TIME 10/1/2025 12:15:25 PM

5 Regulatory Compliance

Construction and operation of the community harbour in Grise Fiord will require securing permits and approvals from: federal, territorial, and municipal governments; Inuit boards; and the QIA. The Project has engaged with Authorities Having Jurisdiction (AHJ), Inuit boards and the QIA to confirm compliance with relevant legislation (and regulations), policies, protocols and Best Management Practices (BMPs) will be in place. Several interested stakeholders will be engaged through the respective permitting processes of NIRB and DFO-FFHPP.

A summary of permits expected to be required for the Project is provided in Table 5-1, the majority of which will be held by GN-CGS/EDT, although several will be the responsibility of the contractor.

5.1 Institutions of Public Government

5.1.1 Nunavut Planning Commission

The Nunavut Planning Commission (NPC) is the 'gate keeper' for all project determinations within the Nunavut Settlement Agreement (NSA) and referrals to NIRB, as stipulated in the *Nunavut Planning and Project Assessment Act* (NuPPAA). The NPC communicates the referral through a Conformity Determination. NPC will take the decision for referral and include pertinent Federal and Territorial regulators, most of whom are encompassed in Table 5-1. The NPC application was submitted on 25 October 2024 (NPC, 2024d)(NPC No. 150556), accepted as complete on 19 November 2024 (NPC, 2024c) and the conformity determination issued on 11 December 2024 (NPC, 2024b).

5.1.2 Nunavut Impact Review Board

The Project proposal was referred to the NIRB on 11 December 2024 (NIRB No. 24XN059), with an additional Information Request (IR) received on 14 January 2025 (NIRB, 2025). The application was submitted on 03 March 2025, and the completeness check was underway at the time of this report. The Project anticipates further required screening under Nunavut Agreement Part 4 by the NIRB (Screening). Screenings are conducted over 45 to 60 days inclusive of a 21-day consultation period. Consultation consists of a public comment period via the NIRB's online registry and a NIRB determined distribution list. The distribution list includes pertinent AHJs, hamlets / municipalities, the HTA, Regional Inuit Associations (RIA), such as the QIA, and non-government organizations. Once comments are received from these groups, NIRB may request additional information through the process of IR.

5.1.3 Nunavut Water Board

The NWB has the mandate to protect, manage and regulate freshwater courses in Nunavut. NWB has a public registry where projects submitted to NWB will be publicly posted. For the Project, an NWB Type B license will be required if the haul road requires new culverts to be installed, or if creek alteration is required for the Project. As Kuuraaluk creek along the east of the community harbour is not a major water course it is expected that a Type B permit will be acceptable, whether the alterations are temporary or permanent. The NWB compliance requirements will be the responsibility of the contractor.

If the contractor requires a water license for water withdrawal, it is expected an Authorization will be sufficient as daily withdrawal needs are significantly less than the 50 m^3 daily threshold (NWB, 2019).

5.1.4 Nunavut Wildlife Management Board

The Nunavut Wildlife Management Board (NWMB) was established in accordance with the Nunavut Agreement (NWMB, 2020). The NWMB's mandate is to regulate and manage the access to wildlife within the NSA. Further to this, they can advise the NPC regarding works within wildlife management zones and provide recommendations to the NIRB or other agencies for mitigation measures or compensations related to impacts from commercial or industrial developments on wildlife habitat. The local Hunters and Trappers' Organization and Associations (HTO/HTA) are created under the NWMB and therefore must be involved in consultation and engagement. The NWMB's mandate will likely be met through the HTA but may be engaged by NIRB and DFO-FFHPP through their respective permitting processes.

5.2 Designated Inuit Organizations

5.2.1 Qikiqtani Inuit Association

The QIA is a DIO under the Nunavut Agreement (QIA, 2020) established to protect, promote and advance the rights and benefits of Inuit of the Qikiqtani region in Nunavut. It is also one of three RIAs affiliated with Nunavut Tunngavik Incorporated (NTI) and manages the Inuit Owned Lands (IOL) in the Qikiqtani Region. When aspects of the Project (community harbour, haul road, quarry (borrow pit)) are located on IOL, a Right of Way Agreement will be required, which would be issued by the QIA. At this time, no part of the Project is within IOL. If this changes, a Right of Way (RoW) Agreement will need to be obtained from the QIA, which is expected to be the responsibility of the contractor. Given its mandate to protect Inuit rights and benefits, the QIA will be interested in ensuring that Inuit harvesting rights are not impacted by the Project.

The QIA has been engaged on the Project since the feasibility phase and has participated in both joint meetings with the Hamlet and HTA during the design phase. The QIA will continue to be engaged throughout the life of the Project. The QIA will also be consulted by NPC, NIRB, and DFO-FFHPP.

5.2.2 Nunavut Tunngavik Incorporated

The NTI is a Designated Inuit Organization (DIO) responsible for ensuring, coordinating and managing the rights and responsibilities set out in the Nunavut Agreement, are respected by federal and territorial governments (NTI, 2024b). The NTI Board of Directors is composed of eight elected members registered under the Nunavut Agreement. The executive committee is comprised of the president and vice-president of the NTI, and the three presidents from each RIA (NTI, 2024a).

The NTI will not be issuing a permit for the Project and are technically already being engaged through communications with the QIA.

5.3 Land Tenure

Land in Nunavut is classified as either Crown land, Commissioner's land, Municipal land, or IOL (Government of Canada, 2022), as per the Nunavut Agreement and is overseen by pertinent AHJs. Crown land is administered through either the CIRNAC or Public Services and Procurement Canada (PSPC). Commissioner's land is administered through the GN-CGS. IOL is administered through the NTI, who delegate responsibilities to the RIAs (Government of Canada, 2022)), and thus QIA.

5.3.1 Community and Government Services

The GN-CGS (Land Administration Office) will be engaged for requirements on LUPs during the construction phase for the quarry (borrow pit), stockpile areas, and the foreshore components of the community harbour. Should the contractor require stockpiling outside of the quarry (borrow pit) (see proposed potential stockpile areas in Figure 1-1), an LUP may be required. The contractor will be responsible for the acquisition of any other LUPs from GN-CGS (Lands Administration Office).

In terms of the transfer of administrative control, GN-EDT will confirm with the GN-CGS (Lands Administration Office) for if Commissioner tenured land is required to be transferred. Further, depending on the status of devolution at the time of the transfer of administrative control for land below the Ordinary High Water Line (OHWL) may also occur through GN-CGS (Lands Administration Office) (see Sections 1.7, 5.3.2,Drawing 5-1).

5.3.2 Crown-Indigenous Relations and Northern Affairs Canada

The GN-CGS/EDT is working with CIRNAC to confirm the transfer of administrative control of the water lot prior to construction. Depending on the status of devolution at the time of the land transfer, the GN-CGS (Lands Administration Office) may hold this responsibility.

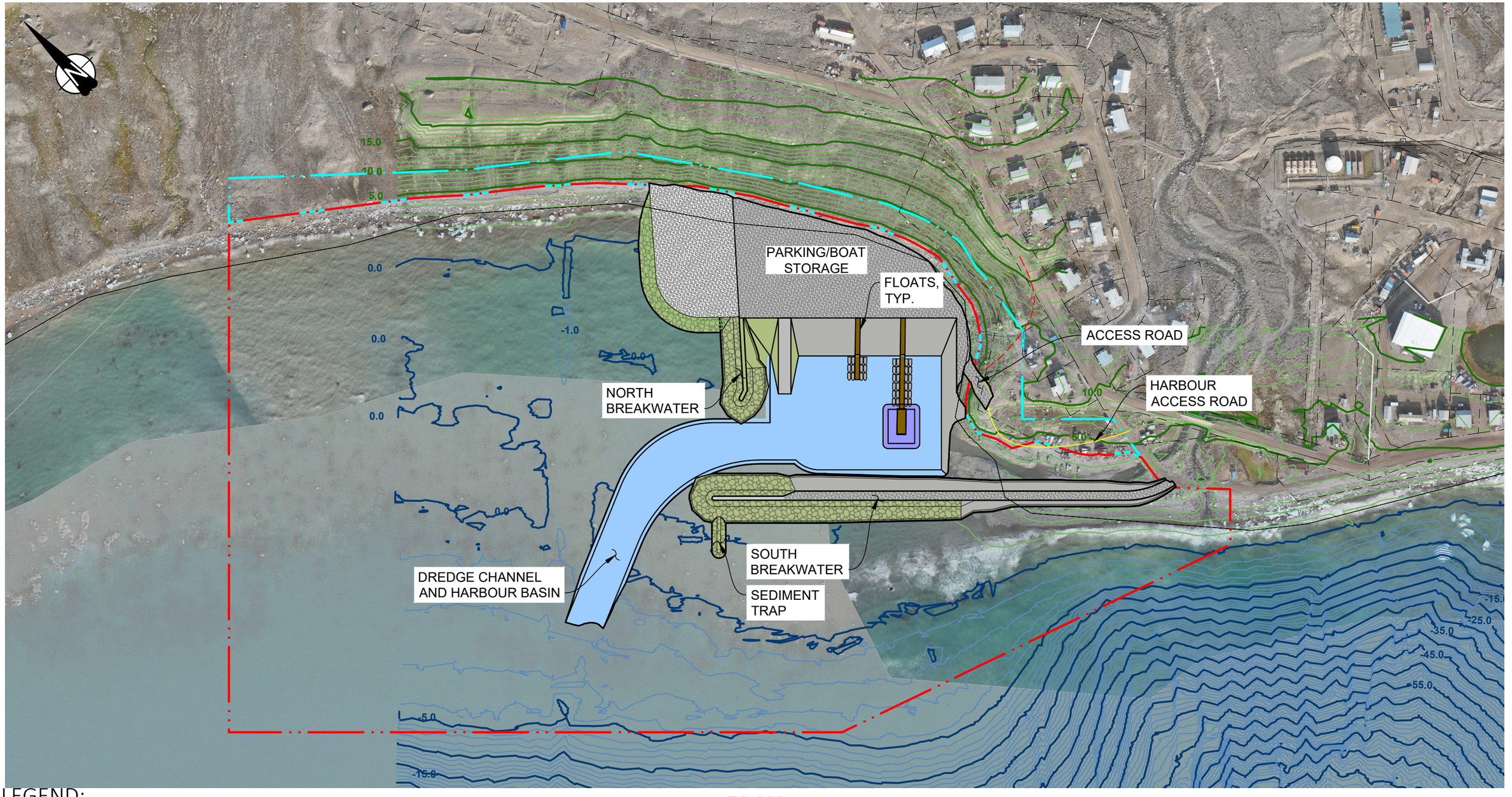
The construction required for the community harbour includes works that are above or below the HWL. The HWL is separate from the OHWM, as the HWL changes as the Project construction is pushed seaward.

CIRNAC will be engaged for requirements on LUPs during the construction phase for lands below the OHWM for the community harbour.

In terms of the transfer of administrative control, GN-EDT will confirm with the GN-CGS (Lands Administration Office) and with CIRNAC for the requirements related to 'crown land' administrative control transfer, depending on the status of devolution for land below the OHWM (see Sections 1.7, 5.3.2, Drawing 5-1).

5.3.3 Qikiqtani Inuit Association

See Section 5.2.1.



LEGEND:

- BATHYMETRIC CONTOUR (1m INTERVALS)
- BATHYMETRIC CONTOUR (0.5m INTERVALS)
- TOPO CONTOUR (1m INTERVALS)
- TOPO CONTOUR (0.5m INTERVAL)
- CGS LOT BOUNDARIES
- CIRNAC LAND TRANSFER BOUNDARY
- GN-CGS LAND TRANSFER BOUNDARY
- DREDGE -1.5m
- DREDGE -2.5m

PLAN
1:3000

BOUNDARIES TO BE CONFIRMED ONCE TOPOGRAPHIC AND BATHYMETRIC SURVEY HAS BEEN FINALIZED

m 0 50 100 150 m

1:3000

GOVERNMENT OF NUNAVUT
GRISE FIORD COMMUNITY
HARBOUR DEVELOPMENT

Drawing 5-1

LAND TENURE AREAS PLAN

Date:	Drawn by:	Edited by:	App'd by:
04-MAR-25	JLC	JLC	CM

Worley Project No. 317086-54175

FIG No 1

REV A

"This drawing is prepared for the use of our customer as specified in the accompanying report. Worley Canada Services Ltd. assumes no liability to any other party for any representations contained in this drawing."

FILE LOCATION: U:\YVR\317086\54170_GON_GRISEFIORD\11_DRAWINGS\14_ENV_PLANNING\CIRNAC\317086-54170-00-MA-FIG1_CIRNAC2025.DWG

PLOT DATE & TIME: 4/3/2025 4:44:05 PM
SAVE DATE & TIME: 4/3/2025 4:29:40 PM
USER NAME: jennifer.copperdale
ISSUING OFFICE: VANCOUVER, B.C.

5.4 Government of Nunavut Departments

5.4.1 Culture and Heritage

An Archaeological Impact Assessment (AIA) was completed in August 2024 under Class 2 Archaeologist Permit 2024-63A (GN-C&H, 2024) and no archaeological sites were recorded within the Project footprint (or within a 100 m buffer) (AECOM, 2024). Previous sites recorded during the 2019 baseline study were revisited (RcHi-3 and RcHi-5) but were deemed unimpacted by the Project. Further permitting through GN-C&H will not be required.

5.4.2 Department of Environment

No permits are expected from the GN-Department of Environment (DoE). However, during construction the contractor will be required to report accidental spills as per territorial requirements. The minimum requirements for spill reporting will be identified in the CEMP (Section 5.4.24, Table 5-26) and a CSPRP will reiterate spill reporting requirements (see Section 8.3.4). Reporting requirements are also summarized in Section 5.10 of the CEMP (Dynamic Ocean & Worley Consulting, 2025a).

5.5 Hamlet

Several approvals or a LUP may be required from the Hamlet as summarized below:

- Quarry: Acquisition of rock for the quarry will need to be approved through the Hamlet. The contractor will be responsible for obtaining a quarry permit from the Hamlet.
- Hazardous Goods: Approval will be required from the Hamlet for the use of explosives. The contractor will be responsible for obtaining this approval for the use of explosives from the Hamlet.
- Construction Camp: Construction of a camp and utilization of laydown areas may require approval from the Hamlet. The contractor will be responsible for obtaining this permit from the Hamlet.
- Community Harbour: The component of the community harbour that is above the HWL may require approval from the Hamlet. The contractor will be responsible for obtaining this permit from the Hamlet.

Additionally, approval is required from the Hamlet for the Project to access community services to support construction such as water, sewage, and waste management services. The Project will adhere to any pertinent Hamlet by-laws (see Table 5-1).

Locations for use as laydown or other construction related uses will be required to be approved by the Hamlet. The Hamlet will also be required to approve the CTMP (see Section 8.3.3).

5.6 Federal Agencies

5.6.1 Fisheries and Oceans Canada – Fish and Fish Habitat Protection Program

Fisheries and Oceans Canada-FFHPP is the AHJ who administers Section 35 and 34.4 of the *Fisheries Act*, which prohibits causing the harmful alteration, disruption or destruction (HADD) of fish habitat and Death of Fish (DoF), respectively. To ensure compliance with the *Fisheries Act*, it is recommended that proponents submit projects to DFO-FFHPP for review. DFO-FFHPP will subsequently review the Project through the Request for Review (RFR) process. If DFO-FFHPP recognizes the Project impacts can be mitigated, a Letter of Advice (LOA) will be issued to the Proponent. If DFO-FFHPP identifies a potential for the Project to result in a prohibition, an Application for Authorization will be required to be submitted for the Project. Other regulatory tools such as the Interim Code of Practice notifications (DFO, 2024c), can be used to remain in compliance with the *Fisheries Act*.

The DFO-FFHPP will be engaged to confirm if the loss of seabed habitat from the construction of the permanent facility components requires a Fisheries Act Authorization (FAA). If an FAA is required, the AFA will be submitted to DFO-FFHPP once the NIRB SDR is received.

5.6.2 Transport Canada

The *Canadian Navigable Waters Act* (CNWA) is administered through the NPP where TC is the AHJ. The CNWA protects marine safety by regulating works in navigable waters. Works include the placement of any structure, device or thing, whether temporary or permanent. Transport Canada will require a NoW approval and navigational commitments will be followed during the construction and operation of the community harbour. The CEMP (Dynamic Ocean & Worley Consulting, 2025a) will require the contractor to comply with established navigational communication procedures.

A Request for Pre-Submission Services was submitted to TC on October 24, 2024, to facilitate early engagement with TC on the Project (Dynamic Ocean, 2024) and a meeting was held with TC on 27 November 2024 to discuss the Project. Transport Canada confirmed that initial completeness check and review of the Project application can be initiated in parallel with the NIRBs review process; however, no permit will be issued until the NIRB SDR is issued. Collaboration with the community and the HTA will be continuous in order to confirm that any potential navigational interferences are well understood, particularly with subsistence harvesting.

5.6.3 Environment and Climate Change Canada

Environment and Climate Change Canada (ECCC) is the AHJ for Section 36 of the *Fisheries Act*, and to meet this requirement, the CEMP has measures in place to confirm whether there are deleterious substances in the marine environment due to the Project (Dynamic Ocean & Worley Consulting, 2025a). Furthermore, ECCC, through the Canadian Wildlife Service (CWS), administers the *Migratory Birds Convention Act* (1994) and associated Migratory Birds Regulations (2022) to protect and conserve migratory birds in Canada. ECCC is likely to be engaged by the NIRB during their public consultation process.

5.6.4 Natural Resources Canada

A permit from NRCan is required for storage of explosives during the construction phase of the Project. Compliance requirements with NRCan regarding explosives will be the responsibility of the contractor. Transportation permits are also required for the explosives, which will be handled by the contractor or by the sealift companies they engage to transport the materials.

5.6.5 Canadian Coast Guard and Nav Canada

A Notice to Airmen (NOTAM) is a notice distributed via telecommunication to personnel concerned with flight operations or information that concerns the establishment, condition or change to any aeronautical facility (NavCan, 2024). A NOTAM for blasting operations that are not published may be issued. Important details that are required in a NOTAM for blasting operations are maximum height of debris and the air blast. A NOTAM is required when an aerodrome is 5 nautical miles from a blast site and will have a maximum duration of 14 days (NavCan, 2024).

If a NOTAM is required, the contractor will be responsible for engaging with NavCanada (NavCan) a minimum of 30 days prior to blasting to confirm proper procedural requirements. The Contractor will be responsible for communications with the Canadian Coast Guard (CCG) Marine Communications and Traffic Services (MCTS) Centre to file appropriate Navigational Warnings (NAVWARNs) so that marine construction activities can be communicated to mariners. NAVWARNs are required regardless of construction being performed with marine- or land-based equipment for all construction that occurs below the HWL.

5.7 Nunavut Marine Council

The Nunavut Marine Council (NMC) was established through the Nunavut Land Claims Agreement (NLCA) as a means of advancing the initiatives set forth by the NWMB, the NPC, the NIRB and the NWB. The NMC is composed of the staff and board members of these organizations to advise and make recommendations on the effects and implications of marine issues in the NSA. As a focus they review existing, or proposed regulatory, policy, research, development, management planning initiatives that affect or may affect marine areas in the future (NMC, 2020). The NMC will not issue any permits for the Project but may be engaged through the NIRB or DFO-FFHPP permitting processes.

5.8 Regional Wildlife Organizations

5.8.1 Qikiqtaaluk Wildlife Board

The Qikiqtaaluk Wildlife Board (QWB) consists of a Chair from each HTO/HTA within the Qikiqtaaluk Region, and was established for the following reasons (QWB, 2020):

- To regulate and manage the harvesting practices of HTO/HTA members.
- Oversee the allocation and enforcement of regional basic needs and adjusted basic needs levels among HTOs/HTAs within the region.

The QWB will not issue any permits for the Project but may be engaged through the NIRB and DFO-FFHPP permitting processes. The interests of the QWB are met through engagement and consultation with the HTOs of specific communities. In Grise Fiord, the HTA have been involved since the feasibility phase of the Project.

5.9 Expected Permits

See Table 5-1 for a summary of Project permits.

Table 5-1: Summary of Federal, Territorial and Municipal Permitting Requirements

Legislation	Authority Having Jurisdiction	Construction Activity	Permit or Approval	Recommended Permit Timelines	Key Documentation	Responsibility of
Municipal (Hamlet)						
• *Nunavut Land Claims Agreement* (Nunavut Agreement, or NA), Article 14 (Planning and Lands Section) https://www.tunngavik.com/documents/publications/LAND_CLAIMS_AGREEMENT_NUNAVUT.pdf	Hamlet	Quarry (stockpiling, blasting, etc.)	Quarry permit	4 to 6 months (but very specific Hamlet to Hamlet)	• Hamlet application form. • Map depicting quarry boundaries and jurisdictional tenures.	• Contractor
Municipal By-Laws: • By-Law 31 Land Administration. https://cgs-pals.ca/downloads/land-admin-bylaws/ • By-Law 63 Community Plan. https://downloads.cgs-pals.ca/resolute_bay/community_plans/cp_bylaw.pdf • By-Law 64 Zoning. https://resolutebay.diligent.community/document/b0e295dc-628b-4b0a-b8b2-cc5fa1528cc6/?modified=2022-05-11T19:09:56.06	Hamlet	Construction camp and laydown areas. Community harbour components that are above the HWL.	Development and other occupancy permit	4 to 6 months (but very specific Hamlet to Hamlet)	• Hamlet application form.	• Contractor • GN CGS/EDT
Territorial Requirements						
Institutions of Public Government						
• *Nunavut Land Claims Agreement Act,* Article 11 https://laws-lois.justice.gc.ca/eng/acts/N-28.7/FullText.html • *NuPPAA* https://laws-lois.justice.gc.ca/eng/acts/N-28.75/	NPC	Development of land and water resources within Nunavut. All aspects of Project construction.	Conformity Determination (NPC File No. 150556) (referral to NIRB)	1 to 2 months	• Online application. • Project description and map.	• GN CGS/EDT

Legislation	Authority Having Jurisdiction	Construction Activity	Permit or Approval	Recommended Permit Timelines	Key Documentation	Responsibility of
• *Nunavut Waters and Nunavut Surface Rights Tribunal Act* (NWNSRTA) https://laws-lois.justice.gc.ca/eng/acts/N-28.8/FullText.html • Nunavut Water Regulations https://laws-lois.justice.gc.ca/eng/regulations/SOR-2013-69/index.html						
• *NuPPAA* https://laws-lois.justice.gc.ca/eng/acts/N-28.75/	NIRB	Any development of land and water resources within Nunavut as determined by NPC's Conformity Determination (NPC File No. 150556) All aspects of Project construction.	SDR (under review) (NIRB File No. 24XN059)	4 to 6 months	• Online application. • PSIR Report. • CEMP. • IQ and Consultation to inform baseline conditions and effects assessment.	• GN CGS/EDT
• NWNSRTA https://laws-lois.justice.gc.ca/eng/acts/N-28.8/FullText.html • Nunavut Water Regulations https://laws-lois.justice.gc.ca/eng/regulations/SOR-2013-69/index.html	NWB	Potential for withdrawal of freshwater or the need to cross freshwater crossings for haul road construction.	Type B Water License	1 to 2 months	• Application Form.	• Contractor
Designated Inuit Organisation						
• *Nunavut Agreement* https://www.tunngavik.com/documents/publications/LAND_CLAIMS_AGREEMENT_NUNAVUT.pdf	QIA	Project work on IOL. No Project components sit on IOL and thus a permit from the QIA is not expected to be required.	RoW Agreement	2 months	• Application Form. • Online Portal. • To be obtained by contractor.	• Contractor
Government of Nunavut Departments						
• *Territorial Lands Act*	GN-CGS/EDT	Construction of Project component above OHWL for land tenure under Commissioners or Untitled Municipal lands.	LUP	2 months		• GN CGS/EDT

Legislation	Authority Having Jurisdiction	Construction Activity	Permit or Approval	Recommended Permit Timelines	Key Documentation	Responsibility of
https://www.laws-lois.justice.gc.ca/eng/acts/T-7/index.html • Land Use Territorial Regulations https://laws-lois.justice.gc.ca/eng/regulations/C.R.C.,_c._1524/index.html		Construction facilities outside of Project components (e.g. camps, laydowns, stockpile, and quarry, etc.) above OHWL for land tenure under Commissioners or Untitled Municipal lands.			• See CIRNAC description below.	• Contractor
• *Nunavut Environmental Protection Act* https://www.justice.gov.nt.ca/en/files/legislation/environmental-protection/environmental-protection.a.pdf	GN-DoE	If upland disposal (instead of re-use) of dredged sediment is needed, GN-DoE will need to be engaged to confirm the strategies in place to minimize negative environmental effects. There is potential for upland dispose (as opposed to re-use) given the amount of dredging required. Although sediment quality characteristics are the primary driver of its useability.	No approval	N/A, no approval, but engagement as early as possible is recommended to minimize disruption the NIRB process.	• Detailed plan for sediment disposal.	• GN CGS/EDT
Federal						
• *Fisheries Act* https://laws-lois.justice.gc.ca/PDF/F-14.pdf	DFO	In-water or near-water works associated with the construction of the community harbour that have the ability to result in the HADD to fish or fish habitat, as defined under the *Fisheries Act.* Typically, when it is determined a HADD will occur (residual effects), it is primarily due to the Project footprint (areas of seabed that are no longer available to fish).	Section 35(2) FAA or LoA	Legislative timelines are 60 and 90 days. The Minister has 60 days from the date of submission of an application to confirm the application is complete and 90 days to issue the FAA (DFO, 2024a). However, 18 to 24 months is recommended for planning as DFO- FFHPP will stop the clock as required to request response to fill information gaps.	• Effects assessment. • CEMP. • Description of HADD footprint. • Indigenous consultation and IQ to confirm baseline conditions, potential effects and offset ideas. • Offsetting Plan.	• GN CGS/EDT
• *CNWA* http://laws-lois.justice.gc.ca/PDF/N-22.pdf	TC	In-water works associated with the construction and operations of the community harbour that have the potential to interfere with navigation.	NoW Application for Approval	6 to 12 months	• Online application. • CEMP. • Plan and side profile drawings. • Schematic layout.	• GN CGS/EDT

Legislation	Authority Having Jurisdiction	Construction Activity	Permit or Approval	Recommended Permit Timelines	Key Documentation	Responsibility of
					• Identify potential navigational interferences.	
• Territorial Land Use Regulations https://laws-lois.justice.gc.ca/eng/Regulations/C.R.C.,_c._1524/index.html	CIRNAC	In-water works relative to the use of the seabed (areas below the OHWL (and thus considered Crown Land).	Class A LUP	2 to 4 months	• Details surrounding ownership of land above and below the HWL of the Project footprint. • CEMP. • Application form.	• GN CGS/EDT
• *Explosives Act* (Section 7): https://laws-lois.justice.gc.ca/PDF/E-17.pdf • Explosives Regulations (2013): https://laws.justice.gc.ca/PDF/SOR-2013-211.pdf	NRCan	Blasting – For any industrial explosive that is to be imported into or manufactured, transported, possessed or used in Canada. Transport, storage and acquisition of explosives.	Authorization of Explosives Magazine Licence Application	3 months	• Application form.	• Contractor

6 Description of the Existing Environment & Socio-Economic Conditions

An ESEB Study was conducted in during the feasibility (2019) (Advisian, 2020b) and detailed design (2024) (Dynamic Ocean & Worley Consulting, 2025b) phases to determine the existing environmental and socio-economic conditions at the Project site. Information on the physical, biological, socio-economic, and archaeological environment was gathered from a combination of desktop review, field programs, and IQ. Desktop review and field survey methodologies are provided in the ESEB Report with high-level summaries provided in the respective sections below (Dynamic Ocean & Worley Consulting, 2025b).

6.1 Valued Ecosystem Component and Valued Socio-Economic Components

Valued Ecosystem Component and Valued Socio-Economic Components were determined from collaboration with the community and key stakeholders, while being guided by NIRB's Proponent Guidance document (NIRB, 2020). Assessment of the potential environmental and socio-economic effects of the Project include the anticipated impacts on VECs and VSECs of residents and community harbour users.

The scope of the ESEB Report encompassed a potential effects assessment in support of the regulatory process (Dynamic Ocean & Worley Consulting, 2025b). The following VECs and VSECs were included (see Table 6-1 for definition):

- Physical:
  - Designated Environmental Areas.
  - Geological Site Conditions.
  - Surface Features.
  - Ground Stability and Permafrost.
  - Hydrology.
  - Air Quality.
  - Noise.
  - Climate Conditions.
  - Marine Sediment and Water Quality.
  - Coastal Morphology.
  - Bathymetry.
  - Tides and Current.
- Biological:
  - Terrestrial Vegetation (including rare plants).
  - Terrestrial Wildlife (including habitat and migratory patterns).

- Migratory and Marine Birds (including habitat and migratory patterns).
- Fish Habitat (including marine vegetation).
- Fish and Marine Mammals.
- Species at Risk.

- Socio-Economic:
  - Employment, Training and Business Opportunities.
  - Land and Resource Use.
  - Local and Regional Traffic Patterns.
  - Human Health and Community Wellness.
  - Community Infrastructure and Services.
  - Archaeological and Culturally Significant Sites.

Table 6-1: Definition of Valued Ecosystem Component and Valued Socio-Economic Components as by Nunavut Impact Review Board

Valued Ecosystem Components	Valued Socio-Economic Components
Those aspects of the environment considered to be of vital importance to a particular region or community, including: 1. Resources that are either legally, politically, publicly or professionally recognized as important, such as parks, land selections, and historical sites. 2. Resources that have ecological importance. 3. Resources that have social importance.	Those aspects of the socio-economic environment considered to be of vital importance to a particular region or community, including components relating to the local economy, health, demographics, traditional way of life, cultural well-being, social life, archaeological resources, existing services and infrastructure, and community and local government organizations.

Source: NIRB (2007)

6.2 Study Area

Study Area was developed for the Project components and was determined based on potential temporary and permanent footprints and alignment with quarry (borrow pits), haul road, and shoreline access infrastructure (Figure 1-1).

Environmental (Physical, Biological) Study Area for the haul road, quarry (borrow pits) and community harbour are considered the footprint plus a 100 m buffer. This is to account for potential environmental effects during construction and to be inclusive of any archaeological buffers, however, based in the AIAs performed in 2019 and 2024, none are expected to be required (see Sections 5.4.1, 6.5.7). When the haul road and quarry (borrow pits) are collectively discussed, it will be referred to as the HRQ Study Area,

and when all Environmental Study Area are collectively discussed, they will be referred to as the Project Study Area.

During the operations phase, the Community Harbour Study Area is the only one to consider as the quarry (borrow pit) and haul road are only required during the construction phase to support the development of the community harbour.

Study Area pertinent to the VECs/VSECs when discussing existing conditions, potential effects and proposed mitigation/monitoring measures are identified in Table 6-2.

Table 6-2: Project Study Area Pertinent to Valued Ecosystem Component and Valued Socio-Economic Components

VEC/VSEC	Study Area
Physical	
Designated Environmental Areas	Project
Geological Site Conditions	Community Harbour, Quarry (Borrow pits)
Surface Features	Community Harbour, Quarry (Borrow pits)
Ground Stability and Permafrost	Project
Hydrology	Community Harbour
Air Quality	Project
Noise	Project
Climate Conditions	Project
Marine Sediment and Water Quality	Community Harbour
Coastal Morphology	Community Harbour
Bathymetry	Community Harbour
Tides and Currents	Community Harbour
Biological	
Terrestrial Vegetation (Including Rare Plants)	HRQ
Terrestrial Wildlife (Including Habitat and Migratory Patterns)	HRQ
Migratory and Marine Birds (Including Habitat and Migratory Patterns)	Project
Fish Habitat (Including Marine Vegetation)	Community Harbour
Fish and Marine Mammals	Project
Species at Risk (SAR)	Project

VEC/VSEC	Study Area
Socio-Economic Conditions	
Population, Education and Employment	Socio-Economic Study Area
Land and Resource Use	
Local and Regional Traffic Patterns	
Human Health and Community Wellness	
Housing and Community Infrastructure and Services	
Archaeological and Culturally Significant Sites	Project (Community harbour limited to intertidal extent)

6.3 Physical Conditions

Grise Fiord, which is located on the south coast of Ellesmere Island in Jones Sound, experiences long, cold winters and short ice-free periods in the open-water season. The area is characterized by marine and tundra environments with exposed valley walls, talus slopes, and steep cliff faces rising above the ocean.

6.3.1 Designated Environmental Areas

Designated areas in Canada meet the International Union for Conservation of Nature (IUCN) definition of a protected area, which states protected areas are "a clearly defined geographic space, recognized, dedicated and managed through legal or other effective means, to achieve the long-term conservation of nature with associated ecosystem services and cultural value" (ECCC, 2016). The United Nations *Convention on Biological Diversity* known as Aichi Target 11 (Convention on Biological Diversity, 2010), committed countries, including Canada, to conserving 10% of coastal and marine areas and 17% of terrestrial areas and inland waters by 2020. In December 2022, The United Nations *Convention on Biological Diversity* adopted the Kunming-Montreal Global Biodiversity Framework (GBF), which ensure that committed countries, including Canada, must enable that at least 30% of terrestrial and inland water areas, and of marine and coastal areas are conserved through governed systems of protected areas and other effective area-based conservation measures, as outlined in Target 3 (Convention on Biological Diversity, 2022; DFO, 2021). As of 2022, terrestrial protected areas covered over 213,000 km^2 (10.2%) of Nunavut, achieving the 2020 target, but falling short of the 2030 targets for terrestrial and inland waters (ECCC, 2023).

The RNLUP (NPC, 2023c) presents existing and proposed protected areas in Nunavut, some of which are described in Section 3.2 of the Grise Fiord ESEB report (Dynamic Ocean & Worley Consulting, 2025b). While Grise Fiord is within the NBRLUP (NPC, 2000), it will be replaced with the RNLUP (NPC, 2023c),

once it is approved. For the purposes of this Report, the RNLUP has been used. Interactive maps from 2014, 2016, 2021 and 2023 are available on Interactive Maps website of the NPC[1] (NPC, 2023b).

The designated areas were considered in the existing conditions and effects review are summarized in Table 6-3, with a more detailed description provided in Section 3.2 (Figures 3-1, 3-2) of the ESEB Report (Dynamic Ocean & Worley Consulting, 2025b).

Table 6-3: Designated Areas in Proximity to Grise Fiord

Designated Habitat	Distance and Direction from Grise Fiord	Section in ESEB Report
National Marine Conservation Areas (NMCAs)	TI NMCA, located in Lancaster Sound and Baffin Bay, approximately 55 km southeast.	3.2.1
Marine Protected Areas (MPAs)	Tuvaijuittuq MPA, located on the northwest Ellesmere Island, approximately 360 km north.	3.2.2
	Sarvarjuaq MPA (not designated but under discussion with DFO, also known as the Pikialasorsuaq/North Water Polynya), approximately 150 km east.	
Other Effective Area-Based Conservation Measures (OECMs) [Marine Refuges)	Davis Strait Conservation Area (DSCA) and Disko Fan Conservation Area (DFCA) within the Eastern Arctic Bioregion of Baffin Bay near Davis Strait and are approximately 1500 km and 1300 km southeast.	3.2.3
Ecologically and Biologically Significant Areas (EBSAs)	Eastern Jones Sound Is the nearest ESBA, located approximately 30 km east.	3.2.4
	North Water Polynya, located approximately 100 km northeast.	
	Cardigan Strait (aka. Hell Gate), approximately 100 km west.	
	Lancaster Sound, approximately 160 km southeast.	
Polynya	See Sarvarjuaq MPA above.	3.2.5
Floe Edges	Approximately 160km southwest on the Eastern edge of Devon Island, near Lancaster Sound.	3.2.6
National Wildlife Areas (NWA)	Nirjutiqavvik NWA located on Coburg Island, located approximately 30 km east.	3.2.7

[1] Interactive Maps website of the NPC available at: https://www.nunavut.ca/land-use-planning/interactive-maps

Designated Habitat	Distance and Direction from Grise Fiord	Section in ESEB Report
Important Bird Areas (IBAs)	Eastern Devon Island Nunataks is the closest IBA located approximately 65 km south.	3.2.8
	Sydkap Ice Field is an IBA located approximately 50 km west.	
	Inglefield Mountains is an IBA located approximately 75 km northeast.	
	Cambridge Point is an IBA surrounding the eastern point of Coburg Island, located approximately 94 km east.	
Migratory Bird Sanctuaries (MBS)	Devon Island is a Class 1 MBS located approximately 120 km southeast.	3.2.9
	Inglesford Mountains is a Class 1 MBS located approximately 75 km northeast.	
	Hobhouse inlet is a Class 1 MBS located approximately 230 km south.	
	Fosheim peninsula is a Class 1 MBS located approximately 300km north.	
	Hell Gate and Cardigan Strait is a Class 2 MBS located approximately 100km west.	
National Parks	Sirmilik National Park on Bylot Island, approximately 310 km south.	3.4
	Qausuittuq (Bathhurst Island) National Park, approximately 400 km west on northern Bathurst Island and smaller surrounding islands.	
	Quttinirpaaq National Park, on northern Ellesmere Island, approximately 550 km north.	
Territorial Parks	Napatulik (or Napaaqtulik, proposed) Territorial Park is located on Axel Heiberg Island located approximately 50 km west of Eureka and approximately 400 km north.	3.5

6.3.2 Geological Site Conditions

Bedrock near the community of Grise Fiord is part of the Etah plutonic assemblage (symbol pPep2, Figure 6-1). The assemblage includes major rock types such as tonalite, granite, minor paragneiss, and pegmatite. The community of Grise Fiord, based on Figure 6-1, is located along an approximate fault, which follows a valley running approximately northeast to southwest.

Surficial Geology mapping of Grise Fiord and the surrounding areas was completed by (Tetra Tech, 2021) as part of a master drainage plan for Grise Fiord, and by Worley Consulting (in prep) as part of this scope of works. The hamlet of Grise Fiord and surrounding areas comprise five post glacial marine terraces between elevation 0 m to approximately 80 m above sea level. The marine terraces are staircase-like landforms formed during postglacial isostatic rebound during the Pleistocene and Holocene (Tetra Tech, 2021). The terraces are comprised of sands and gravels near surface with stratified clays, silts and sands at depth.

The valley running north-west extending towards the airport in the south-east is a u-shaped valley carved out during glaciation. Surficial mapping in the valley indicates various till deposits with till plains and rolling and ridged moraines. An active fluvial channel and active fluvial fans are present at the base of steep slopes.

The geological site reconnaissance undertaken in August 2024 confirmed that proposed borrow sources comprise till plains and rolling and ridged moraines comprised of clay up to boulder sized rock fragments.

Samples were collected at the proposed quarry (borrow pit) locations for Acid Rock Drainage (ARD) and Metal Leaching (ML) potential. Acid Rock Drainage/Metal Leaching testing is currently underway at the time of this report.

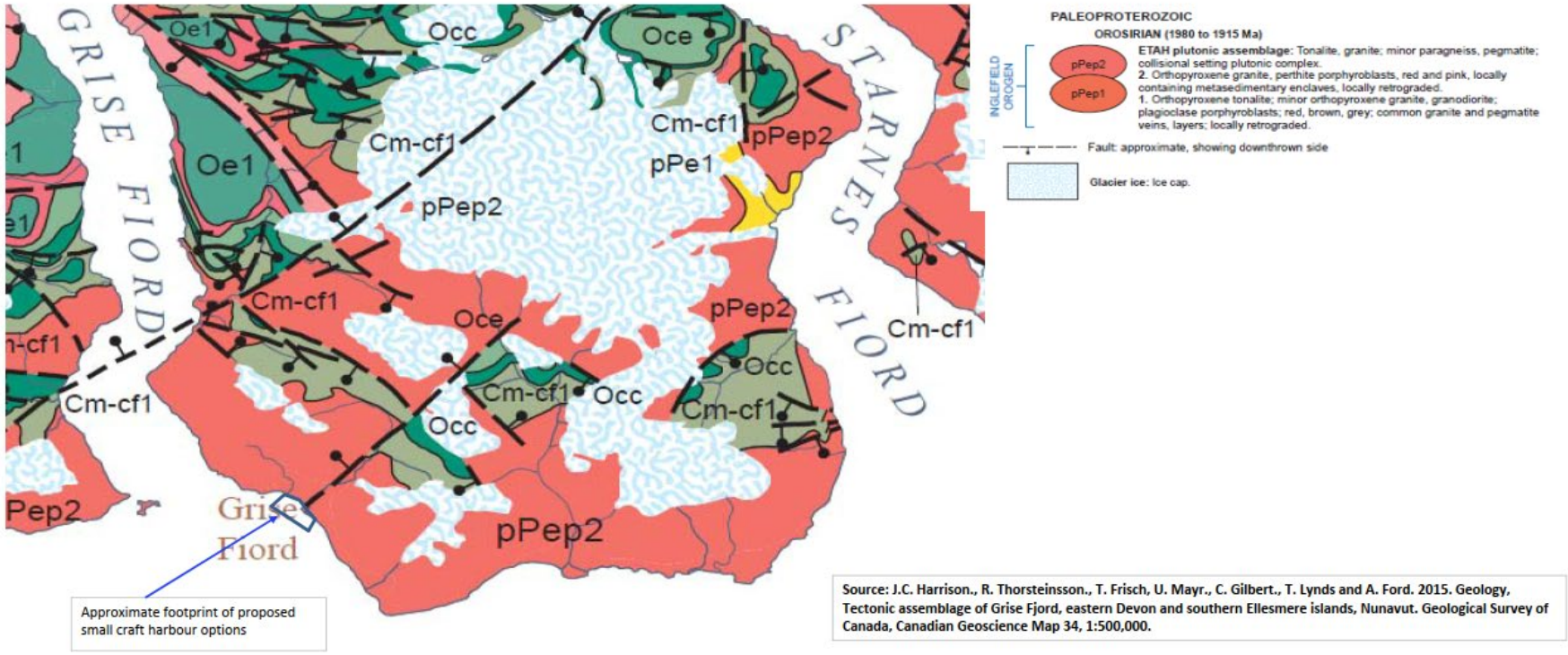


Figure 6-1: Grise Fiord – Bedrock Geology

Source: Harrison *et al.* (2015)

6.3.3 Surface Features

The region is characterized by mountains with large U-shaped valleys calved out by a network of active and/or retreating glaciers, fed by the area's ice caps.

There are two main valleys, one running northwest to southeast and the other northeast to southwest, which connect north of the community with an elevation change of approximately 500 m to 750 m from the community to the mountain plateaus. Valley walls are dominated by individual and coalescing rock fall talus cones and/or avalanche cones and boulder tongues, with very steep rock walls at the top, becoming gentler due to the accumulation of talus nearer the base.

The community is located at the mouth of the two valleys which is relatively flat, compared to the surrounding mountainous terrain, sloping gently to the shoreline. A seasonal creek coming from the northeastern valley, east of Kuuraaluk Creek, runs through the Grise Fiord community, passing to the east of the airport runway. The shoreline includes a narrow beach, strewn with large boulders and is moderately sloped.

Drainage is limited to summer melt of snow and ice channeled along minor creeks, following the two main valleys. The northeast to southwest valley drains through the community, forming Kuuraaluk Creek, whereas the northwest to southwest valley drains to the beach, to the west of the airport runway, approximately 1 km northwest from the community, forming Valley Creek.

6.3.4 Ground Stability and Permafrost

All of Baffin Island is in the Continuous Permafrost Zone (Osterkamp, 2001), where the ground remains below 0°C for a minimum of two years (International Permafrost Association). As per Journeaux Associates (2012), there is no sub-sea permafrost in Nunavut (Figure 6-2). However, Worley Consulting has experienced other projects (Nanisivik and Milne Inlet) where sub-sea permafrost was detected, and it is therefore likely to be present in Grise Fiord. 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.

While melting permafrost could affect the structures, it is unlikely in this case since melting sub-sea permafrost is a relatively slow process (hundreds of years), and it is typically located well below the seabed surface, which in this case is within the stable bedrock.

The slopes to the north and east of the community harbour are comprised of marine terraces (gravels, sands, silts and clays) and are susceptible to permafrost degradation from construction activities. The contractor will be responsible to ensure that adequate measures are in place to protect the underlying permafrost.



Figure 6-2: Distribution of Permafrost in Canada

Source: Figure 1 in Ahlenius (2016)

6.3.5 Hydrology

The freshwater and marine watersheds pertinent to Grise Fiord are displayed in Figure of the ESEB Report (Dynamic Ocean & Worley Consulting, 2025b). Both topics are described below.

6.3.5.1 Fresh Water

Two creeks (Valley Creek, Kuuraaluk Creek, see Figure 1-1, Figure 6-3) drain into Jones Sound in proximity of the community harbour. Neither of these creeks are fish bearing, and this was confirmed during the IQ Workshops.

- Valley Creek, located northwest of the community harbour has a culvert under repair, and is fed by glacier northeast of Grise Fiord and flows into Jones Sound west of the Hamlet.
- Kuuraaluk Creek (pronounced Kuu-Raa-Luk) (IQ Workshop 2019 - Marty Kuluguqtuq), located on the southeast corner of the community harbour, splits into two arms before draining into the harbour. Kuuraaluk Creek is not considered fish bearing and there was no mention of fish during the IQ workshop (Amon Akeeagok, HTA Chair. pers. comm. December 2019). The northern arm of Kuuraaluk Creek will drain into the river, with the southern breakwater installed adjacent to the creek and a sediment basin installed in the intertidal area (see Section 2.1.2.4).

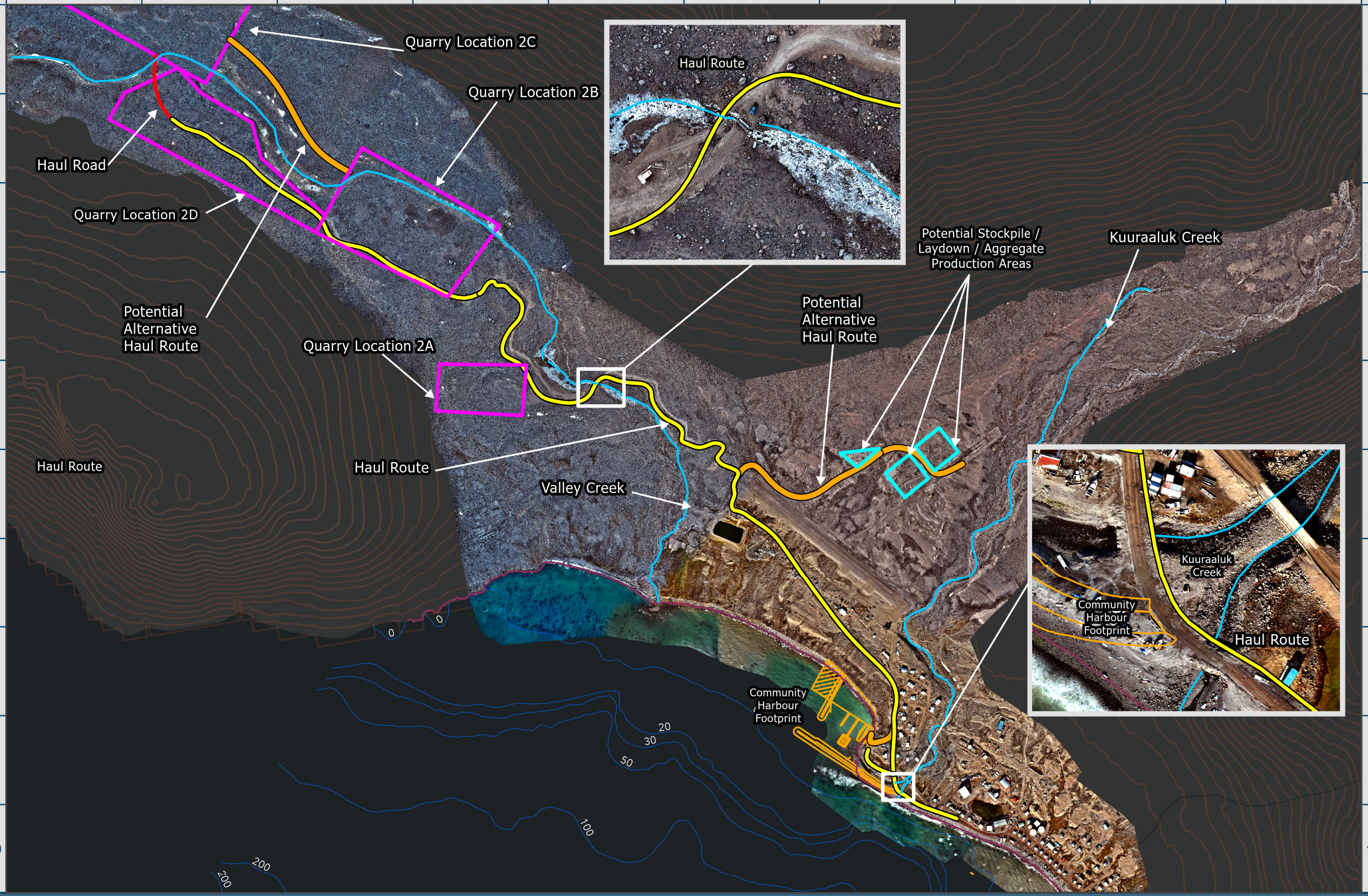


Figure 6-3

Water Courses In Proximity to Project Study Areas

N

Scale: 1:16,465

0 150 300 600 M

Spatial Reference
GCS: GCS North American 1983 CSRS
Datum: North American 1983 CSRS
Projection: Transverse Mercator
Map Units: Meter

Date Saved: 2025-02-27 10:54 AM

Drawn: C. Knight



Dynamic Ocean Consulting Ltd.

worley

Nunavut

6.3.5.2 Marine

Grise Fiord is located on the northern shore of Jones Sound. Jones Sound connects to Baffin Bay in the east and the Arctic Ocean in the west. Water flows from the northwest to Cardigan Strait via Norwegian Bay, a narrow channel between Ellesmere Island and Devon Island, then east through Jones Sound into Baffin Bay (see Figure 1-4).

6.3.6 Air Quality

While air pollution is often thought of as being associated with industrial cities, construction activities taking place in Nunavut can have an impact on local ambient air quality as well. For air quality monitoring within Nunavut, the GN has established the Nunavut Ambient Air Quality Standards (NAAQS), adopted in part from the Canadian Ambient Air Quality Standards (CAAQS). It is noted that the most recent NAAQS are current to 2011, and the CAAQS standards are current to 2020, with new standards being established for 2025 (GN, 2023b). A summary of the NAAQS and CAAQS is presented in Table 6-4.

The DoE works with ECCC to operate air quality monitoring in Nunavut, which is part of the National Air Pollution Surveillance (NAPS) Program. ECCC coordinates the operation of the NAPS program, which operates approximately 600 air-monitoring stations in over 175 locations in Canada. There are currently two active monitoring stations in Nunavut as part of the NAPS Program (current to 2022). These monitoring stations are located in Iqaluit (Water Lab, NAPS ID: 129303) and Alert (NAPS ID: 129401). Between these two, the Water Lab monitoring station has more complete data, current to 2019. Results are summarized in Table 6-4 and are compared to the NAAQS and CAAQS.

Regional air quality monitoring was conducted in 2020 for North Baffin Island as part of the Baffinland Project Annual Report on Air Quality, Dustfall and Meteorology (Nunami Stantec Limited, 2021). At the Mary River Mine Site (approximately 576 km south-southeast from Grise Fiord), the annual average sulphur dioxide (SO_2) was measured at 0.12 µg/m^3, well below the NAAQS annual standard of 30 µg/m^3. The annual average nitrogen dioxide (NO_2) was measured at 18.3 ppb, within the NAAQS of 32 ppb but above the CAAQS of 17 ppb. Ozone (O_3), Total Suspended Particles (TSP), and fine particulate matter were not measured as part of the 2020 Annual Report. The Baffinland Project also released Air Quality Monitoring Results for 2019 (RWDI Air Inc., 2020). The annual average sulphur dioxide (SO_2) was measured at 0.7 µg/m^3, far below the NAAQS annual standard of 30 µg/m^3. The annual average nitrogen dioxide (NO_2) was measured at 19.2 ppb, within the NAAQS of 32 ppb but above the CAAQS of 17 ppb, the same trend from the 2020 report. Ozone, TSP, and fine particulate matter were again not measured as part of the 2020 Annual Report.

Air quality monitoring was conducted in Resolute Bay (see Section 1.17 for distance and direction from Grise Fiord) and Kinngait (formerly Cape Dorset, approximately 1400 km south from Grise Fiord) from 2013-2017 by ECCC as an investigation into the impact of increasing ship traffic on the air quality in northern communities. Resolute Bay is one of the closest Nunavut communities to Grise Fiord (see Section 1.17) and air quality is expected to be similar. It was determined that waste burn, airport operations and town activities such as vehicle traffic, residential combustion and power generators contributed to particulate matter less than 2.5 µm ($PM_{2.5}$) pollution (Aliabadi *et al.*, 2015). Sulphur

dioxide pollution was affected by airport activities and ships anchoring in position (Aliabadi *et al.*, 2015). The maximum measured SO_2 concentration was 1.05 µg/m^3, which is much lower than the Nunavut standards: 450 µg/m^3 (1-hour); 150 µg/m^3 (24-hour); and 30 µg/m^3 (annual). The $PM_{2.5}$ concentration was recorded up to 10 µg/m^3, which is lower than the 24-hour standard of 30 µg/m^3.

Table 6-4: Standards for Air Quality Objectives in Nunavut

Measured Pollutant	Averaging Time	Concentrations (µg/m^3) unless otherwise specified			
		NAPS Data - Iqaluit (2019)	NAAQS (2011)	CAAQS (2020)	CAAQS (2025)
$PM_{2.5}$	24-hour	20	30	27	-
	Annual	-	-	8	-
NO_2	1-hour	79	400	60 ppb	42 ppb
	24-hour	56	200	-	-
	Annual	6	60	17 ppb	12 ppb
SO_2	1-hour	8	450	70 ppb	65 ppb
	24-hour	3	150	-	-
	Annual	0.5	30	5 ppb	4 ppb
O_3	8-hour	38 ppb	65 ppb	62 ppb	60 ppb
TSP	24-hour	-	120	-	-
	Annual	-	60	-	-

Source: GN (2023b)

6.3.7 Noise

Noise data specific to the Project Study Area was not available. It is assumed that noise would be generated from several sources including automobiles, aircrafts and ATVs/snowmobiles and general equipment used in the Hamlet. The Project site is adjacent to a main road which is currently used frequently by trucks and other vehicles accessing the existing breakwater and nearby residential and commercial properties. The area is also frequently used in winter by snowmobiles accessing the ice. The sources described may emit noise for short periods of time and noise effects diminish with distance from a source.

6.3.8 Climate Conditions

Typical of high latitude areas, Grise Fiord experiences 24 hours of sunlight from late April to late August, with an average high temperature of 5 °C in July. During the winter, the community experiences 24 hours of darkness, reaching an average low of -31 °C in February (Time and Date, 2025).

Precipitation in Grise Fiord typically falls as snow through all 12 months of year, with the greatest rainfall occurring during July and August. Average monthly snowfall ranges from 25 mm in July to 227 mm in October. (Government of Canada, 2024a). Snow depth ranges from 228 mm in April to clear of snow from June to August (Government of Canada, 2024a).

Annual mean sea ice extent has on average declined since 1979, at a current rate of 13.1% per decade (ECCC, 2021). Depending on the region, Canadian Arctic summer sea ice area has decreased by 5% to 20% per decade from 1968 to 2016 (Derksen *et al.*, 2019). Inuit Qaujimajatuqangit reports from long-term residents of Grise Fiord state that the 'sea ice is not the same as before. It looks as though some smoke or pollution has settle on to it' and the melted sea ice 'seems to be like oil in ice puddle which look awful for drinking' (Nunavut Climate Change Centre, 2004). The thickness of the sea ice is thinner and rougher, with more packed ice occurring (Nunavut Climate Change Centre, 2004).

In general, the strongest winds in Grise Fiord occur in the fall and early winter months (September to December), ranging between 20 – 31 km/h on average and peaking in October (Government of Canada, 2024a).

6.3.9 Marine Water and Sediment Quality

Water quality in Grise Fiord was assessed over one sampling event on 16 August 2019 by an experienced marine scientist and a local Inuit assistant. Water samples were taken from five locations as shown in Figure 7-3 of the ESEB Report (Dynamic Ocean & Worley Consulting, 2025b). Sample locations were selected to give a broad overview of water quality in the vicinity of the Community Harbour Study Area. Marine water quality in Grise Fiord was relatively consistent across sites and depth profiles. Metal concentrations were below respective the Canadian Council of Ministers of the Environment (CCME) guidelines (CCME, 2003), for all locations except for GF-3 deep, where dissolved cadmium was marginally above. Dissolved metal concentrations generally were comparable to total concentrations, indicating that metals typically are not bound to solids. pH, hardness, alkalinity, total organic carbon, Total Suspended Solids (TSS), sulphur and metal concentrations were consistent across shallow and deep samples.

Sediment quality in Grise Fiord was assessed over one sampling event on 16 August 2019. Particle size distribution varies greatly between the four sampling locations. Percentages of sand increases while percentages of gravel decrease, with decreasing water depth and distance to shore. Concentrations of metals were generally similar throughout all sampling locations, with the exception of sodium at one site, which was less than a quarter of the concentration at the remaining three locations.

Concentrations of metals (and other contaminants) in sediments depends largely on regional and local geology and oceanography, particle size and proximity to contaminant sources (Nunavut General Monitoring Plan, NGMP, 2013), and there is not enough information available in the literature to draw meaningful comparisons to sediment quality results in the Community Harbour Study Area.

Polycyclic Aromatic Hydrocarbons (PAHs) were all below CCME guidelines, and Polychlorinated Biphenyls (PCBs) were below laboratory Reachable Detectable Limits (RDLs) across all sites.

Detailed information regarding the water quality field survey including methods and laboratory analysis, is provided in the Section 5 of the ESEB Report (Dynamic Ocean & Worley Consulting, 2025b).

6.3.10 Coastal Morphology

Grise Fiord and the surrounding area are characterized by mountains and valleys which have been carved out by glaciers. The community of Grise Fiord is located on a series of staircase like marine terraces which occur from sea level to the toe of the surrounding mountains. The Community Harbour Study Area includes a relatively flat shoreline, surrounded to the north by steep marine terraces.

6.3.11 Bathymetry

Bathymetric surveys have been completed by Frontier Geosciences Inc. (Frontier) during the feasibility (2019) and detailed design (2024) phases of the Project. The 2024 bathymetric survey results were not available at the time of this PSIR Report, however Figure 6-4 shows the feasibility phase results. Seabed elevation at the seaward extent of the Community Harbour Study Area is approximately 0.5 to 1.0 m CD.

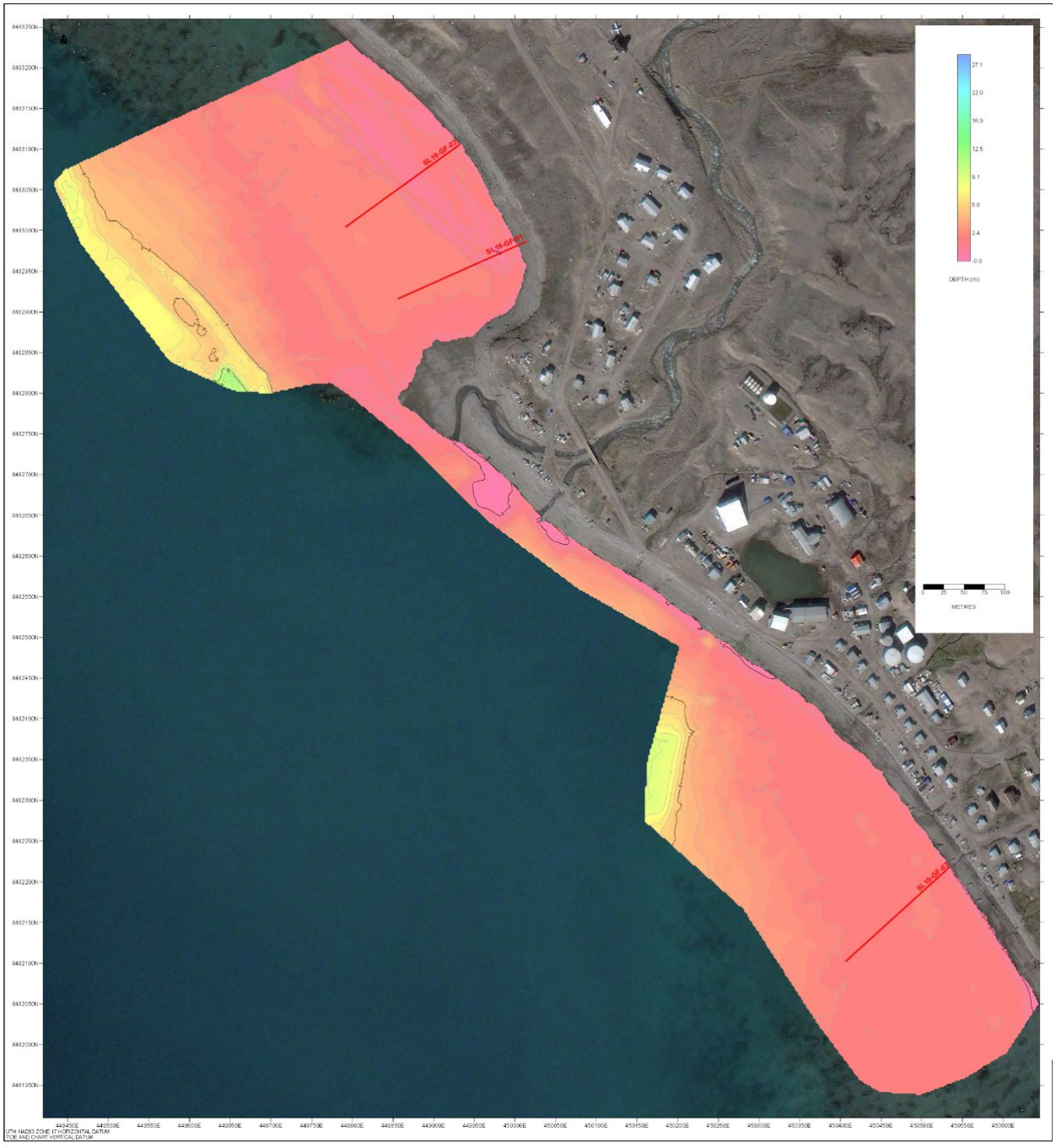


Figure 6-4: Grise Fiord Foreshore Bathymetry

Source: Figure 18 in Frontier Geosciences Inc. (2019)

6.3.12 Tides and Currents

Tide levels for Grise Fiord station were obtained from Canadian Tide and Current Tables, Volume 4 (CHS, 2025), and are provided in Table 6-5.

There are two major wind-driven currents in the Arctic Ocean, the Beaufort Gyre and the Transpolar Drift Stream. Surface water circulates clockwise from east to west. The Arctic Ocean connects to the Atlantic Ocean through the Baffin Island Current, a combination of the West Greenland current inflow, and Artic outflow from channels of the Canadian Artic Archipelago (Britannica & The Editors of Encyclopaedia, 1998). In 2024, surface current data was collected in Grise Fiord using a drogue (a surface float with a GPS tracker). The surface float was set up with an Automatic Identification System (AIS) transponder, which enabled it to be tracked throughout the day so that its location was known for retrieval. Current data was collected for approximately 75 minutes, starting at high tide. The average and maximum current speed were 0.19 km/h and 3.4 km/h, respectively, with a net displacement towards the northeast.

Table 6-5: Tide Levels at Grise Fiord

Tide	Elevation (m, CD)
Extreme Predicted High*	4.0
Higher High Water Large Tide (HHWLT)	3.6
Higher High Water Mean Tide (HHWMT)	3.0
Mean Water Level (MWL)	1.7
Lower Low Water Mean Tide (LLWMT)	0.6
Lower Low Water Large Tide (LLWLT)	-0.1
Extreme Predicted Low*	-0.4

Source: Resolute Station (05560) - CHS (2025)

Note: *Estimated, based on extremes at the reference station of Resolute Bay

6.4 Biological Conditions

Given the harsh climates of the region, biological diversity surrounding Grise Fiord are mostly limited to treeless landscapes, migratory birds, and marine ecosystems.

6.4.1 Terrestrial Vegetation (Including Rare Plants)

Most of Nunavut is located within the Tundra Biome and the Northern and Southern Arctic Ecozones (Ecological Stratification Working Group) (ESWG, 1995). Specifically, the Project is located within Ecoregion 13 - Lancaster Plateau, which is associated with southeastern Ellesmere Island. The Northern Arctic Ecozone incorporates the coldest and driest landscapes in Canada. In addition to the harsh climate, the high winds and shallow soils result in sparse and dwarfed plant life. Herb and lichen communities are the dominant vegetative cover. Lichen communities are associated with rock fields and hilly upland

areas. Vegetation cover is higher on wetter sites, sheltered valleys, and moist corridors along creeks and rivers that typically are more nutrient rich. A review of the Species at Risk Public Registry (Government of Canada, 2024c) showed only Porsild's bryum (*Haplodontium macrocarpum* [Hooker] Spence), listed as Threatened under the Committee on the Status of Endangered Wildlife in Canada (COSEWIC) and Schedule 1 under the *Species at Risk Act* (SARA), whose mapped range overlaps the Haul Road Quarry (HRQ) Study Area.

Field surveys were conducted from 15 to 16 August 2019, by an experienced vegetation ecologist and a local Inuit field assistant. An Ecological Land Classification (ELC) survey was completed to identify the vegetation communities in the HRQ Study Area. Field studies also focussed on identifying each species encountered to collect an inventory for the area. Specimens of unknown species were collected and identified by a taxa expert.

A total of 65 vegetation species were identified, including five shrub, 15 graminoid, 15 forb, 12 bryophytes, and 18 lichen species. Seven distinct vegetation communities were identified and mapped within the HRQ Study Area (see Figure 8-2 in the ESEB Report (Dynamic Ocean & Worley Consulting, 2025b) including Upland Lichen Barren, Upland Dwarf Shrub, Open Water, Disturbed Human-Caused, Wetland Graminoid-Moss Drainage, Coastal Shoreline and Flats, and Upland Graminoid Meadow.

6.4.2 Terrestrial Wildlife (including Habitat and Migratory Patterns)

In general, habitat within Community Harbour Study Area is of limited value for terrestrial wildlife. Human development in the Hamlet extends to the edge of the ocean. The beach is developed and has structures and small craft vessels along its length. Dogs were also tied up along the shoreline and likely deter wildlife. The buildings along the beach and Hamlet area may provide cover for small mammals and weasels. At low tide, the intertidal zone likely provides foraging opportunities. However, the value of these areas for habitat is low given the amount of disturbance and frequent human activity.

Habitat available for wildlife in proximity to the proposed haul route and proposed quarry (borrow pit) areas are similarly of low quality for terrestrial wildlife. Most of the terrain is comprised of rock and outcrop areas with sparse dwarf shrubs and crustose lichens. Patches of wetland and graminoid-moss communities are also present but are infrequent and small. Security, escape, and thermal cover for some small mammals is present. In general, the HRQ Study Area provides low habitat value for terrestrial animals.

The following species were identified as having the potential to inhabit the HRQ Study Area, which was explored during a field survey in August 2019. Arctic hare (*Lepus arcticus*) have confirmed presence (IQ Workshop 2019 - Amon Akeeagok; IQ Workshop 2019 - Manasie Noah; IQ Workshop 2019 - Marty Kuluguqtuq), and portions of the HRQ Study Area may provide habitat for a low population density. Portions of the HRQ Study Area may support a low density of Peary Land collared lemmings (*Dicrostonyx groenlandicus*), but overall, likely provide little value for this species. No lemmings were identified and habitat in the HRQ Study Area was considered limited. Wolverines (*Gulo gulo*) are a wide-ranging, generally nomadic species, and occurrence within the HRQ Study Area is unlikely and would only be transient if present. Arctic fox presence has been confirmed (IQ Workshop 2019 - Amon Akeeagok; IQ

Workshop 2019 - Manasie Noah; IQ Workshop 2019 - Marty Kuluguqtuq) and based upon expected home range sizes, the HRQ Study Area might only partially support one pair or family group of foxes. In the case of arctic wolves (*Canis lupus arctos*) on Ellesmere Island, their primary prey are caribou *Rangifer tarandus pearyi*) and muskoxen (*Ovibos moschatus*) (Anderson & Kingsley, 2015; McLoughlin *et al.*, 2004). Given that it is expected that wolves follow caribou herds (Krizan, 2006) and muskoxen infrequent the Hamlet, it is unlikely that wolves would frequent this area. With the identification of muskoxen scat east of the Hamlet, as well as willows for browse and graminoid meadows, muskoxen could potentially occupy the HRQ Study Area for short periods of time, but the likelihood is low.

6.4.3 Migratory and Marine Birds (including Habitat and Migratory Patterns)

In general, terrestrial habitat in the Community Harbour Study Area is of limited value to migratory and marine birds. Human development dominates the Community Harbour Study Area with structures and small craft vessels along its length. Moreover, teams of dogs were tied up along its length. Species breeding in the Community Harbour Study Area are likely those that nest on bare ground and gravelly areas (e.g., snow buntings: *Plectrophenax nivalis*) and are relatively tolerant of human disturbance (e.g., common raven: *Corvus corax*). However, human use and dogs likely discourage birds from nesting. At low tide, the intertidal zone provides foraging opportunities, but only for those species tolerant of human activity (e.g., gulls [*Larus* spp.] and ravens). Consequently, the value of these habitats is likely low given disturbance and human activity.

A review of the Nunavut Wildlife Harvest Study (NWHS) (Priest & Usher, 2004), revealed that several bird species are harvested by hunters in the Hamlet, confirming their presence and breeding in the surrounding area (see Table 10-1 in the ESEB Report (Dynamic Ocean & Worley Consulting, 2025b)). The species most harvested are ptarmigan (*Lagopus muta*), snow goose (*Chen caerulescens*), eider ducks (*Somateria spp*.), and Canada goose (*Branta canadensis*), respectively. Location data for harvested birds were not collected for most species. Hunters in the Hamlet hunt both common eiders (*S. mollissima*) and king eiders (*S. spectabilis*) and information on the location of harvests for these species was collected. Although no bird harvests have been recorded within the Project Study Area, eider hunting has historically occurred (see Appendix A, Table A- 11 in ESEB Report (Dynamic Ocean & Worley Consulting, 2025b) in nearby fiords (South Cape Fiord, Harbour Ford, Grise Fiord, and Starness Fiord) and at the mouths of these areas towards Jones Sound.

During the field survey from 15 to 16 August 2019, six bird species were identified. No nesting or breeding behaviour was identified. The lack of breeding behaviour does not preclude the potential for birds to nest in the area. Flocks of glaucous gulls (*Larus hyperboreus*), northern fulmars (*Fulmarus glacialis*), and snow buntings were identified within the HRQ and Community Harbour Study Area (see Figure 10-1; Appendix A, Table A-11 and Table A-12 in the ESEB Report (Dynamic Ocean & Worley Consulting, 2025b)). In addition, a flock of common eiders were identified approximately 500 metres offshore from the Community Harbour Study Area (see Figure 10-1 in the ESEB Report (Dynamic Ocean & Worley Consulting, 2025b)). Field-collected data for migratory and marine birds including coordinates are reported in Appendix A, Table A-11 and Table A-12 of the ESEB Report (Dynamic Ocean & Worley Consulting, 2025b).

6.4.4 Fish Habitat (including Marine Vegetation)

Field surveys were conducted in the Community Harbour Study Area in 2019 (15 to 17 August 2019) and 2024 (3 to 6 September 2024) to assess habitat conditions. The intertidal shoreline was primarily hard substrates consisting of cobble, gravel and sand, indicating low habitat quality. No marine vegetation was observed in the intertidal zone during either field survey. Amphipods were observed and typically associated with boulder habitat or in sandy depressions which remain inundated at low tide. As confirmed in the IQ Workshop '*there are lots of amphipods around*' (IQ Workshop 2019 - Marty Kuluguqtuq), and in GN (2012), where the amphipod 'areas of occurrence' are 'everywhere' around the Grise Fiord foreshore.

Subtidal surveys displayed low to moderate habitat quality from both 2019 and 2024 field surveys. The depth of the area observed during the subtidal field surveys ranged from 0.4 m to 23.5 m CD for the community harbour location, and to a maximum of 3.0 m for the Community Harbour Study Area, with a tidal range between 2.7 to 4.0 m (see Section 4.7 in the ESEB Report (Dynamic Ocean & Worley Consulting, 2025b).

In the subtidal field surveys, marine vegetation primarily included rockweed and thread brown algae in infrequent to moderate densities across the entire Community Harbour Study Area. Rockweed was observed in the shallow subtidal and not in the intertidal. Rockweed and kelp are considered abundant in Grise Fiord as confirmed through the IQ Workshop; *'its everywhere'* (IQ Workshop 2019 - Amon Akeeagok). Marine vegetation was most prevalent in areas with hard substrates (i.e., cobble and boulder).

6.4.5 Fish and Marine Mammals

Focal fish and marine mammal species were selected based on several variables which included: their importance to Inuit for subsistence and food security, their geographic ranges which includes the potential to occur in the Project Study Area, and for their representative role in food chain dynamics. Species identified as focal are listed in Table 6-6. Species categories were defined to represent the extent to which the marine species migrate and whether they are permanent residents of Arctic waters. These definitions are provided in Section 6.4.5.1.

Table 6-6: Occurrence of Marine Focal Species

Species (Common Name)	Species (Latin Name)	Species Spatial Category	Type	Seasonal Occurrence
Amphipod	*Gammarus* sp.	Resident	Benthic invertebrate	Year-round
Arctic char	*Salvelinus alpinus*	Anadromous	Pelagic fish	Open-water season
Arctic cod	*Boreogadus saida*	Visitor	Pelagic fish	Open-water season
Bearded seal	*Erignathus barbatus ssp. Barbatus*	Resident	Pinniped	Summer, Fall, Other seasons

Species (Common Name)	Species (Latin Name)	Species Spatial Category	Type	Seasonal Occurrence
				indicated by harvest data, can be found year-round.
Beluga whale	*Delphinapterus leucas*	Resident	Cetacean	Spring, Summer, Fall
Bowhead whale	*Balaena mysticetus*	Resident	Cetacean	Summer
Harp seal	*Pagophilus groenlandicus*	Visitor	Pinniped	Summer, Fall, Other seasons indicated by harvest data
Hooded seal	*Cystophora cristata*	Visitor	Pinniped	Summer, Fall. Spring and Winter ice dependent
Killer whale	*Orcinus orca*	Visitor	Cetacean	Spring, Summer, Fall
Narwhal	*Monodon Monoceros*	Resident	Cetacean	Summer
Polar bear	*Ursus maritimus*	Resident	Ursid/Fissiped	Spring, Summer, Fall
Ringed seal	*Pusa hispida ssp. Hispida*	Resident	Pinniped	Spring, Summer, Fall, Winter
Sculpin	*Myoxocephalus Scorpius* (shorthorn) *Gymnocanthus tricuspis* (Arctic staghorn)	Resident	Bottom dwelling fish	Year-round
Truncate soft-shell clam	*Mya truncate*	Resident	Bivalve invertebrate	Year-round
Atlantic walrus	*Odobenus rosmarus ssp. Rosmarus*	Resident	Pinniped	Summer, Fall

6.4.5.1 Species Spatial Categories

6.4.5.1.1 Fish

Marine fish that are found in the Arctic occupy the ocean differentially, either as residents, migratory species or anadromous, as defined below:

- **Migratory:** species that migrate exclusively in the marine environment on an annual or seasonal basis, triggered by local climate, food availability or for mating reasons.
- **Resident:** species that occupy the same general area throughout the year.
- **Anadromous**: the movement of fish between freshwater and marine environments for the purposes of feeding in one environment and spawning in the other.

The coastal marine environment fronting the Community Harbour Study Area may be used by migratory species such as Arctic char (*Salvelinus alpinus*) and Arctic cod (*Boreogadus saida*). Both species are present predominantly during the open-water season. Sculpins and marine invertebrates, including amphipods and truncated soft-shell clams, are also a common part of the benthic ecosystem in Nunavut.

Arctic char are an important subsistence and commercial fishery species in Nunavut that have both a lacustrine and anadromous life history. Anadromous Arctic char live primarily in fresh water and migrate to the ocean for a short summer migration (~20 to 45 days) (Bégout *et al.*, 1999; Klemetsen *et al.*, 2003), at which time they may double their body mass (Jørgensen *et al.*, 1997). The Nunavut Coastal Resource Inventory (NCRI) for Grise Fiord does not reference any occurrence of in or around Grise Fiord, which was confirmed during the IQ Workshop (GN, 2012; IQ Workshop 2019 - Manasie Noah; IQ Workshop 2019 - Marty Kuluguqtuq). The closest anadromous river to Grise Fiord is in in Baad Fiord (IQ Workshop 2019 - Amon Akeeagok). There is no information on the migratory patterns of Arctic char in and around Grise Fiord.

Arctic cod are a pelagic marine species believed to be the single most important species in the trophic link between plankton, and marine birds and mammals in the Arctic ecosystem (Hobson & Welch, 1992). Little is known about size distribution of Arctic cod; however, they are reported to be ‘everywhere’ in Grise Fiord (IQ Workshop 2019 - Amon Akeeagok; IQ Workshop 2019 - Manasie Noah; IQ Workshop 2019 - Marty Kuluguqtuq; IQ Workshop 2019 - Marty Kuluguqtuq; IQ Workshp 2019 - Amon Akeeagok). Often, when Arctic cod are observed, they are being followed by predators, including narwhal (IQ Workshop 2019 - Marty Kuluguqtuq) and seals (IQ Workshop 2019 - Manasie Noah).

The presence of sculpin was confirmed during the IQ Workshop as being one of the main fishes caught (IQ Workshop 2019 - Manasie Noah; IQ Workshop 2019 - Marty Kuluguqtuq). In Grise Fiord, subsistence fishing for sculpin is conducted along the tide line east of the community and near shore in an area southwest of the community (Figure 4-1).

The distribution of Arctic amphipods is dictated by habitat type and food resources available (Oceans North Conservation Society *et al.*, 2018). When amphipods are present in intertidal benthic environment, there is a tendency to be associated with moist habitats, which consist of either rock (boulder, cobble) or

seaweed (typically rockweed). The truncate soft-shell clam (*Mya truncata*) is an in-faunal species in the Arctic that plays an important role in carbon cycling. Amphipods and soft-shell clams are important food sources for a variety of marine animals including; marine mammals (walrus, bowhead whales, bearded seals *(Hobson et al., 2002)*); fish (Arctic char), and birds (benthic-feeding eider ducks, Thick-billed murres) (Crawford *et al.*, 2015; Gaston & Elliott, 2014; Whitehouse *et al.*, 2017). Given the sedentary adult life stage of the soft-shell clam, they are a valuable and predictable food source for these higher trophic level species (Highsmith & Coyle, 1990).

During intertidal surveys in 2019 and 2024, the only invertebrates observed were amphipods. For the subtidal Remote Operate Vehicle (ROV) surveys, truncate softshell clams (*Mya truncata*) were the most abundant invertebrate. Truncate softshell clam densities ranged from 5/m^2 to upwards of 15/m^2, and their occurrence classification ranged from trace to infrequent.

Other marine invertebrates observed included:

- Green sea urchins (*Strongylocentrotus drobachiensis*).
- Limpets (*Tectura* sp.).
- Brittle stars (*Ophiura sarsi*).
- Anemones (unidentified).
- Hydroids (*Lafoeina maxima* and possibly *Lafoe* sp.).

6.4.5.1.2 Marine Mammals

Marine mammals that are found in the Arctic were categorized as either Arctic residents or Seasonal visitors, as defined below:

- **Arctic resident:** species that resides in the Arctic year-round.
- **Seasonal visitor:** species that predictably resides within the Arctic region for a portion of the year, which most typically is the open-water season.

Seven species of marine mammals are considered residents of the Grise Fiord area (Table 6-6). These include three species of cetacean—narwhal (*Monodon monoceros*), beluga (*Delphinapterus leucas*), and bowhead (*Balaena mysticetus*)—which seasonally occur during the spring, summer, and early winter months. Beluga whales in this region belong to the Eastern High Arctic-Baffin Bay population, and IQ suggests that their presence is closely tied to the North Water Polynya, which extends into Jones Sound (QIA, 2018). Narwhals primarily encountered near Grise Fiord belong to the Jones Sound subpopulation (DFO, 2010; Watt *et al.*, 2013). According to IQ, narwhals are not present year-round in this area but are seasonally found from May to October in Jones Sound and the coastal waters of Ellesmere Island (QIA, 2018). Coburg Island and its surrounding waters also appear to be an important feeding ground for narwhals (Government of Canada, 2017). Bowhead whales seasonally migrate into the area during the months of spring, summer, and early fall. During this time, they follow the ice edge and occur in open

bays and straits. None of these cetacean species are commonly found within the area, with bowhead whales relying mainly on pelagic food sources such as zooplankton and beluga and narwhal relying on Arctic cod as they migrate through the region.

Ringed seals (*Pusa hispida* ssp. *hispida*), bearded seals (*Erignathus barbatus* ssp. *barbatus*), and the Atlantic walrus (*Odobenus rosmarus* ssp. *rosmarus*) are considered resident species in Grise Fiord and Jones Sound. Ringed seals are the most abundant pinniped species in the region, remaining in Arctic waters year-round. They can be found throughout Jones Sound and the surrounding waterways near Grise Fiord, relying on the floe edge and breathing holes during the winter months, and continuing to use these areas until early July. From July to October, they move into open water (QIA, 2018). While less is known about the ecology of bearded seals, Grise Fiord and its surrounding waters fall within the known spring-summer distribution range for this species (COSEWIC, 2007). IQ reports that bearded seals have been observed in the area year-round, except for January. However, there is some variability, as other sources suggest the species may not be present during the winter months (QIA, 2018). In Grise Fiord, bearded seals are most observed during the open water season, from June to September (IQ Workshop 2019 - Amon Akeeagok; IQ Workshop 2019 - Manasie Noah; IQ Workshop 2019 - Marty Kuluguqtuq) . Atlantic walrus are year-round residents of the Arctic, although their distribution varies seasonally in relation to ice cover (COSEWIC, 2006). Most migration activity is observed in mid-October (Koski *et al.*, 1993), when walrus leave as ice forms and move to areas with open water and mobile ice. Walrus are known to winter in several locations in Lancaster Sound (DFO, 2018), including Jones Sound, Devon Island, the floe edge of the North Water Polynya (Born *et al.*, 1995).

Polar bears (*Ursus maritimus*) are found throughout the high Arctic, including the Grise Fiord area (IQ Workshop 2019 - Amon Akeeagok; QIA, 2018). Most sightings occur from March to June, though they can sometimes be observed into early fall in certain years (Garshelis *et al.*, 2012). Polar bears are particularly attracted to the Grise Fiord dump and areas along the shoreline where human food caches are present (IQ Workshop 2019 - Amon Akeeagok), increasing the potential for human-polar bear conflicts. Polar bears are commonly seen along the ice edge foraging for seals in Jones Sound as well (Garshelis *et al.*, 2012).

Although these marine mammal species are resident to Grise Fiord and its surrounding waters, most are seasonal visitors that migrate to the area for breeding and feeding. It is likely that habitat surrounding the Project site can support the lower trophic species that marine mammals feed on, and thus there are minimal impacts expected from the Project construction on resident marine mammals.

6.4.6 Species at Risk

Species discussed in this section have been assessed by international (IUCN, COSEWIC and SARA), territorial agencies (GN-DoE), and the RNLUP (NPC, 2023c). A list of the at-risk vegetation, wildlife, marine and migratory birds, marine fish and marine mammals that have potential to occur in the Project Study Area and their likelihood of occurrence are listed in Table 3-2 of the ESEB Report (Dynamic Ocean & Worley Consulting, 2025b).

Fisheries and Oceans Canada has generated an Aquatic Species at Risk (SAR) map; however, at this time it does not include Grise Fiord (DFO, 2024b).

6.5 Socioeconomic Conditions

The Hamlet of Grise Fiord is known locally as Aujuittuq, which means the “place that never thaws” in Inuktitut. The community is located at the entrance to a fiord on the southern shores of Ellesmere Island at Jones Sound. It is the northernmost community in Canada and is one of the coldest inhabited places in the world. Grise Fiord is surrounded by the Arctic Cordillera Mountain range which shields the community from harsh winds.

The nearest communities are Resolute Bay, Arctic Bay and Pond Inlet (see Section 1.17, Figure 1-4).

6.5.1 Population, Education and Language

According to 2021 census data from Statistics Canada, the total population of Grise Fiord is 144 people, representing an increase of 11.6% since 2016 (Statistics Canada, 2023). The population is young with a median age of 28 years old and children aged 0-14 years representing nearly a quarter (24.1%) of the total population. The Nunavut Bureau of Statistics estimated the population of Grise Fiord as of 01 July 2023 to be 160 (GN, 2023a).

The total Inuit population is 135 or 93.8% of the total population according to Statistics Canada 2021 census data (Statistics Canada, 2023).

In 2021, of the total population 15 years old and over in Grise Fiord, nearly a third (30 individuals) held a secondary school diploma (or equivalent) as their highest educational attainment. An additional 30 individuals held a postsecondary certificate, diploma or degree. Of the 30 individuals with postsecondary accreditations, one third (10 individuals) held apprenticeship or trades certificates; and another third graduated with a University Bachelor’s degree. Nearly half (50 individuals) of the total population 15 years old and over held no certificate, diploma or degree.

Inuktitut is the prevalent language in Grise Fiord, reported as the mother tongue for 65.5% of residents. However, just over one quarter (26.6%) of employed residents in Grise Fiord work in settings where Inuktitut is the language most often used at work (Statistics Canada, 2023). A majority of the total population in Grise Fiord also speak English (135 residents or 93.1%).

6.5.2 Employment and Economic Activity

Grise Fiord experiences higher participation rates and higher unemployment rates compared to Nunavut as a whole. Of the population 15 years old and over (110), 70 people or 63.6% participate in the labour force in Grise Fiord compared to 58.6% participation for the territory. The unemployment rate was reported as 21.4% in Grise Fiord compared to 16.9% for Nunavut (Statistics Canada, 2023).

Low levels of literacy and numeracy present a challenge to labour force development across Nunavut (GN & NTI, 2022).

> "*…the largest group of adult learners in Nunavut needs programming that focuses on literacy, life skills, completion of high school or high school equivalency, adult basic education, and personal empowerment," (GN & NTI, 2022).*

Individuals with low levels of literacy are prevented from gaining meaningful employment, *"while others are dead-ended in positions from which they can't progress without additional education and training*" (GN & NTI, 2022).

Additionally, according to the community's 2024/25 Infrastructure Plan, the community has been without a daycare facility for over 5 years. The absence of a daycare facility has far reaching effects on the families specifically, and the community general. Many parents in Grise Fiord find it hard to find care for their young children during work hours because the community lacks a licensed daycare.

The economy in Grise Fiord can be characterized as a combination of traditional subsistence activities (including hunting, fishing, trapping and gathering) and wage based economic activities. Key employers in the community include the Hamlet of Grise Fiord, the GN (education, power, and health centre) and the Grise Fiord Inuit Co-op and Hotel. Tourism is a growing sector in the economy and Grise Fiord is a frequent destination for polar expeditions and cruise ships travelling the Northwest Passage. Many residents continue to rely heavily on fish, seal and whale hunting, both for subsistence and as a cultural activity, including customary resource sharing practices. According to the 2021 census, residents participate in a variety of occupations including: fishing and hunting; utilities; and educational services. Public administration accounted for the largest industry, occupying one third (33.3%) of the total labour force activity in Grise Fiord (Statistics Canada, 2023).

6.5.3 Land and Resource Use

6.5.3.1 Harvesting and Food Security

Hunting remains essential to life in Grise Fiord. Harvesting of seal and narwhal are of particular importance. The availability of traditionally harvested foods in Grise Fiord is crucial because it lowers the demand for imported food, which is expensive and most often less nutritious. Additionally, the harvesting, preparation, and sharing of meat and skins offers important opportunities for community members to maintain Inuit cultural practices. Residents also obtain food at the Co-Op and convenience store, and through sealift. However, "*Low incomes and high food prices mean most Inuit households can afford less than half the cost of a healthy food basket, while very low-income households can afford only 6–13% of the cost of a healthy food basket*" (Inuit Tapiriit Kanatami, 2021). Additionally, the AFA vessel comes in annually to supply the community with food and hunting supplies. There are often community sales of AFA supplied goods that are priced lower than items at the Co-op store or from sealift (Jaypetee Akeeagok, AFA Chairman. November 2018).

Harvesting locations identified during the IQ program have been provided in the Land Use and Occupancy map (Figure 4-1).

Harvesting in the community occurs mainly along the shoreline fronting town and to the East. A large clam bed is harvested on the east side of the community (Figure 4-1). Some people also harvest kelp in

this area, and some wait for it to be pushed onshore (IQ Workshop 2019 - Amon Akeeagok). Although a smaller bed of clams occurs to the west in the area of the community harbour, no clam harvesting or any kind of plant harvesting is conducted there due to the wastewater discharge (IQ workshop 2024).

Fishing for sculpin is conducted along the tide line east of the community and near shore in an area southwest of the community (see Figure 4-1). Fishing is done by jigging, there are no gillnets placed (IQ workshop 2019 and 2024).

Hunters wait for seals and other marine mammals (including narwhal) all along the shoreline fronting the community, to the east of the community and, to a lesser extent, in an area southwest of the community (see Figure 4-1).

> *"The seal waiting area to the southwest was used more a long time ago, now many of the young won't walk all that way and mostly stay all along the shore closer to the community"* (IQ Workshop 2019 - Amon Akeeagok)

Belugas are commonly observed and harvested close to shore, west of the community, in the area of the community harbour. Additionally, hunting for seals along ice cracks that form at rocky outcrops along the shoreline is common:

> *"the ice will have cracks and seals will make holes, as soon as freeze up happens it creates cracks and then we hunt along these cracks until breakup in Spring"* (IQ Workshop 2019 - Manasie Noah)

Trapping does not occur anywhere within the municipal boundaries of Grise Fiord, including in the areas where Arctic fox and Arctic Hare are present enroute to the ptarmigan hunting area (Grise Fiord IQ Workshop 2019 and 2024).

> *"People feel that animals are too close to the dump and sewage lagoon to harvest them. There used to be fox traps in the area but not so today. However, if a hare or fox is clean and away from refuse, one may harvest if he/she so choses."* (IQ Workshop 2019 - Marty Kuluguqtuq)

Polar bear tracks are commonly sighted at the dump and all along the shoreline where there are food caches (IQ Workshop 2019 and 2024).

Although small blueberry patches are picked for leisure near the seal waiting area southwest of the community (see Figure 4-1) (IQ Workshop 2019 - Manasie Noah), there are no specific or significant plant harvesting areas to avoid in or around the Study Area (IQ Workshop 2019 and 2024).

A known Thule site east of the community and a potential archaeological site west of the community were marked on the map by knowledge holders. There were no other known cultural sites identified by knowledge holders in or around the Study Area (IQ Workshop 2019 and 2024).

6.5.3.2 Access and Navigation

Small craft vessels and skidoos are critical for subsistence harvesting in the Arctic. The majority of harvesting activities are conducted far from Grise Fiord and require small craft vessels and skidoos for access, as made evident by a local hunter:

> *"The community depends on boating for our food, livelihoods, to harvest healthy country food for our kids and grandkids"* (Jaypetee Akeeagok, AFA Chairman. November 2018).

Currently, Grise Fiord does not have an established boat harbour. Boat owners moor their small craft vessels in a rudimentary mooring basin in one of two arms at the mouth of the Kuuraaluk Creek to protect their small craft vessels from storm waves. Kuuraaluk Creek is the major creek that runs through the middle of the Hamlet. Access into and out of the mooring basin is restricted at low tide. The only marine infrastructure consists of two mooring bollards for the fuel re-supply tanker.

Dry cargo from sealift is lightered to shore in the conventional manner, that is, using small tugs and barges that are carried on board the arriving ship. The barges are brought into the beach immediately in front of the RCMP detachment building and temporarily stored in the area surrounding the road that also fronts the RCMP detachment. When the AFA vessel arrives with their annual stores, a GN supplied float is deployed for lightering and brought into the sealift beach area, which is close to the community freezer. Local boat activities are generally segregated from sealift.

The community has been building a road to Nuvuk along the beach by extending the community's main road along the valley behind the Greenlander mountain (see Figure 4-1). Progress on the road has been gradual and currently extends to approximately 250 m from the furthest proposed quarry area (borrow pits). The road aims to provide critical access for hunters to the fjord. The fjord thaws earlier in the spring and freezes faster in the fall extending the ability to hunt and fish during these transitional seasons (IQ workshop 2024).

In general, ice is accessed all along the shoreline and is considered fairly easy most years (IQ workshop 2019 and 2024). Ice trails and access locations change from year to year depending on where the ice has rafted that year. In the spring, when the ice gets too fractured, ice access points continue to move east along the coast to access hunting grounds (see Figure 4-1) (IQ Workshop 2019 and 2024). No concerns were expressed about the Project affecting ice access during consultations.

6.5.3.3 Tourism

Grise Fiord is Canada's most northern community, located 1,160 km from the Arctic Circle. It is nestled among majestic mountains at the end of the stunning fiord that offers a unique tourist experience. Grise Fiord is the closest community to Quttinirpaaq National Park - Canada's second largest and most northern National Park. The Nirjutiqavvik National Wildlife Area is also located nearby.

Ausuittuq Adventures run by Terry Noah[2] is a 100% locally owned Inuit outfitting business providing several tours in and around Grise Fiord, including iceberg viewing, dog team rides, seal hunting and photography tours among many others. The HTA can also arrange for local Inuit guides to support tourists.

Cruise ship and private pleasure craft visits to the community have steadily increased over recent years. According to the Hamlet, the community now receives an average of seven cruise ship visits annually.

6.5.4 Local and Regional Traffic Patterns

Grise Fiord is serviced twice a week by scheduled commercial flights on Kenn Borek Air Ltd. (currently on Mondays and Thursdays).

The roads in Grise Fiord are gravel surface with no walkways. Pedestrians, ATVs, snow machines, cars and trucks all share the road. The Hamlet manages snow clearing and dust suppression on roads.

The Hamlet has identified a need for a pedestrian walkway to connect the two halves of the community and minimize risk from polar bears (GN, 2024a). The community is currently divided by commercial buildings, the school, and municipal infrastructures on one end of town, and the majority of residences on the other. In order to get from one side to the other, pedestrians have to walk along the main road to get to school and work. This is concerning especially in the dark season and with the presence of polar bears that commonly travel along the shoreline.

Sealift is a vital link for all communities in Nunavut that supply residents with their annual cargo of goods and materials. Details on the sealift operations are provided in Sections 1.13 and 6.5.3.2.

6.5.5 Human Health and Community Wellness

The Health Centre in Grise Fiord was built in 1990 and is adequately resourced with two nurses and equipped to meet most health care needs from the community. According to the most recent data, Grise Fiord Health Centre had a total of 1,642 visits in 2016 and 9.8 visits per capita (GN, 2018).

The Health Centre has the ability to provide X-rays and sutures; prescribe drugs; intubate patients; and, in emergency cases, stabilize patients to be medevacked by plane to hospitals in Iqaluit or further south. The Health Centre offers 24-hour on-call emergency service. Given the remote location of Grise Fiord, fly-in specialists are not a regular occurrence; however, an occupational therapist and speech therapist visit once a year. In addition, nurses have access to tele-help to access specialists.

The Health Centre occasionally closes during holidays when staffing is insufficient. Due to weather and remoteness, delays for medical evacuations can take up to 6 days in some circumstances, emphasizing the need for the contractor to plan accordingly (Supervising nurse. pers. comm. December 2024).

[2] Ausuittuq Adventures URL available at: https://www.ausuittuqadventures.com

Workers are also advised to bring all required medication with them and to have first aid response capacity and supplies such as bandages, antiseptic, over the counter medications etc.

Beyond public health programs and the health centre, Inuit traditional activities such as harvesting, preserving food, preparing skins and resource sharing contribute greatly to familial and cultural cohesion which are critical to community wellness. In addition, social activities such as sports, Inuit games, arts and crafts and land-based programs are important factors in promoting community health and personal well-being in Grise Fiord

6.5.6 Housing and Community Infrastructure and Services

The Nunavut Housing Corporation's (NHC) Annual report for 2023-2024 listed Grise Fiord's housing need as a percentage of stock at 29% indicating a less critical need for housing compared to other communities in the territory (NHC, 2024).

Temporary accommodation in Grise Fiord is very limited and is currently provided by the Grise Fiord Lodge with nine rooms and capacity for nineteen guests total (Grise Fiord Inuit Co-op and Lodge Manager. pers. comm. November 2019).

Water is collected from glacial run-off streams from the mountain, gathered in a holding pond and gravity fed to two 3.7 million L holding tanks with the community using about 5 million L annually. The Hamlet monitors water levels daily to ensure adequate and supply and confirmed that there are no current concerns regarding the capacity and reliability of the source water for the community. Water is treated with chlorine before being loaded into trucks at the fill station for distribution to holding tanks in each building and residence. Currently, there is one water truck that delivers water daily to residences and commercial operations and one back-up water truck. A new water treatment plant (described in Section 7.4) is currently being planned and expected to be operational by 2028/29.

The community has a non-engineered sewage lagoon with a capacity of 19,360 m^3 that receives the trucked sewage from holding tanks for each building. The sewage lagoon is located approximately 800 m away from the Hamlet next to the solid waste landfill. The lagoon is a single cell retention system where effluent undergoes natural treatment prior to being discharged into the ocean. According to the Hamlet, the sewage lagoon is relatively small, and its capacity is strained during years with higher-than-average snow and rain. The lagoon is decanted once per year, typically in late June or early July. While the lagoon has functioned adequately to meet current community demands, an influx of approximately 30 additional people could pose capacity challenges (David General, SAO pers. comm. December 2024). Additionally, sewage and municipal wastewater are collected by a sewage truck on a daily basis. There is a back-up sewage truck, however, it currently requires major repairs.

The municipal waste facilities include a domestic solid waste area, and a bulk metal waste area located approximately 800 m away from the Hamlet near the sewage lagoon and close to the Arctic Ocean. The Hamlet stated that they have insufficient equipment for sorting waste at the landfill and emphasized the need for proper fencing to contain debris and manage the risks posed by polar bears (David General, SAO. pers. comm. December 2024). The GN's 2023-2024 supplementary capital budget allocates just

over $1M for upgrades to the solid waste facility under the Small Communities Fund (SCF). These upgrades aim to address existing capacity and operational challenges at the facility.

Electricity is provided by diesel generators owned and operated by QEC, a territorial corporation wholly owned by the GN. Qulliq Energy Corporation is the sole generator, transmitter, and distributor of electrical energy in Nunavut. A new 10kW solar power system with net metering was installed on the west side of the Hamlet/community complex in 2022. According to the Hamlet, an additional 100kW solar power system for the community is expected to be installed by 2025. Fuel for electricity generation and other needs is imported, stored, and distributed by the GN-PPD.

Fuel is stored at a tank farm located less than 500m from the centre of town. Although there have been no significant issues with fuel delivery or storage capacity (see Tabe 12-4) in the community in recent years (except for a jet fuel shortage in 2022), the community often runs low before the annual resupply in mid-August. The fuel storage tanks have not been cleaned for many years. Condensation within the diesel tank has caused issues in the past resulting in milky diesel supply that impacted heavy equipment (Marty Kuluguqtuq, SAO. pers. comm. December 2024). According to the Hamlet's 2024/25 Infrastructure Plan (GN, 2024a), the community plans to expand diesel tank capacity, as there is currently only one diesel tank, and renovate the tank farm, as the existing fuel tanks are old and showing signs of aging.

Table 6-7: Bulk Fuel Storage Capacity for Grise Fiord

Total Diesel (L)	Total Gasoline (L)	Total Jet A-1 (L)
1,289,828	274,386	182,738

Source: Nunavut Maligaliurvia (2023)

Fire protection is the responsibility of the Hamlet and currently relies on 8-9 volunteer firefighters. The Hamlet reports they have sufficient resources for fire response. However, there is no firehall and one of the Hamlet's buildings currently houses the fire truck, fire-fighter bunker gear, and air compressor. This building serves as the "Firehall " since no other building was made available for this purpose. It does not have washroom facilities, nor running water and requires a renovation (GN, 2024a).

The RCMP detachment office is staffed with two full time officers on 2-year rotations.

Landline, mobile, and internet services are provided by NorthwesTel/Bell Mobility and Qiniq. The local community radio (Atta Suvaguuq Radio Society) broadcasts daily in Inuktitut and English.

6.5.7 Archaeological and Culturally Significant Sites

Two AIAs were conducted in support of the Project, in 2019 and 2024. The 2024 AIA, conducted under NU Permit 2024-63A by Brent Murphy with AECOM Canada ULC (AECOM), focused on areas not assessed during the 2019 survey (AECOM, 2024). These included two proposed quarry areas and access road corridors that could be impacted by the development.

The 2024 AIA was carried out between 27 to 29 August 2024 and consisted of a comprehensive pedestrian survey of all areas potentially affected by the Project. This included areas excluded from the 2019 survey, such as portions of the Community Harbour Study Area, potential borrow sites, and access roads.

The assessment identified no archaeological sites within the development footprints or the 100-meter buffer zones. Two previously recorded sites, RcHi-3 and RcHi-5, were revisited during the survey; however, these sites are outside the areas impacted by the Project.

Local knowledge guided the process, with Terry Noah from Grise Fiord assisting in the survey and landform interpretation. No archaeological or paleontological sites were observed within the defined Project Study Area.

7 Potential Impacts and Proposed Mitigation

Potential impacts were considered relative to the proposed construction activities (described in Section 1.11) for the Project Study Area (described in Section 6.2) and specific to each of the VECs and VSECs. Impacts were considered for their potential to affect the baseline environmental and socio-economic conditions, as well as by the criteria NIRB uses for screening decisions:

- Could the Project have significant adverse effects on the environment, and Inuit harvesting?
- Could the Project have significant adverse effects on the well-being of northerners?
- Does the Project cause significant public concern?
- Does the proposal involve new technologies with unknown effects?

Potential impacts were categorized by the terms in Table 7-1 and are summarized in Table 7-2. For the construction phase, the whole Project Study Area was considered (described in Section 6.2); however, during the operations phase, the consideration is exclusive to the Community Harbour Study Area. The descriptions pertinent to the construction and operations phases are summarized in Sections 7.1 and 7.2, respectively.

All impacts were considered either “Positive” or “Negative and Mitigatable” and thus no residual effects are expected subsequent to implementation of mitigation and monitoring measures.

Mitigation and monitoring measures will be implemented for the construction phase to minimize negative effects. These measures are summarized in the subsections below and detailed in the CEMP (Dynamic Ocean & Worley Consulting, 2025a). Further, the contractor will be required to develop Construction Work Plans (CWP) that will detail the methodology for implementing mitigation and monitoring measures (see Sections 8.3.1 and 8.3).

Table 7-1: Screening Assessment Categories

Category	Term in Table 7-2	Definition
Positive	P	Net gain in functionality after construction or during operations
Negative, non-mitigatable	N	Negative and will remain as a residual effect, after construction or during operations
Negative, mitigatable	M	Negative, but measures can be put in place to minimize or eliminate the effect
Unknown	U	Information is not available to confirm what effects will be
No impact	Blank	There is a no effect, and thus considered neutral

Note: see Table 7-2 or VECs and VSECs categories

Table 7-2: Project Specific Information Requirement Environmental Effects Table

	Physical	Designated Environmental Areas	Geological Site Conditions	Surface Features	Ground Stability and Permafrost	Hydrology	Air Quality	Noise	Climate Conditions	Marine Sediment and Water Quality	Coastal Morphology and Bathymetry	Tides and Currents	Biological	Vegetation (Terrestrial)	Wildlife	Birds (Migratory and Marine)	Marine Fish Habitat	Fish and Marine Mammals	Species at Risk	Socio-Economic	Employment, training and business opportunities	Land and resource use	Tourism	Local and regional traffic patterns	Human Health and Community Wellness	Community Infrastructure and services	Archaeological and culturally significant sites
Construction																											
Infill							M	M		M	M			M	M	M	M	M	M		P	M	M	M	M	M	
Dredging							M	M		M	M					M	M	M	M		P	M	M	M	M	M	
Installation of Floating docks							M	M		M							M	M	M		P	M	M	M	M	M	
Drilling and Blasting (land based)					M		M	M		M					M		M	M	M		P	M	M	M	M	M	
Crushing and Screening							M	M							M				M		P	M	M	M	M	M	
Stockpiling																			M		P	M	M	M	M	M	
Haul Road Upgrades														M	M	M			M		P	M	M	M	M	M	
Drainage for quarry or haul roads (culverts)					M										M	M					P	M	M	M	M	M	
Mobilization/Demobilization of equipment							M	M						M					M		P	M	M	M	M	M	
Construction equipment (marine, land based)							M	M		M				M	M	M	M	M	M		P	M	M	M	M	M	
Light (illumination of Project site)														M	M	M		M	M		P	M	M	M	M	M	
Fuel storage, refueling, accidental spills							M	M		M				M	M	M	M	M	M		P	M	M	M	M	M	
Construction workforce							M	M													P	M	M	M	M	M	
Operations																											
Marine Access							M	M													P	P	P	P	P	P	
Road Access							M	M							M	M											
Fuel storage, refueling, accidental spills							M	M						M	M	M										M	
Cargo delivery (sealift operations)																											
Boat launching																					P	P	P	P	P	P	
Decommissioning																											
Not applicable.																											

Note: See Table 7-1 for screening categories

7.1 Construction Phase Impacts and Mitigation

Regulatory compliance requirements will be identified in the CEMP (Dynamic Ocean & Worley Consulting, 2025a), in CWP, and in permits and approvals issued by pertinent AHJs. The contractor will be responsible for the design and implementation of a compliance monitoring program, which will be overseen by the GN-CGS. Roles and responsibilities pertinent to the regulatory compliance program are described in the CEMP (Dynamic Ocean & Worley Consulting, 2025a).

7.1.1 Physical Components

Construction activities as described in Section 2.1.2 that have the potential to impact the physical VECs identified are summarized in Table 7-2 and detailed below.

7.1.1.1 Designated Environmental Areas

There will be no impact to the designated environmental areas due to the construction of community harbour, quarry, and haul road.

7.1.1.2 Geological Site Conditions

Laboratory testing to assess the potential for acid generation (PAG) and ML from the proposed borrow source locations is currently underway.

Certain sulphide minerals in bedrock can be problematic from an ARD perspective. Unstable sulphides can react when exposed to air causing acid generation and ML. If left in the natural state, sulphide minerals remain benign.

It is unlikely that the borrow source is PAG; however, laboratory testing will confirm this.

7.1.1.3 Surface Features

Impacts on surface features due to development at the quarry (borrow pits) and community harbour are expected to be minimal and limited to the footprint of the quarry, community harbour and haul road.

7.1.1.4 Ground Stability and Permafrost

No impacts to ground stability pertaining to permafrost thaw in the intertidal zone within the Community Harbour Study Area are anticipated during construction; however, this is to be confirmed based on the results of the upcoming site investigation in April 2025. Permafrost may affect local stability of the quarry (borrow pits) after blasting at the quarry for rock production (if required) and will need to be monitored/drained effectively.

Any construction or maintenance activities for the haul road can cause ground disturbance and/or change in the ground/air temperature balance. This would cause an increase in the active layer thickness and permafrost degradation. Any thawing of permafrost may lead to differential settlement problems that may lead to ponding of surface water, impact any erosion and cause failure of the

proposed structure. Any construction in low lying areas that are ice rich and have poor drainage would require that the granular working surface (embankment) is constructed to a suitable thickness (at least 1 m to 1.5 m) before any surface course is applied to limit any disturbance to the thermal regime that would induce thawing.

While no impacts due to ground stability and permafrost are expected, the following measures will be required:

- Retain suitable embankments thickness to limit disturbance to thermal regime.
- Road usage with heavy equipment would only be for relatively short period of time.
- Monitoring the road for stability concerns.
- Design of the haul road improvements will allow for pullouts for resident vehicles and rock trucks to pass one another and to soften tight turns. This will be determined by the contractor.

7.1.1.5 Hydrology

It is not expected that there will be impacts to hydrology due to the construction of the community harbour. Construction will not impact ice cover in Grise Fiord or Jones Sound. The ice in the community harbour is anticipated to thaw later and freeze up earlier than the existing nearshore conditions, reducing the overall accessibility period of small craft vessels in the shoulder season. The community is aware of and accepting of this inevitable limitation. The alteration of Kuuraaluk Creek intersecting the community harbour along the southeast will have no negative effects and access for small craft vessels currently stored in this area will be maintained. This creek is known to be a non-fish bearing watercourse. The community harbour is located down-stream of the proposed water treatment facility in-take.

Along the quarry and haul road, the contractor will construct appropriately designed culverts if required during upgrades to the haul road. Further, the contractor will be required to implement appropriate drainage at the quarry site, if necessary.

Impacts to hydrology are not anticipated, but the following measures will be implemented for best practices:

- Work site boundaries will be flagged to prevent inadvertent loss or alteration of habitat.
- Water flow will be maintained in lowland areas by installing culverts and/or other drainage techniques during road construction as deemed appropriate.
- Installation of appropriate Sediment and Erosion Control (SEC) measures implemented as required.

7.1.1.6 Air Quality

Impacts to air quality are considered negative but mitigatable. Minimum compliance requirements to manage and respond to concerns are detailed in Section 5.4.6 (Table 5-6) of the CEMP (Dynamic Ocean

& Worley Consulting, 2025a). Where relevant, CWPs will be developed by the contractor to manage specific concerns (see Section 8.3).

There is the potential for increase of air contaminants such as NO_2 and SO_2 to the atmosphere from diesel- and gas-powered vehicles which will be operating at the community harbour, along the haul road and at the quarry. The primary potential impact to air quality from the Project is expected be dust generated from blasting and crushing at the quarry, rock transfer, stockpile wind erosion, and rock hauling.

The following measures are designed to mitigate potential negative impacts to air quality (further detailed in the CEMP (Dynamic Ocean & Worley Consulting, 2025a)):

- The contractor will have an appropriate inspection and maintenance program in place for all construction equipment and vehicles.
- Appropriate measures will be included in the CTMP (Section 8.3.3) to identify speed limits or other actions equipment operators need to consider minimizing dust, wildlife mortality, and other negative effects. The maximum speed limit will be 20 km/hr.
- Selection of appropriate construction material for any road construction that will not require significant dust management efforts.
- Use of approved dust suppressants and/or watering to reduce dust generation. Dust suppressants will be in accordance with the GN, Department of Sustainable Development, Environmental Protection Service, and Environmental Guideline for Dust Suppression (GN, 2023c).
- Proactive maintenance to address problem areas of the haul route which may produce significant dust.
- Implementation of a CQBMP (see Section 8.3.5).

7.1.1.7 Noise

Impacts to noise are considered negative but mitigatable.

Nearly all Project construction activities have the potential to affect noise levels (Table 7-2). The community harbour is located adjacent to residential properties, which are the closest non-project receptors to construction activities. The greatest source of increased noise to these residents will result from use of heavy equipment and machinery at the community harbour. The use of heavy equipment and machinery during construction will be comparable to existing equipment used in the Hamlet and at a lower noise level than the planes using the airport.

The quarry is located outside the residential portion of the Hamlet. The closest community residence is located approximately 1.8 km southeast of the quarry. The greatest source of increased noise at the quarry will result from blasting, screening and crushing activities. Similarly with the community harbour, the use of other heavy equipment and machinery at the quarry will be comparable to existing equipment used in the area and at a lower noise level than the planes using the airport.

The following measures are designed to mitigate potential negative impacts to noise (further detailed in the CEMP (Dynamic Ocean & Worley Consulting, 2025a)):

- The contractor will have an appropriate inspection and maintenance program in place for all construction equipment and vehicles.
- Implement control technologies such as the installation of silencers and mufflers on equipment where appropriate, limitations on engine revving where applicable.
- Locating and orientating equipment to minimize propagation of noise in critical directions of receptors.
- Limit revving of engines on mobile or stationary machines.
- As there is no applicable noise by-law, timing restrictions will be agreed through discussion with the Hamlet.
- A notification protocol with input from the Hamlet and residents for advance notification of planned noise-causing activities, such as blasting.

Potential impacts of noise on biological receptors is discussed in other sections for terrestrial wildlife (Section 7.1.2.2), migratory and marine birds (Section 7.1.2.3) and fish and marine mammals (Section 7.1.2.5).

7.1.1.8 Climate Conditions

There will be no impacts to climate conditions due to the construction of the community harbour.

7.1.1.9 Marine Sediment and Water Quality

Impacts to marine sediment and water quality are considered negative but mitigatable. Minimum compliance requirements to manage and respond to concerns are detailed in the CEMP (Dynamic Ocean & Worley Consulting, 2025a). Where relevant, CWPs will be developed by the contractor to manage specific concerns (see Section 8.3).

Potential impacts to marine sediment and water quality are summarized below.

7.1.1.9.1 Decreased Water Quality Due to Sediment Mobilization

During construction, there is the potential for mobilization or introduction of sediment into the marine environment. A compliance monitoring program, provided in Section 5.4.8 (Table 5-8) of the CEMP (Dynamic Ocean & Worley Consulting, 2025a), will be in place to confirm sediment plumes do not exceed CCME turbidity thresholds.

Further to that, appropriate SEC measures will be required to confirm that land-based activities do not result in excessive sediment being introduced to the marine environment.

7.1.1.9.2 Decreased Water Quality Due to the Deleterious Substances

Use of construction equipment on (e.g., barge, ice) or near the marine environment during the Project has potential for accidental spills of deleterious substances. A CSPRP (see Section 8.3.4) will be developed and implemented by the contractor to confirm appropriate measures are in place to respond to accidental spills of deleterious substances. The CSPRP will include standard preventative measures (e.g. use of secondary containment (spill trays), spill response protocols).

The following measures are designed to mitigate potential negative impacts to marine sediment and water quality (further detailed within the CEMP (Dynamic Ocean & Worley Consulting, 2025a)):

- A qualified Environmental Monitor (EM) will be present during construction activities.
- A documentation and reporting process will be managed by the contractor to confirm disturbance, injury or death of any land or marine wildlife due to Project construction.
- The contractor will have an appropriate inspection and maintenance program in place for all construction equipment and vehicles (including brake checks).
- A turbidity monitoring program will be in place to confirm appropriate measures are in place for works in or near water that have the potential for sediment mobilization (see Section 5.5.5 of the CEMP (Dynamic Ocean & Worley Consulting, 2025a)).
- The EM will confirm appropriate SEC monitoring measures are in place to confirm that land-based activities do not result in sediment or other deleterious substances entering aquatic environments (marine, freshwater). Where appropriate equipment installations will be undertaken (e.g. turbidity curtain, silt fences).
- The CSPRP will detail response procedures to be implemented in the event of an accidental release; and refuelling and storage practices for operation of equipment over or near water (see Section 8.3.4).
- Fuel storage and transfer measures will be detailed in the CSPRP (see Section 8.3.4) and include appropriate measures for fuelling near or over water. At no time will storage of fuel be less than 31 m from aquatic watercourses (marine, freshwater).
- Stockpiling and storage of material must occur in upland designated areas and controlled in a way that debris and sediment will not enter the marine or freshwater environment.
- Actions to prevent and respond to accidental release of deleterious substances into the marine environment will be undertaken by the EM. Minimum measures will be detailed in the CCEMP (Section 8.3.1) and CSPRP (see Section 8.3.4).

7.1.1.10 Coastal Morphology

The impacts to coastal morphology are minimal and localized to the Project footprint.

The community harbour is situated in a natural shallow water bay on a flat marine terrace / bench. The foreshore directly in front of the southern arm of Kuuraaluk creek, to the south of the Project site, has a

steep slope to deep water depths. The foreshore in front of the community's southeast shoreline is a shallow water bench.

The key morphological feature of the Grise Fiord shoreline is the creek mouth which discharges through two outlets. Satellite image shows that the northwest outlet is experiencing some morphological shift. Anecdotal information indicated that sedimentation occurred at the entrance of the mooring basin, from a combination of some sediments from the creek and wave erosion of the shoreline. The new community harbour breakwater will minimise the shoreline erosion currently experienced from wave action, and the settling basin will minimise the amount of material entering the community harbour.

A glacier, located 4 km to the southeast of the Project site near Brume Point, is a source of sedimentation in the area. Time lapse images from university researchers show longshore transport of material towards the Hamlet of Grise Fiord.

Some amount of sediment accumulation is expected to occur on the southwest side of the south breakwater. This will be in the form of beach formation for littoral drift due to southerly storm waves within the bay. A sediment trap on the seaward face of the breakwater is planned to capture sediments prior to entering the dredged channel. On the northwest side of the community harbour, it is not expected that significant amounts of sediments will be transported into the inner harbour. The rate of accumulation will be estimated once the geological field program and coastal studies are completed.

Residents have advised that the east shoreline is eroding due to wave attack and floods. This is currently understudy by researchers. Due to the location of the community harbour, it is not anticipated to increase or decrease these occurrences.

7.1.1.11 Bathymetry

The impacts to bathymetry are minimal and localized to the Project footprint. Dredging will be executed within the community harbour and the entrance approaching the south breakwater. The entrance and inner harbour will be dredged to an elevation of 1.5 m CD. A section beneath the easternmost small craft float will be dredged to an elevation of 2.5 m CD.

A breakwater extension off the southwest tip of the south breakwater will act as a sediment trap (depicted in Drawing 1-1) to prevent sediment accumulation in the entrance channel. Additionally, a sediment stilling basin will be created where the exiting boat launch beach enters the inner harbour to prevent sediment accumulation from creek flow.

7.1.1.12 Tides and Currents

There will be minimal impacts to currents within the Project Study Area. The presence of a new and larger breakwater will affect localized tidal induced currents. The tidal currents are already minimal in the area; therefore, the effect of the new breakwater will be negligible.

There will be no impact to tides due to the Project.

7.1.2 Biological Components

Construction activities, as described in Section 2, that have the potential to effect the biological VECs identified are summarized in Table 7-2 and detailed below.

7.1.2.1 Terrestrial Vegetation (Including Rare Plants)

Impacts to vegetation are considered negative but mitigable and significant adverse effects are not expected. Mitigation measures will be in place to manage and minimize negative effects. Where relevant, CWPs will be developed by the contractor to manage specific concerns (see Sections 8.3.1 and 8.3).

Potential impacts to vegetation are summarized below.

7.1.2.1.1 Removal of terrestrial vegetation within the Project footprint

There is no terrestrial vegetation in the community harbour footprint, therefore there are no impacts to terrestrial vegetation in the community harbour footprint. Surface clearing will be minimal and limited to the quarry and haul road upgrade footprints. Where vegetation is present, it is sparse. The quarry is dominated by bedrock with lichen cover, as well as sporadically occurring perennial Arctic plant species. Project impacts to vegetation are mitigatable in the long term as it is expected that lichen and other hardy Arctic plants will recolonize portions of the area following removal. In addition, the availability of bedrock for lichen growth is not limited in the area. Disturbances to plant harvesting sites is considered minimal because berry picking generally occurs outside of the HRQ Study Area (IQ Workshop 2019 - Manasie Noah; IQ Workshop 2019 - Marty Kuluguqtuq).

7.1.2.1.2 Impacts to vegetation health resulting from dust deposition and/or contaminant spills

There is potential for dust deposition resulting from rock blasting and vehicle traffic during construction. Dust can negatively impact vegetation by affecting important processes (photosynthesis, respiration, and transpiration) of the plant (Farmer, 1993). Impacts include decreased vegetative productivity, and vegetation community shifts towards species which are adapted to mineral rich environments and those that are more dust tolerant (Walker & Everett, 1987). Vegetation with mat and prostate growth forms, which are common in Nunavut, have high susceptibility to dust coverage as their form traps dust (Walker & Everett, 1987). Dust control mitigation measures will be implemented as outlined in the CTMP (Section 8.3.3).

Spills could directly affect vegetation through contact and physical damage and indirectly via contaminant assimilation from soil or water subsequent to a spill. The Contractor will be responsible for the development and implementation of an CSPRP that will minimize or eliminate potential effects to terrestrial vegetation (see Section 8.3.4).

7.1.2.1.3 Potential introduction of invasive plant species

There are 14 plant species known to be human-introduced in Nunavut (GN & ECCC, 2022). Although there are currently no known plant species that are classified as terrestrially invasive in Nunavut, the

potential for seeds and plant propagules to be transported via shipping and movement of equipment northward increases with greater human activity and development (Lassuy & Lewis, 2013). The warming of the global climate further gives more opportunities for invasive species to establish (Lassuy & Lewis, 2013). Mitigation and monitoring measures will be implemented to reduce the chance of spreading non-native plant seeds and plant propagules.

The following measures are designed to mitigate potential negative impacts to terrestrial vegetation (further detailed in the CEMP (Dynamic Ocean & Worley Consulting, 2025a)):

- A qualified EM will be present during construction activities.
- A documentation and reporting process will be managed by the Contractor to confirm disturbance, injury or death of any land or marine wildlife due to Project construction.
- Inclusion of decommissioning procedures to be in the CQBMP prior to the closure of the quarry, if required (Section 8.3.5).
- The EM will confirm appropriate SEC monitoring measures are in place to confirm that land-based activities do not result in sediment or other deleterious substances entering aquatic environments (marine, freshwater). Where appropriate, equipment installations will be undertaken (e.g., turbidity curtain, silt fences).
- Water flow will be maintained in lowland areas by installing culverts and/or other drainage techniques during road construction as deemed appropriate.
- Use of approved dust suppressants and/or watering to reduce dust generation on roadways, stockpiles, and any other construction activity that generates dust. Dust suppressants will be in accordance with the GN, Department of Sustainable Development, Environmental Protection Service, and Environmental Guideline for Dust Suppression (GN, 2023c).
- Confirm Project equipment mobilized to the Hamlet is inspected to be clean and free of soil that may introduce invasive species to the area.
- Stockpiling and storage of material must occur in upland designated areas and controlled in a way that debris and sediment will not enter the aquatic environments (marine, freshwater).
- The contractor will have an appropriate inspection and maintenance program in place for all construction equipment and vehicles.

7.1.2.2 Wildlife (including Habitat and Migratory Patterns)

Impacts to wildlife (including habitat and migratory patterns) are considered negative but mitigable and significant adverse effects are not expected. Mitigation measures will be in place to manage and minimize negative effects. Where relevant, CWPs will be developed by the contractor to manage specific concerns (see Sections 8.3.1 and 8.3).

7.1.2.2.1 Loss or alteration of habitat

Given the level of existing human development and activity within the Project Study Area, the Project is not expected to remove or alter habitat of consequence, and any loss or alteration is unlikely to be adverse for most species. Existing infrastructure exists within the Project Study Area and will be upgraded, and the low to moderate value habitat does not appear to be limiting. Large mammals are unlikely to occupy the Project Study Area and most large mammals (e.g. Arctic wolves and caribou) have large home ranges, are wide ranging, and somewhat wary of human development. Moreover, any species inhabiting the Project Study Area are likely relatively tolerant of human activity (e.g. Hèllstedt & Henttonen, 2006), and thus are expected to adapt quickly to minor changes in habitat.

7.1.2.2.2 Sensory disturbance and habitat avoidance

Noise, light, and general human activity and presence resulting from construction may result in minor temporary sensory disturbance. Without mitigation, sensory disturbance may temporarily alter habitat use in the Project Study Area causing some individuals to avoid otherwise suitable habitat. However, most species that are likely to use habitat within the community harbour will already be tolerant of human activity and associated sensory disturbances (noise and light). Blasting activities at the quarry and piling at the community harbour have the greatest potential for sensory disturbance and habitat avoidance, although the frequency and timing are expected to be of relatively short duration.

7.1.2.2.3 Injury and mortality

Increased human presence, road traffic, equipment, and machinery activities are unlikely to injure wildlife given the predominant land activity is related to upgrading existing infrastructure. Improper waste management could result in increased human-wildlife interactions and subsequent lethal control of wildlife for protection of community members and Project personnel. Fuel or other contaminant spills could also result in negative impacts on wildlife. However, construction is to occur within areas already exposed to human activity and waste management and spill prevention plans will be in place.

The following measures are designed to mitigate potential negative impacts to wildlife. These measures will be further detailed within the CEMP (Dynamic Ocean & Worley Consulting, 2025a):

- A qualified EM will be present during construction activities.
- A documentation and reporting process will be managed by the contractor to confirm disturbance, injury or death of any land or marine wildlife due to Project construction.
- A zero-tolerance policy regarding the harassment, disturbance, and feeding of wildlife, birds, and aquatic organisms will be implemented.
- All relevant Project personnel will be educated on the wildlife (potentially nesting birds, fish, marine mammals etc.) and SAR expected to occur in the area according to scientific research and IQ/traditional knowledge.
- The CEMP (see Section 5.10 (Dynamic Ocean & Worley Consulting, 2025a)) will identify an appropriate strategy for documentation of wildlife observations. An immediate reporting

structure will be in place to communicate observations of potentially dangerous wildlife observations which includes recording the time, date, location, activity, and proximity to Project personnel (e.g., polar bears).

- Food, food waste, and other attractants will be handled, stored, and disposed of safely to avoid attracting and habituating wildlife.
- Wildlife will be given the right-of-way so as not to chase, haze, harass, or injure animals on the road.
- Implement timing restrictions to one 12-hour shift per day. As there is no applicable noise by-law, timing restrictions will be agreed through discussion with the Hamlet.
- A pre-construction wildlife (including migratory and marine birds) sweep will be conducted by a qualified professional to identify any sensitive wildlife features. Works cannot begin until this survey has been completed and confirmed that additional compliance measures are not required. The contractor will confirm their pre-construction wildlife sweep described in Section 5.4.11 (Table 5-11) of the CEMP (Dynamic Ocean & Worley Consulting, 2025a). Minimum requirements for the survey are provided in Section 5.5.3 of the CEMP.
- Work site boundaries will be flagged to prevent inadvertent loss or alteration of habitat.
- Lighting will be limited to the extent required to provide a safe work site and shielded and directed to reduce diffusion outside of the work area.
- The CSPRP (see Section 8.3.4) will detail response procedures to be implemented in the event of an accidental release and refuelling and storage practices for operation of equipment over or near water.
- Movement of vehicles and machinery will be restricted if any large congregations of wildlife or birds occur in the community harbour, quarry, or along the haul road. The EM will determine if work stoppage is required and when work can commence.

7.1.2.3 Migratory and Marine Birds

Impacts to migratory and marine birds are considered negative but mitigable and significant adverse effects are not expected. Mitigation measures will be in place to manage and respond to concerns. Where relevant, CWPs will be developed by the contractor to manage specific concerns (see Sections 8.3.1 and 8.3).

Potential impacts to migratory and marine birds are summarized below.

7.1.2.3.1 Loss or alteration of habitat

The Project is not expected to destroy or alter habitat of consequence and any loss or alteration is unlikely to be detrimental to birds because of the existing human development and activity within the Community Harbour Study Area. Also, there is existing infrastructure within the Project Study Area, which will be upgraded. This lower value habitat does not appear to be limiting. Most avian species

likely to nest within the Project Study Area (e.g., common raven) are relatively tolerant and often nest in areas modified by human development (Cornell Lab of Ornithology, 2017).

7.1.2.3.2 Sensory disturbance and habitat avoidance

Noise, light, and general increased human activity and presence resulting from construction could result in temporary sensory disturbances. Without mitigation these sensory disturbances may temporarily alter habitat use causing some less-tolerant individuals to avoid otherwise suitable habitat or at worst, result in abandonment of nests. Lighting during construction could disrupt migratory patterns; however, this impact is likely limited given that construction will occur primarily during summer months when daylight will be at its maximum and migratory birds are already present. Blasting activities at the quarry and pile driving at the community harbour have the greatest potential for sensory disturbance and habitat avoidance, although the frequency and timing are expected to be of relatively short duration. Mitigation measures will be implemented to reduce sensory disturbance to migratory and marine birds.

7.1.2.3.3 Injury and mortality

Construction activities including grading, site preparation, and blasting have the potential to disturb nesting migratory birds and contribute to incidental take without proper mitigation. Increased human presence, road traffic, machinery, and work activities have the potential to inadvertently injure birds during construction. Specifically, blasting could result in injury, or mortality and abandonment of nesting, and fuel or other contaminant spills could result in mortality, injury or sub-lethal effects on birds. Mitigation measures will be implemented to reduce the possibility of injury and mortality to migratory and marine birds.

The following measures are designed to mitigate potential negative impacts to migratory and marine birds. These measures will be further detailed within the CEMP (Dynamic Ocean & Worley Consulting, 2025a):

- A qualified EM will be present during construction activities.
- A documentation and reporting process will be managed by the contractor to confirm disturbance, injury or death of any land or marine wildlife, due to Project construction.
- A zero-tolerance policy regarding the harassment, disturbance and feeding of wildlife, birds, and aquatic organisms will be implemented.
- All Project personnel will be educated on the wildlife (potentially nesting birds, fish, marine mammals, etc.) and SAR expected to occur in the area according to scientific research and IQ/traditional knowledge.
- Food, food waste, and other attractants will be handled, stored, and disposed of safely to avoid attracting and habituating wildlife.
- Movement of vehicles and machinery will be restricted if any large congregations of wildlife including marine or migratory birds occur in the Project Study Area. The EM will determine if work stoppage is required and when work can commence.

- Activities and infrastructure will be sited away from nests and roosts which will be protected by prohibited entry buffers based upon government or biologist recommended setback distances and the 'alert' and 'flush' behaviors.
- A pre-construction wildlife (including migratory and marine birds) sweep will be conducted by a qualified professional to identify any sensitive wildlife features and bird nests. Works cannot begin until this survey has been completed and confirmed that additional compliance measured are not required. The contractor will confirm their pre-construction wildlife sweep in the CCEMP (see Section 8.3.1). Minimum requirements for the survey are provided in Section 5.5.3 of the CEMP (Dynamic Ocean & Worley Consulting, 2025a).
- Work site boundaries will be flagged to prevent inadvertent loss or alteration of habitat.
- If there are large flocks of marine or migratory birds near the Project during sound producing activities (such as pile driving), the EM will document their behaviour. No large flocks are anticipated to be present near the Project other than when foraging or staging during migration.
- Lighting is limited to the extent required to provide a safe work site and shielded and directed to reduce diffusion outside of the work area.
- The CSPRP (see Section 8.3.4) will detail response procedures to be implemented in the event of an accidental release; and refuelling and storage practices for operation of equipment over or near water.

7.1.2.4 Fish Habitat (including Marine Vegetation)

Impacts to fish habitat are considered negative but mitigable and significant adverse effects are not expected. Mitigation measures will be in place to manage and minimize negative impacts. Where relevant CWPs will be developed by the contractor to manage specific concerns (see Sections 8.3.1 and 8.3).

An Offset Plan will be developed if DFO-FFHPP determines that a FAA is required for the Project so as to offset for the loss of seabed due to Project construction. There will be some positive habitat impacts due the hard substrates provided by the shoreline protection component of the community harbour breakwaters.

The following measures are designed to mitigate potential negative impacts to fish habitat. These measures will be further detailed within the CEMP (Dynamic Ocean & Worley Consulting, 2025a):

- A qualified EM will be present during construction activities.
- A documentation and reporting process will be managed by the contractor to confirm disturbance, injury or death of any land or marine projects due to Project construction.
- If HADD to fish habitat or DoF beyond what is identified in the FAA is determined, DFO-FFHPP will be notified.
- No disturbance to the seabed outside of the Project footprint shall occur (with the exception of barge spudding and vessel anchoring).

- If marine-based equipment is used by the contractor, and if temporary pads need to be constructed on the foreshore for overwinter storage, the location will be discussed with and approved by DFO-FFHPP.
- Any Project generated debris that enters the marine environment will be retrieved and disposed of at an appropriate facility. Dredged sediment will be disposed of at an approved offsite facility.
- The EM will confirm appropriate SEC monitoring measures are in place to confirm that land-based activities do not result in sediment or other deleterious substances entering aquatic environments (marine, freshwater). Where appropriate, equipment installations will be undertaken (e.g. turbidity curtain, silt fences).
- The CSPRP (see Section 8.3.4) will detail response procedures to be implemented in the event of an accidental release; and refuelling and storage practices for operation of equipment over or near water.
- Land-based sources of sediment (stockpiling, placement of rock fill, drainage ditches) will be controlled in a way that debris and sediment will not enter the aquatic environments (marine, freshwater).
- Actions to prevent and respond to accidental release of deleterious substances into the marine environment will be undertaken by the EM. Minimum measures will be detailed in the CCEMP (Section 8.3.1) and CSPRP (see Section 8.3.4).

7.1.2.5 Fish and Marine Mammals

Impacts to fish and marine mammals are considered negative but mitigable and significant adverse impacts are not expected. Mitigation measures will be in place to manage and minimize negative impacts. Where relevant CWPs will be developed by the contractor to manage specific concerns (see Sections 8.3).

Potential impacts to fish are summarized below.

7.1.2.5.1 Fish Mortality

Direct mortality to fish is not expected to occur to the extent that would impact the ongoing productivity of fish. There will be some mortality for sessile species in the immediate footprint of the community harbour due to infill and dredging activities; however, mobile species (e.g., Arctic char, Arctic cod, sculpin) are expected to move to other neighbouring habitats.

Any impacts to the distribution of marine fish are expected to be short-term and reversible, as neighbouring habitats can be used that are of equal value. Within these neighbouring habitats, the opportunity for foraging or protection from predators is expected to be the same. The construction of the community harbour will not impact the migratory needs of Arctic char or Arctic cod, as they will be able to swim around the facilities (Indigenous and Northern Affairs Canada [INAC]) (now known as CIRNAC) (INAC, 2012).

7.1.2.5.2 Behavioural Modifications

Potential for behavioural modifications of fish or marine mammals from certain activities (e.g., artificial light) are expected to be minimal and short term. If night works are required, lights will generally be pointed away from the marine environment.

7.1.2.5.3 Water and Sediment Quality Degradation

Impacts to fish health due to sediment mobilization are not expected. A compliance turbidity monitoring program will be in place to confirm sediment plumes generated by dredging activities do not exceed CCME (CCME, 1999) turbidity thresholds (described in Section 5.5.5 of the CEMP (Dynamic Ocean & Worley Consulting, 2025a)).

The following measures are designed to mitigate potential negative impacts to fish (further detailed within the CEMP (Dynamic Ocean & Worley Consulting, 2025a)):

- A zero-tolerance policy regarding the harassment, disturbance and feeding of wildlife, birds and marine organisms will be implemented.
- All Project personnel will be educated on the wildlife (potentially nesting birds, fish, marine mammals etc.) and SAR expected to occur in the area according to scientific research and IQ/traditional knowledge.
- Turbidity monitoring will be implemented. If monitoring results exceed CCME (CCME, 1999) water quality guidelines, adaptive management will be implemented (e.g., use of silt curtains) (described in Section 5.5.5 of the CEMP (Dynamic Ocean & Worley Consulting, 2025a)).
- A qualified EM will be present during construction activities.
- A documentation and reporting process will be managed by the contractor to confirm disturbance, injury or death of any land or marine projects due to Project construction.
- Actions to prevent and respond to accidental release of deleterious substances into the marine environment will be undertaken by the EM. Minimum measures will be detailed in the CCEMP (Section 8.3.1) and CSPRP (Section 8.3.4).
- Lighting will be limited to the extent required to provide a safe work site and shielded and directed to reduce diffusion outside of the work area.
- Marine Mammal Observers (MMOs) will be present on site to implement necessary monitoring requirements during in-water works, including establishment of Exclusion Zones (EZ) and documentation of marine mammals observed.
- Construction small craft vessels will maintain vigilance for marine mammals: minimum approach distances and best practices as outlined in the Marine Mammal Regulations must be adhered to, and protected areas as outlined within the most recent Notice to Mariners published by the CCG at the time of construction will be followed.
- The CSPRP (see Section 8.3.4) will detail response procedures to be implemented in the event of an accidental release; and refuelling and storage practices for operation of equipment over or near water.

7.1.2.6 Species at Risk

Very few SAR are likely to be within the Project Study Area during construction, as discussed in Section 6.4.6, and in Section 3.1(Table 3-1) of the ESEB Report (Dynamic Ocean & Worley Consulting, 2025b). Project impacts and mitigation measures for terrestrial wildlife, migratory and marine birds, fish, and marine mammal SAR will be similar to those discussed in Sections 7.1.2.1 to 7.1.2.5. Construction activities that have the potential to impact on SAR include blasting, construction traffic and land-based equipment.

The likelihood of negative impacts to SAR is considered very low. These potential impacts are mitigatable and therefore serious adverse impacts to SAR are not expected. If observed, the following measure will be undertaken:

- If SAR are encountered during construction, the EM will document appropriately. This will include recording the locations and dates of any observations of SAR, behaviour or actions taken by the animals when Project activities were encountered, and any actions taken by the contractor to avoid contact or disturbance to the species and its habitat.
- All Project personnel will be educated on the wildlife (particularly SAR) expected to occur in the area according to scientific research and IQ/traditional knowledge.
- Appropriate measures will be in place to confirm potential SAR are protected. It is not likely that SAR species are in the footprint.

Potential for polar bear to occur in the Project Study Area is possible because of the overlap in mapped range and previously sighted denning areas. If observed the following measure will be taken.

- If polar bears are sighted near a workspace, the EM will determine if work stoppage is required and when work can commence.
- Measures to protect polar bear will follow those outlined in Section 2.3 of the RNLUP (NPC, 2023c).

7.1.3 Socio-Economic Components

Construction activities as described in Section 2 that have the potential to impact the socio-economic VSECs identified are summarized in Table 7-2.

7.1.3.1 Employment, Training and Business Opportunities

Employment, training and business opportunities available during construction represent a short-term positive impact to the community.

The Project will comply fully with the GN's NNI Policy (01 April 2017) aiming to maximize local Inuit employment, training and business opportunities.

Positive short-term economic spin-offs are also anticipated, including potential purchases of local arts and crafts by southern workers, supporting local artisans and fostering cultural exchange.

7.1.3.2 Land and Resource Use

Harvesting, Travel Routes, and Access

Harvesting is essential to Inuit culture and livelihood. Residents in Grise Fiord continue to rely on harvesting activities (hunting, fishing, trapping and gathering) as a source of nutrition, clothing, and for arts and crafts. The following factors have been taken into consideration for assessing the potential impacts from the Project to harvesting, travel routes and access:

- Harvesting locations in and around the Project areas (depicted in Figure 4-1).
- Access to ice, water and land.
- Timing of construction activities.
- Potential impacts to harvested wildlife.

Feedback received from elders, HTA members, Guardians, and other knowledge holders has indicated that harvesting is limited in Grise Fiord, with the exception of some sculpin fishing and the occasional seal or whale. Hunters and fishers are not concerned about impacts to subsistence harvesting caused by construction of the Project and indicated the Project would have no impact on their ability to fish or hunt. Additionally, when asked about any concerns on wildlife impacts, especially marine mammals due to underwater sound generated during construction, the feedback received indicated that the hunters expected the impact would be temporary and wouldn't have any lasting impacts on the wildlife they harvest.

During construction, although it is expected that boaters will be able to launch as they currently do along the shoreline fronting the RCMP building, the Project has the potential to impede access to boaters.

Ice access is considered very good along the shoreline fronting the Hamlet and is not anticipated to be an issue during construction of the community harbour.

The following measures are designed to mitigate potential negative impacts on Inuit Harvesting. These measures will be further detailed within the CEMP (Dynamic Ocean & Worley Consulting, 2025a):

- The contractor will be required to coordinate and sequence construction activities so that access to boaters is maintained at all times during construction.
- The Project will construct skidoo access over any potential barriers caused by stockpiles or stockpile pads to provide pass-through access to hunters.
- Any road closures will be limited to ~ 30 mins/day.
- Notice will be provided to residents prior to any road closures. Notices will be posted on radio, social media, at the Hamlet and HTA offices, Co-op store, and on VHF radio.

- Continued consultation and coordination of construction activities with the HTA and the Guardians will be conducted.

Given the limited harvesting activities identified in the Project Study Area and the mitigations described above (along with the mitigations proposed in previous sections for noise, wildlife, fish, marine mammals, and fish habitat), the Project does not expect to have a significant adverse effect on land and resource use or Inuit harvesting rights and any impacts are mitigatable.

Prior to demobilization at the end of each construction season, the contractor will meet with a designated HTA representative to confirm that Project site has been left in a state so as to maintain access throughout the winter months. If concerns are raised, the contractor will make corrections that are accepted by the HTA representative prior to end of season demobilization.

7.1.3.2.1 Tourism

The Project has the potential to impede access for outfitters and cruise ship tenders during construction. Potential impacts to tourism are considered negative but mitigatable and significant adverse effects to tourism are not expected.

The following measures are designed to mitigate potential negative impacts to tourism. These measures will be further detailed within the CEMP (Dynamic Ocean & Worley Consulting, 2025a):

- The Project will consult with cruise ship operators and outfitters to maintain safe access for passengers.
- The contractor will be required to coordinate and sequence construction activities so that access for outfitters and cruise ship tenders and passenger safety are maintained during construction.
- Contractor will be required to issue NAVWARNs to notify mariners of any potential navigational interferences.

7.1.3.3 Local and Regional Traffic Patterns

Potential impacts to local and regional traffic patterns are considered to be negative but mitigatable and significant adverse effects are not expected.

The Project has the potential to impede operations of the sealift in the laydown area during construction of the community harbour. To mitigate for this potential negative effect, the Project will consult and coordinate with the sealift companies and engage the Hamlet to confirm construction vehicles and equipment do not obstruct traffic going in and out of the area while the sealift is in. Additionally, the sealift area is located outside the Project footprint and will remain accessible as always.

Given this mitigation and that sealift operations last only a few days, it is anticipated that Project construction activities will not interrupt sealift activities and residents will continue to have access to their cargo as usual.

To reduce impacts on air transportation, the Project is expected to use chartered flights, with limited use of scheduled flights to avoid the Project filling seats on flights that the community depends on.

A large volume of haul truck traffic will be required to transport the rock from the quarry to the community harbour. The existing haul road will require improvements to allow for safe truck travel such as easing corners, increasing width in areas, pull outs to permit vehicle passing etc. The contractor will also be responsible for maintaining the road in good condition. Use of the existing road by the contractor will also require adherence to a CTMP (see Section 8.3.3) to mitigate impacts on residential areas, community service trucks and community traffic.

Given the volume of truck traffic expected and the fact that roads are shared by many users including ATVs, snow machines, trucks, cyclists, and pedestrians, a CTMP will be implemented by the contractor in order to minimize the risk of traffic accidents.

The following measures are designed to mitigate potential negative impacts on local and regional traffic patterns. These measures will be further detailed within the CEMP (Dynamic Ocean & Worley Consulting, 2025a):

- The contractor will implement an appropriate driver training and safety awareness program.
- The contractor will confirm that appropriate vehicles and equipment are in use during construction that are properly suited for conditions of the road, especially brakes to handle steepness.
- The contractor will have an appropriate inspection and maintenance program in place for all construction equipment and vehicles (including brake checks).
- Appropriate measures will be included in the CTMP (see Section 8.3.3) to identify speed limits or other actions equipment operators need to consider minimizing dust, wildlife mortality, and other negative impacts. The maximum speed limit will be 20 km/hr.
- Adequate lighting on all vehicles so they can be easily seen.
- Use of approved dust suppressants and/or watering to reduce dust generation on roadways, stockpiles and any other construction activity that generates dust. Dust suppressants will be in accordance with the GN, Department of Sustainable Development, Environmental Protection Service, and Environmental Guideline for Dust Suppression (GN, 2014, 2023c).
- Traffic control measures such as flag people at busy intersections and along residential segments of the haul route.
- The contractor will conduct a traffic awareness campaign concerning road safety, particularly for children and teens (e.g. traffic safety and awareness talks in local schools and public events/community centres, posters distributed and posted around town, radio shows etc.).
- Any road closures will be limited to ~ 30 mins/day.
- Notice will be provided to residents prior to any road closures. Notices will be posted on radio, social media, at the Hamlet and HTA offices, Co-op store, and on VHF radio.

7.1.3.4 Human Health and Community Wellness

Potential impacts to human health and wellness are considered negative but mitigatable and significant adverse effects are not expected.

Given the construction workforce's size relative to the small population of the community, the Project aims to minimize any strain on the community's health centre. To this end, the contractor will be required to provide a dedicated emergency responder for Project personnel and ensure all workers receive industry-standard health and safety training. In emergencies, the health centre may assist with stabilizing injured workers until medical evacuation to a larger facility. However, a dedicated emergency responder for the workforce's modest size, coupled with an emergency medi-vac plan, is expected to effectively minimize any potential strain on local health services.

The impacts of increased dust caused by construction activities are considered negative but mitigatable and will be minimized. Impacts to respiratory health due to increased dust during construction are not anticipated.

The following measures are designed to mitigate potential negative impacts on human health and community wellness. These measures will be further detailed within the CEMP (Dynamic Ocean & Worley Consulting, 2025a).

- The contractor will be responsible for installing diesel particulate filters on diesel equipment.
- The contractor will have an appropriate inspection and maintenance program in place for all construction equipment and vehicles (including brake checks).
- Appropriate measures will be included in the CTMP (Section 8.3.3) to identify speed limits or other actions equipment operators need to consider minimizing dust, wildlife mortality, and other negative impacts. The maximum speed limit will be 20km/hr.
- Use of approved dust suppressants and/or watering to reduce dust generation on roadways, stockpiles and any other construction activity that generates dust. Dust suppressants will be in accordance with the GN, Department of Sustainable Development, Environmental Protection Service, and Environmental Guideline for Dust Suppression (GN, 2014, 2023c).
- Implementation of a CQBMP (see Section 8.3.5).

The contractor will be required to bring in all supplies, including food, first aid equipment and supplies and over the counter medications for the construction workforce to ensure that the Co-op store's limited resources are not stretched beyond its capacity. This measure will help maintain the regular supply of food and goods for community members and avoid potential shortages. Additionally, the Health centre has advised that workers bring in any required prescription medications as there is no capacity in the community to fulfill prescriptions for non-local personnel.

There is potential for negative social impacts during construction resulting from a relatively large number non-local workers (compared to the community's population) living and interacting with community members. The Project will take steps to minimize activities and behaviours with the potential to cause negative social or environmental impacts on the community. As part of their

employment with the contractor, workers will be required to sign a Code of Conduct governing their behaviour on the job and during recreational hours. This will include adhering to all rules at construction sites and the construction camp. Additionally, the worker induction program will include an Inuit cultural awareness component to promote understanding and respect for local culture and residents. There will also be a zero-tolerance policy for alcohol, marijuana or illicit drug possession or use.

7.1.3.5 Community Infrastructure and Services

Potential impacts to community infrastructure and services are negative but mitigatable and significant adverse effects are not expected.

The Project aims to minimize any undue burden on community services and infrastructure. Maintaining community infrastructure and services is also a priority for the Hamlet.

Given the limited availability of accommodation in Grise Fiord, accommodation for non-local workers during construction will be provided by a construction camp. This will effectively minimize any impacts on housing and accommodation facilities in the community.

The Hamlet provides fire response, water, sewage and solid waste services for the community. The Project will limit use of Hamlet services by having an on-site fire response plan to deal with local fires and have staff trained in the use of fire suppression aids. In the rare event that additional firefighting aid is required, the local volunteer fire station will be called.

It is anticipated that any solid waste disposal and water services required for the Project will be minimal and can be met by the current capacity of the hamlet's landfill facility and water reservoir facilities. The Project will have a dedicated water truck to support construction water and dust suppression needs. The Hamlet has expressed concern that the current sewage lagoon may not have the capacity to accommodate the construction's workforce of 30 people. The Project will coordinate closely with the Hamlet of Grise Fiord and the GN-CGS to assess the capacity of the sewage lagoon prior to mobilizing the construction workforce. If necessary, the contractor will implement appropriate measures to manage the wastewater generated by the Project, ensuring no strain is placed on the community's existing wastewater infrastructure.

The Project will have a dedicated fuel truck for meeting Project fuel requirements. Given that fuel supply in the community will not be sufficient to meet construction needs, the Project is coordinating with PPD, who may arrange multiple fuel shipments to support both community and construction requirements. If this becomes impractical, the contractor will be required to bring in temporary double-wall fuel tanks for fuel storage during construction to avoid impacting the community's fuel supply.

A CTMP (see Section 8.3.3) will be implemented for the Project to mitigate potential negative effects from the large volume of haul truck traffic required to transport rock material from the quarry to the community harbour on the delivery of trucked community services such as water, fuel, and wastewater disposal.

Use of approved dust suppressants and/or watering to reduce dust generation on roadways, stockpiles and any other construction activity that generates dust. Dust suppressants will be in accordance with

the GN, Department of Sustainable Development, Environmental Protection Service, and Environmental Guideline for Dust Suppression (GN, 2014, 2023c).

7.1.3.6 Archaeological and Culturally Significant Sites

There were no archaeological, paleontological or culturally significant sites found within the Project Study Area; therefore, no impacts are anticipated. The Contractor will be required to have Archaeological Resource Discovery Plan (ARDP) in place.

If historical or palaeontological features (e.g., stone features, stone tools, modified bone, fossils) or potential human remains are discovered within the construction footprint during construction, the measures outlined in Section 5.4.14 of the CEMP (Dynamic Ocean & Worley Consulting, 2025a) will be followed.

Project personnel will be prohibited from collecting any archaeological or palaeontological materials.

7.2 Operations Phase Impacts and Mitigations

During the operations phase of the Project, only the Community Harbour Study Area is relevant to potential impacts. The quarry will no longer be in operation for Project needs and rock hauling along the road will have ceased.

Operation of the community harbour will be managed by the GN-EDT and an OEMP will be developed (see Section 8.4).

The operations phase does not consider potential changes from increased shipping. The community harbour is not anticipated to attract more marine traffic than what already exists for ports of call to Grise Fiord.

7.2.1 Physical Components

7.2.1.1 Designated Environmental Areas

Once operational, there will be no impacts to designated environmental areas due to community harbour. There will be no changes to shipping from what is currently existing; therefore, no impacts to the nearby TI NMCA. The proponents for the development of any new inshore commercial fisheries would need to confirm if any territorial permitting was required because of the potential impacts from increased shipping.

7.2.1.2 Geological Site Conditions

No impacts to the geological site conditions during operations.

7.2.1.3 Surface Features

No impacts to the surface feature condition during operations.

7.2.1.4 Ground Stability and Permafrost

No impacts to the ground stability and permafrost conditions during operations.

7.2.1.5 Hydrology

No impacts to hydrology conditions during operations because the haul road and quarry will only be used by the Project during construction.

7.2.1.6 Air Quality

The future community harbour is not considering new equipment for operations thus no additional emissions will be generated. Road and marine traffic levels during operation of the community harbour will be the same as existing and therefore there is no impact on air quality during operations. The improvements to access may reduce congestion and waiting times and therefore reduce the amount of idling.

7.2.1.7 Noise

For future community harbour operations there is no new equipment being considered which will eliminate additional noise generation. Road and marine traffic levels during operation of the community harbour will be the same as prior to the construction of the Project and therefore there is no increase in noise during operations. The improvements to access may reduce congestion and waiting times and therefore may reduce the amount of noise (e.g., idling).

7.2.1.8 Climate Conditions

An expanding open-water season resulting from climate change will likely see the community harbour used for a comparative increased length of time, as subsistence fishing throughout the accessible season is important to the community. No additional impacts from an increased period of use have been identified.

7.2.1.9 Sediment and Water Quality

No new equipment or activities within the community harbour are anticipated to impact water or sediment quality during operations beyond the existing boating related activities.

Potential impacts to water quality during operations activities could occur due to accidental vessel spills. The increased and safer access to the water is expected to reduce the risk of spills compared to existing operations; these impacts are considered positive. An OEMP will be prepared to manage operations and minimize the risk of spills, as described in Section 8.4.

7.2.1.10 Coastal Morphology

The impacts to coastal morphology are minimal and localized to the Project footprint.

7.2.1.11 Bathymetry

As noted in Section 6.3.11, the bathymetry will change due to littoral drift in the areas adjacent to the breakwater.

7.2.1.12 Tides and Currents

There will be minimal impacts to currents within the community harbour footprint. The presence of a new and larger breakwater will affect localized tidal induced currents. The tidal currents are already minimal in the area; therefore, the effect of the new breakwater will be negligible.

There will be no impact to tides.

7.2.2 Biological Components

7.2.2.1 Terrestrial Vegetation (Including Rare Plants)

There will be no impacts to vegetation during operations as all surface disturbances and blasting activities will be complete.

7.2.2.2 Wildlife (including Habitat and Migratory Patterns)

Road traffic levels to the community harbour will be similar to existing and given the low incidence of wildlife and value of the habitat for with the Community Harbour Study Area, no adverse impact on wildlife during operations is expected.

7.2.2.3 Migratory and Marine Birds (including Habitat and Migratory Patterns)

No nests or colonies of marine and migratory birds are located near the Community Harbour Study Area and no adverse impacts during operations are expected on birds that might forage in the area.

7.2.2.4 Marine Fish Habitat (including Marine Vegetation)

Impacts to marine fish habitat due to operational activities are considered positive as the community harbour will facilitate existing boating activities that will be conducted in a safer manner with less risk to the marine environment from spills. Additionally, the construction of the breakwaters will provide high quality fish habitat.

7.2.2.5 Fish and Marine Mammal Species

No impacts to marine fish during the operational phase of the Project are anticipated. The community harbour will provide a safer access point with less risk to the marine environment from spills. The Project will be constructed to service existing marine use and therefore additional vessel traffic is not planned. Furthermore, the presence of the facility is unlikely to interfere with fish migration as they are expected to swim around the breakwater.

Freshwater fish are not expected to be impacted during operations as the quarry and haul road are only required during the construction phase and no freshwater fish courses have been identified within the Project Study Area.

7.2.2.6 Species at Risk

No impacts to vegetation, wildlife or marine mammal SAR have been identified from the operation of the community harbour as there are very few SAR likely to be present within the Community Harbour Study Area; therefore, impacts on species-at-risk are not expected.

7.2.3 Socioeconomic Conditions

7.2.3.1 Population, Education and Employment

In the future, the presence of a community harbour in Grise Fiord could provide opportunities for economic development in the community such as fisheries and increased tourism by attracting more outfitting and cruise ship visits. However, any such opportunities would be developed outside of this Project and related impacts would be addressed directly by the proponent of these activities.

7.2.3.2 Land and Resource Use

Once operational, the Project will have a positive impact on harvesting, navigation, and travel. The Project will provide a safe harbour for launching, landing and mooring small craft vessels.

No concerns from the community were expressed about the community harbour affecting ice access once operational. Feedback received from elders, HTA members, Guardians and other knowledge holders has indicated that ice access is considered very good along the shoreline fronting the community and is not anticipated to be an issue during operation of the community harbour.

7.2.3.3 Local and Regional Traffic Patterns

The community harbour will have a positive impact on marine traffic navigating through Grise Fiord by providing a safe harbour for boaters and cruise ship passengers. Boat launching and landing facilities will be improved and an area to safely moor and offload small craft vessels will be provided. The community harbour will therefore have a positive impact on local and regional traffic patterns.

7.2.3.4 Human Health and Community Wellness

The community harbour will improve the access and safety of boating operations and therefore will have a positive impact on community health and wellness.

7.2.3.5 Housing and Community Infrastructure and Services

The operation of the community harbour will have a positive impact on existing community infrastructure for boat launching, landing and mooring by providing a dedicated launch ramp, a safe harbour and an expanded laydown area for parking and storage.

The operation of the Project will have no impact on the delivery of trucked community services (i.e., water, fuel, sewage, and solid waste).

7.2.3.6 Archaeological and Culturally Significant Sites

There will be no impacts to archaeological or culturally significant sites from the operation of the community harbour.

7.3 Residual Effects

No residual effects to the environment are expected after the mitigation and monitoring measures for the Project are implemented. A FAA may be required from DFO-FFHPP and if so, an Offset Plan will be developed and proposed to DFO-FFHPP to offset for residual effects to fish and fish habitat.

7.4 Cumulative Effects

All Project effects 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.

Table 7-3: Grise Fiord Projects and Cumulative Effects Considerations

Project Name	NPC No.	NIRB No.	Cumulative Effect	Description
Grise Fiord Power Plant	125042	17XN001	No	Project construction is complete, and has been operational since Oct-22 (CIRNAC, 2022), and there are no operational interference expected between the two projects.
Grise Fiord Solid Waste Facility	150230	25XN006	Potentially	A solid waste facility and water treatment facility are planned for construction (NPC, 2023a, 2024a) and may be built at the same time as the community harbour. The main impact would be the increased demand for camp requirements if the construction schedules overlap. Since all three projects are led by the GN-CGS, the GN will coordinate internally to address this issue and collaborate with the Hamlet of Grise Fiord to minimize any negative impacts on the community.
Grise Fiord Water Treatment Plant	150165	23XN069		

7.5 Assessment of Transboundary Effects

Potential Project effects identified in Section 6.2 are localized to the Project Study Area and will be minimized or eliminated by the mitigation measures described.

The community harbour has been designed to improve existing access for small craft vessels and the overall safety of marine activities in the community by providing a protected harbour. Any increase in shipping during operation of the community harbour is not considered part of the Project. Any new commercial fisheries that may be developed and use the community harbour would require permitting under a separate application to NPC for referral to NIRB.

No anticipated transboundary effects are therefore expected from the Project, with the closest territorial, provincial or international boundaries to the Project Study Area being Greenland (330 km to northeast) and the NWT (900 km to the southwest) (see Figure 7-1).



Figure 7-1: National and International Boundaries

Source: OneWorld (2021)
Note: Red dot depicts Grise Fiord location

8 Environmental Management and Monitoring Plans

Regulatory compliance will be managed using BMPs and the development of several compliance documents, including a CEMP, CWPs and an OEMP.

8.1 Best Management Practices

Guidelines and BMPs that will be incorporated into the CEMP, the CCEMP and into the Contractor CWPs are outlined in Section 5.1 of the CEMP (Dynamic Ocean & Worley Consulting, 2025a).

8.2 Construction Environmental Management Plan

A CEMP (Dynamic Ocean & Worley Consulting, 2025a) has been developed that details measures to be implemented to minimize potential negative environmental and socio-economic effects associated with the construction phase of the Project. Implementation of mitigation and monitoring measures will support permitting and regulatory requirements and will be in place to confirm that residual effects due to Project construction do not occur.

8.3 Construction Work Plans

Prior to construction, the contractor will be responsible for submitting a construction method plans which describes the phases for mobilization, preparation, drilling, site clean up and restoration and demobilization.

Construction Work Plans will be developed prior to construction as summarized below. Minimum requirements for the CWPs are provided in Section 5.3 of the CEMP (Dynamic Ocean & Worley Consulting, 2025a).

8.3.1 Contractors Construction Environmental Management Plan

The contractor will be responsible for developing a CCEMP, to be in compliance with the Regulatory CEMP (Dynamic Ocean & Worley Consulting, 2025a) and permit and approval conditions received from pertinent AHJs.

8.3.2 Marine Safety Plan

The Contractor Marine Safety Plan (CMSP) is intended to minimize traffic interferences for the community and confirm that Inuit harvesting rights are not impacted on land or in water. The CMSP will identify a communication plan for mariners, and regulatory authorities (NAVWARNs) and identify any temporary structures associated with the Project. It is also to confirm that mitigation measures (e.g., navigational markers and marine construction buoys) are being undertaken for the TC NoW permit to minimize navigational interferences.

8.3.3 Traffic Management Plan

The CTMP is intended to confirm an appropriate plan is in place to manage site access, traffic through the community and ensure the community is informed of ongoing construction traffic safety concerns. This includes driver training and safety awareness, establishing a dedicated haulage route, management of road closures, and a public safety awareness campaign.

8.3.4 Spill Prevention and Response Plan

The CSPRP will identify spill prevention and response procedures and confirm compliance with regulatory communication requirements in the event of accidental spills. The CSPRP will describe procedures for safe fuel handling and storage, including details of the requirements for secondary containment for all equipment in addition to any specific procedures required for near- or over-water fuelling. The purpose of the CSPRP is to establish policies, procedures, and a communication matrix for the steps to be followed during an accidental spill.

8.3.5 Quarry and Blasting Management Plan

A CQBMP is intended to confirm the procedures for the safe operation of the quarry (borrow pits) during construction and blasting. The CQBMP will be developed to detail the operations and maintenance to be undertaken by the contractor during community harbour construction, including site safety and security measures and steps for development, operation, maintenance and monitoring of the quarry (borrow pits). The CQBMP will also identify appropriate decommissioning of the quarry (borrow pits), including soil replacement, removal of waste and public safety measures.

8.3.6 Health and Safety and Emergency Response Plan

A Contractor Health and Safety and Emergency Response Plan (CHSERP) is intended to establish Health and Safety procedures to be undertaken to confirm a safe working environment and Emergency Response. The CHSERP will address all health and safety aspects of the Project as required by Nunavut Safety Acts and Regulations to address potential emergency situations (e.g., fire, vehicle or equipment incidents, major first aid, wildlife encounters or natural disasters) that could occur at the Project site during the construction phases.

8.4 Operations Environmental Management Plan

The GN-EDT is responsible for oversight of marine harbours under GN's ownership, including Iqaluit and Pond Inlet on Baffin Island and as such is familiar with the preparation and implementation of regulatory operations manuals and plans, including emergency response plans, Standard Response Protocols (SRP), facilities inspection protocols, inventory management, and reporting requirements. The GN-EDT will be responsible for the operations of the community harbour and will develop and implement plans for all aspects of the community harbour operations. The GN-EDT will work with the Hamlet of Grise Fiord, the HTA, and local contractors as required to confirm that operational requirements are met.

The plan will incorporate any permit conditions that relate to operations. The components of the plan will include:

- Roles and Responsibilities, including inter-agency agreements with the Municipality, the Municipal Fire Department, and the HTA as required.
- Operations –procedures for cargo handling, fuelling, seasonal float removal and reinstatement, etc.
- Environmental Management, Mitigation and Monitoring Measures:
  - Waste Management.
  - Spill Prevention and Response.
  - Sediment and Erosion Control.
  - Wildlife and Vegetation.
  - Inspections, Reporting and Conformance – daily, seasonal and longer-term inspection schedules.
  - Maintenance – marine structures, rock armour, supporting infrastructure (i.e. beach erosion, etc.).
  - Training and Competency.
  - Operations CHSERP to same minimum requirements described in Section 8.3.4.
  - Communications Protocols – regulatory and community.

9 References

Aarluk. (2012). Summary of Knowledge Report on Valued Ecosystemic and Socio-Economic Components and Valued Land and Water uses in Nunavut. *Prepared for Nunavut General Monitoring Plan Secretariat. Prepared by Aaruk Consulting Ltd., March 30, 2012*.

Advisian. (2020a). Arctic Bay Harbour Development. Prepared for Fisheries and Oceans Canada – Small Craft Harbours. *(Document No. 307071-01306-00-MA-REP-0002, Revision 1)* January 2020.

Advisian. (2020b). Grise Fiord Harbour Development. Environmental and Socio-Economic Baseline Survey. Prepared for Fisheries and Oceans Canada. Doc No: 307071-01306 -00-EN-REP-0003. January 15, 2020. Rev. 0.

AECOM. (2024). Archaeological Impact Assessment of the Grise Fiord Small Craft Harbour (Permit 2024-63A). Non-Technical Report. Prepared for Worley by Brent Murphy, AECOM Canada Ltd. November 19, 2024.

Ahlenius, H. (2016). Global Outlook for Ice and Snow - Permafrost extent in the Northern Hemisphere. Available at: https://www.grida.no/resources/5234. Accessed: January 2025.

Aliabadi, A. A., Staebler, R. M., & Sharma, S. (2015). Air Quality Monitoring in Communities of the Canadian Arctic During the High Shipping Season with a Focus on Local and Marine Pollution. *Atmos. Chem. Phys, 15*, 2651-2673.

Anderson, M., & Kingsley, M. C. S. (2015). Distribution and abundance of Peary caribou (Rangifer tarandus pearyii) and muskoxen (Ovibos moschatus) on southern Ellesmere Island. Status Report. Available at: https://www.nwmb.com/en/conservation-education/list-all-documents/nwmb-meetings/regular-meetings/2017/rm003-2017/6744-inuk-tab-08f-survey-report-on-peary-caribou-on-southern-ellesmere-island-eng-inuk/file. Accessed: January 2025.

Bégout, A. M. L., Gyselman, E. C., Jorgenson, J. K., Kristofferson, A. H., & Anras, L. (1999). Habitat Preferences and Residence Time for the Freshwater to Ocean Transition Stage in Arctic Char. *Journal of the Marine Biological Association of the United Kingdom, 79*, 153-160. doi:https://doi.org/10.1017/S0025315498000174

Born, E. W., Gjertz, I., & Reeves, R. R. (1995). *Population assessment of Atlantic walrus (Odobenus rosmarus rosmarus L.)*.

Britannica, & The Editors of Encyclopaedia. (1998). Baffin Island Current. Encyclopedia Britannica. Available at: https://www.britannica.com/place/Baffin-Island-Current. Accessed: October 2024.

Canadian Navigable Waters Act. (1985). R.S.C., 1985 c. N-22. Current to March 5, 2020. Available at: https://laws-lois.justice.gc.ca/PDF/N-22.pdf. Accessed: January 2025.

CCME. (1999). Turbidity. Water Quality Guidelines for the Protection of Aquatic Life - Marine. Available at: https://ccme.ca/en/chemical/219#_aql_marine_concentration. Accessed May 2024.

CCME. (2003). Canadian Water Quality Guidelines for the Protection of Aquatic Life. Guidance on the Site-Specific Application of Water Quality Guidelines in Canada: Procedures for Deriving Numerical Water Quality Objectives. In: Canadian environmental quality guidelines, 1999, Canadian Council of Ministers of the Environment, Winnipeg. Available at: https://ccme.ca/en/res/wqimanualen.pdf. Accessed: January 2025.

CHS. (2025). Canadian Tide and Current Tables. Volume 4. Arctic and Hudson Bay. Available at: https://publications.gc.ca/collections/collection_2024/mpo-dfo/Fs73-4-2025-1.pdf Accessed: February 2025.

CIRNAC. (2022). Transitioning Toward Clean Energy in Grise Fiord, Nunavut. Available at: https://www.rcaanc-cirnac.gc.ca/eng/1678471627982/1678471654050. Accessed: February 2025.

Convention on Biological Diversity. (2010). Target 11. Available at: https://www.cbd.int/sp/targets/rationale/target-11/ Accessed: November 2024.

Convention on Biological Diversity. (2022). Kumming-Montreal Global Diversity Framework. Available at: https://www.cbd.int/doc/decisions/cop-15/cop-15-dec-04-en.pdf. Accessed on November 2024.

Cornell Lab of Ornithology. (2017). eBird. Available at: http://ebird.org/content/ebird/ Accessed: November 2024.

COSEWIC. (2006). COSEWIC Assessment and Update Status Report on the Atlantic walrus *Odobenus Rosmarus rosmarus* in Canada. Committee on the Status of Endangered Wildlife in Canada. Ottawa. ix + 65pp. Available at: www.sararegistry.gc.ca/status/status_e.cfm. Accessed: September 2024.

COSEWIC. (2007). COSEWIC Assessment and Update Status Report on the Bearded Seal *Erignathus barbatus* in Canada. Committee on the Status of Endangered Wildlife in Canada. Ottawa. vii + 40pp. Available at: https://wildlife-species.canada.ca/species-risk-registry/virtual_sara/files/cosewic/car_COSEWIC_annual_report_2007_e.pdf Accessed: November 2024.

Crawford, J. A., Quakenbush, L. T., & Citta, J. J. (2015). A comparison of ringed and bearded seal diet, condition and productivity between historical (1975–1984) and recent (2003–2012) periods in the Alaskan Bering and Chukchi seas. *Progress in Oceanography, 136*, 133–150.

Derksen, C., Burgess, D., Duguay, C., Howell, S., Mudryk, L., Smith, S., Thackeray, C., & Kirchmeier-Young, M. (2019). Changes in snow, ice, and permafrost across Canada; Chapter 5 in Canada's Changing Climate Report, (ed.) E. Bush and D.S. Lemmen; Government of Canada, Ottawa, Ontario, p.194–260. Available at: https://changingclimate.ca/site/assets/uploads/sites/2/2018/11/CCCR_Chapter5-Changes-in-Snow-Ice-and-Permafrost-Across-Canada.pdf. Accessed: September 2024.

DFO. (2010). Stock definition of Belugas and Narwhals in Nunavut. Available at: https://waves-vagues.dfo-mpo.gc.ca/library-bibliotheque/340603.pdf. Accessed: November 2024. *Canadian Science Advisory Secretariat, Science Advisory Report*.

DFO. (2018). Atlantic Walrus in the Nunavut Settlement Area. Available at: https://www.dfo-mpo.gc.ca/fisheries-peches/ifmp-gmp/walrus-atl-morse/walrus-nunavut-morse-eng.html. Accessed: November 2024.

DFO. (2021). Government of Canada making significant progress and investment to protect Canada's oceans. Available at: https://www.canada.ca/en/fisheries-oceans/news/2021/07/government-of-canada-making-significant-progress-and-investments-to-protect-canadas-oceans.html. Accessed: November 2024.

DFO. (2024a). Applicant's Guide Supporting the "Authorizations Concerning Fish and Fish Habitat Protection Regulations" Available at: https://www.dfo-mpo.gc.ca/pnw-ppe/reviews-revues/applicants-guide-candidats-eng.html Accessed: March 2025.

DFO. (2024b). Aquatic Species at Risk Map. Available at: http://www.dfo-mpo.gc.ca/species-especes/sara-lep/map-carte/index-eng.html Accessed: October 2024.

DFO. (2024c). Standards and Codes of Practice. Available at: https://www.dfo-mpo.gc.ca/pnw-ppe/practice-practique-eng.html. Accessed November 2024.

Dynamic Ocean. (2024). RE: Pre-Submission Services Request for Grise Fiord Community Harbour Project. File No. 2024-613612. Email correspondence from Dynamic Ocean (Laura Borden) to Transport Canada (Dallas Babuik) on October 24, 2024.

Dynamic Ocean, & Worley Consulting. (2025a). Grise Fiord Community Harbour: Construction Environmental Management Plan. Prepared for the Governmnet of Nunavut. Doc No: PLN-WRL-07-Grise Fiord Community HRB CEMP-0001. 26 March 2025. Rev5.

Dynamic Ocean, & Worley Consulting. (2025b). Grise Fiord Community Harbour: Environmental and Socio-Economic Baseline Survey. Prepared for the Government of Nunavut. Doc No: REP-WRL-07-Grise Fiord Existing Conditions Report-0002. 26 March 2025. Rev2.

ECCC. (2016). Canadian Protected Areas Status Report 2012-2015. Available at: https://publications.gc.ca/collections/collection_2016/eccc/En81-9-2016-eng.pdf Accessed: October 2024.

ECCC. (2021). Canadian Environmental Sustainability Indicators: Sea ice in Canada. Available at: https://www.canada.ca/en/environment-climate-change/services/environmental-indicators/sea-ice.html. Accessed: November 2024.

ECCC. (2023). Canadian Environmental Sustainability Indicators: Canada's conserved areas. Available at: www.canada.ca/en/environment-climate-change/services/environmental-indicators/conservedareas.html. Accessed: November 2024.

ESWG. (1995). A national ecological framework for Canada. Agriculture and Agri-Food Canada, Research Branch, Centre for Land and Biological Resources Research and Environment Canada, State of the Environment Directorate, Ecozone Analysis Branch, Ottawa/Hull. Report and national map at 1:7,500,000 scale. Available at: https://sis.agr.gc.ca/cansis/publications/manuals/1996/index.html. Accessed: January 2025.

Explosives Act. R.S.C., 1985, c. E-17. Last Ammended February 26 2015. Available at: http://laws-lois.justice.gc.ca/PDF/E-17.pdf. Accessed: November 2024.

Farmer, A. M. (1993). The Effects of Dust on Vegetation - A Review. *Environmental Pollution, 79*, 63-75.

Fisheries Act. (1985). RSC 1985, c F-14 http://laws-lois.justice.gc.ca/PDF/F-14.pdf Last Amended April 5, 2016.

Frontier Geosciences Inc. (2019). Grise Fiord Bathymetric Depth Contour Plan. Prepared for Advision. Doc. No. 307071-01306 – 00-MA-REP-0003. January 17, 2020. Rev0.

Garshelis, D., Peacock, E., & Atkinson, S. (2012). *Foxe Basin Polar Bear Aerial Survey, 2009 and 2010. Final Report. Government of Nunavut. Available at: https://www.gov.nu.ca/sites/default/files/publications/2022-01/aerial_survey_population_monitoring_of_polar_bears_in_foxe_basin._final_report_2012.pdf . Accessed: November 2024*.

Gaston, A. J., & Elliott, K. H. (2014). Seabird diet changes in northern Hudson Bay, 1981-2013, reflect the availability of schooling prey. *Marine Ecology Progress Series, 513*, 211-223.

GN-C&H. (2024). 2024 Nunavut Archaelogical Permit (Permit 2024-63A) for Grise Fiord Small Craft Harbour. Prepared for Brent Murphy, AECOM Canada Ltd. by The Government of Nunavut. June 18, 2024. *Department of Culture and Heritage*.

GN. (2012). Nunavut Coastal Resource Inventory - Grise Fiord. Government of Nunavut, Department of Environment - Fisheries and Sealing Division. Available at: https://www.gov.nu.ca/sites/default/files/documents/2022-07/ncri_grise_fiord_en.pdf Accessed: November 2024.

GN. (2014). Environmental Guideline for Dust Supression on Unpaved Roads. Government of Nunavut, Department of Environment. Revised April 2014. Available at: https://www.gov.nu.ca/sites/default/files/publications/2022-01/2014_03_dust_suppression_on_unpaved_roads_0.pdf. Accessed: November 2024.

GN. (2017). Nunavummi Nangminiqaqtunik Ikajuuti Implementation Act. Available at: https://nni.gov.nu.ca/. Accessed: November 2024. *Department of Economic Developement and Transportation*.

GN. (2018). Nunavut Community Health Centre Visits by Community, Region and Territory. Annual, April 1 to March 31, 2003 to 2016. Available at: https://www.gov.nu.ca/sites/default/files/nunavut_community_health_centre_visits_-_2003_to_2016_28_tables.xlsx. Accessed: November 2024.

GN. (2023a). 2023 Population Estimates. Available at: https://www.gov.nu.ca/sites/default/files/documents/2024-09/Population_Estimates_Report_July_1_2023.pdf. Accessed: November 2024.

GN. (2023b). Environmental Guideline for Ambient Air Quality. Department of Environment. Available at: https://www.gov.nu.ca/sites/default/files/publications/2024-05/Ambient%20Air%20Quality%202023-03.pdf. Accessed: March 2025.

GN. (2023c). Environmental Guideline for Dust Suppression. Department of Susitanable Development Environmental Protection Service. January 2002. Available at: https://gov.nu.ca/sites/default/files/Guideline%20Dust%20Suppression.pdf Accessed: March 2025.

GN. (2024a). ICSP Toolkit-Infrastructure Plan for Grise Fiord. Available at: https://toolkit.buildingnunavut.com/en/Community/Plan/b17ac5f3-8273-41ec-9982-a1f700f2d229#. Accessed: January 2025.

GN. (2024b). Internal Memo: Transitional Notices for Procurment Documents for the 2025 Governmnet Reorganization. Issued 03 December. Accessed: January 2025.

GN, & ECCC. (2022). Non-native invasive species in Nunavut. Available at: https://www.gov.nu.ca/sites/default/files/publications/2022-01/invasive_poster_english_jan31-4.pdf. Accessed: November 2024.

GN, & NTI. (2022). Nunavut Adult Learning Strategy. Available at: https://www.gov.nu.ca/sites/default/files/documents/2022-01/nu_adult_learning_strategy_eng.pdf Accessed: November 2024.

Government of Canada. (2017). Selection of sites as national wildlife areas. Available at: https://www.canada.ca/en/environment-climate-change/services/national-wildlife-areas/site-selection.html Accessed: October 2024.

Government of Canada. (2021). 30-year ice climate normals. Available at: https://iceweb1.cis.ec.gc.ca/30Atlas/page1.xhtml?lang=en. Accessed: November 2024.

Government of Canada. (2022). Land and resource management overview. Available at: https://www.rcaanc-cirnac.gc.ca/eng/1646153802021/1646251899137. Accessed: November 2024.

Government of Canada. (2024a). Canadian Climate Normals 1991-2020 Station Data: Grise Fiord. Available at: https://climate.weather.gc.ca/climate_normals/results_1991_2020_e.html?searchType=stnProv&lstProvince=NU&txtCentralLatMin=0&txtCentralLatSec=0&txtCentralLongMin=0&txtCentralLongSec=0&stnID=379000000&dispBack=0Accessed: November 2024.

Government of Canada. (2024b). Nunavut Devolution. Available at: https://www.rcaanc-cirnac.gc.ca/eng/1352471770723/1537900871295. Accessed: November 2024.

Government of Canada. (2024c). Species at Risk Public Registry. Available at: https://species-registry.canada.ca/index-en.html#/species?sortBy=commonNameSort&sortDirection=asc&pageSize=10. Accessed: March 2025.

Hamlet of Resolute Bay. (2009a). Community Plan By-Law Number 63. Pursuant to the provisions of the Planning Act, RSNWT, 1988, c. P-7, s.4. Available at: https://downloads.cgs-pals.ca/resolute_bay/community_plans/cp_bylaw.pdf. Accessed: November 2024.

Hamlet of Resolute Bay. (2009b). Zoning By-Law Number 64. Pursuant to the provisions of the Planning Act, RSNWT, 1988, c. P-7, s.13. Available at: https://downloads.cgs-pals.ca/resolute_bay/community_plans/zoning_bylaw.pdf Accessed: November 2024.

Harrison, J. C., Thorsteinsson, R., Frisch, T., Mayr, U., Gilbert, C., Lynds, T., & Ford, A. (2015). Geology, Tectonic assemblage map of Grise Fiord, eastern Devon and southern Ellesmere islands, Nunavut. *Geological Survey of Canada, Canadian Geoscience Map 34, 2nd edition*. doi:10.4095/296222

Hèllstedt, P., & Henttonen, H. (2006). Home Range, Habitat Choice, and Activity of Stoats (*Mustela erminea*) in a Subarctic Area. *Journal of Zoology, 269*(2), 205-212.

Highsmith, R., & Coyle, K. (1990). High Productivity of Northern Bering Sea Benthic Amphipods. *Nature 344*, 862-864.

Hobson, K. A., Fisk, A. T., Karnovsky, N., Holst, M., Gagnon, J., & Fortier, M. (2002). A stable isotope model for the North Water food web: implications for evaluating trophodynamics and the flow of energy and contaminants.

Hobson, K. A., & Welch, H. E. (1992). Determination of trophic relationships within a high Arctic food web using δ13C and δ15N analysis. *Marine Ecological Progress Series, 84*, 9-18.

IIBA. (2019). Tallurutiup Imanga National Marine Conservation Area. Inuit Impact and Benefit Agreement. August 1, 2019. Available at: https://www.qia.ca/wp-content/uploads/2019/09/2019-08-01_TINMCA-IIBA_FULLY-SIGNED-1.pdf Accessed: November 2024.

Impact Assessment Act. (2020). S.C 2019, c28 s1. Current to March 5, 2020. Available at: https://laws-lois.justice.gc.ca/PDF/I-2.75.pdf. Accessed: January 2025.

INAC. (2012). Anadromous Arctic char: Available at: https://www.aadnc-aandc.gc.ca/eng/1315676277753/1315676351336 Accessed: November 2024.

IPCC. (2023). Climate Change 2023: Synthesis Report. Contribution of Working Groups I, II and III to the Sixth Assessment Report of the Intergovernmental Panel on Climate Change [Core Writing Team, H. Lee and J. Romero (eds.)]. Available at: https://www.ipcc.ch/assessment-report/ar6/. Acessed: January 2025. *IPCC*, 35-115. doi:10.59327/IPCC/AR6-9789291691647.

IQ Workshop 2019 - Amon Akeeagok. Grise Fiord Workshop Occurred on 30 May 2019. Verification on 6 November 2019. .

IQ Workshop 2019 - Manasie Noah. Grise Fiord Workshop Occurred on 30 May 2019. Verification on 6 November 2019.

IQ Workshop 2019 - Marty Kuluguqtuq. Grise Fiord Workshop Occurred on 30 May 2019. Verification on 6 November 2019.

IQ Workshop 2019 - Marty Kuluguqtuq. Grise Fiord Workshop Occurred on 30 May 2019. Verification on 6 November 2019

IQ Workshp 2019 - Amon Akeeagok. Grise Fiord Workshop Occurred on x May 2019. Verification on x November 2019.

Jones, M. M., Hildebrand, J. A., Thayre, B. J., Jameson, E., Small, R. J., & Wiggins, S. M. (2022). The influence of sea ice on the detection of bowhead whale calls. *Scientific Reports, 12*(1), 8553. doi:10.1038/s41598-022-12186-5

Jørgensen, E. H., Johansen, S. J. S., & Jobling, M. (1997). Seasonal Patterns of Growth, Lipid Deposition and Depletion in the Anadromous Arctic charr. *Journal of Fisheries Biology, 51*, 312-326.

Journeaux Associates. (2012). Engineering Challenges for Coastal Infrastructure / Docks with Regard to Climate Change in Nunavut. Report No.L-111-1472. Prepared for Government of Nunavut. Available at: https://www.climatechangenunavut.ca/sites/default/files/docks_final.pdf November 2024.

Klemetsen, A., Amundsen, P. A., Dempson, J. B., Jonsson, B., Jonsson, N., Connell, O., & Mortensen, E. (2003). Atlantic salmon Salmo salmar, Brown trout *Salmo trutta* (L), and Arctic char *Salvelinus alpinus* (L): A Review of Aspects of their Life Histories. *Ecology of Freshwater Fish, 12*, 1-59.

Koski, W. R., Davis, R. A., Miller, G. W., & Withrow, D. E. (1993). *The bowhead whale* (J. Burns, J. J. Montague, & C. J. Cowles Eds.).

Krizan, J. (2006). Nunavut Wolf Morphology and Diet Study. *Government of Nunavut, Department of Environment, Iqaluit. Final Wildlife Report, 11*, 60.

Lassuy, D. R., & Lewis, P. N. (2013). Invasive species: human-induced. Arctic biodiversity assessment. Status and trends in arctic biodiversity, 559-565.

Marine Mammal Regulations. SOR/93-56. Last amended: November 2, 2018. Enabling Act: *Fisheries Act.* Available at: https://laws-lois.justice.gc.ca/eng/regulations/sor-93-56/index.html. Accessed: November 2024.

McLoughlin, P. D., Walton, L. R., Cluff, H. D., Paquet, P. C., & Ramsay, M. A. (2004). Hierarchical Habitat Selection by Tundra Wolves. *Journal of Mammalogy, 85*(3), 576-580.

NavCan. (2024). Canadian NOTAM Operating Procedures. Version 8.0 updated 21 March 2024. Available at: https://www.navcanada.ca/en/cnop-8.0-21-mar-2024.pdf. Accessed: December 2024.

NGMP. (2013). Nunavunmi Tamainni Takuurivangnikkut Parnaiyautaanni. NGMP Monitoring Blueprint Compendium. Available at: https://www.ngmp.ca/DAM/DAM-PSGN-NGMP/STAGING/texte-text/monitoringBlueprint_1424179146631_eng.pdf Accessed: October 2024.

NHC. (2024). 2023-2024 Annual Report for the Nunavut Housing Corporation. Available at: https://different-basket-89cd87b086.media.strapiapp.com/NHC_2024_Annual_Report_EN_43333bc106.pdf. Accessed: January 2025.

NIRB. (2007). Nunavut Impact Review Board. Guide to Terminology and Definitions. Updated August 2007. Available at: https://www.nirb.ca/sites/default/files/_documents/guides/NIRB-F-Guide%202-Terminology%20and%20Definitions-OH2E.pdf. Accessed: November 2024.

NIRB. (2020). Proponent's Guide. NIRB Technical Guide Series. Updated February 2020. Available at: https://www.nirb.ca/publications/guides/NIRB%20Proponents%20Guide.pdf. Accessed: October 2024.

NIRB. (2025). Additional Information Required: Information Request # 1 for the Department of Community and Government Services' "Grise Fiord Community Harbour Project" Proposal. Issued to the Department of Community and Government Services. No. 24XN059. January 14, 2025.

NMC. (2020). Nunavut Marine Council. Available at: http://www.nunavutmarinecouncil.com/node/30 Accessed: October 2024.

NPC. (2000). North Baffin Regional Land Use Plan. Available at: https://www.nunavut.ca/land-use-plans/north-baffin-region-land-use-plan. Accessed: November 2024.

NPC. (2023a). 150165-Grise Fiord New Water Treatment Plant. Conformity Determination. 31 October 2023.

NPC. (2023b). Nunavut Planning Commission - Interactive Maps. Available at: https://www.nunavut.ca/land-use-plans/interactive-maps. Accessed: January 2025.

NPC. (2023c). Recommended Nunavut Land Use Plan (RNLUP). Available at: https://www.nunavut.ca/sites/default/files/23-001e-2023-06-20-recommended_nunavut_land_use_plan-eng_r.pdf. Accessed: November 2024. 136p.

NPC. (2024a). 150230-Grise Fiord Solid Waste Disposal Facility. Conformity Determination. 27 February 2024.

NPC. (2024b). 150556-Grise Fiord Community Harbour Project. Conformity Determination. 11 December 2024.

NPC. (2024c). Re: NPC automatic notification: application complete. Email correspondence from NPC to Dynamic Ocean (Victoria Burdett-Coutts) on November 19, 2024.

NPC. (2024d). Re: NPC automatic notification: application submitted. Email correspondence from NPC to Dynamic Ocean (Victoria Burdett-Coutts) on October 25, 2024.

NRCan. (2016). Polar Continental Shelf Program. Arctic Operations Manual. Available at: https://www.nrcan.gc.ca/sites/www.nrcan.gc.ca/files/earthsciences/files/pdf/polar/pcsp_manual_eng.pdf Accessed: December 2024.

NTI. (2024a). NTI Board of Directors. Available at: https://www.tunngavik.com/about/board-of-directors/. Accessed: December 2024.

NTI. (2024b). Nunavut Tunngavik Incorporated. Available at: https://www.tunngavik.com/about/. Accessed: December 2024.

Nunami Stantec Limited. (2021). 2020 Annual Air Quality, Dustfall and Meteorology Report. Prepared for Baffinland Iron Mines Corp. by Nunami Stantec Ltd. Available at: https://www.baffinland.com/_resources/document_portal/2020-Air-Quality-Memo.pdf. Accessed: January 2025.

Nunavut Agreement. (1993). Agreement Between the Inuit of the Nunavut Settlement Area and Her Majesty the Queen in Right of Canada. Signed May 25, 1993. Available online at: https://www.gov.nu.ca/sites/default/files/Nunavut_Land_Claims_Agreement.pdf. Searchable at: https://nlca.tunngavik.com/?lang=en&_sm_nck=1.

Nunavut Climate Change Centre. (2004). Climate Change Inuit Qaujimajatuqangit Interview Responses. Available at: https://climatechangenunavut.ca/sites/default/files/north_baffin_report_-_grise_fiord_interviews.pdf. Accessed: November 2024.

Nunavut Maligaliurvia. (2023). Annual Fuel Purchases, Bulk Fuel Storage Capacity and Annual Resupply Operations. Legislative Assembly of Nunavut-Return to Written Question. Available at: https://assembly.nu.ca/sites/default/files/RWQ4-6%282%29_Qavvik_CGS_Annual_Fuel_Purchases..._eng.pdf. Accessed: January 2025.

Nunavut Planning and Project Assessment Act. SC 2013, c. 14, s. 2. Last amended: May 27, 2022. Available at: https://laws-lois.justice.gc.ca/eng/acts/N-28.75/. Accessed: November 2024.

Nunavut Waters and Nunavut Surface Rights Tribunal Act. (2019). S.C. 2002, c. 10. Last Ammended August 28 2019. Available at: https://laws-lois.justice.gc.ca/PDF/N-28.8.pdf. Accessed: November 2024.

NWB. (2019). Thresholds for Type A, Type B Licences & Authorizations. Available at: https://www.nwb-oen.ca/regulatory-process/legal-authorities/thresholds. Accessed: October 2024.

NWMB. (2020). Nunavut Wildlife Management Board. Available at: https://www.nwmb.com/en/about-nwmb/responsibilities Accessed: November 2024.

Oceans North Conservation Society, World Wildlife Fund Canada, & Ducks Unlimited Canada. (2018). Canada's Arctic Marine Atlas. Ottawa, Ontario: Oceans North Conservation Society. Available at: https://arcticwwf.org/site/assets/files/1872/canadas-arctic-marine-atlas.pdf Accessed: November 2024.

OneWorld. (2021). Canada's Country Profile. Available at: https://www.nationsonline.org/oneworld/map/canada-administrative-map.htm#:~:text=About%20Canada&text=The%20country%20is%20bordered%20by,island%20which%20belongs%20to%20France. Accessed: November 2024.

Osterkamp, T. E. (2001). Subsea Permafrost. Academic Press. University of Alaska, Alaska, USA.

Priest, H., & Usher, P. J. (2004). The Nunavut Wildlife Harvest Study. Nunavut Wildlife Management Board. 816p. Available at: http://www.nwmb.com/en/list-all-site-files/publications/harvest-study. Accessed: October 2024.

QIA. (2018). Qikiqtaaluk Inuit Qaujimatatuqangit and Inuit Quajimatangit Iliqqusingitigut for the Baffin Bay and Davis Strait Marine Environment. November 2018. Available at: https://www.nirb.ca/publications/strategic%20environmental%20assessment/190125-17SN034-QIA%20Final%20IQ%20Baseline%20Report%20for%20Baffin%20Bay%20and%20Davis%20Strait-IEDE.pdf Accessed: November 2024.

QIA. (2020). Qikiqtani Inuit Association: Empowering Qikiqtani Inuit. Protecting The Qikiqtani Region. Available at: https://www.qia.ca/qikiqtani-inuit-association-empowering-qikiqtani-inuit-protecting-the-qikiqtani-region/ Accessed: October 2024.

QWB. (2020). Qikiqtaaluk Wildlfe Board. Available at: https://www.niws.ca/qwb/ Accessed: October 2020.

RWDI Air Inc. (2020). Summary of AQ Monitoring Results for 2019 Baffinland AQ Monitoring Mary River and Milne Inlet. RWDI Ref. No. 1402090. Available at: https://www.baffinland.com/_resources/2019_AirQualityMemo.pdf. Accessed: January 2025.

Species at Risk Act. (2002). S.C. 2002, c. 29. Last amended: June 17, 2024. Available at: https://laws.justice.gc.ca/eng/acts/s-15.3/. Accessed: January 2025.

Statistics Canada. (2023). Profile table, Census Profile. 2021 Census of Population - Grise Fiord, Hamlet (HAM Nunavut [Census subdivision]. Statistics Canada Catelogue no. 98-316-X2021001. Ottawa. Released November 15, 2023. Available at: https://www12.statcan.gc.ca/census-recensement/2021/dp-pd/prof/index.cfm?Lang=E. Accessed: November 2024.

Tetra Tech. (2021). Hamlet of Grise fiord Master Drainage Plan. Presented to the Department of Community and Government Services (CGS) Government of Nunavut. Available at: https://downloads.cgs-pals.ca/grise_fiord/drainage_geotechs/drainage_geotech.pdf. Accessed: November 2024.

Time and Date. (2025). Climate and Weather Averages in Grise Fiord, Nunavut, Canada. Available at: https://www.timeanddate.com/weather/canada/grise-fiord/climate. Accessed: November 2024.

Walker, D. A., & Everett, K. R. (1987). Road Dust and Its Environmental Impact on Alaskan Taiga and Tundra. *Arctic and Alpine Research, 19*(4), 479-489.

Watt, C. A., Heide-Jørgensen, M. P., & Ferguson S.H. (2013). How adaptable are narwhal? A comparison of foraging patterns among the world's three narwhal populations. *Ecosphere, 4*(6), 1-15. doi:https://doi.org/10.1890/ES13-00137.1

Whitehouse, G. A., Buckley, T. W., & Danielson, S. L. (2017). Diet compositions and trophic guild structure of the eastern Chukchi Sea. *Deep Sea Research Part II: Topical Studies in Oceanography, 135*, 95-110.

Worley Consulting. (2024). Grise Fiord Community Harbour: Community Consultation Plan. Prepared for the Government of Nunavut. Doc No: 317086-54170-00-PM-PLN-00001. July 22, 2024. Rev A.

WSCC. (2021). Workers Safety & Compensation Commission Legislation. Available at: https://www.wscc.nt.ca/about-wscc/policy-and-legislation/legislation#SafetyAct Accessed: November 2024.

Appendix A: Consultation Log

Grise Fiord Community Harbour Project - Consultation Log

Group	Method and Date	Topic	Feedback/Questions/Concerns	Project Response and Mitigations
Iviq HTO Hamlet Council Guardians/QIA Invited hunters and elders	Joint Meeting - Aug 6, 2024	Harbour Design	Option 1 is not centrally located. Most boat owners will be unable to see their boats moored.	Noted.
			Option 1 is concerning because of theft and vandalism, we would need to think about security or monitoring the harbour once built.	Noted.
			As a community, we could conduct a public awareness campaign to announce through the Hamlet on the radio and social media that the harbour is a public facility and should be treated with respect.	Noted.
			There is often debris carried by strong winds that ends up accumulating in the area of Option 1.	Noted.
			Option 2 has a lot of shacks and cabins. Where would they be moved to?	They would be moved to a location the community agrees to.
			For Option 2, we've already been dealing with issues of beach buildup burying our clams. Now that you've explained so well how Option 2 might mean a beach will build up because of sediments and the current this doesn't seem like the better option anymore.	Noted.
			We don't want to cause more erosion on the east side of the shoreline if a harbour will be built in Option 2.	Noted.
			There is not much melt from the river that you need to be concerned about for Option 1.	Noted.
			Are there any plans to improve the lower bridge? The culverts are in need of repair. Those culverts need replacing every 2-3 years.	The contractor may need to work on the bridges and culverts if there's any damage and ensure the roads are maintained. It is the contractor's responsibility to maintain the haul road in good condition during construction.
			Is there a reason why the laydown area for parking and storage is so big?	We need space to store the floats during the winter We want to push the harbour in to deeper water so there is less dredging needed (which is expensive) We need an area to put the sediments that will be dredged to make the harbour deeper.
			We will provide the information you've provided us, including the pros and cons list for Option 1 and 2 and your drawings to our community members through Facebook, radio, and posted here at the Hamlet office. We will get back to you as a community through our difference organizations with support letters for our community's preferred harbour location once we've reached a consensus.	We appreciate that very much, thank you. The sooner the community can decide on a preferred harbour location the sooner we can get started on the detailed design.
		Access to ice and water	Will the harbour be snowmobile friendly?	Yes, the slopes allow access for snowmobiles in and through the harbour.
		Fuel	Will the contractor bring in their own fuel and tanks? The community often runs low on fuel.	The project is coordinating with PPD to see if there can be 2 shipments of fuel during construction years and if there's not enough fuel, the contractor will have to provide their own tanks, the community always gets first priority for fuel.
		Construction	Will construction be 24/7?	That's up to the community and what you are willing to tolerate. If they are able to work longer hours they may be able to finish earlier but a lot of the work that might be extended past 12 hours wouldn't be super disruptive. It could be work at the quarry away from the community, not hauling trucks 24 hrs/day.
			Will the contractor only work during low tide?	They will push material in to the water and work from the top, but the wheels can't be under water so they will maximize working with the tide as much as possible.
			How late in to the fall will construction continue?	Possibly until end of October. They will keep pushing as long as they can depending on conditions/weather.
		Quarry	Location 4 is unacceptable as it's a recreational area and a busy area to access harvesting areas. Muskox harvested there just 2 weeks ago. Concerns about steepness and rock falls in the area as well.	Noted.

Grise Fiord Community Harbour Project - Consultation Log

Group	Method and Date	Topic	Feedback/Questions/Concerns	Project Response and Mitigations
			Location 1 at the base of the Greenlander is also not preferred. We wouldn't want to deface our beautiful view and put a big hole in it.	Noted.
			There may be another potential quarry area further to the east located around Brume Point (6 KM East)	Thank you for that suggestion. We want to use as much as we can of the funds we have to build the harbour. A quarry that much farther away would mean we would be spending more money on building roads and hauling further distances which means less money for the harbour.
			Location 2 is best suited and acceptable for a quarry. There's nothing up there and we have no concerns. The community is currently building a road using an excavator and a loader to the other side to access Nuvuk (the shore of the Fjord) because it freezes faster and thaws earlier, so it extends our hunting time during transitional	Noted.
			Are the holes filled after blasting?	If we do end up blasting, the hole would remain. The quarry could get turned over to the Hamlet to use as a quarry for the community.
			How loud would the blasting be?	Blasting is loud but will be carefully controlled. If regular blasting is required, we would try to have the contractor schedule it at consistent times each day, allowing residents to anticipate and prepare. Community notices will be also be posted in advance to keep everyone informed. While the blast sound may be heard in town, the quarry's location, away from the community, is expected to mitigate the noise to some extent.
		Haul Road	We don't really see how there's any other option than to use the haul route you've shown.	Noted.
		Data Sharing (Coastal research)	We don't have any issue with the coastal erosion team sharing their data with the project. The more you share with each other the better the project will be.	Noted.
		Field Program	What are you studying with the cores?	The cores help us understand the strength of the seabed material to be able to handle the rocks we place for the breakwater.
		Project Management	Will this be the team that comes to consult with us every time? Will we have consistency in getting us through this?	Yes, the project manager and engineering team will remain the same until the contractor is hired and then a construction team will join in discussions.
		Local site conditions	There are culverts in the lower river with 4 X 3 or 4 ft culverts. The flow had previously been slightly diverted to the west within the location of Option 1. Suggestion to possibly divert the flow of the river to its original flow which is straight out to the sea from the main bridge. The partial diversion was made back in the 1980s.	Noted.
			There is less and less multiyear ice in recent years. We haven't seen any multi year ice so far this year.	Noted.
		Employment and Training	Suggest you train locals to be rock haul drivers ahead of the contractor starting so locals have jobs and can improve their skills and employability.	Noted. The Project aims to maximize participation of Inuit labour, training, and Inuit owned businesses on the Project. The contractor will work with the Hamlet and the community to understand how best to advertise for positions well ahead of time
AFA Community Representative	Drop in meeting Aug 6, 2024	General	Community has one fishing vessel, Qivivk 2.	Noted.
			When AFA delivers shipments to the community, they use the white ponton barge to ferry supplies from the vessel to shore near the sealift area. Harbour Option 1 would not impact this.	Noted.
Iviq HTO Hamlet Council Invited hunters and elders	Joint Meeting - Dec 5, 2024	Field Program and Results	What is the condition of the laydown area right now?	Is it very loose right now and gets rocky along the shore. We will be building it up about 4m and compacting it with the sediments dredge from the seabed to make the harbour deeper.
			SmartIce equipment in the community but the program hasn't launched yet this year.	Noted.
			Suggest making a list of archaeological sites around, there are a few.	The archaeologist did find some sites south of town but not in the area we are working. Archaeological Impact Assessments have now been conducted for the Project that document any sites that may be impacted by the project. There are no known sites in these areas or along the haul route that will be impacted.

Grise Fiord Community Harbour Project - Consultation Log

Group	Method and Date	Topic	Feedback/Questions/Concerns	Project Response and Mitigations
		Harbour Design	Will the road be two lanes so trucks will be able to pass each other?	Yes, we will make it so there are two lanes if we are able to move the shacks that are currently there or at the least we would build a passing lane.
			Some of us have trailers so we can't back up easily	Yes, we will be make is so you don't have to back up. We will make sure a truck and trailer can navigate the area wit
			Will the entrance be dug out?	Yes, everything that is in light blue on the drawing will be dredged to a depth of about 1.5m
			Concerning the access road, going down the lower road seems like a good idea.	Noted.
			Will the harbour be able to accommodate AFA or small fishing vessels?	The harbour is only designed for local boat sizes, so boats in the 20-25ft range or smaller. Bigger boats like the AFA vessels would need to work with the tides to come in to the harbour. During high tide, bigger boats will be able to come in and go. We will look in to maximizing the boat size the harbour can accommodate as much as possible.
			Is the harbour being designed in a way that it can be expanded in the future?	It would take more work, but yes, the way it's designed allows for future expansion/modifications.
		Lighting	Would we only be using the general harbour lights in September and October?	Yes, just in the shoulder season there may be bright spot lights for construction.
		Haul road	It would be great to upgrade that road. It would be nice to grade it.	The haul road will be improved to allow for safe truck travel. The contractor will be responsible for maintaining the roads they use in good condition.
			Concern about the area being muddy	The contractor would have to upgrade the road and compact it. There is a culvert so they would need to upgrade. There will be a lot of truck driving back and forth during the summer months around people who live in the harbour area. We will be talking to residents along the haul route and in the harbour area to understand and address their concerns and answer any questions.
			With the road heading to the quarry, there is a river, would you go through the river, around it, or build a bridge?	We would most likely do a culvert. It would be sized for big trucks. It may still get washed away but the contractor will be responsible for maintaining it.
		Quarry	No concerns for Location 2 areas to be used as a quarry.	
			Will you be gathering existing boulders or blasting?	We are planning on using existing boulders but we may need to blast a bit just to loosen the boulders out of the ground as they are so big and the ground may be frozen.
			No concerns about proposed areas to be used for stockpiling and contractor equipment laydown.	
		Construction	Will construction be seasonal, so just spring and summer when the snow is gone?	Yes, it will be during open water. They may be able to do some work at the quarry before the open water season and stop work by sometime in October.
			Community will consider allowing some construction activities to be 24 hrs/day.	Noted.
			Will they need boats?	There is a need for boats, but its usually small boats. Contractors will bring in their own boats or at times rent from local community. If they decide to use marine construction methods for dredging, it may require barges and small tugs.
			Will that beach road be completely inaccessible? It's our only access to the area. Could we put another crossing farther up to us access?	The beach road will remain accessible with traffic safety measures. At times, there will be flag people there who will have to stop people from using it momentarily while the big trucks are turning.
			The community would be fine with using the road behind the haul road during construction. It needs to be maintained for water and sewage anyway.	Noted.
			How will the project's fuel needs be met?	We will work with the contractor to determine how much fuel they will need and then coordinate with PPD about getting a second ship to come top up the tanks at the end of the season. If it's still a concern for the Project and the community, the contractor will be responsible for bringing in their own fuel storage tanks. If it was ever running low the contractor would need to stop work and leave the fuel for the community. The community always gets first priority.

Grise Fiord Community Harbour Project - Consultation Log

Group	Method and Date	Topic	Feedback/Questions/Concerns	Project Response and Mitigations
			That's a good plan on the fuel. Most activity in the community happens in the spring and summer so we use quite a bit of gas, we just don't want to have to worry about running out of fuel.	Noted. We do pay very close attention with fuel requirements. At this point, it would probably be the contractor bringing tanks up.
			We also need to think about food.	Yes. That's another tricky one given the size of your community and the remoteness. The contractor will be responsible for bringing in food for the workforce and will not take from the community's food supply at the Co-op.
			That would mean more planes and more fuel.	Yes, it does. It will increase plane traffic temporarily during construction months.
			What about accommodation and food for the construction workforce?	The contractors are responsible for both. We have been talking to Marty (ASAO), David (SAO) and Laisa (Councillor, Guardians Supervisor) about areas that may be suitable for a camp. The location for the camp will require the community's approval.
			SAO - Will construction be taking place at the same time of year that the whales go by? It seems like a lot of disturbance, do you monitor that?	Yes, we hire local wildlife monitors to observe and look out for marine mammals. If a wildlife monitor spots any marine mammals, work would stop. We have had reports of less mammals during construction years on other projects.
		Access to ice and water	Concerning maintaining access for boats during construction, there is an area in that little harbour we use in front of the RCMP. Is there a way we can flatten that launch there? There are 2 boulders also that need clearing. If that area could be improved that would be help as an alternative for launching during construction. We often have to have two trucks to pull up boats just to make it up that shoreline.	Yes, we could look at upgrading that little ramp in that area to make it more accessible during construction.
		Employment and Training	Does the community have a say in who wins the construction contract?	The GN usually goes with the lowest bidder but this time we may need to do some things differently in the request for proposal because we have learned some hard lessons. Unfortunately, I think only the GN can work on evaluating the bids but we can certainly get input from the community on what goes in to the decision, what the criteria there should be.
			It can be important with these contracts to include training	With the RFP, we could weight something like that higher.
			Will the Project be responsible for training locals for heavy equipment or would that fall to the Hamlet? It would be nice to see locals hired to drive the equipment.	In the past, contractors have set up training for driving the haul trucks but usually in the excavators they need people with a lot of experience. The Hamlet in the mean time could also look in to see if there are training programs that can held in the community in anticipation of the project in 2026.
			SAO - we do need to look into getting drivers trained in class 3 for just normal operation of the community. So it is something the hamlet should look into. I was also think that a local business could be hired for camp catering, that could be a good opportunity.	Yes, the contractors are open to hiring locals to fill those positions. They usually like to have control over who they hire versus hiring a company to run it all but there would be an opportunity for local employment even if it wasn't a local business being hired to run it all.
		Navigation	No concerns expressed concerning navigation or the planned navigation lighting locations.	Noted.
		Fish and Fish Habitat	No concerns were raised regarding fish and fish habitat.	Noted.
			There are usually cod and sculpin in the area but we don't harvest or fish in the harbour area. In august, the seal can go there but we travel farther to hunt.	Noted.
		Operations	Once it is built, who will look after it?	The GN will work with the QIA and the community to find a plan on how the facility will be managed and what is possible. During construction the GN will own the harbour. The GN will also own the facility initially once complete but we will work with the community to find the best possible operations management arrangement.
			What is the difference between a recreational facility and an industrial facility?	Great question. This would be considered a recreational harbour. The harbour would be used by the community boats. An industrial facility would be for the really large ships. It would have to be very large structures in very deep water to accommodate those ships. When we said that industrial ships are not able to use the harbour, we mean the very large sealift vessels or fuel tankers, not the boats that are used for inshore fisheries like the AFA or community boats.
			Will the community have a say in who can use the facility?	Yes, we would work with the community to make the harbour rules.

Grise Fiord Community Harbour Project - Consultation Log

Group	Method and Date	Topic	Feedback/Questions/Concerns	Project Response and Mitigations
Community (22 residents)	Open House Dec 6, 2024	General	Inquiries on local employment opportunities	Noted the types of jobs that will be available and that there will be a local hiring process once a contractor has been hired.
			Inquiries about widening a hamlet road that isn't part of the haul route and extending the road to Nuvuk	Open to considering how to support this. We don't want to take funding away from the harbour but we could work with the contractor while the equipment is in the community to see what can be done. The Hamlet would have to apply for funding, perhaps through CTIP to fund these improvements.
			Concerns about dust and mitigations	As part of the construction environmental management plan, the contractor will be required to control for dust. The maximum speeds will be kept low (20km/hr) and dust suppression will be used (water or other approved dust suppressant).
			Comments that the flow from the river in to the harbour will make it ice free sooner which is a benefit.	Noted.
			Concerns about sediments filling the harbour.	The harbour includes a sediment trap that will be designed to contain sediments as much as possible to minimize the frequency of maintenance dredging required.
			Inquiries about ice access within the harbour and being able to skidoo down the ramp	Yes, the harbour will allow snowmobile access, including the ramp.
			Inquiries on funding for maintenance	The GN will have funding for annual maintenance of the facility.
Community Stakeholders (RCMP, Health Centre, Co-Op, Fire Station etc.)	Drop in visits - Dec 2024	General	All expressed support for the Project and its benefit to the community.	Noted.
			RCMP suggested police background checks for workers and a policy prohibiting the consumption of alcohol with residents into the workers' code of conduct. Also recommended a CTV in the harbour once built.	Noted.
			Concern that the workforce would put a strain on the Co-op store for food and other supplies	The contractor will be responsible for bringing food and supplies in for the workforce.
			The RCMP noted that they currently do not have any RCMP vessels that would use the facility and they are not aware of any local Coast Guard Auxiliary	Noted.
			The Health Centre noted that there are times they have limited medication surplus and if the contractor would have their own first aid attendants and basic medical supplies, the Health Centre can support for cases beyond basic first aid incidents. They also noted out that due to the communities remoteness, medical E-Vac is challenging	Noted.
			SAO - could the work camp be transferred to the Hamlet after construction? There are 1-2 lots near the airport road that are zoned industrial that may be a suitable area.	The modules are more like a hotel accommodation but the Project could look in to being transferred over. The contractor will be responsible for establishing the camp, so the idea of leaving the camp behind should be discussed with the contractor directly. However, contractors usually need these camps to move with them for other Projects.
Haul Road Residents and shoreline shack owners	One-to-one discussions- Dec	General	No concerns with shacks being moved for construction of the harbour as long as the Project can help move them.	Noted. The contractor will help move the shacks to a location approved by the owners and Hamlet.
			Concerns about public safety with the traffic. There are always children playing in the road and along the shoreline at all hours, especially in the summer.	The safety of the community is our number one concern. Public safety measures will be described in detail in the contractor's construction environmental management plan which will include traffic management measures such as: flag people/spotters at intersections and near any homes or buildings, limiting vehicle speeds to 20km/hr, ensuring all trucks have proper braking systems to handle the conditions of the road (especially any steepness), equipment kept properly maintained to avoid accidents with equipment failure, providing the community with timely notices and implementing a traffic awareness campaign especially for kids and youth etc.
			Appreciative of Project information being provided directly as a resident along the haul route.	Noted.

Grise Fiord Community Harbour Project - Consultation Log

Group	Method and Date	Topic	Feedback/Questions/Concerns	Project Response and Mitigations
L'Université du Québec à Rimouski (UQAR)	Ongoing meetings and emails beginning June 2024	Collaboration between the UQAR research team and the Project on data and resource/equipment sharing.	UQAR is interested in using the Project's drill that is in the community. UQAR shared bathymetric data. UQAR presented data available and plans to share info.	The Project shared preliminary results with UQAR from the summer 2024 nearshore boreholes and passed on Geotech reports from the water treatment plant. Project is appreciative of data shared.
Sealift Carriers	Emails- Feb 2025 to provide Project information and updates and solicit feedback.	General	No comments received to date.	
Fuel Carriers	Emails- Feb 2025 to provide Project information and updates and solicit feedback.	General	No comments received to date.	The Project is well removed from any fuel transfer operations associated with the tank farm.
Cruise Ship Operators	Emails- Feb 2025 to provide Project information and updates and solicit feedback.	General	No comments received to date.	