2023 **NWB Annual Report** Year being reported: License No: 1BR-COR2325 Issued Date: June 15, 2023 Expiry Date: June 14, 2025 Coral Harbour Remediation Project **Project Name:** Crown-Indigenous Relations & Northern Affairs Canada – Contaminated Sites Licensee: Program Mailing Address: P.O. Box 2200 Igaluit, NU, X0A 0H0 Name of Company filing Annual Report (if different from Name of Licensee please clarify relationship between the two entities, if applicable): N/A General Background Information on the Project (*optional): The Coral Harbour Site Remediation Project location (Site) is at the site of a former military/army base located approximately 10 kilometers northwest of the Hamlet of Coral Harbour. The Site was used by Canadian and American Forces during the construction of the Distant Early Warning (DEW) Line in Northern Canada during the Second World War. The Site, which was active from the 1940s until the 1970s, was also used to support various other northern projects. The purpose of the Project is to conduct remedial activities to reduce future risk to the biophysical and human environment due to potential wastes and physical hazards that currently exist on Site. Licence Requirements: the licensee must provide the following information in accodance with Part B Item 1 A summary report of water use and waste disposal activities, including, but not limited to: methods of obtaining water; sewage and greywater management; drill waste management; solid and hazardous waste management. Water Source(s): Municipal water supply of Coral arbour Water Quantity: 15 Quantity Allowable Domestic (cu.m) 1 Actual Quantity Used Domestic (cu.m) 0 Quantity Allowable Drilling (cu.m) Total Quantity Used Drilling (cu.m) 0 Waste Management and/or Disposal ✓ Solid Waste Disposal Sewage ☐ Drill Waste ✓ Greywater ☐ Hazardous Other: Additional Details:

Graywater from the camp site.

Spill No.: N/A (as reported to the Spill Hot-line) Date of Spill: July 3, 2023 Date of Notification to an Inspector: August 9, 2023 Additional Details: (impacts to water, mitigation measures, short/long term monitoring, etc) While opening a drum for testing, the contents were pressurized and caused a minor release (<1-L) of lubricating oil. Several drops of oil landed on the ground and some collected on top of the drum. The oils on the drum were cleaned with absorbent pads. The ground is already scheduled to be remediated in August 2023. The incident was internally reported on July 3, 2023 to the project teams internal Environmental Health and Safety system. Upon later review of the Land-Use Permit it was noted that all spills are to be reported. Spill No.: N/A (as reported to the Spill Hot-line) Date of Spill: August 16, 2023 Date of Notification to an Inspector: August 17, 2023 Additional Details: (impacts to water, mitigation measures, short/long term monitoring, etc) While operating a Terex truck to mobilize demolition materials to the on site landfill, the equipment failed, releasing transmission fluid into the environment. The result was an ~1-m2 area of contamination. In response, the operator immediately halted operations and took action to clean up the spill using absorbent pads and Oil-Dri general absorbent granules. Additional efforts included scraping and disposing of the top layer of soil. **Revisions to the Spill Contingency Plan** SCP submitted and approved - no revision required or proposed Additional Details: N/A **Revisions to the Abandonment and Restoration Plan** AR plan submitted and approved - no revision required or proposed Additional Details: No revisions to the original AR or RAP submitted before the start of remediation

A list of unauthorized discharges and a summary of follow-up actions taken.

Progressive Reclamation Work Undertaken

Additional Details (i.e., work completed and future works proposed)

Season one (2023-2024) completed. Season two is scheduled for 2024-2025.

Works completed in Season one (2023-2024) include:

- Snow clearing for the 1st year of site remediation and camp setup
- Solid waste debris collection, and transportation to the Solid Waste Landfill (SWLF);
- Granular materials borrow production from the Borrow Areas.
- Citing, construction and operation of the SWLF
- Surface Debris collection from the various Areas of Environmental Concerns (AECs) AEC 1, AEC 2, AEC 3, AEC4, AEC6 and transportation to the NHWLF.
- Excavation of PHC contaminated soils from the Former Maintenance Building (FMB) foundation area
- Treatment of the PHC contaminated soils in the Land Treatment Unit (LTU) area.
- Drums' contents' collection, and the decomissioning of empty drums at the various drum catches on the site.
- Incineratiuon of waste oils and other incinerable drum contents from the drums and site equipment started.
- CIRNAC EHS Ebvironmental Health and Safety Audit
- Materials, equipment and camp winterization and temporary winter shut down after 2023-2024 construction season.

Works planned for season 2 (2024-2025) include:

- Environmental site assessment at the 3 approved CIAAs.
- Identification of the remediation strategies to be adopted on the CIAAs
- Remediation construction year 2 (to include the collection of surface debris at the 3 CIAAs, decommissioning of the 9 above ground fuel storage tank systems (FSTS), completion of the excavation of PHC contaminated soils from the Former Maintenance Building (FMB) foundation area and the foundation of the 9 above ground FSTS, excavation and disposal of the contents of the several Burried Debris Areas (BDAs) on the site, complete the treatment of the PHC contaminated soils in the Land Treatment Unit (LTU) area, decommissioning of the LTU, completion of operation and final closure of the SWLF, site remediation completion and demolization through sealift downsouth.)
- Remediation Project Closure
- The start of long term monitoring (LTM)

Results of the Monitoring Program including:

The GPS Co-ordinates (in degrees, minutes an each location where sources of water are utiliz	· · · · · · · · · · · · · · · · · · ·
Not Applicable (N/A)	▼
Additional Details:	
N/A	

	o-ordinates (in degrees, minutes and seconds of latitude and longitude) of on where wastes associated with the licence are deposited;
Additional De	etails:
	er Sump Pit for Camp: 64°12'03"N 83°20'08"W ste Landfill area: 64°12'11"N 83°19'20"W
Results of a	ny additional sampling and/or analysis that was requested by an Inspector
No additional s	ampling requested by an Inspector or the Board
Additional Do	etails: (date of request, analysis of results, data attached, etc)
N/A	
Any other details on wate being reported.	er use or waste disposal requested by the Board by November 1 of the year
No additional s	ampling requested by an Inspector or the Board
_Additional De	etails: (Attached or provided below)
N/A	
Any responses or follow	up actions on inspection/compliance reports
No inspection a	and/or compliance report issued by INAC
_Additional D	etails: (Dates of Report, Follow-up by the Licensee)
N/A	
Any additional comments	s or information for the Board to consider
N/A	
Date Submitted: Submitted/Prepared by: Contact Information:	October 9, 2024 Dele Morakinyo Tel: (873) 354-1694 Fax: N/A email: dele.morakinyo@rcaanc-cirnac.gc.ca

GPS Coordinates for water sources utilized

	Latitude			Longitude		
Source Description	o Deg	, Rin	, Sec	o Deg	, ri Mi	, Sec
N/A						

GPS Locations of areas of waste disposal

Location Description (type)	Latitude		Longitude)	
	o Deg	Min	, Sec	o Deg	, Min	, Sec
Greywater Sump Pit for Camp	64	12	3	-83	20	8
Solid Waste Landfill area	64	12	11	-83	19	49



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During the 2023 construction season, SDL encountered persistent mechanical issues with the two screeners on site. As shown above, relatively small volumes of material were screened. Additional borrow development work is anticipated in 2024. Based on the materials available in the remaining borrow areas, and required volumes of the various granular fill types for the project, it is anticipated that significantly more processing efforts (e.g., screening, blending) will be required by SDL during the 2024 construction season, than were conducted during the 2023 construction season. SDL has indicated that it will attempt the following actions to address the mechanical issues experienced in 2023:

- Setting up the screeners in a different borrow area (screeners were placed in GMD-A in 2023).
- Using a different screen size and/or screen orientation.
- Using different material loading configurations (i.e., excavator, front-end loader, loading from the back and/or from the side, etc.).

Following development during the 2023 construction season, borrow materials were used in various areas on the site as follows:

- Approximately 623 m³ of Type 1 material was used for perimeter berm construction at the NHW Facility.
- Approximately 3,961 m³ of Type 4 material was used for several purposes on the Site including HMPA berm construction, LTU berm construction, access ramp construction, and backfilling contaminated soil excavations.

Note that the volumes of granular materials used on the Site to date represent estimates only. Given the ongoing borrow extraction for the 2024 construction season, the existing borrow sources remain in their disturbed condition and have yet to be properly closed/decommissioned.

5.4 WATER LICENCE MONITORING

5.4.1 Water License Monitoring Stations

The WL for the Project prescribes monitoring at stations COR-1 through COR-8; however, several of the WL monitoring stations were not applicable in 2023. A description of the WL monitoring stations along with a summary of their applicability to the work completed in 2023 is provided in Table 5-11.

Table 5-11 Summary of Water Licence Monitoring Stations (2023)

Monitoring Program Station ID	Station Description	Monitoring Summary
COR-1	Station for freshwater intake - Daily quantities of water utilized for camp and other purposes measured and recorded in m³ (Volume)	Freshwater supplied by the Hamlet of Coral Harbour. Approximate volume of freshwater supplied in 2023 is discussed in Section 5.4.2.
COR-2	Station at the Sewage Disposal Facility or Sewage Treatment Plant discharge point (Volume and Water Quality)	Not applicable. No sewage disposal facility/treatment plant was used for the Project; however, quantity of greywater discharged was tracked indirectly (refer to Section 5.4.3).

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Table 5-11 Summary of Water Licence Monitoring Stations (2023)

Monitoring Program Station ID	Station Description	Monitoring Summary
COR-3	Station installed at the discharge point of demolition waste rinse water collection area (Volume and Water Quality)	Samples collected from FMB excavation water and from contractor's process water treatment system (refer to Section 5.4.4.).
COR-4	Station installed at the discharge point of the surface water collection system for the LTU Facility (Volume and Water Quality)	Not applicable. No water discharged from surface water collection system at LTU in 2023; however, volume of water collected from sumps for future treatment/reuse tracked (refer to Section 5.1.13).
COR-5	Station installed at the discharge point of the surface water collection system for the NHW Facility (Volume and Water Quality)	Not applicable. NHW Facility still under construction, including surface water collection system. (refer to Section 5.1.4).
COR-6 ¹	Monitoring well installed downgradient of the NHW Facility (Water Quality)	Monitoring well sampled once in 2023 (refer to Section 5.4.5.)
COR-7 ¹	Monitoring well installed downgradient of the NHW Facility (Water Quality)	Not applicable. Monitoring well dry in 2023 and could not be sampled (refer to Section 5.4.5.).
COR-8 ¹	Monitoring well installed upgradient of the NHW Facility (Water Quality)	Not applicable. Monitoring well dry in 2023 and could not be sampled (refer to Section 5.4.5).
Notes:		

^{1.} Water License 1BR-COR2325 contains a duplicate of COR-5. Stantec has assumed that the WL contains a typo and that NHW Facility monitoring well stations should be named COR-6, COR-7, and COR-8.

Additional details regarding the WL monitoring stations are provided in the following sub-sections.

5.4.2 Water Use

Part D, Item 3 of the WL requires that daily quantities of water use for camp and other purposes from Monitoring Station COR-1 should be measured and recorded in cubic metres. Monitoring Station COR-1 refers to the small freshwater lake near the camp. SDL opted to source freshwater for the camp from the Hamlet of Coral Harbour instead of withdrawing from the small freshwater lake; however, the amount of freshwater delivered to the camp was still recorded opportunistically. Approximately 61.3 m³ of freshwater was delivered to the camp by the Hamlet of Coral Harbour in 2023. Based on the number of days that the camp was active in 2023 (62 days; July 29 – September 30), which included a two-week camp set-up period where Matrix workers resided in the camp, daily freshwater use was approximately 1 m³/day. Prior to the arrival and set-up of the camp facilities, SDL and Stantec staff resided in local accommodations and freshwater delivery from the Hamlet was not required.

5.4.3 Waste and Wastewater Management

In accordance with Part D, Item 5 of the WL, greywater from the camp was pumped into a sump located at least 31 m from the ordinary high-water mark of the nearest water body, where direct flow into the nearby water body was not possible, and no additional impacts were created. The location of the greywater sump is presented on Figure 10, Appendix A, and the coordinates are as follows: 64° 12' 03" N, 83° 20' 09" W. Greywater was generated from bathroom sinks and showers, and kitchen sinks.

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Blackwater (i.e., sewage) generated at the camp was captured in Pacto bags and did not require freshwater input. As such, it is assumed that the volume of greywater discharged in 2023 was approximately equal to the amount of freshwater delivered to the camp. A total of 61.3m³ of freshwater was delivered to the camp in 2023; therefore, approximately 61.3 m³ of greywater was discharged. As discussed in Section 5.4.2, the camp was active for 62 days in 2023. As such, daily greywater discharge from the camp was approximately 1 m³/day.

As discussed above, blackwater (i.e., sewage) generated at the camp was captured in Pacto bags which were then incinerated daily in the camp incinerator. The location of the camp incinerator is presented on Figure 10, Appendix A, and the coordinates are as follows: 64° 12′ 04″ N, 83° 20′ 09″ W. Other domestic waste generated at the camp was captured in garbage bags which were also incinerated daily in the camp incinerator.

As no sewage disposal facility was constructed in 2023, WL monitoring station COR-2 did not apply.

5.4.4 Additional Water Monitoring

As discussed in Section 4.6, additional water samples were collected from accumulated surface water within the FMB excavation and from the contractor's process water treatment system. Additional water analytical results are presented in the Tables C2a to C2e, Appendix C. Laboratory COAs are provided in Appendix F. A summary of the additional water monitoring completed in 2023 is provided in Table 5-12.

Table 5-12	Summary	of Additional Water	Monitoring Results
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Sample ID	WL Monitoring Station	Description	WL Criteria Exceedances	Summary
06-FMB-DW- 001	COR-3	Accumulated surface water within FMB excavation.	N/A	No exceedances of WL criteria; therefore, FMB excavation water was discharged to ground surface.
02-HMPA- TW-001	COR-3	Treated water from contractor's process water treatment system.	pH, dissolved lead, dissolved nickel, dissolved zinc, total chromium, total lead, total nickel, and total zinc.	Water requires further treatment prior to discharge on-site (no treated water discharged to date).

As no exceedances of the WL criteria were observed in water sample 06-FMB-DW-001, the accumulated FMB excavation water could be discharged on-site. On September 16, 2023, approximately 72,000 L of water was pumped from the FMB excavation and discharged to the nearby ground surface.

Exceedances of pH, dissolved lead, dissolved nickel, dissolved zinc, total chromium, total lead, total nickel, and total zinc were observed in surface water sample 02-HMPA-TW-001. As such, further treatment is required before this water can be discharged on-site, or the water needs to be sent for off-site disposal. It should be noted that no water has been discharged from the contractor's process water treatment system to date.



5.4.5 Groundwater Monitoring

Groundwater monitoring and sampling activities were completed at the monitoring wells installed around the NHW Facility on September 29, 2023. Only one monitoring well (03-NHWF-MW03) contained sufficient water for sampling, while the two remaining monitoring wells (03-NHWF-MW01 and 03-NHWF-MW02) were dry.

As discussed in Section 3.3, groundwater analytical results were compared to the FIGQGs and are presented in the Tables C3a to C3d, Appendix C. Laboratory COAs are provided in Appendix F. A summary of the groundwater monitoring completed at the NHW Facility in 2023 is provided in Table 5-13.

Table 5-13 Summary of Groundwater Monitoring Results

Monitoring Well ID	WL Monitoring Station	Monitoring Date	Depth to Water (mbTOC)	Depth to Bottom (mbTOC)	FIGQG Exceedances
03-NHWF-MW01	COR-6	Sept. 29, 2023	Dry	2.27	No sample collected.
03-NHWF-MW02	COR-7	Sept. 29, 2023	Dry	2.32	No sample collected.
03-NHWF-MW03	COR-8	Sept. 29, 2023	2.16	2.31	Chloride, sulfate, total dissolved solids (TDS), total aluminum, arsenic, cadmium, chromium, iron, lead, mercury, selenium, silver, titanium, and zinc.
Notes:					

'mbTOC' = metres below top of casing.

Caution should be exercised when interpreting the observed groundwater exceedances. Although monitoring well 03-NHWF-MW03 was developed following installation and prior to sampling, the minimal groundwater observed (0.17 m) combined with the fact that the well was installed in an excavated test pit as opposed to drilling, likely resulted in a high concentration of suspended solids in the sample. This is evidenced by a total suspended solids (TSS) concentration of 12,600 mg/L. High TSS in water samples can bias total metals concentrations high due to metals adsorbing to the suspended particles. As such, the observed exceedances in 03-NHWF-MW03 are likely the result of high TSS in the sample and are not necessarily representative of actual groundwater concentrations. This is further evidenced by the fact that dissolved metals concentrations were often several order of magnitude lower than the corresponding total metals concentrations, and no exceedances of the applied guidelines were observed for dissolved metals.

Groundwater monitoring is recommended to be completed at the start and end of the 2024 construction season to continue to assess NHW Facility performance and identify associated potential impacts to groundwater quality. To limit the potential bias introduced by high TSS concentrations, Stantec recommends additional monitoring well development (i.e., purging) prior to the collection of future groundwater samples.



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As discussed in Section 4.5, SDL collected groundwater samples from the three LTU monitoring wells on August 24, 2023 and submitted them for analysis of BTEX and PHC F1 to F4. All three samples exceeded the FIGQG Tier 1 guideline (commercial land use, coarse-grained soil) for F2 (1.3 mg/L). It should be noted that the LTU groundwater samples were collected while Type B PHC contaminated soil was still being placed within the LTU (refer to Section 5.1.13) and the observed F2 exceedances are unlikely to be associated with operation of the LTU. Additional details on groundwater sampling at the LTU are provided in SDL's August 2023 Soil Remediation Operations Report (SDL, 2023b). SDL anticipates completing additional groundwater monitoring at the LTU in 2024.

5.5 QUALITY ASSURANCE AND QUALITY CONTROL RESULTS

5.5.1 Soil QA/QC Results

The results of the BFD analyses are presented in Tables C1a to C1f, Appendix C. RPDs were calculated as described in Section 4.7, and are presented in Table 5-14.

Table 5-14	Summary of Soil QA/QC Results			
Analysi	s	Media		

Analysis	Media	Range of % RPD	Number of Analytes >60% RPD	
PHCs	Soil	1 – 172 %	8 of 36	
PAHs	Soil	See Note 3		
Metals	Soil	0 – 159 %	21 of 272	
PCBs	Soil	See Note 3		
VOCs	Soil	See Note 3		
Glycols	Soil	See Note 3		

Notes:

- 1. RPD not calculated if parent and/or duplicate concentrations were <5x the laboratory RDL.
- 2. Number of analytes <60% RPD were only counted for analytes where the RPD was calculated.
- 3. All parent and/or duplicate parameter concentrations were <5x the laboratory RDL.

The results indicate acceptable RPD for most parameters analyzed and demonstrates that field sampling was generally completed in a consistent manner. For parameters that exceeded the acceptable RPD of 60%, one or more of the following applied: there were no guidelines for the parameter in question; concentrations in both the parent and duplicate samples were below the applied guidelines; or concentrations in both the parent and duplicate samples were above the applied guidelines. The only exceptions are as follows:

- PHC F3 in parent sample 06-SO-007-W21 did not exceed the applied guidelines, while concentrations in the duplicate sample 06-SO-007-QC03 did exceed.
- Lead in parent sample 04-BDA-002-SP10 did not exceed the applied guidelines, while concentrations in the duplicate sample 04-BDA-002-QC01 did exceed.

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APPENDIX B SOME SAMPLE SITE PHOTOS



Project - 123513974

Site Name: Coral Harbour Site Site Location: Coral Harbour, NU

Photograph ID: 1

Photo Location:

NHW Facility

Direction:

SE

Survey Date:

7/12/2023

Comments:

View of third-party surveyor laying out the NHW Facility control points.



Photograph ID: 2

Photo Location:

NHW Facility

Direction:

S

Survey Date:

7/25/2023

Comments:

View of contractor constructing access ramp off Airport Rd. towards the NHW Facility.







Project - 123513974

Site Name: Coral Harbour Site Site Location: Coral Harbour, NU

Photograph ID: 3

Photo Location:

NHW Facility

Direction:

SW

Survey Date:

7/28/2023

Comments:

View of contractor excavating the NHW Facility base.



Photograph ID: 4

Photo Location:

NHW Facility

Direction:

SE

Survey Date:

8/6/2023

Comments:

Aerial view of the NHW Facility base excavation. Borrow piles in GMD B can be observed in the background.







Project - 123513974

Site Name: Coral Harbour Site Site Location: Coral Harbour, NU

Photograph ID: 5

Photo Location:

NHW Facility

Direction:

Ε

Survey Date: 8/14/2023

Comments:

First load of non-hazardous debris placed within the NHW Facility.



Photograph ID: 6

Photo Location:

NHW Facility

Direction:

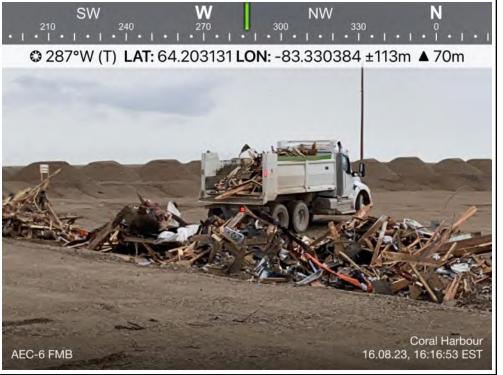
W

Survey Date:

8/16/2023

Comments:

View of truck unloading FMB demolition debris within the NHW Facility.





PSPC/CIRNAC Project: **Coral Harbour Remediation** Client:

Project - 123513974

Site Location: Coral Harbour, NU Site Name: **Coral Harbour Site**

Photograph ID: 7

Photo Location:

NHW Facility

Direction:

SW

Survey Date:

8/23/2023

Comments:

View of creosote-treated wood waste from the FMB demo wrapped in poly liner and deposited in the NHW Facility.



Photograph ID: 8

Photo Location:

NHW Facility

Direction:

SE

Survey Date:

8/27/2023

Comments:

View of workers unloading a trailer at the NHW

Facility.







Project - 123513974

Site Name: Coral Harbour Site Site Location: Coral Harbour, NU

Photograph ID: 9

Photo Location: NHW Facility

Direction:

N/A

Survey Date: 8/29/2023

Comments:

Aerial view of excavator moving waste within the NHW Facility.



Photograph ID: 10

Photo Location:

NHW Facility

Direction:

SW

Survey Date:

8/29/2023

Comments:

View of the NHW Facility in foreground and the camp near the centre.







Project - 123513974

Site Name: Coral Harbour Site Site Location: Coral Harbour, NU

Photograph ID: 11

Photo Location:

NHW Facility

Direction:

SW

Survey Date:

9/9/2023

Comments:

Aerial view of the NHW Facility. Contractor can be observed constructing the perimeter berms.



Photograph ID: 12

Photo Location:

NHW Facility

Direction:

N/A

Survey Date:

9/9/2023

Comments:

Aerial view of NHW Facility.







Project - 123513974

Site Name: Coral Harbour Site Site Location: Coral Harbour, NU

Photograph ID: 13

Photo Location: NHW Facility

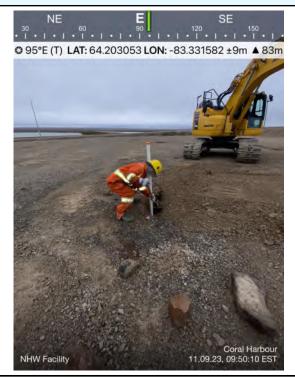
Direction:

Ε

Survey Date: 9/11/2023

Comments:

View of contractor installing a monitoring well at the NHW Facility.



Photograph ID: 14

Photo Location:

Camp

Direction:

NE

Survey Date:

7/7/2023

Comments:

Birds nest containing four eggs in initial proposed camp area. Camp was moved further south to avoid disturbing the nest.







Project - 123513974

Site Name: Coral Harbour Site Site Location: Coral Harbour, NU

Photograph ID: 15

Photo Location:

Camp

Direction:

SW

Survey Date:

7/10/2023

Comments:

View of contractor preparing ground for future camp construction.



Photograph ID: 16

Photo Location:

Camp

Direction:

SW

Survey Date:

7/21/2023

Comments:

View of contractor completing baseline soil sampling at the camp site prior to construction.







Project - 123513974

Site Name: Coral Harbour Site Site Location: Coral Harbour, NU

Photograph ID: 17

Photo Location:

Camp

Direction:

SW

Survey Date:

7/28/2023

Comments:

View of camp construction in progress.



Photograph ID: 18

Photo Location:

Camp

Direction:

NW

Survey Date:

12/8/2023

Comments:

View of camp construction in progress.







Project - 123513974

Site Name: Coral Harbour Site Site Location: Coral Harbour, NU

Photograph ID: 19

Photo Location:

Camp

Direction:

SW

Survey Date:

8/29/2023

Comments:

Aerial view of the camp during the 2023 operational period.



Photograph ID: 20

Photo Location:

Camp

Direction:

Ε

Survey Date:

9/9/2023

Comments:

Aerial view of the camp during the 2023 operational period.

