ENVIRONMENTAL IMPACT ASSESSMENT
SPEERS LAKE SITES
KITIKMEOT REGION, NUNAVUT

Prepared for:

Public Services and Procurement Canada | Services publics et Approvisionnement Canada

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Project Number: 240355

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EXECUTIVE SUMMARY

IMPORTANT: *This executive summary provides an overview of the main findings of the study to which it pertains. This executive summary does not provide a comprehensive report, and its review should not be considered a substitute for reading the report in its entirety.*

The seven sites of the Speers Lake bundle Project (the Sites) are located on Crown land in the Kitikmeot region of Nunavut. The Sites are uninhabited with varying amounts of recreation and subsistence use by locals and visitors. Site details including their location, historical use and summary of debris forming the remedial action plans (RAPs) for the Sites are provided in Table E-1 below.

Table E-1: Location and History of all Sites

Site	Distance from Kugluktuk	Coordinates	Site History	Debris Quantity
Speers Lake (WK097)	95 km from Kugluktuk	66° 59’ 47” N and 115° 15’ 08” W	Former exploration camp	• 229 m^3 of debris • 3 lead acid batteries • 347 fuel barrels, 11 of which contain fuel or fuel/water mix (2,050 L)
Asiak River (WK154)	40 km from Kugluktuk	67° 37’ 02” N, 114° 27’ 54” W	Former exploration camp	• 14 m^3 of debris • 9 empty fuel barrels • 2 m^3 lead painted equipment
Kendall River (WK165)	90 km from Kugluktuk	67° 07’ 02” N, 116° 07’ 45” W	Former fishing outpost camp	• 13 m^3 of debris • 1 empty fuel barrel and 2-20 L empty jerry cans
Tahiapik River (WK170)	100 km from Kugluktuk	67° 16’ 54” N, 116° 55’ 30” W	Former exploration camp	• 29 m^3 of debris • 1 empty fuel barrel • 1 fuel barrel with unknown contents
Impact Lake (WK176)	90 km from Kugluktuk	67° 34’ 22” N, 117° 04’ 38” W	Former exploration camp	• 65 m^3 of debris • 47 fuel barrels, 14 of which contain fuel or fuel/water mix (1,968 L)
Coppermine Area (WK199)	50 km from Kugluktuk	67° 24’ 11” N, 115° 09’ 54” W	Former exploration camp	• 11 m^3 of debris • 1 water tank, 2 propane tanks and 1 empty mini fuel barrel
Coppermine Area (WK210)	75 km from Kugluktuk	67° 29’ 08.5” N, 116° 34’ 20” W	Former exploration camp	• 43 m^3 of debris • 12 empty fuel barrels, 2 mini fuel barrels, 1 jerry can, , 8 metal tanks, 1 propane tank • 3 fuel barrels with unknown contents

All the sites are under Crown-Indigenous and Northern Affairs Canada's (CIRNAC's) responsibility. The project that is the subject of the environmental impact assessment (EIA) is the remediation of the Sites (the "Project"). "). CIRNAC (the Proponent) will manage the Project that will involve the demolition of structures and the removal of hazardous and non-hazardous debris (as summarized in Table E-1 above).

Following the Remedial Options Analysis and the community engagement session, the recommended remediation option was southern off-site disposal of all hazardous debris and non-hazardous debris with the exception of rock cores and a concrete slab that will be left on-site and unpainted wood debris that will be burned on-site. Due to the challenging access to the Sites, equipment requirements will be kept to a minimum with only helicopter, float plane (Speers Lake site only) and fixed wing aircraft (via the nearby Hope Lake airstrip) assumed to be used to access the Sites. A small day camp is planned at the Speers Lake site to support the clean-up work and will include the use of ATVs and trailers to transport debris to staging areas for demobilization from the Site.

The remediation project is expected to take approximately 1 summer season to complete, during summer 2026. The proposed work is expected to be completed over two parts encompassing the larger Speers Lake site (Phase 1), and the other six Sites (Phase 2, including Asiak River (WK154), Kendall River (WK165), Tahiapik River (WK170), Coppermine Area 199 (WK199) and Coppermine Area 210 (WK210)). Personnel and staff will likely be accommodated in Kugluktuk for most of the work with the exception of a small temporary camp at the Speers Lake site. Water, wastewater and waste management will be required for this small camp that is anticipated to accommodate 10 personnel. Wildlife monitors and remediation support personnel will be sourced from local communities where possible.

In the short term, species and their habitats are expected to be impacted. The majority of this impact will be in the form of disturbance from the presence of humans, aircraft, equipment and the accompanying noise, dust and activity. There is the possibility of more serious impacts from spills, fires, erosion and sedimentation and encounters with wildlife, however, these will be mitigated by the development of a comprehensive set of management plans developed, reviewed, and approved prior to commencing work.

Ultimately, any short-term negative impacts are anticipated to be offset by an overall improved environment and habitat to support species in their medium and long-term future.

The execution of the remedial plan will be competitively procured, with the contractor making final decisions regarding the implementation strategy. The scope of the project described below is the anticipated approach to be used based on the proponent's knowledge of site access, site conditions and remedial activities required. If the scope changes significantly, the Proponent will notify the Authorities Having Jurisdiction (AHJs).

TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

LIST OF APPENDICES

1 INTRODUCTION

1.1 PROJECT PURPOSE

The Joint Venture BLM-KEL-60 Corporation (JV-60) was retained by Public Services and Procurement Canada (PSPC) Western Region to conduct an Environmental Impact Assessment (EIA) for a remediation Project bundling seven sites located in the vicinity of Speers Lake, Nunavut. The seven sites (the Sites) are located in the Kitikmeot district of Nunavut. The included sites are listed as follows:

- Speers Lake (WK097)
- Asiak River (WK154)
- Kendall River (WK165)
- Tahiapik River (WK170)
- Impact Lake (WK176)
- Coppermine Area 199 (WK199)
- Coppermine Area 210 (WK210)

This work was completed in response to terms of reference (TOR) received May 15, 2023, (with amendments May 24, 2023, and June 23, 2023): Terms of Reference (TOR), *Consulting Services for Speers Lake Sites, Nunavut*. This work was completed on behalf of PSPC's client Crown-Indigenous Relations and Northern Affairs Canada (CIRNAC).

1.2 PROJECT LOCATION, LAND TENURE AND SITE HISTORY

The Speers Lake Sites are located on Crown land in the Kitikmeot region of Nunavut. The Sites are uninhabited with varying amounts of recreation and subsistence use by locals and visitors. Site details are provided in Table 1 below.

Table 1: Location and History of all Sites

Site	Distance from Kugluktuk	Coordinates	Site History	Debris Quantity
Speers Lake (WK097)	95 km from Kugluktuk	66° 59' 47" N and 115° 15' 08" W	Former exploration camp	• 229 m^3 of debris • 3 lead acid batteries • 347 fuel barrels, 11 of which contain fuel or fuel/water mix (2,050 L)
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The location of the Sites are presented in **Figure 1 (Site Location Map)**. A site plan for each Site is presented on **Figures 2-10 (Site Features Map).**

1.3 PREVIOUS STUDIES – PROJECT CONTEXT

The following sections summarize previous studies that were conducted on the Sites and provide context for the EIA.

1.3.1 Archaeological Assessment

***Final Report, Speers Lake (WK097), Land-Use Study and Archaeological Potential Evaluation of Six Additional Sites (WK154, WK165, WK170, WK176, WK199, WK210), Vicinity of Kugluktuk (Kitikmeot Region, Nunavut), Archaeological Impact Assessment*. BluMetric Environmental Inc., March 2024 (BLM 2024a)**

An Archaeological Impact Assessment (AIA) was conducted for the Speers Lake Site by BLM-KEL-60 (BLM-KEL-60 Corporation, 2024a). No prehistoric sites were found there, but two contemporary tent rings and a probable cache were documented at APEC 3. It was not possible to determine if these occupation features were from indigenous land use or related to the exploration camp site.

The territorial archaeologist for the Government of Nunavut was consulted and recommended that since the two tent rings and single cache *may* represent evidence of modern indigenous land use, they represent future archaeological sites and indicated that they be avoided, if possible, during remediation activities.

Condensed assessments of archaeological potential were conducted for the six additional Sites. Four Sites were found to hold high archaeological potential, and included Asiak River WK154, Kendall River WK165, Tahiapik River WK170, and Coppermine Area 199 WK199. Coppermine Area 210 WK210 was considered to have moderate archaeological potential, and Impact Lake WK176 was considered to have low archaeological potential.

1.3.2 Borrow Source Assessment and Site Access Evaluation

Speers Lake Site (WK097), NU Geotechnical Assessment Report, February 9, 2024 (Trek 2024)

Geotechnical assessments of the seven Sites were conducted by TREK Geotechnical Inc. (TREK). TREK completed a preliminary terrain assessment for the Speers Lake site WK097 in March 2022 which included information reviews and aerial photography interpretation to identify potential borrow areas and general terrain features. The intent of the geotechnical field program was to determine the soil types available at each Site for potential remedial activities, visually assess potential staging or facility locations and other pertinent Site features such as drainage, access and permafrost conditions.

Remedial measures considered within this report were for any, hazardous material, non-hazardous material and debris at the Sites. Remedial measures also considered the removal of materials from the Sites for off-site disposal, or containment of the materials (on or off-site), and demolition of existing structures. At the time of the geotechnical assessment, the potential for permanent on-site disposal was still a consideration and was later disqualified through the remedial options assessment. On-site disposal of Site debris would require the construction of permanent on-site facilities such as landfills, containment cells, or soil covers for re-graded areas. In this regard, the only Site that would have been considered for a permanent facility was Speers Lake as it has the largest quantity of debris. Based on the terrain mapping and test pits completed during the 2024 field investigation, four borrow sources were identified at the Speers Lake site. Adequate quantities of common fill, riprap, granular fill, and bedding sand are expected to be available across the Site although some may require processing (e.g., screening).

Borrow areas were not delineated at the remaining six Sites given the limited time on-site to complete a geotechnical assessment. Terrain mapping and site observations suggested that an adequate quantity of backfill material is located at various locations across the Sites to support any proposed upgrades to Site access and/or regrading.

In 2023, all of the Sites were accessed by helicopter. A Site access evaluation for the Speers Lake site was conducted as part of the Phase III ESA activities and was informed by field observations, discussions with local field team members and desktop assessment. Practical access to the Site is by helicopter. Float plane access could be considered on Speers Lake, as there was a barrel cache present along the shore suggesting that Speers Lake was previously used for fixed wing access. Visible vehicle tracks indicate that a cat train route may have been previously used for Site development and this historic routing could be considered for equipment mobilization for remedial works.

Site access for the other six Sites is feasible by helicopter. Float plane access was deemed feasible at Impact Lake site WK176, Coppermine WK199, and Tahiapik River WK170 sites. It is noted that while float plane access is feasible at the Tahiapik River WK170 site, there is a 13 m increase in grade from the float plane access point to the Site which may make the use of a float plane to mobilize equipment and demobilize waste from this Site undesirable. Suitable areas for land-based airstrips capable of accommodating fixed wing aircraft were not observed at any of the Sites. Sea lift and overland access using cat trains were not discussed in the Site access assessments for the other six Sites.

1.3.3 Community Consultation

Speers Lake- Community Meeting Minutes, BLM-KEL-60, October 22 2024 (BLM-KEL-60, 2024b) Representatives of CIRNAC, PSPC and JV-60 participated in community-level RAP Workout Presentations in the hamlet of Kugluktuk, Nunavut on October 22, 2024. Over 70 community members were in attendance along with young adults and children. The meeting included a presentation which provided an overview of the Project, work completed to date, the proposed remediation/risk management options and recommended options for each waste stream based on the outcome of the evaluation. A video showing aerial footage of each of the seven Sites was also presented. Discussion was encouraged through a question-and-answer period following the presentation. Translation to Inuinnaqtun was provided during the presentation and the question-and-answer period.

The discussion provided local insight pertaining to the proposed remedial approach for the Sites. During the community engagement session, CIRNAC outlined a plan for the removal of all hazardous material and non-hazardous material off-site for disposal excluding the concrete pad at the Coppermine WK199 site and rock cores located at the Speers Lake WK097 site, Coppermine WK199 site, and Tahiapik WK170 site. Community members provided feedback on the Sites including information regarding site history, general feedback regarding the state of the Sites and also ideas for site access to support the remediation including the hiring of local residents to travel over land by snowmobile to remove the waste. Feedback received also emphasized the importance of handling the hazardous materials like fuels, batteries and lead paint appropriately to protect human and ecological health. No opposition to the proposed remedial action plan was indicated by those attending and the general feedback was positive that the Sites will be cleaned up.

Hard copies of the presentation in both English and Inuinnaqtun were provided to the Kugluktuk Angoniatit Association following the meeting.

1.4 PREVIOUS STUDIES – ENVIRONMENTAL CONDITION OF THE PROPERTY

1.4.1 Environmental Site Assessments

Several studies have been completed for the Sites and are listed in Table 2. Each study investigated potential historic impacts in surface soil and surface water at one of the seven Sites.

Table 2: Summary of Previous Site Studies

Previous Study/Assessment	Reference
Phase I and Phase II Environmental Site Assessment, Speers Lake, Kitikmeot Region, Nunavut, Golder Associates Ltd., May 2005	(Golder Associates, 2005a)
Integrated Phase I and Limited Phase II Environmental Site Assessment, WK154– Asiak River, Kitikmeot Region, Nunavut, WESA, March 2009	(WESA, 2009a)
Integrated Phase I and Limited Phase II Environmental Site Assessment, WK165– Kendall River, Kitikmeot Region, Nunavut, WESA, March 2009	(WESA, 2009b)
Integrated Phase I and Limited Phase II Environmental Site Assessment, WK170– Tahiapik River, Kitikmeot Region, Nunavut, WESA, March 2009	(WESA, 2009c)
Integrated Phase I and Limited Phase II Environmental Site Assessment, WK176– Impact Lake, Kitikmeot Region, Nunavut, WESA, March 2009	(WESA, 2009d)
Integrated Phase I and Limited Phase II Environmental Site Assessment, WK199 – Coppermine Area, Kitikmeot Region, Nunavut, WESA, March 2009	(WESA, 2009e)
Phase I and Phase II Environmental Site Assessment, Coppermine Area WK210, Kitikmeot Region, Nunavut, Golder Associates Ltd., May 2005	(Golder Associates, 2005b)
Phase III Environmental Site Assessment, Speers Lake (WK097), Kitikmeot Region, Nunavut, BLM-KEL- 60., August 2024	(BLM-KEL-60, 2024a)
Phase III Environmental Site Assessment, Asiak River (WK154), Kitikmeot Region, Nunavut, BLM-KEL- 60., August 2024	(BLM-KEL-60, 2024c)
Phase III Environmental Site Assessment, Kendall River (WK165), Kitikmeot Region, Nunavut, BLM-KEL- 60., August 2024	(BLM-KEL-60, 2024d)
Phase III Environmental Site Assessment, Tahiapik River (WK170), Kitikmeot Region, Nunavut, BLM-KEL- 60., August 2024	(BLM-KEL-60, 2024e)
Phase III Environmental Site Assessment, Impact Lake (WK176), Kitikmeot Region, Nunavut, BLM-KEL- 60., August 2024	(BLM-KEL-60, 2024f)
Phase III Environmental Site Assessment, Coppermine Area (WK199), Kitikmeot Region, Nunavut, BLM-KEL- 60., August 2024	(BLM-KEL-60, 2024g)
Phase III Environmental Site Assessment, Coppermine Area (WK210), Kitikmeot Region, Nunavut, BLM-KEL- 60., August 2024	(BLM-KEL-60, 2024h)

The full scope of work for the Phase III ESAs included sampling one or more of soil, surface water, sediment, vegetation, barrel contents, and building materials (asbestos and paint) to investigate APECs and delineate previously identified AECs. A Hazardous and Non-Hazardous Materials Inventory was also conducted for each site. The Phase III ESAs were conducted during a single, 11-day mobilization between August 29 and September 8, 2023.

The total number of samples collected for soil, surface water, sediment, vegetation, fuel and paint (including blind field duplicate and background samples) for each site are listed in Table 3.

Table 3: Quantity of Samples Collected by Media at each Site in 2023

Site	Soil	Sediment	Surface Water	Vegetation	Paint	Fuel
Speers Lake (WK097)	84	10	9	14	0	1
Asiak River (WK154)	29	0	0	8	1	0
Kendall River (WK165)	14	3	3	6	1	2
Tahiapik River (WK170)	13	1	2	6	0	0
Impact Lake (WK176)	23	0	0	9	0	0
Coppermine Area (WK199)	38	1	3	5	0	0
Coppermine Area (WK210)	38	6	3	7	0	1
Total	239	21	20	55	2	4

Background samples were collected for soil, surface water, sediment and vegetation at undisturbed areas surrounding the Sites, and are included within the overall tally of samples summarized above. A regional background sampling program was also implemented and included soil, vegetation, surface water, and sediment samples. The regional background data set consisted of samples from each site visited (seven sites total) as part of a larger investigation of background concentrations at neighbouring sites in the region.

Through the field investigation work of the Phase III ESA across the seven Sites, impacts were identified in soil, surface water and sediment. Hazardous materials were also identified to be present at several sites.

Based on the contaminants identified and the relatively small quantities of impacted soil and sediment identified at these remote sites, it was recommended that risk assessments be completed for the seven Sites. The results of the risk assessments would define areas where

unacceptable risk to human or ecological receptors is present and refining the areas of impact identified in the Phase III ESAs.

1.4.2 Human Health and Ecological Risk Assessment

Human Health and Ecological Risk Assessment, Speers Lake Sites, Nunavut. **CanNorth, September 10 2024 (CanNorth 2024b)**

The Human Health and Ecological Risk Assessment (HHERA) (Canada North Environmental Services, 2024) was carried out using data collected in 2023 as part of the 2023 Phase III ESA completed by BLM-KEL-60 (BLM-KEL-60 Corporation, 2024b). The objective was to evaluate whether contaminants of concern (COCs) at the Sites pose unacceptable risks to human health and/or ecological receptors. The use of this site-specific risk-based approach ensures that appropriate remedial/risk management decisions are made based on the site-specific risks associated with each of the Sites with respect to the evaluation of remedial options.

The Human Health Risk Assessment (HHRA) evaluated the risk to humans who may be present at the Sites, noting that the Sites are difficult to access and are therefore rarely visited by humans. The qualitative analysis of risk to human health at all of the Sites involved a comparison of the maximum measured concentrations in soil to human health guidelines. Results of the qualitative analysis indicated there were no exceedances of the human health guidelines for soil, or exceedances were localized and not considered to pose a risk. There were no exceedances of drinking water guidelines at any of the lakes present at the Sites. Therefore, no unacceptable risk to human health was identified at the Sites.

The Ecological Risk Assessment (ERA) evaluated the risk to vegetation, soil invertebrates, and wildlife that may forage at the Sites. The qualitative analysis of risk to ecological receptors at all the Sites involved the comparison of the maximum measured concentrations in soil to ecological guidelines. Results of the qualitative analysis indicated that all concentrations were below ecological guidelines, or exceedances were localized and not considered to pose a risk. Maximum concentrations in surface water and sediment were deemed not to represent risk to ecological populations and benthic communities were determined not to be at risk. Therefore, no unacceptable risk to ecological health was identified at the Sites.

The results of the HHERA were used to determine the scope to be addressed through the remedial action plan. No soil, sediment or surface water impacts were identified after the completion of the HHERA which left the management of hazardous and non-hazardous debris as the basis of the remedial scope for the Sites.

1.4.3 Remedial Action Plan, Speers Lake Sites. BLM-KEL-60, January 2025 (BLM-KEL-60, 2025)

Based on the assessment results, a Remedial Options Analysis (ROA) and Remedial Action Plan (RAP) for the Speers Lake bundle Project were completed.

Evaluation criteria were developed to meet the remedial objectives that were used to identify the most appropriate remediation or risk management measure for the Sites. The evaluation included assigning numeric scores for effectiveness, ease of implementation, anticipated socio-economic benefit, anticipated cost and anticipated carbon footprint to identify the most appropriate remedial/risk management approach. The highest scoring option for each of the waste streams became the recommended remediation or risk management option. The remediation or risk management options for the Sites are separated by waste stream type: hazardous waste and non-hazardous waste.

The recommended remediation and risk management options for the two types of waste streams were to appropriately containerized, remove off-site and dispose of all hazardous and non-hazardous waste at licensed southern facilities. This option scored highest in the Options Evaluation Matrices. This option scored highest in effectiveness, anticipated costs, and anticipated carbon footprint for the hazardous waste stream and highest in effectiveness in the non-hazardous waste stream. Off-site disposal provides the only “walk-away” remedial solution as all environmental impacts and subsequent liabilities are removed from the Sites.

Although some assumptions on the implementation strategy needed to be made for comparing the remedial options, the remedial contractor will be responsible for further evaluating the site access through the development of a mobilization and demobilization plan to remove the waste from the Sites.

The Project team participated in community-level RAP Workout Presentations in the hamlet of Kugluktuk, Nunavut in the Fall of 2024. The recommended options were presented and validated by the participants in the meeting.

2 PROJECT RATIONALE

Although the Phase III ESA (BLM-KEL-60, 2024a) completed for the Sites identified soil, sediment and surface water exceeding the applicable criteria, the HHERA (Canada North Environmental Services, 2024) did not identify unacceptable risk to human or ecological health associated with these soil, sediment and surface water exceedances. As a result, the areas requiring remediation no longer required the treatment or removal of contaminated soil, sediment or surface water.

The Sites also contain both hazardous and non-hazardous debris that pose a health and safety risk to wildlife and visitors. The remedial strategy was focused on removing all debris found at each of the Sites. Discussion with the local community confirmed their support to remediate the Sites.

2.1 SUMMARY OF ITEMS REQUIRING REMEDIAL ACTION

Based on the findings of the Phase III ESAs, the HHERA and feedback during the community engagement session, the combined volumes of waste by site were compiled from the waste and debris inventory conducted as part of the Phase III ESA for the Site (BLM-KEL-60, 2024a) and are summarized below in Table 4. Details are provided in **Appendix A** and their locations are documented in **Figures 11-18**.

Table 4: Summary of Items Requiring Remediation at the Speers Lake Sites

Site	Non-Hazardous Debris* (m^3)	Hazardous Materials (liquid (L), paint (m^3))**	Number of Barrels and Fuel Tanks On-Site
Speers Lake WK097	141.0	2,050 L, 3 lead acid batteries	347 barrels
Asiak River WK154	11.5	2.25 m^3 lead containing paint	9 barrels
Kendall River WK165	12.5	-	-
Tahiapik River WK170	28.0	-	2 barrels
Impact Lake WK176	52.5	1,968 L	47 barrels
Coppermine Area WK199	10.5	-	1 barrel, 2 propane tanks
Coppermine Area WK210	8.0	-	17 barrels, 8 tanks, 1 propane tank
Total	264.0	4018 L, 2.25 m^3 of metal containing lead paint, and 3 lead acid batteries.	423 barrels, 8 tanks, 3 propane tanks

Notes:

* includes volume of all non-hazardous debris present at the Site including crushed barrels and tanks, building debris, metal, other miscellaneous debris, and painted wood.

** includes liquid remaining in barrels

2.2 ALTERNATIVES CONSIDERED

In the ROA the available remediation and risk management options for the Sites were pre-screened for regulatory requirements, potential for community concern, material availability, allowance for traditional land use, preservation of areas of historical value and climate resilience. Only those options passing the pre-screening were subjected to the more detailed evaluation using a Remedial and Risk Management evaluation matrix. This method allowed the evaluation to focus only on options that met the feasibility requirements specified by the Project stakeholders.

For the options passing the pre-screening, the Remedial and Risk Management evaluation matrix scored the remedial options against five criteria as follows: effectiveness, ease of implementation, anticipated socio-economic benefit, anticipated cost and anticipated carbon footprint. A numerical score was generated to identify the preferred approach. The full methodology and detailed results are found in the RAP (BLM-KEL-60, 2025). A summary of the results is presented in Table 5.

Table 5: Summary of RAP Results

Waste Type	Remedial and/or Risk Management Options Evaluated	Preferred Remedial Option
Hazardous Waste	1) Southern, off-site disposal 2) Consolidate waste and long-term monitoring 3) Do Nothing	Southern, off-site disposal
Non-hazardous Debris	1) Dispose of on-site 2) Southern, off-site disposal 3) Consolidate 4) Do Nothing	Southern, off-site disposal

2.3 REMEDIATION STRATEGY

The preferred remediation strategy was informed by the results of the previous studies summarized in Sections 1.3 and 1.4 of this report, PSPC's and CIRNAC's experience with nearby sites in the region, and the input received during the public meeting from Kugluktuk community members.

While the Contractor will ultimately make final decisions about the implementation strategy, a proposed work plan has been put together based on previous similar projects that have been implemented by CIRNAC. Furthermore, there are some aspects of the program that will be required, including those that relate to health and safety and protection of the environment. The work plan is detailed in Section 4. In summary, the proposed work is anticipated to be split into two phases encompassing one summer field season (assuming work will be completed in the 2026-27 fiscal year). The proposed work plan is summarized as follows:

- The first phase will occur at the Speers Lake site (WK097) over approximately 27 days in Summer 2026 with the mobilization of the Project team and equipment, execution of the remedial works and demobilization of equipment and waste materials from the Speers Lake Site.
- The second phase will occur at the other six Sites (Asiak River (WK154), Kendall River (WK165), Tahiapik River (WK170), and Coppermine Area 199 (WK199) and Coppermine Area 210 (WK210)) over approximately 24 days in Summer 2026 including the mobilization of the Project team and equipment, execution of the remedial works and demobilization of equipment and waste materials.
- Following completion of both phases, a final inspection and removal of any remaining items will take place infall of 2026 or spring of 2027. .

The former Hope Lake airstrip was identified as an additional mobilization/demobilization option for some of the Sites (**Figure 20**). Hope Lake is an abandoned mining exploration site from the 1960s that was remediated in the early 2010s. An airstrip remains that could be used as a staging area for the four Sites located nearby. The Hope Lake Airstrip is located at UTM Zone 11W, Easting: 525300 Northing: 7479400 and is reportedly 1500 m in length. The Hope Lake Airstrip has historically been accessed by Hercules Aircraft and has most recently been accessed by Twin Otter, Skyvan, and Dornier in 2010 - 2014. Impact Lake WK176, Coppermine Area WK210, Tahiapik River WK170, and Kendall River WK165 are all within 50 km of this airstrip. It is advantageous for debris from these sites to be staged at Hope Lake Airstrip via helicopter sling. Following staging, a Twin Otter aircraft can be used to transport debris to Kugluktuk for transportation south. Recent condition assessments indicate that it is suitable for the landing of a Twin Otter aircraft and can reduce the slinging distance for wastes by helicopter from some of the Sites. During the community meeting held in October 2024, community members have suggested their participation in the Project's demobilization efforts using snowmobiles and sleights. A combination of multiple access strategies, including land transport, could be further explored by the selected Contractor.

Details are provided below, and proposed work areas are shown on **Figure 19 and 20**.

It is anticipated that personnel and staff will be largely accommodated in Kugluktuk during Summer 2026 and will commute to the Sites by helicopter/twin otter aircraft. There is however a potential that a small soft-sided camp will be mobilized to the Speers Lake site. For the purpose of the EIA, assessment of impacts will be done assuming a soft-sided camp at the Speers Lake site. It is also anticipated that the site cleanup will require approximately 10 workers to be on-site completing the cleanup activities. Workdays are expected to be 10 hours on-site with 2 hours of additional time for travel and safety/administrative meetings that may occur on-site or in the community. Wildlife monitors, equipment operators and labourers will be sourced from local communities where possible.

Due to challenging access to the site, equipment requirements will be kept to a minimum and are assumed to include: a barrel crusher, barrel and tank cleaning equipment, all-terrain vehicles (ATVs), trailers, and hand tools.

Phase 1 Speers Lake Site (Summer 2026):

- Mobilization of personnel, equipment, materials, and a soft-sided camp;
- Stabilization of rock cores to remain on site;
- Collection, cleaning and crushing of barrels;
- Collection and sorting of debris;
- Burning of unpainted/untreated wood debris;
- Excavation of limited borrow material (aggregate) to facilitate any regrading of debris removal areas as required;
- Segregation, consolidation, packaging and containerization of all debris (hazardous and non-hazardous) and equipment for shipment;
- Weekly or bi-weekly shipments of materials are expected throughout the duration of Summer 2026, with hazardous waste/debris demobilization occurring on backhauls.
- Deconstruction of the temporary camp and packaging for removal.

Final inspection and collection of any remaining small debris will occur either at the end of the program anticipated to be Fall 2026 or following spring thaw (Spring 2027).

Phase 2: Other Sites - Asiak River (WK154), Kendall River (WK165), Tahiapik River (WK170), Coppermine Area 199 (WK199), Coppermine Area 210 (WK210) (Summer 2026):

- Mobilization of personnel, equipment, and materials;
- Stabilization of rock cores(Tahiapik River, Coppermine 199) and a concrete slab (Coppermine 199) to remain on site;
- Collection, cleaning and crushing of barrels;
- Collection and sorting of debris;
- Burning of unpainted/untreated wood debris;
- Excavation of limited borrow material (aggregate) to facilitate any regrading of debris removal areas as required;
- Segregation, consolidation, packaging and containerization of all debris (hazardous and non-hazardous) and equipment for shipment;
- Asiak River (WK154) and Coppermine Area 199 (WK199), debris will be slung by helicopter from the Sites to Kugluktuk

- Kendall River (WK165), Tahiapik River (WK170), Impact Lake (WK176), and Coppermine Area 210 (WK210) debris is anticipated to first be slung to the nearby Hope Lake Airstrip and then flown by Twin Otter aircraft from Hope Lake Airstrip to Kugluktuk.
- Regular shipments of materials are expected throughout the duration of Summer 2026, with hazardous waste/debris demobilization occurring on backhauls.
- Final inspection and collection of any remaining small debris will occur either fall of 2026 or the following spring thaw (Spring 2027).

A Site-Specific Environmental Health and Safety Plan and a selection of Management Plans will be developed for the Project that will include (but are not limited to):

- On-site Contingency and Emergency Response Plan;
- Spill Contingency Plan;
- Fire Safety Plan;
- Wildlife Encounter and Management Plan;
- Fuel Management Plan;
- Historical, Archaeological and Cultural Resources Plan;
- Wildlife Protection Plan;
- Near Water Works Work Methodology Plan; and
- Mobilization and Demobilization Plan.

2.3.1 Hazardous Materials

The hazardous materials requiring removal from the Sites are summarized in Table 6:

Table 6: Summary of Hazardous Waste Quantities Grouped by Site

Site	# Barrels - Empty (assumed sludge volume (L))	# Barrels – With Content (fuel or fuel/water mix, list L present as well)	# Tanks – Empty (with sludge only)	# Tanks –With Content (fuel or fuel/water mix, list L present as well)	Hazardous Materials (m3) (excluding fuel products or sludge)
Speers Lake – WK097	347 barrels (694 L)	11 barrels 2,050 L	None	None	3 lead batteries
Asiak River – WK 154	9 barrels (18 L)	None	None	None	Lead paint = 2.25 m^3

Site	# Barrels - Empty (assumed sludge volume (L))	# Barrels – With Content (fuel or fuel/water mix, list L present as well)	# Tanks – Empty (with sludge only)	# Tanks –With Content (fuel or fuel/water mix, list L present as well)	Hazardous Materials (m3) (excluding fuel products or sludge)
Kendall River – WK 165	0.5 barrel 2 jerry cans (20L size)	None	None	None	None
Tahiapik River – WK 170	2 barrels (4 L)	Unknown if 1 barrel contains fuel or fuel/water mix as it was seen from the air.	None	None	None
Impact Lake – WK 170	47 barrels 2 mini barrels (Total 94 L)	14 barrels 1,968 L	None	None	None
Coppermine River – WK199	1 mini barrel (2 L)	None	1 hot water tank 2 propane tanks (100 lbs size)	None	None
Coppermine River – WK210	15 barrels 2 mini barrels 1 jerry can (20L size) (Total 34 L)	Unknown if 3 barrels contain fuel or fuel water mix as they were seen from the air.	6 large metal tanks (600 L) 2 small metal tanks (200 L) 1 propane tank (100 lbs size)	None	None

The hazardous liquid waste to be removed from the Site includes barrels of PHCs, lead containing paint, lead acid batteries, and the sludge resulting from the cleaning of the fuel barrels and tanks. The hazardous materials will be collected and placed into suitable containers or barrels for shipment off-site. A summary of hazardous debris to be removed is found in **Appendix A.**

Volumes of on-site treatment and discharge water produced during tank and barrel cleaning were assumed to be 1646 L total and would require a permit if the contractor selects this approach for barrel processing.

2.3.2 Non-Hazardous Debris

The non-hazardous debris requiring removal from the Sites are summarized in Table 7.

Table 7 Summary of Non-Hazardous Waste Quantities Grouped by Site.

Site	# Barrels On Site	# Tanks On Site	Volume (m3) of All Non-Hazardous Debris to be removed from Site (including cleaned barrels and tanks (m^3))	Volume of all Non-Hazardous Debris to be managed on Site (including burnable Wood and rock core (m^3))
Speers Lake – WK097	347 barrels	None	176.7 m^3	52.5 m^3
Asiak River – WK 154	9 barrels	None	12.8 m^3	1.0 m^3
Kendall River – WK 165	0.5 barrel 2 jerry cans (20L size)	None	12.3 m^3	0.75 m^3
Tahiapik River – WK 170	2 barrels	None	5.1 m^3	23.5 m^3
Impact Lake – WK 170	47 barrels 2 mini barrels	None	16.8 m^3	47.7 m^3
Coppermine River – WK199	1 mini barrel	1 hot water tank 2 propane tanks (100 lbs size)	10.0 m^3	1.5 m^3
Coppermine River – WK210	15 barrels 2 mini barrels 1 jerry can (20L size)	6 large metal tanks (600 L) 2 small metal tanks (200 L) 1 propane tank (100 lbs size)	39.9 m^3	3.1 m^3

Clean wood debris (unpainted and/or untreated) will be burned on-site. Following incineration, ashes will be collected and placed into suitable containers or barrels for shipment off-site.

Non-hazardous debris that will remain on-site includes rock core found at Speers Lake (WK097), Coppermine Area 199 (WK199), and Tahiapik River (WK170), and a concrete slab found at Coppermine Area 199 (WK199). These debris items slated to remain on the Sites were disclosed to the community during the community meeting. These debris items are considered inert and pose no risk to potential land users and/or the environment.

All remaining non-hazardous debris on-site will be packaged and consolidated for removal. Removal of non-hazardous materials is assumed by aircraft as described above in Section 2.3. A summary of non-hazardous debris to be removed is found in **Appendix A.**

3 PROJECT APPROVAL AND PERMIT REQUIREMENTS

3.1 APPLICABLE LEGISLATION

The applicable federal and territorial legislation that applies to the Project includes, but is not limited to, the list in Table 8 below.

Table 8: Summary of Applicable Legislation

Federal References and Codes	Territorial References and Codes
Abandoned Military Site Remediation Protocol (Indian and Northern Affairs Canada (INAC), 2009). Canada Labour Code Part II-Occupational Health and Safety (R.S. 1985, c.L-2). Canada Occupational Health and Safety Regulations (SOR/86-304). Canada-Wide Standard for Petroleum Hydrocarbons (PHC) in Soil (CCME, 2008). Canadian Environmental Protection Act, S.C. 1999 (S.C. 1999, c.33) a.SOR/2002-318. Canadian Soil Quality Guidelines for the Protection of Environmental and Human Health (Canadian Council of Ministers of the Environment; CCME, 1999). Canadian Standards Association (CSA), Signs and Symbols for the Workplace CAN-Z321-96 (R2006). CSA-S350-M1980, Code of Practice of Safety in Demolition of Structures. Canadian Water Quality Guidelines for the Protection of Aquatic Life (CCME, 1999). Environment Canada Technical Document for Batch Waste Incineration, EC, 2010.	Spill Contingency Planning and Reporting Regulations (Nunavut), March 2023. Department of Sustainable Development, Government of Nunavut, Environmental Guideline Industrial Waste Discharges in Nunavut, April 2002. Environmental Guideline for Ambient Air Quality, December 2002, Revised October 2011, (NU). Environmental Guideline for the Burning and Incineration of Solid Wastes (Nunavut) January 2012. Environmental Guideline for Contaminated Site Remediation, Revised March 2009 (Nunavut). Environmental Guideline for Dust Suppressants (Nunavut) March 2023. Environmental Guideline for the General Management of Special and Hazardous Waste, (Nunavut) March 2023. Environmental Guideline for Waste Batteries (Nunavut), January 2002, Revised January 2011. Environmental Guideline for Waste Lead and Lead Paint (Nunavut), November 2001, Revised April 2014.

Federal References and Codes	Territorial References and Codes
Export and Import of Import of Hazardous Waste and Hazardous Recyclable Material Regulations (EIHWHRMR) (SOR/2005-149). Guidelines for Canadian Drinking Water Quality (Federal, Provincial, Territorial Committee on Health and the Environment) May 2008. Hazardous Waste Worker Training Manual: Canadian LIUNA Contractors Training Council, 1992. Health Canada / Workplace Hazardous Materials Information System (WHMIS 2015), Safety Data Sheets (SDS). Fisheries Act (R.S.C., 1985, c. F-14). Interprovincial Movement of Hazardous Waste Regulations (SOR/2002-301). Migratory Birds Convention Act, 2017. Motor Vehicle Safety Act (S.C. 1993, c.16). National Building Code of Canada, 2010. National Fire Code of Canada, 2015. Occupational Safety and Health Guidance Manual for Hazardous Waste Site Activities: National Institute for Occupational Safety and Health (NIOSH) Publication No. 85-115. Territorial Lands Act (R.S.C. 1985), including Territorial Quarrying Regulations (C.R.C, c. 1527). Territorial Land Use Regulations (C.R.C., c.1524) a.98-43. Transportation of Dangerous Goods Act, 1992 (S.C. 1992, c.34) Transportation of Dangerous Goods Regulations (SOR/2001-286) a.SOR/2011-60. Species at Risk Act (S.C. 2002, c. 29). Storage Tank System for Petroleum Products & Allied Petroleum Products Regulations (SOR / 2008-197).	Environmental Guideline for Used Oil and Waste Fuel (Nunavut), June 2012. Environmental Guideline for Waste Solvents (Nunavut), January 2002, Revised January 2011. Environmental Protection Act (Nunavut) (R.S.N.W.T. 1988, c. E-7) a. 1998, c.21, c.24. Fire Prevention Act, R.S.N.W.T. (NU) 1988, c.F-6. Guidelines for Spill Contingency Planning (INAC) April 2007. Northwest Territories and Nunavut, Working with Lead Guideline, May 2017, WSCC. Nunavut Labour Standards Act, RSNWT. 1988, c.L-1. Nunavut Safety Act, R.S.N.W.T. 1988, c S-1. Nunavut Waters and Surface Rights Tribunal Act (S.C. 2002, c.10). Occupational Health and Safety Regulations, NU, Reg 003-2016. Public Health Act, R.S.N.W.T. (NU) 1988, c.P-12. Spill Contingency Planning and Reporting Regulations (R-068-93), July 1993 (Nunavut). Transportation of Dangerous Goods Regulations, NU Reg 009-2017. Used Oil and Waste Fuel Management Regulation, November 2003. Wildlife Act (S.N.U, 2003, c.26). Workers' Safety and Compensation Commission (WSCC) (NWT & NU). Worksite Smoking Regulations, NU Reg 029-2003.

3.2 AUTHORIZATIONS AND APPROVALS

The scope of the Project triggers the two known authorizations listed in Table 9 below.

Table 9: Summary of Authorizations Required

License/Permit/ Authorization	Regulatory Authority	Legislation
Land Use Permit	**CIRNAC** Tracey McCaie Manager, Lands Administration 867-975-4280 Tracey.mccaie@rcaanc-cirnac.gc.ca	Territorial Land Use Regulations (C.R.C., c.1524 Territorial Lands Act
Water Licence*	**Nunavut Water Board** Richard Dwyer, Manager of Licensing Tel.: 867-360-6338 ext. 27; richard.dwyer@nwb-oen.ca	Nunavut Waters Regulations (SOR/2013-69) Nunavut Land Claims Agreement act Nunavut Waters and Nunavut Surface Rights Tribunal Act

Note: ** Requirement will be based on contractor's selected approach for barrel processing*

4 DETAILED PROJECT DESCRIPTION

The remedial program will be competitively procured, with the contractor making final decisions regarding the implementation strategy. The scope of the Project elements described below is the anticipated approach to be used based on the proponent's knowledge of site access, site conditions and remedial activities required. If the scope changes significantly, the Proponent will advise the Authorities Having Jurisdiction (AHJs).

4.1 SCHEDULE

The remediation Project is expected to take approximately 1 summer season to complete. The proposed work is expected to be complete over two parts encompassing the larger Speers Lake site (Phase 1), and the other six sites (Phase 2, including Asiak River (WK154), Kendall River (WK165), Tahiapik River (WK170), Coppermine Area WK 199 (WK199) and Coppermine Area WK210 (WK210)).

Phase 1 of the work is expected to occur at the Speers Lake site (WK097) over 27 days in Summer 2026 with the mobilization of the Project team and equipment, execution of the remedial works and demobilization of equipment and waste materials at the Speers Lake site.

Phase 2 is expected to occur at the other six Sites including Asiak River (WK154), Kendall River (WK165), Tahiapik River (WK170), Coppermine Area 199 (WK199) and Coppermine Area 210 (WK210) over 24 days in Summer 2026 including the mobilization of the Project team and equipment, execution of the remedial works and demobilization of equipment and waste materials.

Following completion of both phases of work, the final aspect of remediation will occur in either in fall of 2026 or spring of 2027 with a final inspection and removal of any remaining items. Details of implementation are provided below, and proposed work areas are shown on **Figure 19 and 20**.

4.2 MOBILIZATION

Mobilization of the small soft-sided camp and the necessary equipment needed to complete the remedial work is expected to occur at the start of the summer season from Kugluktuk, NU. The camp and equipment will likely be mobilized via a small, fixed wing aircraft on floats to the Speers Lake (WK097) site only. Improvements to the dock(s) to facilitate the unloading/loading of the aircraft will be required.

Mobilization to the other six Sites is expected to be by helicopter from Kugluktuk, NU. The former Hope Lake airstrip will likely be used to stage equipment/supplies by Twin Otter for transfer to the Sites by helicopter. All equipment and supplies will ultimately be brought to the Sites via helicopter. Due to the scope of the remedial work at the six other Sites, no large equipment will be required.

4.3 TEMPORARY CAMP AND PERSONNEL

Should a contractor elect to use a camp, it is assumed that the camp in Summer 2026 will be located at the north end of the Speers Lake site due to the flat topography of the area and proximity to the work. The camp facilities shall consist of, but not be limited to:

- Approved self-containing toilet facilities
- Camp wastewater collection, treatment, and disposal systems.
- Waste, refuse, and garbage collection and disposal system.
- Camp fire prevention, alarm and firefighting system.
- Camp and site facilities safety and security service.
- Meals and catering service.
- Shower/wash facilities.
- Soft walled sleeping facilities for up to 10 personnel.
- Janitorial services.
- First Aid facilities and service.

The camp will include all utilities and services required for camp facilities including, but not limited to, heating, electricity, lighting, fuel, potable water and camp hygiene wash water systems.

4.4 EQUIPMENT, FUEL AND HAZARDOUS MATERIALS

The assumed equipment, fuel, and hazardous materials to be used on-site during the Project have been summarized in Table 10 andTable 11 below. Due to the remote access to the site, equipment requirements will be kept to a minimum and are assumed to include a barrel crusher, barrel and tank cleaning equipment, ATVs, trailers, and hand tools. The Contractor will comply with requirements of Workplace Hazardous Materials Information System (WHMIS) regarding employee training, use, handling, storage, and disposal of hazardous materials, and regarding labelling and provision of Material Safety Data Sheets (MSDS), as required by WHMIS.

Table 10: Summary of Equipment Requirements

Type and Estimated Number	Model (example only)	Proposed Use	Sites where equipment would be required
3 – ATVs & trailers	Honda	Summer transportation – wildlife monitors & staff	Speers Lake (WK097)
1 – Barrel crusher	DC5000	Summer 2026 remediation	Speers Lake (WK097) Hope Lake Airstrip
1 – Tank/barrel cleaning equipment	-	Summer 2026 remediation	Speers Lake (WK097) Hope Lake Airstrip
1 – Acetylene Torch	-	Summer 2026 remediation	Speers Lake (WK097) Hope Lake Airstrip Coppermine Area 210 (WK210)
3 – Metal Saws	Stihl TS700	Summer 2026 remediation	Speers Lake (WK097) Coppermine Area 210 (WK210) Hope Lake Airstrip
Outfitted, Tent Camp	Weatherhaven or Equivalent	Accommodation camp	Speers Lake (WK097)
1 – Diesel generator	40 kw	Camp power/electrical heating	Speers Lake (WK097)
1 – Barrel pumps	-	Fuel transfer	Speers Lake (WK097)
1 – Water pump	2” Honda water pump	Non-potable water supply	Speers Lake (WK097)
1 – Small forklift/Pump cart	-	Loading aircraft	Speers Lake (WK097) Hope Lake Airstrip
Hand tools	Shovels, saws, drills	Summer 2026 remediation	All Sites

Table 11: Summary of Anticipated Fuel Requirements

Fuel Type	Estimated Quantity	Proposed Use	Sites where equipment would be required	Storage and handling
Gasoline	400 L	Vehicles	Speers Lake (WK097)	- Barrels containing fuel will be stored in an elevated position, either on their side with bungs facing 9 and 3 o'clock position, or on pallets, upright, and banded. - Fuel storage area to be constructed with secondary containment Storage location to be approved by AHJ
Diesel	5,000 L	Generator fuel	Speers Lake (WK097)	
Aviation Fuel	6400 L	Helicopter fuel	Hope Lake Airstrip Speers Lake Site	
Aviation Fuel	1600 L	Fixed Wing fuel	Hope Lake Airstrip Speers Lake Site	
Hydraulic Oil and Motor Oil	25 L each	Equipment and vehicle maintenance	Speers Lake (WK097)	
Grease	6 tubes	Equipment and vehicle maintenance	Speers Lake (WK097)	
Propane	400 lb	Camp heating and cooking	Speers Lake (WK097)	
Acetylene	300 cubic feet	Cutting metal debris	Speers Lake (WK097) Coppermine Area (WK210) Hope Lake Airstrip	
Oxygen	750 cubic feet	Cutting metal debris	Speers Lake (WK097)	

Two fuel storage areas will be required. The first fuel storage area will be located adjacent to the construction camp at the Speers Lake site and the second is anticipated to be located at the Hope Lake airstrip. Both fuel storage areas will be lined with an oil-resistant membrane and protected by either geotextile or plywood. Berms will be built around the perimeter of the storage area. Barrels containing fuel will be stored in an elevated position, either on their side with bungs facing 9 and 3 o'clock position, or on pallets, upright, and banded.

When not in use, barrels will be covered with tarpaulins to prevent water from pooling. Refuelling and fuel transfer will be done only by qualified personnel. An electric ULC-approved mobile fuel pump with an automatic shut-off will be used for refuelling equipment directly from the barrels. The refuelling will not be permitted within 30 m of a watercourse except for refueling of a float plane at the Speers Lake Site, however refueling is expected to occur in Kugluktuk. Drip pans and spill kits (booms and pads) will be present during refuelling activities. Emergency spill equipment will include at least two fuel pumps, empty 200 litre barrels and absorbent material sufficient to clean up a 1000 litre spill at all fuel storage sites.

4.5 BORROW REQUIREMENTS

At the Speers Lake site, the temporary camp, laydown and storage areas are anticipated to be located at the north end of the Speers Lake site in an area that is already flat and compact. Borrow requirements are therefore expected to be minimal during the summer program.

At the Speers Lake site, the remediation program will take place using small ATVs and on foot. As such, it is not anticipated that a significant amount of borrow material will be required for improving on site trails and access. The borrow sources presented on **Figure 21** represent potential areas where material may be sourced, and the majority of material required will likely be sourced from one or two of these potential locations. Although not expected, small quantities of local soils will be utilized if needed to even out any grading following the removal of partially buried debris at the Sites to minimize the potential for erosion or physical hazards.

At the six other Sites, no borrow is expected to be required. Remediation of these Sites will take place using a helicopter and hand tools to hand pick debris. No improvement to site trails or regrading of excavated areas is expected to be required.

4.6 TRANSPORTATION AND LAYDOWN AREAS

4.6.1 Speers Lake Site

At the Speers Lake site, all equipment, machinery, camp materials and supplies are expected to be mobilized to the Site via small, fixed wing aircraft on floats, landing on Speers Lake. It is assumed that the laydown area for waste and equipment will be established adjacent to the camp.

All waste to be removed from the Speers Lake site will be collected and consolidated in the laydown area and labelled to meet all governing regulations. The on-site waste will be accessed on foot or on an ATV. The terrain at the Site is composed primarily of vegetated tundra and bedrock. ATV tires may need to be equipped with low pressure tires to minimize impact to the tundra while navigating the terrain. Additional portable mats or pads may be required to facilitate access to debris areas so that material can be consolidated and transported to the laydown area.

From the laydown area, the waste will be hand-loaded onto the fixed wing aircraft using ramps, or if possible, with pump carts or a small forklift, and shipped to Kugluktuk, Nunavut. The waste will be staged in Kugluktuk until it is able to be transported via barge to a licenced facility in the South. The hazardous and non-hazardous wastes will then be shipped over land to one or more appropriate waste facilities. The transportation of hazardous materials must follow the Dangerous Goods regulations.

4.6.2 Hope Lake Airstrip Area Sites

Work at Impact Lake (WK176), Coppermine Area (WK210), Tahiapik River (WK170), and Kendall River (WK165) is anticipated to be completed using the Hope Lake Airstrip area as a laydown area. Debris from these sites will first be consolidated on-site. A small utility helicopter will likely be used to sling the debris from the Sites to the Hope Lake airstrip and debris staged on the airstrip apron.

From the airstrip apron area, the waste will be hand-loaded using ramps onto the fixed wing aircraft, or if possible, with pump carts or a small forklift, and shipped to Kugluktuk, Nunavut. The waste will be staged in Kugluktuk until it is able to be transported via barge to a licenced facility in the South. The hazardous and non-hazardous wastes will then be shipped over land to one or more appropriate waste facilities. The transportation of hazardous materials must follow the Dangerous Goods regulations.

4.6.3 Coppermine Area 199 and Asiak River

Debris from these sites will first be consolidated in small piles near areas that are accessible for landing a helicopter. A small utility helicopter will likely be used to sling the debris from the sites to Kugluktuk. Debris will be staged in an approved area in Kugluktuk until it is able to be transported via barge to a licenced facility in the South. The hazardous and non-hazardous wastes will then be shipped over land to one or more appropriate waste facilities. The transportation of hazardous materials must follow the Dangerous Goods regulations.

4.7 DEMOLITION

The wood structure at the Speers Lake site is lined with sheet metal and contains pink fiberglass insulation. Demolition of this structure will be conducted by qualified personnel supplied by the remediation contractor.

No removal of the lead-based paint from the drill rig located at Asiak River will be required on- site. The drill rig will be transported south as is and will be disposed of at a licensed facility.

The Contractor will be required to provide a qualified supervisor who has experience with barrel and tank cleaning procedures as well as the handling, packaging and labelling of hazardous materials. All hazardous lead-based paint items and non-hazardous waste will be separated into acceptable approved containers, clearly labelled, and transported to the laydown area.

4.8 SURFACE DEBRIS

As described in Section 4.6, at each laydown area, the surface debris will be separated into non-hazardous debris and hazardous waste and packaged and labelled accordingly. The hazardous materials will be placed into approved containers (e.g., barrels, overpacks, megabags) and then properly labelled and transported to the appropriate laydown area for demobilization.

The non-hazardous waste will be further separated into untreated/unpainted wood (see Section 4.10) and all other materials. The other materials will be broken down, if needed to facilitate packaging for transportation from the Site. Non-hazardous materials will be placed into containers (e.g., clean barrels, megabags, shipping crates) and then transported to the appropriate laydown area as described in Section 4.6.

4.9 BARRELS AND TANKS

4.9.1 Speers Lake Site

At the Speers Lake site, barrels that contain liquid will be separated from other surface debris items. Barrel liquids will be consolidated into new barrels to minimize the potential for leaks during transportation. This procedure will be carried out ensuring containment measures are taken so that no liquid is spilled into the environment. All barrels are considered hazardous until

properly cleaned. Barrels containing liquids will need to be stored and consolidated in approved containers with spill containment during their storage in the laydown areas prior to transport.

The barrels will be washed and crushed on-site and consolidated prior to placement in the staging area. It is assumed that the cleaning of barrels will result in approximately 2 litres (L) of sludge per barrel. Collection of water produced during barrel cleaning (if required) will need to be placed into approved acceptable containers and properly labelled. Vapour monitoring and clearance of tanks for cutting will be supervised by qualified personnel. Empty barrels on the site will be classified as non-hazardous once cleaned.

The hazardous materials will be placed into approved containers (e.g., barrels, overpacks) and properly labelled. All materials will be transported to the laydown area for storage in preparation for demobilization from the Site.

4.9.2 Hope Lake Airstrip Area Sites

At Impact Lake WK176, Coppermine Area WK210, Tahiapik River WK170, and Kendall River WK165, barrels that contain liquid will be separated from the other surface debris and the liquids will be consolidated into new lined barrels to minimize the potential for leaks. This procedure will be carried out ensuring containment measures are taken so that no liquid is spilled into the environment. All barrels and tanks are considered hazardous until properly cleaned. Barrels containing liquids will need to be stored and consolidated in approved containers with spill containment during their storage in the laydown areas prior to transport.

Once the barrels and tanks are transported to the Hope Lake airstrip, they will be washed and crushed/cut in the laydown area and consolidated. It is assumed that the cleaning of barrels will result in approximately 2 L of sludge per barrel and 100 L of sludge per tank. Collection of water produced during barrel and tank cleaning (if required) would be placed into approved containers and properly labelled. Vapour monitoring and clearance of tanks for cutting will be supervised by qualified personnel. Empty barrels at the airstrip will be classified as non-hazardous once cleaned.

The hazardous materials will be placed into approved containers (e.g., barrels, overpacks) and properly labelled. All materials will be transported to the laydown area for storage in preparation for transportation.

4.9.3 Coppermine Area WK199 and Asiak River

The empty barrels will be transported to Kugluktuk by sling, washed and crushed in Kugluktuk . I The hazardous materials will be placed into approved containers (e.g., barrels, overpacks) and properly labelled. All materials will be transported to the laydown area for storage.

4.10 WOOD WASTE

Clean wood is generally described as any wood that is unpainted and/or untreated wood material. All clean wood will be burned on each Site as outlined in the AMSRP guidelines (Indian and Northern Affairs Canada, 2009) and the Nunavut Department of Environment – Environmental Guidelines for the Burning and Incineration of Solid Waste (Department of Environment, Government of Nunavut, 2012). Burning will be carried out by trained personnel in a controlled area (i.e. burn pad). The Contractor will be responsible for providing a supervisor familiar with safe burning operations.

All ash material will be collected and packaged in acceptable containers and moved to the laydown areas for staging as described in Section 4.6. The materials will be held in the laydown areas in preparation for transportation.

4.11 DEBRIS TO REMAIN ON SITE

Large non-hazardous debris that will remain on-site includes rock core found at Speers Lake (WK097), Coppermine Area 199 (WK199), and Tahiapik River (WK170), and a concrete slab found at Coppermine Area 199 (WK199). These items will be consolidated on each Site and left in a state that removes any safety hazards they may pose.

4.12 CAMP WASTE

At Speers Lake, combustible camp waste will be disposed of by incineration. Non-combustible waste will be collected, packaged in appropriate containers, and shipped off-site for disposal along with all other debris collected during the remediation program. There will be no on-site sewage treatment systems as there will be self-contained toilet system. All waste materials will be shipped off site for disposal. It is expected that on average 1.5 kg/person/day for a total of 900 kg of camp waste will be generated during the on-site components of the remediation.

No camp is anticipated for the other six Sites.

4.13 WATER MANAGEMENT

It is assumed that drinking water will be brought to camp as bottled water.

At Speers Lake, it is assumed that non-potable water will be pumped from Speers Lake for personal hygiene. Domestic water use associated with the camp is estimated to be 3 - 5 m^3/day.

Remedial activities may require water for cleaning barrels, as well as decontamination of equipment as required. Remedial water use is estimated to be up to 10 m^3/day (for up to 5 days), and this volume is not anticipated to be required over the full duration of the remedial program.

The volume of water required is assumed to be in the range of 0 – 50 m^3/day for both domestic and remedial use. Contractors will be required to use a pump that is contained within a rigid containment unit with a liner to contain any leaks. The intake will feature a mesh screen specifically designed to prevent fish from being drawn into the pump during pumping operations.

The grey water sump/discharge for the potential camp at Speers Lake will be located away from water supplies and drainage areas. Self-contained toilets will be used and therefore no on-site blackwater discharges or sewage treatment systems are anticipated.

A Type B Water Licence (as described in Section 3.2) is not triggered by the camp activities but may be required due to the deposit of wastewater from processing barrels and decontaminating equipment (Nunavut Waters Regulations, SOR/2013-69). Any water resulting from equipment decontamination or barrel processing will be treated on-site if feasible and discharged to a sump, and/or will placed in containers to be removed for off-site disposal.

4.14 EQUIPMENT FUEL AND HAZARDOUS MATERIALS

Equipment, fuel, and hazardous materials anticipated to be used on-site during the Project have been summarized in Table 11 above. The Contractor will provide more specific information on the types, quantities, and the Safety Data Sheets (SDS) for all fuel and chemicals on-site, upon contract award. The Contractor will comply with requirements of Workplace Hazardous Materials

Information System (WHMIS) regarding employee training, use, handling, storage, and disposal of hazardous materials, and regarding labelling and provision of SDS, as required by WHMIS.

Emergency spill equipment at all fuel storage sites will include at least two fuel pumps, empty 200 litre barrels and absorbent material sufficient to clean up a 1000 litre spill. Spill mats or pans are to be used under mobile fuelling containers and a spill kit is to be maintained at the refuelling area.

4.15 SITE CLOSURE AND DEMOBILIZATION

All materials will be removed from the Sites via fixed wing aircraft, rotary aircraft, or a combination of the two. Demobilization is expected to occur following or concurrently with site remediation. This will include the removal of all remaining materials on-site including the camp facilities and all hazardous/non-hazardous debris scheduled for shipment. It is also expected to include the dismantling, decontamination and removal of all Contractor equipment and transportation of labour from Site.

It is assumed that a Twin Otter on floats would be used for demobilization at the Speers Lake Site, a helicopter would be used for demobilization at Coppermine Area WK199 and Asiak River, and a helicopter and fixed wing aircraft combination would be used at the four remaining Sites.

4.16 OFF-SITE DISPOSAL

It is assumed that waste materials shipped off-site will be shipped to Kugluktuk, where they will be staged until they can be loaded onto a barge for shipment south. The final destination for the waste materials will be determined by the contractor but will be a licensed waste facility for each type of waste.

4.17 WORKFORCE AND HUMAN RESOURCES

Based on the scope of work and specified site requirements, a work force of approximately 10 persons will be required, including a site superintendent/foreman, cook/camp attendant, wildlife monitors, medic, and general labourers. Workdays are expected to be 10 hours on-site with 2 hours of additional time for travel and safety/administrative meetings that may occur on-site. Wildlife monitors, equipment operators and labourers will be sourced from local

communities where possible. The contractor will define the exact schedule, including the duration of work and rotation length.

Contractors will be asked to include an Inuit Participation Plan as part of their submissions. The successful contractor will hire local Inuit labour and utilize local Inuit companies, where possible to complete the work. This may include positions of Wildlife Monitors and Labourers. Potential local Nunavut Subcontractors include transportation, camp resupply, and HR support. There are also proposed training opportunities associated with the Project including emergency response, first aid, transportation of dangerous goods, fire safety, and lead paint abatement.

5 SITE DESCRIPTIONS

5.1 SITE LOCATIONS

The Sites lie at various elevations within the region, and amongst varying geographical features. Descriptions of each of the seven site locations are provided in the following paragraphs.

Speers Lake (WK097)

The terrain at the Speers Lake site consists largely of broadly rolling uplands and lowlands underlain by Precambrian granitic bedrock. Much of it is mantled by discontinuous morainal deposits, except near the coasts, where fine-textured marine sediments cover the surface. Throughout the Site, there are exposures of bedrock. Strung out across the landscape are long, sinuous eskers reaching lengths of up to 100 km in places, and the surrounding landscape contains various lakes, ponds, and wetlands.)

Kendall River (WK165)

The Kendall River site is located at an elevation of approximately 240 metres above sea level (masl). The Site is located on a ridge southwest adjacent to the convergence of the Kendall and Coppermine Rivers. The topography slopes steeply towards the shoreline of the Kendall and Coppermine Rivers and is mostly flat to the west, gradually increasing in elevation. Evidence of what appears to be a permafrost slump was observed along the Kendall River shoreline.

Tahiapik River (WK170)

The Tahiapik River site is located at an elevation of approximately 310 masl and slopes steeply to the northwest and towards the shore of Fran Lake. Bedrock outcrops and rolling hills are present on all sides of the Site.

Impact Lake (WK176)

The Impact Lake site is located at approximately 415 masl. The Site area is relatively flat and gently slopes to the north, toward the shore of Impact Lake.

Coppermine Area (WK199)

The Coppermine Area site (WK199) is at approximately 380 masl, 24 km east of the Coppermine River, on a small point on the northern shore of an unnamed lake. The Site topography slopes steeply toward the shoreline of the lake in some areas. The main part of the Site is located on a relatively flat area, and regional topography ascends south of the unnamed lake and to the north of the Site. Several bedrock outcrops are present at the Site that create small depressions, and a boulder field is present adjacent to the north of the Site.

Coppermine Area (WK210)

The Coppermine Area site (WK210) is located at approximately 329 masl, is generally flat, and slopes gently to the southwest toward the shore of an unnamed lake. The regional terrain consists largely of broadly rolling uplands and lowlands with discontinuous morainal deposits and long, sinuous eskers that can reach lengths of up to 100 km.

Asiak River (WK154)

The Asiak River site is located at approximately 247 masl and is situated at the top of a series of beach ridges in an undulating valley, approximately 4 km east of the Asiak River. There are several small ponds located to the south, east, and west of the Site. The terrain slopes upward to the north to a steep 60 m ridge a few hundred meters away. Drainage is assumed to be towards the ponds located approximately 80 m to the south of the Site.

5.2 CLIMATE

The Asiak (WK154), Coppermine (WK199) and Impact Lake (WK170) sites are within an Arctic region that has average daily temperatures between -27.0 degrees Celsius (°C) in February and 11.2°C in July. Whereas the Coppermine (WK210), Tahiapik (WK170), Kendall (WK165) and Speers

(WK097) sites have average daily temperatures between -27.8 degrees Celsius (°C) in January and 10.7°C in July. All Sites have daily average temperatures above 0°C for four months, from June to September. The most precipitation is received from July through October, with an average of 45.2 millimetres (mm) in July to 23.3 mm in October. (Environment Canada, 2023)

5.3 GEOLOGY

The geology of the Sites is summarized by describing three geological features: surficial geology, bedrock geology and permafrost. Details for the Sites are summarized in Table 12 below.

Table 12: Geological description of all Sites

Sites	Surficial Geology	Bedrock Geology	Permafrost
Speers Lake (WK097)	Till blanket with a gentle rolling surface. Consists of sediments deposited directly by ice.	Part of Muskox Intrusion. A shallow level, Proterozoic, mafic to ultramafic layer intrusion. Anticipated to be enriched with chromium, cobalt, nickel and copper.	Continuous permafrost with an anticipated shallow active layer.
Asiak River (WK154)	Comprised of glaciofluvial sediment. Till material consists of rounded gravel, pebbles and sand.	Underlain by Coppermine River Group, approximately 3,000m thick with an upper layer that is mostly sedimentary	
Coppermine Area (WK199)	Part of an overlying till consisting of sediments deposited directly by ice.		
Impact Lake (WK176)	Glacial deltaic sediments. Consists of sand, gravel and cobbles.	Underlain by Paleozoic sandstone. Overlies sedimentary units including siltstones, shales, mudstones, sandstones, and calcareous bed of limestone and dolomites	Continuous permafrost. Active layer ranges from 15 cm in depth in areas supporting a thick organic mat to more than 120 cm in areas where vegetation cover is thin.
Kendall River (WK165)			
Tahiapik River (WK170)			
Coppermine Area (WK210)	Organic rich peat underlain by silt and trace to little sand.	Lies within the Southern Artic Ecoregion, underlain by the Precambrian Granitic Bedrock. Part of Muskox Intrusion, anticipated to be enriched with chromium, cobalt, nickel and copper.	

5.4 HYDROGEOLOGY

The hydrogeological features for the Sites are characterized by groundwater seepage, groundwater flow and surficial runoff. In general, the shallow groundwater at the Sites is present above the permafrost creating the 'active layer'. Shallow groundwater flows according to the topography of the Site and/or is governed by bedrock outcrops present at the Sites. Site specific observations from the assessment work pertaining to the hydrogeological features of the Sites are summarized in the following table:

Table 13: Hydrogeological features of all Sites

Sites	Groundwater Seepage	Groundwater Flow	Surficial Runoff
Speers Lake (WK097)	Seepage observed within active layer (23 of 46 test pits) during assessment at depths between 0.0 and 0.4 mbgs. No seepage observed within background sampling tests pits.	Shallow groundwater would flow toward Speers Lake.	Surficial runoff would follow local topography during precipitation or melt events. Runoff would eventually flow towards Speers Lake.
Asiak River (WK154)	No seepage observed in tests pits during assessment. Groundwater is likely located below 0.6 mbgs.	Shallow groundwater would generally flow to the south to southwest towards the ponds.	Surficial runoff would follow local topography during precipitation or melt events.
Coppermine Area (WK199)	Seepage observed within active layer (4 of 28 test pits) during site assessment at depths between 0.03 and 0.2 mbgs. No seepage observed within background sampling tests pits.	Shallow groundwater would flow toward the steep slopes to the east and west, toward the shoreline of the unnamed lake.	Surficial runoff would follow local topography during precipitation or melt events. Runoff would flow toward the shoreline of the unnamed lake.
Impact Lake (WK176)	Seepage observed within active layer (5 of 13 test pits) during site assessment at depths between 0.0 and 0.4 mbgs. No seepage observed within background sampling tests pits.	Shallow groundwater would flow north toward Impact Lake.	Surficial runoff would follow local topography during precipitation or melt events. Runoff would flow north to Impact Lake.
Kendall River (WK165)	No seepage was observed in test pits during the site assessment. Groundwater is likely located below 0.6 mbgs.	Shallow groundwater would flow north and east toward the Kendall or Coppermine Rivers.	Surficial runoff would follow local topography during precipitation or melt events. Runoff would flow either north to Kendall River, east to Coppermine River or southwest to a topographic low area of the Site.
Tahiapik River (WK170)	Observed within active layer (1 of 5 test pits) during JV-60 field investigation at a depth of 0.4 mbgs. Not observed during background tests pits.	Shallow groundwater would flow northwest toward Fran lake.	Surficial runoff would follow local topography during precipitation or melt events. Runoff would flow northwest toward Fran Lake.

Sites	Groundwater Seepage	Groundwater Flow	Surficial Runoff
Coppermine Area (WK210)	Observed within active layer (17 of 25 test pits) during JV-60 field investigation at depths between 0.05 and 0.5 mbgs. Not observed during background tests pits.	Shallow groundwater would flow south towards the unnamed lake.	Surficial runoff would follow local topography during precipitation or melt events. Runoff would flow southwest toward the unnamed lake.

5.5 SURFACE WATER

Speers Lake (WK097)

The main surface water feature at the Speers Lake site is Speers Lake. Speers Lake feeds the Coppermine River which flows north into the Coronation Gulf of the Arctic Ocean. Two smaller lakes are also present approximately 200 m and 500 m to the northwest of the North Site area. Small drainage channels are visible from these lakes towards Speers Lake. The surrounding area is peppered with small ponds, streams, and lakes.

Kendall River (WK165)

The Kendall River site is located adjacent to both the Kendall and Coppermine Rivers. The Coppermine River is a large river which has the capacity to retain heat and therefore discourages the formation of permafrost. Other small streams and lakes are located in the area surrounding the Site.

Tahiapik River (WK170)

The Tahiapik River site is located within close proximity (less than 30 m) to Fran Lake, which is a small sized body of water (approximately 1.2 square kilometers [km^2]) located at a topographic low on the west side of the Site. An unnamed body of water is located on the east side of the site with rolling hills in all directions. There are also many other small ponds and streams in the area surrounding the site.

Impact Lake (WK176)

The Impact Lake site is located within close proximity (less than 30 m) to Impact Lake, which is a small sized body of water (0.4 km^2) located at a local topographic low between rolling hills in all directions. There are many other small ponds and streams in the area surrounding the site.

Coppermine Area (WK199)

The Coppermine Area (WK199) site is situated on the northern shore of an unnamed lake with an approximate surface area of 3.6 km^2. Many other small lakes, streams, and ponds are present in the surrounding area in all directions.

Coppermine Area (WK210)

The Coppermine Areas (WK210) site is situated on the north shore of the east end of an unnamed lake with an approximate surface area of 0.51 km^2. This unnamed lake feeds the Coppermine River that flows into the Coronation Gulf of the Arctic Ocean. Small lakes and streams in the surrounding area also feed into the Coppermine River.

Asiak River (WK154)

The Asiak River site is located approximately 4 km east of the Asiak River, which is a large river located at a local topographic low between rolling hills in all directions. Locally the land slopes down toward several ponds located south and west of the site. The nearest surface water body observed at the site is located approximately 80 m to the south.

5.6 VEGETATION

The Speers Lake sites are located within the Kitikmeot region of Nunavut, which is within the Southern Arctic ecozone and the Coronation Hills ecoregion (Wiken,1986; Environment Canada, 2024). The Southern Arctic ecozone landscape is characterized as undulating rounded hills and lowlands covered by continuous permafrost. The landscape is comprised of weathered bouldery moraines etched by long eskers of gravel, sand and silt (Environment Canada, 2024). The Coronation Hills ecoregion occurs between Amundsen and Coronation gulfs and Great Bear Lake. The region can be characterized as extensive shrublands and wet sedge meadows riddled with clear, cold lakes. The Coronation Hills ecoregion experiences dramatic annual daylight variations, exceptionally short and cool summers (average = 5 °C), cold winters (average = -26 °C), and considerably low precipitation rates (average = 250 millimetres/year; Environment Canada, 2024). As a result, the vegetation is generally sparsely distributed and stunted (Mallaroy & Aiken, 2013).

The Coronation Hills ecoregion exhibits near continuous shrub tundra vegetation (Mallaroy & Aiken, 2013). The dominant soils are Turbic and Static Cryosols that developed on undulating to ridged glacial tills and fluvioglacial and rock deposits (Wiken,1986). Common plant species

include northern Labrador tea (*Rhododendron ledum palustre*), dwarf birch (*Betula pumila var. glandulifera*), willows (*Salix* spp.), sedges (*Carex* spp), and Arctic white heather (C*assiope tetragona*; Mallaroy & Aiken, 2013). Portions of the southern boundary of the ecoregion have open, dwarf coniferous forest.

The Project sites and surrounding areas are characterized as a mosaic of sand and gravel glacial deposits with thinly dispersed vegetation that are primarily composed of sedges, dwarf shrubs, herbaceous plant species, lichens, and mosses (inferred from site photographs and drone imagery). All of the Project sites except for Asiak River (WK154) are located within proximity of surface water features (lakes or rivers) that are bordered by sedges and dwarf shrubs but do not appear to support aquatic or emergent vegetation (inferred from site photographs and UAV imagery). There are no vascular plant or moss species at risk (SAR) expected to occur within the Sites (**Appendix B**). Rare plants have not been recorded in the region; however, detailed inventories have not been conducted. Site visits and environmental investigations were conducted during August-September 2024, where vegetation was sampled to determine the uptake of contaminants of concern to inform future risk assessment work. A high-level summary of characteristic vegetation present at the Sites (based on identifications from site photographs), is provided below:

Table 14: Summary of Characteristic Vegetation Present at the Project Sites

Species Common Name	Speers Lake (WK097)	Asiak River (WK154)	Coppermine Area (WK199)	Coppermine Area (WK210)	Impact Lake (WK176)	Tahiapik River (WK170)	Kendall River (WK165)
Sedges	X	X	X	X	X	X	X
Mosses	X	X	X	X	X	X	X
Lichens	X	X	X	X	X	X	X
Dwarf Shrubs	X	X	X	X	X	X	
Herbaceous Plants	X	X	X	X	X	X	X
Dwarf Birch	X	X	X	X	X	X	X
Willows	X	X	X	X	X	X	X
Arctic White Heather	X		X		X		
Tall Shrubs							X
Open Coniferous Forest							X

5.7 MAMMAL, AVIAN, AND FISH SPECIES

Characteristic mammal species in the region include barren ground caribou (*Rangifer tarandus*), moose (*Alces alces*), muskox (*Ovibos moschatus*), Arctic fox (*Vulpes lagopus*), wolverine (*Gulo gulo*), Arctic wolf (*Canis lupus arctos*), polar bear (*Ursus maritimus)*, grizzly bear (*Ursus arctos*), Arctic hare (*Lepus arcticus*), ermine (*Mustela erminea*), least weasel (*Mustela nivalis*), mink (*Neovision vision*), brown lemming (*Lemmus trimucronatus*), northern red-backed vole (*Myodes rutilus*) and Arctic ground squirrel (*Urocitellus parryii*; Anand-Wheeler, 2002). Characteristic bird species include lapland longspur (*Calcarius lapponicus*), semipalmated plover (*Charadrius semipalmatus*), willow ptarmigan (*Lagopus lagopus*) rough-legged hawk (*Buteo lagopus*) and gyrfalcon (*Falco rusticolus*) (Anand-Wheeler, 2002).

Given the habitat and vegetation present, and the remoteness of the Speers Lake sites, typical arctic tundra wildlife species for the region can be expected to utilize the study area. The wildlife SAR that are present in Nunavut and their potential occurrence at the Project sites is provided in **Appendix B**.

5.8 SOIL AND AQUATIC INVERTEBRATES

The Project sites provide minimal habitat for soil invertebrate communities, due to the presence of permafrost that limits soil structure and depth of soil use by invertebrates. Soil invertebrates include organisms such as worms, springtails, spiders and insects. As a result, soil invertebrates are uncommon in terrestrial arctic ecosystems (Danks *et al*., 1997).

Aquatic invertebrates in northern areas are primarily the larvae of insect species such as Dragonflies/Damselflies (Order Odonata), Mayflies (Order Ephemeroptera), Stoneflies (Order Plecoptera), and Midges (Order Diptera). There is no information available to base estimates of their abundance or species diversity. Aquatic invertebrates in northern areas generally prefer warm, shallow water habitats. Flying adults lay eggs in water at various times during the summer (depending on the species). The eggs hatch into larvae that may spend multiple years maturing into adults that emerge from the water at various times during the summer. It can be expected that species of aquatic invertebrates are present in ponded areas present at or adjacent to the seven sites included in the Project.

5.9 SPECIES AT RISK

Species at Risk (SAR) are identified by both the federal government and the Nunavut government. The *Committee on the Status of Endangered Wildlife in Canada* (COSEWIC) is an independent body of experts that uses criteria to critically evaluate and recommend status rank for each species in Canada. Following this, a federal government Minister then decides whether to place the species on Schedule 1 of the *Species at Risk Act* (*SARA*; 2002) after a consultation process. Once a species has been placed on Schedule 1 of *SARA* (2002), it is legally a SAR. A species can be at risk within Nunavut, while not being at risk within Canada as a whole; however, no such species have been identified by the Government of Nunavut.

There are 27 (non-marine) animal and plant SAR that occur in Nunavut, which are provided in **Appendix B** (Government of Canada, 2025). First, each species was evaluated to determine whether it may be potentially present in the vicinity of the seven Sites included in the Speers Lake bundle. Following this, it was determined whether a species may occur at any of the Sites or surrounding area, based on the existing habitat conditions. Some SAR species are unlikely to occur in the vicinity of the Project Site and are noted as “nil” occurrence in **Appendix B**. Marine species were excluded from the assessment because there are no marine habitats within the vicinity of the Sites. There are ten SAR potentially present at the Sites, including five birds and five mammals (Table 15).

Table 15: Species at Risk Potentially Present at the Speers Sites

Species Common Name	COSEWIC	SARA	SARA Schedule	Species Habitat Description	Speers Lake WK097	Asiak River WK154	Coppermine WK199	Coppermine WK210	Impact Lake WK176	Tahiapik River WK170	Kendall River WK165
Eskimo Curlew	Endangered	Endangered	Schedule 1	Within species breeding distribution. Quality nesting habitats include largely treeless area with dwarf shrubs and grassy tundra vegetation, as well as grassy meadows and shoreline habitat, that may be present within or adjacent to the study area.	X	X	X	X	X	X	X
Harris's Sparrow	Special Concern	No Status	No Schedule	Within species breeding distribution. Preferred nesting sites include small, isolated wooded areas with trees or tall shrubs that may be present within or adjacent to the study area.	X	X	X	X	X	X	X
Lesser Yellowlegs	Threatened	No Status	No Schedule	All sites are located within the species breeding distribution, except for the Coppermine sites (WK199 and WK210) and Asiak River (WK154) sites, which are in close proximity (26-63 km south). Quality nesting habitats include dry ground near peatlands, marshes, ponds and small lakes, which are present within or adjacent to the study area.	X	X	X	X	X	X	X
Red-necked Phalarope	Special Concern	Special Concern	Schedule 1	Within species breeding distribution. Quality nesting habitats are ponded areas dominated by grasses and sedges, emergent aquatic vegetation and open freshwater, that may be present within or adjacent to the study area.	X	X	X	X	X	X	X

Species Common Name	COSEWIC	SARA	SARA Schedule	Species Habitat Description	Speers Lake WK097	Asiak River WK154	Coppermine WK199	Coppermine WK210	Impact Lake WK176	Tahiapik River WK170	Kendall River WK165
Short-eared Owl	Threatened	Special Concern	Schedule 1	Within species breeding distribution. Quality nesting habitats include open tundra habitats and wetlands. Nests tend to be located on the ground bear clumps of taller vegetation that provide concealment. The open habitat and shrubs within the study area may provide suitable hunting and breeding habitat.	X	X	X	X	X	X	X
Caribou (Barren ground population)	Threatened	No Status	No Schedule	Within the species distribution. The Impact Lake (WK176) and Tahiapik River (WK170) sites are within the species calving area, and all other sites are located within close proximity except for Speers Lake (WK097). Vegetation within the study area may provide suitable forage.	X	X	X	X	X	X	X
Caribou (Dolphin and Union population)	Endangered	Special Concern	Schedule 1	The Speers Lake (WK097) site is located within the species winter range, and other sites are within close proximity (30-70 km south). Vegetation within the study area may provide suitable forage.	X	X	X	X	X	X	
Polar Bear	Special Concern	Special Concern	Schedule 1	The Asiak River Site is within the species known distribution. The remaining sites are within close proximity (approximately 13-58 km). Habitat is closely associated with sea ice and marine mammal prey. Species may rarely pass through Project Site when travelling or if forced inland due to loss of sea ice.	X	X	X	X	X	X	X
Grizzly Bear	Special Concern	Special Concern	Schedule 1	Within species known distribution. The study area may provide suitable forage in the spring, summer and autumn seasons.	X	X	X	X	X	X	X

Species Common Name	COSEWIC	SARA	SARA Schedule	Species Habitat Description	Speers Lake WK097	Asiak River WK154	Coppermine WK199	Coppermine WK210	Impact Lake WK176	Tahiapik River WK170	Kendall River WK165
Wolverine	Special Concern	Special Concern	Schedule 1	Within species known distribution. The study area and/or surrounding area may provide suitable forage and denning habitat.	X	X	X	X	X	X	X

5.10 SITE SPECIFIC LAND USE

Site specific land use includes the historical and present uses of the Sites. The following sections summarize information collected during the assessment phase of the Project. The archaeological summary presented below is reproduced directly from the Archaeological Impact Assessment Report (BLM-KEL-60, 2024i).

5.10.1 Past and Current Land Use

Sites	Historical Use	Archaeological Potential	Current Use
Speers Lake WK097	Former exploration site used in the 1950s, 80s and 90s	No prehistoric or historic indigenous sites were found during the Archaeological Impact Assessment conducted in 2023.	Part of a traditional fishing area. Kugluktumiut travel to the area in spring, late fall and winter by snowmobile, mainly for caribou, moose, wolf, muskox, wolverine and fishing.
Asiak River WK154	Former mineral exploration camp	Holds high archeological potential for Pre-Inuit and Inuit sites, including hunting features (blinds, caribou drive systems), caches, graves and inuksuit	Not on a regular travel route. Lakes to the east of the Site are visited for fishing.
Kendall River WK165	Former fishing outpost camp		Important harvesting ground. The sector is visited often from late fall to spring for caribou, moose, wolf, muskox and wolverine.
Coppermine Area WK199	Former mineral exploration camp		Frequently visited to hunt caribou, moose, wolf, muskox, wolverine. It is heavily used in spring, late fall and winter, and many travel routes pass by this sector.
Tahiapik River WK170	Former mineral exploration camp and storage site		Important harvesting ground. The sector is visited often from late fall to spring for caribou, moose, wolf, muskox and wolverine.
Impact Lake WK176	Unknown, but the Site contains debris consistent with a mineral exploration camp	Holds low archaeological potential as it is outside known harvesting grounds.	Not visited by hunters regularly, according to local residents of Kugluktuk.
Coppermine Area WK210	Unknown, but Site conditions suggest it was a mineral exploration camp	Holds moderate archaeological potential as archaeological sites were identified nearby in 2010 and 2015.	

5.11 CULTURAL RESOURCES AND SPECIAL PLACES

The Archaeological Impact Assessment of WK097-Speers Lake found no evidence of archaeological traces in the study area. However, two modern tent rings and one cache or support structure were observed. There is no information to indicate whether these features were associated with the mineral exploration activities, or an indigenous hunting camp. Two archaeological test-pits were excavated and both proved sterile, yielding no cultural remains. On the advice of the territorial archaeologist of the Government of Nunavut, these features represent future archaeological resources as evidence of land use. (BLM-KEL-60, 2024i).

6 PROJECT/ENVIRONMENTAL INTERACTIONS – PHYSICAL

6.1 DESIGNATED ENVIRONMENTAL AREAS

No Designated Environmental Areas are located in the vicinity of the Sites nor where work is planned, therefore not applicable.

6.2 PERMAFROST, GROUND STABILITY

6.2.1 Anticipated Impacts to Permafrost

Information collected during the Phase III Environmental Site Investigations indicate the near surface soils at the Sites consist largely of sandy clay with gravel and cobbles. Test pits were excavated as part of the environmental program, as well as at locations off Site away from Site activities. No permafrost was encountered in any environmental test pits or geotechnical test pits at any of the Sites, the deepest of which was 1.4 mbgs (at the Speers Lake Site). The depths of test pits ranged from 0.6 mbgs to 1.4 mbgs over the Sites. There is no planned excavation at the Sites however some borrow may be required for access trails, construction of a temporary camp and to infill/contour debris areas if required. Some debris may have sunken into the surface soils and may require some minor hand excavation to extract it.

Borrow excavation would include manual excavation of borrow material. It is expected that the risk of potential impacts to permafrost are greatest at the Speers Lake Site, where there is planned use of ATV's and a temporary camp that may require borrow materials to improve access

and facilitate the camp installation. However, potential impacts may also occur at other sites where remediation work will happen and where sunken debris may be present.

Potential effects to permafrost are summarized in Table 16. Considering the duration, extent, magnitude, frequency, and reversibility of each potential effect that may occur as a result of Project activities, and the mitigation measures available, there are no significant negative impacts for permafrost anticipated and there are no residual negative effects anticipated.

Table 16: Potential Effects from Project Activities on Permafrost

Potential Effect	Direction	Duration	Geographic Extent	Magnitude	Frequency	Probability of effect	Reversibility	Mitigations Available	Significance	Site Applicable
Borrow material for Camp Set up	Negative	Temporary/short	Local	Minor	Intermittent	Low	No	Yes	No	Speers Lake
Ground contouring around sunken debris	Negative	Temporary/short	Local	Minor	Intermittent	Low	No	Yes	No	All sites
Removal of Hazardous Debris/Debris	Positive	Continuous	Local	Minor	Continuous	High	No	No	Yes	All Sites

6.2.2 Proposed Mitigation Measures for Impacts to Permafrost

Mitigation measures are proposed to reduce or avoid adverse effects to permafrost and/or ground stability that may occur as a result of Project remediation activities. The potential effects to permafrost and/or ground stability have been adequately considered and can be successfully mitigated.

- Conduct pre-work meetings with all workers to discuss the environmental requirements. Awareness training will be conducted at onsite meetings such as project orientation and daily tailgate meetings, and to include considerations for the protection of permafrost and/or ground stability.
- Impacts to permafrost will be mitigated by limiting the excavation depth of any potential borrow areas to above the permafrost. Potential borrow sources will also be excavated to allow free flowing water to avoid pooling water. With minimal equipment on site, excavations will be manual which will be less likely to disturb permafrost at the Site.
- At the Kendall River Site WK165, a 30 m setback will be set from natural cracks and erosion observed in the riverbanks in order to not further disturb these areas. No debris was observed to be present in this setback.

6.3 HYDROLOGY/LIMNOLOGY, WATER QUALITY

6.3.1 Anticipated Impacts to Water Quality

Water quality at the Sites may have been impacted from the abandoned materials and debris. There are small quantities of on-site hazardous materials present at the Sites and it is expected that the removal of debris from the Sites will result in long-lasting, positive impacts on the local water ways.

Potential effects to water quality can occur from on-site hazardous waste and spills during equipment refueling and maintenance, or through equipment leaks that can migrate to surface and groundwater. Liquid fuel on the Sites is mainly contained in barrels with limited fuel residuals remaining in empty tanks at the Sites. It is expected that the risk of potential impacts to surface water are greatest at the Speers Lake Site, where there is planned use of ATV's, fuel storage and a temporary camp using water. However, potential impacts may also occur at other sites where remediation work will happen near water courses. No surface water is present on the Asiak River

site so impacts are not anticipated at that specific site. The potential for these spills is low with mitigation measures as outlined below in Section 6.3.2.

The potential disturbance to soil and sediments may occur during the development of on-site transportation routes, removal of partially buried debris, sunken debris within surface waters, and the manual excavation of borrow materials can result in soils or sediments migrating to local surface water environments. This may result in potential impacts to water quality and habitat.

Potential effects hydrology/limnology and water quality are summarized in Table 17. Considering each of the Sites has a relatively small footprint, these impacts are anticipated to occur on a local scale, and the risk of occurrence is expected to be low with mitigation measures in place.

Table 17: Potential Effects from Project Activities on Hydrology/Limnology, Water Quality

Potential Effect	Direction	Duration	Geographic Extent	Magnitude	Frequency	Probability of effect	Reversibility	Mitigations Available	Significance	Site Applicable
Contamination of surface and groundwater	Negative	Temporary/short	Local	Minor	Intermittent	Low	Yes	Yes	No	All Sites except Asiak River
Sedimentation	Negative	Temporary/short	Local	Minor	Intermittent	Low	Yes	Yes	No	All Sites except Asiak River
Removal of Hazardous Debris/Debris	Positive	Continuous	Local	Minor	Continuous	High	No	No	Yes	All Sites

6.3.2 Proposed Mitigation Measures for Impacts to Water Quality

Mitigation measures are proposed to reduce or avoid adverse effects to surface water and groundwater that may occur as a result of Project activities. The potential effects to surface water and groundwater have been adequately considered and can be successfully mitigated.

- Conduct pre-work meetings with all workers to discuss the environmental requirements. Awareness training will be conducted at onsite meetings such as project orientation and daily tailgate meetings, and to include considerations for the protection of surface and groundwater.
- An Erosion and Sediment Control plan will be developed and implemented prior to commencing work. At a minimum, this plan will outline where and how erosion and sediment control will be erected and discuss minimum requirements for maintenance and monitoring including that all disturbed areas, including borrow areas, are restored to a stable or pre-disturbed state using the Best Available Technology Economically Achievable (BATEA) upon completion of the work and/or de-commissioning. It will include specific information pertaining to erosion and sediment control measures to be applied during the removal of debris from surface waters. See mitigation measures for fish and aquatic species (7.4.2) for further details.
- A Spill Response Plan including Fuel Management Plan, Near Water Works and other related plans will be developed and implemented prior to commencing work. These plans will work together to proactively prevent spills and, where spills do occur, manage them quickly and efficiently to minimize impacts. At a minimum, these plans will:
    - Define minimum distance (30 m) between refueling and (100 m) fuel storage areas to identified water bodies and environmentally sensitive areas. If required, an exception for refueling of a float plane at the Speers Lake Site may be necessary, however refueling is expected to occur in Kugluktuk
    - Address the methods of storage of fuel and other materials (including waste materials) including, but not limited to, the use of liners and secondary containment
    - Include standard refueling, storage and transportation procedures for fuel, hazardous material and waste materials
    - Identify required signage and labeling requirements for fuel, hazardous materials and waste materials
    - Identify required spill response equipment and clean up materials including volumes and their locations on site

- Include standard inspection schedules and protocols
- Define spill reporting requirements including emergency contact details for spills reporting
- Identify required staff qualifications and training

6.4 CLIMATE CONDITIONS

6.4.1 Anticipated Impacts to Climate Conditions

Greenhouse gases (GHG) from Project activities have the potential to affect human health and climate change. Burning of fossil fuels through the use of generators, equipment and the flights required to mobilize personnel and materials to and from the Site will result in GHG emissions from the Project work.

Potential effects to climate conditions are summarized in Table 18. Removing hazardous/non-hazardous debris from the Sites will promote a positive effect on the environment and ultimately the climate. Improper waste disposal could lead to impacts on the climate through increased greenhouse gas emissions through decay and decomposition, also hazardous debris may eventually release toxins or contaminants into the environment, expediting plant, permafrost, and soil decay and releasing additional greenhouse gases. Considering the duration, extent, magnitude, frequency, and reversibility of each potential effect that may occur as a result of Project activities, and the mitigation measures available, there are no significant negative impacts for climate conditions anticipated and there are no residual negative effects anticipated.

Table 18: Potential Effects from Project Activities on Climate Conditions

Potential Effect	Direction	Duration	Geographic Extent	Magnitude	Frequency	Probability of effect	Reversibility	Mitigations Available	Significance	Site Applicable
Burning of fossil fuels	Negative	Temporary/short	Local	Minor	Intermittent	Low	No	Yes	No	All Sites
Removal of Hazardous Debris/Debris	Positive	Continuous	Local	Minor	Continuous	Low	No	No	Yes	All Sites

6.4.2 Proposed Mitigation Measures for Impacts to Climate Conditions

Several mitigation measures are proposed to reduce/minimize the adverse climate conditions caused by the Project activities. The potential effects to climate conditions have been adequately considered and can be mitigated. The mitigation measures are outlined below:

- Conduct pre-work meetings with all workers to discuss the environmental requirements. Awareness training will be conducted at onsite meetings such as project orientation and daily tailgate meetings, and to include considerations for the protection of climate conditions.
- GHG emissions can be reduced/minimized through;
  - The use of Hope Lake Airstrip as a central staging area for four of the Sites;
  - No use of heavy machinery at Site;
  - Optimization of waste removal flights;
  - Turning off engines when machinery is not in use;
  - An effective burn plan for on-Site waste; and,
  - Proper disposal of organic wastes.
- The short timeframe of this Project will reduce the overall impacts of the above-mentioned contributors.

6.5 ESKERS AND OTHER UNIQUE OR FRAGILE LANDSCAPES

No eskers nor unique/fragile landscapes located in the vicinity of the Sites or where the work is planned, therefore not Applicable.

6.6 SURFACE AND BEDROCK

6.6.1 Anticipated Impacts to Surface and Bedrock

Surface soil quality may have been impacted at all Sites from the abandoned materials and debris. It is expected that the removal of debris from the Sites will result in long-lasting positive impact on surface soil quality.

No disturbance to bedrock is anticipated at any of the Sites.

Potential effects to surficial soils are summarized in Table 19. It is expected that the risk of potential impacts to surficial soils are greatest at the Speers Lake Site, where additional activities are planned (temporary camp and ATV use) as well as greater amounts of materials/debris to be removed. Partially sunken debris may require infill contouring once removed from the soils which can impact surficial soils and composition.

Considering the duration, extent, magnitude, frequency, and reversibility of each potential effect that may occur as a result of Project activities, and the mitigation measures available, there are no significant negative impacts for surface soils and bedrock anticipated and there are no residual negative effects anticipated.

Table 19: Potential Effects from Project Activities on Surface and Bedrock

Potential Effect	Direction	Duration	Geographic Extent	Magnitude	Frequency	Probability of effect	Reversibility	Mitigations Available	Significance	Site Applicable
Movement of Materials	Negative	Temporary/short	Local	Minor	Intermittent	Low	No	Yes	No	All Sites
Helicopter Landing	Negative	Temporary/short	Local	Minor	Intermittent	Low	No	Yes	No	All Sites except Speers Lake
Equipment use (ATVs)	Negative	Temporary/short	Local	Minor	Intermittent	Low	No	Yes	No	Speers Lake
Camp Areas	Negative	Temporary/short	Local	Minor	Intermittent	Low	No	Yes	No	Speers Lake
Laydown Areas	Negative	Temporary/short	Local	Minor	Intermittent	Low	No	Yes	No	Speers Lake
Removal of Hazardous Debris/Debris	Positive	Continuous	Local	Minor	Continuous	High	No	No	Yes	All Sites

6.6.2 Proposed Mitigation Measures for Impacts to Surface and Bedrock

Mitigation measures are proposed to reduce or avoid adverse effects to surface and bedrock that may occur as a result of Project remediation activities. The potential effects to surface and bedrock have been adequately considered and can be successfully mitigated.

- Conduct pre-work meetings with all workers to discuss the environmental requirements. Awareness training will be conducted at onsite meetings such as project orientation and daily tailgate meetings, and to include considerations for the protection of surface and bedrock.
- At the Speers Lake Site, the camp and laydown areas will be located on durable surfaces, such as gravel or sand that is consolidated and can withstand repeated, heavy use.
- At the Speers Lake Site, wherever possible, existing trails will be used during Project activities and only ATVs will be used to navigate the Site, No heavy equipment will be used.
- Disturbance of slopes prone to natural erosion will be avoided where possible during the debris removal.
- The Erosion and Sediment Control will be protective of the surface soils at the Sites and travel routes will be chosen to minimize the creation of erosion channels and disruption of the landscape in areas not slated for remedial work.
- Disturbed areas will be graded to maintain the surrounding elevation to minimize the development of erosion channels. The impacted areas will be small compared to the overall Sites which will mitigate the overall impact.

6.7 SEDIMENT AND SOIL QUALITY

6.7.1 Anticipated Impacts to Sediment and Soil Quality

Soils and Sediments at the Sites may have been impacted from past Site activities and abandoned materials and debris left at the Sites. It is expected that the removal of debris from the Sites will result in long-lasting positive impact on sediment and soil quality. Potential effects to soil quality from the activities include reduced soil quality through mixing resulting from the transfer of soils for regrading and soil compaction on the Sites. The Speers Lake Site could have additional soil quality impacts due to a camp set up and the use of ATVs on Site. Soil compaction and disturbance is likely to have occurred previously when the Sites were operational.

Potential effects to sediment include reduced sediment quality through mixing resulting from the removal of debris from surface waters at the Speers Lake and Coppermine Area WK199 Sites. The Speers Lake Site could have additional sediment quality impacts due to the use of a Twin Otter aircraft on floats to access the Site.

Contamination may occur from spills during equipment refueling and maintenance, or through equipment leaks. Spills can affect soil or sediment pH and contaminant levels, and in turn reduce overall soil quality. Potential sources of spills include equipment malfunctions or operator error, resulting in contamination of the soils or sediment.

Potential effects to sediment and soil quality are summarized in Table 20. Impacts to soils and sediments as a result of the Project are expected to be limited to the Site's relatively small footprint. Any impacts are expected to be on a local scale, and occurrence is expected to be low with mitigation measures in place. In general soil and sediment quality is expected to improve with the removal of debris from these Sites.

Table 20: Potential Effects from Project Activities on Sediment and Soil Quality

Potential Effect	Direction	Duration	Geographic Extent	Magnitude	Frequency	Probability of effect	Reversibility	Mitigations Available	Significance	Site Applicable
Soil Mixing	Negative	Temporary/short	Local	Minor	Intermittent	Low	No	Yes	No	All Sites
Sediment Mixing	Negative	Temporary/short	Local	Minor	Intermittent	Low	No	Yes	No	Speers Lake, Coppermine Area WK199
On Site Spills	Negative	Temporary/short	Local	Minor	Intermittent	Low	No	Yes	No	All Sites
Equipment Leaks	Negative	Temporary/short	Local	Minor	Intermittent	Low	No	Yes	No	All Sites
Removal of Debris	Positive	Long Term	Local	Minor	Continuous	High	No	No	Yes	All Sites

6.7.2 Proposed Mitigation Measures for Impacts to Sediment and Soil Quality

Mitigation measures are proposed to reduce or avoid adverse effects to sediments and soils that may occur as a result of Project remediation activities. The potential effects have been adequately considered and can be successfully mitigated.

- Conduct pre-work meetings with all workers to discuss the environmental requirements. Awareness training will be conducted at onsite meetings such as project orientation and daily tailgate meetings, and to include considerations for the protection of soils and landforms.
- A Spill Response Plan including Fuel Management Plan, Near Water Works and other related plans will be developed and implemented prior to commencing work. These plans will work together to proactively prevent spills and, where spills do occur, manage them quickly and efficiently to minimize impacts.
- An Erosion and Sediment Control plan will be developed and implemented prior to commencing work.

6.8 TIDAL PROCESSES

All seven Sites are located inland and not adjacent to the ocean, therefore this section is not applicable.

6.9 AIR QUALITY

6.9.1 Anticipated Impacts on Air Quality

Air quality at the Sites may be impacted through Project activities. Air quality impacts are anticipated to include emissions from the use of equipment such as ATVs, generators, burning of clean wood waste, and the camp waste incinerator for the Speers Lake Site. The use of aircraft at the Sites will contribute to air quality impacts and dust may be generated during aircraft landing/take off .

Potential effects to Air Quality are summarized in Table 21. Considering the duration, extent, magnitude, frequency, and reversibility of each potential effect that may occur as a result of Project activities, and the mitigation measures available, there are no significant negative impacts for air quality anticipated and there are no residual negative effects anticipated.

Table 21: Potential Effects from Project Activities on Air Quality

Potential Effect	Direction	Duration	Geographic Extent	Magnitude	Frequency	Probability of effect	Reversibility	Mitigations Available	Significance	Site Applicable
Emissions from vehicles and equipment	Negative	Temporary/short	Local	Minor	Intermittent	Low	No	Yes	No	Speers Lake
Burning of clean wood	Negative	Temporary/short	Local	Minor	Intermittent	Low	No	Yes	No	All sites
Camp waste Incineration	Negative	Temporary/short	Local	Minor	Intermittent	Low	No	Yes	No	Speers Lake
Dust generation	Negative	Temporary/short	Local	Minor	Intermittent	Low	No	Yes	No	All sites

6.9.2 Proposed Mitigation Measures for Impacts on Air Quality

Mitigation measures are proposed to reduce or avoid adverse effects to air quality that may occur as a result of Project remediation activities. The potential effects have been adequately considered and can be successfully mitigated.

- Conduct pre-work meetings with all workers to discuss the environmental requirements. Awareness training will be conducted at onsite meetings such as project orientation and daily tailgate meetings, and to include considerations for the protection of air quality;
- No heavy machinery will be used at the Sites;
- Turning off engines when machinery is not in use;
- Implementing an effective burn plan for on-Site waste;
- At the Speers Lake Site, the temporary camp will be laid out in order to minimize impacts to air quality of Site personnel when operating the incinerator;
- The number of flights will be minimized by optimizing cargo for waste demobilization flights and through the potential use of Hope Lake Airstrip as a central laydown for debris to allow for more efficient debris removal;
- Any dusty conditions which could impact air quality in the breathing zones of Site personnel will be mitigated by the use of appropriate personal protective equipment (PPE); and,
- The short timeframe of this Project will reduce the overall impacts of the above-mentioned contributors to impacted air quality at the Site.

6.10 NOISE LEVELS

6.10.1 Anticipated Impacts to Noise Levels

Noise levels at the Sites may be impacted through Project activities. Noise generated from the Project will include increased aircraft activity and remedial activities including cutting and piling debris. At the Speers Lake Site the use of ATVs, the temporary camp, and generator noise will produce additional noise. The increased noise levels may disrupt wildlife at the Sites.

Potential effects to noise levels are summarized in Table 22. Considering the duration, extent, magnitude, frequency, and reversibility of each potential effect that may occur as a result of Project activities, and the mitigation measures available, there are no significant negative impacts to noise levels anticipated and there are no residual negative effects anticipated.

Table 22: Potential Effects from Project Activities on Noise Levels

Potential Effect	Direction	Duration	Geographic Extent	Magnitude	Frequency	Probability of effect	Reversibility	Mitigations Available	Significance	Site Applicable
Aircraft noise	Negative	Temporary/short	Local	Minor	Intermittent	Low	No	Yes	No	All sites
Generator/camp noise	Negative	Temporary/short	Local	Minor	Intermittent	Low	No	Yes	No	Speers Lake
ATV noise	Negative	Temporary/short	Local	Minor	Intermittent	Low	No	Yes	No	Speers Lake
Remedial noise	Negative	Temporary/short	Local	Minor	Intermittent	Low	No	Yes	No	All sites

6.10.2 Proposed Mitigation Measures

Mitigation measures are proposed to reduce or avoid adverse effects to noise levels that may occur as a result of Project remediation activities. The potential effects have been adequately considered and can be successfully mitigated.

- Conduct pre-work meetings with all workers to discuss the environmental requirements. Awareness training will be conducted at onsite meetings such as project orientation and daily tailgate meetings, and to include considerations for the protection of noise levels;
- No heavy machinery will be present on Site which will limit the impacts of noise levels during the remediation of the Site.
- Wildlife Management plans will include procedures to minimize the disruption of species that may be encountered at the Sites during the period of work by limiting noise exposure in the presence of wildlife.
- Noise will be isolated to specific areas of the Site and will be considered to be short term.

7 PROJECT/ENVIRONMENTAL INTERACTIONS - BIOLOGICAL

7.1 VEGETATION

7.1.1 Anticipated Impacts on Vegetation

Vegetation at the Sites may have been impacted from the abandoned materials and debris. Considering this, it is expected that the removal of debris from the Sites will result in long-lasting, positive impacts on local vegetation. Potential effects to vegetation (including rare plants) as a result of Project remediation activities includes habitat loss and/or alteration, introduction and/or spread of invasives, changes in hydrology, erosion and contaminants.

Habitat loss includes the direct removal of vegetation and soil at the Site as a result of on-site activities. Habitat alteration includes changes in soil compaction and composition, changes in microclimate (moisture, exposure, temperature), and changes in vegetation structure and composition, which may be caused by Project activities including driving of ATVs, the construction of a camp, the use of access trails and helicopter landing sites. Habitat fragmentation includes changes in patch size and distribution of available habitats for plant species as a result of remediation activities.

The introduction of invasive plant species has the potential to occur at locations disturbed by Project activities including remediation Sites, helicopter landing and pick-up, the temporary camp, and access trails, which may spread into the surrounding areas. Although not expected at the scale that work will happen, changes in hydrology and erosion have the potential to occur if Project remediation activities result in changes to sedimentation or local topography such as gradient and slope orientation, which can impact vegetation structure and composition. These potential impacts would be localized and are not anticipated to negatively impact vegetation at a population level. Finally, contamination may occur including accidental spills that may arise during Project activities such as the removal of hazardous materials and driving of machinery.

Potential effects to vegetation are summarized in Table 23. It is expected that the risk of potential impacts to vegetation are greatest at the Speers Lake Site, where there is planned use of ATV's and a temporary camp. However, potential impacts may also occur at helicopter landing sites, staging and storage areas and borrow pit sites. Considering the duration, extent, magnitude, frequency, and reversibility of each potential effect that may occur as a result of Project activities, and the mitigation measures available, there are no significant negative impacts for vegetation anticipated and there are no residual negative effects anticipated. The extent of anticipated vegetation biomass and soil loss or alteration at the Site as a result of Project remediation activities is expected to be extremely small in relation to the habitat available in the surrounding area. Importantly, the potential negative effects to vegetation can be mitigated with appropriate measures, which are outlined in Section 7.1.2.

Table 23: Potential Effects of the Project Activities on Vegetation

Potential Effect	Direction	Duration	Geographic Extent	Magnitude	Frequency	Probability of effect	Reversibility	Mitigations Available	Significance	Site Applicable
Habitat loss and/or alteration	Negative	Temporary /short	Local	Minor	Continuous	Low	Yes	Yes	No	All Sites
Habitat fragmentation	Negative	Temporary /short	Local	Minor	Continuous	Low	Yes	Yes	No	All Sites
Introduction/ spread of invasives	Negative	Temporary /short	Local	Minor	Continuous	Low	No	Yes	No	All Sites
Changes in Hydrology	Negative	Temporary /short	Local	Minor	Continuous	Low	Yes	Yes	No	All Sites
Erosion	Negative	Temporary /short	Local	Minor	Continuous	Low	Yes	Yes	No	All Sites
Contaminant Exposure	Negative	Temporary /short	Local	Minor	Continuous	Low	No	Yes	No	All Sites
Removal of sources of Contaminants and debris	Positive	Permanent	Local	Minor	Continuous	High	No	No	Yes	All Sites

7.1.2 Proposed Mitigation Measures for Impacts on Vegetation

Mitigation measures are proposed to reduce or avoid adverse effects to vegetation that may occur as a result of Project activities. The potential effects to vegetation have been adequately considered and can be successfully mitigated.

- Pre-work meetings will be conducted to discuss the environmental requirements.
- The PCR will be present during all Project activities. The PCR's role will include ensuring that the Environmental Protection Plan, Erosion Sediment and Drainage Control Plan, Fuel Management Plan, and In Stream or Near Water Works Work Methodology Plan measures are implemented appropriately. Wherever feasible, potential negative effects to vegetation will be minimized by containing machinery to previously disturbed areas, establishing and enforcing speed limits, and ensuring effective planning to limit the extent of vehicle movements.
- Wherever feasible, ATVs will not be driven on banks and slopes, within 30 m of riparian areas and waterbodies and in well-vegetated areas (including significant lichen patches). The PCR will place buffers around these areas to prevent machinery from driving on them and minimize negative impacts. If ATV's must be driven near riparian areas or waterbodies, then measures to mitigate negative impacts on vegetation will be site specific and include ground inspections, ground protection mats and/or silt screens if necessary.
- Where feasible, potential effects of vegetation habitat loss and/or alteration and/or fragmentation will be minimized by selecting sites where vegetation (including lichen) is absent or minimal for the camp, staging and storage areas, helicopter landing and pick-up sites, and borrow areas.
- Potential effects of vegetation habitat loss and/or alteration and/or fragmentation will be minimized by limiting the size of borrow areas, staging and storage areas and the temporary camp as much as feasible.
- If vegetation (including lichen) is present at borrow areas, vegetated surface material will be stockpiled, and replaced after excavation is complete.
- Wherever feasible, driving in wet conditions or muddy areas will be avoided. Sharp turns, sudden braking or acceleration that may cause rutting and damage to vegetation will be avoided.

- The establishment and spread of invasive plant species will be prevented by having the PCR inspect all ATVs and equipment prior to mobilization to site, and upon arrival at the Project Site. ATVs must be clean of all dirt, mud, non-native plants, and their seeds. Any ATVs found to not be clean upon arrival to Site will be segregated, cleaned and the wastewater containerized for off-site disposal.
- A Spill Response Plan including Fuel Management Plan, Near Water Works and other related plans will be developed and implemented prior to commencing work. These plans will work together to proactively prevent spills and, where spills do occur, manage them quickly and efficiently to minimize impacts.
- The PCR will visit the location to conduct post-work inspection and ensure the disturbed areas are on a trajectory to returning to their pre-disturbance state.
- Equipment with low tire pressure will be used during site preparation and operation.
- Equipment will be regularly inspected for leaks throughout the duration of the Project.
- Dust control best management practices will be implemented on-site as required, including limiting activities during periods of high wind periods.
- All hazardous materials will be transported in accordance with regulatory requirements under the Transportation of Dangerous Goods Act (Government of Canada 1992).
- Burning of debris on-site will follow the Government of Nunavut Environmental Guideline for the Burning and Incineration of Solid Waste (2012).

7.2 WILDLIFE

7.2.1 Anticipated Impacts to Mammals

Mammals present at the Sites may have been impacted from the abandoned materials and debris. Considering this, it is expected that the removal of debris from the Sites will result in long-lasting, positive impacts on mammals. Potential effects to mammals as a result of Project activities include habitat loss and/or alteration, habitat fragmentation, habitat displacement, loss or disruption to movement, contaminant exposure and direct mortality. Habitat loss includes the removal of vegetation, soil and debris from the Site that may be used by mammal species for breeding foraging, security, thermal cover and/ or hibernation (e.g., the removal of den sites). Habitat alteration includes the reduction of specific values provided to mammal species by a habitat (e.g., changes to soil compaction, vegetation composition and structure), which may be caused by Project activities including the removal of debris, driving of ATVs, the construction of a temporary camp, helicopter landing/pick-up sites, and access trails. Habitat displacement

includes the temporary loss of habitat due to behavioral responses by mammal species as a result of sensory disturbances, which may be caused by noise from ATVs and helicopters and human presence. Loss or disruption of movement includes changes to the landscape that result in barriers to wildlife species dispersal and/or seasonal or daily movements, which may be caused by Project activities including the removal of debris, the construction of a temporary camp, helicopter landing/pick-up sites, and the access trail. Contamination includes accidental spills that may arise during Project activities including the removal of hazardous and non-hazardous debris and the use of machinery. Finally, direct mortality includes collisions with ATVs and/or entrapment in equipment or debris and may also include exposure to hazardous materials.

Potential effects to mammal species including SAR are summarized in Table 24. Given the scope of work, and considering the duration, extent, magnitude, frequency, and reversibility of the remediation effects, and the mitigation measures available, there are no significant negative impacts for mammal species anticipated and there are no residual negative effects anticipated. The existing habitat available at the Site is extremely small in relation to the habitat available in the greater surrounding area. For most mammal species including the SAR that may be present, the Site likely only represents a small portion of individuals' home ranges and most animals including barren-ground caribou, grizzly bear and wolverine can be expected to avoid or move out of the Project Site during remediation activities. However, Impact Lake and Tahiapik River Sites are located within calving areas of the barren-ground caribou and the Kendall River and Coppermine Sites are located in close proximity. During calving, barren-ground caribou are particularly sensitive to disturbance. Most calves are born within a few days of each other between June 1-17, however, the timing of the calving may vary annually, and caribou may be found in the calving area before or after this time (COSEWIC, 2016b). Importantly, however, the potential negative impacts to mammal species including barren-ground caribou can be mitigated with appropriate measures, which are outlined in Section 7.2.2.

Table 24: Potential Effects of the Project Activities on Mammals

Potential Effect	Direction	Duration	Geographic Extent	Magnitude	Frequency	Probability of effect	Reversibility	Mitigations Available	Significance	Site Applicable
Habitat loss and/or alteration	Negative	Temporary /short	Local	Minor	Intermittent	Low	Yes	Yes	No	All Sites
Habitat fragmentation	Negative	Temporary /short	Local	Minor	Intermittent	Low	Yes	Yes	No	All Sites
Habitat displacement	Negative	Temporary /short	Local	Minor	Intermittent	Low	Yes	Yes	No	All Sites
Loss or disruption to movement	Negative	Temporary /short	Local	Minor	Intermittent	Low	Yes	Yes	No	All Sites
Direct Mortality	Negative	Temporary /short	Local	Minor	Intermittent	Low	No	Yes	No	All Sites
Removal of sources of Contaminants and debris	Positive	Permanent	Local	Minor	Continuous	High	No	No	Yes	All Sites

7.2.2 Proposed Mitigation Measures for Impacts to Mammals

Mitigation measures are proposed to reduce or avoid adverse effects to mammal species including SAR that may occur as a result of Project activities. The potential effects to mammal species have been adequately considered and can be successfully mitigated.

- Pre-work meetings will be conducted with all workers to discuss the environmental requirements. Awareness training will be conducted at onsite meetings such as project orientation and daily tailgate meetings, and to include bear awareness, wildlife encounters and considerations for SAR. Signage and bulletins will be posted at the temporary camp, alerting workers to the issues regarding working in polar bear, grizzly bear, barren-ground caribou, and wolverine habitat.
- A Wildlife Encounter and Management Plan and a Wildlife Protection Plan will be developed and implemented that will detail mitigation measures.
- The PCR will be present during all Project activities. The PCR's role will include providing guidance and assistance to ensure that Wildlife Encounter and Management Plan and Wildlife Protection Plan measures are implemented appropriately.
- Local Wildlife Monitors will be hired for the duration of the Project. The Wildlife Monitors' role will include assessing the presence of wildlife in or near the Project area during Project activities and advising on appropriate actions to reduce interactions. Work will cease if bears or caribou are spotted on the Site until they have moved through the area.
- Wildlife Monitors will conduct pre-work surveys at the Sites and immediate surrounding area to identify and avoid physical destruction of mammal habitat features including burrows, trails, wallows, and mineral licks. If mammal habitat features are identified during pre-work surveys, the PCR will work with Wildlife Monitors and regulators to apply appropriate no-work buffers and minimize human-use in these areas.
- Negative impacts to calving barren-ground caribou will be avoided by planning work activities to be conducted outside the calving period (June 1-17). If not feasible, a wildlife monitor shall be present during all activities to ensure that caribou are not located within 2 km of the work area. If caribou are observed within 2 km of the work area, ATV's will be shut down to allow the animal(s) to move through the area undisturbed and without stress. Operations will re-commence only after the animals are observed to have moved at least 2 km away from the work site. Helicopters shall not land or take off if caribou are observed within 2 km of the work Site during the calving period.

- If large mammals including polar bears, grizzly bears, barren-ground caribou, or muskox are observed approaching within 500 m of the Site or Project activities area, ATVs will be shut down to allow the animal(s) to move through the area undisturbed and without stress. Operations will re-commence only after the animals are observed to have moved at least 500 m away from the work Site.
- Employees and contractors will not be permitted the following activities:
  - Recreational use of all-terrain vehicles
  - Recreational hunting/shooting/firearms
  - Dogs
  - Feeding or harassing wildlife
- Construction and remediation materials such as cables, wires, and fencing will be properly stored to avoid entanglement hazards for wildlife.
- Wildlife attractants including food, garbage, and fuel will be managed adequately. All attractants must be stored in wildlife-proof containers or incinerated. All combustible waste will be collected, contained, and incinerated. Non-combustible waste will be collected, contained, and stored in wildlife-proof containers.
- If feasible, the temporary camp and all potential attractants (e.g., fuel) will be secured within a portable electric fence to prevent access by dangerous wildlife and SAR including grizzly bear, polar bear, wolf, and wolverine.
- A Spill Response Plan including Fuel Management Plan, Near Water Works and other related plans will be developed and implemented prior to commencing work. These plans will work together to proactively prevent spills and, where spills do occur, manage them quickly and efficiently to minimize impacts.
- Aircraft flights will fly at a minimum altitude of 500 m above ground level except for takeoff and landing.
- Aircrafts shall maintain a minimum of 500 m line of sight from caribou, polar bear, grizzly bear, wolverine and other SAR at all times. There shall be no circling or direct approach of observed animals.
- Any incidents of human-wildlife conflict will be immediately reported to the local conservation officer.
- Equipment will be regularly inspected for leaks throughout the duration of the Project.
- Dust control best management practices will be implemented on-site as required, including limiting activities during periods of high wind periods.
- All hazardous materials will be transported in accordance with regulatory requirements under the Transportation of Dangerous Goods Act (Government of Canada 1992).

- Burning of debris on-site will follow the Government of Nunavut Environmental Guideline for the Burning and Incineration of Solid Waste (2012).

7.3 AVIAN SPECIES

7.3.1 Anticipated Impacts to Avian Species

Avian species present at the Sites may have been impacted from the abandoned materials and debris. Considering this, it is expected that the removal of debris from the Sites will result in long-lasting, positive impacts on birds. Potential effects to bird species as a result of Project activities include habitat loss and/or alteration, habitat fragmentation, habitat displacement, loss or disruption to movement, contaminant exposure and direct mortality. Habitat loss includes the removal of vegetation, soil and debris from the Site that may be used by bird species for breeding, foraging, security, and thermal cover (e.g., the removal of nest sites). Habitat alteration includes the reduction of specific values provided to bird species by a habitat (e.g., changes to vegetation composition and structure), which may be caused by Project activities including the removal of hazardous and non-hazardous debris, driving of ATVs, the construction of a temporary camp, helicopter landing and pick-up, and access trails. Habitat displacement includes the temporary loss of habitat due to behavioral responses by bird species as a result of sensory disturbances, which may be caused by noise from ATVs and helicopters and human presence. Loss or disruption of movement includes changes to the landscape that result in barriers to wildlife species dispersal and/or seasonal or daily movements, which may be caused by Project activities including the removal of hazardous and non-hazardous debris and the construction of a temporary camp. Contamination includes accidental spills that may arise during Project activities including the removal of contaminated material/debris and the use of ATVs and helicopters. Finally, direct mortality includes collisions with ATVs and helicopters and/or entrapment in equipment or debris and may also include exposure to hazardous and non-hazardous materials and debris.

Potential effects to bird species including SAR are summarized in Table 25. Given the scope of work, and considering the duration, extent, magnitude, frequency, and reversibility of the remediation effects, and the mitigation measures available, there are no significant negative impacts for bird species anticipated and there are no residual negative effects anticipated. The existing habitat available at the Site is extremely small in relation to the habitat available in the greater surrounding area. Most bird species including the SAR can be expected to be temporarily displaced/avoid or move out of the Project Site during remediation activities.

Nevertheless, the PCR will work with the Wildlife Monitors to identify species of nesting birds and place appropriate no-work buffers around active nests if encountered to ensure compliance with the requirement of the *Migratory Birds Convention Act* (1994) and the *Species at Risk Act* (2002). In the event that remediation activities cannot be completed without disturbing/ destroying nests or burrows associated with migratory birds or species of special concern, a wildlife officer from the Government of Nunavut and ECCC will be consulted for additional guidance and/or to obtain a permit authorizing the removal of nests or disruption of habitat. Importantly, the potential negative effects to bird species can be mitigated with appropriate measures, which are outlined in Section 7.3.2.

Table 25: Potential Effects of the Project Activities on Avian Species

Potential Effect	Direction	Duration	Geographic Extent	Magnitude	Frequency	Probability of effect	Reversibility	Mitigations Available	Significance	Site Applicable
Habitat loss and/or alteration	Negative	Temporary /short	Local	Minor	Intermittent	Low	Yes	Yes	No	All Sites
Habitat fragmentation	Negative	Temporary /short	Local	Minor	Intermittent	Low	Yes	Yes	No	All Sites
Habitat displacement	Negative	Temporary /short	Local	Minor	Intermittent	Low	Yes	Yes	No	All Sites
Loss or disruption to movement	Negative	Temporary /short	Local	Minor	Intermittent	Low	Yes	Yes	No	All Sites
Direct Mortality	Negative	Temporary /short	Local	Minor	Intermittent	Low	No	Yes	No	All Sites
Removal of sources of Contaminants and debris	Positive	Permanent	Local	Minor	Continuous	High	No	No	Yes	All Sites

7.3.2 Proposed Mitigation for Impacts to Avian Species

Mitigation measures are proposed to reduce or avoid adverse effects to bird species including SAR that may occur as a result of Project remediation activities. The potential effects to bird species have been adequately considered and can be successfully mitigated.

- Pre-work meetings will be conducted with all workers to discuss the environmental requirements. Awareness training will be conducted at onsite meetings such as project orientation and daily tailgate meetings, and to include considerations for bird species, including migratory birds and SAR.
- A Wildlife Protection Plan will be developed and implemented that will detail mitigation measures.
- The PCR will be present during all Project activities. The PCR's role will include providing guidance and assistance to ensure that Wildlife Protection Plan measures are implemented appropriately.
- Since Project activities will need to occur during the breeding bird window for the region (May 15 to August 18), the Project team will endeavour to identify and avoid physical destruction of bird nests by having Wildlife Monitors conduct pre-work surveys at the Sites and immediate surrounding area. If bird nests are identified during pre-work surveys, Wildlife Monitors will apply appropriate no-work buffers and minimize human-use in these areas. Employees and contractors will not be permitted the following activities:
  - Recreational use of all-terrain vehicles
  - Recreational hunting/shooting/firearms
  - Dogs
  - Feeding or harassing birds
- Construction and remediation materials such as cables, wires, and fencing will be properly stored to avoid entanglement hazards for wildlife.
- Wildlife attractants including food and garbage will be adequately managed. All attractants must be stored in wildlife-proof containers or incinerated. All combustible waste will be collected, contained, and incinerated. Non-combustible waste will be collected, contained, and stored in wildlife-proof containers.

- A Spill Response Plan including Fuel Management Plan, Near Water Works and other related plans will be developed and implemented prior to commencing work. These plans will work together to proactively prevent spills and, where spills do occur, manage them quickly and efficiently to minimize impacts.

7.4 FRESHWATER AQUATIC SPECIES

7.4.1 Anticipated Impacts to Fish and Aquatic Species

Transfer of contaminants to fish species and aquatic invertebrates may occur through direct contact with contaminated water or sediments, or by feeding on contaminated plants and insects. Considering this, it is expected that the removal potential of contaminant sources and debris from the Site will result in positive, long-lasting (I.e., residual) impacts on fish and aquatic species and their habitats.

Potential effects to fish and aquatic invertebrate species as a result of Project activities include habitat loss and/or alteration, erosion and sedimentation, contaminant exposure and direct mortality. Habitat loss includes the removal of (riparian and aquatic) vegetation and debris from the Site that provide the conditions required for fish species for breeding, foraging, security, and cover. Habitat alteration includes the reduction of specific values provided to fish species by a habitat (e.g., changes to habitat structure and cover, changes in nutrient concentrations and/or food supply), which may be caused by Project activities including the removal of riparian vegetation, removal of hazardous and non-hazardous debris, driving of ATVs and the drawing of water. Changes in erosion and sedimentation includes changes to bank stability and exposed soils, which may arise during Project activities including the placement of materials or structures in water, the removal of partially submerged debris and the use of machinery (ATVs and pump). Exposure to contaminants includes accidental spills that may arise during Project activities including the removal of contaminated debris and the use of machinery including ATVs, helicopters and pumps. Finally, direct mortality includes mortality of fish/eggs/ova from collisions with machinery and/or entrapment in equipment or debris and may also include exposure to hazardous materials.

Potential effects to fish species are summarized in Table 26. Given the scope of work, and considering the duration, extent, magnitude, frequency, and reversibility of the remediation effects, and the mitigation measures available, there are no significant negative impacts for fish or aquatic invertebrate species anticipated and there are no residual negative effects anticipated. Any time that work occurs near or within water there is potential to affect fish and/or fish habitats, either at the Site where the works are being completed or further downstream. Mitigation measures for potential impacts include implementing Erosion and Sedimentation Plan measures, as appropriate, during remediation activities. Importantly, the potential negative effects to fish and aquatic species and their habitat can be mitigated with appropriate measures, which are outlined in Section 7.4.2.

Table 26: Potential Effects of the Project Activities on Fish

Potential Effect	Direction	Duration	Geographic Extent	Magnitude	Frequency	Probability of Effect	Reversibility	Mitigations Available	Significance	Site Applicable
Habitat loss and/or alteration	Negative	Temporary /short	Local	Minor	Intermittent	Low	Yes	Yes	No	All Sites except for Asiak River Wk154
Changes in Hydrology	Negative	Temporary /short	Local	Minor	Intermittent	Low	Yes	Yes	No	All Sites except for Asiak River Wk154
Erosion and Sedimentation	Negative	Temporary /short	Local	Minor	Intermittent	Low	Yes	Yes	No	All Sites except for Asiak River Wk154
Contaminant exposure	Negative	Temporary /short	Local	Minor	Intermittent	Medium	No	Yes	No	All Sites except for Asiak River Wk154
Direct Mortality	Negative	Temporary /short	Local	Minor	Intermittent	Low	No	Yes	No	All Sites except for Asiak River Wk154
Removal of sources of Contaminants and debris	Positive	Permanent	Local	Minor	Continuous	High	No	No	Yes	All Sites except for Asiak River Wk154

7.4.2 Proposed Mitigation for Impacts to Fish and Aquatic Species

Mitigation measures are proposed to reduce or avoid adverse effects to fish and aquatic species that may occur as a result of Project remediation activities. The potential effects to fish and aquatic species have been adequately considered and can be successfully mitigated.

- Pre-work meetings will be conducted with all workers to discuss the environmental requirements.
- A Spill Prevention and Spill Response Plan, Near Water Works, and Erosion and Sedimentation Plan will be developed and implemented that will detail mitigation measures.
- The PCR will be present during all Project activities. The PCR's role will include monitoring hazards, determining the presence of fish, and providing guidance and assistance to ensure measures to mitigate potential effects on fish and fish habitat are appropriately applied.
- A Spill Response Plan including Fuel Management Plan, Near Water Works and other related plans will be developed and implemented prior to commencing work. These plans will work together to proactively prevent spills and, where spills do occur, manage them quickly and efficiently to minimize impacts.
- Surface water flows will be managed to prevent sediment and contaminants from entering riparian habitats or waterbodies.
- All equipment working near the stream or waterbody will be properly maintained and free of leaks, and all equipment will be washed prior to coming onto the worksite.
- Potential effects of erosion and changes in hydrology will be minimized by implementing Erosion and Sedimentation Plan measures to prevent any movement of sediment into the stream to avoid harm to fish and aquatic invertebrates. These potential impacts would be localized and are not anticipated to negatively impact freshwater aquatic species at a population level.
- Potential effects of erosion or changes in hydrology by avoiding driving machinery on banks and slopes, within 30 m of riparian areas and waterbodies, except where necessary for remediation activities. These potential impacts would be localized and are not anticipated to negatively impact freshwater aquatic species at a population level.
- Potential effects of contamination will be minimized by housing the pump used for drawing water in a self-contained unit with liner to contain any potential leaks.

- Mortality or harm to fish will be avoided by using a ¼ inch mesh filter specifically designed to prevent fish from being drawn into the pump during pumping operations.
- The PCR will visit the location to conduct post-work inspection and ensure the disturbed areas are on a trajectory to returning to their pre-disturbance state.

7.5 WILDLIFE PROTECTED AREAS

No protected areas are in the vicinity of the Site nor where work is planned, therefore not applicable.

8 PROJECT/ENVIRONMENTAL INTERACTIONS – SOCIO-ECONOMIC

8.1 ARCHAEOLOGICAL AND CULTURAL RESOURCES

Considering the scope of work, as well as the duration, extent, intensity, and frequency of remediation activities, along with the reversibility of their effects and the available mitigation measures, no significant negative impacts on cultural resources are expected, and no residual negative effect is anticipated.

8.1.1 Impacts on Cultural Resources

No archaeological resources were identified during the archaeological assessment in the study area at Speers Lake WK097. However, two modern tent rings and a cache or support structure were observed.

Even though there is no information to determine whether these stone features were associated with the mineral exploration activities or to indigenous occupation of this area, these features *may* represent evidence of modern indigenous land use and therefore they represent future archaeological resources. With the proposed mitigation measures presented in Section 8.1.3, risk of disturbance of these cultural features is not significant.

As for the other Sites where high or moderate archaeological potential were identified, given the limited scope of work, lack of machinery, lack of soil disturbance (no excavation expected), and proposed mitigation measures, no significant negative impacts on cultural resources are expected at other Sites.

8.1.2 Impacts on Traditional Land-Use

In general, the removal of hazardous and non-hazardous debris from the Site is expected to have positive effects on traditional use. Although on short-terms it may impact harvesting activities in certain limits.

Speers Lake is known as a traditional fishing and harvesting area for wolves, wolverine, and arctic hare. While two travel routes exist nearby, they do not cross the Sites. The greater area is also a traditional winter gathering site. Today, Inuit from Kugluktuk continue to visit the area in spring, late fall, and winter for hunting and fishing.

Traditional use directly at Site is expected to be minimal, but potential short-term impacts such as limited access and disturbance to target harvested species, may affect hunting, trapping, and other land uses nearby. Probability of these impacts are further reduced as they will be confined to the small Projects' areas and summertime when the Sites are not known to be accessed by community members.

8.1.3 Proposed Mitigation for Impacts on Cultural Resources and Traditional Land-Use

Mitigation measures are proposed to minimize or prevent potential adverse effects on cultural resources from the Project's remediation activities. The potential impacts have been thoroughly assessed and can be effectively mitigated. These measures address the Project's impact on cultural features.

- Pre-work meetings will be held with all workers to review environmental requirements, including cultural resource protection and public safety. Awareness training will take place during onsite meetings, such as project orientation and daily tailgate sessions.
- Prior to remediation work, the Contractor will be informed of the presence of the 3 modern cultural features (2 tent ring, 1 cache/support). A buffer will be established around, and these will be identified as a “no go zone” for staff, to the extent possible.
- The PCR will be present on-site throughout work activities to oversee and ensure the proper implementation of mitigation measures.

- As per the Historical, Archaeological and Cultural Resources Plan that will be developed and implemented, if any potential archaeological resource or significant features are discovered during the Project, work will be halted immediately. The PCR will then contact the Government of Nunavut Department of Culture and Heritage for instructions on how to properly manage the discovery. The primary method of mitigation will be to avoid the area, with designated buffers established around the Site, and access to these areas will be restricted to prevent disturbance.
- Communities will be informed during the Pre-Construction Community Meeting of the Project schedule and advised to refrain from visiting the area. Wildlife monitors will be involved in the Project to ensure the team is aware of wildlife presence in the area and to provide guidance on preventing or minimizing impacts on them.
- Staff will be informed that visitors must be approved and signed in with the Superintendent Site upon arrival.

8.2 EMPLOYMENT

It is anticipated that there will be short term positive impacts to the local community of Kugluktuk. Contractors bidding on the Project will be required to submit an Inuit Participation Plan and will likely be hiring local Inuit labour and utilizing local Inuit companies, where possible, to complete the work. This may include positions of Wildlife Monitors, Field Assistants and Labourers. Potential local Subcontractors include transportation, camp resupply, and HR support. There will also be capacity-building training opportunities associated with the Project. Accommodations, meals and supplies would be procured locally from Kugluktuk. Local chartered aircraft would be a large part of the budget increasing local spending past 20%.

Pre-Construction Community meetings will be held in Kugluktuk to inform community members of employment opportunities and allow the Contractor to meet interested candidates.

8.3 COMMUNITY WELLNESS

The Project is anticipated to have a positive impact on community wellness as the community will work collaboratively with all Project stakeholders to complete the Project. By providing employment opportunities for local community members on the Site, community members will be directly involved in the removal of debris from the Sites known to have been impacted by previous uses. .

8.4 COMMUNITY INFRASTRUCTURE

The Sites are located over 50 to 100 km from the nearest community and therefore any impacts to Community Infrastructure are not applicable. The scale, duration and number of personnel requiring housing in Kugluktuk will be limited and as such is not expected to cause any significant impacts on the community infrastructure.

8.5 HUMAN HEALTH

The risks to public health are low during the course of the Project as the Sites are infrequently visited. The remedial work planned will reduce the risk of impacts to members of the public in the long term by removing hazardous and non-hazardous debris from the Sites.

8.5.1 Proposed Mitigation for Impacts on Socio-Economic Components

Mitigation measures are proposed to reduce or avoid socio-economic impacts that may occur as a result of Project remediation activities. The potential effects have been adequately considered and can be successfully mitigated.

- Pre-work meetings will be conducted with all workers to discuss the environmental requirements. Awareness training will be conducted at onsite meetings such as project orientation and daily tailgate meetings, and to include considerations of public safety.
- In order to mitigate public health and safety risks, communities will be notified of the anticipated Project schedule and discouraged from visiting.
- Pre-Construction Community well be held in Kugluktuk to inform community members of employment opportunities and allow the Contractor to meet interested candidates.

9 MANAGEMENT AND OPERATIONAL PLANS

The development of management plans and associated staff training will be critical to ensuring that impacts from the Project are anticipated and minimized. These management plans will ensure work is completed in a manner consistent with applicable legislation and regulations and will tackle the potential areas of impact identified in the EIA, as well as how to quickly and effectively address impacts that are unavoidable. They will be reviewed and approved by the

Proponent prior to commencing work and submitted to appropriate Authorities Having Jurisdiction (AHJs). Management Plans required to support the Project include:

- On-site Contingency and Emergency Response Plan;
- Spill Contingency Plan;
- Fire Safety Plan;
- Wildlife Encounter and Management Plan;
- Fuel Management Plan;
- Wildlife Protection Plan;
- Erosion Sediment and Drainage Control Plan;
- In Stream or Near Water Works Work Methodology Plan;
- Mobilization and Demobilization Plan;
- Environmental Protection Plan;
- Waste Management Plan;
- Burn Plan;
- Historical, Archaeological and Cultural Resources Plan; and
- Site-Specific Health and Safety Plan.

The Contractor, PCR, PSPC, CIRNAC, and a wildlife monitor will conduct pre-work surveys of the Sites to help establish the location of ecologically sensitive areas and associated buffers, as well as assisting in defining appropriate locations for the camp, laydown, and staging areas, on site trails, borrow sources and buffer zones to minimize impacts.

A PCR will be on site throughout the Project. The PCR will be responsible for conducting pre-work meetings with workers to discuss the environmental requirements and complete awareness training. The PCR will also be responsible for ensuring that the environmental requirements of the Project are applied as intended including, but not limited to, the implementation of buffer zones and management plans. Upon completion of the Project, the PCR will conduct post-work inspection and ensure the disturbed areas are on a trajectory to returning to their pre-disturbance state.

10 RESIDUAL IMPACTS

The Project involves the removal of the majority of the Sites' debris and all equipment and materials used to support the remedial plan. The material remaining on Site will include rock core and a concrete pad. The risk remaining from these materials is considered negligible. No negative residual impacts are expected.

11 CUMULATIVE ENVIRONMENTAL EFFECTS

11.1 PAST AND EXISTING STRESSORS

The Speers Lake Sites have been used in some capacity between pre-World War I and through the 90s when the Sites were eventually abandoned, their use has been relatively limited since. Six of the seven Sites, Speers Lake (WK097), Asiak River (WK154), Tahiapik River (WK170), Impact Lake (WK176), Coppermine Area (WK199), and Coppermine Area 210 (WK210) were mineral exploration sites. Kendall River (WK165) operated as a fishing outpost. Section 5.10.1 provides specific details of the past land uses at each Site.

11.2 RESULTING CONTRIBUTION

This Project involves the removal of the majority of debris on the Sites. Clean (unpainted and untreated) wood waste will be burned, and the ash removed. The material remaining on the Sites will include rock core and a concrete pad which will be consolidated into a single location at each Site if possible. The overall goal is to enhance the quality of habitats and wildlife and to remove hazardous risks at the Sites. A summary of impacts associated with each of the aspects of the Project scope is presented in **Appendix C**.

Considering the limited scope and duration of the Project potential impacts, combined with those of any other project that has been carried out, is being carried out or is likely to be carried out in the area, no cumulative ecosystemic and socioeconomic impacts are expected.

11.3 EFFECTS ON RENEWABLE RESOURCES

While natural resources will be used (e.g., borrow, water) and impacted (e.g., borrow sources, wildlife, vegetation) during the course of work, the impacts will be limited to the 50 – 60 days during remediation. Further, the intent of the Project is to improve the natural environment and thus is anticipated to have a positive long-term effect on fish and wildlife species and their habitat.

With proper mitigation measures in place, no negative cumulative impacts are anticipated to natural resources.

11.4 EFFECTS ON HERITAGE VALUES

No archaeological sites requiring protection have been identified on the Sites, however, a suspected tent ring site has been identified at the Speers Lake (WK097) Site. With the implementation of a buffer and “no go zone”, no negative impacts are expected. No other archaeological sites were identified at the other six Sites.

11.5 MITIGATION MEASURES

No negative cumulative impacts have been identified, and no unique mitigation measures have been developed to address cumulative impacts.

12 KNOWLEDGE DEFICIENCIES

The source of information pertaining to the presence of wildlife, habitat, and SAR on the Sites is limited to literature reviews, professional judgement and information provided from the environmental investigation team that visited the Sites in 2023. No vegetation or wildlife surveys have been conducted. Despite knowledge deficiencies, measures to avoid, mitigate and/or rehabilitate negative impacts to vegetation and wildlife are available (as described in Section 7), and if applied correctly should serve to protect environmental values including SAR.

Additionally, consultation and incorporation of Traditional Ecological knowledge (TEK) has been initiated at the onset of the Project but remain limited. Ongoing engagement will continue throughout the Project and the support of the Wildlife Monitor in the management of the Project's impacts will allow for further incorporation of TEK.

Finally, Archaeological field surveys were not conducted at six of the Project Sites. Desktop assessments of the archaeological potential of the Sites were conducted to ensure no known archaeological or cultural features were located near the work areas. Despite knowledge deficiencies, limited scope of work at the Sites and the development and implementation of the Historical, Archaeological and Cultural Resources Plan to avoid and mitigate any potential negative impacts should be sufficient to adequately protect archaeological features.

13 PUBLIC CONCERNS

The community engagement documented in the Community Engagement Minutes (BLM-KEL-60, 2024b) identified the communities' positive perspective of the remediation work. A Pre-Construction Meeting to discuss work planned and employment opportunities and a Post-Construction Meeting to share results of the program will provide further opportunity for community feedback.

Overall, the remediation Project is anticipated to provide a desirable outcome to the local communities who may periodically visit the Site.

14 CONCLUSIONS AND RECOMMENDATIONS

The intent of this Project is to improve the environment at the Sites. Currently hazardous and non-hazardous materials, such as abandoned buildings, equipment, barrels, and their contents pose risks to both humans and wildlife. The Project will involve the burning of all untreated/unpainted wood and the removal of the majority of the hazardous and non-hazardous materials and debris at the Sites. Rock core from the exploration activities at select Sites as well as a concrete slab will be left on site, but all hazardous materials will be removed from them to reduce the future risks. The work planned will have a positive impact to the Sites and surrounding habitat in the long term. Furthermore, the removal of health and safety risk and hazardous and non-hazardous will prevent future potential injury to visitors.

In the short term, species and their habitats are expected to be impacted. The majority of this impact will be in the form of disturbance from the presence of humans and machinery and the accompanying noise, dust and activity. There is the possibility of more serious impacts from spills, fires, erosion and sedimentation and encounters with wildlife, however, these will be mitigated by the development of a comprehensive set of management plans developed, reviewed, and approved prior to commencing work. These will include fuel and spills management, emergency response, wildlife management, erosion and sedimentation control among others and will be designed to proactively anticipate and reduce impacts and effectively address any contraventions. Ultimately, the negative impacts are anticipated to be offset by an overall improved environment and habitat to support species in the future.

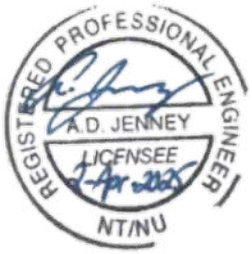
15 CLOSURE AND STATEMENT OF LIMITATIONS

The observations and results obtained during this investigation are representative of the conditions encountered at the sampling locations during the site investigation only. The conditions that BluMetric interprets to exist at, between, and beyond sampling points may differ from those that actually exist. The statements made in this report are based solely on the information obtained to date as part of the above referenced investigation. BluMetric has used its professional judgment in analyzing this information and formulating its conclusions. No other warranty or representation expressed or implied, as to the accuracy of the information or recommendations is included or intended in this report.

BluMetric Environmental Inc. makes no warranty as to the accuracy or completeness of the information provided by others, or of conclusions and recommendations predicated on the accuracy of that information. BluMetric Environmental Inc. accepts no responsibility for any loss or damages suffered by any unauthorized third party as a result of decisions made or actions taken based on this report.

Respectfully submitted,

Stephen Anderson, M.Sc.
Environmental Scientist, BluMetric



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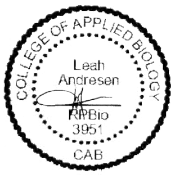

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Biologist, Ecofor

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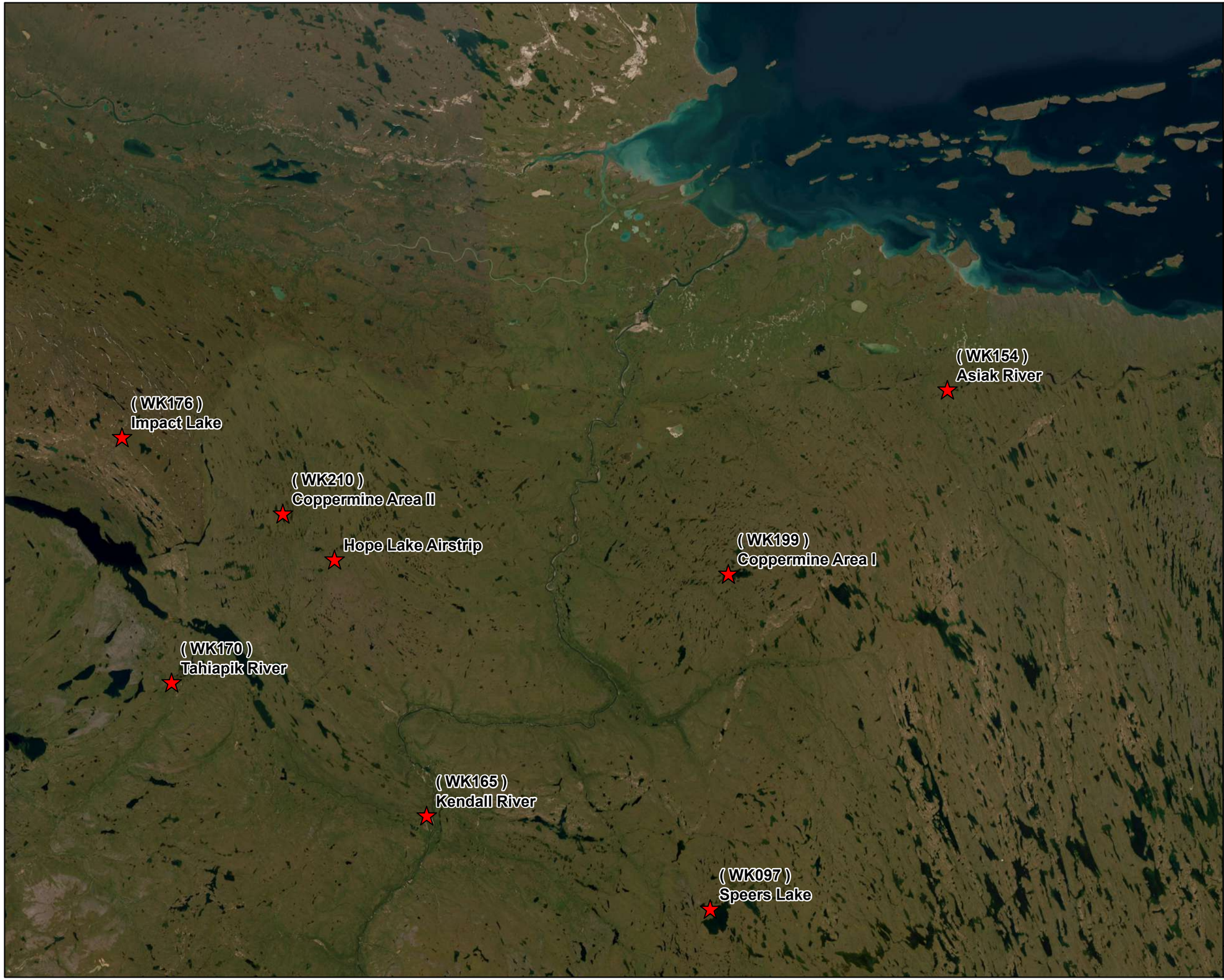
FIGURES



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CLIENT

Public Services and Procurement Canada

PROJECT

Environmental Impact Assessment
Speers Lake Sites Kitikmeot Region, Nunavut

TITLE

Site Locations

BLM-KEL-60
A Kitikmeot JV Corporation
BluMetric • KBL • Accutech
30b Mitik Street Cambridge Bay, NU X0B 0C0

PROJECT #	*DATE*		
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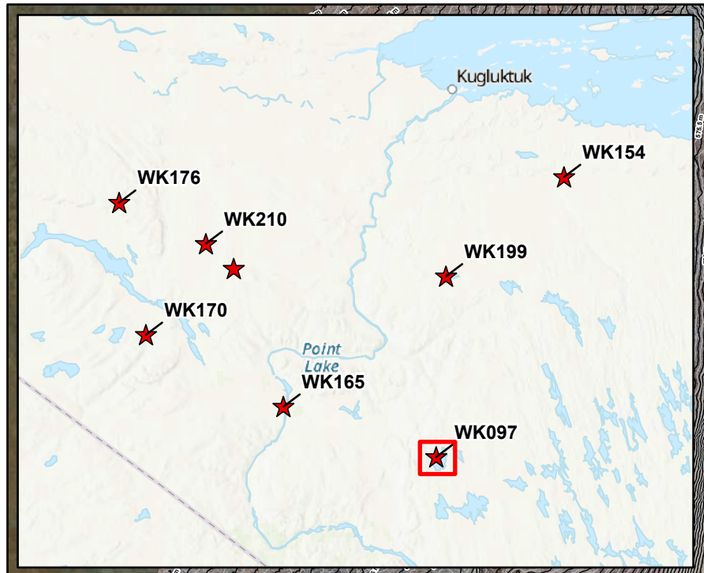

Speers Lake

LEGEND

- North Site Outline
- South Site Outline
- Intermediate Contour (0.5 m)
- Major Contour (1 m)
- Approximate CAT Train Trail
- Site Locations

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REFERENCES

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CLIENT

Public Services and Procurement Canada

PROJECT

Environmental Impact Assessment
Speers Lake Sites Kitikmeot Region, Nunavut

TITLE

Speers Lake (WK097)
Site Location

BLM-KEL-60
A Kitikmeot JV Corporation
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30b Mitik Street Cambridge Bay, NU X0B 0C0

PROJECT #	*DATE*		
230468	**February 24, 2025**		
DRAWN	*CHECKED*	*FIG NO.*	*REV*
PB	**SA**	**02**	**0**

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LEGEND

- North Site Outline
- Debris
- Barrel
- Lead Batteries
- Barrel Cache
- Former Structure

REV.	DESCRIPTION	YY/MM/DD	BY	CHK
1				

REFERENCES

DO NOT SCALE DRAWING.
THIS DRAWING MAY HAVE BEEN REDUCED. ALL SCALE NOTATIONS INDICATED ARE BASED ON 11"x17" FORMAT DRAWINGS.

N W E S

0 5 10 15 20 25 Metres

1:500

CLIENT

Public Services and Procurement Canada

PROJECT

Environmental Impact Assessment
Speers Lake Sites Kitikmeot Region, Nunavut

TITLE

Speers Lake (WK097)
North Area Site Features

BLM-KEL-60
A Kitikmeot JV Corporation
BluMetric • KBL • Accutech
30b Mitik Street Cambridge Bay, NU X0B 0C0

PROJECT #	*DATE*		
230468	**February 24, 2025**		
DRAWN	*CHECKED*	*FIG NO.*	*REV*
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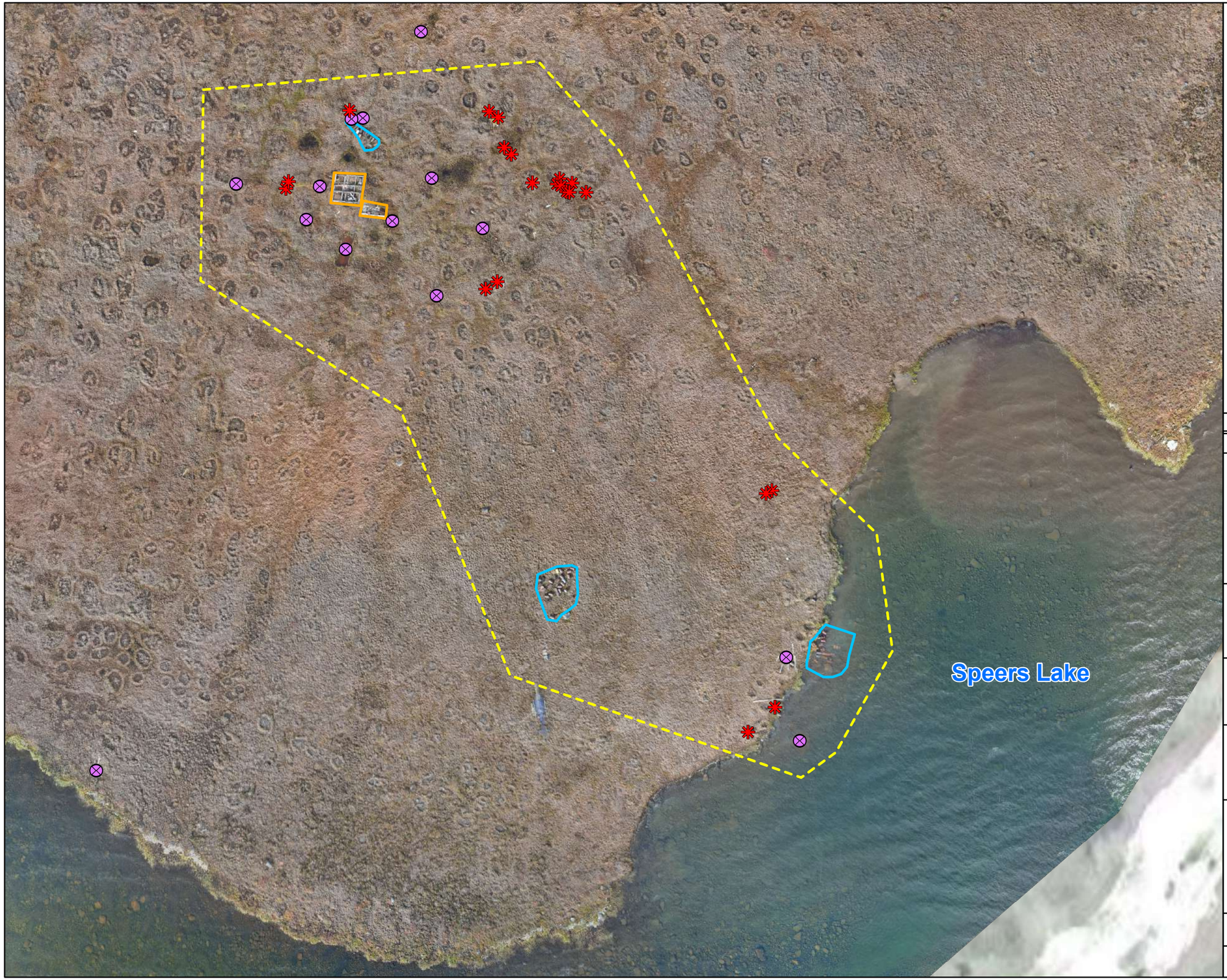

LEGEND

- South Site Outline
- Debris
- Barrel
- Barrel Cache
- Former Structure

REV.	DESCRIPTION	YY/MM/DD	BY	CHK
1				

REFERENCES

DO NOT SCALE DRAWING.
THIS DRAWING MAY HAVE BEEN REDUCED. ALL SCALE NOTATIONS INDICATED ARE BASED ON 11"x17" FORMAT DRAWINGS.

N W E S

0 5 10 15 20 25 Metres

1:750

CLIENT

Public Services and Procurement Canada

PROJECT

Environmental Impact Assessment Speers Lake Sites Kitikmeot Region, Nunavut

TITLE

Speers Lake (WK097) South Site Features

BLM-KEL-60
A Kitikmeot JV Corporation
BluMetric • KBL • Accutech
30b Mitik Street Cambridge Bay, NU X0B 0C0

PROJECT #	*DATE*
230468	**February 24, 2025**

DRAWN	*CHECKED*	*FIG NO.*	*REV*
PB	**SA**	**04**	**0**

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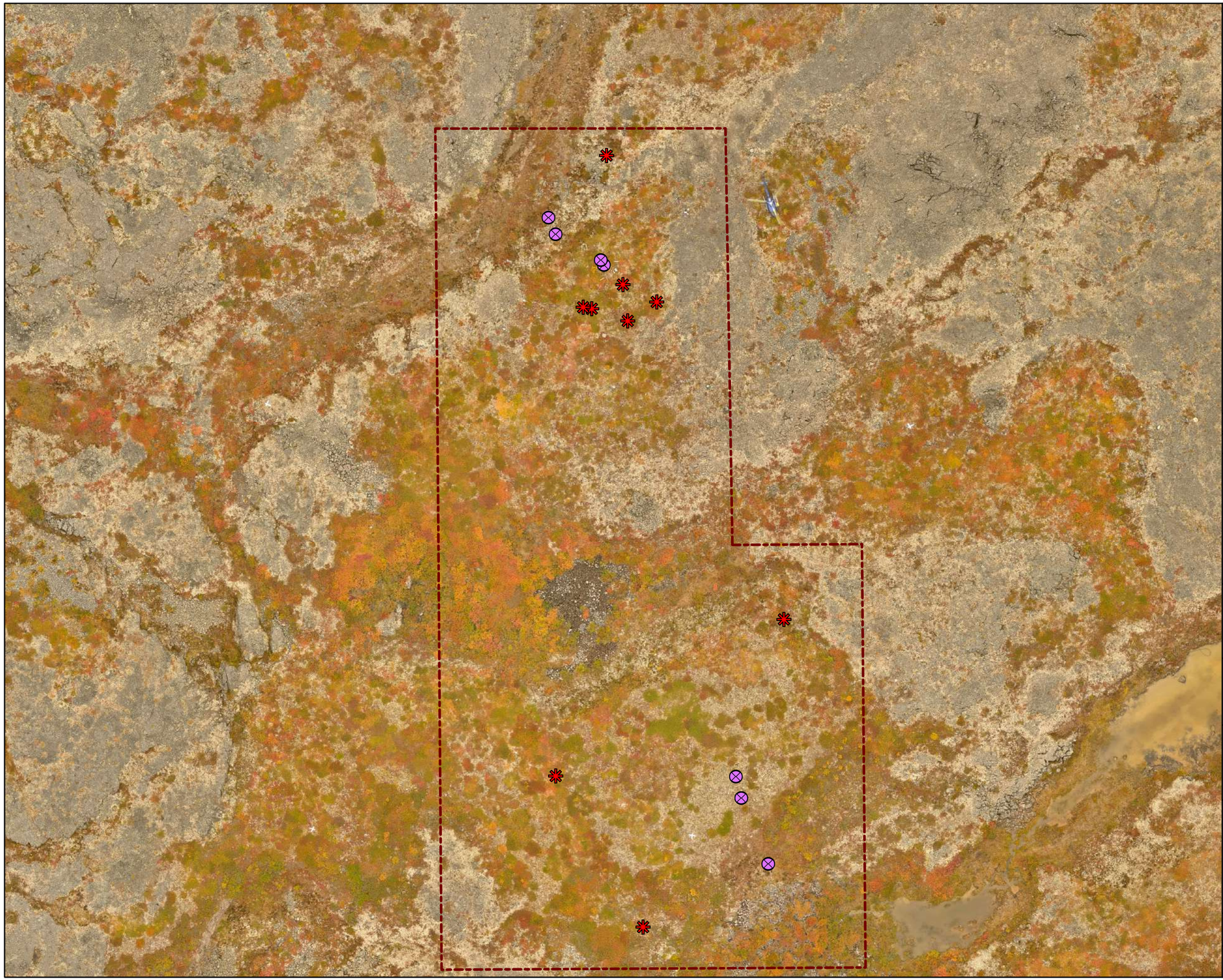

LEGEND

- Site Boundary (approximate)
- Debris
- Barrel

REV.	DESCRIPTION	YY/MM/DD	BY	CHK
1				

REFERENCES

DO NOT SCALE DRAWING.
THIS DRAWING MAY HAVE BEEN REDUCED. ALL SCALE NOTATIONS INDICATED ARE BASED ON 11"x17" FORMAT DRAWINGS.

N W E S

0 20 40 Metres

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CLIENT

Public Services and Procurement Canada

PROJECT

Environmental Impact Assessment
Speers Lake Sites Kitikmeot Region, Nunavut

TITLE

Asiak River Site (WK154)
Site Features

BLM-KEL-60
A Kitikmeot JV Corporation
BluMetric • KBL • Accutech

30b Mitik Street Cambridge Bay, NU X0B 0C0

PROJECT #	*DATE*		
230468	**February 24, 2025**		
DRAWN	*CHECKED*	*FIG NO.*	*REV*
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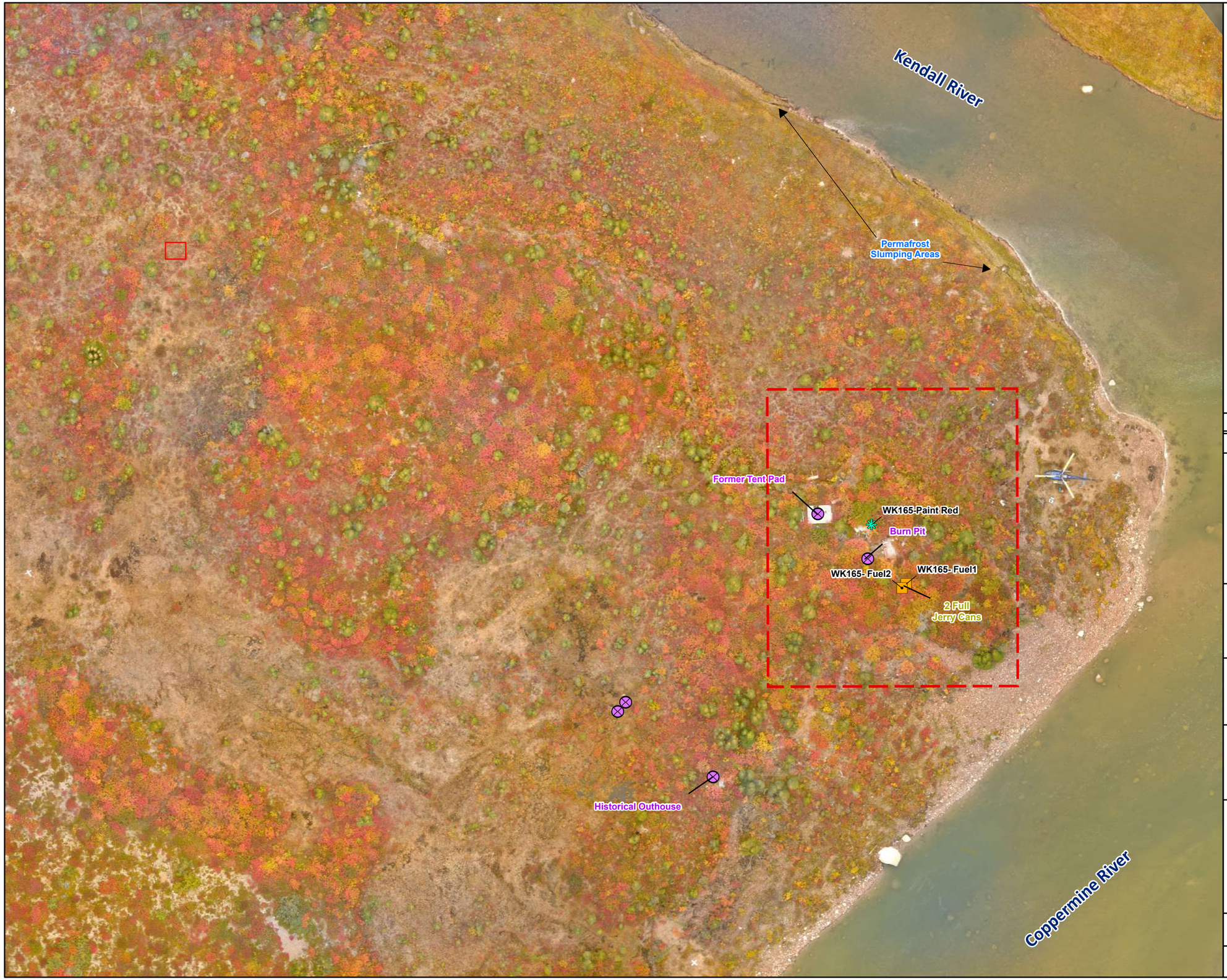

LEGEND

- Site Area (Approximate)
- Debris
- Fuel Sample Location
- Paint Sample Location

REV.	DESCRIPTION	YY/MM/DD	BY	CHK
1				

REFERENCES

DO NOT SCALE DRAWING.
THIS DRAWING MAY HAVE BEEN REDUCED. ALL SCALE NOTATIONS INDICATED ARE BASED ON 11"x17" FORMAT DRAWINGS.

N W E S

0 10 20 Metres

1:750

CLIENT

Public Services and Procurement Canada

PROJECT

Environmental Impact Assessment Speers Lake Sites Kitikmeot Region, Nunavut

TITLE

Kendall River Site (WK165) Site Features

BLM-KEL-60
A Kitikmeot JV Corporation
BluMetric • KBL • Accutech
30b Mitik Street Cambridge Bay, NU X0B 0C0

PROJECT #	*DATE*
230468	**February 24, 2025**

DRAWN	*CHECKED*	*FIG NO.*	*REV*
PB	**SA**	**06**	**0**

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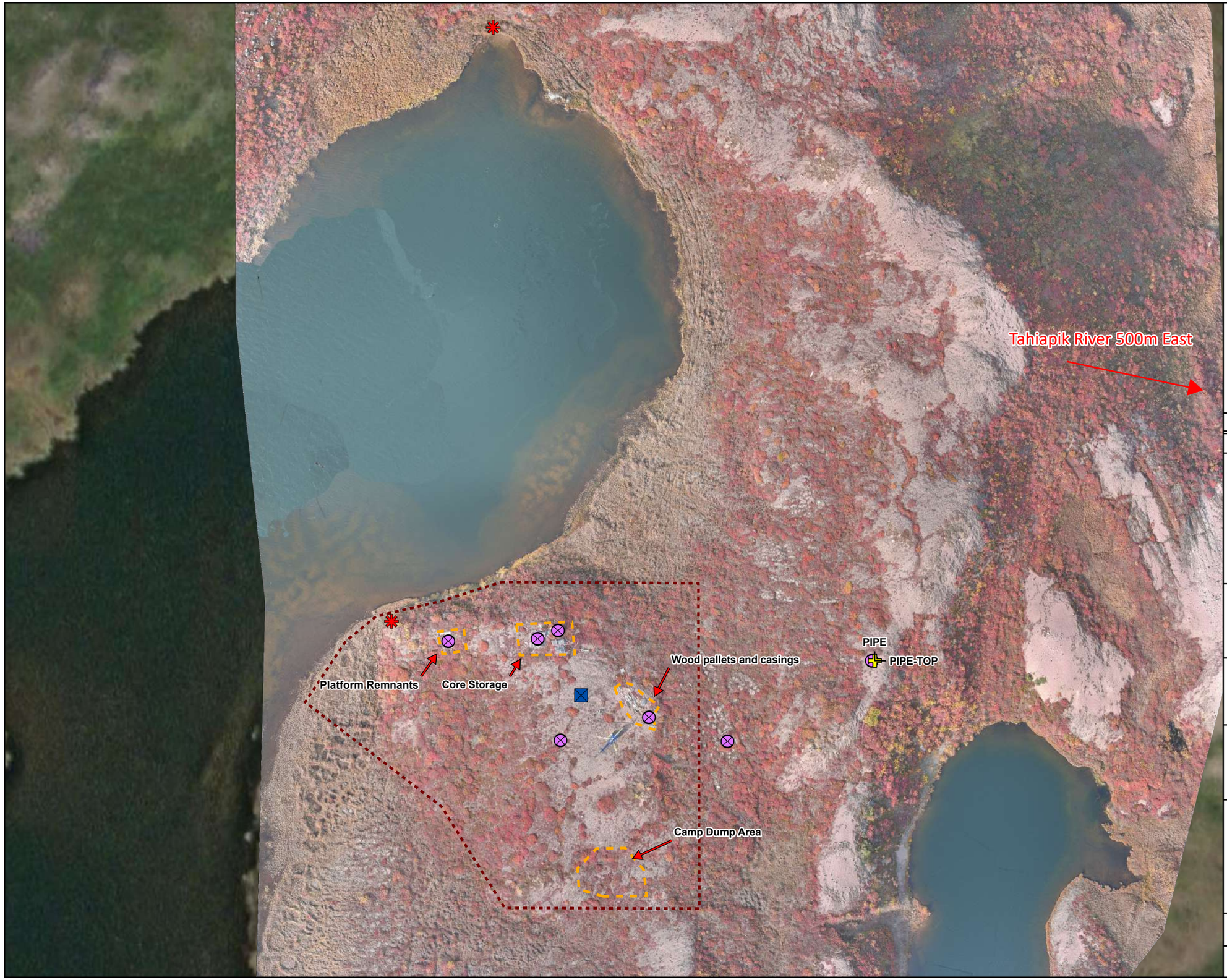

LEGEND

- Site Area (Approximate)
- Site Feature Areas
- Site Feature
- Burn Pit
- Debris
- Barrel

REV.	DESCRIPTION	YY/MM/DD	BY	CHK
1				

REFERENCES

DO NOT SCALE DRAWING.
THIS DRAWING MAY HAVE BEEN REDUCED. ALL SCALE NOTATIONS INDICATED ARE BASED ON 11"x17" FORMAT DRAWINGS.

N W E S

0 20 40 Metres

1:1,250

CLIENT

Public Services and Procurement Canada

PROJECT

Environmental Impact Assessment Speers Lake Sites Kitikmeot Region, Nunavut

TITLE

Tahiapik River Site (WK170) Site Features

BLM-KEL-60
A Kitikmeot JV Corporation
BluMetric • KBL • Accutech
30b Mitik Street Cambridge Bay, NU X0B 0C0

PROJECT #	*DATE*		
230468	**February 24, 2025**		
DRAWN	*CHECKED*	*FIG NO.*	*REV*
PB	**SA**	**07**	**0**

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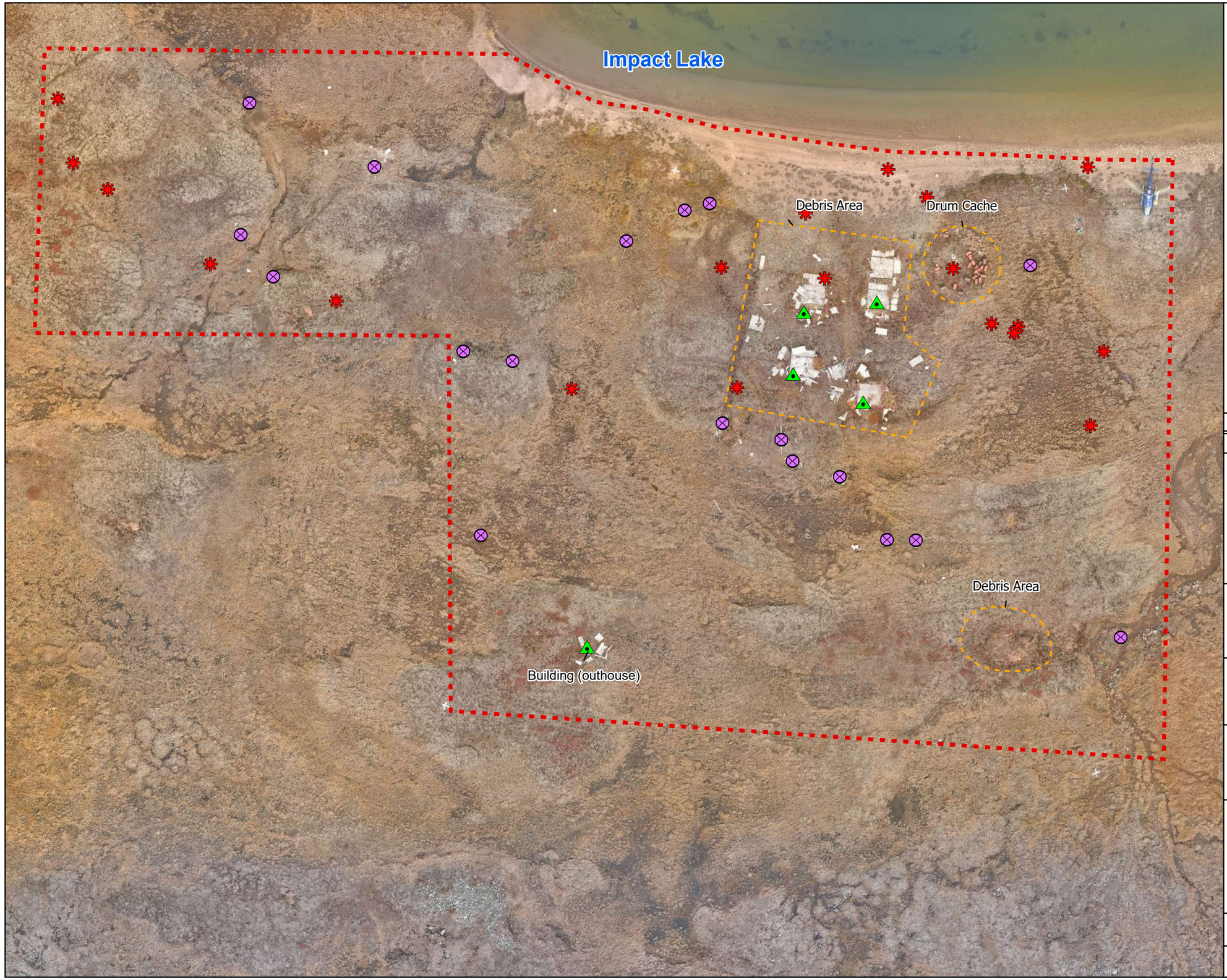

LEGEND

- Barrel
- Former Structure
- Debris
- Site Area (Approximate)
- WK176 Site Feature Areas

REV.	DESCRIPTION	YY/MM/DD	BY	CHK
1				

REFERENCES

DO NOT SCALE DRAWING.
THIS DRAWING MAY HAVE BEEN REDUCED. ALL SCALE NOTATIONS INDICATED ARE BASED ON 11"x17" FORMAT DRAWINGS.

N W E S

0 10 20 Metres

1:650

CLIENT

Public Services and Procurement Canada

PROJECT

Environmental Impact Assessment
Speers Lake Sites Kitikmeot Region, Nunavut

TITLE

Impact Lake Site (WK176)
Site Features

BLM-KEL-60
A Kitikmeot JV Corporation
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30b Mitik Street Cambridge Bay, NU X0B 0C0

PROJECT #	*DATE*		
230468	**February 24, 2025**		
DRAWN	*CHECKED*	*FIG NO.*	*REV*
PB	**SA**	**08**	**0**

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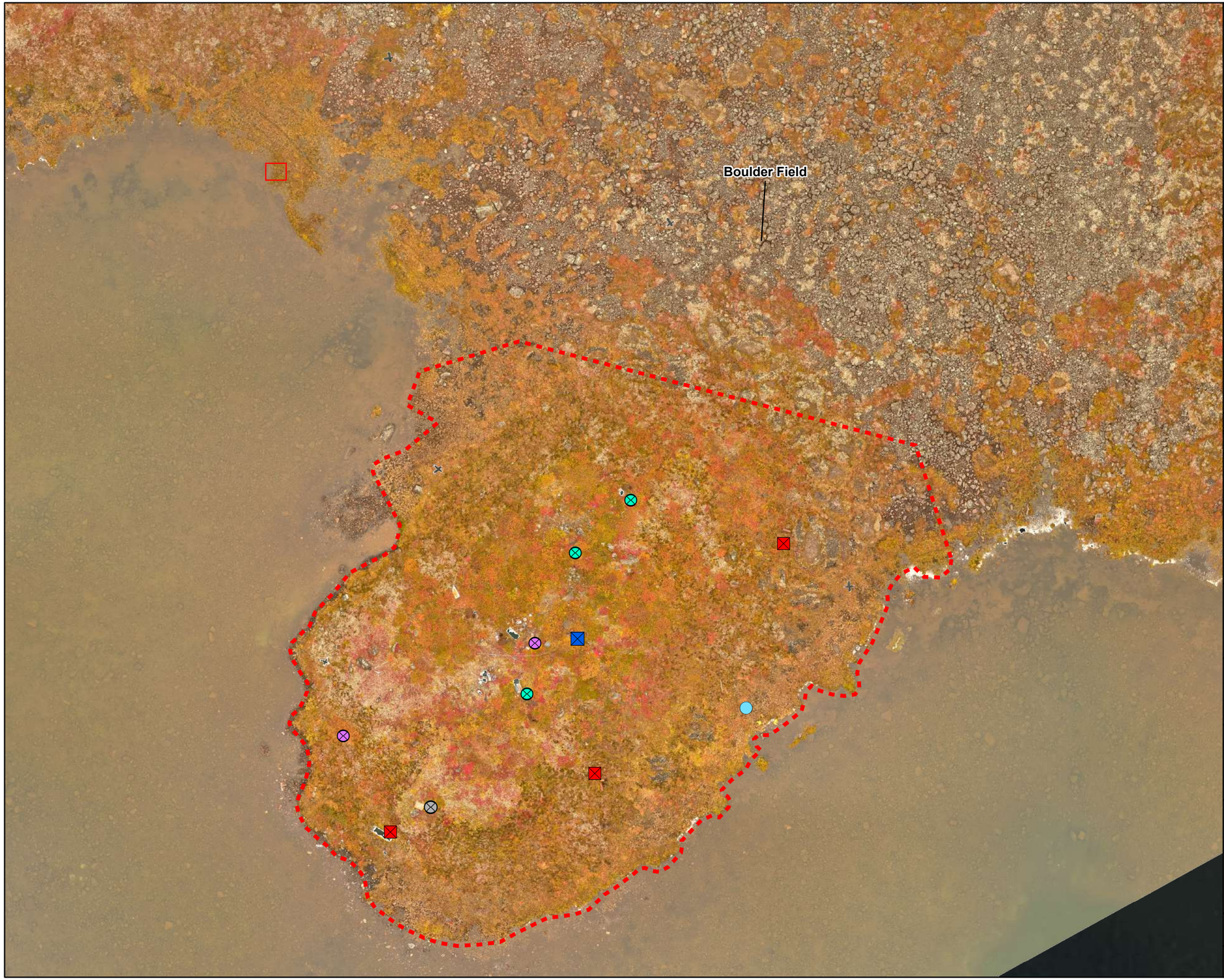

LEGEND

Site Area (Approximate)

Site Features

- Debris
- Barrel
- Concrete Pad
- Burn Pit
- Machinery
- Drill Core
- Tank

Inuit Owned Land

REV.	DESCRIPTION	YY/MM/DD	BY	CHK
1				

REFERENCES

N W E S

0 10 20 Metres

1:500

CLIENT

Public Services and Procurement Canada

PROJECT

Environmental Impact Assessment Speers Lake Sites Kitikmeot Region, Nunavut

TITLE

Coppermine Area Site (WK199) Site Features

BLM-KEL-60
A Kitikmeot JV Corporation
BluMetric • KBL • Accutech

30b Mitik Street Cambridge Bay, NU X0B 0C0

PROJECT #	*DATE*		
230468	**February 24, 2025**		
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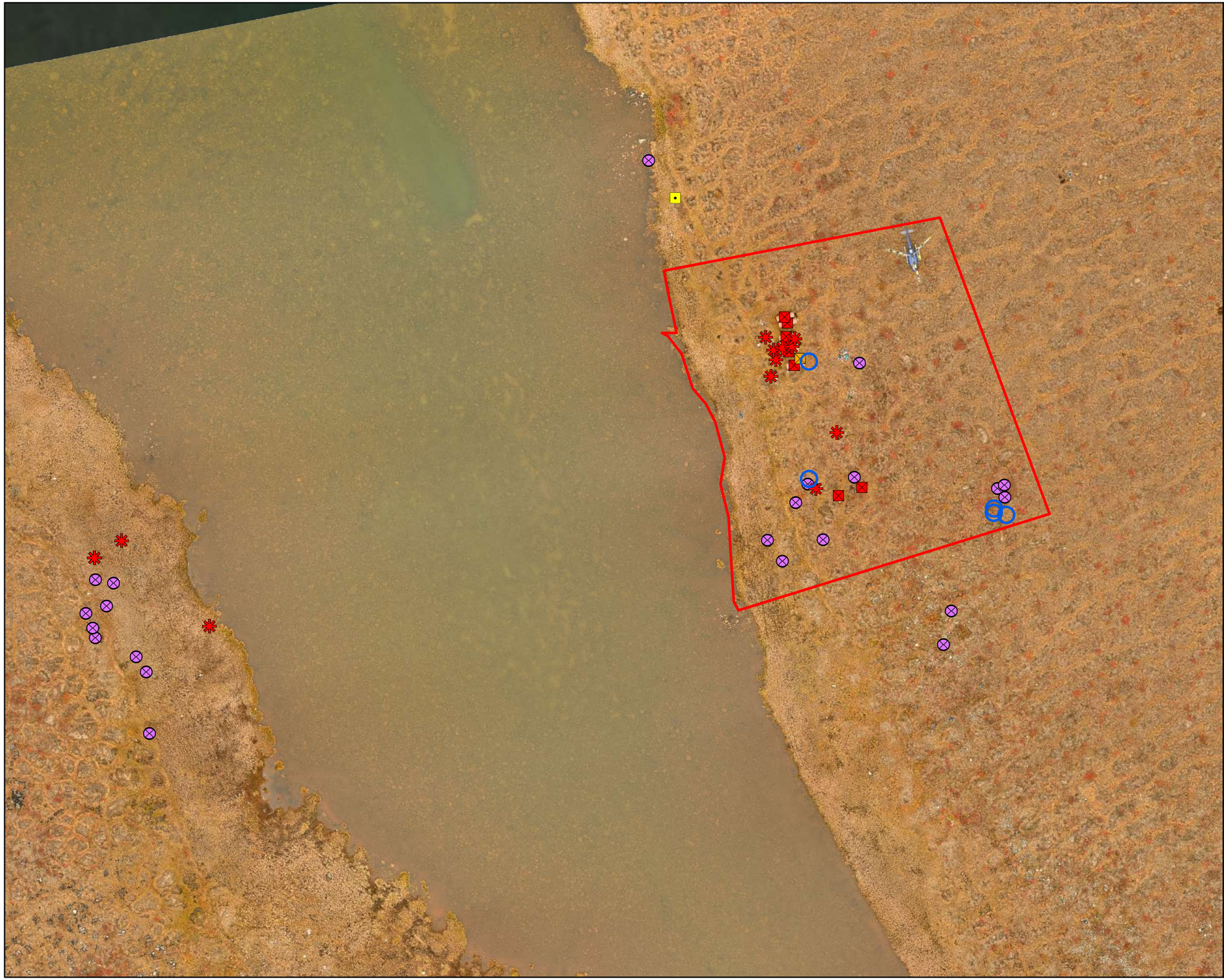

LEGEND

- Site Boundary (approximate)
- Debris
- Tank
- Barrel
- Gas Cylinder
- Jerry Can
- Mini-Barrel

REV.	DESCRIPTION	YY/MM/DD	BY	CHK
1				

REFERENCES

DO NOT SCALE DRAWING.
THIS DRAWING MAY HAVE BEEN REDUCED. ALL SCALE NOTATIONS INDICATED ARE BASED ON 11"x17" FORMAT DRAWINGS.

N W E S

0 10 20 Metres

1:750

CLIENT

Public Services and Procurement Canada

PROJECT

Environmental Impact Assessment Speers Lake Sites Kitikmeot Region, Nunavut

TITLE

Coppermine Area Site (WK210) Site Features

BLM-KEL-60
A Kitikmeot JV Corporation
BluMetric • KBL • Accutech

30b Mitik Street Cambridge Bay, NU X0B 0C0

PROJECT #	*DATE*		
230468	**February 24, 2025**		
DRAWN	*CHECKED*	*FIG NO.*	*REV*
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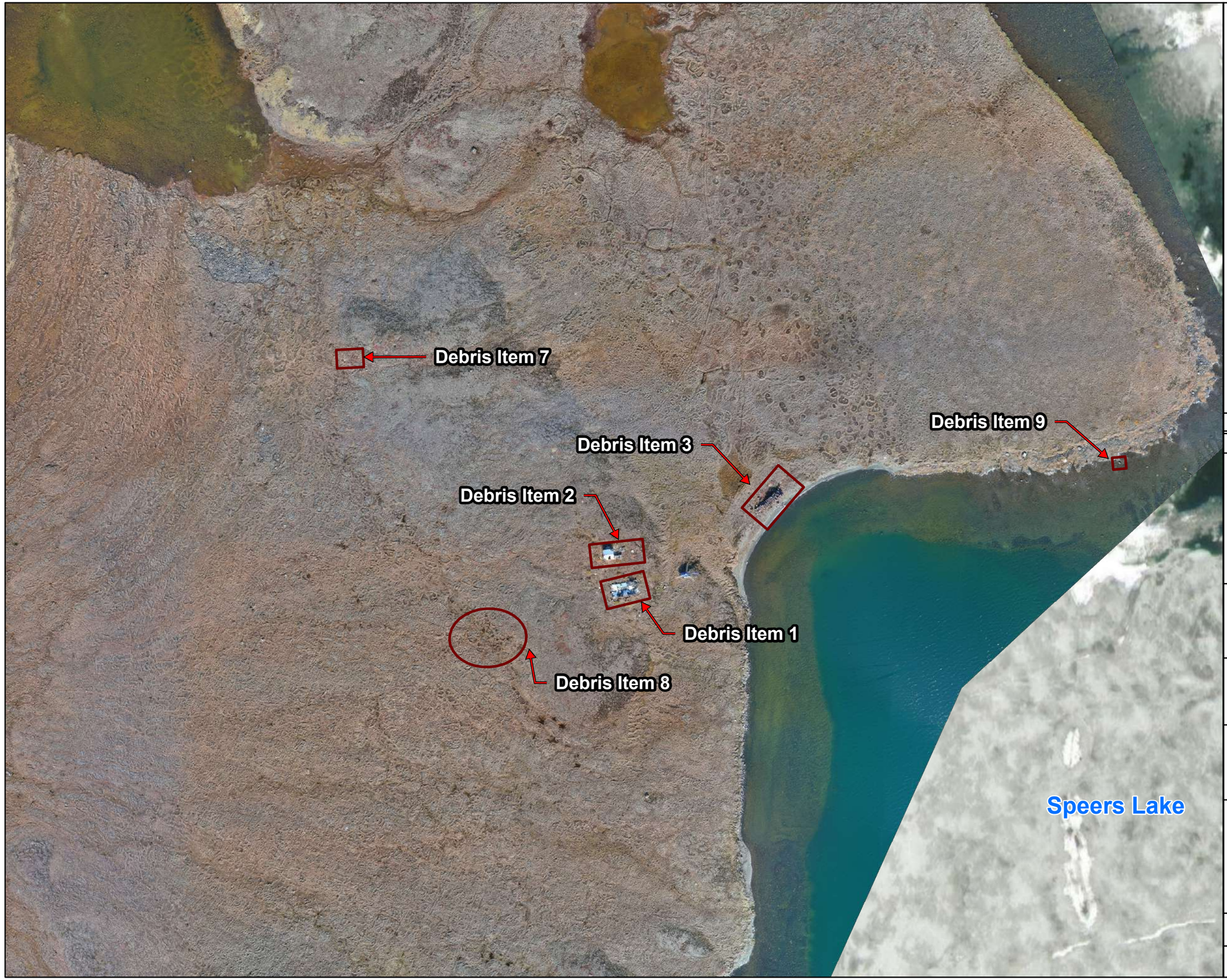

LEGEND

Debris Items

REV.	DESCRIPTION	YY/MM/DD	BY	CHK
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REFERENCES

THIS DRAWING MAY HAVE BEEN REDUCED. ALL SCALE NOTATIONS INDICATED ARE BASED ON 11"x17" FORMAT DRAWINGS.

N W E S

0 10 20 30 40 50 Metres

1:1,750

CLIENT

Public Services and Procurement Canada

PROJECT

Environmental Impact Assessment
Speers Lake Sites Kitikmeot Region, Nunavut

TITLE

Speers Lake (WK097)
North Area Site Debris

BLM-KEL-60
A Kitikmeot JV Corporation
BluMetric • KBL • Accutech
30b Mitik Street Cambridge Bay, NU X0B 0C0

PROJECT #	*DATE*		
230468	**February 24, 2025**		
DRAWN	*CHECKED*	*FIG NO.*	*REV*
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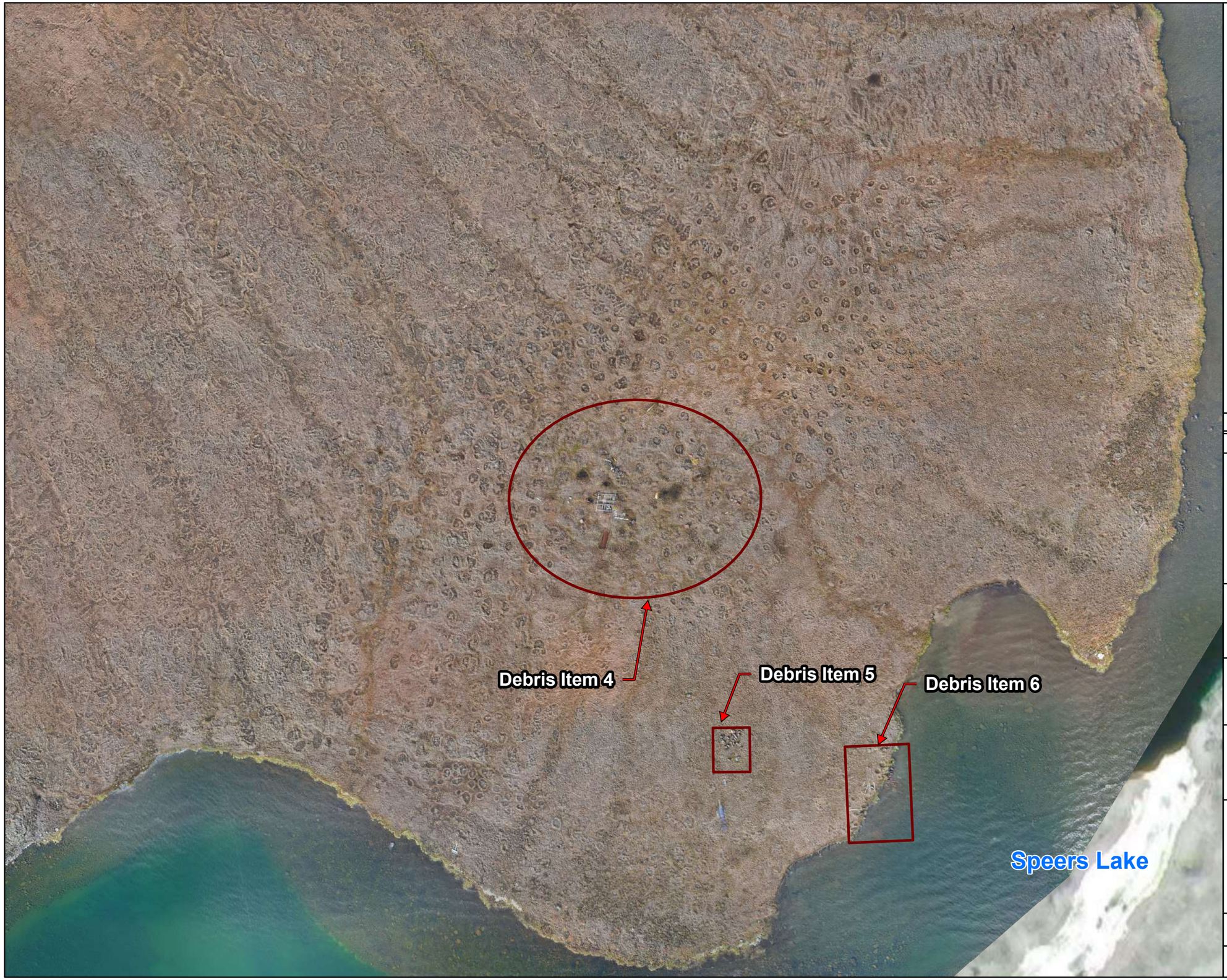

LEGEND

Debris Items

REV.	DESCRIPTION	YY/MM/DD	BY	CHK
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REFERENCES

DO NOT SCALE DRAWING.
THIS DRAWING MAY HAVE BEEN REDUCED. ALL SCALE NOTATIONS INDICATED ARE BASED ON 11"x17" FORMAT DRAWINGS.

N W E S

0 5 10 15 20 25 Metres

1:1,250

CLIENT

Public Services and Procurement Canada

PROJECT

Environmental Impact Assessment
Speers Lake Sites Kitikmeot Region, Nunavut

TITLE

Speers Lake (WK097)
South Area Site Debris

BLM-KEL-60
A Kitikmeot JV Corporation
BluMetric • KBL • Accutech
30b Mitik Street Cambridge Bay, NU X0B 0C0

PROJECT #	*DATE*		
230468	**February 24, 2025**		
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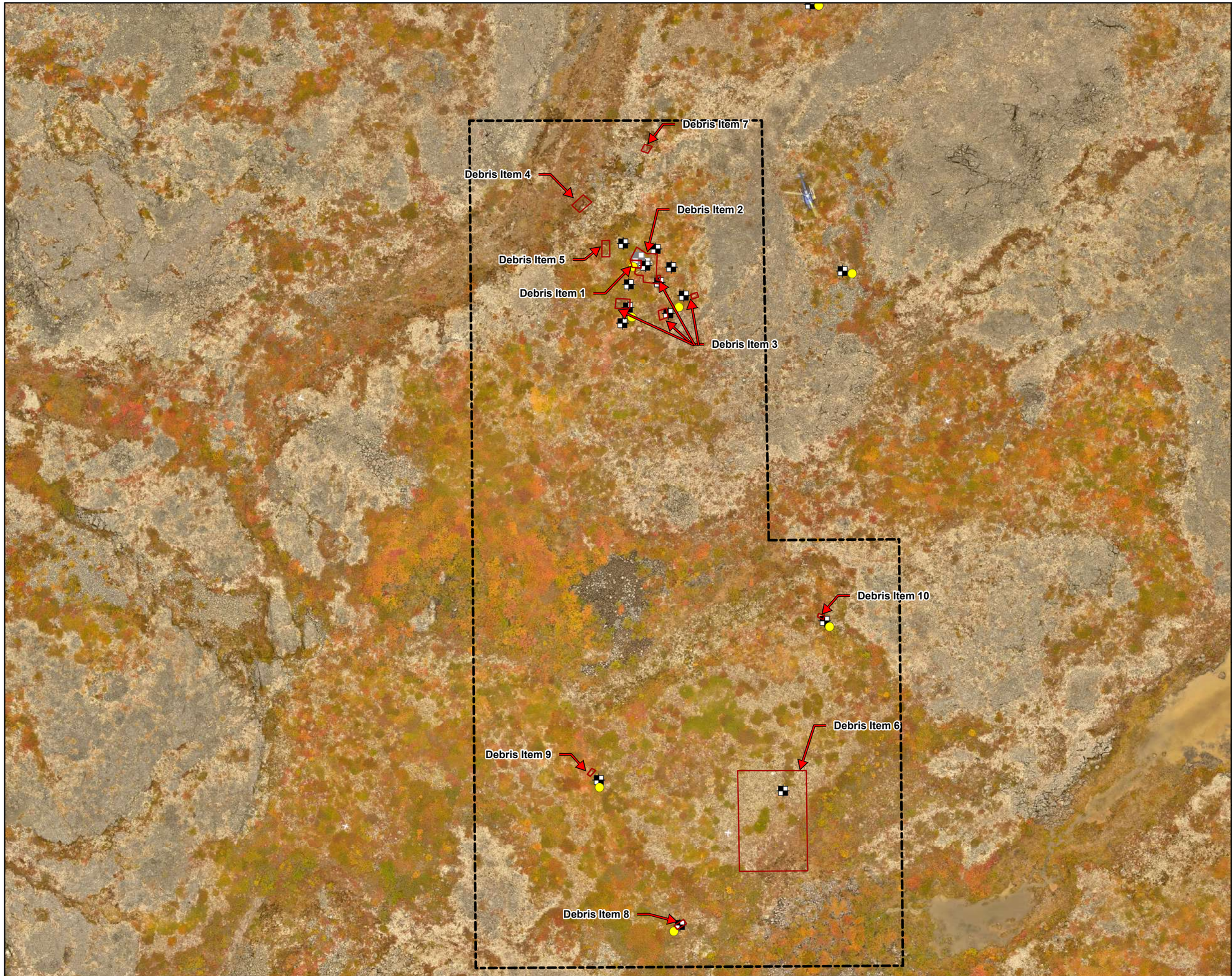

LEGEND

- Site Boundary (approximate)
- Soil Sample Location
- Vegetation Sample Location

Historical Sample Location (Golder 2005)

- Historical Sample Soil Sample
- Debris Areas
- RPA guide

REV.	DESCRIPTION	YY/MM/DD	BY	CHK
1				

REFERENCES

DO NOT SCALE DRAWING.
THIS DRAWING MAY HAVE BEEN REDUCED. ALL SCALE NOTATIONS INDICATED ARE BASED ON 11"x17" FORMAT DRAWINGS.

N W E S

0 10 20 Metres

1:850

CLIENT

Public Services and Procurement Canada

PROJECT

Environmental Impact Assessment Speers Lake Sites Kitikmeot Region, Nunavut

TITLE

Asiak River Site (WK154) Hazardous and Non-Hazardous Materials Inventory Results

BLM-KEL-60
A Kitikmeot JV Corporation
BluMetric • KBL • Accutech
30b Mitik Street Cambridge Bay, NU X0B 0C0

PROJECT #	*DATE*		
230468	**February 24, 2025**		
DRAWN	*CHECKED*	*FIG NO.*	*REV*
PB	**SA**	**13**	**0**

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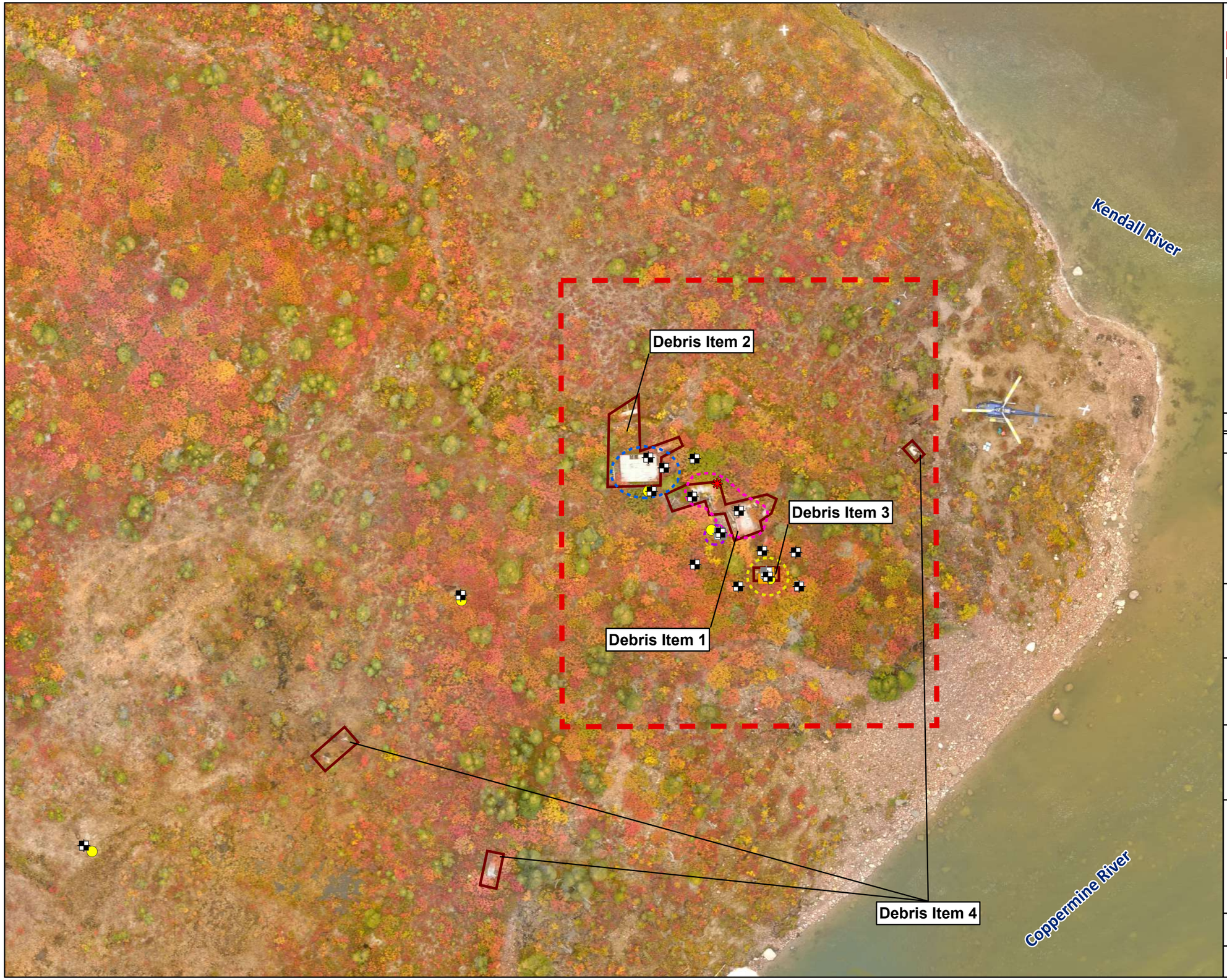

LEGEND

- Site Area (Approximate)
- Debris Area
- Soil Sample Location
- Historical Soil Sample Location
- Vegetation Sample Location
- Fuel Sample Location
- Paint Sample Location
- RPA Guide

Areas of Concern / Areas of Potential Environmental Concern

- AEC 1 - Jerry Can Storage Area
- AEC 2 - Burn Pit
- APEC 3 - Debris Area 1
- APEC 4 - Debris Area 2

NOTES:
Debris Items are described in the Debris Inventory (Table E-1) provided in Appendix E of the accompanying report

REV.	DESCRIPTION	YY/MM/DD	BY	CHK
1				

REFERENCES

N W E S

0 10 20 Metres

1:500

CLIENT

Public Services and Procurement Canada

PROJECT

Environmental Impact Assessment Speers Lake Sites Kitikmeot Region, Nunavut

TITLE

Kendall River Site (WK165) Hazardous and Non-Hazardous Materials Inventory Results

BLM-KEL-60
A Kitikmeot JV Corporation
BluMetric • KBL • Accutech
30b Mitik Street Cambridge Bay, NU X0B 0C0

PROJECT #	*DATE*		
230468	**February 24, 2025**		
DRAWN	*CHECKED*	*FIG NO.*	*REV*
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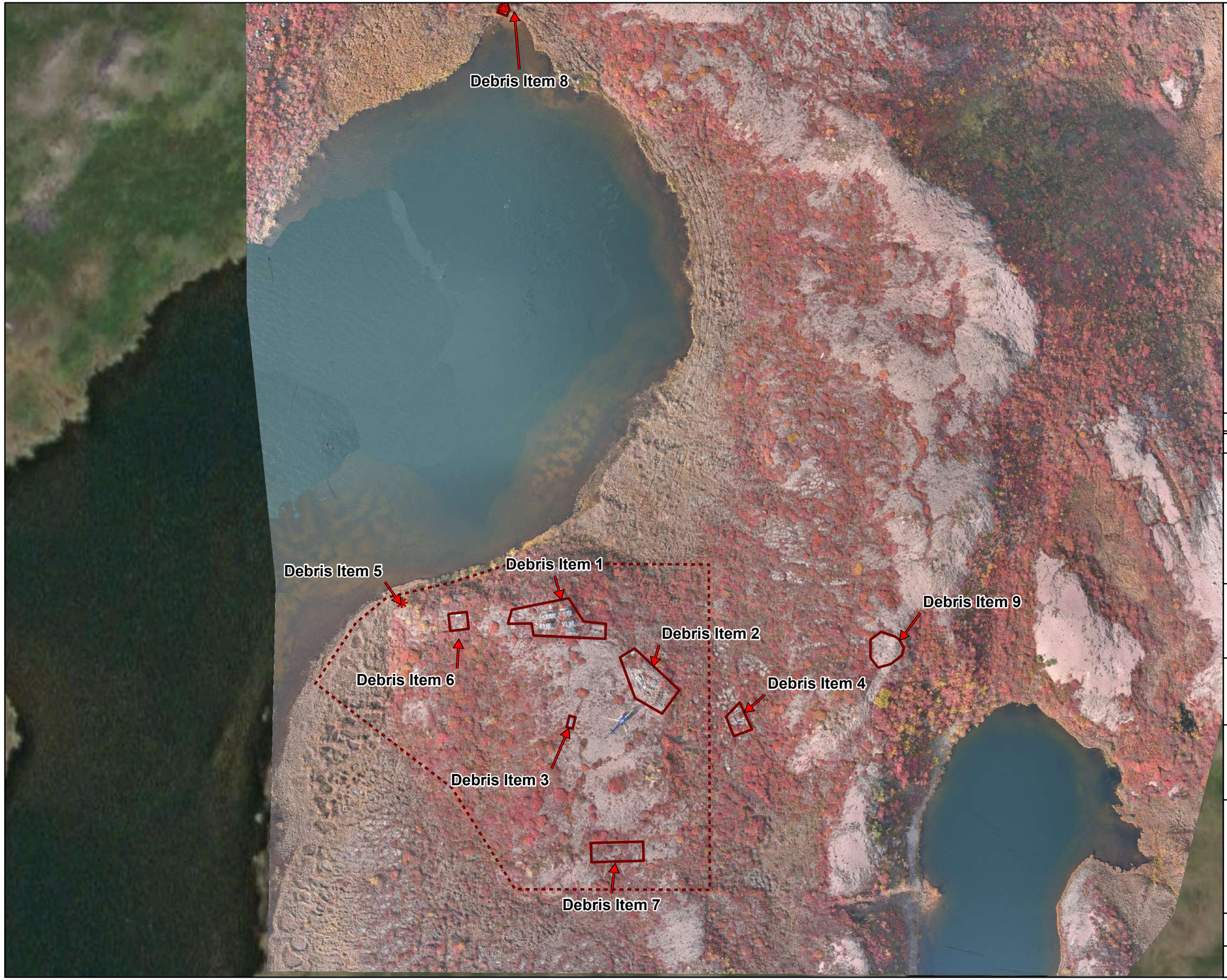

LEGEND

- Site Area (Approximate)
- Debris Areas
- Barrel

REV.	DESCRIPTION	YY/MM/DD	BY	CHK
1				

REFERENCES

THIS DRAWING MAY HAVE BEEN REDUCED. ALL SCALE NOTATIONS INDICATED ARE BASED ON 11"x17" FORMAT DRAWINGS.

N W E S

0 20 40 Metres

1:1,250

CLIENT

Public Services and Procurement Canada

PROJECT

Environmental Impact Assessment Speers Lake Sites Kitikmeot Region, Nunavut

TITLE

Tahiapik River Site (WK170) Hazardous and Non-Hazardous Materials Inventory Results

BLM-KEL-60
A Kitikmeot JV Corporation
BluMetric • KBL • Accutech
30b Mitik Street Cambridge Bay, NU X0B 0C0

PROJECT #	*DATE*		
230468	**February 24, 2025**		
DRAWN	*CHECKED*	*FIG NO.*	*REV*
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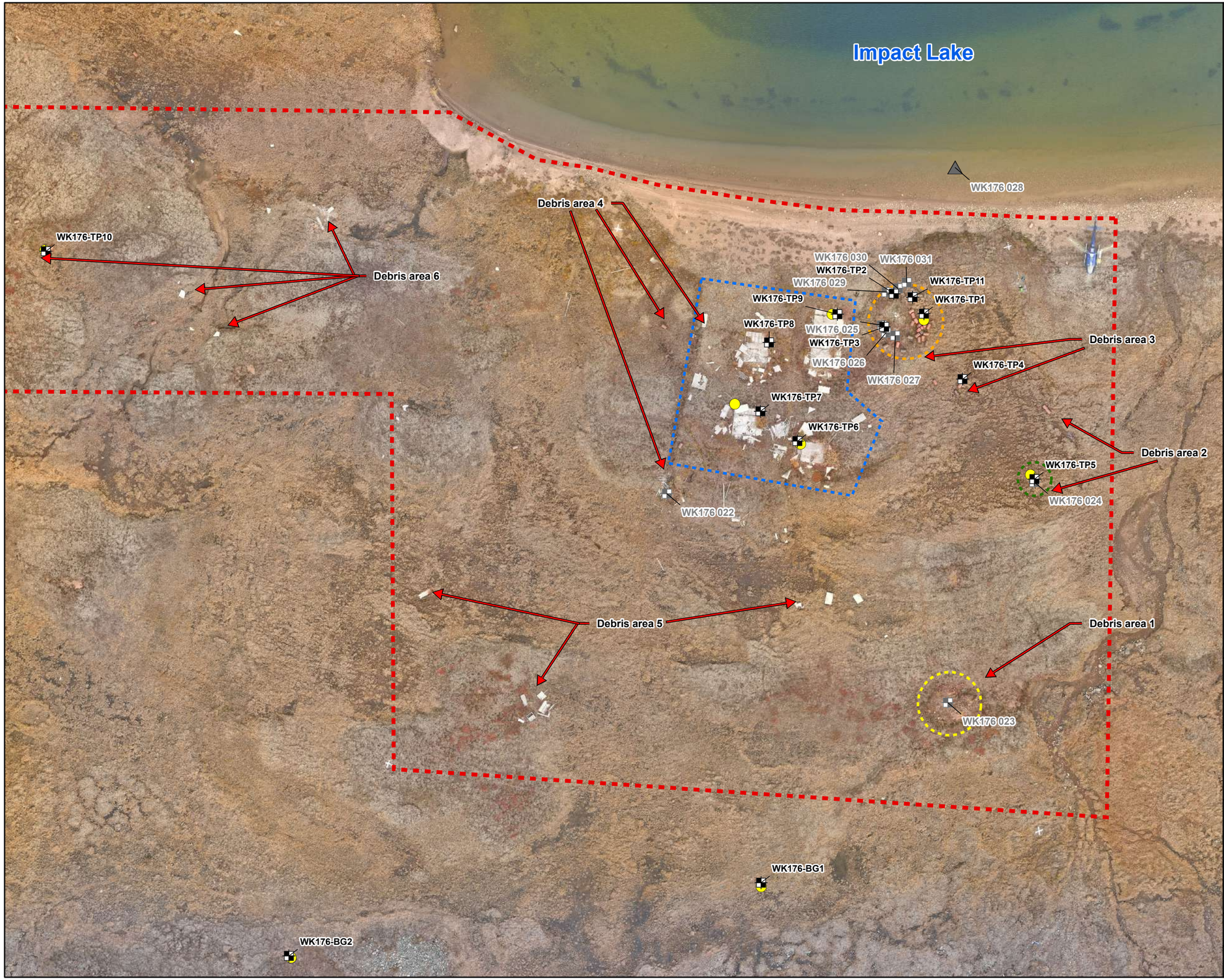

LEGEND

- Site Area (Approximate)
- Soil Sample Location
- Vegetation Sample Location
- Historical Soil Sample
- Historical Surface Water Sample

Areas of Concern / Areas of Potential Environmental Concern

- AEC 1 - Historical Debris and Burning (WK176-SS-023)
- AEC 3 - Barrel Cache Area
- APEC 2 - Barrel Contents (WK176-024)
- APEC 4 - Historical Structures and Debris Area
- RPA Guide

REV.	DESCRIPTION	YY/MM/DD	BY	CHK
1				

REFERENCES

DO NOT SCALE DRAWING.
THIS DRAWING MAY HAVE BEEN REDUCED. ALL SCALE NOTATIONS INDICATED ARE BASED ON 11"x17" FORMAT DRAWINGS.

N W E S

0 10 20 Metres

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CLIENT

Public Services and Procurement Canada

PROJECT

Environmental Impact Assessment Speers Lake Sites Kitikmeot Region, Nunavut

TITLE

Impact Lake Site (WK176) Hazardous and Non-Hazardous Materials Inventory Results

BLM-KEL-60
A Kitikmeot JV Corporation
BluMetric • KBL • Accutech
30b Mitik Street Cambridge Bay, NU X0B 0C0

PROJECT #	*DATE*		
230468	**February 24, 2025**		
DRAWN	*CHECKED*	*FIG NO.*	*REV*
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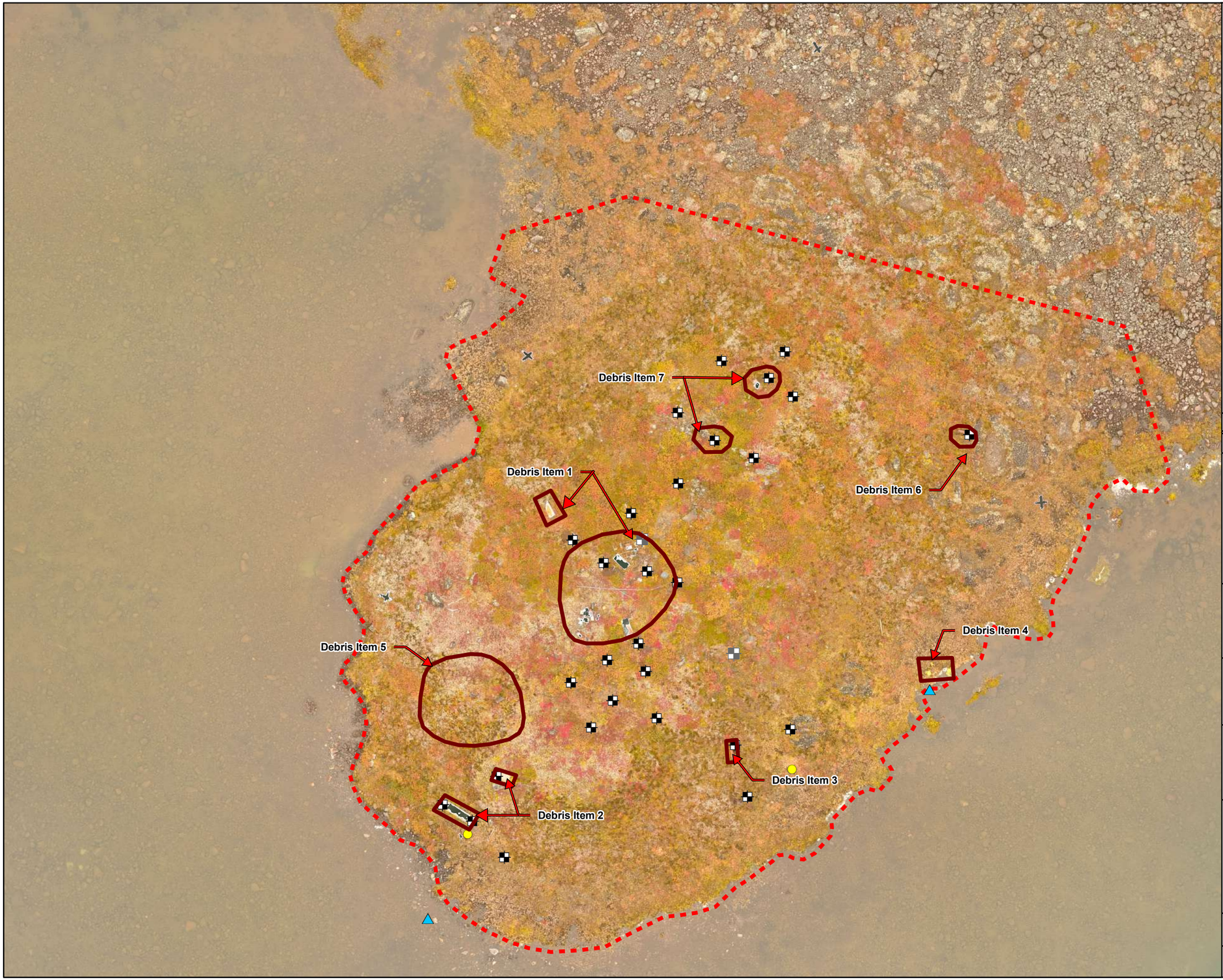

LEGEND

- Debris Item Location
- Site Area (Approximate)
- Soil Sample Location
- Surface Water Sample Location
- Vegetation Sample Location
- Historical Soil Sample (WESA 2009)
- RPA Guide

REV.	DESCRIPTION	YY/MM/DD	BY	CHK
1				

REFERENCES

DO NOT SCALE DRAWING.
THIS DRAWING MAY HAVE BEEN REDUCED. ALL SCALE NOTATIONS INDICATED ARE BASED ON 11"x17" FORMAT DRAWINGS.

N W E S

0 10 20 Metres

1:400

CLIENT

Public Services and Procurement Canada

PROJECT

Environmental Impact Assessment Speers Lake Sites Kitikmeot Region, Nunavut

TITLE

Coppermine Area Site (WK199) Hazardous and Non-Hazardous Materials Inventory Results

BLM-KEL-60
A Kitikmeot JV Corporation
BluMetric • KBL • Accutech

30b Mitik Street Cambridge Bay, NU X0B 0C0

PROJECT #	*DATE*
230468	**February 24, 2025**

DRAWN	*CHECKED*	*FIG NO.*	*REV*
PB	**SA**	**17**	**0**

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LEGEND

- Site Boundary (approximate)
- Soil Sample Location
- Surface Water Sample
- Sediment Sample Location
- Vegetation Sample Location

Previous Samples

- Historical Soil Sample (Golder 2005)
- Historical Background Surface Water and Sediment Sample (Golder 2005)
- Debris Item Location
- RPA Guide

REV.	DESCRIPTION	YY/MM/DD	BY	CHK
1				

REFERENCES

N W E S

0 5 10 Metres

1:750

CLIENT

Public Services and Procurement Canada

PROJECT

Environmental Impact Assessment
Speers Lake Sites Kitikmeot Region, Nunavut

TITLE

Coppermine Site (WK210)
Site Debris Location

BLM-KEL-60
A Kitikmeot JV Corporation
BluMetric • KBL • Accutech
30b Mitik Street Cambridge Bay, NU X0B 0C0

PROJECT #	*DATE*		
230468	**February 24, 2025**		
DRAWN	*CHECKED*	*FIG NO.*	*REV*
PB	**SA**	**18**	**0**

LEGEND

- North Site Outline
- Debris
- Barrel
- Lead Batteries
- Barrel Cache
- Former Structure
- Proposed Camp Area

REV.	DESCRIPTION	YY/MM/DD	BY	CHK
1				

REFERENCES

N W E S

0 5 10 15 20 25 Metres

1:500

CLIENT

Public Services and Procurement Canada

PROJECT

Environmental Impact Assessment
Speers Lake Sites Kitikmeot Region, Nunavut

TITLE

Speers Lake (WK097)
North Area Site Features

BLM-KEL-60
A Kitikmeot JV Corporation
BluMetric • KBL • Accutech
30b Mitik Street Cambridge Bay, NU X0B 0C0

PROJECT #	*DATE*		
230468	**February 24, 2025**		
DRAWN	*CHECKED*	*FIG NO.*	*REV*
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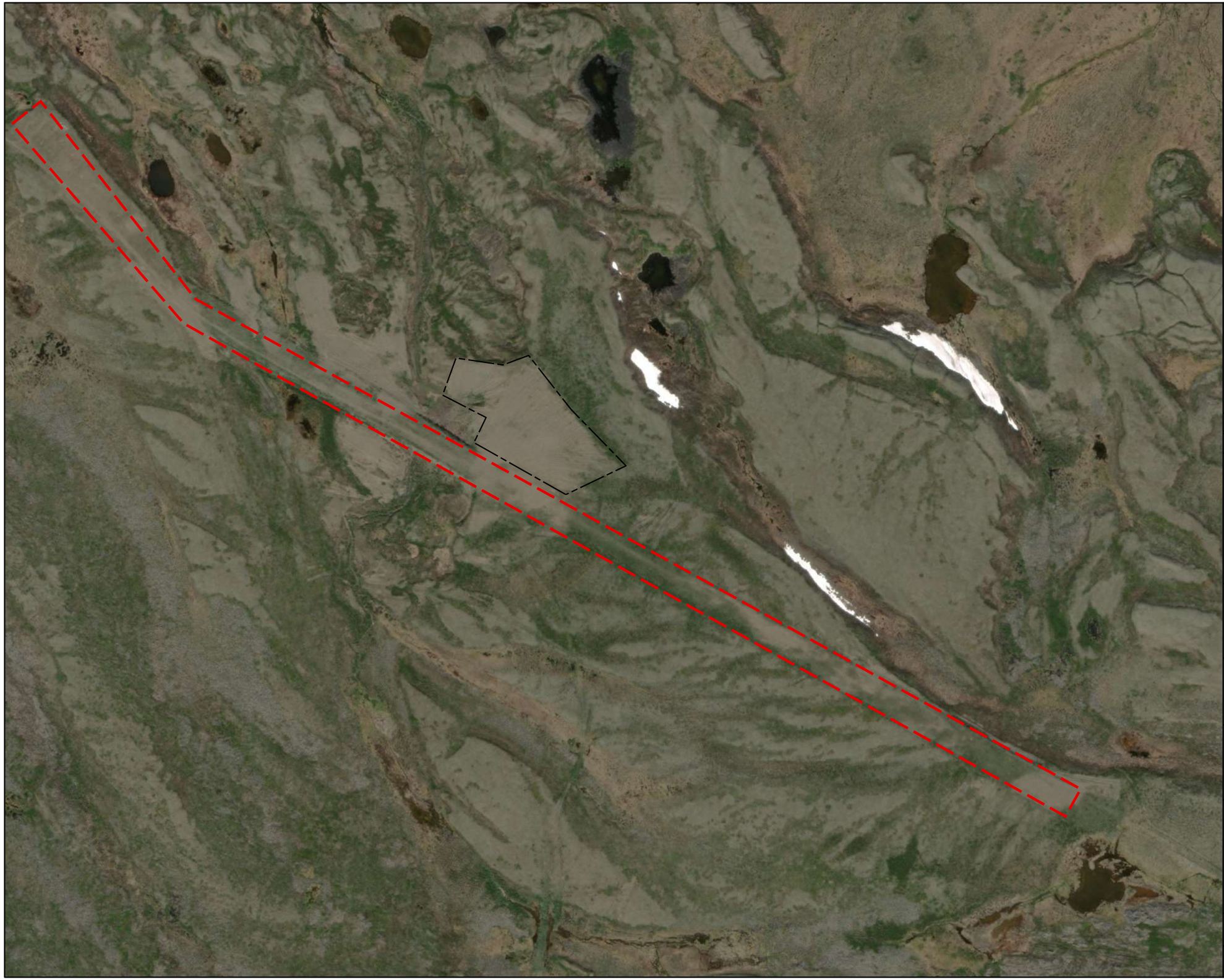

LEGEND

Airstrip Boundary

Laydown area/Airstrip Apron

REV.	DESCRIPTION	YY/MM/DD	BY	CHK
1				

REFERENCES

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CLIENT

Public Services and Procurement Canada

PROJECT

Environmental Impact Assessment
Speers Lake Sites Kitikmeot Region, Nunavut

TITLE

Hope Lake Airstrip

BLM-KEL-60
A Kitikmeot JV Corporation
BluMetric • KBL • Accutech

30b Mitik Street Cambridge Bay, NU X0B 0C0

PROJECT #	*DATE*		
230468	**February 24, 2025**		
DRAWN	*CHECKED*	*FIG NO.*	*REV*
PB	**SA**	**20**	**0**

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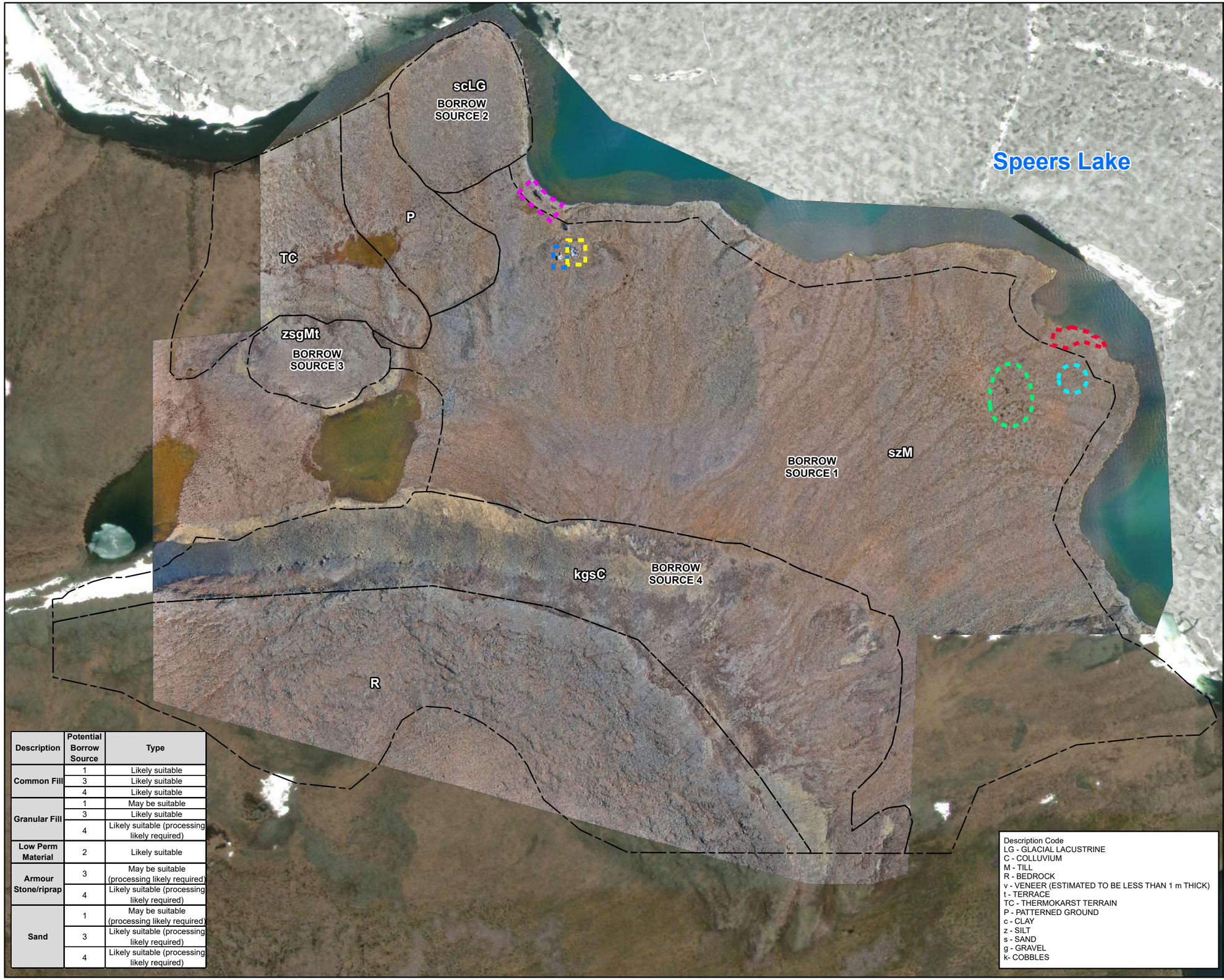
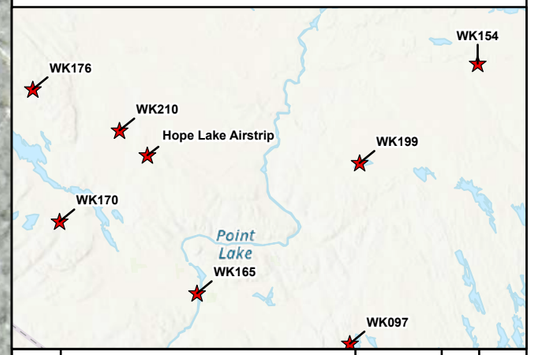


Description	Potential Borrow Source	Type
Common Fill	1	Likely suitable
	3	Likely suitable
	4	Likely suitable
Granular Fill	1	May be suitable
	3	Likely suitable
	4	Likely suitable (processing likely required)
Low Perm Material	2	Likely suitable
Armour Stone/riprap	3	May be suitable (processing likely required)
	4	Likely suitable (processing likely required)
Sand	1	May be suitable (processing likely required)
	3	Likely suitable (processing likely required)
	4	Likely suitable (processing likely required)

Description Code
LG - GLACIAL LACUSTRINE
C - COLLUVIUM
M - TILL
R - BEDROCK
v - VENEER (ESTIMATED TO BE LESS THAN 1 m THICK)
t - TERRACE
TC - THERMOKARST TERRAIN
P - PATTERNED GROUND
c - CLAY
z - SILT
s - SAND
g - GRAVEL
k- COBBLES

LEGEND

- Borrow Source
- Site Locations
- APEC 1 - North Building
- AEC 2 - South Building
- AEC 3 - North Beach Area
- APEC 4 - Wood/Metal Debris Area
- AEC 5 - South Camp
- AEC 6 -South Beach Area



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REFERENCES

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CLIENT

Public Services and Procurement Canada

PROJECT

Environmental Impact Assessment
Speers Lake Sites Kitikmeot Region, Nunavut

TITLE

Speers Lake (WK097)
Potential Borrow Source Locations

BLM-KEL-60
A Kitikmeot JV Corporation
BluMetric • KBL • Accutech
30b Mitik Street Cambridge Bay, NU X0B 0C0

PROJECT #	*DATE*
230468	**February 24, 2025**

DRAWN	*CHECKED*	*FIG NO.*	*REV*
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APPENDIX A

Limited Building Material Investigation and Debris Inventory

Table A1: Summary of Hazardous Waste Quantities Grouped by Site.

Item #	Site	Area Description	Hazardous Debris					
			Total Debris for Removal					
			Liquids (L)	Paint (m^3)[1]	Batteries (count)	Barrels quantity	Barrel Sludge (L)	Tank Sludge (L)
1	Speers Lake WK097	Core Shed	205	-	1	1	2	-
2		Main Collapsed Structure and Metal Debris	1230	-	-	41	82	-
3		Barrel Cache	-	-	2	210	420	-
4		Historical Structure and Debris	-	-	-	39	78	-
5		Metal Barrels and Scattered Debris	410	-	-	26	52	-
6		Scattered Debris in South Beach Area	205	-	-	29	58	-
7		Scattered Metal Debris	-	-	-	-	-	-
8		Scattered Plastic Debris	-	-	-	-	-	-
9		Barrel on the Shoreline	-	-	-	1	2	-
		Sub Total	**2050**	**0**	**3**	**347**	**694**	**0**
1	Asiak River WK154	Drill Rig	-	2.25	-	-	-	-
2		Misc. Metal, Drill Rods and Wood Debris	-	-	-	-	-	-
3		Metals Barrels	-	-	-	5	10	-
4		Misc. Metal Debris	-	-	-	-	-	-
5		Hydraulic Hose	-	-	-	-	-	-
6		Kitchen Stove and other Misc. Debris	-	-	-	-	-	-
7		Metal Barrel	-	-	-	1	2	-
8		Metal Barrel	-	-	-	1	2	-
9		Metal Barrel	-	-	-	1	2	-
10		Metal Barrel	-	-	-	1	2	-
11		Rubber Hose and Metal Debris	-	-	-	-	-	-

Item #	Site	Area Description	Hazardous Debris					
			Total Debris for Removal					
			Liquids (L)	Paint (m^3)[1]	Batteries (count)	Barrels quantity	Barrel Sludge (L)	Tank Sludge (L)
		Sub Total	**0**	**2.25**	**0**	**9**	**18**	**0**
1	Kendall River WK165	Tent Pads	-	-	-	0.5	-	-
2		Large Tent Pad	-	-	-	-	-	-
3		Metal Jerry Cans	-	-	-	-	-	-
4		Scattered Wood Debris	-	-	-	-	-	-
		Sub Total	**0**	**0**	**0**	**0.5**	**0**	**0**
1	Tahiapik River WK170	Scattered Drill Core Boxes	-	-	-	-	-	-
2		Scrap Metal Casings and Wood Debris	-	-	-	-	-	-
3		Loose Household Debris	-	-	-	-	-	-
4		Wood Debris Southeast of Metal Casings	-	-	-	-	-	-
5		Barrel Along Lake	-	-	-	1	2	-
6		Camp Pad	-	-	-	-	-	-
7		Camp Dump and Metal Debris	-	-	-	-	-	-
8		Fuel Barrel	-	-	-	1	2	-
		Sub Total	**0**	**0**	**0**	**2**	**4**	**0**
1	Impact Lake WK176	Camp Dump	-	-	-	-	-	-
2		Barrel Contents	205	-	-	3	6	-
3		Barrel Cache	1025	-	-	31	62	-
4		Historical Structure and Debris	103	-	-	4	8	-
5		Scattered Debris West of APEC 4	635	-	-	9	18	-
6		Scattered Debris North of APEC 4	-	-	-	-	-	-
		Sub Total	**1968**	**0**	**0**	**47**	**94**	**0**

Item #	Site	Area Description	Hazardous Debris					
			Total Debris for Removal					
			Liquids (L)	Paint (m^3)[1]	Batteries (count)	Barrels quantity	Barrel Sludge (L)	Tank Sludge (L)
1	Coppermine Area WK199	Scattered Metal Debris	-	-	-	-	-	-
2		Hot Water Tank	-	-	-	-	-	-
3		Propane Tanks	-	-	-	1	2	-
4		Snowmobile Parts	-	-	-	-	-	-
5		Polypropylene Tubing	-	-	-	-	-	-
6		Propane Tank 2	-	-	-	-	-	-
7		Scattered Rock Core	-	-	-	-	-	-
		Sub Total	**0**	**0**	**0**	**1**	**2**	**0**
1	Coppermine Area WK210	Large Metal Tanks and Barrels	-	-	-	8	16	600
2		Smaller Metal Tanks and Barrels	-	-	-	2	4	200
3		Metal Barrel	-	-	-	1	2	-
4		Metal Barrels	-	-	-	3	6	-
5		Wooden Signs	-	-	-	-	-	-
6		Propane Tank	-	-	-	-	-	-
7		Collapsed Wooden Dock Structure	-	-	-	-	-	-
8		Camp Dump	-	-	-	-	-	-
9		Additional Debris	-	-	-	3	6	-
		Sub Total	**0**	**0**	**0**	**17**	**34**	**800**
Total Debris by Material			**4018**	**2.25**	**3**	**423**	**846**	**800**

[1]This volume includes the entire drill rig assumed to be removed from Site as is with the paint to be removed at an appropriate waste facility in the south.

Table A2: Summary of Non-Hazardous Debris Quantities Grouped by Site and Management Strategy

Item #	Site	Area Description	APEC ID	Non-Hazardous					
				Total Debris for Removal				Total Debris Managed on Site	
				Building Debris (*Volume Excluding Clean Wood*)[1] (m^3)	Metal (*Crushed volume*[5]) (m^3)	Other[2] (m^3)	Painted Wood (m^3)	Burnable Wood (m^3)	Rock Core (m^3)
1	Speers Lake WK097	Core Shed	1	20 (*10*)	1.3 (*1.04*)	-	-	13	3[4]
2		Main Collapsed Structure and Metal Debris	2	45 (*22.5*)	14 (*3.6*)	-	-	22.5	-
3		Barrel Cache	3	-	61.9 (*9.38*)	-	-	2.5	-
4		Historical Structure and Debris	4	15 (*7.5*)	24.7 (*14.56*)	1	-	9.5	-
5		Metal Barrels and Scattered Debris	5	-	7.8 (*1.04*)	-	-	-	-
6		Scattered Debris in South Beach Area	6	-	20.7 (*13.16*)	-	-	2	-
7		Scattered Metal Debris	-	-	2	-	-	-	-
8		Scattered Plastic Debris	-	-	-	3	-	-	-
9		Barrel on the Shoreline	-	-	0.3 (*0.04*)	-	-	-	-
		Sub Total		***40***[1]	**132.7 (*44.82*)**	**4**	**-**	**49.5**	**3**[4]
1	Asiak River WK154	Drill Rig	1	-	2.25	-	-	-	-
2		Misc. Metal, Drill Rods and Wood Debris	1	-	2.25	-	-	0.75	-
3		Metals Barrels	1	-	1.5 (*0.2*)	-	-	-	-
4		Misc. Metal Debris	-	-	1.13	-	-	-	-
5		Hydraulic Hose	1	-	-	0.2	-	-	-
6		Kitchen Stove and other Misc. Debris	3	-	1.25	-	-	0.25	-
7		Metal Barrel	2	-	0.3 (*0.04*)	-	-	-	-
8		Metal Barrel	3	-	0.3 (*0.04*)	-	-	-	-
9		Metal Barrel	3	-	0.3 (*0.04*)	-	-	-	-

Item #	Site	Area Description	APEC ID	Non-Hazardous					
				Total Debris for Removal				Total Debris Managed on Site	
				Building Debris (*Volume Excluding Clean Wood*)[1] (m^3)	Metal (*Crushed volume*[5]) (m^3)	Other[2] (m^3)	Painted Wood (m^3)	Burnable Wood (m^3)	Rock Core (m^3)
10		Metal Barrel	3	-	0.3 (0.04)	-	-	-	-
11		Rubber Hose and Metal Debris	-	-	2	1	-	-	-
		Sub Total		**0**	**11.58 (8.24)**	**1.2**	**-**	**1**	**0**
1	Kendall River WK165	Tent Pads	3	-	0.3 (*0.04*)	-	6.75	-	-
2		Large Tent Pad	4	-	0.2	-	4.5	-	-
3		Metal Jerry Cans	1	-	0.5 (*0.05*)	-	-	-	-
4		Scattered Wood Debris	-	-	-	-	-	0.75	-
		Sub Total		**0**	**1.0 (*0.29*)**	**0**	**11.25[3]**	**0.75**	**0**
1	Tahiapik River WK170	Scattered Drill Core Boxes	3	-	-	-	-	8[4]	7[4]
2		Scrap Metal Casings and Wood Debris	1	-	3.5	-	-	4	-
3		Loose Household Debris	-	*0.2*	-	-	-	0.02	-
4		Wood Debris Southeast of Metal Casings	1	-	-	-	-	3	-
5		Barrel Along Lake	5	-	0.3 (*0.04*)	-	-	-	-
6		Camp Pad	4	-	-	-	-	1.5	-
7		Camp Dump and Metal Debris	-	*0.02*	0.73	-	-	-	-
8		Fuel Barrel	6	-	0.3 (*0.04*)	-	-	-	-
		Sub Total		***0.22***	**4.83 (*4.31*)**	**0**	**-**	**16.52**	**7**
1	Impact Lake WK176	Camp Dump	1	-	3	-	-	-	-
2		Barrel Contents	2	-	0.9 (*0.12*)	-	-	-	-

Item #	Site	Area Description	APEC ID	Non-Hazardous					
				Total Debris for Removal				Total Debris Managed on Site	
				Building Debris (*Volume Excluding Clean Wood*)[1] (m^3)	Metal (*Crushed volume*[5]) (m^3)	Other[2] (m^3)	Painted Wood (m^3)	Burnable Wood (m^3)	Rock Core (m^3)
3		Barrel Cache	3	-	9.15 (*1.22*)	-	-	-	-
4		Historical Structure and Debris	4	-	1.05 (*0.14*)	-	-	40	-
5		Scattered Debris West of APEC 4	5	-	2.7 (*0.36*)	-	-	4.4	-
6		Scattered Debris North of APEC 4	-	-	-	-	-	3.3	-
		Sub Total		**0**	**16.8 (*4.84*)**	**0**	**-**	**47.7**	**0**
1	Coppermine Area WK199	Scattered Metal Debris	3	-	5	-	-	-	0.5
2		Hot Water Tank	6	1	1.5	-	-	-	-
3		Propane Tanks	5	-	0.65 (*0.52*)	-	-	-	-
4		Snowmobile Parts	4	-	-	0.3	-	-	-
5		Polypropylene Piping	-	-	-	1	-	-	-
6		Propane Tank 2	2	-	0.5	-	-	-	-
7		Scattered Rock Core	1	-	-	-	-	-	1
		Sub Total		**1**	**7.65 (*7.52*)**	**1.3**	**-**	**0**	**1.5**
1	Coppermine Area WK210	Large Metal Tanks and Barrels	1	-	31.61 (*3.27*)	-	-	-	-
2		Smaller Metal Tanks and Barrels	2	-	5.3 (*0.55*)	-	-	1	-
3		Metal Barrel	2	-	0.3 (*0.04*)	-	-	-	-
4		Metal Barrels	-	-	0.9 (*0.12*)	-	-	-	-
5		Wooden Signs	-	-	-	-	-	0.2	-
6		Propane Tank	-	-	0.5	-	-	-	-

Item #	Site	Area Description	APEC ID	Non-Hazardous					
				Total Debris for Removal				Total Debris Managed on Site	
				Building Debris (*Volume Excluding Clean Wood*)[1] (m^3)	Metal (*Crushed volume*[5]) (m^3)	Other[2] (m^3)	Painted Wood (m^3)	Burnable Wood (m^3)	Rock Core (m^3)
7		Collapsed Wooden Dock Structure	-	-	-	-	-	0.75	-
8		Camp Dump	3	-	0.4	-	-	0.1	-
9		Additional Debris	5	-	0.9 (*0.12*)	-	-	1	-
		Sub Total		**0**	**39.91 (*5.00*)**	**0**	**-**	**3.05**	**0**
Total Debris by Material (rounded)				**41**	**215 (75)**	**7**	**11**	**119**	**12**
Total Debris for Removal and/or On-Site Management				**274 (134)**				**131**	

Notes:

[1] Assumed half of the building debris is clean wood and can be burned on Site (total volumes are split in the table between overall building debris and volume excluding clean burnable wood)

[2] Other column includes plastics, rubbers, and all other types of debris not accounted for in other categories.

[3] Paint at Kendall River is considered a Lead-based paint but is considered non-hazardous.

[4] Core piles assumed to contain 50% clean burnable wood.

[5] Volumes were calculated based on the barrels being crushed to industry standard and tank volumes being reduced to 10%.

Table A3: Debris Piles Descriptions and Inventory for Speers Lake WK097

Item	Surface Debris	APEC/AEC	Description	Inventory – Hazardous	Inventory – Non-hazardous
1	**Core Shed** 	1	Debris Area 2 consists of the area within AEC 2, located approximately 15 m north of Debris Area 1. This area contains the metal sided and roofed core shed, which was observed to be still standing. Additionally, 3 upright core racks and 3 collapsed core racks, both containing cores were observed. One lead acid battery, collapsed outhouse and associated toilet, 3 metal cots, insulation, plywood, scrap metal and one full metal barrel were also observed in this area.	205 L of liquid in one barrel Lead acid battery **Total Liquid: 205 L** **Total Other: 1 battery**	Misc. building debris: 20 m^3 Metal barrels (crushed): 0.3 m^3 (0.04 m^3) Misc. metal debris: 1 m^3 Cores and racks: 6 m^3 **Total: 27.3 m^3 (27.04 m^3 crushed)**
2	**Main Collapsed Structure and Metal Debris** 	2	Debris Area 1 consists of the area within APEC 1. This area comprises of the largest partially collapsed structure on the site and contains mixed building material debris in the form of: metal siding, metal roof, dimensional lumber, plywood, pink insulation and wood shelving, mixed metal debris in the form of stove piping, metal bed frames and piping scattered throughout. Additionally, 33 metal barrels (of which 4 were full and 2 half-full) and 2 mini barrels were observed grouped along the exterior southern wall of the structure. 1 additional full barrel was observed on the west side as well as 5 barrels on the east side of the structure. Scrap metal drill casings were observed along the north side of the structure.	5 full and 2 half full barrels **Total Liquid: 1230 L**	Misc. building debris: 45 m^3 - includes 22.5 m^3 of wood Misc. metal debris: 2 m^3 Metal barrels (crushed): 12 m^3 (1.6 m^3) **Total: 59 m^3 (48.6 m^3 crushed)**
3	**Barrel Cache** 	3	Debris Area 3 consists of the area within AEC 3, and the beach area directly to the east. This area is located approximately 80 m northeast of Debris Area 1. There are 194 barrels, 16 mini barrels and 1 jerry can in this area. The barrels and jerry can were empty. Scattered scrap metal including metal cots and an anchor; wood debris including a collapsed dock; and 2 lead batteries were also observed in this area.	2 lead batteries **Total Other: 2 batteries**	Metal barrels (crushed): 60.6 m^3 (8.08 m^3) Wood debris: 2.5 m^3 Metal debris: 1.3 m^3 **Total: 64.4 m^3 (11.88 m^3 crushed)**
4	**Historical Structure and Debris** 	4	Debris Item 4 consists of the area within APEC 4. The area consists of scrap wood, metal, and barrels. A wooden floor structure is in the middle of the APEC and around this structure 4 metal basins, 2 metal barrels, drill casings that had sunken into the earth, one smaller collapsed wooden structure, a metal lift, plastic tubing, a drill head still in the ground, and scattered scrap metal were observed. Additionally, 37 barrels were observed in the area. The barrels were empty.	None	Structure debris: 15 m^3 - includes 7.5 m^3 of wood Metal barrels (crushed): 11.7 m^3 (1.56 m^3) Misc. wood debris: 2 m^3 Misc. metal debris: 8 m^3 Metal drill casings: 5 m^3 Plastic tubing: 1 m^3 **Total: 42.7 m^3 (32.56 m^3 crushed)**

Item	Surface Debris	APEC/AEC	Description	Inventory – Hazardous	Inventory – Non-hazardous
5	**Metal Barrels and Scattered Debris** 	5	Debris Item 5 consists of the area within AEC 5. This debris is largely metal barrels. One group of 26 metal barrels were observed in this area in addition, 2 barrels were full.	410 L in 2 full barrels **Total Liquid: 410 L**	Metal barrels (crushed): 7.8 m^3 (1.04 m^3) **Total: 7.8 m^3 (1.04 m^3 crushed)**
6	**Scattered Debris in South Beach Area** 	6	Debris Item 6 consists of the area within AEC 6. This debris is made up of 19 metal barrels in a group submerged in the water (some of which have partially disintegrated), and 10 additional barrels along the shoreline, one of which was full. Scattered metal debris including >100 drill casings (most submerged in water) and wood debris is also present throughout the area.	205 L in 1 full metal barrels **Total Liquid: 205 L**	Metal debris: 12 m^3 Wood debris: 2 m^3 Metal barrels (crushed): 8.7 m^3 (1.16 m^3) **Total: 22.7 m^3 (15.16 m^3 crushed)**
7	**Scattered Metal Debris** 	-	Debris Item 7 consists of scattered miscellaneous metal debris located approximately 170 m northwest of Debris Item 1.	None	Metal debris: 2 m^3 **Total: 2 m^3**
8	**Scattered Plastic Debris** 	-	Debris item 8 consists of scattered plastic pipe located approximately 60 m south west of APEC 1.	-	Plastic Debris: 3 m^3 **Total: 3 m^3**

Item	Surface Debris	APEC/AEC	Description	Inventory – Hazardous	Inventory – Non-hazardous
9	**Barrel on the Shoreline** 		Debris item 9 consists of a barrel on the shoreline approximately 60 m northeast of AEC 3.	-	Metal barrels (crushed): 0.3 m^3 (0.04 m^3) **Total: 0.3 m^3 (0.04 m^3 crushed)**
			Total Volume Estimates	**Total Liquid: 2,050 L** **Total Other: 3 lead acid batteries**	**Total (debris): 229.2 m^3 (141.32 m^3 crushed)**

Notes:

- [1]Analytical results indicate liquid in barrel sample was Fuel
- Barrel volume (205 L) assumed to be 0.3 m^3 whole and 0.04 m^3 crushed (reduced to a 3 inch height),
- Mini barrels are assumed to be 0.15 m^3 whole and 0.02 m^3 crushed (reduced to a 3 inch height)

Table A4: Debris Piles Descriptions and Inventory for Asiak River WK154

ITEM	Surface Debris	AEC/APEC	Description	Inventory – Hazardous	Inventory – Non-hazardous
1	**Drill Rig** 	1	Debris Item 1 consists of a disused drill rig. Yellow paint was observed on the drill rig. A sample of this paint was sent for analysis, and it was confirmed to be lead containing.	Lead Paint: 2 m^2 (assumed 2.25 m^3 volume of lead painted metal debris) **Total: 2 m^2 (2.25 m^3 painted metal debris)**	Metal debris: 2.25 m^3 **Total: 2.25 m^3**
2	**Misc. Metal, Drill Rods and Wood Debris** 	1	Debris Item 2 consists of approximately 16 to 20 metal drill rod casings, ranging in length from 1.2 to 1.8 metres scattered in the area immediately around and to the south of the drill rig. Other miscellaneous metal and wood debris were observed in this area as well, including an additional smaller sized internal combustion motor.	None	Metal drill rods: 1 m^3 Other metal debris: 1.25 m^3 Wood debris: 0.75 m^3 **Total: 3.0 m^3**
3	**Metal Barrels** 	1	Debris Item 3 consists of five 205 litre metal barrels scattered in the area to the south of the Debris Item 1 drill rig.	None	Metal barrels (crushed): 1.5 m^3 (0.2 m^3) **Total: 1.5 m^3 (0.2 m^3 crushed)**
4	**Misc. Metal Debris** 	-	Debris Item 4 consists of miscellaneous metal debris scattered to the west of Debris Item 1.	None	Metal debris: 1.13 m^3 **Total: 1.13 m^3**

ITEM	Surface Debris	AEC/APEC	Description	Inventory – Hazardous	Inventory – Non-hazardous
5	**Hydraulic Hose** 	1	Debris Item 5 consists of two lengths of hydraulic hose located approximately three to five metres to the west of Debris Item 1.	None	Hydraulic hose: 0.2 m^3 **Total: 0.2 m^3**
6	**Kitchen Stove and other Misc. Debris** 	3	Debris Item 6 consists of a metal kitchen stove and other miscellaneous metal and wooden debris scattered around the area of sample WK154-TP12 approximately 135 m to the south of Debris Item 1.	None	Metal stove: 1 m^3 Misc. Metal: 0.25 m^3 Misc. Wood: 0.25 m^3 **Total: 1.5 m^3**
7	**Metal Barrel** 	2	Debris Item 7 consists of one metal barrel located approximately 25 metres north of Debris Item 1.	None	Metal barrels (crushed): 0.3 m^3 (0.04 m^3) **Total: 0.3 m^3 (0.04 m^3 crushed)**
8	**Metal Barrel** 	3	Debris Item 8 consists of one metal barrel located approximately 40 metres southwest of Debris Item 6.	None	Metal barrels (crushed): 0.3 m^3 (0.04 m^3) **Total: 0.3 m^3 (0.04 m^3 crushed)**

ITEM	Surface Debris	AEC/APEC	Description	Inventory – Hazardous	Inventory – Non-hazardous
9	**Metal Barrel** 	3	Debris Item 9 consists of one metal barrel located approximately 40 metres west of Debris Item 6.	None	Metal barrels (crushed): 0.3 m^3 (0.04 m^3) **Total: 0.3 m^3 (0.04 m^3 crushed)**
10	**Metal Barrel** 	3	Debris Item 10 consists of one metal barrel located approximately 40 metres north of Debris Item 6.	None	Metal barrels (crushed): 0.3 m^3 (0.04 m^3) **Total: 0.3 m^3 (0.04 m^3 crushed)**
11	**Rubber Hose and Metal debris** 	-	Debris Item 11 was seen after review aerial photography of the Site. This area is located approximately 170 m south east of AEC 1. Debris Item 11 consists of some rubber hose, as well as some metal debris which looks to be consistent with the items found in debris item 4.	None	Metal debris: 2 m^3 Rubber hose: 1 m^3 **Total: 3 m^3**
			Total Volume Estimates	**Total surface area: 2 m^2** **Total estimated volume of lead painted metal debris: 2.25 m^3**	**Total (debris): 13.78 m^3 (11.44 m^3 crushed)**

- Notes: Barrel volume (205 L) assumed to be 0.3 m^3 whole and 0.04 m^3 crushed (reduced to a 3 inch height)

Table A5: Debris Pile Descriptions and Inventory for Kendall River WK165

Item	Surface Debris	APEC	Description	Inventory – Hazardous	Inventory – Non-hazardous
1	**Tent Pads in APEC 3** 	3	Debris Item 1 consists of the area within APEC 3. All structures in this area have collapsed. Two former tent pads with a 3.7 m by 4.9 m base made of plywood and dimensional lumber were present. Red paint was present on most of the debris in this area. A sample of this paint was obtained and sent for analysis and came back as non-hazardous. Also present is half of a metal barrel (empty).	None	Wood debris: 6.75 m^3 Metal barrels (crushed): 0.3 m^3 (0.04 m^3) **Total: 7.05 m^3 (6.79 m^3 crushed)**
2	**Large Tent Pad in APEC 4** 	4	Debris Item 2 consists of the area within APEC 4. One tent pad structure had a 3.7 m by 4.9 m base made of plywood and dimensional lumber. No discernable paint or scrap metal was observed in the debris piles. Additional plywood and dimensional lumber was scattered in this area. An old metal 6-foot stepladder was also present.	None	Wood debris: 4.5 m^3 Metal debris: 0.2 m^3 **Total: 4.7 m^3**
3	**Metal Jerry Can Storage Site** 	1	Debris Item 3 consists of the area within AEC 1, the area immediately to the southeast of the tent pads of Debris Item 1. There are four metal jerry fuel cans in this area (20L each). Two cans were partially full and two were empty. Results indicate the liquid in the two jerry cans were mostly water (96.9% and 94.8% water).	None	Empty jerry cans (crushed): 0.5m^3 (0.05 m^3) **Total: 0.5 m^3 (0.05 m^3 crushed)**

Item	Surface Debris	APEC	Description	Inventory – Hazardous	Inventory – Non-hazardous
4	**Various Scattered Wood Debris** 	Various	Various pieces of wood debris, both plywood and dimensional lumber are scattered across the site. Plywood debris was noted approximately 20 m to the east of the tent pad of Debris Item 1. An old Privy was also noted approximately 30 m to the southwest of the tent pad of Debris Item 2.	None	Wood debris: 0.75 m^3 **Total: 0.75 m^3**
			Total Volume Estimates	**Total Debris: None** **Total Paint: None** **Total Liquid: None**	**Total (debris): 13 m^3 (12.29 m^3 crushed)** **Total (liquid): None**

Notes: Barrel volume (205 L) assumed to be 0.3 m^3 whole and 0.04 m^3 crushed (reduced to a 3 inch height)

Table A6: Debris Piles Descriptions and Inventory for Tahiapik WK170

Item	Surface Debris	APEC	Description	Inventory – Hazardous	Inventory – Non-hazardous
1	**Scattered Drill Core Boxes** 	3	Used wooden drill core boxes stacked into piles located East of Fran Lake. Some piles are standing upright while others have begun to lean and collapse. Boxes and support pieces are made of wood with metal nails and fasteners, core samples are arranged throughout.	none	Wood debris and boards 8 m^3 Core samples 7 m^3 **Total: 15 m^3**
2	**Scrap Metal Casings and Wood Debris** 	1	No structure remains. Located to the Southeast of the drill core boxes, in excess of 50 metal casings and wood debris made up of pallets and other wooden boards/beams are present in this area.	none	Wood debris 4 m^3 Metal debris 3.5 m^3 **Total: 7.5 m^3**
3	**Loose Household Debris** 	N/a	No structure remains. Wooden debris and household debris (a tarp) are located in this area to the South of the core sample boxes.	none	Wood debris 0.02 m^3 Household debris (tarp) 0.2 m^3 **Total: 0.22 m^3**
4	**Wood Debris Southeast of Metal Casings** 	1	No structure remains. Wooden plywood, planks and beams are located in this area to the Southeast of Area/Item 2.	none	Wood debris 3m^3 **Total: 3 m^3**

Item	Surface Debris	APEC	Description	Inventory – Hazardous	Inventory – Non-hazardous
5	**Barrel along the Lake** 	5	No structure remains. Single empty barrel is present in this area West North West of the drill core boxes.	none	Metal barrels (crushed): 0.3 m^3 (0.04 m^3) **Total: 0.3 m3 (0.04 m^3 crushed)**
6	**Camp Pad** 	4	No structure remains. Wooden debris, plywood, beams, and planks are present in this area west of the drill core boxes.	none	Wood debris 1.5 m^3 **Total: 1.5 m^3**
7	**Camp Dump and Metal Debris** 	N/a	No structure remains. Metal debris and household debris (tarp) are present in this area to the South of the drill core boxes.	none	Metal debris 0.73 m^3 Household debris (tarp) 0.02 m^3 **Total: 0.75 m^3**

Item	Surface Debris	APEC	Description	Inventory – Hazardous	Inventory – Non-hazardous
8	**Barrel at north end of Fran Lake** 	6	A single barrel to the north of the main Site area.	unknown	Metal barrels (crushed): 0.3 m^3 (0.04 m^3) **Total: 0.3 m^3 (0.04 m^3 crushed)**
9	**Historical stick up** 	-	An old metal stick up from historical drilling activity. It is unknown how deep this drill rod extends.	N/A	Metal debris: <0.1 m^3 **Total: <0.1 m^3**
			Total Volume Estimates	**Total Debris: None** **Total Paint: None** **Total Liquid: None**	**Total (debris): 28.57m^3 (28.05 m^3 crushed)** **Total (liquid): None**

Notes:

Barrel volume (205 L) assumed to be 0.3 m^3 whole and 0.04 m^3 crushed

Table A7: Debris Piles Descriptions and Inventory for Impact Lake WK176

ITEM	Surface Debris	APEC/AEC	Description	Inventory – Hazardous	Inventory – Non-hazardous
1	**Camp Dump** 	1	Debris Area 1 consists of the area within APEC 1. This area looks to be the historical camp dump and contains many pieces of stove pipe, old metal food cans, various other pieces of metal, and some glass bottles.	none	Metal debris: 3 m^3 Glass debris: <0.1 m^3 **Total: 3 m^3**
2	**Barrel Contents** 	2	Debris Area 2 consists of the area within APEC 2 and the area directly north. There 2 empty barrels and 1 full barrel remaining in this area.	205 L of liquid in one barrel **Total Liquid: 205 L**	Metal barrels (crushed): 0.9 m^3 (0.12 m^3) **Total: 0.9 m^3 (0.12 m^3 crushed)**
3	**Barrel Cache** 	3	Debris Area 3 consists of the area within AEC 3, the area directly north of AEC 3, and the beach area. There are 30 barrels and 1 mini barrel in this area. Four barrels are full of unknown liquids, and 2 are half full. The remaining barrels (24 full sized and 1 mini barrel) are empty.	1,025 L of liquid in six barrels **Total Liquid: 1,025 L**	Metal barrels (crushed): 9.15 m^3 (1.22 m^3) **Total: 9.15 m^3 (1.22 m^3 crushed)**

ITEM	Surface Debris	APEC/AEC	Description	Inventory – Hazardous	Inventory – Non-hazardous
4	**Historical Structures and Debris** 	4	All structures at APEC 4 have collapsed. There are remnants of 5 different structures located in this area. Each structure had a 3.7 m by 4.3 m base and each was built from dimensional lumber and plywood. No paint or scrap metal was observed in the debris piles. Four barrels (3 full sized and 1 mini) are located within or just outside of APEC 4; one barrel is half full and the others are empty.	103 L of liquid in one barrel **Total Liquid: 103 L**	Metal barrels (crushed): 1.05 m^3 (0.14 m^3) Wood debris 40 m^3 **Total: 41.05 m^3 (40.14 m^3 crushed)**
5	**Scattered Debris West of APEC 4** 	5	No structure remains. Wood debris is scattered to the west of APEC 4. This debris is largely dimensional lumber and plywood. There are also 9 barrels scattered throughout the area; 2 are full of liquid, 2 are half full of liquid, and 2 have trace amounts of liquid (approximately 10 L each), the remaining are empty.	635 L of liquid in six barrels **Total Liquid: 635 L**	Wooden debris 4.4 m^3 Metal barrels (crushed): 2.7 m^3 (0.36 m^3) **Total: 7.1 m^3 (4.76 m^3 crushed)**
6	**Scattered Debris North of APEC 4** 	N/A	No structure remains. Wooden debris is scattered north of APEC 4, including an old outhouse that has since collapsed, several sheets of plywood and mixed dimensional lumber.	none	Wood debris 3.3 m^3 **Total: 3.3 m^3**
			Total Volume Estimates	**Total Liquid: 1,968 L**	**Total (debris): 64.5 m^3 (52.54 m^3 crushed)**

Notes: Barrel volume (205 L) assumed to be 0.3 m^3 whole and 0.04 m^3 crushed (reduced to a 3 inch height)
Mini Barrel volume assumed to be 0.15 m^3 whole and 0.02 m^3 crushed (reduced to a 3 inch height)

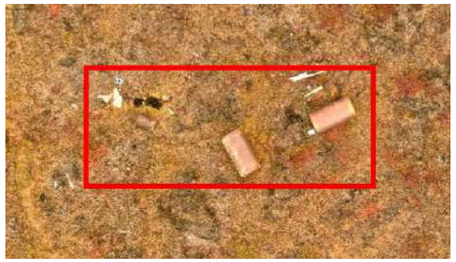
Table A8: Debris Piles Descriptions and Inventory for Coppermine Area WK199

ITEM	Surface Debris	APEC	Description	Inventory – Hazardous	Inventory – Non-hazardous
1	**Scattered Metal Debris** 	3	Debris Item 1 consists of a variety of scattered metal debris including long metal pipes/poles, canisters, stove pipes, sheet metal, and tubing. This area also contains some piles of drill cores.	None	Metal debris: 5 m^3 Drill cores: 0.5 m^3 **Total: 5.5 m^3**
2	**Hot Water Tank** 	6	Debris Item 2 consists of a hot water tank and a concrete pad located southwest of the scattered metal debris of Debris Item 1. No discernable paint was observed on the items.	None	Hot water tank: 1.5 m^3 Concrete pad: 1 m^3 **Total: 2.5 m^3**
3	**Propane Tanks** 	5	Debris Item 3 consists of one 100-pound propane tank and one mini barrel located south-southeast of the scattered metal debris of Debris Item 1. Both tanks were empty.	None	Empty propane tanks: 0.5 m^3 Metal barrels (crushed): 0.15 m^3 (0.02 m^3) **Total: 0.65 m^3 (0.52 m^3 crushed)**
4	**Snowmobile Parts** 	4	Debris Item 4 consists of snowmobile parts, in an area along the shoreline southeast of the metal debris of Debris Item 1. Debris is majority yellow plastic with some pieces semi-submerged in the water.	None	Plastic debris: 0.3 m^3 **Total: 0.3 m^3**

ITEM	Surface Debris	APEC	Description	Inventory – Hazardous	Inventory – Non-hazardous
5	**Polypropylene Piping** 	NA	Debris Item 5 consists of black polypropylene piping, scattered throughout the area. Approximately 50 m of this pipe is located on Site.	None	Plastic debris: 1 m^3 **Total: 1 m^3**
6	**Propane Tank 2** 	2	Debris Item 6 consists of one 100-pound propane tank located northeast of the scattered metal debris of Debris Item 1. The tank was empty.	None	Empty propane tank: 0.5 m^3 **Total: 0.5 m^3**
7	**Scattered Cores** 	1	Debris Item 7 consists of several piles of drill cores, scattered throughout the area. No racking system was present in the area.	None	Drill cores: 1 m^3 **Total: 1 m^3**
			Total Volume Estimates	**None**	**Total (debris): 11.45 m^3 (11.32 m^3)**

Note: Barrel volume (205 L) assumed to be 0.3 m^3 whole and 0.04 m^3 crushed
Mini Barrel volume assumed to be 0.15 m^3 whole and 0.02 m^3 crushed

Table A9 - Debris Piles Descriptions and Inventory Coppermine Area (WK210)

ITEM	Surface Debris	APEC	Description	Inventory – Hazardous	Inventory – Non-hazardous
1	**Large Metal Tanks and Barrels** 	1	Debris Item 1 consists of six large metal tanks, seven 205 litre (L) metal barrels, one mini barrel and one 20 L jerry can. One metal tank was observed to be approximately 10% full of an unknown liquid. Analytical results indicated that the liquid was > 90% water.	None[1]	Metal tanks (crushed): 29.16 m^3 (2.92 m^3) Metal barrels (crushed): 2.25 m^3 (0.3 m^3) Other metal debris (crushed): 0.2 m^3 (0.05 m^3) **Total: 31.61 m^3 (3.27 m^3 crushed)**
2	**Smaller Metal Tanks and Barrels** 	2	Debris Item 2 consists of two smaller metal tanks, one 205 L metal barrel, one mini barrel, and some wood debris. This area is located approximately 30 metres (m) south-southeast of APEC 1.	None	Tank Volume: 4.85 m^3 (0.49 m^3 crushed) Barrel Volume: 0.45 m^3 (0.06 m^3 crushed) Wood Debris: 1 m^3 **Total: 6.3 m^3 (1.55 m^3 crushed)**
3	**Metal Barrel** 	2	Debris Item 3 consists of one 205 L metal barrel tank located between Debris Items 1 & 2.	None	Metal barrels (crushed): 0.3 m^3 (0.04 m^3) **Total: 0.3 m^3 (0.04 m^3 crushed)**
4	**Metal Barrels** 	-	Debris Item 4 consists of three semi-crushed 205 L metal barrels located approximately 30 m southeast of Debris Item 2.	None	Metal barrels (crushed): 0.9 m^3 (0.12 m^3) **Total: 0.9 m^3 (0.12 m^3 crushed)**

ITEM	Surface Debris	APEC	Description	Inventory – Hazardous	Inventory – Non-hazardous
5	**Wooden Signs** 	-	Debris Item 5 consists of two wooden signs made of plywood and dimensional lumber located directly south of Debris Item 4.	None	Wooden debris: 0.2 m^3 **Total: 0.2 m^3**
6	**Propane Tank** 	-	Debris Item 6 consists of one 100-pound metal propane tank located approximately 30 m northwest of Debris Item 1.	None	Metal tank: 0.5 m^3 **Total: 0.5 m^3**
7	**Collapsed Wooden Dock Structure** 	-	Debris Item 7 consists of two wooden docks made of plywood and dimensional lumber located directly northwest of Debris Item 6.	None	Wooden debris: 0.75 m^3 **Total: 0.75 m^3**
8	**Camp Dump** 	3	Debris Item 8 consists of the camp dump, which includes various small metal barrels/buckets, various metal debris, and some wood debris.		Metal barrels/buckets: 0.4 m^3 Wooden debris: 0.1 m^3 **Total: 0.5 m^3**

ITEM	Surface Debris	APEC	Description	Inventory – Hazardous	Inventory – Non-hazardous
9	**Additional Debris** 	5	Additional Debris was seen across the Unnamed Lake to the east. This area was only seen from the air. Three additional barrels and some wooden debris was seen scattered in this area.		Metal barrels (crushed): 0.9 m^3 (0.12 m^3) Wooden debris: 1 m^3 **Total: 1.9 m^3 (1.12 m^3 crushed)**
	Total Volume Estimates			**Liquid: 0**	**Total (debris): 42.96 m^3 (8.05 m^3 crushed)**

Notes:

- [1]Analytical results indicate liquid in tank sample was significantly diluted with water (95% water) and is not considered to be fuel
- Barrel volume (205 L) assumed to be 0.3 m^3 whole and 0.04 m^3 crushed (reduced to a 3 inch height)
- Mini Barrel volume assumed to be 0.15 m^3 whole and 0.02 m^3 crushed (reduced to a 3 inch height)
- Void space estimated at 90% of volume for metal tanks

APPENDIX B

Species at Risk in Nunavut

COSEWIC = Committee on the Status of Endangered Wildlife in Canada. **SARA** = Species at Risk Act.

Common Name	Scientific Name	COSEWIC Status	SARA		Presence at Study Area		
			Status	Schedule 1	Potential Presence	Species Presence Rationale	Reference
Insects							
Transverse Lady Beetle	*Coccinella transversoguttata*	Special Concern	Special Concern	Schedule 1	Possible	Species range includes study area; suitable habitat is present.	COSEWIC (2016)
Freshwater Fish							
Fourhorn Sculpin	*Myoxocephalus quadricornus*	Data Deficient	Special Concern	No schedule	Nil	Species range includes study area; suitable cold, deep freshwater lake habitat absent.	COSEWIC (2003a)
Birds							
Barn Swallow	*Hirundo rustica*	Special Concern	Threatened	Schedule 1	Nil	Species range does not include study area.	COSEWIC (2011a)
Buff-breasted Sandpiper	*Tryngites subruficollis*	Special Concern	Special Concern	Schedule 1	Nil	Species range does not include study area.	COSEWIC (2012c)
Common Nighthawk	*Chordeiles minor*	Special Concern	Threatened	Schedule 1	Nil	Species range does not include study area.	COSEWIC (2018)
Eskimo Curlew	*Numenius borealis*	Endangered	Endangered	Schedule 1	Nil	Species range does not include study area.	COSEWIC (2009)
Harlequin Duck	*Histrionicus histrionicus, Eastern population*	Special Concern	Special Concern	Schedule 1	Nil	Species range does not include study area.	COSEWIC (2013)
Harris's Sparrow	*Zonotrichia querula*	Special Concern	No Status	No schedule	Possible	Within species breeding range. Species nests in small, isolated wooded areas with trees or tall shrubs that may be present adjacent to the study area.	COSEWIC (2017)
Horned Grebe	*Podiceps auritus, Western population*	Special Concern	Special Concern	Schedule 1	Nil	Species range does not include study area.	COSEWIC (2009b)
Hudsonian Godwit	*Limosa haemastica*	Threatened	No Status	No Schedule	Nil	Species range does not include study area.	COSEWIC (2019)
Ivory Gull	*Pagophila eburnea*	Endangered	Endangered	Schedule 1	Nil	Species range does not include study area.	COSEWIC (2001)
Lesser Yellowlegs	*Tringa flavipes*	Threatened	No Status	No Schedule	Possible	Within species breeding range. The wetlands that are present in the study area provide suitable breeding habitat.	COSEWIC (2020)
Olive-sided Flycatcher	*Contopus cooperi*	Special Concern	Threatened	Schedule 1	Nil	Species range does not include study area.	COSEWIC (2007)
Peregrine Falcon anatum/tundrius	*Falco peregrinus anatum/tundrius*	Not at Risk	Special Concern	Schedule 1	Nil	Species range does include study area, but suitable cliff habitats for nesting do not occur at or near the study area.	COSEWIC (2007a)

Common Name	Scientific Name	COSEWIC Status	SARA		Presence at Study area		
			Status	Schedule 1	Potential Presence	Species Presence Rationale	Reference
Red Knot islandica subspecies	*Calidris canutus islandica*	Not at Risk	Special Concern	Schedule 1	Nil	Species range does not include study area.	COSEWIC (2007b)
Red Knot rufa subspecies	*Calidris canutus rufa*	Endangered	Endangered	Schedule 1	Nil	Species range does not include study area.	COSEWIC (2007b)
Red-necked Phalarope	*Phalaropus lobatus*	Special Concern	Special Concern	Schedule 1	Possible	Within species breeding range. The wetlands present in the study area may provide suitable breeding habitat.	COSEWIC (2014)
Ross's Gull	*Rhodostethia rosea*	Threatened	Threatened	Schedule 1	Nil	Species range does not include study area.	COSEWIC (2021)
Rusty Blackbird	*Euphagus carolinus*	Special Concern	Special Concern	Schedule 1	Nil	Species range does not include study area.	COSEWIC (2006)
Short-eared Owl	*Asio flammeus*	Threatened	Special Concern	Schedule 1	Possible	Within species breeding range. The open habitat within the study area may provide suitable breeding habitat.	COSEWIC (2008a)
Terrestrial Mammals							
Barren ground Caribou	*Rangifer tarandus groendlandicus*	Threatened	No status	No Schedule	Possible	Within species range. Vegetation within the study area may provide suitable forage during the summer season.	COSEWIC (2011b); COSEWIC (2016a)
Dolphin and Union Caribou	*Rangifer tarandus*	Endangered	Special Concern	Schedule 1	Nil	Species range does not include study area.	COSEWIC (2011b); COSEWIC (2016a)
Torngat Mountains Caribou	*Rangifer tarandus*	Endangered	No Status	No Schedule	Nil	Species range does not include study area.	COSEWIC (2011b); COSEWIC (2016a)
Peary Caribou	*Rangifer tarandus pearyi*	Threatened	Endangered	Schedule 1	Nil	Species range does not include study area.	COSEWIC (2011b); COSEWIC (2016a)
Grizzly Bear	*Ursus arctos, Western population*	Special Concern	Special Concern	Schedule 1	Possible	Within species range. The study area may provide suitable forage.	COSEWIC (2002)
Polar Bear	*Ursus maritimus*	Special Concern	Special Concern	Schedule 1	Possible	Within species range. Species may inhabit study area if forced inland due to loss of sea ice.	COSEWIC (2008b)
Wolverine	*Gulo gulo*	Special Concern	Special Concern	Schedule 1	Possible	Within species range. The study area may provide suitable forage.	COSEWIC (2014d)
Plants							
Porsild's Bryum	*Haplodontium macrocarpum*	Threatened	Threatened	Schedule 1	Nil	Species range does include study area, and suitable mountainous and rocky habitats with continuous seepage do not occur at or near the study area.	COSEWIC (2017a)

APPENDIX 1. NUNAVUT SPECIES AT RISK-POTENTIAL OCCURRENCE WITHIN PROJECT AREA

COSEWIC = Committee on the Status of Endangered Wildlife in Canada. **SARA** = Species at Risk Act.

Common Name	Scientific Name	COSEWIC Status	SARA		Presence at Site		
			Status	Schedule 1	Potential Presence	Species Presence Rationale	Reference
Insects							
Transverse Lady Beetle	*Coccinella transversoguttata*	Special Concern	No Status	No schedule	Low	Study area is within species range. Suitable habitat is present.	COSEWIC (2016)
Birds							
Barn Swallow	*Hirundo rustica*	Special Concern	Threatened	Schedule 1	Nil	Species range does not include study area	COSEWIC, (2017b)
Buff-breasted Sandpiper	*Tryngites subruficollis*	Special Concern	Special Concern	Schedule 1	Nil	Species range does not include study area	COSEWIC (2012b)
Common Nighthawk	*Chordeiles minor*	Threatened	Threatened	Schedule 1	Nil	Species range does not include study area	COSEWIC (2018a)
Eskimo Curlew	*Numenius borealis*	Endangered	Endangered	Schedule 1	Medium	The study area is within the species range.	COSEWIC (2009a)
Harlequin Duck	*Histrionicus histrionicus* Eastern population	Special Concern	Special Concern	Schedule 1	Nil	Species range does not include study area.	COSEWIC (2013)
Harris's Sparrow	*Zonotrichia querula*	Special Concern	No Status	No schedule	Medium-High	The study area is within the species range. Suitable habitat is present within or adjacent to study area.	COSEWIC (2017c)
Horned Grebe	*Podiceps auritus,* Western population	Special Concern	Special Concern	Schedule 1	Nil	Species range does not include study area.	COSEWIC (2009b)
Hudsonian Godwit	*Limosa haemastica*	Threatened	No Status	No schedule	Nil	Species range does not include study area.	COSEWIC (2019a)
Ivory Gull	*Pagophila eburnea*	Endangered	Endangered	Schedule 1	Nil	Species range does not include study area.	COSEWIC (2006a)
Lesser Yellowlegs	*Tringa flavipes*	Threatened	No Status	No schedule	Low-High	The Speers Lake, Kendall River, Tahiapik River, and Impact Lake sites are within the species breeding range. The Coppermine and Asiak River sites are within close proximity (26 and 63 km respectively). Suitable habitat is present within or adjacent to study area.	COSEWIC (2020a)

Common Name	Scientific Name	COSEWIC Status	SARA		Presence at Site		
			Status	Schedule 1	Potential Presence	Species Presence Rationale	Reference
Olive-sided Flycatcher	*Contopus cooperi*	Threatened	Threatened	Schedule 1	Nil	Species range does not include study area.	COSEWIC (2018b)
Red Knot islandica subspecies	*Calidris canutus islandica*	Special Concern	Special Concern	Schedule 1	Nil	Species range does not include study area.	COSEWIC (2020b)
Red Knot rufa subspecies	*Calidris canutus rufa*	Endangered	Endangered	Schedule 1	Nil	Species range does not include study area.	COSEWIC (2020b)
Red Knot rufa subspecies	*Calidris canutus rufa*	Endangered	Endangered	Schedule 1		Species range does not include study area.	COSEWIC (2020b)
Red-necked Phalarope	*Phalaropus lobatus*	Special Concern	Special Concern	Schedule 1	Medium	The study area (all sites) are within the species breeding range. Suitable habitat is present within or adjacent to study area, however, aquatic vegetation is limited in ponded areas and Lakes.	COSEWIC (2014a)
Ross's Gull	*Rhodostethia rosea*	Threatened	Threatened	Schedule 1	Nil	Species range does not include study area.	COSEWIC (2021a)
Rusty Blackbird	*Euphagus carolinus*	Special Concern	Special Concern	Schedule 1	Nil	Species range does not include study area.	COSEWIC (2017d)
Short-eared Owl	*Asio flammeus*	Special Concern	Special Concern	Schedule 1	High	The study area is within the species breeding range. Suitable nesting and foraging habitat are present.	COSEWIC (2021b)
Mammals							
Caribou	*Rangifer tarandus* Barren ground pop.	Threatened	No Status	No schedule	High	The study area is within the species annual range (all sites) and some sites are located within calving areas (Impact Lake, Tahiapik River) or are in close proximity (Kendall River, Coppermine Area).	COSEWIC (2016b)
Caribou	*Rangifer tarandus* Dolphin and Union pop.	Endangered	Special Concern	Schedule 1	Low-High	The Asiak River site is within the species winter range. The remaining portions of the study area are within fairly close proximity (30-90 km) of the species winter range.	COSEWIC (2017f)
Caribou	*Rangifer tarandus* Torngat Mountains pop.	Endangered	No Status	No schedule	Nil	Species range does not include study area.	COSEWIC (2017e)
Perry Caribou	*Rangifer tarandus pearyi*	Threatened	Endangered	Schedule 1	Nil	Species range does not include study area.	COSEWIC (2015)
Grizzly Bear	*Ursus arctos,* Western population	Special Concern	Special Concern	Schedule 1	High	The study area is within the species range. Suitable habitat is present.	COSEWIC (2012c)

Common Name	Scientific Name	COSEWIC Status	SARA		Presence at Site		
			Status	Schedule 1	Potential Presence	Species Presence Rationale	Reference
Polar Bear	*Ursus maritimus*	Special Concern	Special Concern	Schedule 1	Low	The Asiak River site is within the species range. The remaining portions of the study area are within proximity (13-58 km).	COSEWIC (2018c)
Wolverine	*Gulo gulo*	Special Concern	Special Concern	Schedule 1	High	The study area is within the species range. Suitable habitat is present.	COSEWIC (2014b)
Plants - Mosses							
Porsild's Bryum	*Haplodontium macrocarpum*	Threatened	Threatened	Schedule 1	Nil	Species known range does not include study area.	COSEWIC (2017g)

APPENDIX C

Summary of Impacts

Activity: Airstrip and Helicopter Use

PHYSICAL	Identification of Environmental Impacts	Comments
Designated environmental areas (Parks, Wildlife Protected Areas, etc.)		
Ground stability	**NM**	Small landing area; low impact, minimum to no work planned to the airstrip, use of small planes
Permafrost		
Hydrology / limnology		
Water Quality	**NM**	Fuel Management, Spills Contingency plans in place
Climate Conditions	**NN**	Small impact; fossil fuel burning
Eskers and other unique or fragile landscapes		
Surface and Bedrock Geology	**NM**	Sediment and Erosion Control Plan
Sediment and soil quality	**NM**	Fuel Management, Spills Contingency plans in place
Tidal processes and bathymetry		
Air quality	**NN**	Short term impact
Noise levels	**NM**	Flight hieghts, timing of flights.

BIOLOGICAL	Identification of Environmental Impacts	Comments
Vegetation	**NN**	Short term impact
Wildlife (including habitat and migration patterns)	**NM**	Pre-landing aerial survey, Wildlife Management Plan,Wildlife Monitor present at all times, Short term impact
Birds (including habitat and migration patterns)	**NM**	Pre-landing aerial survey, Wildlife Management Plan, Nesting survey on arrival, Wildlife Monitor present at all times, Short term impact
Aquatic species (including habitat, migration, and spawning)		
Wildlife protected areas		

SOCIO-ECONOMIC	Identification of Environmental Impacts	Comments
Archaeological and cultural historic sites	**NM**	Awareness training and installation of buffer around known sites.
Employment		
Community wellness		
Community infrastructure		
Human health		

Legend: Identification of Environmental Impacts
P = Positive
NN = Negative / Non-mitigatible
NM =Negative / Mitigatible
UN = Unknown
Leave blank all items not applicable to this project

Activity: Floatplane Use

PHYSICAL	Identification of Environmental Impacts	Comments
Designated environmental areas (Parks, Wildlife Protected Areas, etc.)		
Ground stability		
Permafrost		
Hydrology / limnology	**NN**	Small area of the lake impacted, lake use limited in duration
Water Quality	**NM**	Fuel Management, Spills Contingency plans in place
Climate Conditions	**NN**	Small impact; fossil fuel burning
Eskers and other unique or fragile landscapes		
Surface and Bedrock Geology		
Sediment and soil quality	**NM**	Fuel Management, Spills Contingency plans in place
Tidal processes and bathymetry	**NN**	Small area of the lake impacted, lake use limited in duration
Air quality	**NN**	Short term impact
Noise levels	**NM**	Flight hieghts, timing of flights.

BIOLOGICAL	Identification of Environmental Impacts	Comments
Vegetation		
Wildlife (including habitat and migration patterns)	**NM**	Pre-landing aerial survey, Wildlife Management Plan,Wildlife Monitor present at all times, Short term impact
Birds (including habitat and migration patterns)	**NM**	Pre-landing aerial survey, Wildlife Management Plan, Nesting survey on arrival, Wildlife Monitor present at all times, Short term impact
Aquatic species (including habitat, migration, and spawning)	**NM**	Survey of fish habitat, Spill response plan, short term impact.
Wildlife protected areas		

SOCIO-ECONOMIC	Identification of Environmental Impacts	Comments
Archaeological and cultural historic sites		
Employment		
Community wellness		
Community infrastructure		
Human health		

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Activity: Borrow Areas

PHYSICAL	Identification of Environmental Impacts	Comments
Designated environmental areas (Parks, Wildlife Protected Areas, etc.)		
Ground stability	**NM**	Minimal use of equipment, no heavy equipment, limited borrow material required. Borrow areas selected by PCR to avoid sensitive areas.
Permafrost	**NM**	Shallow excavation; low impact; no heavy machinery
Hydrology / limnology		
Water Quality	**NM**	Fuel Management, Spills Contingency, Erosion/Sediment control plans in place; borrow will preferentially be used from areas at least 30m from a water body
Climate Conditions		Only hand equipment planned
Eskers and other unique or fragile landscapes		
Surface and Bedrock Geology	**NM**	Sediment and Erosion Control Plan
Sediment and soil quality	**NM**	Fuel Management, Spills Contingency plans in place
Tidal processes and bathymetry		
Air quality	**NM**	Use of a equipment; isolated and short term impact, only hand equipment use planned
Noise levels	**NN**	Use of a equipment; isolated and short term impact

BIOLOGICAL	Identification of Environmental Impacts	Comments
Vegetation	**NM**	Borrow will be preferentially taken from sources that have little/no vegetation; if vegetated areas cannot be avoided, vegetation will be stored and reestablished
Wildlife (including habitat and migration patterns)	**NM**	Wildlife Management Plan in place.
Birds (including habitat and migration patterns)	**NM**	A nest sweep will occur prior to commencing work. Avoidance of nests planned through site inspections and buffers.
Aquatic species (including habitat, migration, and spawning)	**NM**	Fuel Management, Spills Contingency, Erosion/Sediment control plans in place; borrow will preferentially be used from areas at least 30m from a water body
Wildlife protected areas		

SOCIO-ECONOMIC	Identification of Environmental Impacts	Comments
Archaeological and cultural historic sites	**NM**	Awareness training and installation of buffer
Employment		
Community wellness		
Community infrastrcture		
Human health		

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Activity: Site Clean Up and Remediation

PHYSICAL	Identification of Environmental Impacts	Comments
Designated environmental areas (Parks, Wildlife Protected Areas, etc.)		
Ground stability	**NM**	Minimal use of equipment, no heavy equipment. Small work areas, minimal travel routes, camp and laydown areas selected by PCR and constructed on previously disturbed areas where possible.
Permafrost	**NM**	Debris partially buried will be removed manually, minimizing impact to permafrost. No heavy equipment.
Hydrology / limnology		
Water Quality	**P**	Removal of contaminants and hazardous materials from the site will have a positive impact.
Climate Conditions	**P**	Proper disposal of non-hazardous and hazardous materials from the site will have a positive impact.
Eskers and other unique or fragile landscapes		
Surface and Bedrock Geology	**NM**	No major excavations - only debris removal, Sediment and Erosion Control Plan, no heavy equipment use.
Sediment and soil quality	**P**	Removing contaminants and hazardous materials from the site will have a positive impact.
Tidal processes and bathymetry		
Air quality	**P**	Proper disposal of non-hazardous and hazardous materials from the site will have a positive impact.
Noise levels	**NN**	Use of a equipment; isolated and short term impact

BIOLOGICAL	Identification of Environmental Impacts	Comments
Vegetation	**P**	Disturbance to vegetation could occur from camp, laydowns, or travel routes, however vegetation will be stockpiled when possible, equipment with low tire pressure will be used. Long term impact is positive due to removal of contaminants.
Wildlife (including habitat and migration patterns)	**P**	Disturbance of terrestrial mammals at risk (polar bear, artic wolf and caribou) could occur if individuals are located within the Site or its surroundings while remediation work is conducted. Isolated and short term impacts. Wildlife Management Plan. Long term impact is positive due to removal of contaminants.

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Activity: Site Clean Up and Remediation

PHYSICAL	Identification of Environmental Impacts	Comments
Birds (including habitat and migration patterns)	**P**	A nest sweep will occur prior to commencing work. Avoidance of nests planned through site inspections and buffers. Long term impact is positive due to removal of contaminants.
Aquatic species (including habitat, migration, and spawning)	**P**	The majority of waste will be disposed off-site. Fuel Management, Spills Contingency, Erosion/Sediment control plans in place. Specific mitigation identified for sediment removal and water intake. Long term impact is positive due to removal of contaminants.
Wildlife protected areas		

SOCIO-ECONOMIC	Identification of Environmental Impacts	Comments
Archaeological and cultural historic sites	**NM**	Awareness training and installation of buffer
Employment	**P**	Provides local opportunities
Community wellness	**P**	Engagement in cleaning up the Site
Community infrastrcture		
Human health	**P**	Removing contaminants from the site reduces human risk of exposure

Legend: Identification of Environmental Impacts

Activity: Water Intake

PHYSICAL	Identification of Environmental Impacts	Comments
Designated environmental areas (Parks, Wildlife Protected Areas, etc.)		
Ground stability		
Permafrost		
Hydrology / limnology	**NM**	Water consumption is limited and intake monitored to minimize impacts to surface water body
Water Quality	**NM**	Pump will have secondary containment for leaks. Spills Management Plan in place.
Climate Conditions		
Eskers and other unique or fragile landscapes		
Surface and Bedrock Geology		
Sediment and soil quality	**NM**	Pump will have secondary containment for leaks. Spills Management Plan in place.
Tidal processes and bathymetry		
Air quality	**NN**	Use of a equipment; isolated and short term impact
Noise levels	**NN**	Use of a equipment; isolated and short term impact

BIOLOGICAL	Identification of Environmental Impacts	Comments
Vegetation		
Wildlife (including habitat and migration patterns)	**NM**	Wildlife Management Plan will be in place.
Birds (including habitat and migration patterns)	**NM**	Nest sweep to be conducted prior to commencing work. Buffers will be established as required.
Aquatic species (including habitat, migration, and spawning)	**NM**	Pump will have secondary containment for leaks. Mesh installed on intake pipe. All waste will be disposed off-site. Spills contingency plan in place.
Wildlife protected areas		

SOCIO-ECONOMIC	Identification of Environmental Impacts	Comments
Archaeological and cultural historic sites		
Employment		
Community wellness		
Community infrastrcture		
Human health		

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