



## Sahtu Land and Water Board

P.O. Box 1  
Fort Good Hope, NT  
X0E 0H0  
Phone: 867-598-2413  
Fax: 867-598-2325  
[www.slwb.com](http://www.slwb.com)

### STAFF REPORT

---

<b>Proponent:</b>	Department of Indian Affairs and Northern Development – Contaminants and Remediation Division		
<b>File(s):</b>	S17L8-002/S17D-003	<b>Report No.:</b>	1
<b>Date Prepared:</b>	July 9, 2017	<b>Meeting Date:</b>	July 13, 2017
<b>Subject:</b>	Type B Water Licence Renewal and Type A Land Use Permit Renewal Applications for the Great Bear Lake Sites Remediation Project		

---

## 1. Purpose/Report Summary

To inform the Board about applications made by the Department of Indian Affairs and Northern Development – Contaminants and Remediation Division (DIAND-CARD) for a [Type B Water Licence \(WL\) Renewal Application](#) for a term of seven years and a [Type A Land Use Permit \(LUP\) Renewal Application](#) to complete Phase II of the Great Bear Lake (GBL) Sites Remediation Project. The project refers collectively to the remediation activities required at the abandoned historic industrial properties of Silver Bear Mines (made up of Terra, Northrim, Norex, Graham Vein and Smallwood mine sites), El Bonanza and Bonanza Mine, Contact Lake Mine and Sawmill Bay site. The GBL Sites are located on or adjacent to the eastern shore of Great Bear Lake, within the Sahtu Region of the Northwest Territories. The now abandoned sites are all within the boundaries of the *Sahtu Dene and Metis Comprehensive Land Claim Agreement* and a portion of the Silver Bear Mines also overlap with the Tłıç hq Mqwhì Gogha Dè Njįłèè Boundary. The sites are 400-440 km north-northwest of Yellowknife, 175-220 km north of Gamètì and 215-275 km east of Délıne (the nearest community within the Land Claim). The purpose of the remediation project is to restore and remediate the abandoned sites to their original state as much as possible which will have an overall positive impact on the environment. The WL renewal application will replace S15L8-001 and the LUP renewal application will replace S09D-001.

## 2. Background

### 2.1 Project Overview

DIAND has the responsibility to manage a number of contaminated sites that are no longer maintained by the original occupant. The abandoned GBL Sites are amongst these legacy properties.

Under the Contaminated Sites Management Program (CSMP), the DIAND Contaminants and Remediation Division (CARD) aims to remediate the GBL Sites to improve environmental conditions and reduce environmental/safety risks. The GBL Sites have been the subject of numerous assessments and studies to characterize the nature of environmental contamination and hazards. DIAND's efforts to date have included Environmental Site Assessments, Hazardous Material Surveys, Risk Assessments and focused geochemical studies to name a few. Efforts culminated in the production of Remedial Action Plans (RAPs) for each of the project sites.

The RAPs summarized site conditions, interpreted results of sampling/assessment, evaluated remedial options and presented the selected remedial approach. The RAP for each site serves as the primary guidance document for remedial activities and site management. The remedial actions have been selected based on guidance from technical experts and with input from community members to identify preferences and environmental considerations. Following the finalization of the RAPs, the project advanced to the detailed design and engineering stage which resulted in minor updates to several of the concepts that were presented in the RAPs. In support of this WL and LUP application, any updates to the RAPs have been included within a cover page, highlighting refinement of remedial approaches and progress to date. These documents may be found for each of the project sites within **Annex A-1, A2, A3 and A4** on the SLWB Public Registry.

Remediation of the GBL Sites was initially envisioned as a three-phase project: Phase I to address environmental and health and safety issues which would not require mobilization of heavy equipment at Contact Lake Mine, El Bonanza/Bonanza Mine and Sawmill Bay; Phase II to address all other remedial work at Contact Lake Mine, El Bonanza/Bonanza Mine and Silver Bear Mines; and Phase III to address all outstanding remedial work at Sawmill Bay. Phase I was successfully completed by DIAND in 2010-2011 and is detailed in the respective completion reports (**Annex A-6 and A-7** on the SLWB Public Registry). A 2016 Barrel Removal Program was also conducted to remove all drums with residual fuels from the GBL Sites.

***The aforementioned Phase II and Phase III programs have now been consolidated, and a single remedial program will be used to complete site remediation. All future work will be implemented under the title of the GBL Sites Phase II Remediation Project. The scope of remedial activities remains consistent with earlier WL applications and renewals (S15L8-001) and represents simply a consolidation of two work plans into one.***

The scope of work as detailed in the WL and LUP applications will ultimately be implemented by a remedial contractor on behalf of DIAND who will tailor an approach based on construction knowledge, local understanding, skills and cost savings. However, DIAND will take all appropriate measures to require environmental protection and compliance throughout the project. This includes various contract mechanisms and the presence of a Departmental Representative (DR) on-site to monitor and ensure compliance with the contract.

### **2.1.1 Mine Sites**

The abandoned Silver Bear Mines were underground mining properties that produced primarily silver, copper, and bismuth and were in operation from 1969 to 1985. Located in the Camsell River area, the mine sites are situated near the southeast corner of Great Bear Lake.

Contact Lake Mine is located on Contact Lake, approximately 265 km east of Déljñę and 12 km east of the abandoned El Bonanza/Bonanza mines. The now abandoned mine site was originally an underground silver mine during the 1930s but was also mined for uranium in 1949/50. The former El Bonanza/Bonanza Mines are located on the Dowdell Peninsula, approximately 430 km northwest of Yellowknife on the east coast of Great Bear Lake (approximately 10 km southwest of Port Radium and 12 km west of Contact Lake Mine). The sites were mined for silver from 1934-1936, 1956-1957 and in 1965.

Sawmill Bay is located approximately 65 km southwest of Port Radium, along the northern section of the Leith Peninsula at the eastern end of Great Bear Lake. Now abandoned, the site was first established as a sawmill in the 1930's, after which it was used for barging and air transportation of uranium ore from Port Radium (1940's-1950). It was subsequently used for various military activities (the 1950s) and later as a fishing lodge (late 1950s to 1987). The site covers approximately 2038 ha (20 km<sup>2</sup>), which extends from the beach landing on the south shore of the bay, to the lodge area, to the two intersecting airstrips located approximately 1,000 m inland from the tip of the bay.

### **2.1.2 Site Access**

None of the GBL sites are road accessible and the access approach will be selected by the Contractor. It is anticipated that the Contractor will likely utilize the Government of the Northwest Territories (GNWT) winter road to Déljñę and barge across Great Bear Lake. This was the access route chosen for the Port Radium remediation work. Proposed mitigation measures for winter road and barge activities for the remediation project have been submitted with the application. The SLWB will be notified of the Contractor's preferred access approach, though submission of a **Mobilization and Demobilization Plan**.

Maintenance, upkeep, and in select areas, upgrades will be required for the site access roads. The onsite access roads will be upgraded during the summer season between July and September every year. Maintenance would consist of road grading, installation of culverts and temporary docks. The access road to El Bonanza Mine (from the airstrip to site) will require the installation of a culvert across the wetland area at the outfall of Silver Lake. Also, the route to the Bonanza mine may require some infrastructure such as temporary dock construction. New winter roads connecting each site may also be required.

### **2.1.3 Mineral Tenure in Vicinity of the GBL Remediation Program**

During the Land Use Permit and Water Licence renewal process, DIAND has notified the holders of mineral rights concerning the remediation activities that affect site access and potential exploration activities. The Contractor will respect the mineral tenure and legal rights of claim owners during the remediation project.

#### *Silver Bear Mines*

The majority of the federal exclusion for the Silver Bear Mine sites has active mineral claims and leases held by DEMCo Ltd. All lands are within the Sahtu Dene and Metis Settlement Area, though the project sites are Federally Managed Lands by DIAND-CARD (surface and subsurface). Lands immediately west and east of the Silver Bear sites are Sahtu Settlement Lands (Aboriginal Owned Lands).

#### *Contact Lake Mine*

There are five active mineral leases at Contact Lake. These leases are held by Trevor Teed, Michael Magrum, Lane Dewar and Vivienne Gair. The lands are within the Sahtu Dene and Metis Settlement Area, though the project sites are Federally Managed Lands by DIAND-CARD (surface and subsurface).

#### *El Bonanza/Bonanza Mine*

There is one active mineral claim at the El Bonanza/Bonanza Mine held by Vivienne Gair. All lands are within the Sahtu Dene and Metis Settlement Area, though the project sites are Federally Managed Lands by DIAND-CARD (surface and subsurface).

#### *Sawmill Bay*

The federal exclusion area for the Sawmill Bay site has active mineral claims held by Lane Dewar. The lands are within the Sahtu Dene and Metis Settlement Area; however, the Camp and Airstrip areas are removed from the Sahtu Settlement Lands and are Federally Managed Lands by DIAND-CARD (surface and subsurface). The Beach Landing Area, Former Sawmill and Fishing Dock lie within Sahtu Settlement Lands (Aboriginal Owned Lands) and are not part of the exclusion zone.

## **2.2 Overview Of Project Activities**

The following sections present a brief summary of the remedial activities planned for the GBL Sites Phase II Remediation Project, as well as documenting the remedial activities conducted to date. Complete descriptions of the project activities are described in the complete application.

### **2.2.1 Mine Openings**

A large number of underground mine openings are found at the Silver Bear Mines, with a lesser number at Contact Lake Mine and El Bonanza/Bonanza Mine (no mining activities occurred at Sawmill Bay). Some of the vertical openings (shafts, raises, and open stopes) are uncovered and present significant fall hazards for people and animals. Horizontal openings (adits and portals) present risks if deliberately entered, from both poor air quality and unstable conditions. A shallow “open pit” is found at Terra Mine and a mined trench/pit at Northrim Mine.

The closure methodology selected for the mine openings was generally consistent across the GBL Sites, and summarized as follows:

- Shafts/Vent Raises: Install engineered concrete cap;
- Portals and Adits: Install backfill with local waste rock;
- Open Stopes: Backfill with local waste rock, where accessible; and,
- Open Pit: Backfill open pit/mined trench at Graham Vein with local waste rock and backfill adit/stope at the base of Terra “open pit”.

A listing of the GBL Sites mine openings and selected closure approach is provided in Table 2 in the complete WL application.

Geotechnical inspections will be implemented on a routine frequency after closure to confirm the ongoing structural integrity of the closures and identify any corrective measures required. The scope of these activities will be outlined in the **Geotechnical Inspection Plan**.

### **2.2.2 Waste Rock**

Waste rock is located at all individual Silver Bear Mine sites, Contact Lake Mine, and Bonanza/El Bonanza Mines. Remedial approaches for the management of waste rock were designed based on the geochemical and radiological risks presented from the materials and the impacts on downstream receptors and are detailed in the RAPs. Table 3 in the complete WL application presents the selected remedial approaches agreed to during community consultations and tailored to the specific waste rock deposit. The overarching approach of the remedial measures is to reduce surface water interaction with the waste rock. The sole exception is the installation of a cover to reduce gamma radiation from small areas of Contact Lake Mine waste rock.

Water quality monitoring will be conducted downstream of the waste rock deposits during construction and post-construction to confirm the effectiveness of remedial measures. Geotechnical inspections will be implemented on a routine frequency after remediation to confirm the ongoing structural integrity of the remedial works. The scope of these activities will be outlined in the **Water Quality Monitoring Plan** and **Geotechnical Inspection Plan** respectively.

### **2.2.3 Tailings**

Tailings are located at Silver Bear Mines (Terra, Northrim, and Norex only) and at Contact Lake Mine. Most of the tailings at Terra Mine are located under water in Ho Hum Lake Tailings Containment Area. Most of the tailings produced at Northrim Mine lie under water in Hermandy Lake TCA. Tailings are also located under water in the Camsell River, close to the dock. A portable mill operated at Norex for a brief period and produced tailings in or near Xeron Pond. At Contact Lake Mine tailings are scattered on the surface between the former mill site location and the edge of the tailings pond..

Remedial approaches for the management of tailings were designed based on the geochemical risks presented from the materials and the impacts on downstream receptors. Table 4 of the WL complete application presents the selected remedial approaches agreed to during community consultations and tailored to the specific geochemistry and setting of the tailings deposits.

Water quality monitoring will be conducted downstream of the tailings deposits to confirm the effectiveness of remedial measures. Geotechnical inspections will be implemented on a routine frequency to confirm the ongoing structural integrity of the remedial works. The scope of these activities will be outlined in the **Water Quality Monitoring Plan** and **Geotechnical Inspection Plan** respectively.

### **2.2.4 Buildings, Equipment, and Infrastructure**

Camps and operational infrastructure was constructed at each of the GBL Sites. At Contact Lake Mine, El Bonanza/Bonanza Mine and Sawmill Bay, operations were small and the number of structures minimal. Many of the structures have either collapsed or partially collapsed in the decades since abandonment. However, some standing buildings remain which may present tempting but unstable shelter for wildlife or site visitors.

Alternatively, Silver Bear Mines contains substantially more buildings and infrastructure and is many decades newer. The majority of buildings are found at Terra Mine and are steel framed/clad structures with concrete foundations and floors. Most of the smaller shops and storage sheds are timber framed and timber sided, with steel roofs. The camp buildings include timber structures built

on site and ATCO trailer complexes. The buildings at Silver Bear are typically in better condition than other sites, though have been unmaintained for decades and are deteriorating.

Structures present physical hazards in their current state and as they deteriorate further in the future. Hazardous building materials have also been documented and sampled, including lead amended paints, polychlorinated biphenyl (PCB) amended paint, wood treated with pesticides (Dichlorodiphenyltrichloroethane or DDT) and asbestos containing materials (ACMs) such as insulation, floor tiles and pipe wrap.

The primary concern in considering remedial action for buildings and equipment is the safety of people who may visit the sites and wildlife which may opportunistically use structures. The following remedial approach was agreed to during community consultations and will be applied consistently across all sites:

- Demolish all buildings/infrastructure after removal of hazardous materials and dispose of non-hazardous debris in an approved manner.

During the 2010 GBL Sites Phase I Remediation Project, the majority of buildings at the Contact Lake Mine and El Bonanza/Bonanza Mine were demolished; however some buildings still remain. Hazardous building materials were shipped to a licensed off-site management facility, with the exception of ACMs which were double bagged and remain at the sites. Non-hazardous debris was consolidated into stockpiles awaiting transport to the Terra Mine landfill. Unpainted untreated wood was burned under permit and the ash sampled for management. No building or infrastructure demolition was conducted at Sawmill Bay or Silver Bear Mines.

### **2.2.5 Non-Hazardous Wastes**

The GBL Sites contain a significant amount of non-hazardous waste, the greatest volume of which is found at Terra Mine. These materials are in consolidated waste disposal areas, scattered around the site or will be generated during building/infrastructure demolition. Primary materials are steel, wood, and concrete, with lesser quantities of plastics, rubber, glass, insulating materials and paper products. Significantly smaller volumes of material are found at the Contact Lake Mine, El Bonanza/Bonanza Mine and Sawmill Bay site.

The following remedial option was selected for all sites and agreed to during consultations:

- Consolidate non-hazardous waste and transport to the non-hazardous waste landfill at Terra Mine.

A portion of the mill/campsite area at the Terra Mine site has been selected as a candidate site for the new non-hazardous waste landfill. The landfill will be placed at the highest impacted part of the site where the former camp and tank farm were located. The landfill will be enhanced with a top liner so that limited infiltration of water will occur. This decision is not reflected in the Silver Bear RAP but has been accepted by the community as it is the highest and driest point at the site and is located in an impacted area (see **Engagement Log** on the SLWB Public Registry). The Terra Mine Landfill will accept non-hazardous wastes from all GBL Sites.

Water quality monitoring will be done around the landfill to ensure that no contaminants are leaching from the landfill. Geotechnical inspections will be implemented on a routine frequency to confirm the

structural integrity of the landfill. The scope of these activities will be outlined in the **Water Quality Monitoring Plan** and **Geotechnical Inspection Plan** respectively.

In 2010 the following activities were conducted during the GBL Sites Phase I Remediation Program:

- Contact Lake Mine: Scattered surface debris and debris <0.5m depth at waste disposal sites was consolidated in stockpiles. After building demolition, non-hazardous building debris was added to these stockpiles.
- El Bonanza/Bonanza Mine: Scattered surface debris and all debris at waste disposal sites was consolidated in stockpiles. After building demolition, non-hazardous building debris was added to these stockpiles.
- Sawmill Bay: Scattered surface debris and debris <0.5m depth at waste disposal sites was consolidated in stockpiles. No building demolition occurred. Approximately 10,800 empty drums were crushed and stockpiled.
- Silver Bear: No activities conducted.

### **2.2.6 Hazardous Wastes**

At the Silver Bear Mines, there is a considerable inventory of potentially hazardous waste materials that include batteries, lead paint, old lime and residual mill reagents, with lesser volumes identified at the Contact Lake Mine, El Bonanza Mine and Sawmill Bay. Hazardous building materials include DDT-impacted wood, lead and PCB amended paints, ACMs (select insulation, tiles, pipe wrap, window sealant, drywall tape, etc.) and transformers. Vehicles, equipment, tanks, drums and various mine infrastructure may also have lead-amended paint exceeding leachable lead criteria for the Terra Mine Landfill and require off-site management as a hazardous material. Based on technical evaluations, community consultations, and design refinements, the following remedial options were selected:

- *Designated Substances / Hazardous Materials* – Remove and dispose of in a designated licensed facility for hazardous materials; and
- *Asbestos* – Remove and dispose at Terra Mine non-hazardous landfill.

All hazardous materials (with the exception of ACMs) will be shipped off-site in accordance with the Transportation of Dangerous Goods Regulations (TDGR) to a licensed disposal facility. On June 23, 2017, DIAND-CARD received a letter from KBL Environmental Ltd. to receive hazardous and non-hazardous wastes from Great Bear Lake remediation project (Attachment 1). ACM building materials will be double bagged and placed in one corner of the onsite landfill, clearly marked by the Contractor.

The GBL Phase II Remediation Program will include the consolidation and off-site management of all remaining hazardous materials at the Contact Lake Mine (remaining buildings only), El Bonanza/Bonanza Mine (remaining buildings only), Sawmill (all buildings) and Silver Bear (debris and buildings).

### **2.2.7 Hydrocarbon Impacted Soil**

Significant hydrocarbon impacts were identified at Silver Bear Mines, primarily of the waste rock lay down areas, around the mine sites. As a result of the long history of industrial and military activity at Sawmill Bay, soils in some parts of the site are also contaminated with hydrocarbons from fuel oil, lubricating oils, and gasoline.

Alternatively, at the Contact Lake Mine, only limited areas and quantities of hydrocarbon impacted soils and waste rock were identified. At El Bonanza/Bonanza Mine hydrocarbon impacted soils were identified near several buildings, one of the dumpsites, the drum storage area at El Bonanza and the airstrip. As was agreed in community consultations, these impacted soils will be remediated with an approach tailored to the nature of contaminants.

As the mine sites are remote and access is extremely limited, generic CCME criteria for hydrocarbon impacts in the soil are very conservative given they assume regular access to the sites. Site-specific clean-up criteria for hydrocarbon impacted soils have therefore been developed for the Silver Bear sites and those criteria will be applied to all Great Bear Lake sites. The site-specific criteria are summarized in Table 5 of the complete WL application, and the full report available in **Annex A-5** on the SLWB Public Registry. Note that separate criteria were developed for Sawmill Bay, as there was the potential for longer exposure because of the presence of a former lodge and because of the type of soil at Sawmill Bay (sand).

Soil impacted with light F1 and F2 hydrocarbon fractions (gasoline/diesel mobile fractions) will be excavated and treated on-site in windrow treatment areas (i.e. landfarms). More stringent criteria for F2 mobile fractions have been established for areas that are in close proximity to water bodies (within 30 m). This ensures that the water bodies on-site will be protected to an FAL Criteria. Soil impacted with F3 and F4 hydrocarbon fractions (heavier lube oils/non-mobile fractions) will either be covered in place (Contact Lake Mine and El Bonanza/Bonanza Mine) or excavated and placed in the non-hazardous Terra Mine landfill as intermediate fill (Silver Bear).

A **Landfarm Management Plan** will also be developed by the Contractor to outline the design approach, treatment methodology, monitoring requirements, soil testing requirements and criteria for soil management. Water quality monitoring will be done around the treatment area to confirm that no contaminants are leaching and geotechnical inspections will be implemented on a routine frequency to confirm structural integrity. The scope of these activities will be outlined in the **Water Quality Monitoring Plan** and **Geotechnical Inspection Plan** respectively.

In 2010, a small volume of PHC-impacted soil at the Sawmill Bay airstrip was shoveled into polyethylene liner bags, placed into drums and transported to Yellowknife for approved disposal. These clean-up efforts were conducted at discrete areas due to recent spills from drums (i.e. did not include historic contamination).

### **2.2.8 Drums, Tanks and Residual Fuels**

More than 10,000 drums and numerous above-ground storage tanks were identified at the GBL Sites, many of which contained residual fuel, other products (e.g. glycols) or fuel/product mixed with water. Based on these considerations, the following remedial option was selected:

- *Drums and Fuel Storage Tanks* – Dispose of contents (in accordance with relevant guidelines) and drums/ tanks at Terra Mine non-hazardous landfill.

The community agreed to have the barrels collected, cleaned and crushed during the GBL Sites Phase I Remediation Project. In 2010, a total of 8,235 empty drums were consolidated and crushed at the Sawmill Bay site, including 34 from Contact Lake Mine and 76 El Bonanza/Bonanza Mine. Crushed drums were placed with the non-hazardous debris stockpiles. The remaining 2,590 drums contained some residual liquid product. In 2011, drums with liquid were consolidated based on disposal



requirements set in the Abandoned Military Site Remediation Protocol, laboratory results, and visual observations. The emptied drums were washed within the drum processing area (a lined box). The process water was treated with an oil-water separator which resulted in two liquid streams: treated water and process waste. The process waste was consolidated, while the treated water was either held in temporary holding bladders and sampled for discharge or recycled back into the washing system. The treated water was discharged in accordance with the requirements set in the Water Licence. A total of 202 drums containing product and process waste were removed from the site in 2014, followed by removal of an additional 950 drums in 2016. It is believed that all drums with the residual product have been removed from the GBL Sites, though some residual sludge remains in the tanks.

During the GBL Sites Phase II Remediation Project, any residual fuel and fuel/product mixtures will be managed per Phase I protocols and shipped off-site for disposal in a licensed facility. Empty drums (once washed if containing product) will be crushed and managed within the Terra Mine landfill, as will dismantled tanks with lead paint applications below leachable criteria. If exceeding criteria, materials will be managed per hazardous materials and shipped to a licensed off-site hazardous waste management facility.

### **2.2.9 Docks**

Three docks are found at the Silver Bear Mines on the Camsell River; one at Terra, one at Northrim and one at Norex. A dilapidated dock and sand crib is also associated with the Contact Lake Mine and is found along the shore of the East Arm of Great Bear Lake. The docks are in disrepair and some contain contaminated soils/wood. The following remediation options were agreed to during community consultations:

- *Dock and crib structures* – remove and dispose of these structures and debris in a landfill

The plan is to remove the docks with minimal disturbance to the surrounding sediments and stabilize the shorelines. The docks will be excavated to the original shoreline and stabilized with rock fill (where necessary).

Water quality monitoring will be conducted during and following dock removal. Geotechnical inspections will also be implemented on a routine frequency to confirm the structural integrity of the shoreline. The scope of these activities will be outlined in the **Water Quality Monitoring Plan** and **Geotechnical Inspection Plan** respectively.

### **2.2.10 Airstrips**

Historic airstrips are found at Silver Bear Mine (Terra and Smallwood), El Bonanza/Bonanza (at the shore of Great Bear Lake) and Sawmill Bay. While unmaintained, the airstrip at Terra Mine and Sawmill Bay are still used to access the sites. The airstrips at Smallwood and El Bonanza/Bonanza are overgrown and no longer in use.

The remedial plan is to leave the El Bonanza/Bonanza and Smallwood airstrips as is to continue natural revegetation. For the Terra Airstrip and Sawmill Bay airstrip, intermittent use may be required during and following remediation (to support long-term monitoring). The RAPs identified a preference to also leave these airstrips as is and Transport Canada will be consulted to identify requirements when use is no longer required.

### **2.2.11 Roads and Culverts**

GBL Site roads are constructed from local borrow materials and waste rock to varying degrees, though all are considered to pose a little environmental risk. Culverts are found at discrete locations, many of which would only carry ephemeral water during freshet or major precipitation events. Roadways will be required to access the sites during the remediation program and in some locations upgrades or additional culverts may be necessary.

The remedial approach for the roads is to remove the culverts and to allow the roads to naturally revegetate. DFO has been consulted and will continue to be consulted to assure any new culverts installed or culverts removed at closure would be done with Best Management Practices and fisheries approval where required. Considerations will include proper stream channel design, fish passage (if required with DFO input), and long-term stability of the stream bed and banks at each location. If roads are upgraded for use, they will be scarified and left to naturally revegetate at the completion of the remedial works.

### **2.2.12 Camp Facilities**

Completion of the GBL Sites Phase II Remediation Project will require operation of a field camp. Upon selection, the Contractor will be required to submit a **Camp Methodology and Layout Plan** (either as a stand-alone document or part of the Comprehensive **Work Plan**), to be provided to the SLWB. In the interim, DIAND has estimated a camp size of approximately 20-50, in operation for seven months per year for five years.

The remedial Contractor will ultimately be responsible for the design and implementation of camp facilities, pending DIAND review. It is assumed the Contractor will use Terra Mine for the new primary camp. Due to the existing camp's overlap with the proposed non-hazardous waste landfill to be constructed and the need to demolish the former mine/camp buildings, the Contractor may elect to establish a new camp. The most probable location would be on the main Terra Mine site, adjacent to the large pit area. The location must not interfere with remediation activities and facilities must be removed at the completion of work activities.

Satellite camps at the other sites may operate concurrently or in sequence. The temporary satellite camps may also act as a base for the remediation project when the existing central camp at Terra Mine is being demolished. Satellite camps are predicted to be 10-15 persons or less and would be composed of temporary structures.

Camps will be placed on areas cleared during historical operations. As much as possible, camp facilities will be located greater than 100 m from a waterbody. However, at some sites, the most suitable cleared area is less than this distance (e.g. El Bonanza/Bonanza).

Each camp facility established shall be required to meet minimum standards and provide the following three general items:

- Potable water source and treatment that meets Health Canada *Guidelines for Canadian Drinking Water Quality*;
- Treatment facility for greywater and blackwater generated from the camp; and
- Suitable camp facilities that include offices, accommodation, kitchen/dining room, showers, bathrooms, etc.

## **2.3 Program Components**

### **2.3.1 Fuel Storage**

A summary of the total estimated fuel requirements for the GBL Sites Phase II Remediation Project is provided below. Updated estimates will be provided by the Contractor, including maximum on-site volumes. Fuel will be stored primarily at Terra Mine.

Diesel	1,000,000 L capacity
Gasoline	180,000 L capacity
Aviation Fuel	20,000 L capacity
Propane	30 cylinders

Fuel transfer will primarily be from central fueling locations at the camp or main site workings; however, will also be undertaken by gravity feed, electric drum pumps or manual drum pumps (e.g. wobble pumps). Personnel will be in attendance during all refueling activities. Spill kits will be available at every refueling station and secondary containment will be in place under fuel transfer locations. Please refer to the Spill Contingency Plan for additional information.

### **2.3.2 Water Management**

Water use will be required for camp facilities (potable water, kitchen use, toilets, and ablution); dust suppression on roadways, in support of remedial activities (e.g. washing, concrete mixing) and fire suppression.

Water use will depend largely on the remedial approach selected by the Contractor and will be influenced by any reuse, recycling or reduction techniques employed. The estimated daily water quantities are indicated below for each type of use:

- Camp Use: <15 m<sup>3</sup>/day;
- Dust Suppression: <50 m<sup>3</sup>/day;
- Cleaning: <5 m<sup>3</sup>/day;
- Concrete Mixing: <20 m<sup>3</sup>/day; and
- Other Industrial Use: <10 m<sup>3</sup>/day

The estimated volumes above are daily maximums and actual use is expected to be lower. At no point will water use exceed the 300 m<sup>3</sup> per day threshold of a “Type B” Water Licence, except in the unlikely event of emergency fire response. The workers would be on-site for approximately 7 months each year (210 days), requiring total water use of approximately 21,000 m<sup>3</sup>/year.

DIAND has indicated that water will be drawn from the following water sources: Great Bear Lake, Camsell River, Contact Lake, Smallwood Lake, Silver Lake and Whale Lake.

### **2.3.3 Equipment Used**

Below is a list of equipment estimates for the remediation of the abandoned sites; however, is subject to updates by the Contractor. Other equipment required to support the remediation work includes

generators, lighting towers, and pumps. After the contracts have been awarded, a final equipment list for each site will be set out as a part of the Contractor's Work Plan.

- Excavators (2)
- Loaders, Conventional with Attachments (3)
- Loaders, Skid Steer (2)
- Bulldozer
- Rock Trucks, Articulated (2)
- Crushing Plant
- Packer
- Snow Ploughs (1)
- Pickups (6)
- Fuel/Lube Truck
- ATVs (5)
- Screen Decks (2)
- Concrete Mixer (1)
- Fuel Truck (1)
- Dump Truck, Single Axle (1)
- Grader (1)
- Vacuum Truck (1)
- Crane, Conventional 150 Ton (1)
- Crane, Mobile (1)
- Manlift

### **2.3.4 Emergency Response and Spill Contingency Planning**

An [Interim Spill Contingency Plan](#) was included in the application package. The purpose of CARD's Spill Contingency Plan is to provide a plan of action for unforeseeable spill events at the GBL Sites Phase II Remediation Project. The Plan identifies key response personnel and their roles and responsibilities in the event of a spill, as well as the equipment and other resources available to respond to a spill. It details spill response procedures that will minimize potential health and safety hazards, environmental damage and clean-up efforts. The Plan has been prepared to ensure quick access to information required in responding to a spill. A Final Spill Contingency Plan will be provided by the Contractor and will at minimum meet the requirements as specified within the Interim Plan.

### **2.3.5 Waste Management**

#### *Garbage*

The waste materials which require management during the GBL Sites Phase II Remediation Project are within two general streams:

- Legacy Site Waste: These materials were generated during original operation of the now abandoned sites and in keeping with remedial objectives, will be managed to improve site conditions. Legacy site waste includes unpainted/untreated wood, non-hazardous waste, hazardous materials, impacted soils, waste rock and tailings, and Ho Hum TCA Discharge. The RAPs for each of the project sites have been designed in part to manage the legacy waste and may be consulted for options analysis and technical considerations.
- Project Generated Waste: The GBL Sites Phase II Remediation Project will generate discrete waste during camp operation and remedial activities. The City of Yellowknife has granted permission to receive camp waste at their facility (Attachment 2).

Detail of the Project Generated Waste stream is provided in the submitted [Waste Management Plan](#). Upon contract award and selection of a remedial approach, the Contractor will be required to submit an updated and refined **Waste Management Plan**, including methodologies and specific equipment requirements. All waste will be segregated and managed by incineration, recycling, or transfer to an approved facility and incorporate means to reduce waste (e.g. source reduction, reuse, recycling, and treatment).

#### *Sewage (Sanitary and Greywater)*

The GBL Sites Phase II Remediation Project will generate two discrete wastewater streams to be tested, treated (if necessary) and discharged:

- *Camp Wastewater:* Greywater (ablution, general use), kitchen sumps/traps and blackwater (sewage).
- *Process Wastewater:* Water used for washing and decontamination, such as washing drums, tanks, equipment, soil and non-hazardous waste before deposition in the on-site landfill.

The location and design of the facility will be chosen by the successful Contractor and will be provided in the **Work Plan** and updated **Waste Management Plan**. Based on water consumption, it is expected that total wastewater discharge from both streams will not exceed 80 m<sup>3</sup>/day. Treatment systems will be provided for wastewater as necessary to meet discharge criteria provided in the Water Licence. Testing will be conducted prior to discharge and at regular frequencies during discharge.

Tested effluent will be released onto the ground at a location reviewed and accepted by the Departmental Representative that is a minimum of 30 m from natural drainage courses and 100 m from fish-bearing waters. As much as possible, discharge locations will be a minimum of 100 m from all waterbodies; however, given that camp facilities must be erected within the pre-existing footprint of the historic operations, a minimum setback of 30 m may be required in select locations. Similarly, work activities at shoreline infrastructure (e.g. removal of docks) must be completed within these setback distances. Discharge locations will be selected to minimize erosion (bedrock outcrops or sumps if necessary).

In keeping with other small DIAND-CARD remediation camps, the Contractor may select between alternative approaches to management of sewage waste at the satellite camps, including Incinolet toilets, Pacto-type toilets, discharge to sumps or incineration. The proposed methodology will be provided by the Contractor's updated **Waste Management Plan**.

#### *Brush*

Small amounts of brush may be removed from existing roads, access routes or borrow areas. Cleared brush will be windrowed or burnt, and segregated from standing timber. In the case of burning on-site, the Contractor(s) will obtain a burn permit for the burning of the brush.

#### *Clean Overburden*

No substantial removal of clean overburden is anticipated. However, if removed as a result of acquiring borrow materials or similar tasks, any stripped soil will be stockpiled for later use in restoration and to facilitate revegetation.

#### *Contaminated Soil/Waste Excavation*

Mobile fractions of PHC contaminated soils will be excavated and sifted for large rock particles. Rocks greater than 2 cm in diameter will be returned to the excavation. Clean fill will be placed in the excavated area to prevent water ponding and permafrost degradation. Excavated soils exceeding site-specific F1-F2 criteria will be treated in engineered facilities to be constructed at Terra Mine, El Bonanza/Bonanza Mine and Sawmill Bay. Soils exceeding the F3-F4 criteria will be covered in place or excavated for use as intermediate fill within the Terra Landfill. All other soils/materials identified for excavation will be transported off site for management in licensed waste management facilities.

## **2.4 Process Requirements**

**Application Received:** May 25, 2017

**Application Deemed Complete:** June 1, 2017

**Application Forwarded for Review:** June 5, 2017

**Number of Review Agencies:** 23

**Review Period End Date:** June 30, 2017

**Proponent Response:** July 7, 2017

**Proposed Start Date:** July 23, 2017

No application fee was required for this Water Licence or Land Use Permit as the applicant is the Federal Government.

## **3. Comments**

### **3.1 Permission of Land Owner**

The eligibility of the applicant to apply for the Water Licence and Land Use Permit is under Section 18(b)(i) of the Mackenzie Valley Land Use Regulations because the Government of Canada has a right to occupy the land under the *Sahtu Dene and Métis Comprehensive Land Claim Agreement* Section 21.3.1 (Government Access), and will contract to have the land use operation carried out. The Water use and Waste disposal requirements requested in the renewal application are associated with Crown activities to remediate contaminated sites on Crown Lands (i.e. excluded lands) in the NWT.

Activities proposed by DIAND are intended to reduce the physical, chemical and safety hazards as well as improve aesthetic conditions. DIAND obtains the right and responsibility to access these lands for the purpose of remediation, as defined and outlined in Section 19.3.4 of the SDMCLCA:

*“Where government undertakes any program respecting the cleanup of hazardous waste sites on Crown lands in the settlement area, such program shall apply to hazardous waste sites on Sahtu lands existing at the date of settlement legislation, whether or not identified at that time, and government shall be responsible for the costs associated with such clean-up on Sahtu lands. This provision shall not prevent the government from recovering any such costs from a person made liable for these costs pursuant to legislation.”*

### **3.2 Community Engagement**

Various engagement activities have been initiated with both Sahtu and Tłı̄ch̄q organizations (i.e., affected parties) as part the GBL Sites project. Sahtu organizations engaged in the past include leadership from Déljı̄ne, including the Déljı̄ne First Nation (DFN), Déljı̄ne Land Corporation (DLC), Déljı̄ne

Renewable Resource Council, Elders and community members. Tłıchq organizations engaged in the past include leadership from the Tłıchq Government, Elders and community members.

The main methods of engagement have included the collection of Traditional Knowledge with Elders, the establishment of a Community Liaison Coordinator, capacity building through on-site training opportunities, and information sharing through community meetings and science camps.

Board staff have completed a conformity check of the [Engagement Plan and Record](#) against the Board’s *Engagement and Consultation Policy* (the Policy) and the *Engagement Guidelines for Applicants and Holders of Water Licences and Land Use Permits* (the Guidelines). As a result of this conformity check (Table 1), Board staff have recommended that the Plan meets the criteria of the policy.

**Table 1: Conformity Table, Assessment of Engagement Plan (The Policy, Appendix B)**

Engagement Criteria	Board Assessment
Who was engaged?	Appropriate affected Aboriginal organizations/governments and other affected parties have been contacted; There have been reasonable responses and engagement from the affected parties.
Timing of engagement	Applicant began engagement in 2007 and has been actively engaged over the years with many community programs and initiatives.
Achieved results	All relevant documents have been shared with affected communities; The Engagement Plan reflects Board’s policy; Applicant has invested much time in community meetings face-to-face, science camps and community liaison coordinator position, capacity building/training programs; All responses from affected Aboriginal groups have been noted and included in the record; Applicant has a dispute resolution protocol/process; Applicant has responded to community concerns and noted actions taken to address concerns raised.

In addition to the Policy assessment tool, the Engagement Guidelines outlines six (6) components that an Engagement Plan must satisfy in order to be considered complete. Board staff has conducted a conformity check to ensure the Plan satisfies these requirements (Table 2).

**Table 2: Conformity Table, Engagement Guidelines Requirements**

Engagement Plan Must Have’s:	How DIAND-CARD’s Engagement Plan satisfies these requirements:
1. Describe the goals and methods of engagement;	Six goals and objectives of the community engagement plan are described; Methods of engagement are described and include:

	<ul style="list-style-type: none"> <li>• “Roundtable” meetings will provide a forum for equal and open discussions on project information, a translator will be used if available;</li> <li>• Documents, discussions, and information from meeting minutes, recordings and pictures taken will be shared with all participants; and</li> <li>• DIAND will inform and involve the Déljñę Got’ine Government throughout all phases of the project planning, execution, and monitoring.</li> </ul>
2. Outline a frequency of engagement that allows for relevant and timely information sharing;	DIANDs Engagement Plan describes nine triggers that would require engagement to take place.
3. Establish a process that allows the affected party to raise concerns on issues;	The purpose for each engagement trigger is described.
4. Allow opportunities for, when appropriate, community meetings to take place to be inclusive of perspectives from all sectors of the community, including women, youth, and Elders;	CARD has provided examples of their past approaches to community involvement. CARD has identified the Déljñę First Nation (DFN), Déljñę Land Corporation (DLC), Déljñę Renewable Resources Council (DRRC) and Déljñę Got’ine Government (DGG) as primary contacts in their engagement processes.
5. Ensure the proponent has procedures in place to understand and respond to issues as they arise; and	DIAND has a feedback and evaluation process to ensure all concerns are addressed. Stakeholder feedback is used to understand concerns, information sharing and inform decision making.
6. Provide the opportunity for relationships to be built proactively, not just when issues occur	DIAND will hold bi-annual community and leadership update meetings in Déljñę, to update the Déljñę Got’ine Government leadership and the community on project status, pre-remediation activities and monitoring results at the GBL Sites. The most recent meeting was held in June 2017.

### **3.3 Traditional Environmental Knowledge**

Traditional Knowledge Studies have been completed for the areas that will be addressed as part of the remedial activities of this Project, including the site footprints, road access corridors, and other traditional land use areas (i.e., historic winter roads, traditional hunting and trapping routes, ceremonial burial sites, sacred sites, etc.). These studies were coordinated through the Community Liaison Coordinator for the Sahtu organizations and through the Tłıchq Government. These studies included:

- Déljñę First Nation (2008/2009). Science Camp March 24-28



- Déljñę First Nation (May 2010). Sawmill Bay Traditional Knowledge Studies
- Déljñę Renewable Resource Council, Déljñę First Nation and SENES Consultants (March 2012). Denison Road Traditional Knowledge Study

Extensive Traditional Environmental Knowledge (TEK) was also collected in support of the development of the GBL Remediation Program Remedial Action Plans. A comprehensive TEK study was completed on September 26, 2011. Titled the Déljñę Remediation one Mapping Project, it included:

- Follow up from 2009 Traditional Knowledge mapping project, verifying place name spellings around Great Bear Lake.
- During 2010-11, more in-depth mapping project focused on the 'remediation zone' where abandoned mines are located.
- The project included educational, skill-building and research elements, gave rise to a comprehensive understanding of historical, ecological and cultural aspects of the Remediation Zone landscape.

No additional TEK was submitted with the renewal application.

### **3.4 Potential for Environmental Impacts and Mitigation Measures**

The GBL Sites Phase II Remediation Project has been designed to provide a net positive effect to land and water systems. Any impacts during the remediation program are anticipated to be small relative to the overall benefit. In addition to anticipated effects, there is always a potential for unplanned events or incidents. The probability of unplanned events and the potential impacts they may incur will be reduced through planning and the application of environmental management plans.

#### **3.4.1 Water**

The GBL Remediation Program contains limited in-water work and no significant effects to surface water receivers or groundwater are anticipated. Overall, the remedial measures have been designed to improve water quality, restore original flow pathways and are not expected to affect water quantity. However, management measures will be required to minimize potential effects during the following:

- Dock removal and shoreline work
- Channel restoration
- Culverts
- Barging
- Ice Road
- Groundwater Considerations
- Ho Hum TCA Discharge

Potential impacts will be mitigated through implementation of a **Sediment and Erosion Control Monitoring Plan**, a **Water Quality Monitoring Plan**, **Mobilization and Demobilization Plan**.

#### **3.4.2 Land**

Given the project sites are former industrial properties and remedial efforts are focused on these disturbed areas, there will be minimal incremental impacts to the land. However, there is the potential to impact land systems during select activities which must be managed appropriately. These potential effects and mitigation measures are as follows:

- Spills
- Borrow Source Excavation
- Discharges
- Roads/Earthworks

Potential impacts will be mitigated through implementation of the **Spill Contingency Plan, Sediment and Erosion Control Plan, Waste Management Plan, and Mobilization/Demobilization Plan.**

### **3.4.3 Flora and Fauna**

*Flora:* Given the scope of remedial work is within previously cleared areas, there are not expected to be significant impacts to local flora. A small amount of clearing may be required of overgrown roadways when accessing remote areas of the site and during borrow source extraction. The Contractor will be required to minimize stripping of topsoil and vegetation; protect vegetation as much as possible; and seek approval from DIAND before clearing. No self-propelled machinery will be used for clearing and any vegetation will be cut no more than 20 cm above the ground surface. Any brush/debris will be segregated from standing timber.

*Fauna:* Potential risks to wildlife include disruption during site activities, habituation from camp activities and interaction with workers or vehicles/equipment. The risks from these activities may in most cases be mitigated with active management as explained within the [Wildlife Protection Plan](#).

### **3.4.4 Socio-Economic**

The socio-economic effects accruing from the remediation program will be positive. To enhance regional socio-economic benefits, the contractor will be required to submit a socio-economic plan that will include the contractor's commitments to provide Aboriginal employment, sub-contracting and training. In addition to Aboriginal benefits, the project is anticipated to continue providing significant contracting and employment opportunities for northerners.

### **3.4.5 Archaeological and Heritage**

The Prince of Wales Northern Heritage Center (PWNHC) was contacted to provide additional information and data of the site areas. One archaeological site (a burial site) was identified at Sawmill Bay. Earlier discussions with the SLWB concerning the burial site determined that work activities will not interfere with the site and the remedial activities may continue as planned. However, should borrow source extraction be required in previously undisturbed areas, the evaluation will be required to determine if the archaeological assessment is required.

Worker orientation will include specific training in archaeological preservation. Workers will be instructed to stop work immediately if an archaeological site is identified/suspected and notify the Supervisor and Departmental Representative. A buffer area will be established to prevent disruption and coordinates/photos collected. With the exception of notifying project/territorial archaeologists, this information will be kept confidential.

### **3.5 Preliminary Environmental Screening**

DIAND-CARD has requested that the Board consider the Water Licence renewal application and Land Use Permit renewal application exempt from a Preliminary Screening pursuant to Part 1(2) of Schedule 1 of the Exemption List Regulations of the Mackenzie Valley Resource Management Act (MVRMA) as there have been no modifications to the scope of work since July 13, 2010, Preliminary Screening was completed by the Board at the time the current licence was issued. This application does not require a Preliminary Screening under terms of the MVRMA Exemption List Regulations, Schedule 1, Part 1, Section 2, due to the following points:

- a) has not been modified, and
- b) has fulfilled the requirements of the environmental assessment process established by the MVRMA.

The Board has reviewed DIAND-CARD's application to confirm that the scope of work has not been modified. The Board did not receive any comments or recommendations regarding this request during the public review of the application. Board staff are of the opinion that the application meets the requirements to be exempt from a Preliminary Screening.

### **3.6 Conformity with Land Use Plan**

The SLUP was adopted by the Sahtu Land Use Planning Board (SLUPB) in April 2013 and received approval and came into effect on August 8, 2013. The proposed project is wholly within the Great Bear Lake Watershed Special Management Zone (23). The Zone description is provided in Appendix 1 of the SLUP.

Section 2.5 (Plan Exemptions), Part D (Application to Land Uses that are a Legacy of Decisions before the Approval of the Plan) of the SLUP states that: The MVRMA and SDMCLCA provide for land use plans to be implemented by authorizations and dispositions and do not give land use plans retroactive effect. Accordingly, a land use that has been authorized when the Plan is approved may be undertaken or continued despite any nonconformity with the Plan until the authorization or disposition on which it depends expires or becomes eligible for renewal or amendment. From that date forward the Plan applies to the land use to the extent provided below.

As per Part 3, Section 61(1) of the MVRMA, the Board may not issue, amend, or renew a licence or permit or authorization except in accordance with the applicable land use plan under Part 2. In consideration of best practices (due diligence) and because the exemption list does not clearly identify cleanup and reclamation activities, which are except from CR#1, Board staff have required the Proponent demonstrate how the project meets the appropriate SLUP conformity requirements.

Table 3 outlines how these requirements are being addressed as presented by DIAND with review by Board staff. Under evaluation by the SLWB staff, it appears the project conforms to the SLUP and therefore Board staff do not recommend referral to the SLUPB for a conformity determination as set out in Section 47. The SLWB has met the requirements as per Section 46 of the MVRMA.

**Table 3: GBL Remediation – SLUP Conformity Requirements**

<b>Conformity Requirement</b>	<b>Application Section(s)</b>	<b>Supporting Evidence</b>	<b>Board Staff Review</b>
<b>General Conformity Requirement</b>			
CR#1 – Land Use Zoning	N/A	Proposed land use is not prohibited within the project area (Zone 23). Furthermore, the application is exempt from CR#1 as per S 2.5 of the Plan, as it is related to: F) cleanup of contaminated sites	Confirmed, Activities related to the cleanup and reclamation of contaminated sites or historical industrial sites are exempt from CR#1
CR#2 – Community Engagement and Traditional Knowledge	5a and 6, Appendix F and K	Community Engagement and Traditional Knowledge studies have been carried out and documented in the Engagement Plan and Engagement Log (Appendix F), and in the List of Studies and Reports (Appendix K). Additional consultation will be conducted in June 2017 to ensure communities informed of project progress and updates.	Confirmed, details discussed in sections 3.2 and 3.3 of the staff report
CR#3 – Community Benefits	3 and 6	Contractors will be required to demonstrate Aboriginal Opportunities Considerations and specify the commitment to Aboriginal employment and training. These commitments will be enforced using contractual measures	Confirmed, proposed project addresses community concerns, includes economic benefits, training and capacity building, carrying out TK studies and documenting Elders knowledge for archival purposes; Onsite Departmental Representative for Phase II activities
CR#4 – Archaeological Sites and Burial Sites	6 and Appendix F	Prince of Wales Northern Heritage Centre was contacted to provide additional information and data of the site areas, including database searches. Given the projects are industrial properties; no Archaeological Impact Assessment was conducted. However, through engagement, a burial site was	Confirmed, LUP conditions 26(1)(j) 47 specifies that the Permittee shall not operate any vehicle or equipment within 150 meters of a known or suspected historical or archaeological site or

		discovered near the Sawmill Bay Camp. The SLWB has been consulted to ensure the area is protected during site activities (with all information held confidential). Worker orientation will include specific training in archaeological preservation.	burial ground; and 48 specifies the Permittee shall not knowingly remove, disturb, or displace any archaeological specimen or site.
CR#5 – Watershed Management	6 and Appendix G and H	The remediation project has been designed for net positive effects to land and water systems. Small scale and short term effects during remediation (e.g. dock wall removal, discharge) will be mitigated using control measures with monitoring. Water volumes required during remediation are small relative to waterbodies. No significant effects to the Great Bear Lake Watershed (surface water or groundwater) are predicted during the project.	Confirmed, Section 6 is a description of potential environmental impacts on water sources and describes mitigation measures to minimize the effect. Appendix G is the Spill Contingency Plan and Appendix H is the Waste Management Plan. There is also a Water Quality Monitoring Program and extensive SNP stations to monitor discharges.
CR#6 – Drinking Water	5b (Camp Facilities)	Potable water will be collected from the Camsell River and Great Bear Lake. Testing will be conducted before and during use, and best practices employed to prevent secondary contamination. There are no communities immediately downstream which may be extracting drinking water.	Confirmed, section 5b) confirms that testing will be done prior to use. There is an existing water treatment system (filtration and ultraviolet disinfection) located in the kitchen and medic room at the Terra camp. This system will be available for use by the Contractor during the remediation work. In the absence of analytical test results, local sources must not be used, and the supply of bottled water must be maintained.
CR#7 – Fish and Wildlife	6 and Appendix H and I	The remediation project has been designed to incur net positive effects to land and water systems, including habitat improvement and removal of fish/wildlife hazards.	Confirmed

		Any impacts will be small relative to the projected benefits. Camps will be established on impacted areas (i.e., within the former mine sites) and workers provided with wildlife training. Similarly, a Waste Management Plan (Appendix H) will be used to limit animal attractants, and a Wildlife Management Plan (Appendix I) to minimize effects to resident species. Work related to removal of dock walls, culverts, and other in-water or shoreline work will continue to include consultation with DFO.	
CR#8 – Species Introductions	N/A	Project activities unlikely to have potential for species introductions	Confirmed
CR#9 – Sensitive Species and Features	N/A	Program to take place within disturbed areas and therefore unlikely to impact sensitive species.	Confirmed
CR#10 – Permafrost	6	Project activities are unlikely to have impacts on permafrost. The sole exception is the excavation of contaminated soil and borrow materials. Excavations will be graded to minimize ponded water and subsequent permafrost degradation. Any overburden stripped during remedial work will be stockpiled and placed as cover.	Confirmed
CR#11 – Project-Specific Monitoring	6	A representative of the federal government (i.e. the Departmental Representative) will be present during the Remediation Project to ensure that contract specifications are met, best practices are used and management plans are applied. Aquatic monitoring will be conducted before, during and after remediation, to be detailed within a SLWB approved Water Quality	Confirmed

		Monitoring Plan. Geotechnical inspections will be conducted of engineered works (e.g. landfills, covers, mine closures, naturalized shorelines), to be detailed within a SLWB approved Geotechnical Inspection Plan. General wildlife interactions and incidents will be documented by the Wildlife Monitors employed during the Remediation Project.	
CR#12 – Financial Security	N/A	Federal Agency, exempt from security post	Confirmed. Pursuant to Section 94 (Exemptions) of the Mackenzie Valley Resource Management Act, CARD is exempt from posting security.
CR#13 – Closure and Remediation	6	The intent of the Remediation Project is to reduce hazards and improve environmental conditions and no formal Reclamation Plan is required. However, the Departmental Representative, DIAND or regulators may conduct final inspections to ensure that camp facilities have been fully and properly removed and determine if additional reclamation activities are required. Areas disturbed in the course of remedial activities (e.g. borrow source excavations) will be graded and where available, covered with overburden.	Confirmed.
<b>Special Management Conformity Requirements</b>			
CR#14 – Protection of Special Values	6	The Remediation Project aims to improve the environmental conditions at discrete sites within the Great Bear Lake Watershed Zone. Potential effects will be minimized through management and monitoring conducted to confirm site conditions, respecting the value of the land and water system.	Confirmed, the purpose of the GBL project is to restore and remediate the abandoned sites to their original states as much as possible which will have an overall positive effect on the environment and contribute to protecting the health of Great Bear

			Lake, its watershed and animals.
CR#15 – The Great Bear Lake Watershed	6 and Appendix F	Consultation has been conducted with the community of Déljıne to identify objectives and preferences for site remediation and to provide updates during the ongoing remedial process. Results of Traditional Knowledge studies were also incorporated in remedial planning. Remedial activities have been designed to provide net environmental improvement within the sites and watershed, to be monitored through inspections and aquatic monitoring programs	Confirmed
CR#16 Fish Farming and Aquaculture	N/A	No fish farming or aquaculture will be conducted during the remedial program.	Confirmed
CR#17 – Disturbance of Lakebed	5a	Removal of in-water debris will be conducted at Sawmill Bay. This may require the short-term and small-scale disturbance of surficial sediments, though will be implemented to provide an overall improvement of the aquatic environment in Sawmill Bay.	Confirmed, a Sediment and Erosion Control Plan is a requirement of the Licence.
CR#18 – Uses of Du K’ets’Edi Conservation Zone (Sentinel Islands)	N/A	Not applicable, project not within the Sentinel Islands	Confirmed
CR#19 – Water Withdrawal	N/A	Not applicable, water withdrawal is not occurring from Lac Belot, Stewart Lake or Tate Lake	Confirmed

### **3.7 Draft Licence and Permit**

A draft Water Licence (WL) and Draft Land Use Permit (LUP) with Terms and Conditions has been prepared (Attachment 3 and 4). Comments were received on the draft WL and LUP from several reviewers as well as from the proponent. The attached WL and LUP have been marked up with proposed changes supported by reviewers and/or Board staff based on comments and recommendations received from reviewers during the review process and based on the proponents response to the reviewer comments.



### **3.8 Security Deposit**

In accordance with section 94 of the MVRMA, security is not required for applications made by the Federal government.

## **4. Other Agency Comments**

The application was circulated to 23 organizations requesting a reply by June 26, 2017. ECCC requested a four-day extension to submit their comments, so the comment response date was changed to June 30, 2017. Comments were received from seven review organizations including Environment and Climate Change Canada (ECCC), Fisheries and Oceans Canada (DFO); Government of the Northwest Territories – Environment and Natural Resources (GNWT-ENR), Government of the Northwest Territories – Education, Culture and Employment (GNWT-ECE), INAC-CARD, INAC-NWT Inspectors and Sahtu Renewable Resources Board (SRRB). All review comments are included in the review comment summary table (Attachment 5).

The **SRRB** supports the renewal of the Water Licence and Land Use Permit to allow INAC to remediate the respective sites noting that there will be a net benefit to the people of the Sahtu with the removal of dangerous material and remediation of hazardous conditions on the sites.

On June 15, 2017, a letter of support was received from the **Déljñę Got'ine Government** providing its support with the respective renewal applications for proposed remediation and any and all efforts to protect Great Bear Lake. A copy of the letter is attached (Attachment 6).

**DFO** submitted several recommendations requesting discussion with DFO prior to implementing remedial activities where fish and fish habitat may be affected. INAC agreed with all of their recommendations.

**GNWT-ECE** recommended additional LUP conditions to protect archaeological sites. INAC agreed with the inclusion of two standard conditions - Archaeological Overview and AIA-High Potential to the Permit.

**INAC Inspector** submitted comments and recommendations on the draft LUP and WL conditions. INAC-CARD clarified some of the comments with the Inspector and is in agreement with the recommendations.

### **ECCC comments 1-4 recommended some changes to the SNP and EQC.**

Comment 1 - ECCC requested additional sampling of ammonia and nitrate/nitrite and potentially chlorine at SNP stations S15L8-001 (1)(sewage) and (2)(greywater). It is DIANDs understanding that the SLWB (the Board) and other NWT Land and Water Boards have not in the past provided nitrate/nitrite or ammonia EQCs for wastewater at remote temporary camps. DIAND requests the Board's standard EQC. While INAC does not anticipate the use of chlorine during wastewater treatment, DIAND would support the addition of this parameter if deemed necessary by the Board.

Comment 2 – ECCC requested additional parameters be tested for process water. The parameters listed in the draft WL were requested by the Board. DIAND supports the Board’s EQCs and requests that these remain unchanged. However, DIAND will test for both total and dissolved metal fractions for all EQCs at the prescribed SNP stations to facilitate decision making. DIAND supported adding TSS. A zinc EQC of 1 mg/L is consistent with MMER regulations and the Board’s earlier issuances for the GBL Sites.

Comment 3 - ECCC recommended for SNP stations S17L8-002 7A and 7B to incorporate more stringent EQC and increased monitoring frequency. DIAND provided rationale for leaving the arsenic limit at 1.0 mg/L for S17L8-002 7A (Ho Hum TCA); and added that should the Board feel it necessary, the addition of the MMER Maximum Authorized Monthly Mean (0.5 mg/L) would be suitable to INAC. Similarly, DIAND proposed a revised EQC for arsenic in Moose Bay (S17L8-002 7B) to 0.2 mg/L. ECCC also recommended adding TSS and pH which INAC agreed to. ECCC suggested sampling biweekly during active remediation. INAC feels monthly frequency is appropriate. However, should the Board deem it necessary, DIAND supports a revision to sampling every two weeks while actively conducting remedial efforts in the Ho Hum TCA during the open water season.

Comment 4 - ECCC recommends that the Proponent include TSS, pH, conductivity, hardness, sulphate, and an ICP metal scan (total fractions) for all SNP stations. DIAND agreed to adding these parameters to most of the SNP stations, except S15L8-001 (1) and (2).

**ECCC comment number 5 was with respect to schedule 2, item 1 outlining the elements to be included in the Waste Management Plan.**

ECCC recommended adding the following required elements be added to the list: - collection and disposal of impacted sediment and metal-impacted soils, - sampling and discharge of portal and trench water into soak-away sumps, and - management of seepage and leachate waters. These elements are included in the schedule.

DIAND responded that The Remedial Action Plan (RAP) for each of the project sites provides detailed discussion surrounding impacted sediment, soil, contact water, etc. The RAPs integrate many years of study to synthesize the types/amounts of waste, contaminated environmental media, results of risk assessments, remedial options analysis and the selected management approach for contaminated materials/media. In consideration of these comprehensive documents, DIAND consulted with the Board staff to identify preferences for the Waste Management Plan. It was agreed the RAPs would remain the primary document detailing the management of legacy mine waste, while the Waste Management Plan would focus on the project generated waste from the remedial program.

However, The Board Process requires all waste to be described in the Waste Management Plan and does not recognize the RAPs as Board approved documents. Board staff appreciate that INAC does not want to duplicate information that is already documented in approved plans; however, it is recommended that the requirements of Schedule 2, item 1 be retained. A cross-reference table to the RAPs can be made in the Waste Management Plan for certain required elements of the WMP so parties know where additional information is provided.

**ECCC comment 6 recommended that outstanding management plans be provided for review.**

DIAND responded that the Draft Water Licence lists additional management plan requirements following issuance of the licence.

**ECCC comment 7 recommended that the Waste Management Plan be updated prior to the start of operations to provide details on landfill design, operation and maintenance.**

DIAND responded to refer to detailed design drawings C25, C26 and C31 and Annex A-1. The contractor will be required to provide a Final Detailed Construction Plan further detailing the design approach.

**ECCC comment 10 and GNWT-ENR comments 1 and 2 recommends that the Proponent appropriately characterize the waste rock for more effective management of both PAG and non-PAG rock.**

While not included in the application package (to improve brevity), DIAND has conducted three separate geochemical assessment programs at Silver Bear Sites (EBA 1993, Rescan 2004 and Lorax 2005). It is DIANDs assertion that the geochemical assessments have appropriately and sufficiently characterized the waste rock to facilitate sound remedial decision making as identified in the RAPs.

DIAND has requested revision of the Geochemical Verification Program required in Part D, item 10 and detailed in Schedule 2, item 4. In keeping with the state of knowledge on Silver Bear surface geochemistry and the need to focus efforts to obtain meaningful information about materials at depth, DIAND requests the board replace the Geochemical Verification Program as listed in the Draft Water Licence with a Verification of Depth Geochemistry Program for the Silver Bear Sites. INAC presents the following objectives for the program:

*Verification of Depth Geochemistry Program for Silver Bear Sites:*

- a) Sampling Approach, including Depth and Area (exact station locations may only be determined in-field based on access constraints of equipment and potential concerns identified by geochemical specialists, such as visible sulphides)*
- b) Field Measurements and Observations*
- c) Analytical Approach*
- d) Quality Assurance/Quality Control Methods*
- e) Criteria for defining PAG, non-PAG and Metal Leaching Materials*
- f) Methods to evaluate geochemical results at depth with surface findings from previous geochemical assessments*

It is noted that this program may only be implemented during active remediation due to the requirements for heavy equipment to attain depth samples. DIAND proposes a submittal date for this program of 90 days prior to the start of Silver Bear remediation. This program is specific only to the analysis of waste rock samples at depth from the Silver Bear Sites, given the small volume of waste rock and the absence of any ARD concerns at Contact Lake Mine or El Bonanza/Bonanza Mine.

Board staff do not support the replacement of the Geochemical Verification Program with the Verification of Depth Geochemistry Program for Silver Bear Sites. There was no opportunity for reviewers to comment on this proposed change. Board Staff recommends DIAND to follow the Geochemical Verification Program outlined in the licence, include studies mentioned in the

response and rationale mentioned to only assess the Silver Bear site. The Geochemical Verification Program will be distributed for public review prior to Board decision.

## 5. Conclusion

A draft Permit and Licence has been prepared for the Board's consideration. They reflect the evidence submitted throughout the regulatory process; reviewer comments and recommendations, DIAND's responses, Board staff recommendations, and standard conditions for the draft Permit and Licence. The conditions contained within this draft Permit and Licence should mitigate the potential environmental impacts this development may have on the land and water. A draft Reasons for Decision and a draft Issuance Letter are attached (Attachments 7 and 8).

## 6. Recommendation

It is recommended that the SLWB proceed with the regulatory process and implementation by issuing the Water Licence with Term and Conditions for a period of seven years and the Land Use Permit with Term and Conditions for a period of five years.

It is recommended that the Board:

- a) Approve the Preliminary Screening exemption;
- b) Approve the Engagement Plan;
- c) Approve the Water Licence for a term of seven years;
- d) Approve the Land Use Permit for a term of five years.

## 7. Reference Material Attached

- 7.1. Letter from KBL Environmental to accept hazardous waste
- 7.2 Letter from City of Yellowknife to accept camp waste
- 7.3 Draft Water Licence Conditions
- 7.4 Draft Land Use Permit Conditions
- 7.5 Review Comment Summary Table
- 7.6 Letter of support from Déljñę Got'ine Government
- 7.7 Draft Reasons for Decision
- 7.8 Draft Issuance Letter

Respectfully submitted,



Bonnie Bergsma  
Regulatory Specialist

Executive Director Comments:



Paul Dixon  
Executive Director