Roaster Complex Deconstruction – Detailed Project Description

1.0 Introduction

1.1 Application Type and Scope

Aboriginal Affairs and Northern Development Canada (AANDC) is applying for a Type B water licence for the deconstruction of the Giant Mine roaster complex (Figure 1) on behalf of the Giant Mine Team. The Giant Mine Team consists of AANDC and the Government of the Northwest Territories (GNWT), supported by the federal department of Public Works and Government Services Canada (PWGSC). While AANDC will ultimately be responsible for compliance with any water licence issued, the proposed deconstruction work will be conducted by private sector contractors procured through PWGSC.

The proposed roaster complex deconstruction work consists of five parts: removal of hazardous materials from the roaster complex; decontamination of buildings to a degree that will allow for safe deconstruction of the structures; deconstruction of the buildings; on-site storage of arsenic contaminated wastes and asbestos wastes; and, the off-site disposal of all non-arsenic trioxide containing hazardous wastes. Due to the highly contaminated and deteriorated nature of the roaster complex, a specialized and experienced deconstruction contractor is required.

Figure 1 – Giant Mine Roaster Complex

1.2 Rationale for Submitting Application

Deconstruction of the roaster complex is currently undergoing environmental assessment (EA0809-001) as part of the Giant Mine Remediation Project (GMRP). However, recent assessments by independent engineers (AANDC, 2011 and AECOM, 2012) of the roaster complex continue to identify degrading conditions of the structures (Figures 2-10), including:

- Loose exterior asbestos panelling on walls of roaster building as a result of fastener corrosion;
- Corroded or missing roof panels;
- Interior catwalks that are not structurally sound;
- Corrosion of the flues, especially the Cottrell flue, that will release arsenic dust if corrosion continues;
- Asbestos-containing pipe insulation is falling off the flues;
- Eroded exterior and interior masonry of the stack;
- Steel cap at the top of the stack is separating from the mounting bolts; and
- Portion of the steel cap is missing from the stack.

These hazards create significant risk to the environment and human health and safety because the roaster complex is highly contaminated with arsenic dust and asbestos. Any sudden collapse, or partial

collapse, of the roaster complex may release arsenic trioxide and asbestos dust to the environment; and falling debris could physically harm people in and around the area. Reports from independent engineers that describe the condition of the roaster complex are provided under Tab XX in the application package.

Due to the urgent and serious nature of these risks to human health and safety and the environment, an accelerated regulatory timeline is considered necessary. Therefore, using the provisions of Section 119 of the *Mackenzie Valley Resource Management Act*, AANDC is requesting that the MVLWB proceed to the licensing of the deconstruction of the roaster complex prior to the completion of the environmental assessment. This application has been timed to allow the roaster complex deconstruction to advance through the environmental assessment process for as long as possible while still ensuring that the licensing process is completed in time for the contractor to incorporate licence conditions into the early stages of their work planning.

2.0 Detailed Project Description

2.1 Project Location

The Giant Mine Site (the Site) is located approximately five kilometres (km) north of Yellowknife along Highway 4 (Ingraham Trail) as depicted in Figure 11. The Site is considered to include everything within the boundaries of the former lease (Figure 12) that was in place during the operational period of the mine (i.e. Lease L-3668T, now designated as Reserve R662T). Two impacted areas immediately outside the lease area are also considered to be part of the Site. They are the Giant Mine "Townsite", which was removed from the surface lease in 1999 and is now under City Lease 17889T, and an area of historic tailings deposition along the shore of North Yellowknife Bay.

The roaster complex is a group of industrial process structures located completely within the Giant Mine Site south of the B1 Pit across Highway 4 (Figure 13).

AANDC recognizes the *Standards for Geographic Information Systems (GIS) Submissions* issued by the Mackenzie Valley Land and Water Board (MVLWB) on March 1, 2012 and the requirement to submit electronic data in ArcView compatible formats. Electronic mapping is currently based on a unique grid system called the Giant Mine Remediation Grid System but plans are being developed to convert to a more standard system. AANDC commits to providing electronic data in accordance with the MVLWB's *Standards for Geographic Information Systems (GIS) Submissions* when it becomes available.

2.2 Giant Mine Site History

The Giant Mine is an abandoned mine that produced gold from 1948 until 2004, although from 1999 to 2004, gold ore was shipped off site for processing. The on-site processing of ore that occurred until 1999 created 237,000 tonnes of arsenic trioxide dust as a by-product. The arsenic trioxide dust, which is soluble in water, is stored underground in fifteen purpose-built chambers and mined out stopes. In addition to these features, other typical mining infrastructure exists on site including four tailings storage areas, eight open pits, 35 openings to the underground, and over 100 buildings. Baker Creek flows through the length of the lease area and into Great Slave Lake.

The Site is currently under care and maintenance as the GMRP undergoes environmental assessment (EA0809-001). Care and maintenance activities adhere to the conditions set out in former Water Licence N1L2-0043.

Figure 11 – Location of Giant Mine and Surrounding Features

Figure 12 – Giant Mine Lease Boundary

Figure 13 – Project Infrastructure

2.3 Historical Use of the Roaster Complex

Ore processing operations began on May 12, 1948, with circuits for ore crushing, grinding, froth flotation, and mercury amalgamation. Initially, the flotation concentrates were stockpiled to await the completion of the roaster facility.

An Edwards-type multiple-hearth roaster, built by Allis-Chalmers, began operation in January 1949. The roaster calcine (oxidized product) was leached with cyanide solution. The gold was recovered from solution by precipitation onto zinc, and the zinc-gold product was smelted in a furnace to produce gold bullion. Gold was recovered using both mercury amalgamation and cyanidation methods until 1959, at which time amalgamation was discontinued.

The Allis-Chalmers roaster had a low capacity and was difficult to operate. Variations in feed rate and sulphide concentration caused major problems. The roaster frequently had to be shut down and cleaned

out. The temperatures at the exit point from the roaster were low enough that arsenic vapour condensed, forming arsenic trioxide deposits that tended to plug the dust collector. Arsenic trioxide condensation also created difficulties in the roaster emission stack, where dust build-up caused operating problems. Similar difficulties were experienced with the calcine cyclone collectors.

Soon after roasting operations began, fluo-solids roasters were introduced to the market. Testing of Giant Mine ore with the new roaster technology demonstrated that the best gold recovery could be achieved using a two-stage roast, in which arsenic was eliminated in the first stage under reducing conditions, followed by an oxidation stage at a higher temperature. A two-stage fluosolids roaster (known as the No. 1 Dorrco roaster) was commissioned and put into operation in May 1952, when mill tonnage was increased from 425 tons per day to 700 tons per day. The No. 1 Dorrco initially operated in parallel with the original Allis-Chalmers roaster. Experiments with the No. 1 Dorrco were undertaken for a couple of years in an effort to obtain a good compromise between gold extraction and electrostatic precipitator efficiency. This experimentation ended in 1954, when the roaster was operated to optimize extraction, and arsenic dust collection was addressed as a separate issue.

Mill tonnage was increased again in 1958, to 1,000 tons per day. At the same time, the ore being mined became increasingly refractory. To cope with both of these changes, a new fluo-solids roaster (known as the No. 2 Dorrco) went into operation in November 1958, replacing the two other roasters. After an initial optimization period, the No. 2 Dorrco proved to be a much more efficient and reliable roaster. The No. 2 Dorrco roaster remained in operation until ore processing ceased at the end of 1999 and remains on site with associated infrastructure today.

2.4 Detailed Description of Roaster Complex Deconstruction

2.4.1 Description of the Roaster Complex

The roaster complex is a group of highly contaminated industrial process structures (Figure 14) including the following:

- Mill Pipe Shop/AC Roaster Building
- Cottrell Precipitator
- Roaster Stack and Roaster Stack Fan House
- Calcine Plant
- Dorrco Roaster
- Silo Load-Out and Weight Scale
- Bag House
- Exterior Flue Network

Recent hazardous materials inventories of the roaster complex have found:

- Arsenic trioxide dust
- Asbestos-containing insulation coated with arsenic trioxide dusts
- Asbestos-containing wall and ceiling insulation and exterior siding coated with arsenic trioxide dust
- Asbestos-containing pipe and process vessel insulation coated with arsenic trioxide dust
- Asbestos-containing floor products coated with arsenic trioxide dust
- Sodium cyanide dust co-mingled with arsenic trioxide dust

- Wooden and steel building materials and process equipment stained with chemicals/mill process residues including sodium cyanide and arsenic trioxide
- Refractory brick contaminated with arsenic trioxide
- Personal protective equipment (PPE) coated with asbestos and arsenic trioxide dust
- Non-arsenic contaminated asbestos containing floor products and gaskets
- Sodium cyanide containers potentially containing residual quantities
- Containers of motor oil and grease
- Cans of paint and spray paint
- De-greasers, misc. cleaning products
- Cans of glue/adhesives
- Mercury containing control valves
- Mercury containing light tubes
- Dielectric fluids in transformers (potentially PCB containing)
- PCB containing light ballasts
- Fuel storage tank and piping with residual contents
- Granular sulphur
- Barrels of sodium hydroxide
- Barrels of penetrating asbestos encapsulate
- Antifreeze
- Small quantities of lab chemicals (silver nitrate, potassium iodide, potassium permanganate, pH buffer solutions)
- Citrex cleaner
- Partially full barrels of unknown liquids
- Water coolers potentially containing chlorofluorocarbons (CFCs)/ozone depleting substances (ODS)
- Lead-acid batteries
- Lead sheeting

Figure 14 – Structures of the Giant Mine Roaster Complex
(AECOM, March 2012)

2.4.2 Deconstruction Program

Award of the deconstruction contract is anticipated to occur in the first few months in 2013 which will be immediately followed by a planning period, mobilization to the Site, and on-the ground work. Waste management will be of particular importance to the proposed deconstruction work. Further waste management details can be found under Tab XX in the application package.

In general terms, roaster complex deconstruction activities will include:

a) **Work Planning –** Prior to beginning any on-the-ground work, the selected deconstruction contractor will be required to prepare a detailed deconstruction plan that includes the following content:

- An assessment of the potential risks to workers from chosen deconstruction methods and mitigating measures to address these risks, including, but not limited to, the potential generation of arsine gas.
- The methodology and equipment proposed for deconstruction, and the advantages of the chosen method(s) over other alternative methods considered but not chosen by the Contractor.
- The sequence of deconstruction work within each structure of the complex to be taken down, including where decontamination work is required as part of structure deconstruction.
- An assessment of the potential risks to the environment from chosen deconstruction methods and mitigating measures to address these risks.
- Access restrictions and traffic control during deconstruction work, with consideration of the proximity of the existing Highway 4.
- The size reduction, stacking, packaging, and storage procedures for non-hazardous waste, and packaging type and quantities as applicable.
- Spill contingency plans specific to roaster deconstruction that align with the Emergency and Spill Contingency Plan prepared by the current Care and Maintenance Contractor, Nuna/Deton Cho Joint Venture.
- Mitigative measures to control the generation of dust, and the detailed plan for air quality monitoring,

b) **Preparation of the Deconstruction Work Area –** Preventing contaminated dust from spreading beyond the active work area, the active work area will be sealed and negative air pressure conditions will be established. Routine checks and inspections will be performed to ensure seals remain intact.

c) **Preparation of a Temporary Waste Storage Area –** Waste will be segregated according to stream[1] and then those wastes that are contaminated with arsenic or asbestos will be stored in one location at the Central Tailings Pond (Figure 15) which is already a flat and disturbed area. At a minimum, the storage area will be graded and covered with 0.6 m of compacted granular fill obtained from on-site sources of borrow materials, including crushed waste rock from a section of road bed and small existing stockpiles on the Site near the northeast corner of the Central Tailings Pond and Freeze Optimization Study area to create a secure pad. Access to stored hazardous materials will be controlled through fencing. A surface drainage swale will be constructed at the up-gradient perimeter of the storage area to collect and re-direct run-on around the storage area to prevent erosion of the pad and to minimize the volume of water that comes into contact with the waste materials. Further details about the proposed waste storage

[1] As part of the roaster complex deconstruction program, all waste materials will be sorted into different waste types, including: non-hazardous waste; mineral waste (semi-processed ore); arsenic containing hazardous wastes; and non-arsenic containing hazardous wastes. Additional details are provided in the Roaster Complex Deconstruction Waste Management Plan located under Tab XX in the application package.

area are provided in Section 2.2 of the Roaster Complex Deconstruction Waste Management Plan provided under Tab XX in the application package.

Figure 15 – Temporary Waste Storage Area
(Labelled as Material Storage Area Location)

d) **Hazardous Materials Management –** Management of the hazardous materials will depend on the nature of the material as described below:

- Removal and containerization of all arsenic trioxide and asbestos containing materials from the Roaster buildings, and transportation to the Temporary Waste Storage Area (Figure 15). A very small amount of non-leachable lead painted materials may be generated and these materials will also be stored at the Temporary Waste Storage Area.
- Removal, containerization, off-site shipping and disposal of all non-arsenic containing hazardous materials from the Roaster buildings (i.e. leachable lead containing paints, PCBs, mercury, oils, petroleum products, miscellaneous designated substances, etc.) at approved facilities.
- Collection and disposal of semi-processed ores (i.e. mineral wastes) located in process vessels within the roaster complex. Ores contaminated with arsenic trioxide dust will be considered arsenic-containing hazardous waste and will be stored on-site for eventual disposal with the rest of the arsenic trioxide waste at the Site as approved through the Type A licensing process. Ores not contaminated with arsenic trioxide will be disposed of in the Northwest Tailings Pond by the deconstruction contractor.

e) **Decontamination of Building Materials –** Structural and mechanical building materials that are coated with arsenic or asbestos dust will be cleaned to a degree that will allow for the safe deconstruction of the structures. Cleaning will be undertaken by such means as vacuuming, washing or other means proposed by the selected contractor expert in such activities. All water used for decontamination purposes, or "contact water" will be taken from the Polishing Pond (Figure 13) located near the Effluent Treatment Plant (Figure 13) at a rate of less than 300 m^3 per day and will be filtered to remove asbestos fibres. Filtered water will be returned to the Northwest Tailings Pond prior to being treated in the existing Effluent Treatment Plant. A wetting agent may be added to the water used for decontamination purposes to improve the wetting of fibres. The specific wetting agent will be selected by the contractor and information such as the MSDS will be provided to the MVLWB when it becomes available.

f) **Deconstruction of the Roaster Complex –** Specific deconstruction methodologies will be determined by the selected contractor as expert experience is required for this complex work. However, the contractor will be required to control dust using treated minewater from the Polishing Pond (Figure 13) and to dismantle those sections of the roaster complex that contain

arsenic trioxide and/or asbestos dust piece by piece rather than collapsing buildings in their entirety.

g) **Non-Hazardous Waste Management –** Clean non-hazardous wastes such as wood, steel, paper, concrete rubble, plastic and glass will be moved to the Temporary Waste Storage Area (Figure 15). These wastes will be relocated to a permanent disposal area in accordance with any future regulatory approvals for the greater GMRP.

h) **Air Quality Monitoring –** Air quality monitoring plans will be developed and carried out during the proposed work for two purposes: (1) to monitor industrial hygiene; and (2) to determine ambient air quality conditions around the perimeter of the work area. Work will be shut down or dust control measures will be implemented in the event that threshold criteria are exceeded. The requirements for the air quality monitoring plans (industrial hygiene and dust monitoring) to be developed and the threshold criteria are provided under Tab XX in the application package.

2.3.5 Water Usage and Management

The use of recycled water is an important part of project design to limit the volume of freshwater used to just that required for domestic sanitation purposes. Recycled water will be obtained from the Polishing Pond which holds treated mine water discharged from the Effluent Treatment Plant. Further details on the two water use needs are provided below:

1. **Domestic Sanitation** – An office trailer with washing facilities (i.e. a sink) and a decontamination trailer with shower facilities will be set up specifically for the deconstruction activities near the roaster complex to prevent unnecessary or unprotected exposure to contaminants. In the decontamination trailer, workers will be required to leave all "street" clothes and footware on the clean side and to only wear "work" clothes and footware, including personal protective equipment, on the contaminated side. Water from showering and washing facilities within the decontamination trailer and office trailer will be treated as contact water as described in Section 2.1 in the Roaster Complex Deconstruction Waste Management Plan.

   Fresh water for domestic sanitation purposes will be obtained from water storage tanks to be installed at the decontamination trailer and filled with trucked water from the City of Yellowknife on an as needed basis. The size, configuration and exact location of the water storage tanks will be determined by the selected contractor and the daily water use rate will vary depending on the stage of deconstruction. However, maximum daily water use will be approximately 15 m^3 per day and certainly less than 100 m^3 per day.

2. **Decontamination and Dust Control** – Treated minewater from the Polishing Pond (Figure 13) will be used at a maximum rate of 100 m^3 per day to decontaminate building materials and to

control dust during deconstruction activities. Water sampling results for the Polishing Pond are provided in Section 2.2 in the Roaster Complex Deconstruction Waste Management Plan.

A containment system will be constructed in the work area to prevent the release of water used for washing and dust control (i.e. contact water) to the surrounding areas. All captured water will be filtered to remove asbestos fibres and then will be discharged into the Northwest Tailings Pond (Figure 13) for passing through the current mine water treatment system to treat for arsenic and other contaminants. Additional details are provided under Section 2.1 in the Roaster Complex Deconstruction Waste Management Plan.

2.3.6 Sewage Management

Portable toilet facilities will be set up at the deconstruction worksite to prevent spread of arsenic dusts to other areas of the Giant Mine Site such as the Main Office Building. Sewage from the portable toilets will be collected and disposed of at a licensed facility such as the City of Yellowknife; however, this is to be arranged and confirmed by the selected contractor.

2.3.7 Fuel Use

Only diesel is required for the proposed project for fuelling heavy machinery and will be obtained from either the existing one 100,000 litre double-walled diesel tank located at the Site (Figure 13; UTM Zone 11V 636098.25 mE and 6932528.76 mN) or at commercial fuel stations within the City of Yellowknife. Heavy machinery will either be fuelled directly from the on-site double walled diesel tank or from Tidy Tanks located in the back of up to 10 light vehicles (i.e. pick-ups) that may be on the Site at any one time.

The existing fuel tankfarm, which is registered with Environment Canada and conforms to the *Petroleum and Allied Petroleum Products Storage Tanks Regulations,* is underlain by an existing pad and will be inspected daily to confirm the absence of leaks. In addition, drip pans and spill pads as required will be used during refuelling and a spill kit rated to deal with a 1000 litre spill will be located near the double walled tanks at all times. All light vehicles will also be equipped with spill response equipment (absorbent materials, shovels and empty drum) sufficient to manage a 450 litre spill and the light vehicle beds will be inspected at each refuelling event or daily (whichever is more frequent).

3.0 Potential Effects of Proposed Project

The fundamental objective of the Giant Mine Remediation Project is to improve the environment and prevent adverse effects that would otherwise occur if no remediation activities were undertaken. The proposed activities within this application are inherently positive as they will ultimately prevent emergencies from occurring at the Site that could endanger human health and safety and the environment. In addition, the Giant Mine is a recognized contaminated site and all activities will take place in areas previously disturbed by intensive mining activities. However, the implementation of the proposed activities may result in short term and local effects to the environment (including biophysical,

cultural, social and economic aspects). The potential effects and proposed mitigations are identified in Table 1.

Table 1: Potential Impacts of the Proposed Project and Mitigations

Potential Project Effect	Proposed Mitigations
Land disturbance	• No new land disturbance is expected as all activities will occur on areas previously disturbed by over 50 years of mining activity.
Impacts to soil and water quality - Hydrocarbon spills and chemical (e.g. arsenic trioxide) releases to the environment Refuelling machinery, failure of machinery components (e.g., hoses), or failure of fuel tanks may impact surface water and soil quality if releases occur.	• Specialized contractor will be hired to undertake the detailed design of the work which will factor in all potential human health and safety and environmental risks. • Current procedures related to arsenic trioxide dust are provided under Tab XX in the application package. However, the selected contractor is required to develop a spill and emergency response plan specific to the deconstruction of the roaster complex. The development of and training in the use of a spill contingency plan will ensure spills are responded to effectively, in a timely manner, and appropriate notifications are made • Maintaining spill kits at each work site will ensure small spills can be cleaned up immediately and impacts are localized and temporary. • Double-walled tanks are used at the main fuel tank farm • Contractors on site must have appropriate personal protective equipment to protect their health. • To prevent the spread of contaminated materials beyond the work area, dedicated machinery will be used for the deconstruction work and will be washed prior to leaving the work area (the wash water is considered “contact water” under the Roaster Complex Deconstruction Waste Management Plan).
Impacts to soil and water quality – Release of hazardous waste during on-site transport Spills of hazardous or potentially hazardous liquids (e.g., electrical insulating fluids, abatement wash water) or dispersible solid materials (e.g., leachable lead paint flakes, arsenic- or asbestos-containing dust) during transport from building area to containment location.	• The deconstruction contractor will be required to containerize hazardous or potentially hazardous waste in or immediately adjacent to the roaster complex. • The deconstruction contractor will be required to containerize all hazardous waste materials in compliance with the Transportation of Dangerous Goods Regulation and the Export and Import of Hazardous Waste and Hazardous Recyclable Materials Regulation. • The deconstruction contractor will be required to construct a containment system to prevent the release of wash water from leaving the work area. Captured water will be recovered and treated prior to disposal (see

	Section 2.1 in the Waste Management Plan). • Development of and training in the use of a spill contingency plan that addresses all potential types of materials that may be spilled during the course of the work will ensure spills are responded to effectively, in a timely manner, and appropriate notifications are made.
Impacts to soil and water quality - Release of hazardous waste during storage Spills of hazardous or potentially hazardous liquids (e.g., electrical insulating fluids, abatement wash water) or dispersible solid materials (e.g., leachable lead paint flakes, arsenic- or asbestos-containing dust) during storage.	• The deconstruction contractor will be required to containerize all hazardous waste materials in compliance with the Transportation of Dangerous Goods Regulation and the Export and Import of Hazardous Waste and Hazardous Recyclable Materials Regulation. • With the exception of arsenic trioxide and asbestos waste, all other hazardous waste will only be stored temporarily during the course of the deconstruction activity and will be transported off-site for disposal at a licensed facility by the close of the contract. The selected contractor is required to submit confirmation that the receiving facilities will accept wastes and provide disposal certificates to track the delivery of wastes to the licensed facilities. • The selected contractor is required to provide an updated inventory of the Temporary Waste Storage Area on a weekly basis. • During the deconstruction work, weekly inspections of the Temporary Waste Storage Area will be completed. During seasonal hiatuses in the deconstruction work and when the deconstruction work is completed, the Temporary Waste Storage Area will be inspected monthly.
Air quality impacts – emissions from combustion engines and soil dust generated from heavy equipment use will be released to the atmospheric environment.	• Contractors brought to site are responsible for using well-maintained equipment, which will help to minimize combustion engine emissions. • Overall impacts to air quality will be outweighed by the positive effects resulting from deconstruction of the roaster.
Air quality impacts – Contaminated dust plume generated during deconstruction Even after interior building decontamination, residual inaccessible dust will remain. A large airborne plume could be generated when structures are collapsed.	• The deconstruction contractor will be required to dismantle each structure within the roaster complex that contains arsenic trioxide and/or asbestos dust piece by piece rather than collapsing the structures in their entirety. • Any deconstruction activity that will expose building sections with residual contaminated dust will be halted under high wind conditions, which will be part of the selected contractor's health and safety plan. • Air quality monitoring will be done around the perimeter of the work site. Work will be shut down or dust control

	measures will be implemented in the event that threshold criteria are exceeded. An air quality monitoring plan, which includes the criteria, is provided under Tab XX in the application package.
Air quality impacts – High airborne levels of arsenic or asbestos during decontamination activities beyond the contained area Decontamination of building interiors will stir up dust levels leading to high airborne concentrations of contaminants. If there is a breach in the seal created by negative air pressure inside the structure, leakage of dust may occur	• Routine checks and inspections of the seal will be completed to ensure that the work area remains under negative pressure. • Air quality monitoring will be done inside the buildings and outside the containment perimeter. • Work will be shut down if the threshold criteria are exceeded outside of the containment, and will not be allowed to proceed until any leakage has been repaired. • Workers inside the containment area will have the proper personal protection equipment to mitigate their potential for exposure.
Noise emissions – equipment use will result in increased noise in the area.	• Contractors on site must have appropriate personal protective equipment, including ear plugs, to protect their health • Heavy machinery will be equipped with standard industrial noise suppression devices • Increases in noise levels will be short term and will be outweighed by the positive effects that the deconstruction of the roaster complex
Wildlife disturbances – presence of machinery and people on site may disturb terrestrial species that might otherwise be on site or their on-site living spaces.	• The deconstruction contractor will be required to satisfy all requirements specific to the Federal *Migratory Birds Convention Act* and the *Species at Risk Act,* the territorial *Species at Risk Act (NWT) and* territorial *Wildlife Act*. Requirements will include, but are not limited to: o completing periodic wildlife surveys for the project work area. Wildlife surveys include: Daytime walk-through surveys of the Roaster Complex to document presence of birds and signs of bird use. Dawn or dusk follow-up survey may be required to determine if nocturnal species are present (dependent on date of survey and observations of daytime survey). o Comply with and provide any supplementary information as required for any permits obtained to satisfy the Federal *Migratory Bird Conservation Act* and the *Species at Risk Act,* the territorial *Species at Risk Act (NWT) and* territorial *Wildlife Act.* Permits may include but are not limited to a wildlife research permit from the GNWT-ENR. o Be responsible for the implementation of any recommendations and follow-up resulting from wildlife survey(s) and any permits.

	• Workers will be prohibited from harassing or feeding wildlife. • Domestic refuse and other potential wildlife attractants will be managed in accordance with the Roaster Complex Deconstruction Waste Management Plan to minimize potential human-wildlife interactions.
Economic impacts – The socio-economic impacts accruing from the remediation program are expected to be largely positive due to the tendering process.	To enhance regional socio-economic benefits, all contractors bidding on the remediation project will be required to submit an Aboriginal Opportunity Considerations (AOC). Each AOC will specify the commitment of the contractor to Aboriginal employment, sub-contracting and training. AOCs with greater commitments to Aboriginal content will receive higher scores. The AOC commitments will be enforced through contractual obligations.
Disturbance to cultural and heritage resources – a search of the Prince of Wales Northern Heritage Centre's Archeological Sites Database in April 2012 revealed the presence of four prehistoric sites within the Giant Mine lease area. In addition, a number of on-site buildings have been identified as having potential heritage value.	• None of the buildings identified as having potential heritage value will be disturbed by the proposed activities • All proposed activities will take place in areas previously disturbed by over 50 years of mining activity • Contractors will be informed that encountering cultural sites is possible and will be instructed to not disturb any artefacts or sites that may be of cultural value. The Yellowknives Dene First Nation and the Prince of Wales Northern Heritage Centre will be contacted immediately for direction if a cultural resource is suspected. • The ongoing archaeological studies being carried out by the YKDFN will add to the knowledge of culturally important areas within the Site.

4.0 Proposed Remediation Plan for the Roaster Complex Deconstruction Works

Remediation activities associated with proposed deconstruction activities will take place progressively as work advances, at seasonal closures if applicable, and at the end of the project. The core activities undertaken at each of these stages will be similar and include the following:

(i) Removal and disposal of garbage and spent consumables generated as part of the deconstruction activities in accordance with the Roaster Complex Deconstruction Waste Management Plan provided under Tab XX in the application package.

(ii) Any spills at the work sites or the fuel tank farm will be dealt with immediately upon their occurrence in accordance with the Emergency and Spill Response Plan provided under Tab XX in the application package and any subsequent plans provided by the deconstruction contractor. A final inspection of the project work area will occur to identify any additional actions that need to be taken to clean up soils contaminated by the proposed activities.

If seasonal hiatuses in the work occur, the actions listed above will be taken and a final inspection by the responsible PWGSC representative will take place to ensure the project work area has been fully cleaned up. In addition, the heavy machinery and light vehicles used as part of the proposed project may be removed from the Site as the equipment is not owned by AANDC. The contractors are responsible for supplying the necessary machinery to complete the proposed project and the machinery may be required for unrelated projects in which the contractors are involved.

Following completion of deconstruction activities, the surficial soils mixed with small debris within the footprint of the deconstruction work area will be scraped up, containerized and be stored on-site at the Temporary Waste Storage Area (Figure 15) for eventual disposal with the rest of the arsenic trioxide waste at the site as approved under the Type A water licence and other applicable regulatory authorizations. Additional details on the management of arsenic contaminated wastes are provided in Section 2.1 of the Roaster Complex Deconstruction Waste Management Plan.

At the end of the proposed project, a final inspection of the Site will take place by the responsible PWGSC representative to ensure that the two actions (i and ii) listed above were properly carried out and all machinery has been removed. Since the project work area is within the geographic scope of the Giant Mine Remediation Project, the work areas will also undergo remediation in accordance with Giant Mine Remediation Plan once it receives the necessary approvals.

5.0 References

Provided under Tab XX in the application package.

AANDC, 2011. *Site Stabilization Plan for the Giant Mine Remediation Project*. Aboriginal Affairs and Northern Development Canada. October 14, 2011.

AECOM, 2011. *Giant Mine – Structural Condition of the Roaster Complex*. Document Number 305-Demo Debris-15-LET-0003-Rev0_20110913. Prepared for Public Works and Government Services Canada . September.

AECOM, 2012. *Recommendation to Proceed with Site Stabilization Plan at the Giant Mine*. Document Number 320-Eng Support-20-LET-0001-Rev2_20120305. Prepared for Public Works and Government Services Canada. March.

Robertson GeoConsultants Inc., 2010. *Independent Experts Panel Risk Assessment of Roaster Complex, Baker Creek, and Bulkheads Related to Arsenic Trioxide Migration.* Prepared for Contaminated Sites Program, Indian and Northern Affairs Canada. April.