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YK #674409

Information Package to Working Group on 2015 Tarping of Roaster Complex Waste

Giant Mine Working Group:

The Giant Mine Project Team is requesting approval from the Mackenzie Valley Land and Water Board (MVLWB) to amend the Roaster Complex Deconstruction Waste Management Plan (WMP) for the 2014/15 winter. The amendments consist of two parts:

- to have a new storage area for non-hazardous waste included as part of the approved WMP; and
- to have tarping added to the contingency procedures for weather protection for the bagged arsenic impacted wastes for the 2014/15 winter.

Non-Hazardous Waste

In accordance with Section 2.0 of the approved WMP, non-hazardous wastes from the Roaster Complex Deconstruction is to be separated from hazardous wastes and stored separately in neat piles or stacks of like materials in the Material Storage Area (MSA). Due to a lack of space within the MSA and the requirement to handle the waste multiple times the Project requested approval from the Inspector to modify the approved plan.

Two options were considered in discussions with the Inspector:

1. Temporarily removing non-hazardous waste in the MSA to the waste transfer staging area. The non-hazardous waste would then be transferred back to the MSA at the end of the Roaster deconstruction program. This first option was discarded due to the inefficiencies in double handling the wastes.

2. The second option was to find a new location to store the non-hazardous waste before permanent disposal. A few options were considered including the Northwest Tailings Pond approved hazardous waste storage area, an area adjacent to the MSA within the Central Tailings Pond and the existing Temporary Waste Laydown area for the Roaster Deconstruction Program.

Each alternate location was assessed for desirability based on:

1. New construction of a previously undisturbed area would not be required.

2. The area being sufficiently removed from any operational areas to not be in the way and is well drained and is well-patrolled.

3. The identified location already had sufficient space for the entire amount of waste, ensuring that the non-hazardous waste would not be distributed over multiple locations.

4. Finally, preventing the mixing of hazardous and non-hazardous waste at the same location.

Based on this assessment the preferred option is to store the non-hazardous waste in the Temporary Waste Laydown area for the Roaster Deconstruction Program. An insert to the WMP has been prepared and is attached as Appendix 1. The insert is intended to be a standalone section in the WMP and will become section 2.4.7.3 once any input has been addressed.

Figure 10 – Temporary Waste Laydown Area (facing northwest)

As the existing Water Licence, MV2012L8-0010 does not have a clause to modify operational conditions. The Project Team will be requesting that the MVLWB approve this operational change.

<u>Tarping of Arsenic Impacted Waste for 2014/15 Winter</u>

Prior to applying to the MVLWB, the Project Team is seeking input on the proposed tarping of arsenic impacted waste, which is further explained in the attached insert. Below is a summary of the events that led to the shortage of shipping containers and subsequent analysis of options for when to place the bagged waste in shipping containers. Please see the attached options table, attached as Appendix 2, for discussion during the December 11, 2014 Working Group meeting.

Unanticipated additional waste generated from the Roaster Complex deconstruction at the end of the 2014 work season has resulted in an unforeseen shortage of shipping containers. This has led to a delay in placing the waste bags into the shipping containers.

A potential shortage of shipping containers was first noted the week of November 3, 2014 when the Roaster Complex deconstruction contractor estimated that the Roaster Complex deconstruction was 12 pairs of shipping containers short; these were ordered immediately and are anticipated to be delivered in early to mid December. A secondary review was requested and completed by the quality assurance consultant the week of November 10, 2014, and concluded that the Project was 25 pairs short. The Project

again ordered more shipping containers, however delivery will not occur until January, 2015. Please note that a pair of containers consists of one 40' container and one 53' container.

In the meantime, the additional waste has been placed in Transportation of Dangerous Goods (TDG) compliant bags and transported to the Material Storage Area in compliance with the WMP. Currently the waste bags are being stored on pallets and/or geotextile and are covered by geomembrane tarps as a means to protect them from the elements (sun, rain, snow, etc.) until such time as they can be safely transferred into shipping containers.

An earlier amendment to the WMP of the Water Licence had allowed the use of geomembranes as a provisional means to protect the bagged arsenic impacted waste from the elements, however that amendment limited the practice to the 2013-2014 winter season. Before submitting the revised WMP to the MVLWB for approval, the Giant Mine Project Team is seeking your input and questions on the tarping of the waste bags until spring / summer of 2015. This amendment will be a revision to Section 2.4.7.2 in the WMP once any input has been addressed and is attached as Appendix 3. No other changes to the WMP will be made except for administrative changes including updated Table of Contents, the List of Figures and Figure references. Please note that the section and figure references in the inserts are aligned with the number sequence in the approved WMP.

Should you require any additional information or have any questions, please contact Katherine Ross, Project Analyst, Giant Mine Remediation Project at 819.934.9223 or by email at katherine.ross@aandc-aadnc.gc.ca.

Sincerely,

FOR
Katherine Ross
Environmental Scientist
Giant Mine Remediation Project

Encl. Roaster Complex Deconstruction Waste Management Insert
Material Storage Area Arsenic Containerization Options Comparison Table

c.c.: Tim Morton, AANDC
Tyree Mullaney, MVLWB

2.4.7.3 Non-Hazardous Storage

Non-hazardous materials will be sorted and stored in the Temporary Waste Transport Staging Area. Refer to 2.2 for further details on the Temporary Waste Transport Staging Area; refer to Figure 10 for the location of the area.

To allow for the inspections of the non-hazardous waste, which will occur on a weekly basis during active placement and, at minimum, monthly during all other periods, and to allow for ease of access to move and recycle the waste will be placed in a manner to allow ease of movement and inspection.

Figure 10 – Temporary Waste Transport Staging Area (looking NW)

Date: August 19, 2014

As outlined in section 2.4.7, non-hazardous waste will be cut or crushed in a manner to minimize voids when material is transported and stockpiled. Wastes will be cut so that the maximum dimension in any direction is six (6) metres and structural steel materials will be cut into separate members prior to

placement in stockpiles. Heavy and large materials including structural steel members, machine components and concrete slab sections, etc. will be placed on the base of any storage piles. As a minimum, hollow components will be cut in half parallel to the lengthwise axis.

In general, non-hazardous deconstructed building components will be physically sorted and separated into the following waste streams:

- Decontaminated painted non-hazardous waste.
- Decontaminated non-painted steel/metal non-hazardous waste.
- Decontaminated non-painted concrete non-hazardous waste.
- All other decontaminated non-hazardous waste.

Care and maintenance personnel remain on-site year round and are responsible for general site observations and maintenance.

APPENDIX 2
Giant Mine Remediation Project – Roaster Complex Stabilization
Material Storage Area Arsenic Containerization
Options Comparison Table

Consideration	Option 1: Containerize Waste Bags in Spring / Summer 2015	Option 2: Containerize Waste Bags in January 2015
Regulatory	The waste management plan of the water licence issued by the MVLWB for this project has made an exception in the winter of 2013-2014 to allow the tarping over of waste bags due to a lack of steel containers. Such an exception is currently not in place for the winter of 2014-2015.	Containerizing as soon as shipping containers become available is consistent with the waste management plan.
Worker Health and Safety (injury)	During the summer of 2013 and 2014, following standard operating and safe work procedures resulted in no reportable injury to workers as a result of this work. During the summer of 2013 and 2014, no worker death or severe worker injury has occurred on the Roaster project.	Increased likelihood of slips and trips during cold weather; cold weather personal protective equipment worn by operators and labourers result in reduced peripheral vision, mobility, dexterity, reaction time, etc.
Worker Health and Safety (exposure)	During the summer of 2013 and 2014, following standard operating and safe work procedures resulted in no arsenic waste bag failures leading to worker exposure. During the summer of 2013 and 2014 following warmer weather: 0 to 5% of weekly urinalysis results exceeded the action level between June and September 2014.	Synthetic liners within the woven waste bags are more rigid and brittle and subject to damage when handled during cold weather, which increases the risk of failure and of worker exposure. 11%, 22% and 13% of weekly urinalysis results (from samples collected on November 5, 12 and 19, 2014, respectively) exceeded the 35 µg/L actions levels established by the Workers Safety and Compensation Commission (WSCC). This may be explained by workers limiting their exposure to cold weather work and being less diligent in their adherence to Occupational Hygiene Standard Operating Procedures.

Environment (spills)	During the summer of 2013 and 2014, following standard operating and safe work procedures has resulted in very few bags developing leaks during the following year. (Only 0.26% of the total number of bags have leaked.)	Synthetic liners within the woven waste bags are more rigid and brittle and subject to damage when handled during cold weather, which increases the risk of immediate or eventual failure (i.e. leaks during subsequent warm weather).
Worker Health and Safety (operational)	Machinery malfunctions are less likely during warmer weather.	Machinery malfunctions are more frequent during colder weather.
Media / Stakeholder Relations due to leaks	In the summer of 2014, leakage from one container at the Material Storage Area (MSA) observed on 06 June 2014 remains a focus of ongoing discussions with the Working Group of Parties in November 2014.	An increase in leaking bags and containers could cause irreparable damage to stakeholder relations, and bog down the project team in media relations.
Public Perception	Since the 2013-2014 winter, stakeholders have expressed their lack of support for placing waste bags under tarps.	The project stated that all waste bags from 2013 and 2014 work seasons will be containerized by the end of the 2014 work season.
Cost	No weather-related premium.	Weather-related premium to be paid

Key: Green shading represents the more favourable of the two options.
Red shading represents the less favourable of the two options.

2.4.7.2 2014 Contingency Securement – Tarping Arsenic Impacted Wastes

In accordance with Section 2.0 of the approved Waste Management Plan, wastes that contain residual arsenic above the thresholds set out in Figure 8 are currently secured in containers that meet the requirements of the Transportation of Dangerous Goods (TDG) Regulations. Arsenic impacted wastes have been placed inside 1 m^3 and 3 m^3 capacity TDG approved bags manufactured out of a woven UV treated polypropylene (Figure 9).

Unanticipated additional waste generated from the Roaster Complex deconstruction at the end of the 2014 work season and has resulted in an unforeseen shortage of shipping containers. More shipping containers have been ordered, but these will not be delivered until December, 2014 and January, 2015 respectively. Due to the timing of delivery of the shipping containers, it was not be possible to immediately place all bagged wastes in marine shipping containers at the Temporary Waste Storage Area (Figure 5) located on the Central Tailings Pond. Therefore, a contingency plan has been developed that includes covering any bagged arsenic-impacted wastes not placed inside shipping containers with a geomembrane tarp over the winter to provide an additional level of protection, until the bagged waste can be placed safely in the shipping containers in the spring/summer, 2015.

The specific properties of the tarps, which will be made of Low Density Polyethylene (LDPE) material, are presented in Table 3.

Table 13 - Tarp Properties

Parameter	Enviro Liner® 4000 Minimum Properties	
	ASTM Standard	Enviro Liner® 4020
Thickness (Minimum Average)	D5199	20 mil 0.5 mm
Thickness (Lowest Individual of 10 values)	D5199	-10%
Density (Max)	D792	0.939
Tensile Strength at Break	D638 Type IV	76 ppi 13.3 N/mm
Elongation	D638	800%
Tear Resistance	D1004	11 lbs 49 N
Puncture Resistance	D4833	32 lbs 142 N
Carbon Black Content	D1603	2.0-3.0%
Low Temperature Impact Resistance	D746	-69°F -56°C

Prior to tarping the bags, the bags will be either be placed on wooden pallets or placed on a geotextile in order to prevent the bags from being in direct contact with the ground (Figure 9). The tarps will be installed over top of the storage bags such that the bags are fully covered and will be anchored so they will not become airborne during windy conditions. The edges of the tarps will be anchored with gravel placed using a loader. The tarps on top of the waste bag containers will be anchored using tires obtained from the used tire stockpiles at the Site.

Care and maintenance personnel remaining on-site year round are responsible for general site observations and maintenance and will visually inspect the Material Storage Area. In addition to these general site watches, specific monitoring activities to ensure tarp integrity will include monthly monitoring during the winter inactive period, and weekly monitoring during freshet by the Care and Maintenance contractor until conditions allow for the safe containerization of the Roaster Complex Waste. The results of the monitoring events will be documented in a written inspection report. A detailed inspection of each bag of arsenic-impacted waste will be completed after the tarps have been removed and prior to the relocation of the bagged waste into the marine containers.

The surface water management system is described in Section 3.3 below, which remains unchanged from the approved Waste Management Plan. Briefly, runoff from the Temporary Waste Storage Area is managed such that runoff from the storage area is captured and directed to a perimeter ditch that

discharges into the North Tailings Pond. Water from the North Tailings Pond is blended with water from the Northwest Tailings Pond before being treated in the existing Effluent Treatment Plan.

Figure 1~~9~~ - Temporary Waste Storage Area on the Central Tailings Pond (looking east)