



## RED DOG MINE INSPECTION REPORT:

<b>Inspection Date:</b>	July 23 to 25, 2014
<b>Weather:</b>	Overcast and windy with light drizzle to sunny and windy, Approximately 50 degrees
<b>Time of Inspection:</b>	8:00 am to 5:30 pm
<b>Operator Contact:</b>	Chris Menefee (Teck)
<b>Agency Personnel:</b>	ADNR – Brent Martellaro, Stephanie Lovell DEC – Tim Pilon, Neil Lehner, Will Collingwood
<b>Inspection Objectives:</b>	General Inspection of the Red Dog Mine site.

Agency personnel (Agencies) arrived on site July 23, 2014 at approximately 4:30 pm via the Red Dog Mine chartered Alaska Airlines flight and proceeded to the Red Dog Mine Personnel Accommodation Complex (PAC). The Agencies were met by the Environmental Coordinator and on-site escort, Chris Menefee, and the Red Dog Environmental Group led by Jeff Clark, Environmental Superintendent. After introductions, the Agencies were escorted to the check-in area for room assignments and led to their respective dormitory wings for luggage drop off before rallying back for the visitors "Site Environmental, Health, Safety and Security Orientation."

The following morning, July 24<sup>th</sup>, the Agencies, led by Chris Menefee, assembled at the Environmental Department offices for an overview (via aerial map) of the mine and current operations. Prior to departing for the onsite inspection, Personal Protection Equipment (PPE) was distributed to the team.

The inspection commenced at the Main Pit Overlook where the Main Pit, Aqqaluk Pit, Tailings Storage Facility, and Crusher operations were viewed. From this location the organic stockpiles in the Shelley Creek area (Figure 1) and the Oxide Stockpile above the Main Waste Stockpile (Figure 2) were visible. A dozer worked the Main Pit 840 (ft) Bench pushing waste rock into the Main Pit Lake (Figure 3). The water level of the Main Pit Lake and progress in the Aqqaluk Pit were observed (Figure 5). The locations of the primary gyratory crusher (blue building) and the secondary jaw crusher (red and white building) were pointed out (Figure 4). Teck noted that due to harder rock in the Aqqaluk Pit and an interest in increasing the mill's throughput capacity, the company was considering building a larger gyratory crusher for primary use, and using the current gyratory crusher as the secondary in lieu of the jaw crusher, which would be decommissioned and demolished. The need to blend ore for crusher feed was discussed.



Figure 1: Shelley Creek Organic Stockpile



Figure 2: Oxide Stockpile



Figure 3: 840 Bench Waste Rock Dumping Platform

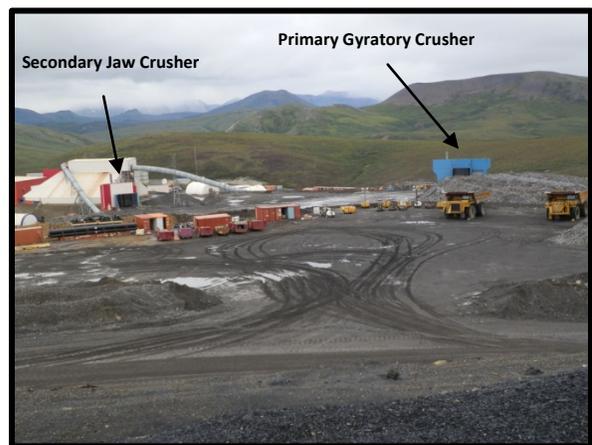


Figure 4: Crusher Area



Figure 5: Aqqaluk and Main Pit Lake (NOTE: photo is panoramic from spliced images and displays some offsets)

After breaking for lunch, the inspection continued. The team examined the Red Dog Creek diversion pipeline area, where during May 28 and 29, 2014 ice temporarily plugged the culvert causing an overflow of the non-contact water out of the culvert's man holes (Figure 6).



Figure 6: Overflow Area



Figure 7: Non-contact Water Collection Point

The diversion pipeline route was observed up to the collection point of the non-contact water just below the confluence of Rachael Creek and the Lisa Creek (Figure 7 above). Along the route, ADNR noted areas where natural colonizing of vegetation was occurring along the Main Pit's upper benches, particularly in the Kivalina Formation (Figures 8 and 9). In benches below Rachael Creek, natural colonizing was also visible in similar looking shale (Kayak or Kivalina Formations) (Figure 10). A young Spruce tree growing above this area was unexpected (Figure 11).

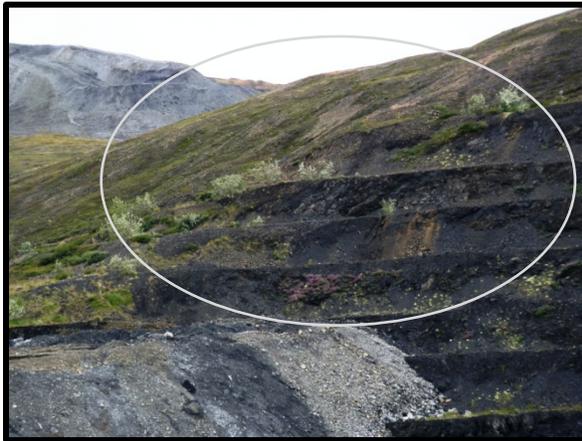


Figure 8: Upper Benches Main Pit Natural Vegetation



Figure 9: Upper Benches Main Pit Natural Vegetation

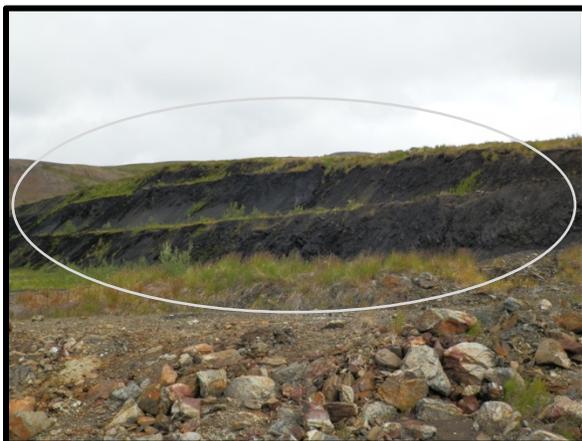


Figure 10: Natural Vegetation below Rachael Creek



Figure 11: Spruce Tree

The inspection proceeded to the Aqqaluk Pit, where the new storm water diversion channel was observed (Figure 12, Inset shows enlargement). Also of note, an exploration drill rig was operating just north of the Aqqaluk Pit (Figure 13). This exploration project was helicopter supported, utilizing a sling to mobilize the equipment to drilling locations, rather than building roads and creating additional disturbance (Figure 13 Inset).



Figure 12: New Storm Water Diversion Channel



Figure 13: Helicopter Supported Exploration Drill Rig

The Red Dog Creek diversion terminus was observed (Figure 14). At the Mine Drainage Dam for contact water, algae were observed growing (Figure 15). The inspection continued to the Seepage Collection area below the Main Dam (Figure 16). The ferricrete removal appears effective in stopping the seeps previously observed and restoring the designed function of the Seepage Collection System. Vegetation along the northwest abutment of the Main Dam had been cleared in preparation for construction of the dam raise (Figure 17).



Figure 14: Red Dog Creek Diversion Terminus



Figure 15: Algae Growth at Mine Drainage Sump



Figure 16: Seepage Collection Area



Figure 17: Vegetation Clearing for Dam Raise

The Landfill located on the Main Waste Stockpile was visited (Figure 18). The inspection proceeded to the Oxide Stockpile where the cover system was observed (Figure 19). The reseeded cover area was stabilized by vegetation displaying natural colonizing of moss species (Figures 20 & 21) and Chrysanthemum species (Figure 22). The team observed Musk Ox tracks along the top of the Oxide Stockpile (Figure 23).



Figure 18: Landfill



Figure 19: Oxide Stockpile



Figure 20: Moss on Oxide Stockpile



Figure 21: Moss on Oxide Stockpile



Figure 22: Chrysanthemums on Oxide Stockpile



Figure 23: Musk Ox Tracks on Oxide Stockpile

From the Oxide Stockpile, the inspection proceeded to the Incinerator Buildings (Figures 24 & 25). From this location the regrading of the Main Waste Stockpile, which had been completed over the last two years, was visible (Figure 26). Natural vegetation was noted near the Incinerator Building area (Figure 27). The truck wash station was also observed (Figure 28). The inspection concluded for the day, and the team returned to the PAC.



Figure 24: Incinerator



Figure 25: Incinerator



Figure 26: Main Waste Stockpile Regrading (NOTE: photo is panoramic from spliced images and displays some offsets)



Figure 27: Natural Vegetation near the Incinerators



Figure 28: Truck Wash Station

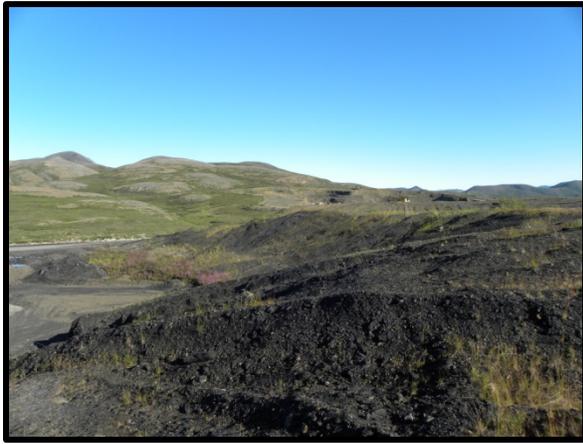
The team assembled with Chris Menefee (Teck) the following morning, July 25<sup>th</sup>, at approximately 8:30 am to conclude the inspection. The first stop was the Bons Creek Bypass and the Overburden Stockpile Pumpback Facilities (Figure 29). From the pumpback road system, the revegetation of the Overburden Stockpile was evident (Figure 30). Teck indicated the last reseeded had been a few years ago. This stockpile was originally intended to be a candidate for reclamation cover material. The stockpile is a mixture of overburden, unmineralized, and some mineralized rock. A small portion of the northwest corner has been removed and used as cover material for the Oxide Stockpile (Figure 31). On the Overburden Stockpile, grasses and woody species are evident (Figure 32, 33, 34 & 35). The Overburden Stockpile appears to sustain vegetation from the reseedings (36 & 37), as well as established natural colonization of species such as Fireweed (Figures 38).



Figure 29: Bons Creek Bypass & Pump back Area



Figure 30: Overburden Stockpile from Pumpback Road



**Figure 31: Corner Removed for Oxide Cover Material**



**Figure 32: Revegetation of Grasses**



**Figure 33: Revegetation of Woody Species**



**Figure 34: Revegetation of Woody Species**



**Figure 35: Grasses & Woody Species**



**Figure 36: Vegetation Cover**



Figure 37: Vegetation Cover



Figure 38: Natural Colonization of Fireweed

From the Overburden Stockpile, the team proceeded to the DD-2 State Material Site (Figure 39). The inspection continued to the Main Waste Stockpile ARD Seepage Collection Pumps (Figures 40 & 41). Aluminum precipitate was visible in the seepage water (Figure 42). Lastly, the team proceeded to the crest of the Main Dam (Figures 43 & 44).



Figure 39: DD-2 State Material Site



Figure 40: ARD Seepage Collection Pump



Figure 41: ARD Seepage Collection Pumps



Figure 42: Aluminum Hydroxide Precipitate in White



Figure 43: Downstream View from Top of Dam



Figure 44: Top of Dam

**Conclusion:**

Operations continue to be conducted in a manner consistent with the expectations of ADNR Mining. The current permit is up for renewal this December, and the State understands Teck will be submitting updated plans and documents that will address the current and future operation plans for the project, as well as an updated estimate for reclamation bonding.

**Action Items:**

Teck should provide in the renewal plans an update that addresses the availability of cover material and any potential for material deficits.

**End of Report**



**DEC keeping the environment clean!**

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