



Red Dog Mine Inspection Report

Inspection Date: August 16, 2023 and August 17, 2023
Weather: Rainy, Foggy, Variable Wind, 45°F to 58°F
Time of Inspection: 10:00 AM to 4:00 PM
Operator Contact: Frank Bendrick and Emily Hart
Agency Personnel: William Groom, Carolyn Curley, and Michael Ladouceur (Mining)
Ben Wagner (Dam Safety), DMLW Director Christianna Colles, and
OPMP Project Coordinator Sylvia Kreel

Inspection Objectives

ADNR Mining Section conducted a site inspection of operations at the Red Dog Mine and Aktigirug-Anarraaq Extension Project sites for compliance with the approved Plans of Operations and Reclamation Plans. The inspection focused on active mining disturbance, areas of active and previous reclamation, and locations for future disturbance.

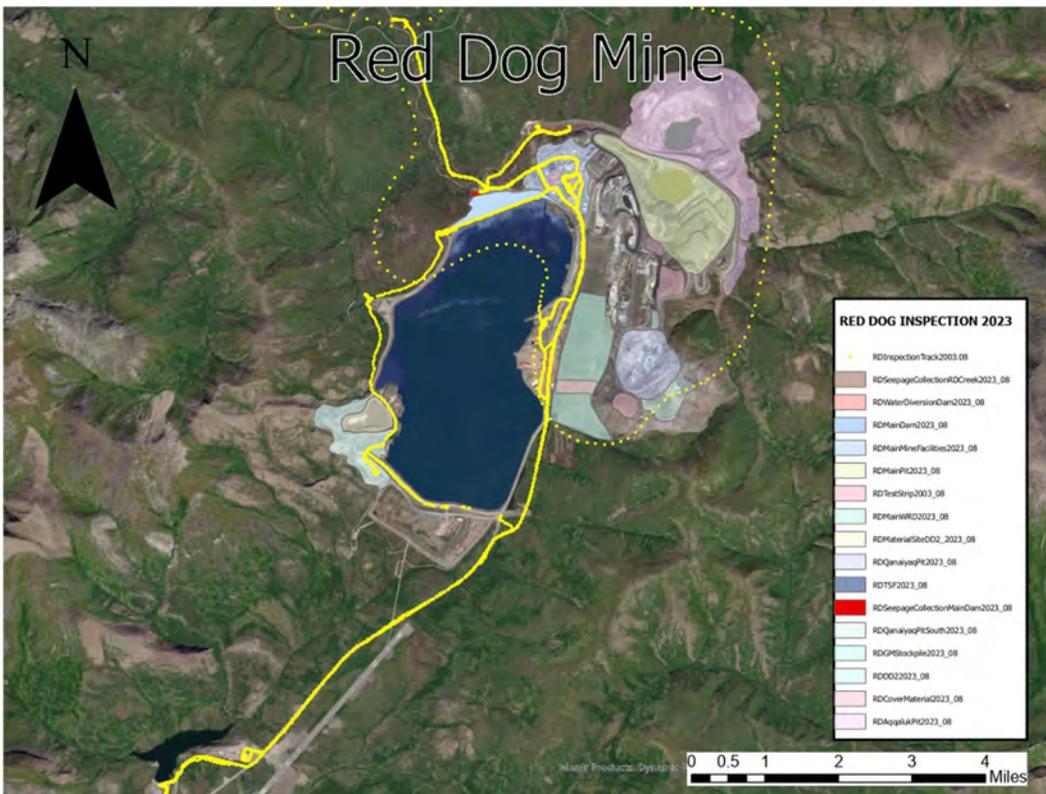
Red Dog Mine is an open pit, truck-and-loader operation using grinding and flotation processes to recover zinc and lead. The mine is in northwestern Alaska in the De Long Mountains of the Western Brooks Range, approximately 82 miles north of Kotzebue and 46 miles inland from the coast of the Chukchi Sea, on land owned by NANA Regional Corporation, Inc. (NANA – Northwest Arctic Native Association) and the State of Alaska. The Aktigirug-Anarraaq Extension Project is operated by Teck American, Inc. with the road route proposed on State of Alaska and NANA lands.

The Red Dog Mine (Map 1) is a partnership between NANA and Teck Alaska Incorporated (Teck) (the operator). Major Red Dog Mine facilities (Map 2) include the Red Dog Main Pit, Aqqaluk Pit, Qanaiyaq Pit, mill, Tailings Storage Facility (TSF), Main Waste Dump (MWD), freshwater storage reservoir, water management systems, an airstrip, and Personnel Accommodations Complex (PAC).

Red Dog Mine facilities visited (Map 2) included the MWD, open pits, freshwater reservoir, back dam, DD-2 material site, closure spillway potential location, Tailings Main Dam, Red Dog Mine Water Diversion Dam, and Red Dog Creek fish weir. Due to weather constraints, aerial photos were taken from a helicopter along the route of the Aktigirug-Anarraaq road. We had the opportunity to travel the Delong Mountain Transportation System (DMTS) to the port facility. On the way back, we visited Material Sites 9 and 10.



Map 1: Satellite view of Red Dog Mine.



Map 2: Red Dog Mine Site Inspection.

Pits

Mining in the Main Pit was completed in 2011. Currently the Main Pit is being backfilled with waste rock from the Aqqaluk and Qanaiyaq pits. Photos 1-3 show activities at the Main and Aqqaluk pits.



Photo 1: View of Main Pit looking toward the northwest as taken from a helicopter.



Photo 2: Aqqaluk Pit in the foreground.



Photo 3: Main Pit backfill in progress.

Main Waste Dump

Photos 4-6, taken from a helicopter flying south along the west side of the MWD, show the ore stockpile, Oxide Stockpile, MWD, and sections undergoing reclamation. Photos 8 – 13 show reclamation activities on the MWD. Drainage ditches have been dug. Liner and cover materials are being placed.



Photo 4: Low Grade Ore Stockpile, Oxide Stockpile, and MWD.



Photo 5: Oxide Stockpile and MWD.



Photo 6: Prior reclamation on the southwest side of the MWD.



Photo 7: Cover Material Stockpile on MWD.



Photo 8: Screen plant for cover material.



Photo 9: Drainage ditch on MWD.



Photo 10: Drainage ditch on south side of the MWD. Liner has been placed. Back Dam and facilities are in the background.



Photo 11: MWD reclamation progress showing liner with cover material placed.



Photo 12: MWD drainage ditch, lined and graveled. Cover material placed on the liner adjacent to the ditch.



Photo 13: MWD reclamation revegetation test plot.

Bons Creek

Bons Creek reservoir provides water for drinking and other uses on site. Water is treated at the Potable Water Treatment Plant and pumped to appropriate facilities for use.



Photo 14: Upstream Bons Creek Dam.



Photo 15: View downstream from the crest of Bons Creek Dam.



Photo 16: Outlet to Bons Creek below Bons Creek Dam.

Back Dam

The Back Dam has been raised to an elevation of 996'. Photos 17 and 18 show views of the Back Dam toward the east and to the west.



Photo 17: Back Dam looking east from the crest of the dam.



Photo 18: The view looking approximately west along the crest of the Back Dam.

Material Site DD-2

Under Millsite Lease ADL 233521, a portion of the DD-2 Material Site is used for tailings storage. Photos 19 through 21 note the conditions at DD-2. From DD-2, we traveled along the west side of the TSF. Photos 22 through 24 show a potential location for the planned closure of the spillway. Markers have been placed in the field for further review and discussion of the spillway route.



Photo 19: Work at DD-2 for tails storage.



Photo 20: DD-2 and TSF. MWD and revegetation test plot visible in the background.



Photo 21: DD-2 highwall



Photo 22: Potential closure spillway location.



Photo 23: Potential closure spillway location.



Photo 24: Stakes for closure spillway.

Tailings Storage Facility and Main Dam

The TSF is located between the Bons Creek drainage and Red Dog Creek drainage. Work is progressing to raise the Main dam from 991' to 996' (Photos 25 through 28). The tailings beach condition is shown in Photos 29 through 31. Photos 32 and 33 provide an aerial view of the facility. Seepage collection facilities are located downstream from the Main Dam (Photos 34 through 36).



Photo 2: Ongoing work at the Main Dam raise.



Photo 3: Main Dam view looking east toward camp and mill facilities.



Photo 4: Liner and cover installation at liner seam location



Photo 5: Progress on the Main Dam raise. The view is in a westerly direction.



Photo 29: West side of the tails beach.



Photo 6: Middle section of the tails beach. MWD is in the background.



Photo 317: Tails discharge pipe



Photo 32: View from the helicopter looking approximately east toward the Main Dam and tails beach.



Photo 33: Aerial view of the western corner of the Main Dam. Red Dog Creek and mine road are in the background.



Photo 34: Main Dam seepage pump house.



Photo 35: Seepage collection pond as viewed from the pump house to the west.



Photo 35: Seepage collection pond as viewed looking northeast.

Red Dog Mine Water Diversion Dam

The Middle and South forks of Red Dog Creek are diverted to prevent contact with mine operations. The Red Dog Mine Water Diversion Dam (Diversion Dam) allows the creek to flow on the north side of the structure and prevents contact with mine disturbance on the south side of the structure. Seepage from the Diversion Dam is collected and pumped for treatment (Photos 36 through 45).



Photo 36: Pond and Diversion Dam north of the camp facilities.



Photo 37: Weir between ponds adjacent to the Diversion Dam.



Photo 38: Outfall from weir along the Diversion Dam.



Photo 39: Pumphouse for Diversion Dam.



Photo 40: Seepage collection pipes for the Diversion Dam.



Photo 41: Seepage collection pipes pumping water for treatment.



Photo 42: Pumphouse for the Diversion Dam.



Photo 43: The view looking upstream toward the Pumphouse for Diversion Dam.



Photo 44: Seepage collection wells for the Diversion Dam.



Photo 45: Red Dog Creek adjacent to the Diversion Dam. Aqqualuq Pit highwall is in the background.

Red Dog Creek

Treated water from mine operations is discharged into Red Dog Creek at Outfall 001. The proposed road to the Anarraaq-Aktigiruk project begins at the end of the road for the fish weir on Red Dog Creek.



Photo 46: Treated water discharging into Red Dog Creek at Outfall 001.



Photo 47: Red Dog Creek upstream from the fish weir.



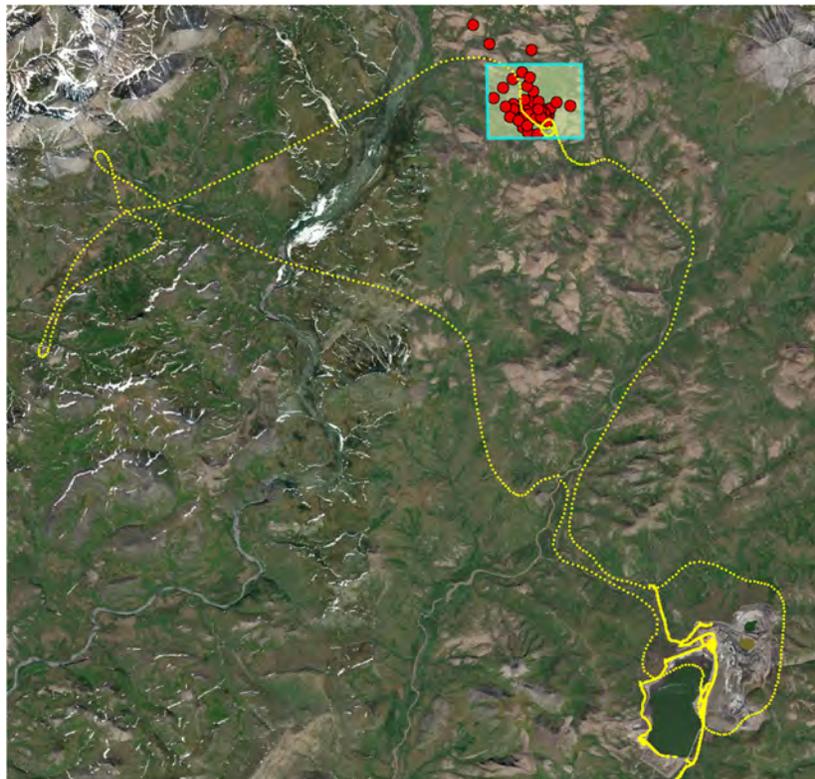
Photo 48: Red Dog Creek fish weir.



Photo 49: Red Dog Creek downstream from the fish weir.

Aktigirug-Anarraaq Extension Project

Helicopter flights from Red Dog Mine (Map 3) were used to view the activities for the Aktigirug-Anarraaq Extension Project along with the proposed road route. Map 4 shows the flight route along with recorded drill holes.



Map 3: Aktigirug-Anarraaq Extension Project location.

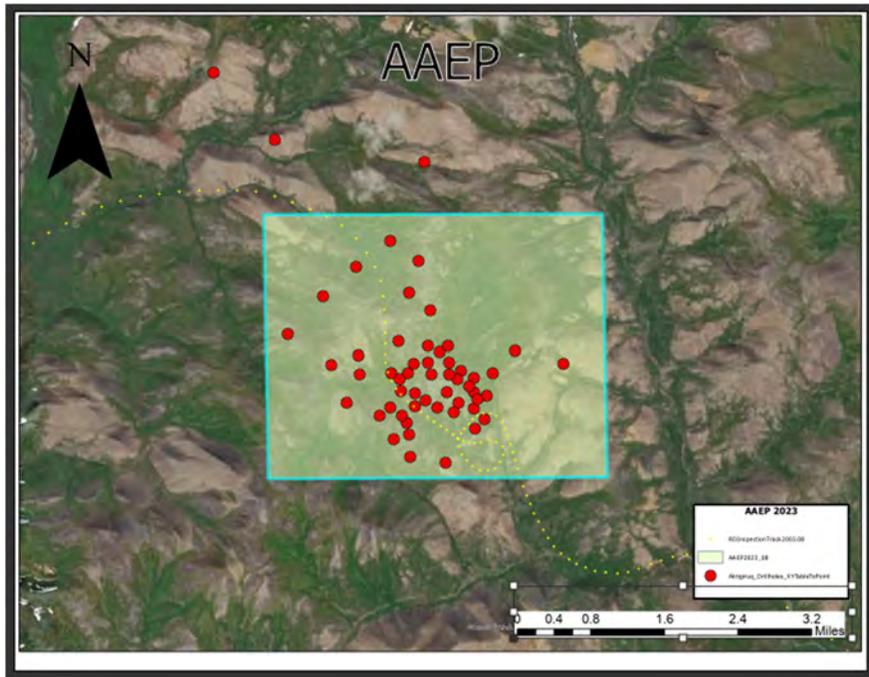


Photo 50: Mine road headed north from Red Dog Mine toward Red Dog Creek Fish weir.

DMTS Road

August 17th, we traveled along the DeLong Mountain Transportation System (DMTS). On the way back from the port, we stopped at Material Site 9 (MS 9) (Photos 51 through 58) and Material Site 10 (MS 10) (Photos 59 through 61). Photos for MS9 highwalls are viewed in a clockwise fashion from the entrance.



Photo 51: MS 9



Photo 52: MS 9



Photo 53: MS 9



Photo 54: MS 9 pump



Photo 55: MS 9



Photo 56: MS 9



Photo 57: MS 9



Photo 58: MS 9



Photo 59: Pallets and debris at MS 10



Photo 60: Hose line in the water at MS 10



Photo 61: MS 10

Conclusion: Red Dog continues work on the main dam raise, main pit backfill, and reclamation of the Main Waste Dump.

Action Items:

Ensure reclamation activities are documented in the annual report and noted for consideration with the project financial assurance costs.

End of Report

Cc:	Kyle Moselle (Teck)	Frank Bendrick (Teck)
	Robert Napier (Teck)	Sylvia Kreeel (ADNR)
	Steve Buckley (ADNR)	Allan Nakanishi (ADEC)
	Tim Pilon (ADEC)	Ben Wagner (ADNR)
	Kim Bustillos (ADNR)	Kindra Geis (ADNR)
	Jenny March (ADNR)	Carolyn Curley (ADNR)
	Audra Brase (ADF&G)	Aaron Kruse (ADNR)
	Jesse White (ADNR)	Harvey Templeton (ADNR)