
Red Dog Mine
4th Quarter & Annual Report 2011 for State of Alaska
Waste Management Permit No. 0132-BA002
Reclamation Plan Approval F20099958
February 28, 2012

Contents

Introduction	4
Biomonitoring Program	4
Annual Biomonitoring Report	4
Annual Summary of Biomonitoring Water Quality Sampling.....	4
Permafrost and Sub-permafrost Groundwater Monitoring.....	4
Five-Year Data Analysis Report.....	4
Mine Water Management.....	4
Mine water flows.....	4
Mine water quality.....	5
Mine Water and Load Balance	5
Visual inspections of mine water systems.....	6
Regents Consumed in Water Treatment in 2011	6
Fish weir inspections	6
Significant activities in mine water management	6
Waste Rock Management.....	6
Quantities, placement locations and analysis of waste rock.....	6
Results of waste rock geochemical monitoring	6
Visual inspections of waste rock facilities.....	6
Significant activities in waste rock management.....	7
Geotechnical Hazards.....	7
Tailings Management.....	8
Quantities and analysis of tailings	8
Tailings pond elevation.....	8
Visual inspections of tailings facilities.....	8
Significant activities in tailings management.....	8
Inert Solid Waste Landfills.....	9
Quantities of inert solid waste	9
Visual inspections of the inert solid waste landfills.....	9
Significant activities in inert solid waste landfills	9
Mining and Milling Activities	9
Mining Activities.....	9
Significant activities in Mining and Milling	9
Reclamation Activities	10
Area Disturbed and Reclaimed	10
Reclamation Research	10
Reclamation Monitoring.....	10
Significant reclamation activities	10
Dust.....	11
Dust monitoring activities.....	11
Wildlife.....	11
Wildlife interactions.....	11
Financial Assurance.....	11

Closing	11
---------------	----

Tables

Table 1. Water Management Flows	5
Table 2. Tailings Produced during the reporting period	8
Table 3. Tailings Pond Water Elevation	8
Table 4. Area Disturbed in 2011	10
Table 5. Grass Analysis Results, Oxide Stockpile	10
Table 6. 2011 Re-sloping activities	10

Appendices

APPENDIX A, Biomonitoring Water Quality Sample Results for 2011	12
APPENDIX B, Mine Water Quality Sample Results for 2011	97
APPENDIX C, Waste Rock Production Summary 4 th Quarter 2011	152
APPENDIX D, Oxide Stockpile Full-Scale Cover System 2010-11 Annual Performance Monitoring Report	156
APPENDIX E, Red Dog One Year Mine Plan 2012.....	157
APPENDIX F, 2011 TDS Management Plan Progress Report & Updated Management Plan for NPDES Permit AK-003865-2.....	158

Maps

Teck Alaska Red Dog Mine Disturbed Land Map, 1:2400, 1 Of 3
Teck Alaska Red Dog Mine Disturbed Land Map, 1:2400, 2 Of 3
Teck Alaska Red Dog Mine Disturbed Land Map, 1:2400, 3 Of 3

Introduction

This report has been prepared to fulfill the quarterly reporting requirements of Red Dog Mine's obligations under the State of Alaska Waste Management Permit No. 0132-BA002 and the Red Dog Mine Reclamation Plan Approval F20099958.

This report covers the time period from January 1, 2011 through December 31, 2011, including quarterly data from October 1, 2011 through December 31, 2011

The report addresses mine water management, waste rock management, tailings management, inert solid waste landfills, mining and milling activities, reclamation activities and wildlife interactions which occur throughout the reporting period.

When appropriate updated plans will be provided with the report and recommendations will be made to modify reporting requirements or the underlying permit conditions.

Biomonitoring Program

Annual Biomonitoring Report

Al Ott and Bill Morris of the Alaska Department of Fish and Game prepared a draft biomonitoring report that has been reviewed and commented on by Red Dog. The report has not been finalized as of the date of this report. Once the final biomonitoring report for 2011 has been finalized, Red Dog will provide the final report to the Large Mine Permitting Team.

Annual Summary of Biomonitoring Water Quality Sampling

Results of monthly samples of Biomonitoring water quality for the period can be found in attached electronic file, *Red Dog Biomonitoring Water Quality Analyses 2011.xlsx*, and in APPENDIX A, Biomonitoring Water Quality Sample Results for 2011.

Biomonitoring water quality is analyzed using Water Quality Profile I from Table 2-7 of the Red Dog Mine Waste Management, Reclamation and Closure Monitoring Plan. The electronic file has a pivot chart with filters to allow the charting of any Profile I analyte for any biomonitoring station.

No unusual trends in the biomonitoring water chemistry were noted during the year other than the seasonal increase in metals due to decreasing water flows and increases or decreases related to freshet.

Permafrost and Sub-permafrost Groundwater Monitoring

Five-Year Data Analysis Report

The Five Year Data Analysis report for the Long-Term Permafrost and Groundwater Monitoring Program is currently being prepared by AMEC E&I. Per the 1997 Consent Decree between Red Dog and the EPA, the report is not due until April 30, 2012. Once the report has been finalized Red Dog will provide the Large Mine Permitting Team with a copy.

Mine Water Management

Mine water flows

Table 1. Water Management Flows, shows the cumulative flows for each month in the reporting period and total flows for the 2011 calendar year.

Table 1. Water Management Flows

Location	Flow in gallons			Total 2011
	Oct-11	Nov-11	Dec-11	
<i>Bon's Creek Total Flow</i>	11,560,000	7,469,000	7,225,000	143,989,000
<i>Mine Water Collection Sump Total Flow</i>	28,230,000	17,260,000	13,340,000	348,919,000
<i>Main Dam Seepage Pumpback</i>	27,890,000	26,510,000	27,650,000	451,790,000
<i>Reclaim Flow to Mill</i>	583,000 ¹	94,000 ¹	426,000 ¹	1,403,552,000 ¹
<i>WTP #1 Influent from Reclaim</i>	0	0	0	499,160,000
<i>WTP #1 Influent from Mine Water Collection</i>	84,000	0	0	4,328,000
<i>WTP #1 Influent from MWD</i>	0	0	0	0
<i>WTP #1 Clarifier Underflow Sludge To Tails</i>	167,000	332,814	0	4,201,000
<i>WTP #1 Effluent to Sandfilter/Discharge</i>	0	0	0	0
<i>WTP #2 Influent from Reclaim</i>	0 ²	0 ²	0 ²	1,415,830,000 ²
<i>WTP #2 Sludge Discharge To Tails</i>	0	0	0	67,064,000
<i>SandFilter Effluent Discharged to Red Dog Ck</i>	0	0	0	1,293,800,000
<i>WTP #3 Influent from MWD</i>	953,000	0	0	25,547,000
<i>WTP #3 Influent from Mine Water Collection</i>	0	0	0	42,800,000
<i>WTP #3 Total Effluent</i>	0	0	0	68,347,000
<i>East Overburden Sump</i>	546,000	204,000	64,000	8,911,000
<i>West Overburden Sump</i>	2,236,000	860,000	225,000	17,092,000
<i>Natural Gas Water</i>	0	0	0	0

Notes to Table 1: 1. The flow meter for the reclaim water to the mill is currently bypassed because of operational requirements. As a result, the reported flows are significantly more than reported. The monthly flow of Reclaim Water to the Mill is usually 290,000,000 to 300,000,000 gallons per month. A plan is being developed to replace or move the flow meter.
2: The measured flows are not accurate. The flow meter was malfunctioning during the reporting period. The flow meter will be replaced before the start of the 2012 discharge season.

There were no unusual, non-seasonal changes in flows in the quarter.

Mine water quality

Results of monthly samples of mine water quality for the period can be found in attached electronic file, Red Dog Mine Water Quality Analyses qrt4 2011.xlsx, and in APPENDIX B, Mine Water Quality Sample Results for 2011. Mine water quality is analyzed using Water Quality Profile II from Table 2-7 of the Red Dog Mine Waste Management, Reclamation and Closure Monitoring Plan.

Seasonal changes in concentrations in mine water quality occur because of flushing of metals from waste stockpiles in the spring, rain events, drought periods and low flows in winter. Spring time flushing generally causes an increase in the very soluble metals. Rain events can have effects similar to spring time flushing depending on the magnitude of the event. Drought periods often cause the concentrations of metals in the streams to increase because of a reduction in dilution. Trending charts of any Profile II analyte and location can be plotted from the pivot chart tab of the electronic file.

Mine Water and Load Balance

A mine water balance is maintained at the Mine in GoldSim, a computer simulation program. An electronic copy of the 2011 GoldSim water balance is presented in an electronic file. Viewing the file requires GoldSim Player. The GoldSim Player is free and can be downloaded from <http://www.goldsim.com/Web/Downloads/>. A summary of annual flows and their loads for several chemical parameters are presented in an electronic file, Red Dog Mine 2011 Water and Mass Balance Estimates.xlsx.

The largest source of total dissolved solids (TDS) in the tailings impoundment water continues to be the Main Waste Stockpile. Red Dog has two major efforts underway to reduce the TDS entering the pond from the

Main Waste Stockpile, our cover system plans for the Main Waste Stockpile and an investigation into improved methods of intercepting flows from the Main Waste Stockpile for treatment prior to the flow entering the tailings impoundment. See the attached 2011 TDS Management Plan Progress Report & Updated Management Plan for NPDES Permit AK-003865-2 in APPENDIX F, 2011 TDS Management Plan Progress Report & Updated Management Plan for NPDES Permit AK-003865-2.

Visual inspections of mine water systems

No unusual conditions were identified during visual inspections of mine water system during the quarter

Regents Consumed in Water Treatment in 2011

Red Dog Mine Reclamation Plan Approval F20099958 requires the following be provided in the annual report.

- Total volume of water treated in WTP#2; - 1.416 billion gal
- Total quantity of flocculant used in WTP#2; - can't be separated from WTP1
- Total quantity of lime used in WTP#2; - can't be tracked separately from the other WTPs.
- Total quantity of sodium sulfide used in WTP#2; - can't be separated from WTP1
- Quantity of any other chemicals used in significant quantities in WTP#2; - none.
- Total quantity of flocculant used in WTP#3; - none.
- Total quantity of lime used in WTP#3; and, - can't be tracked separately from the other WTPs.
- Quantity of any other chemicals used in significant quantities in WTP#3. – none

Total lime used throughout season for WTP1, WTP2, and WTP3 = 8,303 metric tonnes. Total flocculant used throughout the season was 47 metric tonnes for WTP1 and WTP2, most of which is for WTP2. Total sodium sulfide used for the season was 529 metric tonnes, most of which was used for WTP2.

Fish weir inspections

The fall fish weir inspection was conducted on November 4, 2011. Minor settlement of the gabion baskets on the west, downstream side was noted but the settlement did not affect the performance of the weir.

Significant activities in mine water management

Water samples were collected from several existing sumps along the toe of the Main Waste Dump. The water samples were collected to obtain chemical parameter information about the underflow from the Main Waste Dump in advance of further work that will be carried out in 2012 to improve the capture of Acid Rock Drainage from the Main Waste Dump.

Waste Rock Management

Quantities, placement locations and analysis of waste rock

As per Red Dog Mine Waste Management, Reclamation and Closure Monitoring Plan, Section 2.4 Waste Rock Management, the management of waste rock including quantities, locations and analysis of waste rock are reported in APPENDIX C.

Results of waste rock geochemical monitoring

Other than blast hole analyses, no additional geochemical monitoring was conducted on waste rock materials during the reporting period.

Visual inspections of waste rock facilities

Weekly waste stockpile inspections for quarter 3, 2011, began on October 05, 2011, and ended on December 28, 2011. Dig face inspections were carried out on waste shots to confirm waste characteristics and suitability for designated stockpile locations. 7 loads of mineralized Ikalukrok waste were indentified, removed from the Phase 3 clean waste stockpile, and taken to the MWD stockpile. The Phase 3 clean waste stockpile is now being used for low grade ore storage and will not be inspected for waste type until after all of the ore has been removed. No other unusual dumping was noted. For the third quarter 2011, 2,350,910 tonnes of waste was hauled from the Aqqaluk and Main Pits combined.

Main Waste Stockpile

2,249,732 tonnes of “Other Waste” and “Most Reactive Waste” were taken to the MWD stockpile this quarter. Material taken to the Main Waste Stockpile was from Ikalukrok, Siksikpuk, Kivalina, Okpikruak and mixed formations.

Portable Crusher

6,232 tonnes of “Other Waste” from the Ikalukrok formation was taken to a portable crusher located immediately to the north of the marginal ore stockpile. All of this material is categorized as “Other Waste”. Material processed from the portable crusher will be stockpiled at the crusher location and will be used for in pit road gravel during winter months.

Marginal Ore Stockpile

55,586 tonnes of “Other Waste” and “Most Reactive Waste” from the Ikalukrok and “Mixed” formations were taken to the Marginal Ore Stockpile located on the North end of the Main Waste Stockpile. This material is being stored as a potential source for ore if economic conditions change enough to make this material ore grade.

In Pit

North Side Ramp

The North Side Ramp is the final ramp in the north Main Pit under GHZ-7. 37,474 tonnes of “Most Reactive Waste” from the Ikalukrok and Okpikruak formations was taken for the final dump site below the GHZ-7 buttress in the North Main Pit.

Main Haul Road, 625 Elevation

246 tonnes of “Other waste” from the Siksikpuk formation was placed in the Main Pit on the 625 elevation for road construction/repair.

Shelly Creek Ramp.

1640 tonnes of “Other waste” from the Siksikpuk formation was taken to a new ramp system on the south side of the Aqqaluk Deposit. The new ramp system will be used for Main Pit infill haulage.

Significant activities in waste rock management

No new significant activities in waste rock management occurred during the quarter.

Geotechnical Hazards

Two geotechnical hazard zones, Geotechnical Hazard Zone 7 (GHZ-7) and Geotechnical Hazard Zone 8 (GHZ-8) on the southwest and northeast sides of the pit, respectively, continue to control the overall stability of the north, Main Pit. GHZ-7 consists primarily of two bilinear multi-bench failures, one located between the 700 and 850 foot elevation levels, and the other between the 600 and 675 foot elevation levels. GHZ-8 consists primarily of bench-scale failure along weak rock adjacent to a fault that bounds the northeast side of the deposit.

The stability of the south portion of Main Pit is controlled primarily by two geotechnical hazard zones, Geotechnical Hazard Zone 3 (GHZ-3) on the southwest side of the pit and Geotechnical Hazard Zone 5 (GHZ-5) on the east side. GHZ-3 consists primarily of shallow-seated instability together with a multi-bench failure along a combination of fault structures and bedding. A buttress has been installed to prevent large scale instability of GHZ-3. GHZ-5 consists of a complex series of bench to multi-bench failures which occurred within the last 2 years. A buttress was also constructed along the toe of this slope to prevent large scale instability from developing. Little significant movement has been observed in GHZ-3 and GHZ-5 since the southwest and southeast buttresses were constructed during fourth quarter 2011. The geotechnical zones are depicted in maps MP2012_1 through MP2012_12 in APPENDIX E, Red Dog One Year Mine Plan 2012

Tailings Management

Quantities and analysis of tailings

Table 2. Tailings Produced during the reporting period, shows the tonnes of tailings produced and the lead, zinc and iron content of the produced tailings for the quarter and the 2010 calendar year.

Table 2. Tailings Produced during the reporting period

Month	Dry Tonnes Tailings	Analysis		
		%Pb	%Zn	%Fe
Oct-2011	146,932	1.5	4.0	5.3
Nov-2011	191,150	3.3	4.4	6.2
Dec-2011	234,893	4.1	5.6	5.3
2011 Total	2,491,020	2.7	4.3	5.3

There were no additional, non-routine geochemical analyses conducted on tailings during the reporting period.

Tailings pond elevation

Table 3. Tailings Pond Water Elevation. shows the surveyed Tailings Pond water levels for the reporting period. During the period the freeboard of the tailings dam was 955 feet above Mean Sea Level (MSL) and the crest was 960 feet above MSL. Though the tailings pond elevation was above the permitted freeboard level, the coffer dams and tailings beaches that have been constructed on the upstream side of the tailings dam will prevent wind-driven waves from reaching and splashing over the top of the tailings dam

Table 3. Tailings Pond Water Elevation

Survey Date	Pond Level Feet above MSL
10/5/2011	955.38
10/13/2011	955.41
10/20/2011	955.60
10/27/2011	955.74
11/03/2011	955.77
11/11/2011	955.94
11/17/2011	956.01
11/24/2011	956.07
12/01/2011	956.06
12/08/2011	956.31
12/17/2011	956.42
12/22/2011	956.47
12/29/2011	956.62

Visual inspections of tailings facilities

No unusual findings were observed during routine daily and weekly inspections of the tailings facility during the 4th quarter.

Significant activities in tailings management

No significant activities occurred in the quarter that affected tailings management.

Inert Solid Waste Landfills

Red Dog operates two inert solid waste disposal areas at the mine site. One facility is located on the Main Waste Stockpile and is the primary inert solid waste disposal area. The second site is located just south of the incinerators along the shore of the tailings pond. Only incinerator waste is deposited at this location.

Quantities of inert solid waste

Approximately 10,000 cubic yards of material as determined by survey volume was placed in the Main Waste Stockpile inert solid waste landfill at the mine.

Visual inspections of the inert solid waste landfills

There were no significant activities or changes to inert solid waste landfills during the reporting period. During the November visible inspection of the inert solid waste landfill some food wastes and a bag with oily rags were observed in the landfill. These materials were removed from the landfill. No other negative findings or wildlife interactions were noted either during routine inspections or otherwise.

Significant activities in inert solid waste landfills

No significant activities occurred in the inert solid waste landfills during the quarter.

Mining and Milling Activities

Mining Activities

Table 4: Ore Mined During the Reporting Period shows the tonnes of ore hauled to mill feed stockpiles each month during the reporting period.

Table 4: Ore Mined During the Reporting Period

Date	Ore Mined, tonnes
Oct-2011	313,989
Nov-2011	272,738
Dec-2011	354,410
2011 Total	3,798,239

Table 5: Ore Milled During the Reporting Period shows the tonnes of ore fed to mill grinding each month during the reporting period.

Table 5: Ore Milled During the Reporting Period

Date	Ore Milled, tonnes
Oct-2011	228,446
Nov-2011	285,481
Dec-2011	342,580
2011 Total	3,673,065

Significant activities in Mining and Milling

Mill throughput continued to be above historical norms during the reporting period. Because Aqqaluk ore is lower grade than the Red Dog Main Pit, it is expected mill throughput will continue to be above historical norms. Red Dog commissioned and brought on line two IsaMills™ for fine tertiary grinding in the zinc circuit. The IsaMills™ will replace several tower mills at the Red Dog Mine. No other significant activities occurred during the quarter that affected mill operations.

Reclamation Activities

Area Disturbed and Reclaimed

In the calendar year 2011 an additional 22.4 acres were disturbed within the mine air permit boundary. The areas are listed in Maps showing the disturbed areas at a scale of 1:2,400 are included in this report.

Table 4. Area Disturbed in 2011

Disturbed Area	Acres
DD-2 Quarry (State Land)	2.3
Qanaiyaq drill hole sites and roads	5.1
Aqqaluk	10.3
Main Waste Stockpile	4.7
Total 2011 Disturbance	22.4

Reclamation Research

O’Kane Consultants Inc. reported the second year performance of the Oxide Stockpile cover system in the report in APPENDIX D, Oxide Stockpile Full-Scale Cover System 2010-11 Annual Performance Monitoring Report. All indications are that the cover system is performing as designed.

Reclamation Monitoring

A composite sample of grass growing on the Oxide Stockpile cover was collected in July was analyzed for metals uptake by analytical method: EPA 200.8 and preparation method: EPA 3050. The results of the analysis are show below in Table 5. Grass Analysis Results, Oxide Stockpile.

Table 5. Grass Analysis Results, Oxide Stockpile

Parameter	Result	Units
Lead	198	mg/kg
Zinc	315	mg/kg

Significant reclamation activities

As of the end of 2011, the bench faces along the south and west sides of the dump were re-sloped to a 3:1 horizontal to vertical slope using D-9 and D-10 Caterpillar dozers. The re-sloped areas are not at their final landform and will be reshaped prior to construction of cover systems. During the quarter Teck was trained in landform software to assist in development of more natural appearing and stable landforms on the waste rock stockpiles. Table 6. 2011 Re-sloping activities shows the equipment, labor and material quantities moved during the year and the remaining re-sloping to be done in 2012.

Table 6. 2011 Re-sloping activities

Equipment Hours	174
Labor Hours	188
Material Quantity (CY)	21,425
Area remaining to re-slope in 2012 (acres)	21

Dust

Dust monitoring activities

Dust monitoring activities during the 4th Quarter included routine Visible Emissions Evaluations as required by the Title V Operating Permit, regular dust fall jar analysis, and continuous data collection by the TEOMs at the Tailings Dam and PAC. Evaluations of new formulations of extreme low-temperature dust control products are currently in process; upon confirmation of minimal environmental and human health risks of each product, on-site testing will occur to determine applicability to site conditions, and effectiveness at reducing fugitive dusting from roadways and exposed areas.

Wildlife

Wildlife interactions

No significant wildlife interactions occurred during the reporting period.

Financial Assurance

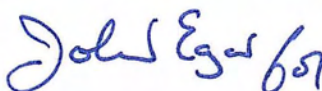
Teck does not feel that the changes from the 2007 mine plan to the current mine plan require substantive changes to the financial assurance for this year. Earthwork conducted as part of the re-sloping of the Main Waste Stockpile in 2011 will reduce the cost of Suspension and Premature Closure costs slightly. Tabulation of the volume moved in 2011 is included in Table 6. 2011 Re-sloping activities.

Closing

Please accept this as the 4th Quarter 2011 and 2011 Annual Report for State of Alaska Waste Management Permit No. 0132-BA002 and Reclamation Plan Approval F20099958. If there are any questions, please contact Chris Menefee at (907) 426-9138 or myself at (907) 426-9127.

Based on information and belief formed after reasonable inquiry, I certify that the statements and information in and attached to this document are true, accurate and complete.

Sincerely,
Teck Alaska Incorporated



Mike D.J. Bonneau, P. Eng.
General Manager

Cc Tim Pilon, ADEC, Fairbanks
Pete McGee, ADEC, Fairbanks
Rick Fredericksen, ADNR, Anchorage
Steve McGroarty, ADNR, Fairbanks
Sharmon Stambaugh, ADNR, Anchorage
Jim Vohden, ADNR/DMLW, Fairbanks
Al Ott, ADF&G, Fairbanks