POGO MINE
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MINING DONE RIGHT

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February 25, 2014
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Alaska Department of Environmental Conservation
Waste Water Discharge Program, Division of Water
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Fairbanks, Alaska 99709-3643

Jack DiMarchi, Large Mine Project Manager
Office of Project Management and Permitting
Alaska Department of Natural Resources
3354 College Road
Fairbanks, Alaska 99709

Re: **Sumitomo Metal Mining Pogo LLC 2013 Annual Activity and Monitoring Report**

Dear Sirs:

Enclosed is Sumitomo Metal Mining Pogo LLC (Pogo's) 2013 Annual Activity and Monitoring Report. This report is prepared to fulfill the requirements of the *Alaska Department of Natural Resources (ADNR) Pogo Mine Millsite Lease ADL416949*, *Alaska Department of Environmental Conservation (ADEC) APDES Permit AK-005334-1,* and *ADEC Waste Management Permit 2011DB0012*. This report covers the period from January 1, 2013 through December 31, 2013. The Annual Meeting is scheduled for Friday March 21, at 3:30 pm at the West Mark Hotel in Fairbanks. Several as-built reports for Appendix D are being finalized and will be submitted when received from Pogo's contract Engineer.

If you have any questions please contact Stacy Staley at 907-895-2761 or stacy.staley@smmpogo.com. Or you may contact me at 907-895-2879 or sally.mcleod@smmpogo.com.

Sincerely,

Sally S McLeod

Sally S. McLeod, CEM, REM
Environmental Manager

Enclosure: 2013 Annual Activity and Monitoring Report

2013 ANNUAL ACTIVITY AND MONITORING REPORT

SUMITOMO METAL MINING POGO LLC

Submitted To:

Alaska Department of Conservation
Division of Water, Compliance Program
555 Cordova Street
Anchorage, Alaska 99501

Alaska Department of Natural Resources
Division of Mining, Land, and Water
550 West 7th Avenue, Suite 900D
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Prepared by:

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March 1, 2014

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1. Introduction

Sumitomo Metal Mining Pogo LLC (Pogo) prepared this report to fulfill the requirements of the *Alaska Department of Environmental Conservation (ADEC) APDES Permit AK005334-1 (5/1/11), Alaska Department of Environmental Conservation (ADEC) Waste Management Permit 2011DB0012 (2/7/2012), Alaska Department of Natural Resources (ADNR) Pogo Mine Millsite Lease ADL416949 (3/9/04)*, *and ADNR Plan of Operations Approval F20129500 (2/7/2012)*. This report covers the period from January 1, 2013 through December 31, 2013. A General Location Map can be found in **Figure 1, Appendix A**.

2. 2013 Monitoring

A prescriptive program of environmental monitoring is conducted as required by Pogo's permits and in accordance with Pogo's approved *Pogo Mine Monitoring Plan* and *Quality Assurance Plan (QAP)*.

The objectives of Pogo's monitoring programs are:

- ❑ To monitor the water quality of the effluent discharged from the facility,
- ❑ To monitor water quality changes in the Goodpaster River and in the groundwater below the facility that may occur as a result of mining activities or discharges from the facility,
- ❑ To monitor the CIP Tailings Processes associated with the underground paste backfill, and
- ❑ To monitor the Flotation Tailings and the materials placed in the Dry Stack Tailings Facility.

Samples collected from the Water Treatment Plant #2 (WTP#2), groundwater stations, surface water stations, the sewage treatment plant (STP) and the Off River Treatment Works (ORTW) effluent were submitted to Analytica Environmental Laboratories, Inc. Samples collected from PC002 to monitor mineralized waste rock, and PC003 floatation

tailings and were analyzed by ALS Chemex. Annual WET Test samples were submitted to AECOM Environmental Laboratory and CH2MHill Laboratory. Annual fish tissue samples were analyzed by Test America Laboratory, Tacoma.

2.1 ANNUAL VERIFICATION OF LABORATORY SPECIFIC MDL STUDY

ADEC Waste Management Permit 2011DB0012 (2/7/12), Section I.3.1.4, 1.7.3

Laboratories perform lab quality assurance and quality control procedures at regular intervals to verify the accuracy of the established MDLs. EPA-accredited laboratories' routinely spike and run replicate samples once or twice a year to either confirm or re-establish laboratory MDLs. A copy of the most recent MDL studies from the laboratories listed in Section 2 above are provided in **Appendix E**.

2.2 SUMMARY

A summary of the 2013 monitoring results show:

- **Outfall 011:** Pogo reported no Outfall 011 exceedances during 2013. Refer to **Section 2.3.1** for more detail.
- **Outfall 001:** Pogo reported three potential Outfall 001 exceedances during the year when flooding conditions increase flow to the ORTW and increased influent river turbidity. Another potential exceedance occurred when a fiber optics cable was accidently cut and manual controls had to be engaged to manage the dilution ratio. Refer to **Section 2.3.2** for more detail.
- **Outfall 002:** Pogo reported no Outfall 002 exceedances during 2013. Refer to **Section 2.3.3** for more detail.
- **Whole Effluent Toxicity WET):** WET testing took place in June. All test results were within the permit limits. Refer to **Section 2.3.4** for more detail.

- **Compliance Order by Consent** (COBC) was executed between Pogo and ADEC on May 9, 2012. All actions items are complete except for one. Refer to **Section 2.3.5** for more detail.

- **Surface Water:** There are no adverse trends in Surface water samples collected during 2013. Refer to **Section 2.4.1** for more detail. Annual fish tissue sampling was completed during September. Refer to **Section 2.4.2** for more detail.

- **Fish Tissue:** Annual fish tissue sampling was completed during September. No adverse trends were observed. Refer to **Section 2.4.2** for more detail.

- **Ground Water:**

  - **2011 Series Wells:** Two wells are located below the Drystack Tailings Facility (DSTF), MW11-001A and MW11-001B. The wells monitor groundwater downstream of the DSTF and upstream of the Recycled Tailings Pond (RTP). Refer to **Section 2.5.1** for more detail.

  - **500 Series Wells:** Three wells are located below the Recycled Tailings Pond (RTP) Dam (MW12-500, MW12-501, and MW12-502). The wells monitor groundwater downstream of the RTP seepage collection system. Monthly samples were collected at MW12-500 during 2013 when water was present; MW12-501 and MW12-502 were dry until September when samples were collected. Refer to **Section 2.5.3** for more detail.

  - **200 Series Wells:** Two wells, MW04-213 and MW11-216, are located downgradient of the ore body to monitor groundwater quality. No adverse trends were observed. Refer to **Section 2.5.4** for more detail.

  - **LL Series Wells:** LL04-031 and LL04-032 are located downgradient of the Off River Treatment Works (ORTW) to monitor groundwater between the ORTW and Goodpaster River. Samples were collected during the third quarter. There are no adverse trends observed. Refer to **Section 2.5.5** for more detail.

- **2012 Series Wells:** Two wells are located adjacent to the Pogo Airstrip, MW12-001A and MW12-001B. Samples are collected monthly. Refer to **Section 2.5.6** for more detail.

❑ **Process Control:**

- **PC001:** PC001 monitors CIP tails prior to use in paste backfill. All samples are within limits and conditions set forth within the permit. Refer to **Section 2.6.4** for more detail.

- **PC002, PC003 Solids:** PC002 samples monitor mineralized waste rock that is placed within the Drystack Tailings Facility (DSTF). PC003 Solids samples monitor floatation tailings that are placed within the DSTF. No adverse trends were observed. Refer to **Sections 2.6.5 and 2.6.6** for more detail.

- **PC003 Liquid:** PC003 Liquid samples monitor interstitial water pressed from the flotation tailings prior to placement within the DSTF. Selenium values are trending downward. Pogo identified a mill reagent, Copper Sulfate, which contains selenium. Pogo is working to switch to low selenium Copper Sulfate. Refer to **Section 2.6.7** for more detail.

A discussion of the results for each sampling program is provided below. Time series graphs are provided in **Appendix C**.

2.3 TREATED EFFLUENT MONITORING

ADEC APDES AK0053341 (5/1/11), Appendix A, 3.0

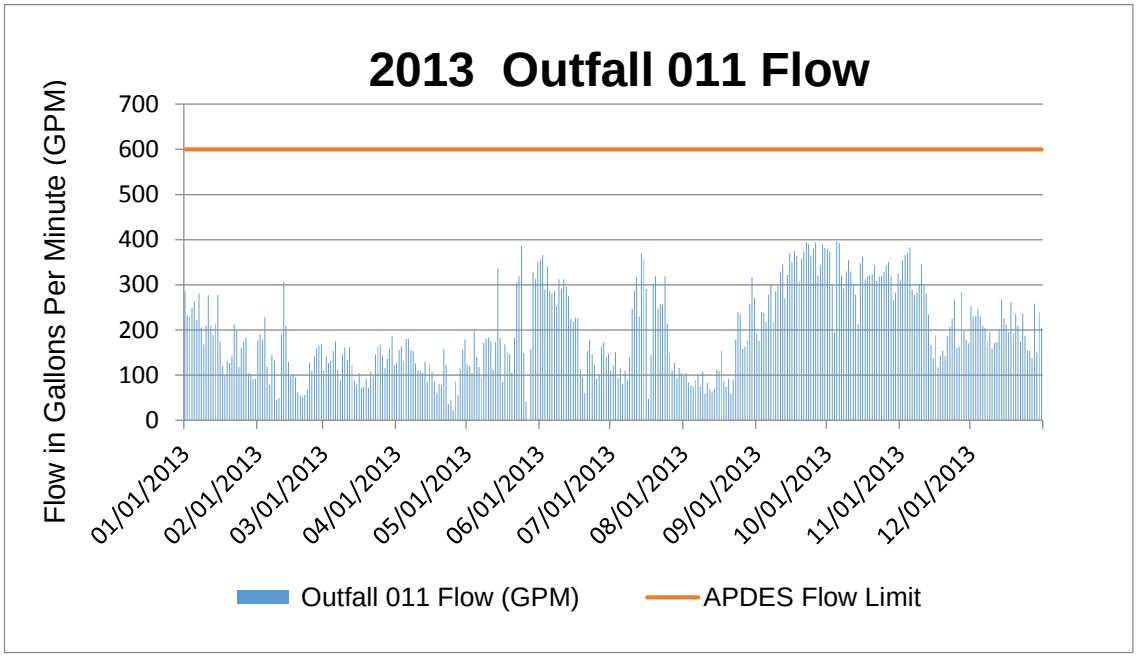
Treated effluent data were previously submitted to ADEC via copies of the Discharge Monitoring Report**s (DMRs)** under the APDES Permit. The monitoring locations for treated effluent are shown on **Figure 2 in Appendix A**.

2.3.1 Outfall 011- Treated Effluent from Mine Water Treatment Plant

ADEC APDES AK0053341 (5/1/11), 1.2

Groundwater and drill water collected from the underground workings are sent to Water Treatment Plant #1 (WTP#1), treated and returned for use underground, sent to the mill to be used as process water, or sent to Water Treatment Plant #2 (WTP#2) for discharge to the Off River Treatment Works (ORTW). Surface runoff and groundwater collected in the RTP, as well as some mine seepage water, are sent to the WTP#2 (located near the 1525 portal), treated and then discharged to the ORTW or directed to the mill for use as process water. Discharge to the ORTW occurred throughout the year. The volume of water discharged from Outfall 011 in 2013 is shown below in **Chart 1.**

Chart 1: 2013 Water Treatment Plant #2 Outfall 011 Discharge to ORTW



Continuous pH data is collected at Outfall 011 along with weekly and quarterly laboratory samples for metals, TSS, Hardness, Weak-Acid Dissociable (WAD) Cyanide, Anions, Cations, and Total Dissolved Solids (TDS).

Outfall 011 has a dual system of continuous pH Meters. pH readings taken during the year all show compliance within permit limits.

All results are within the limits and conditions set forth within the permit. Time series graphs are provided in **Appendix C**. Monitoring and historic data are provided in **Appendix H**.

2.3.2 Outfall 001 – Discharge from Off River Treatment Works

ADEC APDES AK0053341 (5/1/11), 1.1

Treated effluent from WTP#2 is sent to the ORTW. After mixing in the ORTW, water flows over the weir of Pond 2 (Outfall 001) and into the Goodpaster River. The sampling location is at the weir.

Continuous turbidity data and twice-daily pH readings are collected along with weekly laboratory samples for metals, WAD Cyanide, TDS, Turbidity, Sulfate, and Hardness at Outfall 001. In addition, daily field parameters and weekly samples required by the permit, (Lead, Mercury, and Turbidity) and other parameters, were collected upstream from the discharge point (NPDES001B) to determine background water quality of the Goodpaster River.

Discharge to the river was stopped briefly during May due to river flooding that occurred from May 25, 2013 through May 28, 2013. The flow limit through the Off River Treatment Works (ORTW) was exceeded due to the flooding. Pogo reported this event to ADEC. Please refer to the May 2013 DMR for more information.

On June 9, 2013 a sample indicated that the turbidity at Outfall 001 was 5.3 NTU's higher than the NPDES 001B sample. This was a result of turbid water from the May Goodpaster River flood event draining into the ORTW. Treated mine water from Outfall 011 indicated an average turbidity of 0.7 NTU. Please refer to the June 2013 DMR for more information.

On November 25 and 26 there was a potential exceedance of the dilution ratio. The fiber optics cable to the DCS (Data Collection System) was accidently cut during other work in the area. The cut resulted in the dilution pump system and the MWTP discharge system being disconnected from each other. These systems share information to automatically control the ORTW dilution ratio. These systems were operated manually while the fiber optic cable was being repaired. While under manual operation, the manual log sheets

indicate that Pogo may have unintentionally exceeded the 25:1 mixing ratio limit for a short period of time. Please refer to the November 2013 DMR for more information.

Except as noted above, all results are within the limits and conditions set forth within the permit. Time series graphs are provided in **Appendix C**. Monitoring and historic data are provided in **Appendix H**.

2.3.3 Outfall 002 – Treated Effluent from Sewage Treatment Plant

ADEC APDES AK0053341 (5/1/11), 1.3

The Sewage Treatment Plant (STP) operated throughout 2013 with discharge flows ranging between 7,252 and 33,655 gallons per day. Daily field parameters were collected to assess quality of treated effluent prior to discharge in the mixing zone in the Goodpaster River. Weekly samples were also collected for Biological Oxygen Demand (BOD5), Total Suspended Solids (TSS), Fecal Coliform, Nitrates, and Chlorine. Influent data from STP002 were collected for BOD5 and TSS on a monthly basis to determine quarterly percent removal.

All results were within the limits and conditions set forth within the permit. Time series graphs are provided in **Appendix C.** Monitoring and historic data are provided in **Appendix H**.

2.3.4 Whole Effluent Toxicity

ADEC APDES Permit AK-005334-1 (5/1/11), 1.4

The annual Whole Effluent Toxicity (WET) test was conducted June 11 through June 15, 2012 by CH2M Hill's Aquatic Toxicology Laboratory in Corvallis, Oregon. A split of the same sample was also sent to AECOM Environmental Laboratory in Fort Collins, CO. Results from both laboratories are presented in **Appendix B** and indicate that the toxicity for *Ceriodaphnia dubia* (water flea) and Pimephales promelas (fathead minnow) were both <1.0 TU_c. Both species were within the limits and conditions (2.0 TU_c) set forth within the permit. Laboratory reports are provided in **Appendix G**.

2.3.5 Compliance Order by Consent

ADEC APDES Permit AK-005334-1 (5/1/11), 1.1, 1.2, 1.3, Appendix A 1.6, 2.6

In June 2012 Pogo and ADEC entered into COBC 11-0929-50-0002 to fully address several alleged violations from 2011. Under the COBC, Pogo agreed to complete corrective actions. All corrective action is complete except for the upgrade to WTP#2. On October 1, 2013, ADEC amended the COBC to allow Pogo to construct an additional waste water treatment plan in lieu of upgrading WTP#2. The amendment to the COBC requires Pogo to complete the following action times:

Waste Water Treatment Plant #3 (WTP#3): Prior to the following dates, submit to ADEC documentary proof of the completion of the following actions:

- October 31, 2013: Pogo will submit plans to ADEC for construction of a Waste Water Treatment Plant #3, which will, together with existing wastewater treatment plants, allow for a 600 gpm wastewater treatment and discharge capability at Pogo Mine. *Plans were discussed with ADEC on October 31, 2013 and submitted on November 12, 2013.*
- December 31, 2013: ADEC will complete review and determination of whether to approve of the plans for Wastewater Treatment Plant #3. *Conditional approval to construct WTP#3 was issued by ADEC on December 18, 2013.*
- April 1, 2014: Pogo will start construction of Wastewater Treatment Plant #3.
- December 31, 2014: Pogo will complete construction of Wastewater Treatment Plant #3.
- December 31, 2014: Pogo will achieve at least 600 gpm wastewater treatment and discharge capability at Pogo Mine.

The Original COBC Corrective Action items completed in 2013 are as follows:

Required Corrective Action Number One:

Waste Water Treatment Plant #2 (WTP#2): Conduct two engineering studies to,

first, determine the feasibility of increasing plant throughput from 300 to 600 gpm utilizing existing equipment; and second, to evaluate the benefits and drawbacks associated with a spectrum of available treatment options for increasing plant throughput to 600 gpm.

- April 30, 2013: *Results of the second study were presented to ADEC on April 24, 2013.*

Required Corrective Action Number Three:

Recycled Tailings Pond Seepage: Develop a dam seepage grouting plan based upon the results of electromagnetic imaging.

- *September 30, 2013: Grouting was completed in April 2013. Pogo submitted "2013 RTP Dam Grout Curtain Remediation Report to ADNR on June 12, 2013."*

2.4 SURFACE WATER MONITORING

2.4.1 Goodpaster River

ADEC Waste Management Permit 2011DB0012 (2/7/12), 1.6.2.2 & 1.6.4; ADEC APDES AK0053341 (5/1/11), 1.5; Pogo Mine Monitoring Plan (6/13) 5.0

Four surface water stations are monitored to evaluate water quality along the Goodpaster River. They are SW01 located upstream of the Pogo Mine, SW41 located downstream of Outfall 001, SW42 downstream of Outfall 002, and SW15 located downstream from all Pogo facilities.

Surface water samples are analyzed for WAD cyanide, ionic balance, major cations and anions, and total and dissolved metals. Physical and aggregate properties of ammonia, conductivity, hardness, nitrates, pH, TDS, Total Settleable Solids (TSS), Turbidity, TKN, and Temperature are also measured.

Surface water samples were collected on January 8, March 3, June 25, July 10, August 21, and September 17, December 22, of 2013. Fish Tissue samples were collected in conjunction with the September 17, 2013 sampling event. Results of the fish tissue sampling are provided in the next section.

All other results were within the limits and conditions set forth within the permit. The locations of the surface water monitoring stations are shown in **Appendix A, Figure 2.** Time series graphs are provided in **Appendix C**. Monitoring and historic data are provided in **Appendix H**.

2.4.2 Fish Tissue

ADEC APDES Permit AK-005334-1 (5/1/11), 1.5.5

In order to help assess long term trends in Goodpaster River quality, annual whole body analysis of juvenile Chinook Salmon are required at monitoring sites both upstream (SW01) and downstream (SW12) from the project facilities. Juvenile Chinook salmon were collected at these stations on September 17, 2013. Brandy Baker with the Alaska Department of Fish and Game was able to assist with the sampling effort this year. In an effort to better assess any long term trends Pogo obtained permission to collect an additional 5 Slimy Sculpin from both SW01 and SW12.

The required numbers of juvenile Chinook were collected at both locations. Metals analysis was conducted on 10 individuals from each site, and a composite sample of 5 fish was also conducted from each site. Five Slimy Sculpin were caught upstream in minnow traps, at SW01, and five more were caught with dip-nets at SW12 downstream. As required by **Fish Resource Permit SF2013-126** a report of collecting activities and data submission form was submitted to ADFG on October 29, 2013.

All results are consistent with historical data and no statistical differences are observed. 2013 time series graphs are provided in **Appendix C**. Monitoring and historic data are provided in **Appendix H**.

2.5 GROUNDWATER QUALITY MONITORING

Groundwater samples are analyzed for WAD cyanide, ionic balance, major cations and anions, and total and dissolved metals. Physical and aggregate properties of ammonia, conductivity, hardness, nitrates, pH, TDS, Total Settleable Solids (TSS), Turbidity, TKN, and Temperature are also measured.

The locations of the groundwater monitoring stations are shown in **Appendix A**, **Figure 2.**

2.5.1 Downgradient of DSTF

ADEC Waste Management Permit 2011DB0012 (2/7/12), 1.1.4, 1.2.7, 1.6.4; Pogo Mine Monitoring Plan (6/13), 6.0

MW11-001A and MW11-001B provide information on water quality trends down-gradient from the DSTF and up-gradient of the RTP. MW11-001A is an alluvial well and MW11-001B is a bedrock well. Samples were taken MW11-001B on March 13, May 7, June 23, September 4, and October 20, 2013. MW11-001A was dry in 2013 until a sample was collected in September.

The copper and nitrate values for both wells are fluctuating over time with no apparent trend. Piezometer well LT99-099 below the drystack is monitored for water elevation on a quarterly basis. Time series graphs are provided in **Appendix C**. Monitoring and historic data are provided in **Appendix H**.

2.5.2 Liese Creek Flumes

Four flumes were installed in Liese Creek in 2012. They were replaced during the First Quarter of 2013 due to installation defects. Damage occurred during the spring thaw. It was repaired, and wing-walls were constructed at all four sites during the summer of 2013. The As Built reports are provided in **Appendix D**. Figure 1 provides flow data for Flume #1 (near the toe of the DSTF) versus precipitation rate in 2013.

Figure 1: 2013 Liese Creek Flume #1 Flow Data

2.5.3 Downgradient of RTP Dam

ADEC Waste Management Permit 2011DB0012 (2/7/12), 1.1.4, 1.2.6, 1.6.4, Pogo Mine Monitoring Plan (6/13), 6.0

Three wells located below the RTP Dam, MW12-500, MW12-501, and MW12-502 monitor groundwater downstream of the RTP seepage collection system. Samples for these wells were collected monthly throughout 2013 (when they contained enough water to sample); however, the permit only requires a quarterly sample. Trigger limits for groundwater monitoring at these locations are set forth in Pogo's ADEC Waste Management Permit 2011DB0012 and Pogo Mine Quality Assurance Project Plan.

Eight sampling events occurred in 2013 for MW12-500 when water was present in the well. Chloride and Sodium were detected above the trigger limits on all sampling events, Nitrate was detected above the trigger limits during 7 sampling events.

Two sampling events occurred in 2013 for MW12-501 when water was present in the well. Chloride and Sodium were detected above the trigger limits on all sampling events, Nitrate was detected above the trigger limits during one sampling event.

One sampling event occurred in 2013 for MW12-502 when water was present in the well. Chloride and Sodium were detected above the trigger limits on the single sampling event.

Other parameters are also analyzed and compared to the Water Quality Standards. In March and June higher than normal levels of several parameters were indicated. As discussed in Section 2.3.5, remedial grouting of the RTP Dam occurred in March and April that may have impacted the water quality in the wells downstream. MW12-500, 501 & 502 are screened at first water in the alluvium, therefore, impacts to water quality due to grouting may be more readily observed.

Except as noted above, all results are within the limits and conditions set forth within the permit. Time series graphs are provided in **Appendix C**. Monitoring and historic data are provided in **Appendix H**.

2.5.4 Downgradient of Ore Zone

ADEC Waste Management Permit 2011DB0012 (2/7/12), 1.1.4, 1.2.7, 1.6; Pogo Mine Monitoring Plan (6/13), 6.0

Monitoring wells MW04-213 and MW11-216 provide information on water quality trends down-gradient from the ore zones. Samples are collected semi-annually at MW04-213 and MW11-216. Samples were collected from MW04-213 on May 14 and June 23, 2013. A single sample was collected from MW11-216 on May 14, 2013, due to a scheduling mistake. No adverse trends were observed.

Piezometer well MW99-216 is monitored quarterly for water elevation. Time series graphs are provided in **Appendix C**. Monitoring and historic data are provided in **Appendix H**.

2.5.5 Downgradient of ORTW

Not required by permit.

Monitoring stations LL04-031 and LL04-032 are sampled annually and provide information on ground water quality trends between the ORTW and the Goodpaster River. Samples were collected August 21, 2013. No adverse trends were observed. Time series graphs are provided in **Appendix C**. Monitoring and historic data are provided in **Appendix H**.

2.5.6 Goodpaster River Area

Not required by permit.

MW12-001A and MW12-001B were established in support of the hydrogeologic study that was initiated during 2012. Dedicated pumps were installed in 2013 and samples were collected monthly during the entire year to establish background water quality data. Time series graphs are provided in **Appendix B**. Monitoring and historic data are provided in **Appendix C**.

2.6 PROCESS CONTROL MONITORING

Process facilities are monitored as follows.

2.6.1 Water Balance

ADEC Waste Management Permit 2011DB0012 (2/7/12), 1.6.2.4; Pogo Plan of Operations (11/1/2011), 8.0; Water Rights LAS 24611 – LAS 24617

At the beginning of the 2013, RTP reservoir volume was 6.8 million gallons. The ending RTP volume was 16.2 million gallons.

Added to RTP

- 52.2 million gallons of runoff and seepage water was collected in the RTP; and
- 28.2 million gallons of treated water was recycled to the RTP distribution system.

Removed from RTP distribution system

- 13.0 million gallons were pumped from the RTP for underground drill water;
- 16.9 million gallons were pumped from the RTP to the mill process; and
- 6.0 million gallons were pumped from the RTP to the water treatment plant.

Recycled at Mill

- 36.9 million gallons were recycled at the Mill from Water Treatment Plant; and
- 16.9 million gallons were recycled at the Mill from the RTP distribution system.

Discharge from ORTW

- 109.5 million gallons were treated and discharged via the ORTW.

Make up water from Gravel Pit Pond

- 1.2 million gallons of Gravel Pit Pond were used as make-up water.

2.6.2 Hydrogeologic Study for East Deep Expansion

Pogo began a hydrogeologic characterization study for the East Deep expansion in 2012. Pogo submitted Plan of Operations Revision 6 to allow Pogo to begin mining the East Deep expansion on June 27, 2013. It included the following documents: 1) 2013 Pogo Plan of Operations, 2) 2013 Pogo Mine Monitoring Plan, 3) 2013 Pogo Quality Assurance Plan, 4) Golder's Surface Paste Distribution Containment Pipeline System and 5) SRK's Preliminary Groundwater Model Report. It was approved by ADNR on September 9, 2013.

The following additional field work was completed in 2013:

1. Installed six piezometers in surface exploration core holes. Performed slug tests after completion and installed pressure transducers.
2. Conducted hydraulic pressure monitoring, water quality sampling and shut-in tests in eight underground exploration core holes. Seven remain instrumented for long-term hydraulic pressure monitoring and water quality sampling.

The results of hydrogeologic characterization study were presented to ADNR, ADEC, and ADFG during a meeting on December 19, 2013. The final model was calibrated to site-

specific water levels and groundwater inflow to existing underground developments. A final report will be submitted in 2014.

2.6.3 Meteorological Monitoring

Pogo installed two new Meteorological (MET) Stations during August 2011. One is located near the Pogo Airstrip and the other on top of Pogo Ridge above the 1690 portal. On September 30, 2013 Pogo completed two years of Prevention of Significant Deterioration (PSD) quality data collection and achieved a 99% recovery rate. The meteorological data will be used to support future dispersion modeling efforts. A copy of the Sumitomo Metal Mining Pogo LLC, 2013 Annual Data Report for the Pogo Meteorological Monitoring Program is provided in **Appendix F**.

2.6.4 Permits to Appropriate Water and Temporary Water Use Permit Summary

ADNR Permits to Appropriate Water, LAS 24616, 24613, 24611, 24612 Condition 6; ADNR Temporary Water Use Authorization TWUP F2011-131, F2011-76, F2011-130, F2013-023, F2013-143, Condition 14.

In January of 2013, Pogo relinquished Water Right LAS 24617. On June 7, 2013 ADNR issued Pogo temporary water right TWUP2013-023 for ground water collected in sumps within the underground workings. On November 12, 2013 ADNR issued Pogo temporary water use permit TWUP F2013-143 for two surface wells located at the new 2150 portal.

A summary of water usage for Permits to Appropriate Water and Temporary Water Use Permits is provided in **Table 1** and **Table 2.**

Table 1: Permits to Appropriate Water 2013 Monthly Total Flows

Month	LAS 24616 Surface Water Collected in Recycle Tailings Pond (RTP)	LAS 24617 Groundwater from Underground Mine Discharged to ORTW and Recycled Underground	LAS 24613 Goodpaster River ORTW Influent	LAS 24611 Drinking Water Wells DW02 & DW03	LAS 24612 Gravel Pit Pond*
	(gallons)	(gallons)	(gallons)	(gallons)	(gallons)
January	3,122,044	Relinquished 2013	126,000,898	748,529	0
February	908,485		105,586,225	762,736	0
March	1,058,064		110,223,988	768,382	0
April	1,173,316		95,750,123	816,084	372,889
May	6,055,550		151,490,144	737,482	830,353
June	4,794,620		169,945,065	740,558	0
July	6,080,071		143,357,322	715,108	0
August	7,683,283		92,318,449	700,345	0
September	13,938,599		236,319,454	716,900	0
October	6,137,687		247,766,194	663,455	0
November	3,072,322		195,468,120	631,100	0
December	1,212,811		158,347,660	633,000	0
Total (gallons)	**52,462,999**		**1,832,573,645**	**8,633,679**	**1,859,241**
Total in Acre-ft	**161.0**		**5,624.0**	**26.5**	**5.7**
Permit Limit Acre-ft	**387.12**		**24,195.11**	**81.77**	**241.95**

* includes water used for Mill make-up and for road dust control

Table 2: Temporary Water Use Permits 2013 Monthly Total Flows

Month	TWUP F2011-131 RTP Seepage Collection System Wells	TWUP F2011-76 Rosa Creek, Caribou Creek, Gilles Creek, Shaw Creek	TWUP F2011-130 Diversion Ditches	TWUP F2013-023 Underground Water Recycle	TWUP F2013-143 2150 portal Underground Workings
	(gallons)	(gallons)	(acre-feet)	(gallons)	(gallons)
January	2,783,216	Water withdrawn by contractor, Delta Concrete, for road maintenance	Annual Calculated Amount	16,512,289	0
February	2,079,119			13,641,519	0
March	2,258,540			17,178,619	0
April	1,994,358			15,835,001	0
May	2,063,976			15,401,321	0
June	1,845,609			15,611,757	0
July	1,942,451			17,583,044	0
August	2,547,493			16,441,011	0
September	4,225,414			18,668,364	0
October	5,148,511			21,432,003	0
November	5,196,798			20,008,632	100,000
December	5,149,460			21,175,548	100,000
Total Gallons	**37,234,946**	**1,440,000**		**209,489,106**	**200,000**
Total Acre-feet			**838.02**	**642.8**	**0.61**
Permit Limit	**1,945,000,000 gals**	**14,400,000 gals**	**1460 acre-ft**	**1613.3 acre-ft**	**646.97 acre-ft**

2.6.4 CIP Tailings Cyanide Destruction

ADEC Waste Management Permit 2011DB0012 (2/7/12), 1.2.3, 1.6.2.3; Pogo Mine Monitoring Plan (6/13), 4.2

After cyanide destruction, the CIP tailings are stored in the CIP tank prior to being mixed with cement and used as backfill in the mine. Pogo's Mine Monitoring Plan requires grab samples at station PC001 (CIP Stock Tank), which is located directly after the cyanide destruction circuit. Pogo collects a daily sample during a paste pour. The Waste Management Permit 2011DB0012 requires that samples must contain less than 10 mg/kg of WAD Cyanide as a monthly average and none of the samples can contain more than 20 mg/kg of WAD cyanide.

Pogo's 2013 Underground Closure Study included collecting two samples of each of the three types of paste backfill samples that were submitted total elemental analysis, SPLP leachate analysis, and acid base accounting. Results will be included in the Final Report due March 31, 2014.

During 2013, 100% of the PC001 samples measured less than 10 mg/kg WAD Cyanide.

Time series graphs are provided in **Appendix C**. Monitoring and historic data are provided in **Appendix H**.

2.6.5 Mineralized Development Rock Geochemistry

ADEC Waste Management Permit 2011DB0012 (2/7/12), 1.2.1, 1.6.2.6; Pogo Mine Monitoring Plan (6/13) 4.1.1, Appendix A

Samples of whole rock materials placed in the DSTF (PC002) are collected monthly and composited to form a quarterly sample which is then analyzed. The third quarter sample was unintentionally misplaced before it could be sent to the lab, therefore there is no data available for third quarter. Samples were analyzed for First, Second and Fourth quarter and showed no adverse trends for 2013.

Pogo's 2012-2013 DSTF Closure Study included collecting samples from three sonic drill holes that were submitted for acid-base accounting, multi-element ICP, and shake-flask

leach tests. Results will be included with the Final Report due March 31, 2014.

Appendix B, **Table 2**, shows selected parameters for the PC002 whole rock. Monitoring and historic data are provided in **Appendix H**.

2.6.6 Flotation Tailings Geochemistry

ADEC Waste Management Permit 2011DB0012 (2/7/12), 1.6.4; Pogo Mine Monitoring Plan (6/13) 4.0

Flotation tailings geochemistry samples were collected on March 19, June 11, September 11, and December 12, 2013 at PC003, the underflow of the filter-feed tank at the end of the mill circuit, prior to disposal on the DSTF. No adverse trends were observed. **Appendix B**, **Table 2**, shows selected parameters for the PC003 flotation Tailing. Monitoring and historic data are provided in **Appendix H**.

2.6.7 Flotation Tailings Interstitial Water Chemistry

ADEC Waste Management Permit 2011DB0012 (2/7/12), 1.6.4; Pogo Mine Monitoring Plan (6/13) 4.0

The interstitial water from the tailings samples was collected at PC003 on March 19, June 11, September 10, and December 17, 2013.

Selenium concentration had dropped at the beginning of 2013, but was slightly higher during the latter half of the year. Pogo identified a mill reagent (Copper Sulfate) that contains trace amounts of Selenium**.** Pogo notified the current supplier that we would be discontinuing use of their product and transitioning to a low selenium copper sulfate. Bids were accepted from multiple suppliers in the fourth quarter of 2013. Transitioning to the low selenium product will occur over the first quarter of 2014.

Nickel remained elevated during the year, but appears to be trending downward. Pogo believes this is due to variation in ore chemistry. Time series graphs are provided in

Appendix C. Monitoring and historic data are provided in **Appendix H**.

2.7 VISUAL MONITORING

2.7.1 Facility Inspection

ADEC Waste Management Permit 2011DB0012 (2/7/12), 1.6.2.1, 1.6.9.3, 1.6.9.4; Pogo Mine Monitoring Plan (6/13) 2.0, 3.1; Pogo RTP Operating and Maintenance Manual (10/13), 4.0.

Visual inspections of the DSTF, RTP Dam, and monitoring wells were completed throughout 2013. No cracks, bulging, settlement, geotechnical concerns, erosion or damage were observed.

2.7.2 Biological Survey

ADEC Waste Management Permit 2011DB0012 (2/7/12), 1.6.2.5; Pogo Mine Monitoring Plan (6/13) 2.4

The objective of the visual biological survey program is to monitor wildlife interaction with the surface waste disposal facilities.

No wildlife issues with the surface waste disposal facilities occurred during 2013.

2.8 DEVELOPMENT ROCK SEGREGATION AND STORAGE

ADEC Waste Management Permit 2011DB0012 (2/7/12), 1.2.1, 1.6.2.6; Pogo Mine Monitoring Plan (6/13), 4.1.1, Appendix A

During 2013, 1,831 rounds were blasted underground and sampled in accordance with the Rock Segregation Procedure. Five hundred and fifty-one rounds (30%) exceeded either the Arsenic threshold of 600 mg/l or the Sulfide threshold of 0.5% and these were encapsulated in the DSTF. Two hundred and eighty-six were not sampled due to operational challenges and these rounds were also placed internally in the DSTF.

Pogo's 2013 Underground Closure Study included collecting 37 samples of representative wall rock from throughout the mine ramp system that were submitted total elemental analysis, SPLP leachate analysis, and acid base accounting. Results will be included in the Final Report due March 31, 2014.

In support of the East Deep Expansion, Pogo initiated a Rock Characterization Study in 2013. Samples were selected to represent waste rock that would be removed from mine access tunnels, development rock within mining areas, or and any rock expected to collapse into the workings as mining proceeds. A total of 85 samples were collected that were submitted for acid-base accounting and multi-elemental analysis. Results will be included in the Final Report due June 30, 2014.

2.9 WASTE DISPOSAL

ADEC Waste Management Permit 2011DB0012 (2/7/12), 1.2.1, 1.5.4

During 2013, 650,275 dry tons of flotation tailings and 104,275 tons of mineralized rock were placed in the DSTF. Also during 2013, 130,826 dry tons of CIP Tailing and 211,525 tons of filtered flotation tailings were placed underground as paste backfill.

The quantities of miscellaneous waste materials placed either into the DSTF or underground during the year are shown in **Table 3**.

Table 3: Miscellaneous Waste Disposal in DSTF and Underground

Material	Disposal Location	Quantity	unit
Grinding Media Flotation Debris Screen Residue	DSTF	191	tons
Filter Press Waste	DSTF	19	yds
Filter Press Waste	Underground	8	yds
Water Treatment Plant Sludge	Underground	204	yds
Lab Ore Samples	DSTF	68	lbs

2.10 GEOTECHNICAL MONITORING

ADEC Waste Management Permit 2011DB0012 (2/7/12), 1.5.3, 1.5.3.4; Pogo Mine Plan of Operations F20129500 (11/3/11) Appendix F: Pogo DSTF Construction and Maintenance Plan

No shell construction took place at the DSTF during 2013; therefore, no geotechnical monitoring took place. Currently there are no plans to continue shell construction in 2014.

2.11 DSTF EXPANSION PROJECT

ADNR Division of Mining, Land and Water Pogo Mine Plan of Operations Amendment Approval F20129500 (4/13/12)

The construction of the new diversion ditch and closure of relevant sections of the old ditch were completed on September 15, 2013. ADNR and ADEC inspected these areas on September 12, 2013. Pogo received approval to place material beyond the existing diversion ditch on September 19, 2013. The storage capacity of DSTF is now 20Mt.

3. 2013 AS-BUILT REPORTS AND MAPS

ADEC Waste Management Permit 2011DB0012 (2/7/12), 1.5.9.1; ADNR Plan of Operations Approval F20129500 (2/7/12), pg. 5

- As-Built Report for Installation of Four Flumes in Liese Creek, Pogo Mine (refer to **Section 2.6.2.1**)
- As-Built Report for Design, Build, & Installation of the Incinerator Building and Incinerator, Pogo Mine
- DSTF Expansion Diversion Ditch As-Built Report was submitted to ADNR on January 31, 2014
- As-Builts for the Substation Expansion (ER-1A) and the power distribution system for Portal 2150 (ER-29) are still under development and will submitted to ADNR when completed.

Available As-built reports for the projects are provided in **Appendix D**. Pogo Mine Site 2013 As-built maps are located in **Appendix A** of this report**.** **Figure 3** provides an overview of all facilities within the Pogo Millsite lease boundary at end of 2013. **Figures 3a** through **3d Appendix A** provide additional detail for the major areas of the mine.

4. RECLAMATION AND FINANCIAL RESPONSIBILITY

ADEC Waste Management Permit 2011DB0012 (2/7/12), 1.11, 3. ADNR Plan of Operations Approval F20129500 (2/7/12), pg. 3, 9; ADNR Pogo Mine Millsite Lease ADL416949 (3/9/04), Section 8

An updated mine reclamation and closure cost estimate was agreed to by ADEC and ADNR on March 20, 2012 (refer to March 20, 2012 Letter). The Pogo Mine reclamation and closure bond is currently $52.29 million (refer to **Table 4**). The updated access road/transmission line reclamation and closure cost estimate was also agreed to by ADNR on March 9, 2011 at $4.8 million. Neither Bond changed during 2013 (refer to **Table 5**).

Table 4: Summary of Mine Reclamation and Closure Cost Estimates as of December 2012

SUMMARY OF ESTIMATED RECLAMATION AND CLOSURE COSTS-POGO MINE SITE									
Item Description		**1 year holding cost**	**Phase I**	**Phase II**	**Phase III**	**Phase IV Water Treatment**	**Phase IV Reclamation**	**Phase V**	**Total**
Direct Cost		$ 812,700	$ -	$ 952,400	$ 10,819,000	$ 6,298,300	$ 3,686,000	$ 109,500	$ 22,677,900
Site Management Cost		$ 1,221,900	$ -	$ 27,800	$ 2,953,800	$ 5,374,833	$ 2,001,700	$ -	$ 11,580,033
Subtotal Direct Cost		**$ 2,034,600**	**$ -**	**$ 980,200**	**$ 13,772,800**	**$ 11,673,133**	**$ 5,687,700**	**$ 109,500**	**$ 34,257,933**
Indirect Costs	**% of Subtotal**								
Mobilization/Demobilization	**5.0%**	$ -	$ -	$ 49,010	$ 688,640	$ -	$ 284,385	$ 5,475	$ 1,027,510
Subtotal		**$ 2,034,600**	**$ -**	**$ 1,029,210**	**$ 14,461,440**	**$ 11,673,133**	**$ 5,972,085**	**$ 114,975**	**$ 35,285,443**
Contractor Overhead and Profit	**15.0%**	$ 305,190	$ -	$ 154,382	$ 2,169,216	$ 1,750,970	$ 895,813	$ 17,246	$ 5,292,816
Subtotal		**$ 2,339,790**	**$ -**	**$ 1,183,592**	**$ 16,630,656**	**$ 13,424,103**	**$ 6,867,898**	**$ 132,221**	**$ 40,578,259**
Performance Bond	**3.0%**	$ 70,194	$ -	$ 35,508	$ 498,920	$ 402,723	$ 206,037	$ 3,967	$ 1,217,348
Insurance	**1.5%**	$ 35,097	$ -	$ 17,754	$ 249,460	$ 201,362	$ 103,018	$ 1,983	$ 608,674
Subtotal		**$ 2,445,081**	**$ -**	**$ 1,236,853**	**$ 17,379,036**	**$ 14,028,187**	**$ 7,176,953**	**$ 138,171**	**$ 42,404,281**
Contract Administration	**4.0%**	$ 97,803	$ -	$ 49,474	$ 695,161	$ 561,127	$ 287,078	$ 5,527	$ 1,696,171
Engineering Re-Design	**3.0%**	$ -	$ -	$ 37,106	$ 521,371	$ -	$ 215,309	$ 4,145	$ 777,930
Contingency	**15.0%**	$ 366,762	$ -	$ 185,528	$ 2,606,855	$ 2,104,228	$ 1,076,543	$ 20,726	$ 6,360,642
Total Indirects		**$ 875,046**	**$ -**	**$ 528,761**	**$ 7,429,623**	**$ 5,020,410**	**$ 3,068,183**	**$ 59,069**	**$ 16,981,092**
Total Direct + Indirect		$ 2,909,646	$ -	$ 1,508,961	$ 21,202,423	$ 16,693,543	$ 8,755,883	$ 168,569	$ 51,239,025
Inflation Proofing	**2.06%**	$ 59,926	$ -	$ 31,078	$ 436,676	$ 343,813	$ 180,332	$ 3,472	$ 1,055,297
Total Closure Cost		**$ 2,969,572**	**$ -**	**$ 1,540,039**	**$ 21,639,099**	**$ 17,037,356**	**$ 8,936,215**	**$ 172,041**	**$ 52,294,322**
								Rounded	$ 52,294,000

Table 5: Summary of Pogo Access Road/Transmission Line Reclamation and Closure Cost Estimates as of December 2012

Pogo Access Road and Transmission Line - Estimated Closure Cost							
		Phase I	Phase II	Phase III	Phase IV	Phase V	Total
Direct Cost		$ -	$ 13,666	$ -	$ 2,478,500	$ -	$ 2,492,167
Site Management Cost		$ -	$ 128	$ -	$ 582,645		$ 582,773
Subtotal Direct Cost		**$ -**	**$ 13,794**	**$ -**	**$ 3,061,145**	**$ -**	**$ 3,074,940**
Indirect Costs	% of Subtotal						
Mobilization/Demobilization	6.5%	$ -	$ 897	$ -	$ 198,974	$ -	$ 199,871
Subtotal		$ -	$ 14,691	$ -	$ 3,260,119	$ -	$ 3,274,811
Contractor Overhead and Profit	15.0%	$ -	$ 2,204	$ -	$ 489,018	$ -	$ 491,222
Subtotal		$ -	$ 16,895	$ -	$ 3,749,137	$ -	$ 3,766,032
Performance Bond	3.0%	$ -	$ 507	$ -	$ 112,474	$ -	$ 112,981
Insurance	1.5%	$ -	$ 253	$ -	$ 56,237	$ -	$ 56,490
Subtotal		$ -	$ 17,655	$ -	$ 3,917,849	$ -	$ 3,935,504
Contract Administration	4.0%	$ -	$ 706	$ -	$ 156,714	$ -	$ 157,420
Engineering Re-Design	4.0%	$ -	$ 706	$ -	$ 156,714	$ -	$ 157,420
Contingency	10.0%	$ -	$ 1,766	$ -	$ 391,785	$ -	$ 393,550
1 year holding cost			$ 41,000				$ 41,000
Total Indirects		**$ -**	**$ 48,038**	**$ -**	**$ 1,561,916**	**$ -**	**$ 1,609,955**
Total directs and indirects		$ -	$ 61,833	$ -	$ 4,623,061	$ -	$ 4,684,894
Inflation Proofing	2.66%	$ -	$ 1,645	$ -	$ 122,973	$ -	$ 124,618
Total Closure Cost		**$ -**	**$ 63,478**	**$ -**	**$ 4,746,035**	**$ -**	**$ 4,809,513**
						Rounded	**$ 4,810,000**

4.1 ALL-SEASON ROAD AND TRANSMISSION LINE

Right-of-Way permits for Pogo Access Road ADL 417066 and ADL 416809 (12/18/03), Transmission Line ADL 416817 (12/18/03), and Communication Site Access Road ADL 417247 (10/1/04).

The Early Entry Authorizations (EEAs) for ADL 416809 and 416817 were extended to May 1, 2014 by ADNR on January 28, 2014. Pogo submitted an appraisal for the ROW permits on February 19, 2013. ADNR provided revised Pogo Road Easement documents to Pogo on July 19, 2013. Pogo submitted comments on September 5, 2013. ADNR toured Pogo on September 24, 2013. Pogo met with ADNR on November 14, 2013 to discuss the changes. ADNR is still in the process finalizing the Road Easement documents.

4.2 POGO MILLSITE LEASE

ADNR Pogo Mine Millsite Lease ADL416949 (3/9/04), Section 23 Modifications

Refer to Section 3 and Section 5 of the Annual Report.

Potable Water Treatment Plant #1 located in the lower laydown area was demolished following the construction of Potable Water Treatment Plant #3.

5. PERMIT ACTIVITIES

5.1 2013 PERMIT ACTIVITIES

Permitting activities conducted during 2013 included:

US Army COE POA-1996-211-M9 was submitted on January 28, 2013 for 0.91 acres of after-the-fact impact to wetlands and an additional 1.9 acres of wetlands impact as part of the finalized construction of the DSTF expansion. It was approved on May 6, 2013.

Plan of Operations F20129500 Revision 5 for East Deep Expansion Power Distribution System was submitted to ADNR on December 13, 2012. It was approved on December 19, 2012. **US Army COE** Request for Authorization of Activity in support of Plan of Operations Revision 5 for East Deep Expansion Power Distribution System was submitted on January 22, 2013. There will be no impact to wetlands by this project. Wetlands survey was conducted by Three Parameters Plus during the summer of 2012.

Plan of Operations F20129500 Revision 6 to Begin Mining East Deep Expansion was submitted to ADNR on June 27, 2013. It was approved on September 19, 2013. Pogo committed to the following schedule for final report submissions and study completions:

1. Update of DSTF Closure Plan Final Report by December 31, 2013.
2. Hydrogeology Study and Groundwater Model Update completed by December 31, 2014.

3. Proposed East Deep Paste Distribution System detailed design and drawings by January 31, 2014.
4. Update of Underground Mine Closure Plan Final Report by March 31, 2014.
5. East Deep Underground Expansion Geochemical Characterization completed by June 30, 2014.

On December 31, 2013 Pogo requested additional time to complete item 1 to January 31, 2014; item 2 to March 31, 2014; and item 3 to April 30, 2014. An extension was granted by ADNR on December 31, 2013.

Plan of Operations F20129500 Revision 7 for Construction of Mine Water Treatment Plant #3 (MWTP#3) was submitted to ADNR on October 31, 2013. It was approved on December 3, 2013.

5.2 FUTURE PERMIT ACTIVITIES

- Submit Plan of Operations Revision 8 for rest of ORTW Line.
- Submit Plan of Operations Revision 9 for new CIP Stock Tank.
- Submit updated Preliminary Jurisdictional Determination for Pogo Mine.
- Submit Pogo's new Standardized Reclamation Cost Estimator (SRCE) Model.
- Submit Title V Permit for Pogo Mine for East Deep Expansion portal heaters.