POGO MINE

2009

ANNUAL ACTIVITY AND MONITORING REPORT

Submitted To:

United States Environmental Protection Agency
Region 10, Office of Water
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1 Introduction

Sumitomo Metal Mining Pogo LLC (SMM Pogo) has prepared this report to fulfill the requirements of the Alaska Department of Natural Resources (ADNR) Pogo Mine Millsite Lease ADL416949, ADNR Plan of Operations Approval F20039500, the U.S. Environmental Protection Agency (EPA) NPDES Permit AK005334-1, the Alaska Department of Environmental Conservation (ADEC) Waste Disposal Permit, 0131-BA002, and the ADEC Non-domestic Wastewater Disposal Permit, 2004-DB0070. This report covers the period from January 1, 2009 through December 31, 2009.

The Pogo mine is an underground gold mine located 38 miles northeast of the community of Delta Junction in eastern interior Alaska (see Figure 1). SMM Pogo operates the mine on behalf of Sumitomo Metal Mining Co., Ltd. (85%), and Sumitomo Corporation (15%).

The Pogo mine began operations in 2006 with a 10 year mine life. Protection of the Goodpaster River is of prime importance to mine operations. The ore is processed on site to recover gold through a gravity recovery and flotation-concentrate/leach processes. A portion of the tailings are thickened and mixed with cement to form a paste and placed underground as backfill. The remaining tailings are dewatered by pressure filtration and placed in a tailings and waste rock storage facility called the drystack. A diversion ditch has been constructed to divert surface runoff around the drystack and water storage dam. All mill process water is recycled. A water treatment plant treats mine drainage from the underground workings and surface runoff water prior to permitted discharge.

A 49 mile all-season road connects the Pogo mine to the Richardson highway near Shaw Creek, located approximately 20 miles north of Delta Junction. Mine employees travel to the mine site by bus and live at the mine during their work rotations. Potable water and sewage treatment plants provide support for the accommodations.

2 Summary of 2009 Activities

2.1 MINE OPERATIONS

Pogo Mine is a mechanical drift and fill underground gold mine accessed via three portals denoted by their elevation, the 1875, the 1690, and the 1525. After blasting, the ore is loaded by 4 and 9 yd loaders into 30 and 50 ton trucks and hauled to a 3,000 ton underground ore bin. The ore is then transported out of the mine on a 2,500 foot long conveyor via the 1690 portal to the surface mill.

The milling focus in 2009 was continuous improvement and optimization of the milling process. The mill processed 2,550 tons per day in 2009 for a total of 930,836 tons for the year. The budgeted production was 900,527 tons. Gold produced was 389,808 troy ounces verses the 357,894 troy ounces budgeted.

No major mill modifications were undertaken in 2009. The leach circuit pre-aeration tank was placed back on-line in late 2009 following clean-out and repair required due to an agitator failure.

The focus underground remains on the development required to produce the forecast 2,520 tons/day. During the year 944,823 tons were mined and lateral development exceeded projections at 16,771 feet.

Non-mineralized development rock was utilized to construct elevated pads to allow for the construction of a new lower camp to ensure the camp remains above the Goodpaster river flood levels.

An internal mine water recycling system was commissioned during the middle of January 2010, minimizing the mine operations' need to use Recycled Tailings Pond (RTP) water for utility water. This will reduce the total amount of water required to be removed from the mine on a regular basis. With this reduction in flow, Mine Water Treatment Plant #1 (MWTP#1) is capable of processing the majority of the mine seepage water, thus minimizing the need to treat and subsequently discharge mine water from Mine Water Treatment Plant #2

(MWTP#2). As mine seepage water generally contains more WAD and Total Cyanide than RTP water, being able to discharge RTP water at will with little or no mine water should result in lower cyanide levels at Outfall 011, and subsequently lower levels at Outfall 001.

At year end, SMM Pogo had 299 employees, with an additional 101 persons employed by contractors in housekeeping and underground development.

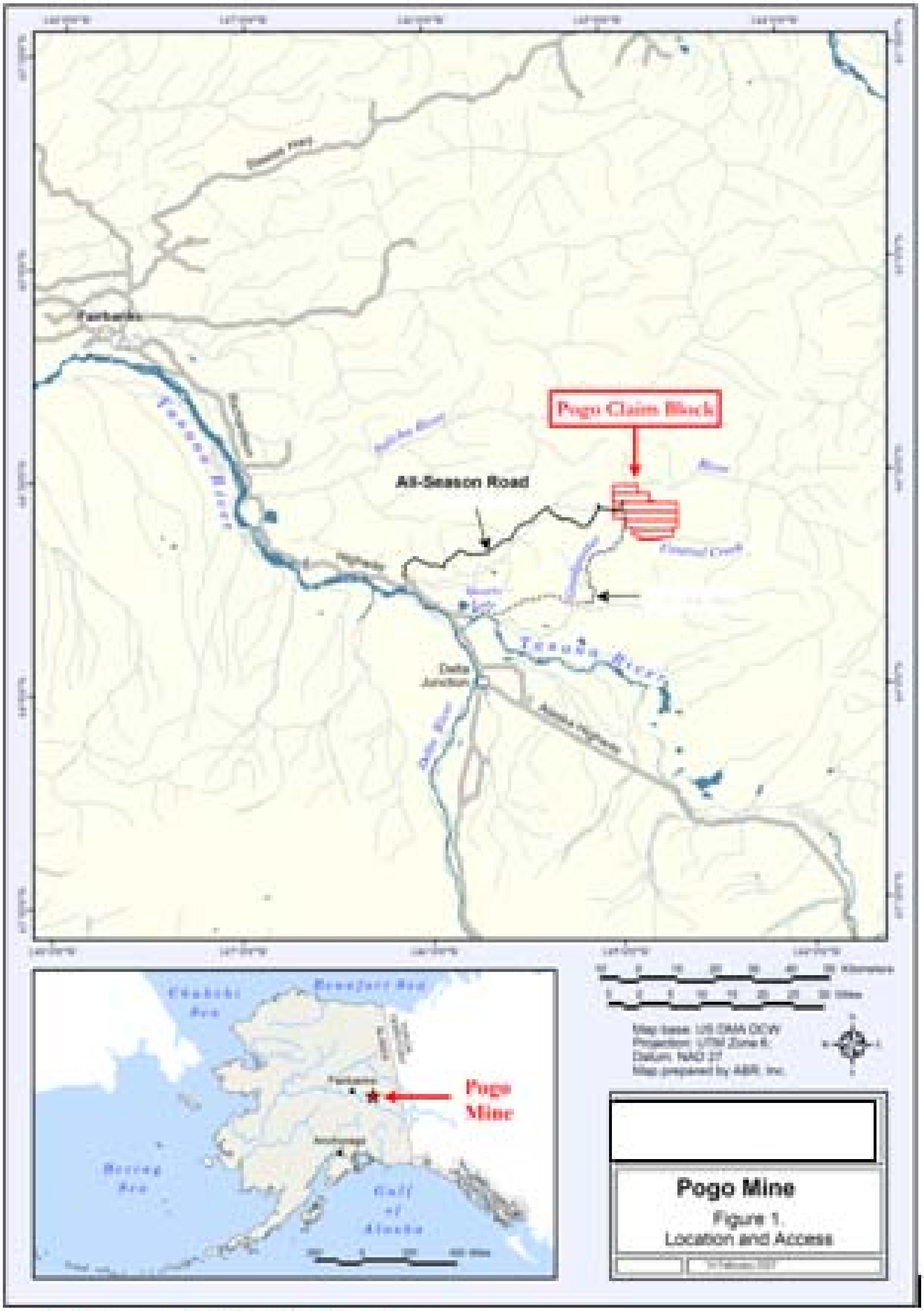


Figure 1. Location and Access

Figure 1. Location and Access

2.2 ALL-SEASON ROAD

Maintenance activities along the all-season road consisted of re-grading the entire road several times. Twenty-one miles of the all-season road were capped with D-1 road gravel from Material Site 18 between mile marker 28 and mile marker 49.

Throughout the year, SMM Pogo maintained a manned security station at the all-season road gate at Mile 0. During the August caribou season and the September 1-15 moose hunting season, SMM Pogo stationed a third party security guard at the intersection of the TAPS right-of-way and the Pogo road to advise roving hunters that the Pogo road is closed to the public. “No trespassing” signs remain posted on the road.

2.3 NEW CONSTRUCTION

A new 78-person camp was built in the Lower Camp area (See Figure 5e). The complex houses a mine dry, kitchen/dining room, recreation room, and a 78–bed dormitory. The camp was fully commissioned in December 2009.

During the summer of 2009 a grout curtain extension was installed at the RTP Dam to intercept potential seepage pathways within the south abutment bedrock that trend parallel and perpendicular to the Liese Creek Fault System. Thirty-one holes were drilled for a total of approximately 2,545 feet and 25,250 gallons of grout, including 113,000 lbs of cement, were used in the curtain extension.

The Liese Creek diversion ditch received approximately 800 feet of shotcrete lining to decrease possible seepage.

2.4 EXPLORATION

In 2009 the Pogo Mine exploration program focused on surface and underground drilling in the immediate mine area. The surface effort, conducted from June 15 through October 25, was a combination of helicopter-supported drilling and road-based that completed 44 drill holes totaling 52,655 feet. Underground exploration drilling was conducted intermittently between January 13 and October 5, completing 35 holes totaling 17,745 feet. Exploration drilling for the year completed 79 holes totaling 70,400 feet.

2.5 PERMITTING ACTIVITIES

In July, 2009 a Temporary Land Use Permit was granted to allow early entry for material site drilling. The all-season road permitting for the Material Sales Contract ADL 418008 was completed and material production began.

An extension for the renewal of the Alaska Department of Natural Resources Pogo Mine Millsite Lease ADL416949, ADNR Plan of Operations Approval F20039500, the Alaska Department of Environmental Conservation Waste Disposal Permit, 0131-BA002, the ADEC Non-domestic Wastewater Disposal Permit, 2004-DB0070, was received. Renewal documents were submitted by Pogo in April and May, 2009.

All of these documents are still currently under review by ADNR and ADEC in the permit renewal process:

- Closure Costs
- Reclamation Plan
- Solid Waste Permit
    - Plan Of Operations
    - Quality Assurance Project Plan
    - Solid Waste Monitoring Plan

3 2009 Monitoring

A prescriptive program of environmental monitoring is conducted by SMM Pogo as specified by permit requirements and in accordance with a DEC and EPA approved Quality Assurance Protection Plan (QAPP).

The objectives of the 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 fish tissue metals content in juvenile Chinook salmon from the Goodpaster River upstream and downstream from the project facilities,
- To monitor the mill processes associated with the treatment facilities, and
- To monitor the treatment facilities and the materials placed in the facilities.

Samples collected from the MWTP#2, groundwater stations, surface water stations, and the Off River Treatment Works (ORTW) effluent were submitted to Test America Inc. Environmental Laboratory, Analytica Laboratories, and ACZ Laboratories. Samples collected for the Sewage Treatment Plant (STP) influent and effluent were submitted to Analytica Laboratories.

3.1 SUMMARY

A summary of the 2009 monitoring results show:

- On May 1, 2 , 3, and 4, flow from Outfall 001 exceeded the 15,600 gal/min due to increased flow from the Goopaster River. No effluent discharge occurred during that time period.

- At the MWTP#2 discharge, Outfall 011, there were no reported exceedances during the period. At the ORTW discharge, Outfall 001, 8 exceedances of the daily maximum (8.5 µg/L) for weak acid dissociable (WAD) cyanide and 4 exceedances of the monthly average (4.3 µg/L) for WAD cyanide were reported during the period. SMM Pogo entered into a Compliance Order By Consent and Request for Information (COBC) with USEPA, dated January 13, 2010, to investigate the root cause(s) of the reported exceedances and to provide recommendations to improve monitoring and measurement to ensure compliance with the NPDES Permit.
- Three wells are located below the RTP Dam, MW03-500, MW03-501, and MW03-502, which monitor groundwater downstream of the RTP seepage collection system. Samples were collected during the third and fourth quarter of 2009, indicating possible influence in the monitoring wells below the seepage collection system.

- In early September 2009, a seep (and resulting small pool of water) was observed approximately 280 feet below the RTP. Analysis indicated possible low levels of WAD cyanide. A pump was placed in the pool and the water was returned to the seepage collection system. After investigation, it was discovered that one of the pumps below the RTP used to collect and return seepages was not set at the correct depth. The pump was adjusted and the seepage returned to the seepage collection system. In 2010, SMM Pogo will monitor and area and take appropriate corrective actions if the seep reappears.

- There were no adverse trends during the period in surface water samples or mill process samples.

A discussion of the results for each sampling program is provided below. Data for some monitoring programs are provided in Appendix A. Time series plots for all other locations are provided in Appendix B.

3.2 TREATED EFFLUENT MONITORING

Detailed data of treated effluent have been previously submitted to EPA and ADEC via copies of the DMRs submitted under the NPDES Permit. The monitoring locations for treated effluent are shown on Figure 2.

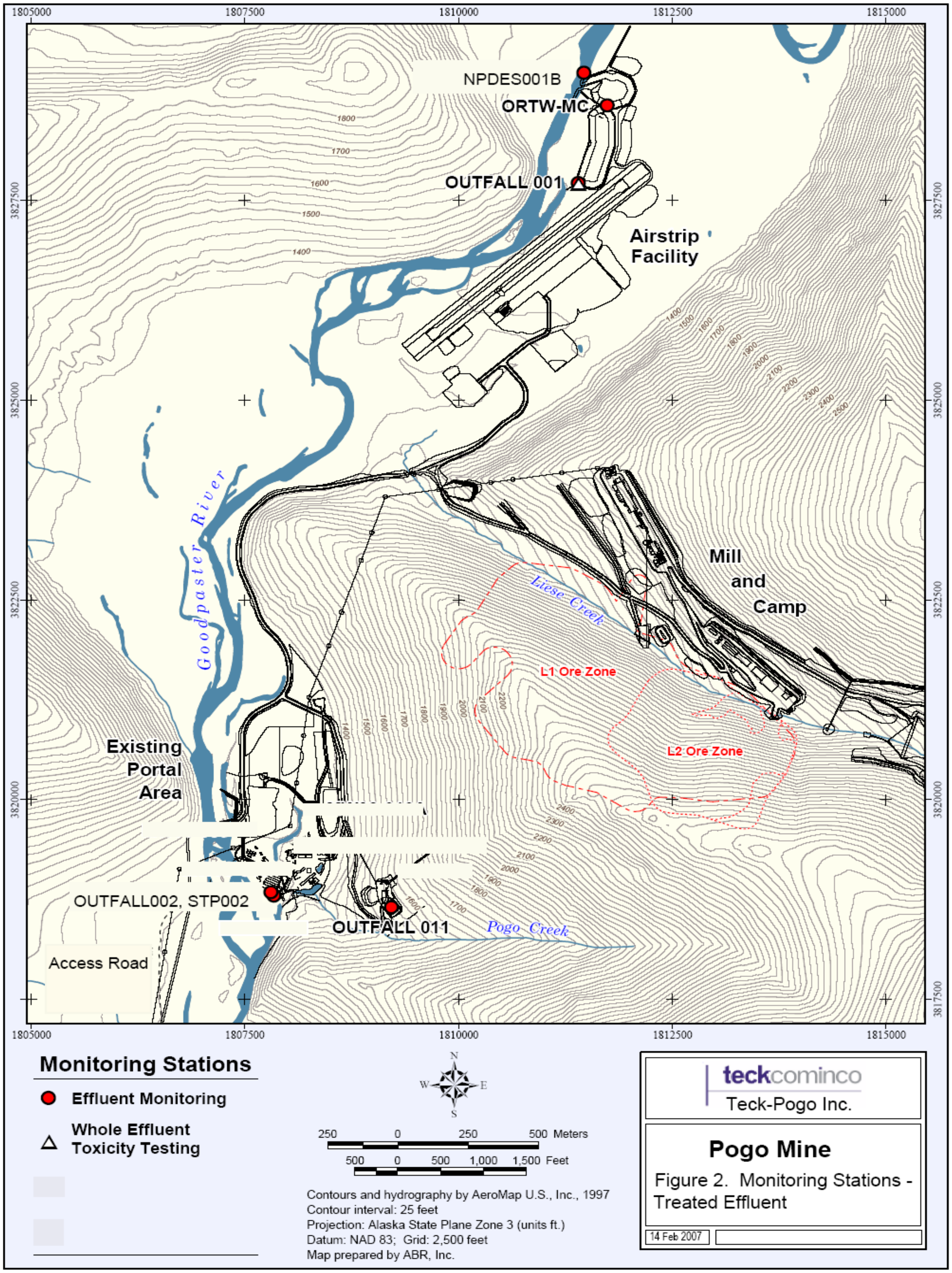
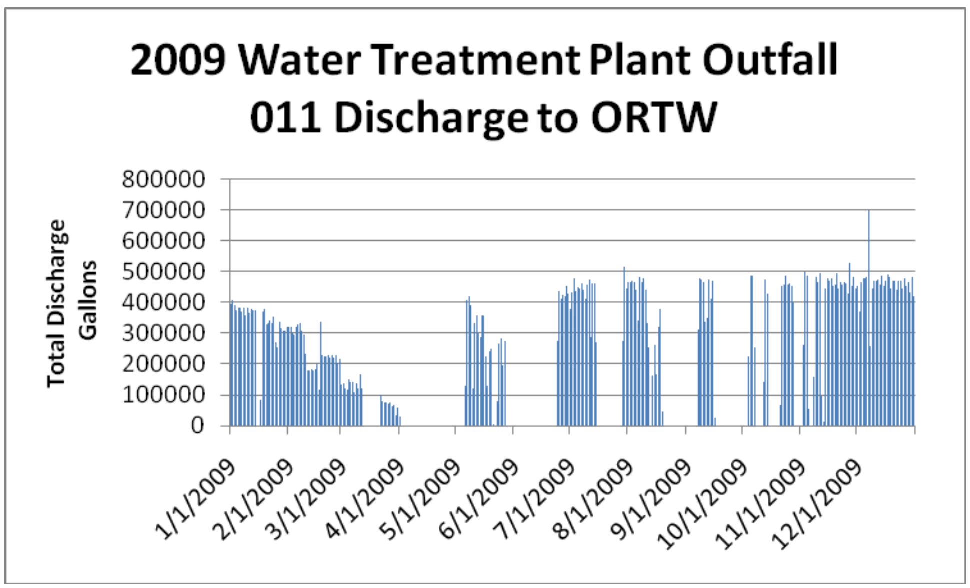


Figure 2. Monitoring Stations – Treated Effluent

3.2.1 Outfall 011- Treated Effluent from Mine Water Treatment Plant

Groundwater and drill water collected from the underground workings are sent to MWTP#1, treated and returned for use underground or sent to the mill to be used as process water. Surface runoff and groundwater collected in the RTP, as well as some mine seepage water, are piped to the MWTP#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 intermittently throughout the year. The volume of water discharged from the Water Treatment Plant is shown below in Chart 1.

Chart 1: 2009 Water Treatment Plant Outfall Total Discharge in Gallons



Daily field parameters were 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).

All results were within the limits and conditions set forth in Part I.B. of EPA NPDES Permit AK005334-1.

3.2.2 Outfall 001 – Discharge from Off River Treatment Works

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

Daily field parameters were collected along with weekly laboratory samples for metals, WAD Cyanide, TDS, Turbidity, Sulfate, and Hardness. In addition, daily field parameters and weekly samples (Lead, Mercury, and Turbidity) were collected upstream from the discharge point (NPDES001B) to determine background water quality of the Goodpaster River.

On May 1, 2, 3, and 4, flow from Outfall 001 was exceeded the 15,600 gal/min due to increased flow from the Goodpaster River. No effluent discharge occurred during that time period.

At the ORTW discharge point, Outfall 001, eight exceedances of the daily maximum for WAD cyanide and 4 exceedances of the monthly average for WAD cyanide were reported in 2009. SMM Pogo entered into the COBC to address the reported exceedances. Pursuant to the COBC, SMM Pogo will submit a Water Characterization Study to USEPA by March 1, 2010.

See Table 1 Below.

Table 1: Daily Maximum and Monthly Average WAD Cyanide Exceedances

Month	Day	Daily Max Exceedances (Limit 8.5 µg/l)	Monthly Average Exceedances (Limit 4.3 µg/L)
May	**20**	8.9	5.0
August	**5** **12** **18**	18.0 26.5 15.6	8.5
September	**9** **15** **18**	11.7 29.85 14.1	6.1
October	**26**	9.8	None
November		None	4.4
	Total	**8**	**4**

SMM Pogo engaged Dr Terry Mudder, a world renowned expert in cyanide, to determine the root cause of the reported WAD cyanide exceedances. Dr. Mudder's findings indicate that the elevated WAD cyanide is likely due to analytical variability particularly at the very low NPDES Permit limits which approach method detection limits. Dr. Mudder recommends that the most prudent and scientifically defensible regulatory approach to ensure compliance and the protection of aquatic life would be to relocate the compliance point to Outfall 011. Dr. Mudder also recommends developing a site specific method detection limit (MDL) and minimum reporting level (ML). This approach would allow for the establishment of a new WAD cyanide effluent limitation at Outfall 011 of sufficient magnitude to allow accurate measurement above the site specific ML, thereby avoiding the inherent analytical issues.

Except as noted above, all results were within the limits and conditions set forth in Section I.A. of EPA NPDES Permit AK005334-1.

3.2.3 Outfall 002 – Treated Effluent from Sewage Treatment Plant

The Sewage Treatment Plant (STP) operated throughout 2009 generally in a range of between 20,000 and 35,000 gallons per day. Daily field parameters were collected to assess 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 also collected for BOD5 and TSS on a quarterly basis.

All results were within the limits and conditions set forth in Section I.B. of EPA NPDES Permit AK005334-1.

3.2.4 Whole Effluent Toxicity

Whole Effluent Toxicity (WET) testing is required under NPDES Permit AK-005334-1 at Outfall 001. The annual WET test was conducted June 15 through June 23, 2009 by CH2M Hill's Aquatic Toxicology Laboratory in Corvallis, Oregon. A split of the same sample was also sent to ENSR Laboratory in Fort

Collins, CO.

Results from both laboratories are presented in Appendix A and indicate that the toxicity for both *Ceriodaphnia dubia* (water flea) and Pimephales promelas (fathead minnow) was 1.25 TU_c or less, well under the toxicity trigger of 2.0 TU_c.

All results were within the limits and conditions set forth in Section I.D. of EPA NPDES Permit AK005334-1.

3.3 SURFACE WATER MONITORING

3.3.1 Goodpaster River

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

Surface water station SW12 located on the Goodpaster River at the confluence of Central Creek was also sampled concurrently with the fish tissue monitoring program in mid September.

Surface water samples are analyzed for cyanides, ionic balances, 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 were taken.

No adverse trends were observed.

The location of the surface water monitoring stations are shown in Figure 3.

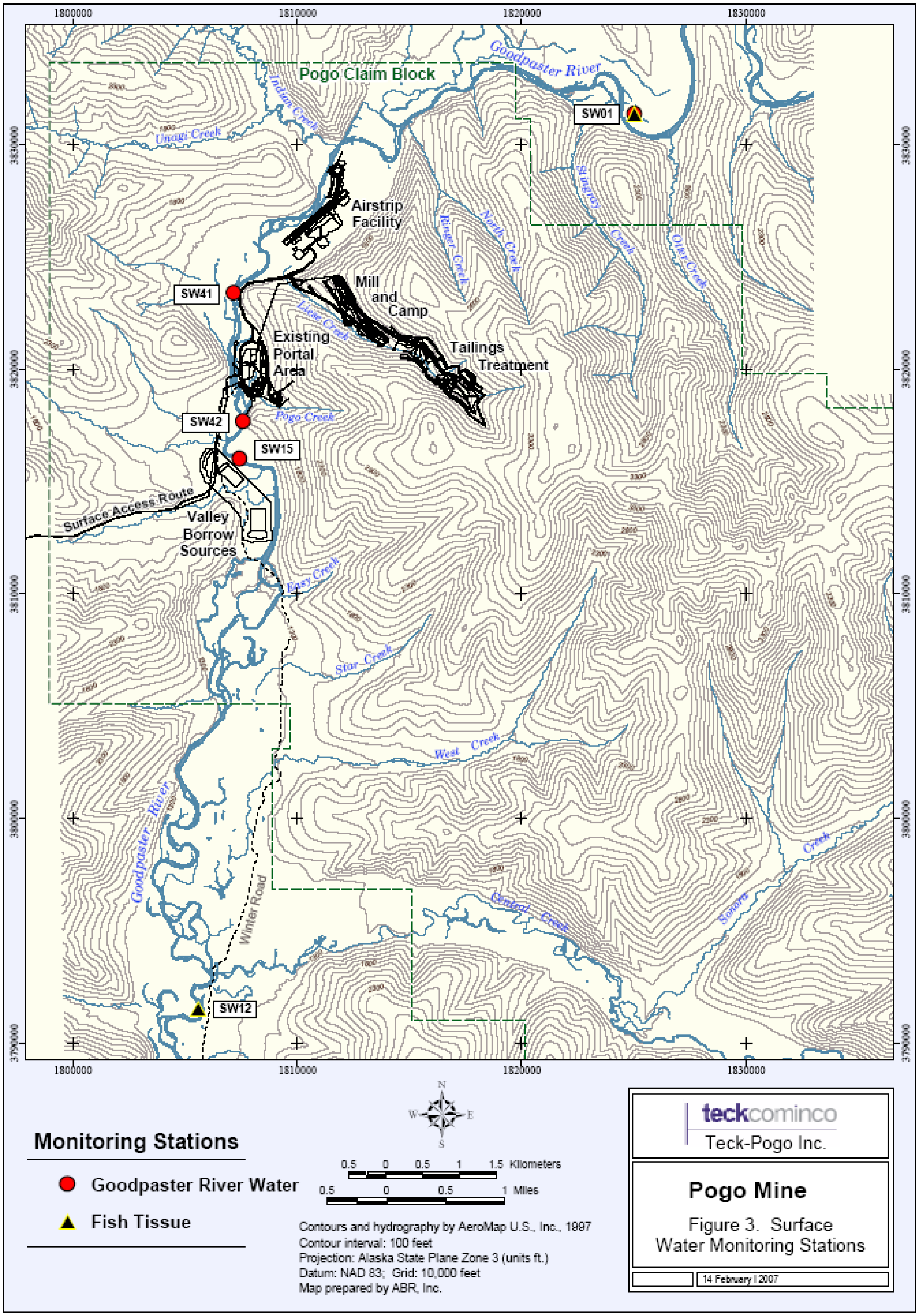


Figure 3. Monitoring Stations - Surface Water

3.3.2 Fish Tissue

In order to help assess long term trends in Goodpaster River quality, annual whole body analysis of juvenile Chinook salmon is required under NPDES Permit AK-005334-1 at monitoring sites both upstream (SW01) and downstream (SW12) from the project facilities. Juvenile Chinook salmon were collected at these stations in late September. Due to the small sample size of the fish (about 3 gram wet weight), laboratory detection limits are variable not only between years, but often between individual fish from the same station.

No adverse trends were observed.

3.4 GROUNDWATER QUALITY MONITORING

The locations of the groundwater monitoring stations are shown in Figure 4.

3.4.1 Downgradient of DryStack and RTP Dam

Action limits for groundwater monitoring are set forth in the Pogo Mine Quality Assurance Project Plan as part of the requirements of the ADEC Waste Disposal Permit, 0131-BA002.

To increase accuracy in detecting leakage from the RTP embankment, ADEC developed parameter concentration levels for MW03-500, MW03-501, and MW03-502, which indicate possible seepage infiltration and trigger corrective actions.

Samples were collected on August 5, November 3, and December 1, 2009, indicating chloride, nitrate, and sodium above trigger concentrations. ADEC was notified and monthly monitoring of the wells will continue. See Table 2.

Table 2: Groundwater Concentrations that Trigger Corrective Action for Wells MW03-500, MW03-501 and MW03-502

	As (total) µg/L	CL mg/L	CN-WAD (dissolved) µg/L	K (dissolved) mg/L	Na (dissolved) mg/L	Nitrate-N (dissolved) mg/L	Se (dissolved) µg/L
Trigger Concentrations MW03-500	**47.8**	**0.79**	**5.2**	**3.18**	**5.41**	**1.28**	**1.35**
8/5/2009 sample	*19.2*	*1.79*	*2.7*	*2.55*	*4.83*	*4.16*	*0.9*
11/3/2009 sample	*19.9*	*2.3*	*<1.65*	*2.45*	*4.88*	*6.42*	*0.93*
12/1/2009 sample	*18.3*	*2.28*	*2.3*	*2.39*	*5.81*	*6.73*	*0.580*
Trigger Concentrations MW03-501	**47.6**	**1.23**	**5.2**	**3.69**	**5.27**	**2.66**	**0.99**
8/5/2009 sample	*10.8*	*1.72*	*<1.65*	*2.25*	*5.78*	*4.38*	*0.53*
11/3/2009 sample	*11.4*	*2.07*	*<1.65*	*2.28*	*5.30*	*5.53*	*0.84*
12/1/2009 sample	*10.4*	*1.64*	*1.7*	*2.26*	*5.71*	*6.03*	*0.67*
Trigger Concentrations MW03-502	**45**	**1.06**	**5.2**	**3.27**	**3.90**	**2.39**	**0.64**
8/5/2009 sample	*8.49*	*1.77*	*<1.65*	*2.14*	*6.78*	*4.69*	*0.29*
11/3/2009 sample	*7.7*	*2.34*	*<1.65*	*2.2*	*6.14*	*7.0*	*0.56*
12/1/2009 sample	*7.23*	*2.23*	*1.9*	*2.21*	*7.33*	*7.25*	*0.45*

In September 2009, surface water sampling at a small pool that formed below the seepage collection system showed conductivity similar to the conductivity of the RTP water. A pump was placed in the small pool and the water returned to the seepage collection system. The seep ceased to flow not long after the last sampling date in December; the results are below in Table 3.

Table 3: WAD cyanide analysis (µg/l) from small pool below Seepage Collection System

	Test America Lab	Analytic Group Lab	ACZ Lab
9/2/2009	2.8	No Detect	No Sample
10/7/2009	1.8	No Detect	No Sample
10/15/2009	No Detect	No Sample	No Sample
10/21/2009	No Sample	No Detect	No Sample
11/3/2009	4.6	No Detect	No Detect
12/2/2009	1.8	No Detect	No Detect

In response, Pogo drew down the RTP level to minimize overall seepage. The WAD cyanide values obtained above may also be prone to the same problem faced with the 001 Outfall. The continued operation of low volumes in the RTP is being accomplished with the help of the new underground water recycle operation (see Section 2.1). In 2010, Pogo intends to review the effectiveness of the seepage collection system and will address seepage issues if additional seeps are observed below the system.

3.4.2 Downgradient of the Solid Waste Facility

Monitoring wells MW04-503 and MW04-504 were installed to detect potential impacts to groundwater down gradient of the originally proposed solid waste facility. Construction of this solid waste disposal facility has been postponed and sampling of these wells has been suspended, as it is now anticipated that solid waste will be disposed in the drystack in accordance with Permit 0131-BA002. In the interim, solid waste is hauled off-site to an approved landfill.

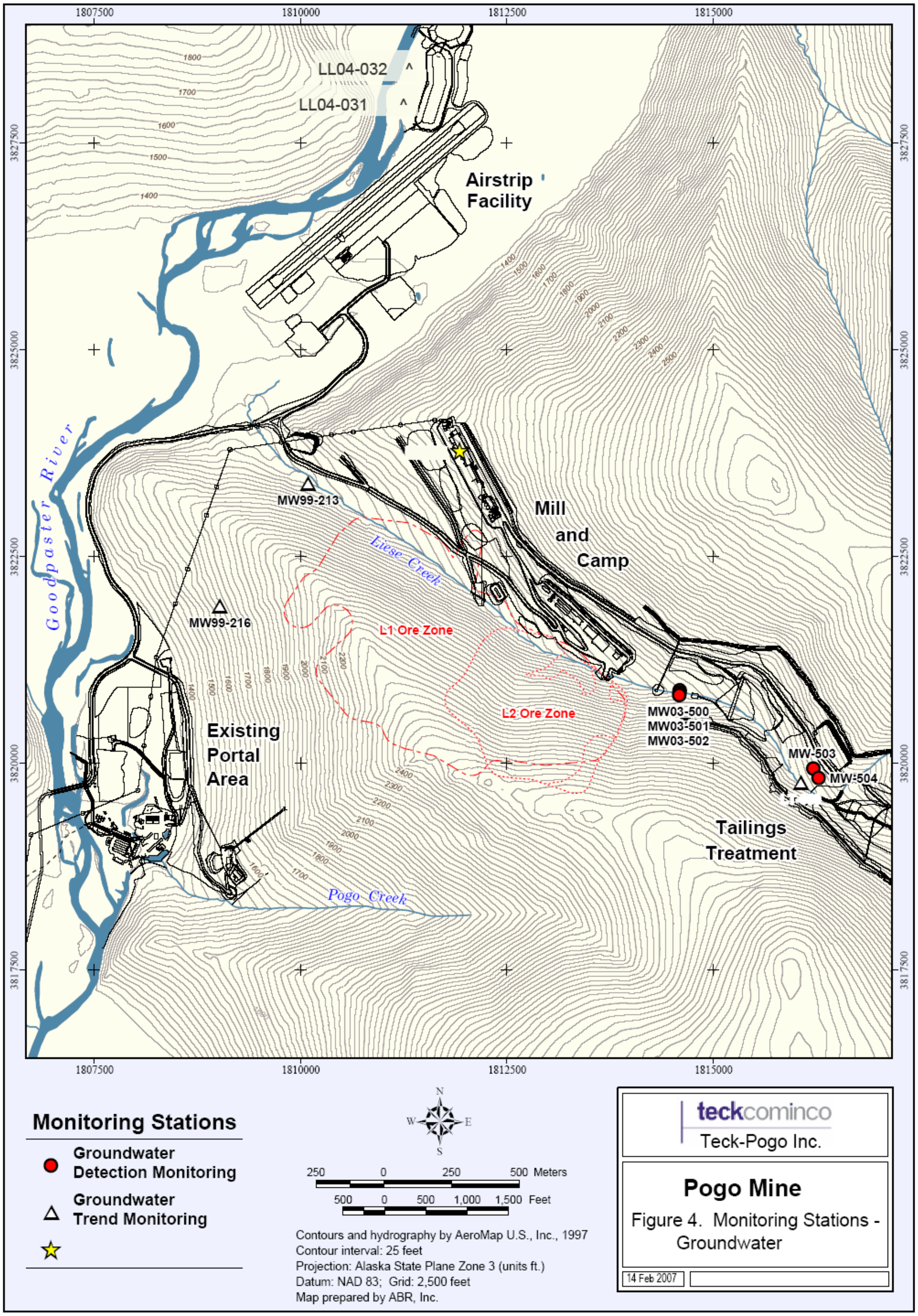


Figure 4. Monitoring Stations - Groundwater

3.4.3 Downgradient of Ore Zone

Monitoring wells MW04-213 and MW99-216 provide information on water quality trends down-gradient from the ore zones. Samples were collected on May 28, and September 16. No adverse trends were observed.

3.4.4 Downgradient of ORTW

Monitoring stations LL04-031 and LL04-032 provide information on ground water quality trends between the ORTW and the Goodpaster River. No adverse trends were observed.

3.5 PROCESS CONTROL MONITORING

The objective of these programs is to monitor the processes associated with the treatment facilities.

3.5.1 Water Balance

The beginning RTP reservoir volume for 2009 was 14.0 million gallons. During the year, 138.9 million gallons were collected in the RTP, 4.0 million gallons of treated water were recycled to the RTP, 67.0 million gallons were pumped from the RTP for underground drill water, 50.6 million gallons were pumped from the RTP to the mill process, and 31.2 million gallons were pumped from the RTP to the water treatment plant leaving an ending RTP volume of 8.1 million gallons. 81.3 million gallons of mine drainage and RTP water were treated and discharged via the ORTW during the year.

3.5.2 CIP Tailings Cyanide Destruction

After gold is recovered from the ore in the carbon-in-pulp (CIP) tanks, and prior to disposal as part of the paste backfill, DEC permit 0131-BA002 requires that the CIP tailings be subjected to cyanide destruction using the SO2/air process or other suitable cyanide destruction process. After cyanide destruction, the CIP tailings are stored in the CIP stock tank prior to being mixed with cement and used for backfill in the mine. Samples to confirm cyanide destruction are taken at the stock tank and reported in Appendix A as PC001. At least 90% of the samples shall contain less than 10 mg/kg of WAD cyanide and none of the samples shall contain more than 20 mg/kg of WAD cyanide.

During 2009, 100% of the CIP stock tank samples returned values of less than 10 mg/kg and none returned a value greater than 20 mg/kg .

3.5.3 Mineralized Whole Rock Geochemistry

Composite samples of development rock materials placed in the drystack facility were collected on March 12, June 16, October 1 and December 15. These samples were analyzed for whole-rock chemistry and ABA and are reported in Appendix A as PC002. No adverse trends were observed.

3.5.4 Flotation Tailings Geochemistry

Flotation tailings geochemistry samples were collected on March 17, June 18, September 17 and December 15, at PC003, the underflow of the filter-feed tank at the end of the mill circuit, prior to disposal on the drystack. The results are presented in Appendix A. No adverse trends were observed.

3.5.5 Flotation Tailings Interstitial Water Chemistry

The interstitial water from the tailings samples collected at PC003 on March 17, June 18, September 17, and December 15 were recovered and analyzed. The results are presented in Appendix B. There were no adverse trends observed.

3.6 VISUAL MONITORING

3.6.1 Facility Inspection

The objective of the facility inspection program is to monitor the surface waste disposal facilities for signs of damage or potential damage.

Weekly visual inspections of the RTP dam were completed throughout 2009. No settlement or geotechnical concerns were observed via visual inspection.

3.6.2 Biological Survey

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

No wildlife issues with the RTP or drystack occurred during the year.

3.7 DEVELOPMENT ROCK SEGREGATION AND STORAGE

During 2009, 1,149 rounds of development were taken and sampled in accordance with the Rock Segregation Procedure. 375 rounds (33%) exceeded either the Arsenic or Sulfur threshold, with 444 rounds (100%) of these placed internally in the drystack. 44 rounds (4%) were not sampled due to operational challenges. Of these rounds, 44 rounds (100%) were placed in the drystack. All mineralized rock was placed in the drystack tailings at least twenty feet from the margins and covered with a minimum of 2 feet of compacted tailings.

3.8 WASTE DISPOSAL

During 2009, 662,000 dry tons of flotation tailings and 107,000 tons of mineralized rock were placed in the drystack. During the year, 312,000 dry tons of tailings were placed underground as paste backfill.

The quantities of miscellaneous waste materials placed either into the drystack or underground during the year are shown below:

Table 4: Miscellaneous Waste Disposal in Drystack and Underground

Material	Disposal Location	Quantity	unit
Grinding Media Flotation Debris Screen Residue	Drystack	86	tons
Lab Ore Sample Disposal	Drystack	1.64	tons
Concrete	Drystack	0	tons
Shotcrete	Drystack	0	tons
Water Treatment Plant Sludge	Drystack	259	yds
Water Treatment Plant Sludge	Underground	124	yds
Paste Pump Cleanup	Underground	788	yds

3.9 GEOTECHNICAL MONITORING

Construction of the shell of the dry stack tailings facility using filtered flotation tailings began this summer in July and ceased in early October due to the cold weather. A series of geotechnical tests and field measurements were carried out in accordance with the Quality Assurance Project Plan.

The grain size distribution, Atterberg limits, Standard Proctor Tests were conducted by Mappa Testlab in North Pole, Alaska. Triaxial Compression Test, Hydraulic Conductivity and Moisture Retention Test were conducted by Golder Associates in Saskatoon, Saskatchewan, Canada. Below is a summary of the conclusions and recommendations resulting from the testing.

3.9.1 Physical parameters of dry stack

- All geotechnical tests were conducted to satisfy the monitoring requirements for physical parameters of dry stack during start-up.
- The grain size of dry stack is coarser r than expected, and the physical properties of th dry stack are more like sandy material than assumed. This fact works to improve the structural stability of the compacted dry stack.
- The physical parameters of the dry stack such as Plasticity Index, Standard Proctor maximum dry density, shear strength properties, hydraulic conductivity, and water retention characteristics are well coincident with the historical data and satisfy the design criteria for the shell of dry stack tailings facility.

3.9.2 Field Compaction

- It was confirmed that at least four (4) passes would be required to achieve the 95% of maximum dry density.
- Since high moisture may cause inadequate compaction, it is

recommended to use six (6) passes to secure the design criteria.

- Troxler density gauge was proved to be a useful tool for moisture and density monitoring at the field. The measurements should be conducted randomly during the shell construction.

4 2009 As-built Maps

Figure 5 provides an overview of all facilities within the Pogo millsite lease boundary as of yearend 2009. Figures 5a through 5d provide additional detail for the major areas of the mine. Figure 5e shows the new 78-person camp.

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Pogo Mine

Figure 5
POGO Mine
As-Built Dec 2009

17 Feb 2010

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Pogo Mine

Figure 5a
1525 Portal Area
As-Built Jan 2010

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Figure 5d
RTP and Drystack Area
As–Built Dec 2009

17 Feb 2010

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of operations in 2008.

Table 5: Pogo Mine Summary of Reclamation and Closure Cost Estimates updated as of February 2005

			Road	**T-Line**	**Minesite**
Phase I	Post Construction		$483,000	$138,000	$437,221
Phase II	Concurrent with Mining		$110,000	$9,000	$778,514
Phase III	Final Reclamation and Closure		$1,096,515	$1,570,000	$9,102,377
Phase IV	Post Closure Reclamation		$37,000	$6,000	$6,105,010
Phase V	Post Closure Monitoring				$1,195,000
	Total Direct Costs		$1,726,515	$1,723,000	$17,618,122
Contractor Profit & Overhead		10%	$172,652	$172,300	$1,761,812
Contingency		10%	$172,652	$172,300	$1,761,812
Agency Administration Costs		3%	$51,795	$51,690	$528,544
Contractor Mob/Demob		5%	$86,326	$86,150	$880,906
Engineering Redesign		3%	$51,795	$51,690	$528,544
	Total Indirect Costs		$535,220	$534,130	$5,461,618
Total Road			$2,261,735		
Total Transmission Line				$2,257,130	
Total MillSite					$23,079,740
Total Road & Transmission Line				$4,518,865	
Total Project					$27,598,605

6 Planned 2010 Activities

6.1 OPERATIONS

The mill will continue to focus on circuit optimization and recovery improvements along with optimization of MWTP#1 and MWTP#2.

In 2010 development activity will remain high; ramp development will continue over the next two years. Mining in 2010 is budgeted for 920,415 tons of ore and 21,000 feet of lateral development. The mining contractor will remain on site throughout the year with 50 employees housed in the new lower camp.

Mining of additional gravel from the airstrip borrow pit will be completed on an as-needed basis to complete underground road maintenance. Additional material from Material Site 18 will be used to conduct road repairs on the remainder of the access road from Mile 0 to Mile 28.

New surface disturbance will be limited to expansion of the drystack tailings storage area within the permitted footprint.

The Liese Creek Diversion ditch will receive further concrete lining in the summer of 2010 to help decrease possible seepage.

In 2010 Pogo will purchase and install a new 2,000 kW generator for backup power generation during power outages.

In 2010 Pogo will be designing and installing secondary containment around a number of structures at the mine that contain low level cyanide contacted solutions. The objective is to install containment equivalent to 110% of the contained structure volume. The areas to be contained are:

- ❑ Carbon in Pulp (CIP) tails storage tank
- ❑ CIP tails and Backfill Dilution (BFD) Water pipelines (Mill to Coarse Ore tower)

- ❑ BFD Water tank
- ❑ Paste Line (Between CV-02 splice shack and the 1690 portal)
- ❑ CIP thickener overflow standpipe (if not already adequately contained)
- ❑ Paste line (Between Paste plant and CV-02, if not already adequately contained)

As of February, 2010, detailed engineering is being completed by a local design firm with anticipated construction during the summer of 2010.

Pogo is also currently investigating the need to upgrade the seepage well system to increase pumping capability.

An archeology survey along the Pogo all-season road, performed by Cultural Resource Consultants LLC, will take place in the summer of 2010. They will reexamine approximately 10.5 miles of road cuts and the perimeters of seven material sites for any new cultural material.

Pogo will be conducting an As-built Survey of the all-season road and transmission line during the summer of 2010 in accordance with the "Special Mapping Instructions for Pogo Mine Access Road and Transmission Line" provided by ADNR.

6.2 ALL-SEASON ROAD

Routine maintenance, including replacing road delineators and adding drainage rock to prevent erosion is planned for 2010. The resurfacing of the road will continue in 2010, to upgrade the all-season road between mile marker 1 and mile marker 28. During the summer of 2010, Calcium Chloride will be applied to the entire 49 miles.

6.3 EXPLORATION

Plans for the Pogo Mine's exploration program for 2010 include:

- ❑ approximately 38,000 feet of helicopter-supported drilling (57 holes, 32 sites) in the mine area and at outer prospects,
- ❑ approximately 32,000 feet of road-based drilling (34 holes, 12 sites) in

the mine area,

- approximately 8,000 feet of underground drilling,
- an airborne EM and Magnetic geophysical survey,
- an airborne LIDAR survey,
- aerial photography and ortho-photogrammetry,
- an extensive helicopter-supported mapping, soil and rock sampling, and related fieldwork throughout the Pogo claim block. Surface drilling will be conducted from mid-April through mid-October. Helicopter operations are planned for June through early September.

6.4 PERMITTING ACTIVITIES

Significant permitting activities planned for 2010 include:

- The continuing renewal of the Alaska Department of Natural Resources (ADNR) Pogo Mine Millsite Lease ADL416949, ADNR Plan of Operations Approval F20039500.
- The Alaska Department of Environmental Conservation (ADEC) Waste Disposal Permit, 0131-BA002, the ADEC Non-domestic Wastewater Disposal Permit, 2004-DB0070.
- The renewal of the U.S. Environmental Protection Agency (EPA) NPDES Permit AK005334-1.
- The renewal of the Right-Of-Ways for the all-season road (ADL416809 & 417066) and Transmission Line (ADL 416817).
    - As-built survey for the all-season road and the Transmission Line in 2010.