Alaska Gold Company
A subsidiary of NovaGold Resources Inc.

ROCK CREEK MINE & BIG HURRAH PROJECT

2011 ANNUAL REPORT

Submitted To:

Alaska Department of Environmental Conservation

&

Alaska Department of Natural Resources

Submitted By:

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March 5, 2012

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Acronyms and Abbreviations

ADEC	Alaska Department of Environmental Conservation
ADNR	Alaska Department of Natural Resources
AGC	Alaska Gold Company
AK	Alaska
amsl	above mean sea level
APDES	Alaska Pollutant Discharge Elimination System
AWQS	Alaska Water Quality Standards
BMP	Best Management Practice
CAA	Clean Air Act
CIL	Carbon-in-Leach
COC	Constituent of Concern
CWA	Clean Water Act
CY	Cubic Yards
DC-1	Diversion Channel #1
DC-2	Diversion Channel #2
DC-3	Diversion Channel #3
EPA	US Environmental Protection Agency
EPCRA	Community Right-to-Know Act
ft	feet
GCL	Geosynthetic Clay Liner
gpd	gallons per day
gpm	gallons per minute
HCl	Hydrochloric Acid
HDPE	High Density Polyethylene
hp	Horsepower
IWF	Injection Well Field
LAP	Land Application Permit
LCRS	Leak Collection and Recovery System
m^3	cubic meter
mg/L	milligrams per liter
MSGP	Multi-Sector General Permit
NaOH	Sodium Hydroxide
NPDES	National Pollutant Discharge Elimination System
O&M	Operation and Maintenance
ORP	Oxidation Reduction Potential
PAG	Potentially Acid Generating
psi	pounds per square inch
QAPP	Quality Assurance Project Plan
RCRA	Resource Conservation and Recovery Act
RPA	Reclamation Plan Approval No. F20069578
RWP	Recycle Water Pond
SPCC	Spill Prevention Control and Countermeasure
SWPPP	Storm Water Pollution Prevention Plan
TCP	Temporary Closure Plan
TDS	Total Dissolved Solids
TSCA	Toxic Substances Control Act
TSF	Tailings Storage Facility
TSS	Total Suspended Solids

TWUP	Temporary Water Use Permit
µg/L	micrograms per liter
UIC	Underground Injection Control
UTL	Upper Tolerance Limit
WAD	Weak Acid Dissociable
WET	Whole Effluent Toxicity
WMP	Waste Management Permit No. 2003-DB0051
WTP	Water Treatment Plant

1.0 Introduction

This annual report has been prepared by Alaska Gold Company (AGC), a wholly owned subsidiary of NovaGold Resources, Inc. (NovaGold), in accordance with Section 1.9 of Alaska Department of Environmental Conservation (ADEC) Waste Management Permit (WMP) No. 2003-DB0051 and Alaska Department of Natural Resources (ADNR) Reclamation Plan Approval (RPA) No. F20069578. This report also satisfies annual reporting requirements in Part II E of U.S Environmental Protection Agency (EPA) Underground Injection Control (UIC) Permit No. AK-5X27-001-A, Section 1.7.2.2 of ADEC Land Application Permit (LAP) No. 2010DB0011, and Part 1.5 of ADEC Alaska Pollutant Discharge Elimination System (APDES) Permit No. AK0053627. For purposes of efficiency and avoiding duplication, AGC has prepared one annual report to address the requirements of all permits. This report is based solely on information generated by AGC.

Although the Rock Creek Mine and Big Hurrah site are permitted jointly, the two are located over 40 miles apart. In 2011, activities were focused on the Rock Creek Mine with only minor activities involving surface water sampling conducted at the Big Hurrah site over the same period. Accordingly, this annual report primarily summarizes activities at the Rock Creek Mine.

The Rock Creek Mine was placed into Care and Maintenance status in November 2008 continuing through 2011. The following activities took place at the Rock Creek Mine in 2011:

- All development rock generated has been used for construction purposes; no development rock stockpiles were constructed.
- Maintained components of the Storm Water Management System, and continued final stabilization and reclamation projects.
- Updated the Storm Water Pollution Prevention Plan (SWPPP).
- Disposed of approved wastes in the Rock Creek inert solid waste landfill in accordance with WMP.
- Continued injection of treated mine wastewater from the Tailings Storage Facility (TSF).
- Continued seasonal land application of TSF water using evaporative sprayers, trade named Land Sharks.
- Obtained ADEC Alaska Pollutant Discharge Elimination System (APDES) Permit AK0053627 for surface discharge of treated water to Rock Creek on August 1, 2011. Discharged treated wastewater from August through November 2011.
- Operated the Water Treatment Plant (WTP) providing more than 500 gallons per minute (gpm) treatment capacity and ensuring long-term compliance with effluent limits for injected and surface discharged water.
- Continued surface and groundwater monitoring programs, including analytical sampling and visual inspections.
- Completed 5-year engineering review of Spill Prevention Control and Countermeasure (SPCC) Plan. Revised SPCC plan was developed and implemented in April 2011.
- Completed a one-time hazardous materials cleanup of expired and disused chemicals from the assay lab.

- Continued finalizing the final closure plan for the mine with expected implementation of Phase I activities focusing on breaching the TSF in early 2012.

Table 1 summarizes the various permit reporting requirements and the relevant sections of this report containing additional discussions of AGC's compliance with each.

Table 1: Reporting Requirements

Reference	Requirement	2011 Annual Report Section
Waste Management Permit (WMP) No. 2003-DB0051		
1.9.1	Submit an annual report summarizing the inspection and monitoring results set out in Section 1.8:	
1.8.1.1	Weekly visual monitoring: Signs of damage at facilities; above-grade portions of groundwater monitoring devices; visible portions of liners; containment structures and retaining walls; erosion control/diversion structures; waste escaping or leachate; unauthorized waste disposal; violations of permit conditions. As per Certificate of Reasonable Assurance (AK 0605-05AA), Item (8): Include monitoring of adequacy and effectiveness of Storm Water Management Best Management Practices in weekly visual monitoring required in the WMP.	Section 9.0
1.8.1.2	Surface water monitoring near the sites to ensure that water quality standards are not exceeded outside the waste management areas.	Section 8.2
1.8.1.3	Quarterly groundwater/seep sampling and analyses.	Section 8.3
1.8.1.4	Monitoring of treated pit dewatering wastewater prior to injection to ensure permit limits are met.	Section 8.4
1.8.1.5	Geochemical monitoring of development rock and tailings samples from Rock Creek Mine to ensure that there is low potential for production of leachate that is acidic and/or contains elevated levels of metals.	Section 8.7
1.8.1.6	Monitoring of paste tailings prior to placement in the TSF (and water recycled to the TSF or contained in the RWP) to ensure that limitations in Sections 1.2.3 and 1.2.4 are met.[1]	Section 8.5
1.8.1.7	Geochemical monitoring of development rock produced at Big Hurrah designed to detect and segregate PAG development rock as per Section 1.7.1.2.	Section 8.7
1.8.1.8	Monitoring of seepage, leachate, runoff and down-gradient groundwater of the PAG development rock storage area.	N/A[2]
1.8.1.9	Fluid management monitoring plan including a water accounting of the quantity of seepage through the TSF and treated pit dewatering wastewater discharged to the injection wells.	Section 9.1.2
1.8.1.10	Wildlife monitoring as required in Section 1.4.16.	Section 9.7
1.8.1.11	Water quality monitoring of the RWP.	Section 8.1.2
1.8.2.4	Inspections of TSF in conformance with Operations, Maintenance and Emergency Action Manual approved by ADNR.	Section 9.1
1.8.4	Samples from any groundwater well or surface water monitoring location that had a positive result for cyanide (previously reported to ADEC).	Section 8.0
1.8.5	Summary of log of wastes disposed in TSF, inert solid waste landfill facilities, development rock dump at Rock Creek, PAG and non-PAG development rock dump at Big Hurrah, and any backfill of satellite pit at Big Hurrah.	Section 3.2 Section 3.5
1.8.9	Any additional monitoring of influent, effluent, receiving water, air or solid waste in addition to those in the permit or more frequently than required.	Section 8.8

[1] The requirements outlined in WMP Section 1.8.1.6 have been modified in the above table to include water recycled to the TSF or contained in the RWP. Section 1.8.1.6 states to monitor paste tailings to ensure the limitations in Sections 1.2.3 and 1.2.4 are met. Section 1.2.4 refers to cyanide limitations on recycled water.

[2] Monitoring of seepage, leachate, runoff, and down-gradient groundwater of the PAG development rock storage area will be implemented when this development rock storage area is constructed.

Table 1: Reporting Requirements

Reference	Requirement	2011 Annual Report Section
1.9.4	Adequacy of financial responsibility, including, but not limited to, inflation, significant changes in reclamation activity costs, and concurrent reclamation, expansion or other changes to the operation of the facility.	Section 10.0
1.10.3	Notify ADEC of any exceedences of water quality standards or permit limits at a surface or groundwater monitoring station	Section 8.0
Land Application Permit No. 2010DB0011		
1.7.2	Submit an annual report summarizing the inspection and monitoring results set out in section 1.6.	
1.7.2.4	Quarterly and annual reports shall provide: • Total volume of water land applied • Map indicating areas of application • Hydraulic load per acre during each quarter • Cumulative hydraulic load per acre	Section 3.8
1.6.4; 1.6.5	Quarterly TSF pond, main sump, and TSF monitoring well sampling and analysis in accordance with Appendix D of the revised TCP.	Section 8.1.1 Section 8.1.3 Section 8.3.1
1.6.6	Daily visual monitoring of land applied wastewater to ensure runoff is not occurring and vegetation is not adversely affected.	Section 3.8
1.6.9	Report any positive results for cyanide concentration from any surface water or groundwater monitoring well location to ADEC as soon as possible.	Section 8.0
1.6.10	Maintain a log of all wastes applied to the land. The log shall include date of disposal, estimated volume, and description of the waste, and shall be summarized in the annual report.	Section 3.8
Alaska Pollutant Discharge Elimination Permit No. AK0053627		
1.5	Submit an annual report summarizing water quality monitoring results for all discharge and receiving waters.	Section 8.0
1.2.1	Monitor discharges from Outfall 001 to Rock Creek for parameters listed in Table 2.	Section 8.4
1.3.1	Conduct chronic toxicity tests on effluent samples from Outfall 001	Section 8.4
1.4.1	Monitor surface water in the vicinity of the mine at the stations and frequency listed in Table 3 and for all parameters listed in Table 2	Section 8.2
Reclamation Plan Approval (RPA) No. F20069578		
	Summary of results of all fourth quarter monitoring required by state/federal authorizations.	Section 8.0
	Reclamation activities and surface acreage disturbed.	Section 3.1
	Milling activities, quantities of topsoil salvaged and stockpiled, tons (and CY) of ore and development rock mined at the Rock Creek Mine site, tons (and CY) of ore and both PAG and non-PAG development rock mined at the Big Hurrah site during the previous year and planned for next year, and the available pit volume below the anticipated pit lake elevation at the end of the previous year and expected at the end of the next year.	Section 3.2 Section 3.3
	As built map submitted with annual report showing current development of all facilities within project area described in the Rock Creek Mine Plan of Operations Volume 4, including cleared and grubbed areas, topsoil or growth medium stockpiles, roads, PAG and non-PAG waste rock dumps, material sites, tailings facility, facility construction, and un-reclaimed exploration disturbance.	Section 2.1
	Adequacy of financial responsibility - inflation, changes in reclamation cost, concurrent reclamation, expansion or other changes to operation of facility.	Section 10.0
Underground Injection Control: Class V Permit No. AK-5X27-001-A		

Table 1: Reporting Requirements

Reference	Requirement	2011 Annual Report Section
Part II E.1	Submit quarterly and annual reports summarizing monitoring results described in Part II D including information on data validity and any exceedences of limits contained in this permit or water quality standards.	Section 8.0
Part II D.2	Continuous monitoring of injection (injection rates, pressures, and volumes)	Section 6.0 Appendix D
Part II D.3	Monitoring treated wastewater injection includes: • Water quality analysis of treated wastewater just prior to injection for parameters listed in Part II C.7 • Water quality analysis of groundwater from IWF monitoring wells for parameters listed in Part II C.7	Section 8.4 Section 8.3.3
Part II D.4	Periodic visual inspection of IWF for leaks or signs of groundwater mounding to the surface.	Section 6.0

2.0 Project Overview

The Rock Creek Mine and Big Hurrah site are located on the Seward Peninsula along the west coast of Alaska (figure 1).

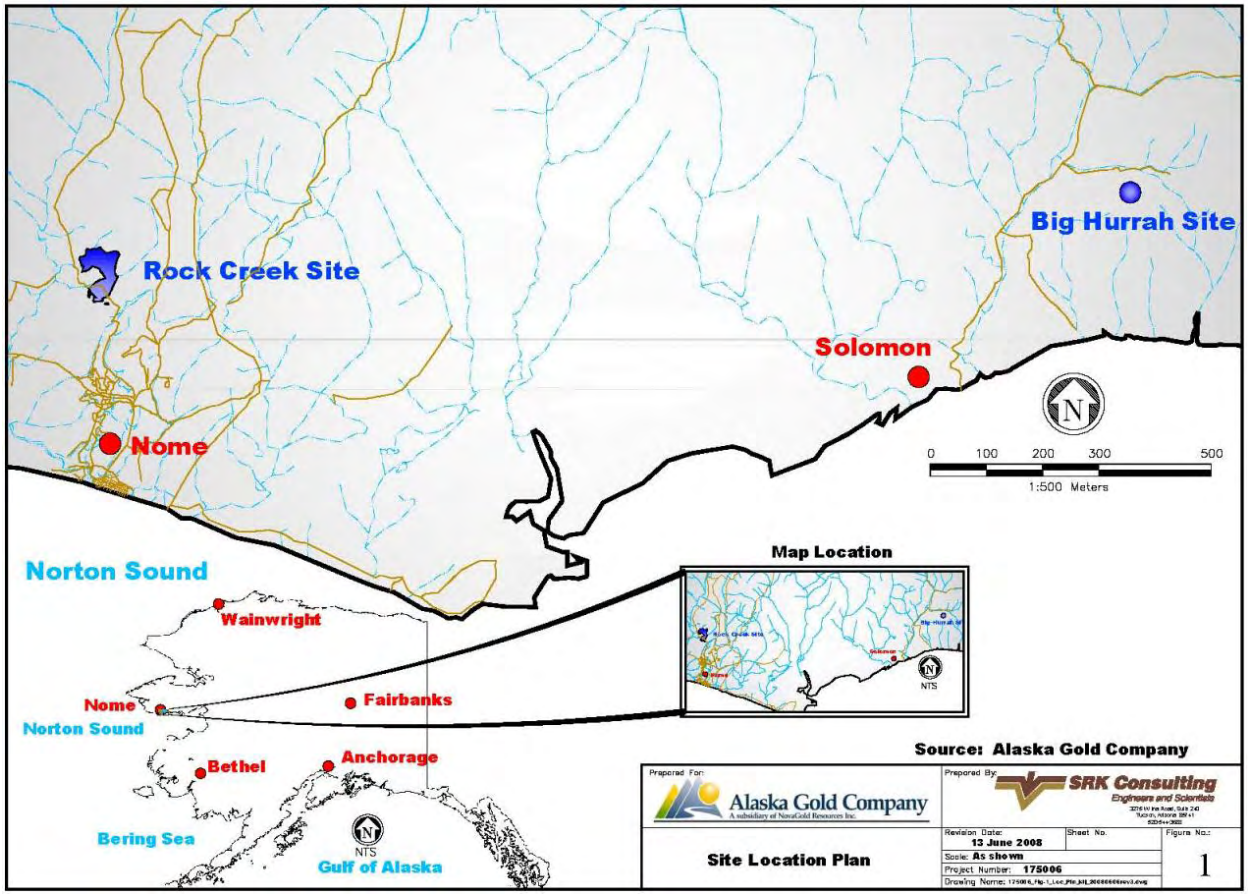

Figure 1: Rock Creek Mine and Big Hurrah Site Regional Location

2.1 Rock Creek Mine

The Rock Creek Mine is located approximately six miles north of Nome in the Snake River drainage on private lands owned by Sitnasuak Native Corporation (surface rights), Bering Straits Native Corporation (sub-surface rights), and AGC. Mine facilities currently include an open pit, TSF, explosive storage areas, injection well field (IWF), organic stockpiles, storm water diversion channels, and mine roads (figure 2). Support facilities include the mill/gold recovery plant, maintenance shop, administration and mine dry buildings, warehouse, WTP, reagent storage locations, recycle water pond (RWP), and fuel storage locations (figure 3).

While in Care and Maintenance status, the Rock Creek Mine operates two 12-hour shifts per day, 365 days per year.

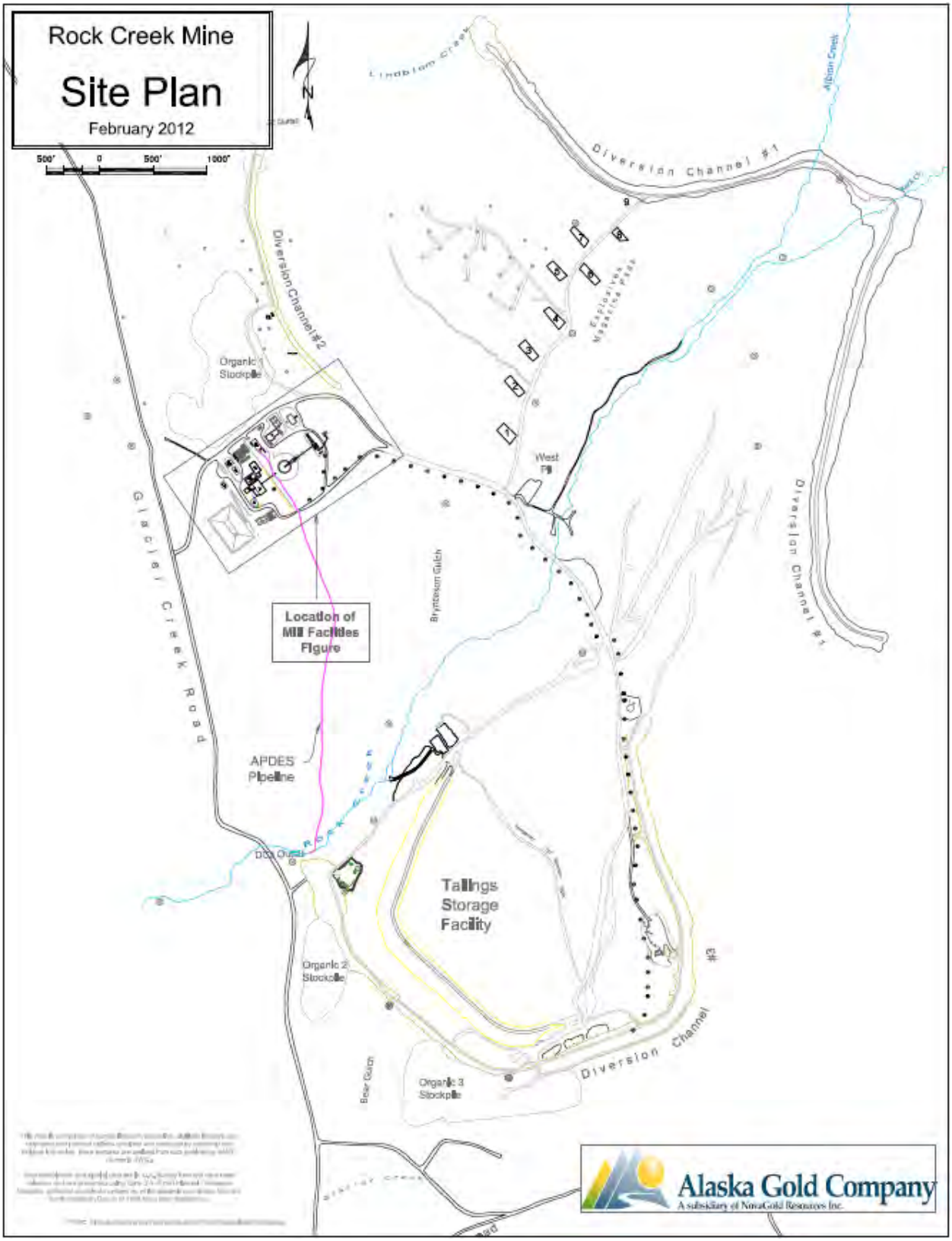

Figure 2: Rock Creek Site Map

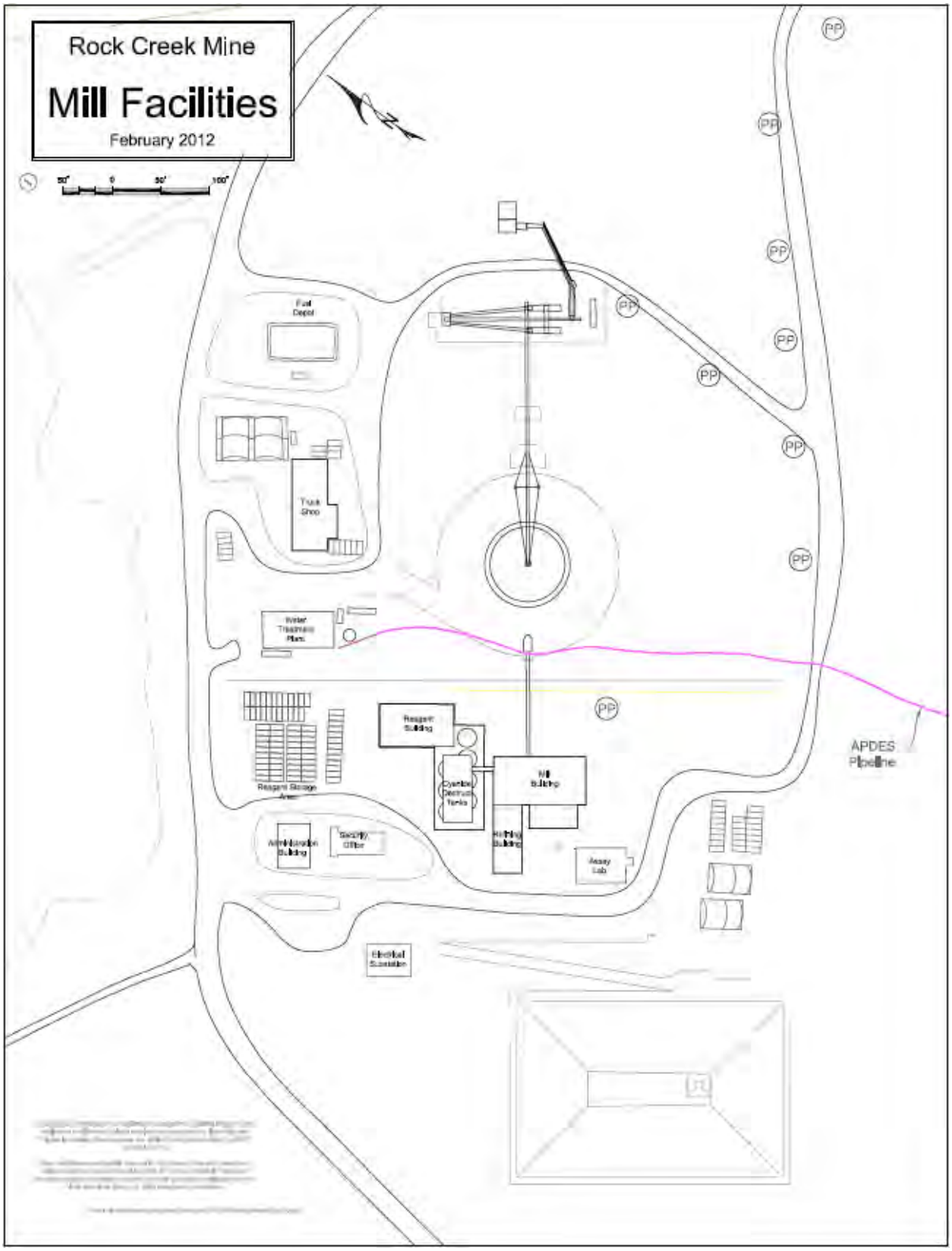

Figure 3: Rock Creek Mine Mill Facilities

2.2 Big Hurrah Site

The Big Hurrah site is located approximately 42 miles east of Nome in the Solomon River watershed on land owned by AGC. The Solomon Native Corporation owns the surface rights to the surrounding land.

2.3 Environmental Policy

AGC follows the corporate governance of NovaGold, which recognizes environmental management as a corporate priority. NovaGold employees place a great emphasis on preserving the environment for future generations and recognize the extensive benefits that are shared by the employees, shareholders and surrounding communities when the Rock Creek Mine is operated according to the highest standards for safety and environmental responsibility. NovaGold adopted the following Statement of Principles to establish corporate-wide standards of excellence that are applied during all stages of exploration, development, mining and closure:

- NovaGold will communicate its commitment to excellence in environmental performance to its subsidiaries, employees, contractors, other agents and the communities in which it operates.
- All new activities and operations will be managed to ensure compliance with applicable laws and regulations. In the absence of regulation, best management practices will be applied to minimize environmental risk.
- Remediation and mitigation of historical mining impacts on properties acquired by NovaGold will be managed through cooperative involvement of NovaGold with previous owners, government agencies and the community.
- To achieve its commitment to environmental excellence, NovaGold will use an environmental management system that ensures prioritization, planning, implementation, monitoring and accurate reporting.
- NovaGold will strive to minimize releases to the air, land or water and will ensure appropriate treatment and disposal of waste.
- NovaGold will allocate the necessary resources to meet its reclamation and environmental obligations.
- NovaGold will continuously seek opportunities to improve its environmental performance through adherence to these principles.
- NovaGold will regularly report progress to its employees, shareholders and the communities in which it operates.

2.4 Regulatory Requirements

The Rock Creek Mine and Big Hurrah sites are regulated primarily by the State of Alaska, with oversight by federal agencies. The various permits, approvals and authorizations in effect during 2011 are listed in table 2.

Table 2: Regulatory Instruments

Regulatory Instrument	Issued by	Regulated Activities
Waste Management Permit 2003-DB0051	ADEC	Disposal of wastes from the Rock Creek and Big Hurrah projects to the TSF, inert solid waste landfills, underground injection of treated wastewater, groundwater and surface water monitoring, and management of development rock. The Temporary Closure Plan (TCP) was developed under the authority of this permit and finalized on February 20, 2009.
Department of the Army Permit POA-2006-742-M	Dept. of the Army	Placement of approximately 15,592,411 cubic yards of fill material into 346.5 acres of waters of the U.S. for development, operation and reclamation of the Rock Creek and Big Hurrah projects
Certificate of Reasonable Assurance	ADEC	Certificate of Reasonable Assurance for Department of the Army Permit POA-2006-742-M
Air Quality Control Minor Permit AQ0978MSS01	ADEC	Installation and operation of emission units in crushing and grinding circuit, shop/warehouse, emergency generators, and Carbon-in-Leach (CIL), process, mill, laboratory and administration buildings
Underground Injection Control Permit AK- 5X27-001-A	EPA Region 10	Injection of treated mine dewatering wastewater and a onetime disposal of treated wastewater contained in the TSF associated with closure of the Rock Creek Mine project utilizing Class V injection wells.
Alaska Pollutant Discharge Elimination System	ADEC	Surface discharge of treated wastewater from the TSF, main pit, and RWP to Rock Creek during periods of open water.
Land Application Permit No. 2010DB0011	ADEC	Seasonal land application of nondomestic wastewater using spray evaporators
APDES General Permit for Storm Water Discharges from Construction Activities No. AKR10BT00	ADEC	Discharge of storm water from construction activities at the Rock Creek Project. During 2012, per State permit requirements and direction from the State, AGC will transition storm water discharge permit coverage to the multi-sector general permit (MSGP) for discharges associated with industrial activity.
Reclamation Plan Approval F20069578	ADNR	Approval of Reclamation Plan for the Rock Creek and Big Hurrah projects
Final Consistency Response AK 0605-05AA	ADNR	Final response regarding consistency of Rock Creek and Big Hurrah projects with the Alaska Coastal Management Program and affected coastal district's enforceable policies
Certificate of Approval to Construct a Dam AK00309	ADNR	Construction of the TSF at the Rock Creek Mine project
Fish Habitat Permit FH06-III-0233	ADNR	Rehabilitation of 2.5 miles of existing access road along Big Hurrah Creek and installation of culverted road crossings in Big Hurrah and Linda Vista creeks
Temporary Water Use Authorization TWUP F2006-09 and F2011-108	ADNR	Withdrawal of groundwater from 11 interceptor wells surrounding Rock Creek Mine pit (pit dewatering)
Temporary Water Use Authorization TWUP F2006-10 and F2011-105	ADNR	Withdrawal of surface water from Rock Creek drainage within the Rock Creek Mine pit (pit dewatering)
Temporary Water Use Authorization TWUP F2006-11 and F2011-106	ADNR	Withdrawal of surface water from a tailings pond, TSF and process plant site drainage channels for mill process water for the Rock Creek Mine project
Temporary Water Use Authorization TWUP F2006-12 and F2011-110	ADNR	Diversion of surface water from Rock Creek drainage diversion channels into Lindblom Creek to minimize drainage through the Rock Creek Mine site
Temporary Water Use Authorization TWUP F2006-13	ADNR	Withdrawal of groundwater from five interceptor wells surrounding the Big Hurrah Mine pit (pit dewatering)
Temporary Water Use Authorization TWUP F2006-14	ADNR	Withdrawal of surface water from the Little Hurrah Creek drainage within the Big Hurrah Mine pit (pit dewatering)
Temporary Certificate of Approval to Operate a Tailings Dam No. AK0039	ADNR	Reissued on December 31, 2009 as a temporary certificate to operate the TSF dam.

In addition to the permits, approvals and authorizations listed in table 2, AGC must comply with other state and federal laws including, but not limited to, state regulations regarding spill reporting, water quality standards, mining, reclamation and solid waste management, Resource Conservation and Recovery Act (RCRA), Emergency Planning and Community Right-to-Know Act (EPCRA), Toxic Substances Control Act (TSCA), Clean Air Act (CAA), and Clean Water Act (CWA).

2.4.1 WMP No. 2003-DB0051

ADEC issued WMP No. 2003-DB0051 to AGC on August 9, 2006. The WMP includes a requirement to submit quarterly and annual reports and regulates the following:

- Tailings disposal to the TSF at the Rock Creek Mine
- Inert solid waste disposal to solid waste landfill facilities at the Rock Creek Mine and Big Hurrah site
- Underground injection of treated mine wastewater at Rock Creek Mine and Big Hurrah site
- Groundwater and surface water monitoring at the Rock Creek Mine and Big Hurrah site
- Storage of potentially acid generating (PAG) development rock prior to disposal in the pit at closure at the Big Hurrah site
- Hazardous chemical storage and containment at the Rock Creek Mine and Big Hurrah site
- Reclamation and closure activities at the Rock Creek Mine and Big Hurrah site

The final Temporary Closure Plan (TCP) (February 20, 2009) was developed under the WMP and specifically addresses activities during the temporary closure period. Subsequent revisions approved by ADEC modified the TCP's monitoring and reporting requirements for the Rock Creek site. The most recent revision was approved on April 26, 2010.

2.4.2 RPA No. F20069578

ADNR (Division of Mining, Land and Water) issued RPA No. F20069578 for the Rock Creek Mine and Big Hurrah site to AGC on August 9, 2006. The RPA was issued in accordance with Alaska Statutes 27.19 (Reclamation) and 38.05 (Alaska Lands Act), and Alaska Administrative Code Title 11, Chapter 97 (Mining Reclamation). The RPA requires AGC to submit an annual report documenting the following activities:

- Financial assurances
- Review of geochemical characterization and water quality data
- Stockpiling of organic materials
- Geochemical characterization of development rock
- Waste rock handling
- Fuel and hazardous substance management
- Reclamation and mine closure
- Environmental audits

3.0 Rock Creek Mine Activities

Activities at the Rock Creek Mine in 2011 were directly related to the mine's Care and Maintenance status and consisted of TSF water management, WTP upgrades, IWF maintenance and optimization, treated water injection, TSF pond water land application, treated water surface discharge, maintenance of the existing storm water diversion channels, and continued implementation of best management practices (BMPs). These activities are discusses in the following sections.

3.1 Disturbance and Reclamation

There was no new disturbance of wetland and upland areas at the Rock Creek Mine in 2011. The cumulative disturbed area, including disturbances prior to 2011, totals 424.71 acres with 20.07 upland acres reclaimed (table 3).

Table 3: Disturbed and Reclaimed Area

Year	Area (Acres)			
	Wetlands		Uplands	
	Disturbed	Replaced	Disturbed	Reclaimed
2008	0	0	42	5
Cumulative – End of 2008	241	0	139	5
2009	0.92	0	0.94	0
Cumulative – End of 2009	241.92	0	181.94	5
Net Disturbance – End of 2009	**241.92**		**176.94**	
2010	0.51	0	0.34	15.07
Cumulative – End of 2010	242.43	0	182.28	20.07
Net Disturbance – End of 2010	**242.43**		**162.21**	
2011	0	0	0	0
Cumulative – End of 2011	242.43	0	182.28	0
Net Disturbance – End of 2011	**242.43**		**162.21**	

3.2 Development Rock Stockpiles

Development rock from the Rock Creek Mine was used entirely for construction activities; no stockpiles were constructed in 2011.

3.3 Organic Stockpiles

No material was placed in or removed from organic stockpiles #1, #2, or #3 during 2011 (table 4). Material placed prior to 2011 will be used in future reclamation activities. Disturbed areas are shown by type and land ownership in figure 4.

Table 4: Rock Creek Organic Stockpile Volumes

Description	Units	Stockpile #1	Stockpile #2	Stockpile #3	Total
Total Capacity	m^3	1,225,000	185,000	640,000	2,050,000
Total Volume End of 2008	m^3	487,482	40,962	625,973	1,294,237
End of 2008 Capacity Remaining	m^3	737,518	180,962	14,207	755,763
	%	60%	2%	2%	37%
Volume Placed - 2009	m^3	30,351	0	1,719	32,070
Total Volume End of 2009	m^3	517,833	180,962	627,512	1,326,307
End of 2009 Capacity Remaining	m^3	707,167	4,038	12,488	723,693
	%	58%	2%	2%	35%
Volume Placed – 2010	m^3	0	0	0	0
Total Volume End of 2010	m^3	517,883	180,962	627,512	1,326,307
End of 2009 and 2010 Capacity Remaining	m^3	707,167	4,038	12,488	723,693
	%	58%	2%	2%	35%
Volume Placed - 2011	m^3	0	0	0	0
Total Volume End of 2011	m^3	517,883	180,962	627,512	1,326,307
End of 2011 Capacity Remaining	**m^3**	**707,167**	**4,038**	**12,488**	**723,693**
	%	**58%**	**2%**	**2%**	**35%**

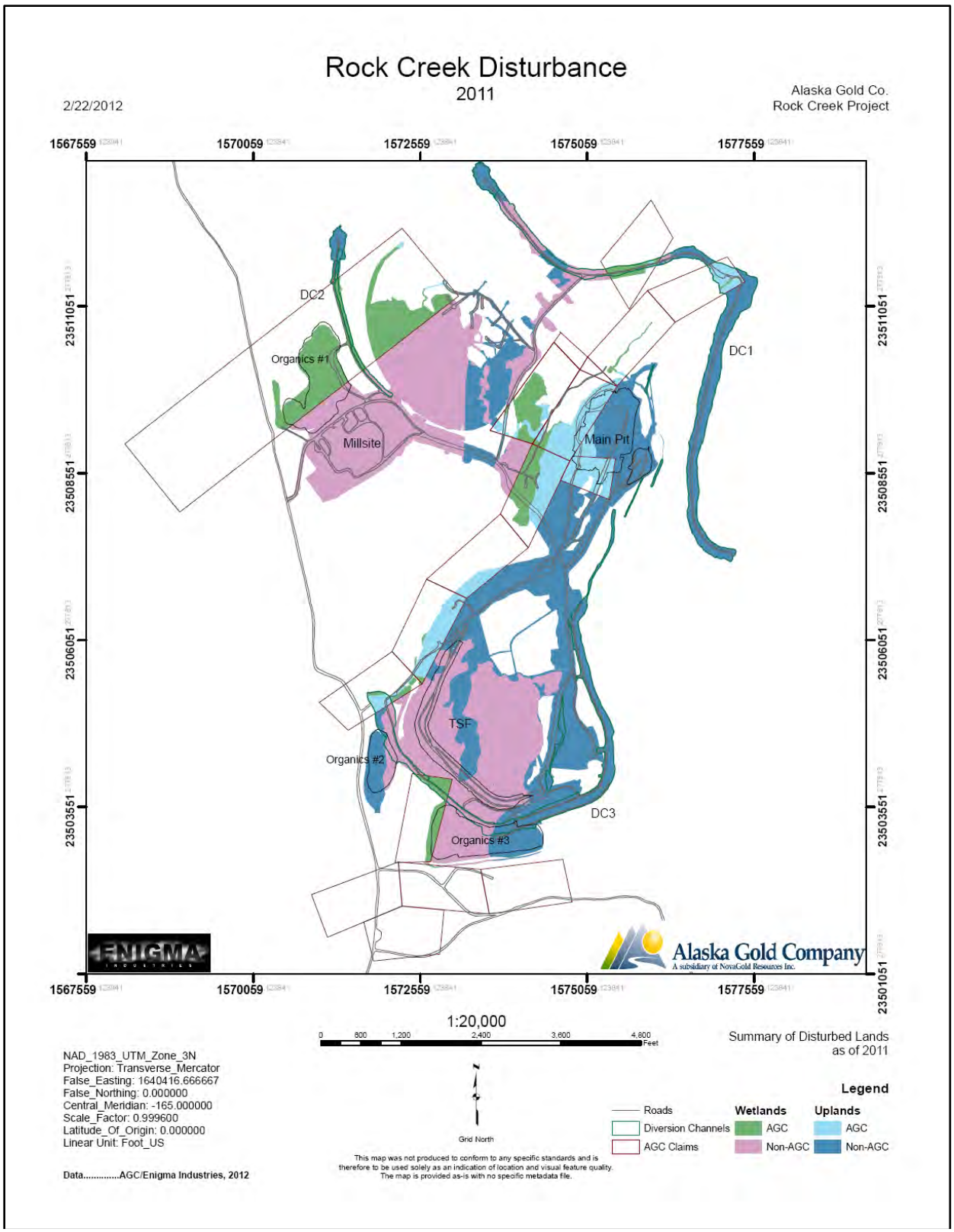

Figure 4: Rock Creek Disturbance Areas

3.4 Paste Tailings Storage Facility

ADNR issued a Certificate of Approval (No. AK00309) to AGC to operate the Rock Creek TSF dam on July 7, 2008. The State of Alaska suspended the Certificate in December 2008 when the Rock Creek Mine status was changed to Care and Maintenance. ADNR issued a Temporary Certificate of Approval (No. AK00309) to AGC to operate the TSF dam on December 31, 2009.

An annual Dam Safety Inspection was conducted between October 3 and October 4, 2011 by AMEC Earth and Environmental to satisfy a regulatory requirement established by the State of Alaska Department of Natural Resources, Division of Mining, Land & Water, Dam Safety and Construction Unit (Dam Safety).

The inspection included:

1. A detailed inspection of the embankment crest, abutments, downstream toe, the seepage collection system, and the diversion channels around the facility which included DC-3 and the temporary TSF diversion.
2. A photographic record of the inspection
3. A review of site records and documentation
4. Discussing the operations with site personnel

The inspection found that, from a dam safety perspective, the Rock Creek TSF is in satisfactory condition. The following recommendations were recommended to be considered during the on-going Care and Maintenance operations and monitoring of the facility.

1. Monitoring of the seepage collection system should continue. Flow rates and documentation of seepage water clarity should continue to be recorded.
2. Monitoring and inspections required in the current Monitoring Plan and the TSF Operation and Maintenance (O&M) Manual should be followed.
3. Monitoring of settlement monuments, inclinometers, piezometers and thermistors should continue. No new installation of instruments is recommended at this time.
4. Repair damaged liner identified during inspection. This is located at liner panels 80 and 169.
5. Remove rocks from upstream crest of embankment that could potentially roll down the slope and damage the liner. Rocks were noted near station 8+00.

Geotechnical data collected during 2011 did not indicate any significant settling or lateral movement of the TSF. On December 7, 2011, AGC submitted an application to DNR to remove/abandon the Rock Mine TSF dam in accordance with the proposed final closure plan. On February 10, 2012 AGC received from DNR a certificate authorizing abandonment of the dam and activities began immediately to breach the dam. Breaching is planned to be completed by spring 2012 break-up. Because of this, the suggested repairs described above were not completed and monitoring has generally been discontinued.

3.5 Solid Waste Landfill

On September 7, 2009 AGC developed an inert materials landfill as permitted under the WMP. AGC continued to place material into the landfill throughout 2011. As of December 31, 2010 Cell 1 was closed. Cell 2 was opened in June 2010 and closed in September 2010. Cell 3 was opened in September 2010 and closed in June 2011. Cell 4 was opened in June 2011 and remains open as the active dump location.

Items discarded to Cell 3 during 2011 include:

- Scrap wood and pallets
- Miscellaneous scrap building materials
- Triple rinsed plastic totes
- Scrap steel and bent pipe
- Miscellaneous scrap sewer and drain pipe
- Miscellaneous scrap sheet metal

Items discarded to Cell 4 during 2011 include:

- Scrap wood and pallets
- Scrap metal including damaged culverts, conduit, wire rope, and scrap building material
- Rubber hoses
- Triple rinsed plastic totes and buckets
- Tent tarp materials, liner, and plastic sheeting
- Worn steel tracks from equipment
- Miscellaneous construction debris

3.6 Inspections

AGC staff conducts weekly visual inspections of the TSF to identify any unusual conditions such as evidence of excessive deformation or crest cracking, embankment sloughing or deformation, erosion channel formation in the embankment slope, embankment toe erosion, and excessive seepage at the embankment toe or slope. Staff also record data from field monitoring instrumentation during the weekly inspection.

3.7 TSF Seepage Collection System

During 2009, AGC constructed a seepage collection system at the TSF dam's downstream toe consisting of flexible drain pipe backfilled with drain rock. The seepage collection sumps were lined with a geosynthetic clay liner (GCL), filled with drain rock and capped with GCL.

Water collected in the sump is conveyed by gravity to one of two collection sumps (Main and South). South sump water is pumped to the Main Sump through a 3-inch insulated, heat-traced high density polyethylene (HDPE) pipeline by a 7.5 horse-power (hp) submersible pump. Main Sump water is pumped by a 58 hp electric pump over the top of the TSF and back into the basin through a 6-inch heat-traced HDPE pipeline. 2011 sump flow data are presented in appendix D.

3.8 Land Application

ADEC issued a permit to dispose of non-domestic wastewater by land application to AGC on August 6, 2010. AGC land applied wastewater from the Main and South sumps to area A3 of the

Rock Creek Mine site (figure 5) using two Land Shark evaporator-sprayer units. The two Land Shark units were placed on a relatively flat bench approximately 2/3 up the A3 hillside. The larger unit emits a fine mist spray at a rate of 125 gpm while the smaller unit has a maximum capacity of 45 gpm. Each unit can rotate the spray direction 360 degrees.

AGC conducts Land Shark operations and monitoring in accordance with permit BMPs. The units and the spray field area were visually monitored twice daily at a minimum. Spray units were rotated as necessary to adjust the spray angle according to the wind speed and direction and if any significant deposition was observed. The AGC staff person conducting the visual inspection recorded the estimated wind speed and direction along with any findings regarding the piping, pumps, sprayers, and blower fans in a central log. This procedure was established to provide AGC staff with current information about any equipment malfunctions, such as broken pipes or power outages to the blower fans, and minimize the risk of uncontrolled runoff or discharge to the ditches and area streams.

For the 2011 season, land application began on June 10, 2011 and ceased October 15, 2011 when falling ambient temperatures led to accumulating snow in the spray field. Over 56 days of operation, the Land Shark units disposed of approximately 6,978,440 gallons of wastewater to the A3 area (table 5a and 5b).

In summary, the Land Shark units operated reliably and without any significant incident or breakdown.

Table 5a: Daily Land Application Rates (Large Sprayer Unit)

Date	Time of Operation (Hours)	Application Rate (GPM)	Volume Applied (Gallons)	Land Application Rate (Gallons per Acre)
6/10/2011	9.7	47	27,200	9,067 - 27,200
6/11/2011	5.5	89	29,370	9,790 - 29,370
6/13/2011	11.7	55	38,360	12,787 - 38,360
6/14/2011	24.0	80	115,210	38,403 - 115,210
6/15/2011	9.9	79	46,770	15,590 - 46,770
6/16/2011	6.5	115	44,810	14,937 - 44,810
6/17/2011	24.0	77	110,400	36,800 - 110,400
6/18/2011	24.0	77	111,280	37,093 - 111,280
6/19/2011	24.0	52	74,530	24,843 - 74,530
6/20/2011	7.5	70	31,410	10,470 - 31,410
6/20/2011	8.5	19	18,390	6,130 - 18,390
6/21/2011	10.0	37	22,180	7,393 - 22,180
6/22/2011	8.5	13	15,790	5,263 - 15,790
6/23/2011	24.0	48	69,270	23,090 - 69,270
6/24/2011	23.0	83	114,690	38,230 - 114,690
6/25/2011	24.0	79	114,060	38,020 - 114,060
6/26/2011	17.8	118	84,830	28,277 - 84,830
6/27/2011	5.5	82	27,020	9,007 - 27,020
6/28/2011	5.0	77	23,110	7,703 - 23,110
6/28/2011	7.5	88	39,650	13,217 - 39,650
6/29/2011	24.0	35	49,870	16,623 - 49,870

Table 5a: Daily Land Application Rates (Large Sprayer Unit)

Date	Time of Operation (Hours)	Application Rate (GPM)	Volume Applied (Gallons)	Land Application Rate (Gallons per Acre)
6/30/2011	24.0	40	58,110	19,370 - 58,110
7/2/2011	15.5	79	73,730	24,577 – 73,730
7/3/2011	13.0	97	75,800	25,267 – 75,800
7/4/2011	15.5	77	72,020	24,007 – 72,020
7/23/2011	16.7	95	95,640	31,880 – 95,640
7/25/2011	14.5	94	82,170	27,390 – 82,170
7/26/2011	24.0	94	135,520	45,173 – 135,520
7/27/2011	10.25	101	62,090	20,697 – 62,090
8/1/2011	18.0	85	91,660	30,553 – 91,660
8/2/2011	24.0	87	125,780	41,927 – 125,780
8/3/2011	13.5	90	72,940	24,313 – 72,940
8/19/2011	12.5	87	65,150	21,717 – 65,150
8/20/2011	24.0	87	125,580	41,860 – 125,580
8/21/2011	8.0	93	44,540	14,847 – 44,540
8/27/2011	9.0	92	49,780	16,593 – 49,780
8/28/2011	24.0	96	138,210	46,070 – 138,210
8/29/2011	12.5	91	68,080	22,693 – 68,080
9/5/2011	13.75	92	75,790	25,263 – 75,790
9/6/2011	24.0	95	136,310	45,437 – 136,310
9/7/2011	24.0	92	131,960	43,987 – 131,960
9/8/2011	24.0	88	127,310	42,437 – 127,310
9/15/2011	1.0	107	6,440	2,147 – 6,440
9/19/2011	14.75	80	70,600	23,533 – 70,600
9/20/2011	24.0	76	109,620	36,540 – 109,620
9/21/2011	24.0	67	96,510	32,170 – 96,510
9/22/2011	24.0	73	105,510	35,170 – 105,510
9/25/2011	8.0	67	32,170	10,723 – 32,170
9/26/2011	24.0	80	115,040	38,347 – 115,040
9/27/2011	18.5	79	88,140	29,380 – 88,140
9/28/2011	11.0	58	38,230	12,743 – 38,230
9/29/2011	21.5	30	38,320	12,773 – 38,320
9/30/2011	7.5	73	32,930	10,977 – 32,930
10/1/2011	8	70	33,740	11,247 – 33,740
10/5/2011	13.5	63	50,730	16,910 – 50,730
10/10/2011	4	52	12,500	4,167 – 12,500
10/14/2011	6	34	12,120	4,040 – 12,120
10/15/2011	5.5	41	13,410	4,470 – 13,410
		Total Gallons Applied	**3,972,380**	

Table 5b: Daily Land Application Rates (Small Sprayer Unit)

Date	Time of Operation (Hours)	Application Rate (GPM)	Volume Applied (Gallons)	Land Application Rate (Gallons per Acre)
6/10/2011	9.7	58	33,870	11,290 - 33,870

Table 5b: Daily Land Application Rates (Small Sprayer Unit)

Date	Time of Operation (Hours)	Application Rate (GPM)	Volume Applied (Gallons)	Land Application Rate (Gallons per Acre)
6/11/2011	5.5	24	34,200	11,400 - 34,200
6/13/2011	11.7	60	42,030	14,010 - 42,030
6/14/2011	24.0	48	69,670	23,223 - 69,670
6/15/2011	9.9	50	30,010	10,003 - 30,010
6/16/2011	6.5	65	25,480	8,493 - 25,480
6/17/2011	24.0	43	61,220	20,407 - 61,220
6/18/2011	24.0	43	61,350	20,450 - 61,350
6/19/2011	24.0	37	53,480	17,827 - 53,480
6/20/2011	7.5	76	34,110	11,370 - 34,110
6/20/2011	8.5	34	17,170	5,723 - 17,170
6/21/2011	10.0	29	17,530	5,843 - 17,530
6/22/2011	8.5	18	9,270	3,090 - 9,270
6/23/2011	24.0	25	35,920	11,973 - 35,920
6/24/2011	23.0	50	68,460	22,820 - 68,460
6/25/2011	24.0	47	67,340	22,447 - 67,340
6/26/2011	17.8	46	49,100	16,367 - 49,100
6/27/2011	5.5	47	15,550	5,183 - 15,550
6/28/2011	5.0	38	11,260	3,753 - 11,260
6/28/2011	7.5	33	15,000	5,000 - 15,000
6/29/2011	24.0	42	60,230	20,077 - 60,230
6/30/2011	24.0	41	59,050	19,683 - 59,050
7/2/2011	15.5	69	64,490	21,497 – 64,490
7/3/2011	13.0	82	64,190	21,397 – 64,190
7/4/2011	15.5	66	61,210	20,403 – 61,210
7/22/2011	16.7	79	78,980	26,327 – 78,980
7/25/2011	14.5	82	71,170	23,723 – 71,170
7/26/2011	24.0	82	118,380	39,460 – 118,380
7/27/2011	10.25	88	54,170	18,057 – 54,170
8/1/2011	18.0	73	78,450	26,150 – 78,450
8/2/2011	24.0	75	107,390	35,797 – 107,390
8/3/2011	13.5	52	42,190	14,063 – 42,190
8/19/2011	12.5	72	53,630	17,877 – 55,630
8/20/2011	24.0	72	103,470	34,490 – 103,470
8/21/2011	8.0	76	36,580	12,193 – 36,580
8/27/2011	9.0	76	41,170	13,723 – 41,170
8/28/2011	24.0	80	114,970	38,323 – 114,970
8/29/2011	12.5	75	56,360	18,787 – 56,360
9/5/2011	13.75	72	59,760	19,920 – 59,760
9/6/2011	24.0	75	108,010	36,003 – 108,010
9/7/2011	24.0	73	104,460	34,820 – 104,460
9/8/2011	24.0	69	99,310	33,103 – 99,310
9/15/2011	1.0	72	4,300	1,433 – 4,300
9/19/2011	14.75	60	53,430	17,810 – 53,430
9/20/2011	24.0	58	82,960	27,653 – 82,960
9/21/2011	24.0	53	76,160	25,387 – 76,160

Table 5b: Daily Land Application Rates (Small Sprayer Unit)

Date	Time of Operation (Hours)	Application Rate (GPM)	Volume Applied (Gallons)	Land Application Rate (Gallons per Acre)
9/22/2011	24.0	57	81,630	27,210 – 81,630
9/25/2011	8.0	51	24,460	8,153 – 24,460
9/26/2011	24.0	60	86,300	28,766 – 86,300
9/27/2011	18.5	59	65,470	21,823 – 65,470
9/28/2011	11.0	42	27,930	9,310 – 27,930
9/29/2011	8.5	59	30,040	10,013 – 30,040
9/30/2011	7.5	57	25,640	8,547 – 25,640
10/1/2011	8	52	24,750	8,250 – 24,750
10/5/2011	11.5	46	32,030	10,677 – 32,030
10/10/2011	4	3	740	247 - 740
10/14/2011	6	1	310	103 - 310
10/15/2011	5.5	1	270	90 - 270
		Total Gallons Applied	**3,006,060**	

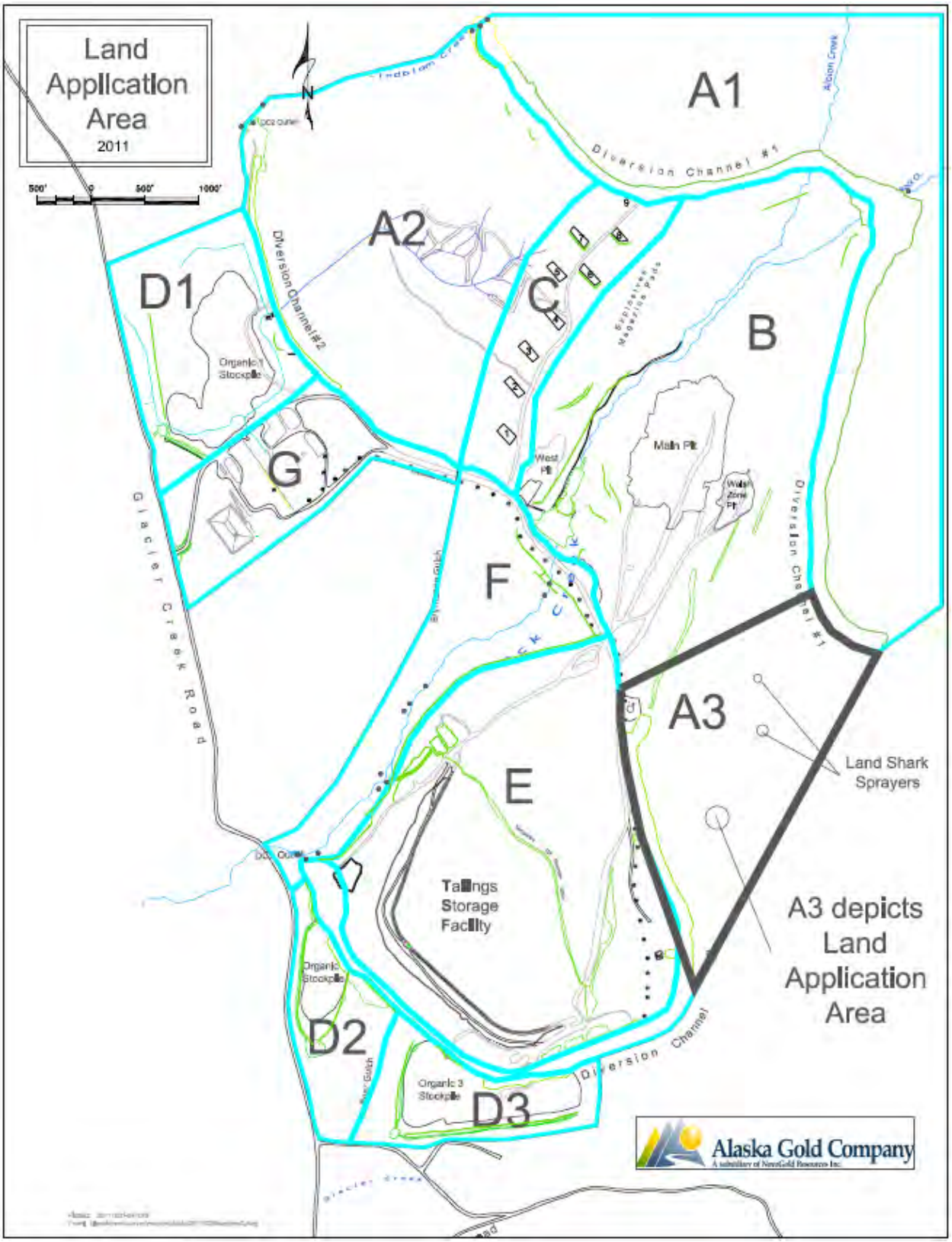

Figure 5: Land Application Area

3.9 Recycle Water Pond

The RWP is a synthetically lined retention pond designed to capture runoff from the plant site and TSF decant water. Over time, leaks were detected in the primary liner from small punctures. Rather than remove and reinstall the primary liner, AGC installed a secondary liner as an overlayment, with a leak collection and recovery system (LCRS) placed between the liners. An additional synthetic underliner is installed below the primary and secondary liners. The interstitial water volume (between the primary and secondary liners) from the LCRS is continuously pumped back to the RWP, with total flow volumes recorded each day (appendix B).

AGC conducts daily visual inspections of the RWP and liner systems, and routinely samples contained water for cyanide (total and WAD). Data show that water from the RWP, as discussed in Section 8.1.2, is not adversely impacting groundwater quality in the immediate vicinity of the RWP.

No repair or other related work was completed at the RWP during 2011. Final closure plans for the RWP are being prepared with planned submittal to the State as an amendment to the final closure plan during the first quarter of 2012. After State approval of the amendment, it is expected that closure of the RWP will occur during summer 2012.

4.0 Storm Water Management

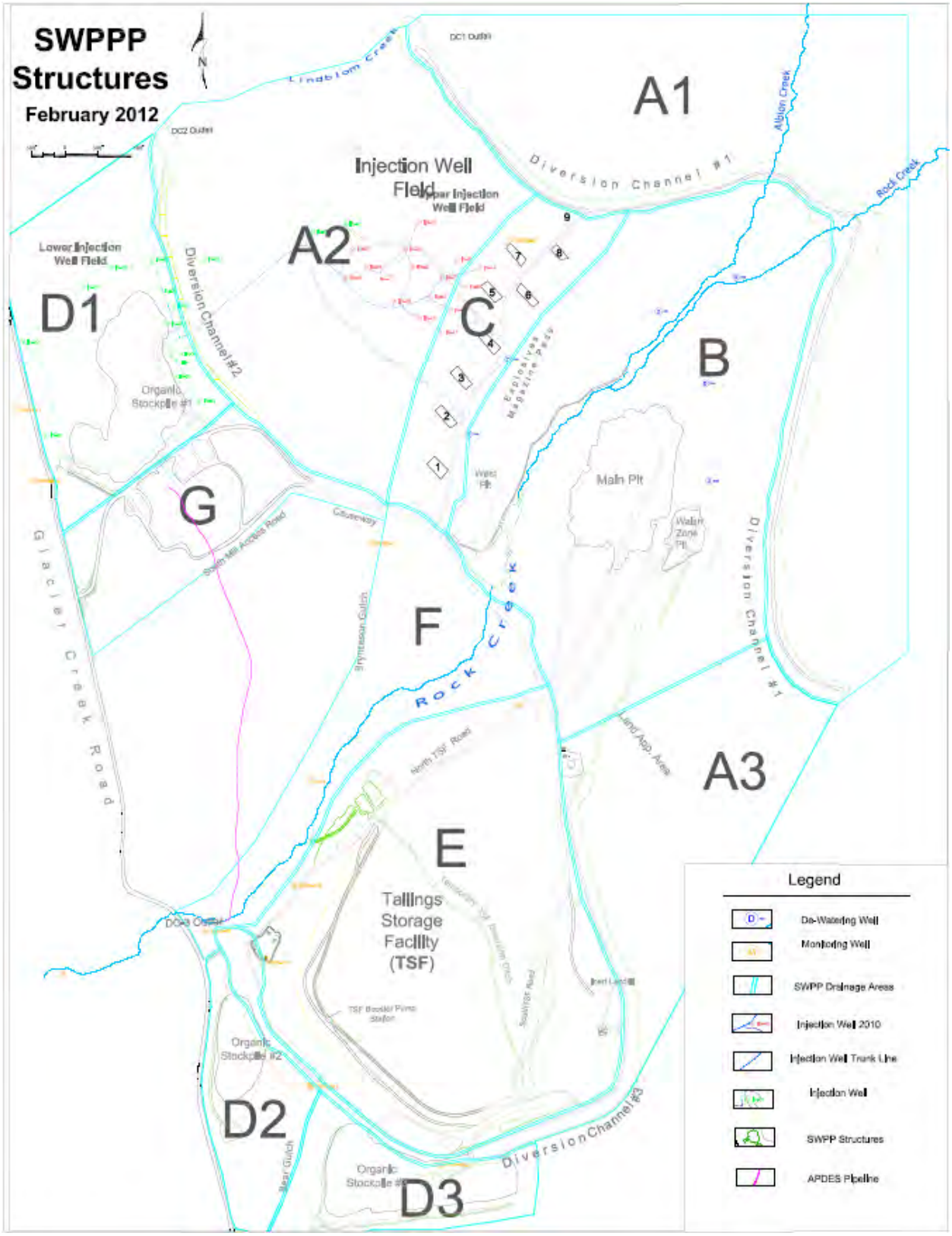

Figure 6: Rock Creek Mine SWPPP Structures

Turbidity levels in Rock and Lindblom Creek were lower during the 2011 spring break-up period than in 2008, 2009, and 2010, demonstrating the continued effectiveness of implemented BMPs and sediment controls.

AGC conducted routine BMP maintenance, erosion control, and re-seeding projects during 2011 including:

- Diversion channel #1 (DC-1) maintenance of the intercept work completed in 2010, minor liner repair over the breach section, and select re-seeding of poor growth areas, berms, and intercept project area.
- Diversion channel #2 (DC-2) outfall maintenance to repair minor undercutting, cleanout of sediment buildup in ponds, and hydro-seeding around outfall repair areas.
- Diversion channel #3 (DC-3) maintenance of minor embankment erosion, outfall maintenance of rock rundown and silt curtain, and spot speeding of touch up areas.
- Cleaned out sediment and ice buildup in sediment ponds around the site to ensure continued effectiveness.
- Rock lined select sections of smaller ditches to stabilize permafrost thawed areas prone to embankment sloughing.
- Improved contouring of broad areas above temporary TSF diversion settling ponds and below inert waste landfill to improve runoff and erosion control.
- Improved the above pit "canyon" drainage by re-contouring, adding rock rundowns, and re-seeding the upper area.
- Completed site wide re-seeding projects and erosion repair as required.

During the fall of 2010, natural surface flows from upper Rock Creek and Albion Creek, which were previously diverted to DC-1, were restored to their respective natural drainage channels through constructed rock lined breaches through DC-1. On the afternoon of May 20, 2011, during peak spring breakup flows, mine staff noted that the high flows appeared to be overwhelming the twin 48-inch culvert pipes that are in place along Rock Creek at the causeway causing water to pond on the upstream side of the causeway. In order to alleviate possible impacts from rising water upstream of the causeway, mine staff made the decision to return Albion Creek and Rock Creek flows to DC-1 by removing berms that were placed in the DC-1 channel as part of the 2010 intercept construction. Flow at both intercepts was managed such that approximately 50% of the upstream flow was diverted to the respective natural drainage and the remaining 50% of flow was diverted to DC-1. To assist in relieving the rising water level upstream of the causeway culverts, two pumps were used to pump flows from upstream of the causeway culverts to Brynteson Gulch which reports to Rock Creek downstream of the causeway. AGC was able to effectively manage rising water levels through these procedures and have plans in place to implement similar controls during the 2012 spring breakup period.

5.0 Water Treatment Plant

AGC continued to operate the WTP throughout 2011. During this time several modifications to the WTP were completed. The most significant modification was the addition of the surface discharge line which allowed AGC to increase plant throughput and decrease the elevation of the

TSF. In order to meet the surface discharge limits and toxicity testing requirements set forth in the APDES permit, a sodium thiosulfate injection system along with acid injection system were installed to control discharge pH and chlorine. Modifications to the WTP in 2011 include:

- TSF to WTP line reroute to increase plant feed and output above 400 gpm
- APDES discharge line constructed to increase discharge capacity above 400 gpm
- Thiosulfate injection system installed for chlorine destruct of surface discharge effluent only
- Acid injection system installed to reduce pH of surface discharge effluent only
- Treated CIL water pipeline to WTP for CIL blending (planned for summer 2012)
- TSF to WTP feed reroute across Rock Creek
- RWP treatment system installed
- Redirected the RPW-02 and underliner directly to the WTP inlet

WTP Flow data for 2011 are presented in appendix E.

6.0 Injection Well Field

The Rock Creek Mine IWF is operated as authorized by UIC Permit No. AK-5X27-001-A. The IWF is also regulated by ADEC WMP No. 2003-DB0051, which incorporates many of the same conditions as the UIC permit. To reduce the water elevation behind the TSF dam to an acceptable level, water is pumped from the TSF, treated to remove arsenic and antimony, and discharged through the IWF. ADEC authorized AGC to commence underground injection on May 15, 2009.

After the plugging and abandonment of Well #25 in September, 2010, there are 29 permitted wells in the injection well system. Of those 29, 26 are available for injection (Wells 3 and 23 have never been operated or even connected to the pipeline and well 45 has shown signs that the annular seal is failing and is not being used). From January through May, the IWF operated intermittently at a reduced rate because of low water levels in the TSF. Beginning in May 2011, the system began operating continuously at an average rate of approximately 292 gpm. The injection rate history is graphically represented in figure 7. At this injection rate and new surface water discharge, AGC was able to effectively lower the water levels contained in the TSF. Note that from August through November 2011 the IWF and the surface water discharge were generally used concurrently to manage treated water.

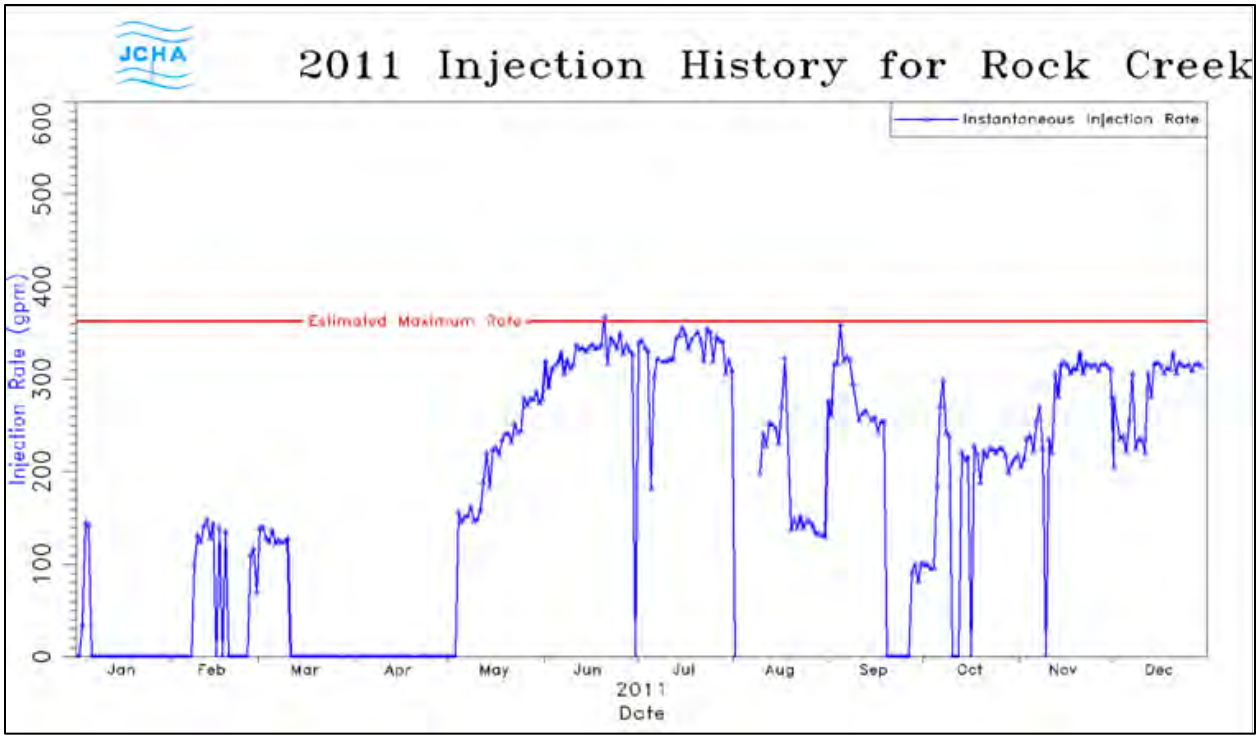

Figure 7: Injection Rate History

The estimated maximum injection rate for the 26 wells is 363 gpm. Various wells may be taken out of service for various reasons; including, for maintenance, when injection pressures are above 50 psi, because the well head is frozen, or the supply line is frozen. These conditions occur more frequently in the winter when conditions make maintenance more difficult. The well field was constructed with redundant wells. Wells that were unavailable at the end of the 2011 season are shown in table 6 and a summary of injection well failures during 2011 are shown in table 7.

Table 6: Unavailable Injection Wells

Well ID	Average Injection Rate (gpm)	Comments
1	5.4	Well header broken, last used 12/1/2011
5	7.4	Well head leaking, last used 10/25/2011
22	6.0	No feed line, last used 10/6/2011
24	N/A	Injection rate < 1 gpm, not used in 2011
29	8.7	Well header frozen, last used 12/1/2011
32	N/A	No feed line, not used in 2011
48	8.0	Well head leaking, last used 12/2/2011
Total	35.5	Total injection capacity out of service at the end of 2011

With these wells out of service, the available injection capacity was approximately 328 gpm at the end of 2011 which is sufficient to meet the anticipated demand for injection.

Table 7: Injection Well leak/failure Summary

Date	Well ID	Comments
2/2/2011	47	250 gallons of groundwater (artesian); caused by packer failure

2/27/2011	28	1,200 gallons of treated water; caused by valve left open after maintenance
3/10/2011	5	Un-quantified amount of treated water; caused by failed gasket at well head
5/14/2011	2	300 gallons of treated water; caused by failed gasket at well head
11/5/2011	48	3,840 gallons of treated water; caused by cracked totalizer on feed line

In all cases, AGC responded promptly to the leaks/failures and none of the leaked water caused a release to surface water.

Other activities performed during 2011 included:

- Maintained an online database to store daily well field operational data, including injection rates, pressures, water levels, and water quality data. This information is shared in real time with AGC's contractors to better facilitate monitoring of IWF performance.

- Managed the injection pattern (injection rates for each well) using a MODFLOW-based model of the IWF to minimize head increases in the injection zone. Modeled injection well pressure zones are shown in figure 8.

- Used hydrochloric acid (HCl) to attempt to rehabilitate well 35. Approximately 25 feet of scale was observed in well 25. The HCl was pumped into 360 feet of 1" diameter PVC threaded pipe, so that the acid would be introduced at the bottom of the well, where the scale would be interfering with the flow of water through the screen and surrounding sand pack. The well was purged and tested. HCl treatment was also tested in a second well. Based on the results, use of HCl to treat the wells is not effective.

A spreadsheet of daily recorded injection well data including packer inflation pressure, injection pressure, instantaneous injection rate, and totalizer readings is provided as an attachment to this report. Monthly injection rate tables are provided in appendix C.

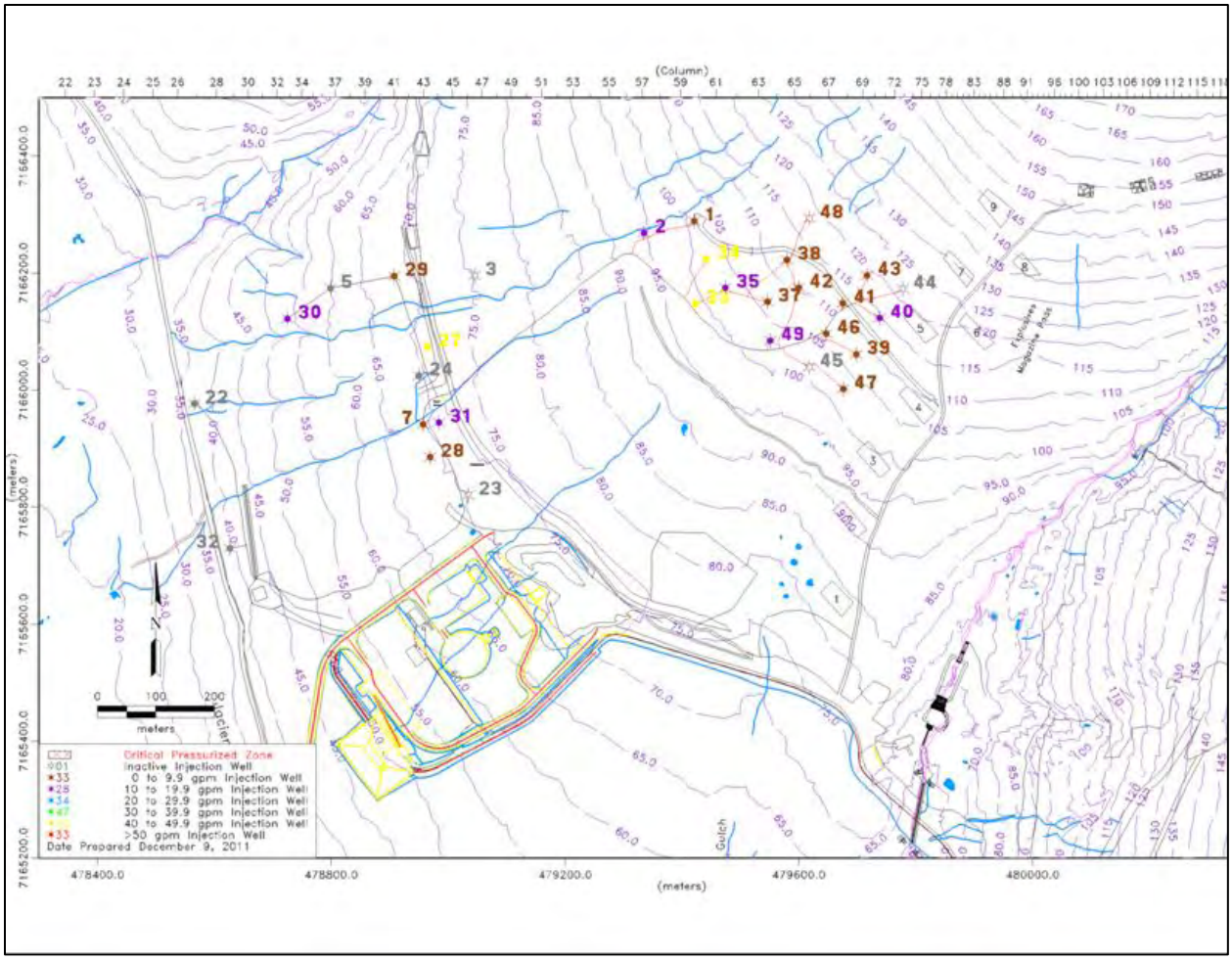

Figure 8: IWF Pressure Zones

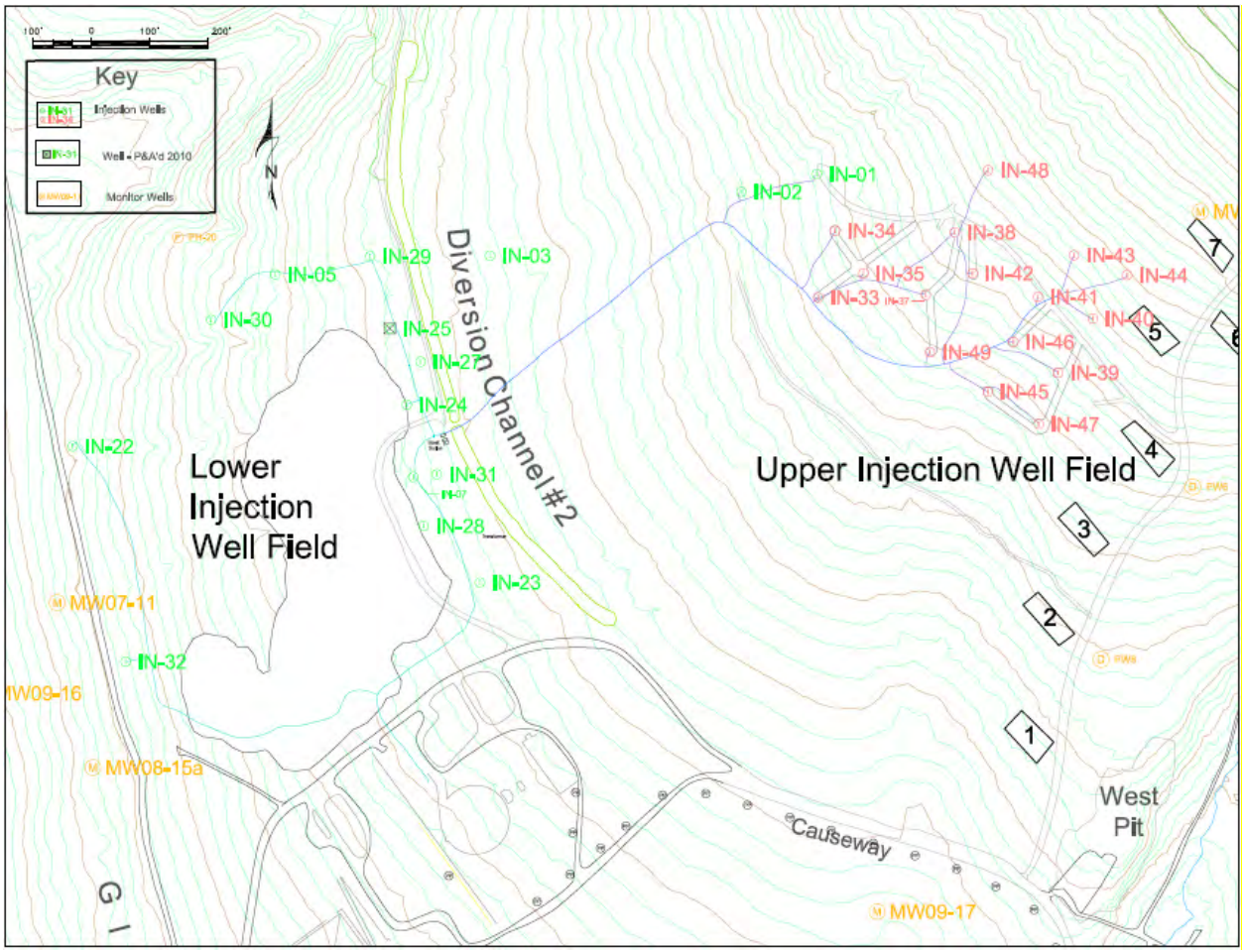

Figure 9: Rock Creek Mine IWF Map

7.0 Reportable Spills

There were four reportable spills at the Rock Creek Mine in 2011 (table 8). Spilled substances were related to construction and maintenance activities, and included hydraulic oil, synthetic gear oil, and used oil. All spills were reported to DEC following spill reporting requirements. All spills were cleaned up immediately.

Table 8: Reportable Spills

Item Spilled	Date	Potential Responsible Party	Location	Quantity	Cause
Used Oil	2/22/2011	Alaska Gold Company	Rock Creek	120 gallons	Failed valve on used oil burner; spill confined to secondary containment
Hydraulic Oil	4/2/2011	Alaska Gold Company	Rock Creek	9 gallons	Hydraulic line failed on 14G grader.
Hydraulic Oil	4/28/2011	Alaska Gold Company	Rock Creek	5 gallons	Failed hydraulic line on Hitachi 270 excavator.
Synthetic Gear Oil	8/27/2011	Alaska Gold Company	Rock Creek	7 gallons	55 gallon drum spilled in secondary containment; small hole in secondary containment allowed release of product

8.0 Monitoring (Analytical)

Environmental monitoring of water sources, development rock, and paste tailings is conducted by AGC as specified by permit requirements and following the current Monitoring Plan (November 2008) and Final TCP (Revised Version – April 26, 2010). During the Care and Maintenance period, analytical monitoring has been primarily focused on water sources. There are no development rock stockpiles at the Rock Creek facility and no paste tailings are generated during Care and Maintenance that require monitoring.

Water quality monitoring requirements and effluent limitations are specified in WMP 2003-DB0051, UIC Permit AK-5X27-001-A, LAP 2010DB0011, and APDES Permit AK0053627. The analytical monitoring program for water is divided into four separate categories: contained, ground, surface, and treated water. Each category is discussed in more detail below. In addition to required sampling events, AGC collects additional water samples not subject to specific compliance requirements. These additional samples include: multiple water samples from various points in the WTP to optimize performance; pit lake water to characterize water chemistry for potential future treatment and disposal; CIL tank process water to determine appropriate treatment methods; additional contained water samples to predict and account for changing WTP influent water chemistry; and groundwater sampling below the main pit and RWP. The additional data is available for review upon request.

With the exception of some conventional parameters analyzed in the field by AGC staff (e.g., pH, temperature, turbidity, and chlorine), all water chemistry samples are analyzed by a contract laboratory (SGS North America Inc.) in Anchorage for the pollutants listed in table 9.

Analytical data for samples collected from Rock Creek and Big Hurrah monitoring locations are reported in appendices A1–A30. These appendices are abridged to display only data with applicable water quality standards or permit limits, and are further limited to parameters for which at least one detectable result was observed during 2011. Complete analytical data and lab reports are available from AGC. Water chemistry data spreadsheets for complete results from Rock Creek 2011 compliance sampling are provided as an attachment to this report.

Table 9: Water Chemistry Sampling Parameters

Parameter	Ground Water WMP/TCP	Surface Water WMP/TCP	Surface Water APDES Permit	Contained Water WMP/TCP	Treated Water UIC Permit	Treated Water APDES Permit
Aluminum*	X	X	X	X	X	X
Antimony*	X	X	X	X	X	X
Arsenic*	X	X	X	X	X	X
Barium*	X	X	X	X	X	X
Beryllium*	X	X	X	X	X	X
Cadmium*	X	X	X	X	X	X
Calcium*	X	X	X	X	X	X
Chromium*	X	X	X	X	X	X
Cobalt*	X	X	X	X	X	X
Copper*	X	X	X	X	X	X
Iron*	X	X	X	X	X	X
Lead*	X	X	X	X	X	X
Magnesium*	X	X	X	X	X	X
Manganese*	X	X	X	X	X	X
Molybdenum*	X	X	X	X	X	X
Nickel*	X	X	X	X	X	X
Phosphorus*	X	X	X	X	X	X
Potassium*	X	X	X	X	X	X
Selenium*	X	X	X	X	X	X
Silicon*	X	X	X	X	X	X
Silver*	X	X	X	X	X	X
Sodium*	X	X	X	X	X	X
Strontium*	X	X	X	X	X	X
Thallium*	X	X	X	X	X	X
Tin*	X	X	X	X	X	X
Titanium*	X	X	X	X	X	X
Vanadium*	X	X	X	X	X	X
Zinc*	X	X	X	X	X	X
pH**	X	X	X	X	X	X
Conductivity	X	X	X	X	X	X
Total Dissolved Solids	X	X	X	X	X	X
Alkalinity	X	X	X	X	X	X
Ammonia-N	X	X		X		
Chloride	X	X	X	X	X	X
Fluoride	X	X	X	X	X	X
Sulfate	X	X	X	X	X	X
Sulfide	X					
Cyanide (total)	X	X		X	X	
Cyanide (WAD)	X	X	X	X	X	X
Mercury	X	X	X	X		X
Total Suspended Solids	X	X	X	X		X
Nitrate/Nitrite-N	X	X		X	X	

Table 9: Water Chemistry Sampling Parameters

Parameter	Ground Water WMP/TCP	Surface Water WMP/TCP	Surface Water APDES Permit	Contained Water WMP/TCP	Treated Water UIC Permit	Treated Water APDES Permit
Chlorine**			X			X
Chronic Whole Effluent Toxicity (WET)						X

*Metals analyzed for total and dissolved concentrations,**Chlorine and pH are measured on-site due to short analytical holding times for these parameters

8.1 Contained Water

Contained water sampling is conducted on a quarterly basis and includes sampling of the TSF Pond, RWP, South Sump, Main Sump, Main Pit Lake, and RWP Underliner (table 10). The TSF Pond, South Sump, and Main Sump samples are used to monitor water quality in the TSF water management system while the RWP and RWP Underliner samples are used to evaluate the integrity of the RWP system. As noted above, AGC is not required to monitor the Main Pit Lake. Main Pit Lake samples are only collected when the water surface is ice free.

There are no contained water systems at the Big Hurrah site.

Table 10: Contained Water Sampling Locations

Sample ID	Collection Location Summer	Collection Location Winter
TSF Pond	Directly from TSF pond when unfrozen	Port on WTP influent line prior to untreated water tank
RWP	Port on recirculation loop above pond culverts	Port on recirculation loop above pond culverts
RWP Underliner	Port on recirculation loop above pond culverts	Port on recirculation loop above pond culverts
South Sump	Directly from sump culvert using bailer	Directly from sump culvert using bailer
Main Sump	Directly from sump culvert using bailer	If covered – from port on TSF return line in TSF pump conex
Main Pit Lake	Directly from main pit lake	Not sampled when ice covered

8.1.1 Tailings Storage Facility

The TSF Pond is sampled quarterly. Under ice-free conditions, samples are collected directly from the TSF Pond. During colder months the pond surface is frozen over, and the samples were collected from a port on the WTP influent line just prior to the untreated water tank. Samples collected from the TSF are not subject to limitations in the WMP. The data have been used primarily to evaluate trends in the influent concentration to the WTP in order to plan for any necessary operational changes to the WTP processes.

Analytical data for the TSF pond monitoring samples is reported in appendix A1.

8.1.2 Recycle Water Pond

Water from the RWP and RWP Underliner are sampled quarterly. RWP samples are collected from ports on the recirculation loop immediately above the pond culverts. Samples are collected

from the RWP Underliner pump to determine if any RWP water is reaching groundwater through breaches in the primary and secondary liners. The LCRS installed between the primary and secondary liners is designed to collect small leakage volumes from between the liners and pump it back to the RWP before reaching the RWP Underliner. The RWP Underliner was not sampled in the first quarter of 2011 because it was not accessible due to snow drift buildup.

Water contained in the RWP may not exceed WAD cyanide levels of 25 mg/L for any one sample, nor may the 90th percentile of all samples exceed 10 mg/L (WMP Section 1.2.4). All RWP samples showed WAD cyanide levels below permit requirements. Samples collected from the RWP Underliner were also well below the permit limits. A comparison of RWP and RWP Underliner analytical data demonstrates that RWP water is not breaching the liner system or adversely impacting groundwater quality.

Analytical data for RWP and RWP Underliner monitoring samples are reported in appendices A2 and A3.

8.1.3 TSF Seepage Collection System

The TSF seepage collection system includes the South and Main sumps below the TSF dam. Throughout 2011, water was recycled to the TSF dam directly from the Main Sump only; water from the South Sump is pumped to the Main Sump. Both sumps are sampled on a quarterly basis directly from the sump culverts using bailers. During winter months, the Main Sump culvert may become inaccessible due to snow buildup, and the sample has been collected from a port in the pump-back line located in the TSF pump conex on the crest of the dam.

Water recycled to the TSF may not exceed a WAD cyanide level of 25 mg/L for any one sample, nor may the 90th percentile of all samples exceed 10 mg/L (WMP Section 1.2.4). In 2011, all water samples collected from the Main Sump had non-detectable results or were below lab reporting limits for WAD cyanide (figure A4-27 in appendix A4). There are no other permit limits that apply to the sump water.

Analytical data for Main and South sump monitoring samples are reported in appendices A4 and A5. This data is primarily used to monitor input to the TSF and project potential changes in TSF water chemistry that could affect WTP treatment performance.

8.1.4 Pit Lake

There have been no mining activities in the main pit during the temporary closure period, and the pit is not actively dewatered while in Care and Maintenance. The main pit has been allowed to fill with storm water runoff creating the pit lake. There are no requirements to monitor pit lake water chemistry, but AGC has continued to collect quarterly samples from the pit lake during periods of open water in order to continue documenting the quality of storm water that comes in contact with the pit surfaces.

Analytical data for Main Pit Lake monitoring samples are reported in appendix A6.

8.2 Surface Water

Surface water at the Rock Creek Mine is sampled monthly when flow is present. In addition, 3 regional surface water samples are collected in the vicinity of the Rock Creek Mine each quarter during periods of open flow.

There is no requirement in the final TCP (revised April 26, 2010) to collect surface water samples at the Big Hurrah site. AGC has elected to collect annual surface water samples at the Big Hurrah site in order to document background water chemistry trends.

8.2.1 Rock Creek Mine

Monthly surface water samples at Rock Creek mine are collected at the outfall of diversion channel 3 (DC-3). DC-3 collects stormwater runoff from undisturbed areas and conveys runoff away from any active mining areas. Three samples are taken; above the outfall, from the discharge, and below the discharge (within 20 feet). Regional surface water samples are also collected quarterly on the Snake River and on Glacier Creek in order to monitor water quality below the mine site. Additional monthly samples are collected from Rock Creek and the Snake River when actively discharging to Rock Creek in order to monitor impacts to water quality, if any, from surface discharge of treated waste water at APDES outfall 001. Rock Creek surface water sample locations are listed in table 11.

During winter months, Rock Creek is covered in snow and overflow ice. AGC environmental staff checks for water flow at the sample locations by digging holes through the snow and ice until the gravel stream bottom is reached. There were no surface water samples collected from January through April and again in December 2011 as no flow was present on the stream bed. Due to scheduling errors the DC-3 discharge sample point was not collected in August and the September Rock Creek surface water samples were not collected until the first week of October. The regional, quarterly surface water sample was not collected on Glacier Creek during the fourth quarter because there was no open flow.

Table 11: Surface Water Sampling Locations at Rock Creek

Sample ID	Location	Description
SABC	Snake River above Balto Creek	Snake River above mine site (APDES monitoring site)
SRTB	Snake River	Snake River at Teller Bridge (APDES monitoring site)
GLAC	Glacier Creek	Glacier Creek at Glacier Creek Bridge
DC3-Upstream (DC3-A)	Rock Creek	Upstream of the DC-3 outlet/APDES outfall
DC3-Discharge (DC3-B)	Rock Creek	At the discharge of DC-3 to Rock Creek/APDES outfall to Rock Creek
DC3-Downstream (DC3-C)	Rock Creek	Downstream of the DC-3 outlet/APDES outfall

All analytical data collected from the regional sample locations (SABC, SRTB, and GLAC) in 2011 showed pollutants below Alaska Water Quality Standards (AWQS).

During 2011, analytical samples collected from locations within Rock Creek consistently exceeded AWQS for total arsenic. Sampling results also showed isolated exceedences for total

aluminum, total iron, total manganese, sulfate, and TDS in some sample points. A summary of observed exceedences is presented in table 12. AGC notes that elevated levels observed in upstream locations demonstrate naturally high background levels present in Rock Creek. Exceedences observed at the discharge point for aluminum, arsenic, iron, sulfate, and TDS did not impact downstream water quality.

Sampling on Rock Creek is intended to monitor impacts to water quality from both mining activities and surface discharge of treated waste water. It is important to note that DC-3 collects stormwater runoff from undisturbed areas and conveys runoff away from active mining areas. During active discharge to Rock Creek there were no water quality exceedences in WTP effluent with the exception of TDS. There were no exceedences for TDS in downstream samples on Rock Creek.

Table 12: Rock Creek Surface Water Monitoring Summary

Parameter	DC3-Upstream	DC3-Discharge	DC3-Downstream
	# AWQS Exceedences	# AWQS Exceedences	# AWQS Exceedences
Aluminum (total)	1	2	1
Arsenic (total)	8	6	8
Iron (total)	-	1	-
Manganese (total)	1	-	-
Sulfate	-	2	-
TDS	-	1	-

Arsenic

Arsenic is naturally present at elevated levels throughout the Rock Creek drainage, as demonstrated by the fact that all Rock Creek samples collected during 2011 showed concentrations above AWQS (10µg/L). The total arsenic values in the upstream sample ranged from 57.4µg/L to 98.1µg/L and the downstream sample ranged from 51.9µg/L to 69.2µg/L. SRK Consulting conducted a natural condition analysis verifying the ubiquitous nature of arsenic in the Rock Creek vicinity (SRK 2008). AGC notes that there are no trends showing that the mine is causing any elevation of arsenic levels beyond naturally occurring conditions in the area.

AGC reported arsenic exceedences to ADEC by memoranda dated August 11, August 16, October 14, October 27, December 2, and December 6, 2011 in which background arsenic levels were discussed.

Aluminum

Exceedences of AWQS for total aluminum in the May 29, 2011 samples occurred in both stream samples (ranging from 208µg/L to 228µg/L) and the discharge sample (628µg/L). A single exceedence of total aluminum in the upstream sample was also observed in the October 22, 2011 sample (226µg/L).

Review of the data shows total aluminum values are much greater than dissolved metal values indicating that suspended solids contributed to the exceedence (table 13). When aluminum exceedences are observed, corresponding total suspended solids (TSS) are 2 to 4 times higher

than average values in the stream and discharge samples (table 13). Increases in TSS are probably related to elevated stream turbidity during spring runoff and fall storm events.

Table 13: Comparison of total/dissolved Aluminum and TSS Values

Date	Sample ID	Total Aluminum (µg/L)	Dissolved Aluminum (µg/L)	TSS (mg/L)
5/29/2011	DC3-Upstream	208	14.2(J)	10.3
5/29/2011	DC3-Discharge	628	22.7	16.1
5/29/2011	DC3-Downstream	228	15(J)	9.22
10/22/2011	DC3-Upstream	226	ND	8.12

ND = indicates the analyte is not detected; (J) = the quantitation is an estimation
TSS values range from not-detected to 3.74mg/L when no aluminum exceedences are observed

AGC reported aluminum exceedences to ADEC by memoranda dated August 11 and December 2, 2011 in which seasonal fluctuations and elevated TSS were discussed.

Iron and Manganese

A single exceedence of AWQS for total iron (1090µg/L) was observed in the DC-3 discharge sample collected on May 29, 2011, and for total manganese (53.9µg/L) in the DC-3 upstream sample collected on October 22, 2011. Neither sample was significantly above AWQS, and exceedences were not repeated in later sampling events.

AGC reported iron and manganese exceedences to ADEC by memoranda dated August 11 and December 2, 2011.

Sulfate and TDS

The results for sulfate and TDS in the DC-3 outfall discharge show exceedences of AWQS for samples collected on October 5, 2011. Review of past data indicates that both sulfate and TDS experience seasonal fluctuations approaching or exceeding AWQS during September and October later returning to lower levels (figure 10 and 11). The exceedences at the discharge location are not significantly above AWQS and are not contributing to downstream exceedences.

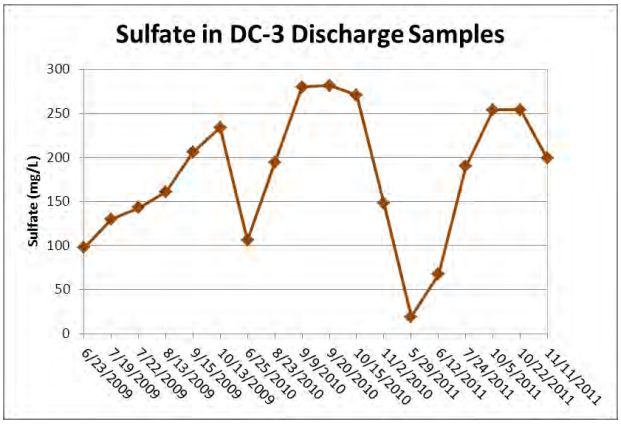

Figure 10: Sulfate in DC-3 Discharge

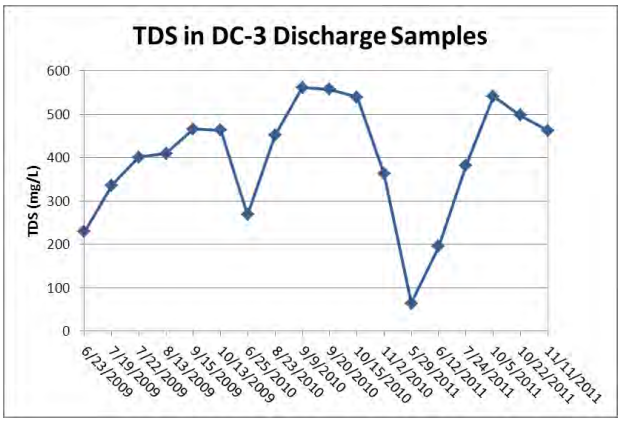

Figure 11: TDS in DC-3 Discharge

AGC reported sulfate and TDS exceedences to ADEC by memoranda dated October 27, 2011 in which seasonal fluctuations were discussed.

Analytical data for samples collected from Rock Creek surface water locations are reported in appendices A7-A12.

8.2.2 Big Hurrah

Surface water is monitored yearly at 6 locations on and around the Big Hurrah site (table 14). Complete analytical data and lab reports of all samples collected from Big Hurrah surface water locations are available on file at the Rock Creek Mine Environmental Department.

Table 14: Surface Water Sampling Locations at Big Hurrah

Sample ID	Location	Description
BHBL	Lower Big Hurrah Creek	Big Hurrah Creek below mine site
BHRU	Upper Big Hurrah Creek	Big Hurrah Creek above mine site
HUFF	Huff Creek	Huff Creek tributary to Big Hurrah Creek above mine site
LHRL	Lower Little Hurrah Creek	Mouth of Little Hurrah Creek below proposed pit
LHRU	Upper Little Hurrah Creek	Little Hurrah Creek above proposed pit
LIDA	Linda Vista Creek	Linda Vista Creek tributary to Big Hurrah below mine site

8.3 Groundwater

AGC's groundwater monitoring program was developed to determine whether TSF seepage or injection to the IWF contribute to exceedences of AWQS. Additional wells are monitored down-gradient of the RWP to identify leaks and below the Rock Creek Mine to identify broad changes to groundwater chemistry from the entire site (table 15). Monitoring wells designated as "A" or "B" refer to deep and shallow collection points for the same well.

Groundwater samples are collected quarterly from each well. Some wells are dry or contain too little water for purging at certain times of the year as groundwater levels seasonally fluctuate.

No groundwater monitoring is required at the Big Hurrah site during the temporary closure period.

Table 15: Rock Creek Groundwater Sample Locations

Well Sample ID	Location	Description
MW03-05	Above Rock Creek Culvert	Background Monitoring Well
MW06-08A,B	South TSF dam/South of South Sump	TSF Monitoring Well
MW06-09A,B	West TSF dam/West of Main Sump	TSF Monitoring Well
MW06-10A,B	Between North TSF and Rock Creek	TSF Monitoring Well
MW07-11	West of IWF	Down-gradient of IWF
MW08-14A,B	South of RWP	Down-gradient of RWP
MW08-15	West of IWF	Down-gradient of IWF
MW09-17	Southwest of IWF	Down-gradient of IWF

8.3.1 TSF Monitoring Wells

There are 3 pairs (one shallow and one deep) of groundwater monitoring wells down-gradient of the TSF. MW06-8A and 8B are down-gradient of the south end of the TSF south of the South Sump, MW06-9A and 9B are down-gradient of the central portion of the TSF west of the Main Sump, and MW06-10A and 10B are down-gradient of the north end of the TSF. Samples are collected from each monitoring well quarterly as specified in the TCP (revised TCP Table D.1). Throughout 2011, wells MW06-08B and MW06-10B were dry and no samples were collected at these points. Monitoring well MW06-9B was dry during the second quarter of 2011.

In addition to AWQS, the TCP incorporates specific upper tolerance limits (UTLs) for key parameters in the groundwater which are based on initial assessment of background constituent of concern (COC) concentrations, and are intended to assess whether TSF seepage is reaching the monitoring wells (TCP Table D.3). When either the UTL or AWQS is exceeded, AGC must initiate corrective actions and follow-up monitoring to address any water quality issues (WMP 1.2.10 and 1.10.3). A summary of the number of exceedences of TCP UTLs and AWQS for TSF monitoring wells are summarized in table 16.

Table 16: TSF Monitoring Well Summary

Parameter	MW06-08A		MW06-09A		MW06-09B		MW06-10A	
	# Times Exceeding:		*# Times Exceeding:*		*# Times Exceeding:*		*# Times Exceeding:*	
	AWQS	TCP Action Level (UTL)	AWQS	TCP Action Level (UTL)	AWQS	TCP Action Level (UTL)	AWQS	TCP Action Level (UTL)
Antimony*	-	-	-	-	-	2	-	-
Arsenic	4	-	4	-	4	-	4	-
Copper**	-	-	-	-	-	3	-	-
Iron	2	-	-	-	4	-	1	-
Manganese	2	-	2	-	4	-	-	-
Nickel**	-	-	-	-	-	4	-	-
Sodium	-	-	-	4	-	4	-	-
Sulfate	-	1	-	1	-	4	-	4
TDS	-	-	-	1	-	3	-	-

*Antimony UTL is for dissolved metals, AWQS is for total metals

**Copper and Nickel UTLs are for total metals, AWQS is for dissolved metals and is hardness dependent

In addition to AWQS and UTLs, AGC has also identified well-specific background levels based on a detailed statistical analysis of baseline condition for each well. AGC contracted Tetra Tech, Inc. to conduct this study in 2009. The resulting analysis demonstrated the strong influence of background groundwater concentrations on the observed exceedences in each well. In fact, most of the sample results from the TSF wells, when compared to the well-specific background levels, are within the range of natural conditions for the Rock Creek drainage.

AGC submitted the detailed results of the Tetra Tech study to ADEC on April 27, 2010. This submittal proposed specific trigger levels for each well based on the higher of AWQS or the well-specific background level. AGC continues to report exceedences of AWQS or UTLs as

required under WMP section 1.2.10; however, AGC only performs further corrective action beyond monitoring when these well-specific background levels have been exceeded.

The TCP UTLs for various key parameters were exceeded in all TSF monitoring wells. It is important to note that although the UTLs were exceeded, there was no exceedence of AWQS for these same parameters, and AGC did not take any further corrective action as a result. Exceedences of AWQS in 2011 and associated corrective actions are discussed below.

Arsenic

Exceedences of AWQS for total arsenic were consistently observed in TSF monitoring wells, but were below natural background limits established for each well. A summary of the range of arsenic values compared to well-specific background values is shown in table 17.

Table 17: Comparison of Total Arsenic in TSF Monitoring Wells versus Established Background Values

Well ID	Total Arsenic range (µg/L)	Background Value (µg/L)
MW06-8A	243 - 268	362
MW06-9A	74.2 - 80	93
MW06-9B	52.6 - 281	340
MW06-10A	64.1 - 117	133.3

AGC reported these exceedences to ADEC by memoranda dated March 23, May 17, and September 6, 2011 and January 9, 2012 in which natural background values for arsenic were discussed.

Iron

Total iron levels in TSF monitoring wells vary widely in individual wells and historically have shown evidence of seasonal fluctuations with elevated levels occurring in winter months. Each TSF monitoring well except MW06-9A experienced occasional exceedences of AWQS in 2011. There are no established background values for total iron for TSF monitoring wells. Total iron values fluctuate widely around the mine site and were observed to range from 221µg/L to 18,200µg/L site wide in 2011 and from non-detectable to 30,200µg/L since sampling began in 2008. Higher values are noted to occur in shallow monitoring wells that monitor sub-surface groundwater in gravel/overburden above bedrock. Total iron values ranged from 1070µg/L to 1090µg/L in MW06-8A, from 1730µg/L to 18,200µg/L in MW06-9B, and from 1100µg/L to 1490µg/L in MW06-10A.

AGC reported specific well iron exceedences to ADEC by memoranda dated March 23, May 17, and September 6, 2011 and January 9, 2012 in which site wide, seasonal fluctuations were discussed.

Manganese

Total manganese values occasionally exceeded AWQS in all TSF monitoring wells except MW06-10A. The AWQS for total manganese was exceeded in MW06-8A two times (52.9µg/L, 59µg/L) and in MW06-9A two times (50.6µg/L and 51.3µg/L). Results were not significantly

above the AWQS for total manganese (50µg/L), and were below established natural background limits for these wells (59µg/L and 86.3µg/L respectively).

Total manganese values in MW06-9B ranged from 799µg/L to 1720µg/L in 2011. These values are above AWQS (50µg/L) and the established background level (314µg/L) for this well. In 2010, AGC observed elevated total manganese levels in MW06-9B above background values and previously observed historic values. As a result, AGC contracted HydroGeo, Inc. (HydroGeo) to conduct a geochemical and hydrologic investigation of MW06-9B, MW06-9A, and the Main Sump, which has elevated manganese levels, and has been considered up-gradient of these wells. HydroGeo did not find any relationship between elevated manganese in the Main Sump and monitoring wells MW06-9A/B. Specifically, water level data show that groundwater appears to move from the wells towards the Main Sump rather than in the other direction. AGC submitted the HydroGeo technical memorandum to ADEC on February 16, 2011. Because total manganese levels continue to be observed at increasing levels in MW06-9B, AGC has contracted HydroGeo to complete an additional geochemical and hydrologic investigation and provide an updated technical memorandum. At the time of this report the investigation was ongoing, but preliminary results are similar to the February 16, 2011 memorandum, i.e., showing that the groundwater gradient flows from MW06-9B toward the Main Sump. With the Main Sump and associated seepage collection system eliminated as a source, HydroGeo is investigating other potential causes of the elevated manganese levels. This work will be completed and submitted to ADEC in March 2012.

Total manganese exceedences for TSF monitoring wells observed during 2011 were reported to ADEC by memoranda dated March 23, May 17, and September 6, 2011 and January 9, 2012.

Analytical data for TSF monitoring well samples are reported in appendices A20-A23.

8.3.2 RWP Monitoring Wells

There is one deep and one shallow groundwater monitoring well (MW08-14A and 14B) down-gradient of the RWP. These locations are monitored to identify possible leaks from the RWP and RWP Underliner. Monitoring well MW08-14B was not sampled during the second, third, and fourth quarter of 2011 because there was insufficient water in the well for proper well purging following established quality assurance methods outlined in the Rock Creek Monitoring Plan (November 2008) Quality Assurance Project Plan (QAPP). A summary of the number of exceedences of AWQS for RWP monitoring wells is summarized in table 18.

Table 18: RWP Monitoring Well Summary

Parameter	MW08-14A	MW08-14B
	# AWQS Exceedences	# AWQS Exceedences
Arsenic (total)	4	1
Iron (total)	4	1
Manganese (total)	-	1

Exceedences of AWQS for total arsenic were consistently observed in RWP monitoring well MW08-14A. Total arsenic values ranged from 67.5µg/L to 86.3µg/L and total iron values

ranged from 1180µg/L to 1480µg/L. Values remained consistent throughout 2011 and are within natural background values observed around the mine site. There is no background data available for this well to establish well-specific background levels. The intent of this well is to monitor for impacts to water quality from leakage, if any, of RWP water through the primary and secondary liners. There is no correlation of total arsenic and total iron between MW08-14A and the RWP.

Monitoring well MW08-14B was sampled one time during 2011 but remained dry throughout most of the year. The sample collected on August 13, 2011 showed unusually high TSS levels and anomalous results for select analytes. After a review of the field data from sample collection, it was determined that this well was not purged following specified QA/QC procedures therefore AGC rejected the data set. Re-sampling of this well could not be completed as water levels had again dropped and the well was dry.

Exceedences of AWQS for RWP monitoring wells observed during 2011 were reported to ADEC by memoranda dated March 23, May 17, and September 6, 2011 and January 9, 2012.

Analytical data for RWP monitoring well samples are reported in appendices A25-A26.

8.3.3 IWF Monitoring Wells

The IWF is operated as authorized by UIC Permit No. AK-5X27-001-A issued by EPA Region 10. Three monitoring wells are located down-gradient of the IWF. Two wells (MW08-15A and MW07-11) are converted injection test wells completed in bedrock and are located along the west side of the Glacier Creek Road, north of the mine entrance gate, and down-gradient of the lower IWF. MW07-11 is located north of MW08-15A. One well (MW09-17) is located southwest of the mine haul road, and down-gradient of the upper IWF. MW09-17 is a replacement monitoring well installed in bedrock which replaces the original monitoring well MW03-07 that collapsed due to permafrost activity. These wells are intended to measure possible water quality influences from injected treated waste water.

In 2011, sample results showed elevated levels above AWQS for arsenic, iron, and manganese as shown in table 19.

Table 19: IWF Monitoring Well Summary

Parameter	MW07-11	MW08-15A	MW09-17
	# AWQS Exceedences	# AWQS Exceedences	# AWQS Exceedences
Arsenic (total)	4	4	4
Iron (total)	-	4	-
Manganese (total)	-	2	4

Arsenic

Total arsenic is consistently above AWQS for IWF monitoring wells. Results remain consistent throughout the year and are within ranges observed for water quality around the mine site. The intent of these wells is to measure possible water quality influences from the injection of treated

waste water. For several years, there have been no exceedences for total arsenic in the WTP effluent, and the observed exceedences in these wells are attributed to natural conditions.

Iron

Exceedences of AWQS for total iron have been consistently observed in MW08-15A (range 1160µg/L to 2700µg/L). There are no established background values for total iron in this well. Elevated iron levels are attributed to natural background variations that are observed around the mine site. The intent of this well is to measure possible influences on groundwater chemistry from the injection of treated waste water. There were no exceedences of total iron in the WTP effluent in 2011.

Manganese

Monitoring wells MW06-15A and MW09-17 show exceedences of AWQS for total manganese. Total manganese is within natural background values observed around the mine site. The intent of these wells is to measure possible water quality influences for the injection of treated waste water. There was one isolated exceedence for total manganese in the WTP effluent on March 10, 2011 (56µg/L) after which the plant was shut down until break-up. However, observed ranges for total manganese in IWF groundwater monitoring wells are consistently above this level further indicating that manganese in groundwater reflects natural conditions.

Analytical data for IWF monitoring well samples are reported in appendices A24, A27, and A30. Exceedences of AWQS in IWF monitoring wells observed during 2011 were reported to ADEC by memoranda dated March 23, May 17, September 6, 2011 and January 9 and January 30, 2012.

8.3.4 Other Groundwater Monitoring Wells

Groundwater monitoring well MW03-05 is located on Rock Creek below the mine site and is sampled in order to observe trends in water chemistry down-gradient of the mine site. No adverse trends were identified in 2011.

Analytical data for monitoring well MW03-05 samples are reported in appendix A19.

8.4 Water Treatment Plant

The WTP treats water from the TSF for injection to the IWF and/or surface discharge to Rock Creek. Injected water is subject to effluent limitations contained in UIC Permit Section 7, which are also incorporated into WMP Section 1.6. Surface discharged water is subject to effluent limitations contained in APDES Permit Section 1.2. WTP effluent limitations are similar for injection and surface discharged waters with additional whole effluent toxicity (WET) testing conducted for surface discharged water only. WTP effluent samples for injection water are collected weekly directly from the injection well line past the treated water tank at the IWF booster pump. WTP effluent samples for surface discharge are collected monthly from a sample port installed on the discharge pipeline past the treated water tank. Effluent samples collected for water chemistry analysis are analyzed by SGS labs in Anchorage for parameters listed in

table 9. WTP effluent samples are monitored daily for physical parameters (pH, conductivity, and temperature) using a hand held multi-meter.

During 2011, weekly sampling data showed one exceedence of permit limits for manganese and periods of elevated TDS levels above permit limits. There was also one exceedence of WAD cyanide limits, which subsequently was identified as likely due to a "false positive" measurement for WAD cyanide. Occasional, non-continuous exceedences of WTP effluent pH were also identified during daily checks. Apart from these isolated issues, the WTP has performed as intended and effluent limits were consistently met in 2011.

Manganese

The total manganese exceedence (56µg/L) occurred on March 10, 2011 on the last day of WTP operations before the plant was temporarily shut down prior to spring breakup. WTP influent water chemistry is closely monitored in order to adjust the plant to changing water chemistry that results from decreasing water levels in the TSF pond during the early spring months. High influent manganese (1010µg/L) was observed the previous day, and oxidation-reduction potential (ORP) values dropped outside of target levels in the late afternoon of March 10, 2011. The regularly scheduled compliance sample had been collected earlier that same day. In part, the WTP was shut down at that point as a result of the observed influent chemistry and erratic ORP values. Note that AGC anticipated the need, and planned for the shutdown until breakup began and TSF water levels increased.

TDS

TDS was above AWQS for most of 2011. The TDS exceedences are a result of chemical dosing required for water treatment. Specifically, the WTP uses ferric chloride, calcium hypochlorite, and sodium hydroxide to remove metals including antimony, arsenic, and manganese. During surface discharge, TDS levels from chemical addition are higher due to the addition of sodium thiosulfate which is used for de-chlorination of treated water. Also, TDS levels in influent water chemistry increase as water levels in the source TSF pond decrease. The increasing TDS in the TSF pond and the added TDS from the water treatment process are expected. As discussed with ADEC staff, however, there are no viable options for reducing TDS concentrations without major modifications to the WTP.

It is important to recognize that while the limit is based on the applicable AWQS, there are no adverse effects on the ambient environment from TDS discharged via the injection wells. In addition, WET testing conducted on the surface discharge in 2011 consistently demonstrates compliance with the requirements in the APDES permit. This shows that TDS in the surface discharge does not adversely impact downstream aquatic life in Rock Creek.

WAD Cyanide

AGC observed one exceedence of the WAD cyanide limit (0.0052 mg/L) in the WTP effluent sample collected on December 15, 2011. The result (0.0059 mg/L) was only slightly above AWQS and was likely a “false positive” result related to chlorine levels in the WTP. AGC

collects quarterly samples at source water locations to characterize the WTP influent. All source water data for 2011 shows cyanide (total and WAD) levels are below AWQS. This was confirmed in January 2012 when additional samples of source water locations were collected to verify cyanide levels (table 20). These results clearly demonstrate that the observed cyanide exceedence was not associated with the TSF.

Table 20: WTP Source Water Cyanide Concentrations

Sample ID	Collection Date	Total cyanide (mg/L)	WAD cyanide (mg/L)
RPW2 Underliner	1/30/2012	Not detected	Not detected
TSF Pond	1/30/2012	Not detected	0.0027 (J)
Main Sump	1/31/2012	Not detected	Not detected

(J) = lab flag that indicates the quantitation is an estimation

In April 2010 an investigation of potential false positive WAD cyanide readings was conducted by AGC and SGS as a result of elevated WAD cyanide readings in WTP effluent. It was determined that false positive readings likely resulted from residual chlorine levels in WTP effluent that were the result of chemical addition used in the treatment process. SGS developed a collection and neutralization procedure for WAD cyanide samples of WTP effluent that reduced the potential for false positive readings. AGC implemented this neutralization procedure in April 2010 and has continued the procedure throughout 2011.

The pre-treatment procedure for WAD cyanide samples of WTP effluent involves collection in a 250mL bottle with no preservative and pre-treatment with a 15g aliquot of ascorbic acid. The pre-treated sample is then transferred to a 250mL bottle containing NaOH preservative as required for WAD cyanide samples. Beginning on April 15, 2010 AGC implemented this pre-treatment procedure and no further WAD cyanide false positive reading were observed until the December 15, 2011 sample. After further review of this procedure, AGC found in early 2012 that a single 15g aliquot of ascorbic acid did not always completely neutralize chlorine levels in the WTP effluent. As a result, AGC has modified the pre-treatment procedure to add two doses (15g each) of ascorbic acid for chlorine neutralization.

pH

Readings for pH are collected daily from WTP effluent at the injection pipeline sample port at the IWF booster pump during periods of injection. The pH readings exceeded the upper AWQS limit for brief periods of time during 2011. The pH is monitored at several set-points within the plant in addition to the effluent monitoring. All exceedences of pH conditions were corrected immediately through modifications to chemical addition. The pH results for injected water are shown in figure 12.

Readings for pH are collected daily from WTP effluent at the surface discharge pipeline sample port during periods of surface discharge to Rock Creek. The pH readings exceeded the upper AWQS limit 2 times during surface discharge. The elevated pH was a result of an unintended pH increase when AGC began the addition of sodium thiosulfate (a de-chlorination chemical) at the end of the treatment process. All exceedences of pH conditions were corrected immediately through modifications to chemical addition and subsequent pH levels were within pH limits. The pH results for surface discharged water are shown in figure 13.

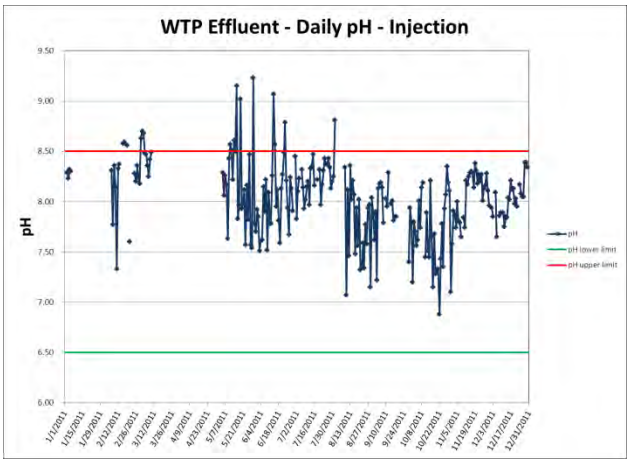

Figure 12: Injected Water Daily pH

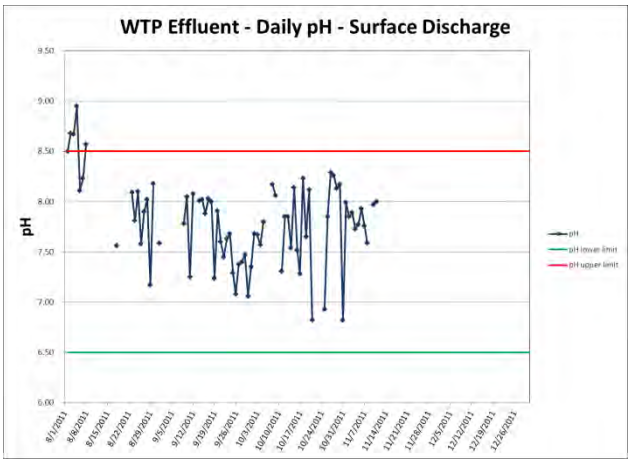

Figure 13: Surface Discharged Water Daily pH

Analytical data for WTP effluent monitoring samples are reported in appendix A28-A29.

8.5 Cyanide Monitoring of Tailings

There is no monitoring of cyanide in tailings during the temporary closure period.

8.6 Development Rock Stockpile Seepage Analysis

There are no development rock stockpiles at Rock Creek or Big Hurrah. All development rock at Rock Creek was used in mine construction. There was no mining at Big Hurrah.

8.7 Geochemical Characterization

There is no geochemical characterization data to report. There is no mining activity while the mine is in temporary closure.

8.8 Other Water Quality Monitoring

In accordance with ADEC WMP 2003-DB0051, ADEC must be notified in the next quarterly report of any water quality monitoring that is conducted beyond what is required in the monitoring plan.

As part of the continuous monitoring and optimization of the WTP in 2011, AGC continued to collect various water samples of WTP influent, in-stream, and effluent water for total and dissolved metals analysis. AGC also collected samples of CIL tank water in order to determine treatment options, additional contained water samples in order to monitor the RWP to TSF batch transfers, pit lake water to characterize storm water run-off in contact with mineralized pit rock which may require future treatment and disposal, background groundwater sampling of well

MW11-18 which may be used as a monitoring well for down-gradient monitoring of the main pit, and groundwater from RWP pumping well RPW-02 to plan for future treatment required at the time of RWP closure. Sample data is available for review upon request.

9.0 Visual Monitoring

Daily and weekly visual monitoring was conducted on the Rock Creek Mine facilities regulated under the WMP 2003-DB0051. Monitoring of erosion control structures and diversion structures was conducted in accordance with the SWPPP. Monitoring of primary and secondary containments for hydrocarbon product storage is conducted in accordance with the site SPCC plan.

Copies of the daily inspections and activities reports are available from AGC for review upon request.

9.1 Tailings Storage Facility

The following sections describe the day-to-day visual monitoring of the TSF. As described in Section 3.4, in 2011, AGC completed a comprehensive engineering evaluation of the TSF. This evaluation showed that the facility is stable under current operating conditions.

9.1.1 TSF Dam

Visual inspections of the TSF include: inspections of the dam for signs of seeps, settlement, cracking, and unusual observations; continuous recording of seepage collection system volumes; continuous recording of thickener discharge amounts; inspections of support structures such as pipes, plumbing, etc.; and daily measurements of the pond water surface elevation. The conditions have been recorded on the daily TSF Inspection Log as per the Rock Creek Tailings O&M Manual. The inspection log is available upon request.

9.1.2 TSF Seepage Collection System

The TSF seepage collection system (Main and South sumps) was visually inspected each day to ensure that no abnormal event has occurred. The sumps, pipe line and pumps were inspected each day. Flow meters were read and recorded at the time of the inspections.

Water collected in the sump is conveyed by gravity to one of two collection sumps (Main and South). The South Sump water is pumped to the Main Sump where it is transferred back to the TSF.

Approximately 17% of the water pumped from the Main Sump is first pumped from the South Sump to the Main Sump. The volume of water pumped from the Main Sump to the TSF is measured with a totalizer. In 2011, the volume pumped was low from January through April, with a pumping rate averaging about 130 gallons per minute (gpm). The volume pumped increased the last few days in April, with a pumping rate increasing close to an average of 400

gpm, where it stayed through October. Throughout November and December the pump rate dropped to a low pump rate of about 170 gpm by the end of December. The 2011 seasonal variation of pumping rates is similar to that observed in 2010 (figure 14). The total amount of water pumped from the Main Sump to the TSF in 2011 was approximately 151 million gallons.

Similar to the pumping rate from the Main Sump, in 2011, the volume pumped from the South Sump was low from January through April, with a pumping rate averaging about 25 gpm. The volume pumped increased the last few days in April, with a pumping rate increasing close to an average of 66 gpm, where it stayed through October. Throughout November and December the pump rate dropped to a low pump rate of about 25 gpm by the end of December (figure 15). The total amount of water pumped from the South Sump to the Main Sump was approximately 25 million gallons, or about 17% of the water pumped out of the Main Sump.

The complete 2011 sump flow data are presented in appendix D.

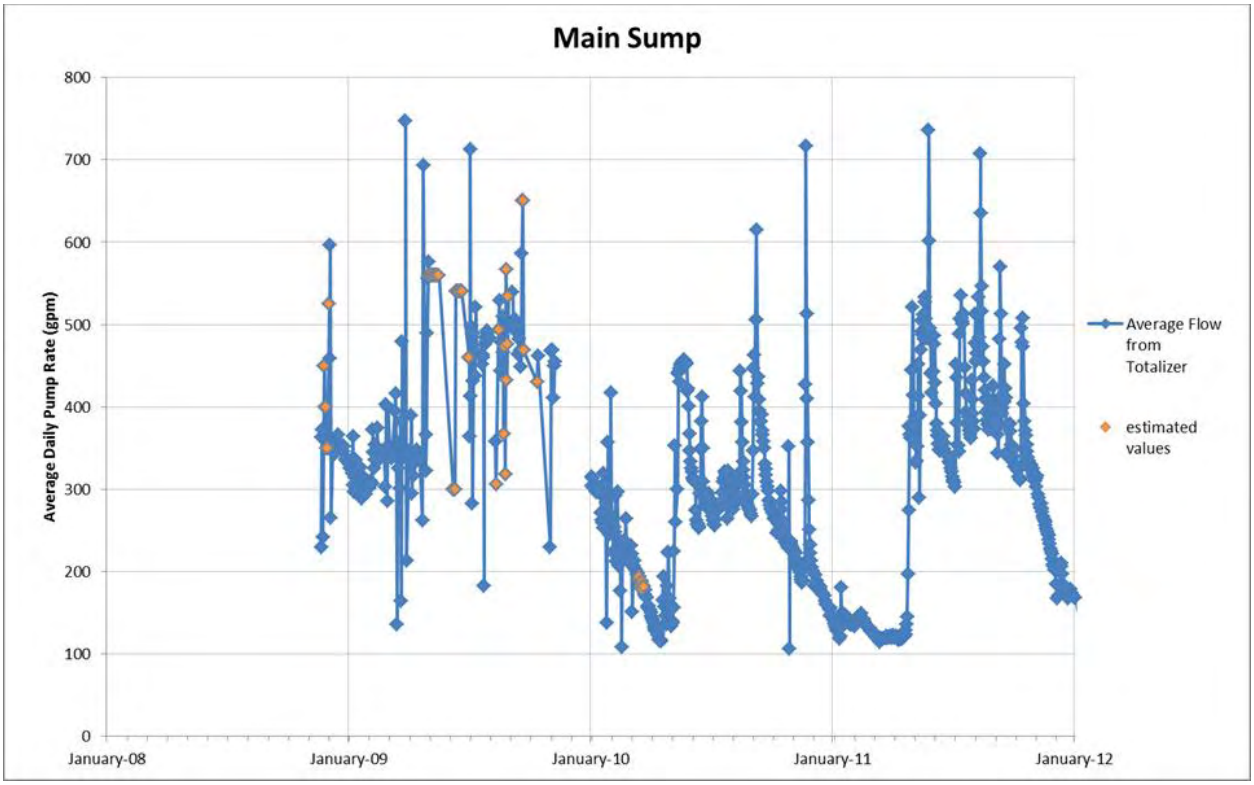

Figure 14: Main Sump Flow Data

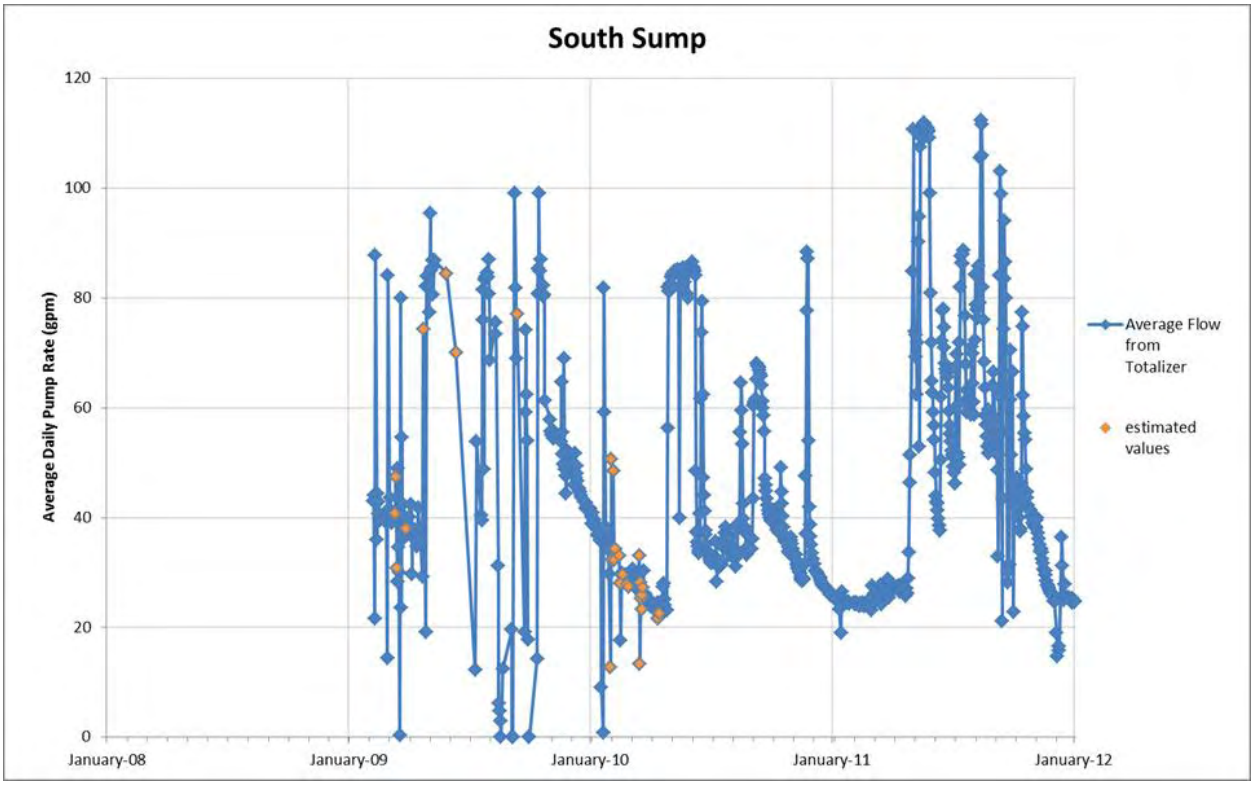

Figure 15: South Sump Flow Data

9.1.3 Thickener

Paste tailings are not discharged from the thickener during the temporary closure period; visual inspections are not conducted.

9.1.4 Support Structures

The TSF dam structure, along with the liner is visually inspected daily and repaired as needed. The conditions have been recorded on the daily TSF Inspection Log as per the Rock Creek Tailings O&M Manual. The inspection log is available on request.

9.1.5 Water Surface

The water surface elevations have been recorded on the daily TSF Inspection Log as per the Rock Creek Tailings O&M Manual. The 2011 water levels in the TSF were lower than in previous years (Figure 16). The 2011 water levels were lowest in March, 134 ft above mean sea level (amsl), and highest in May and again in August at an elevation of 143 ft amsl. On December 31st, the water level in the TSF was approximately 135.9 ft amsl, which is the lowest it has been on that date over the past 4 years.

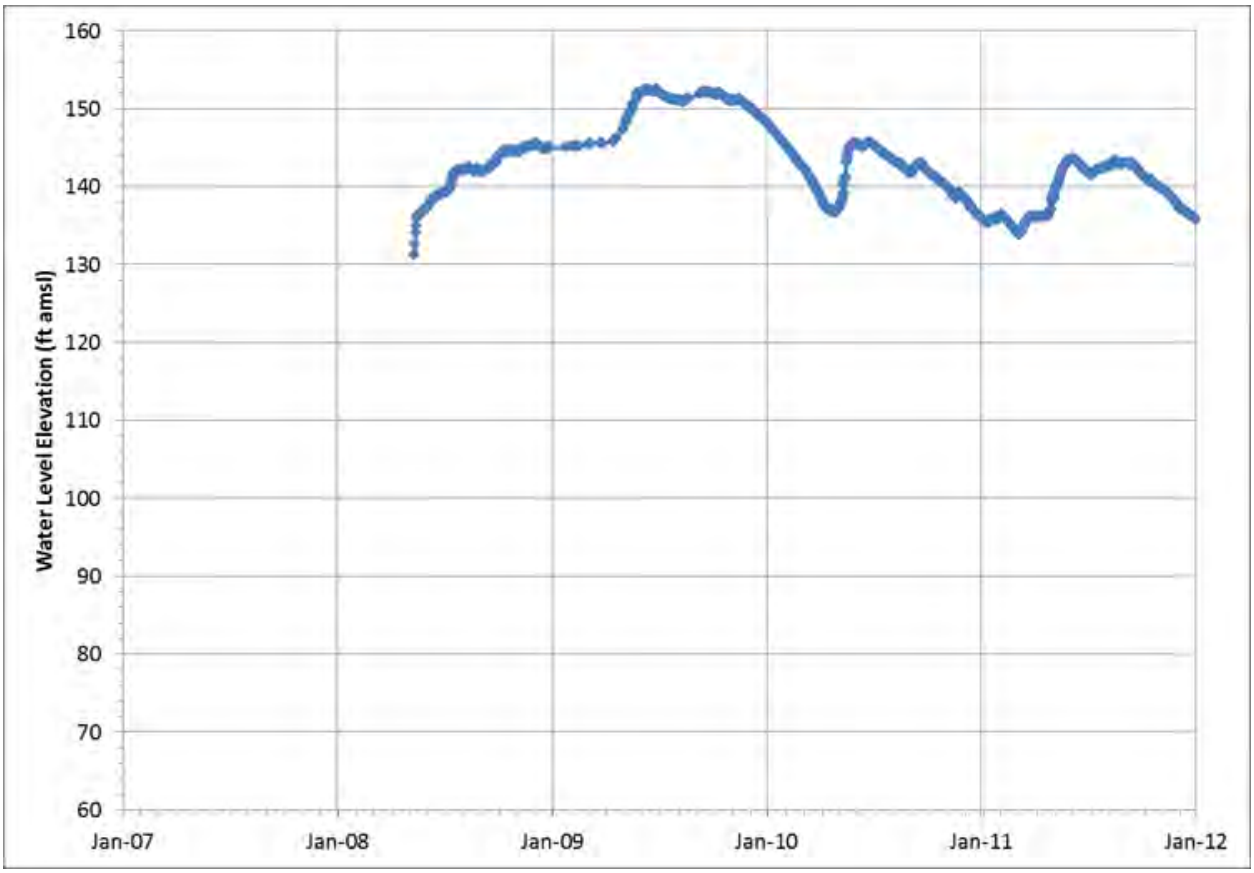

Figure 16: TSF Pond Elevation Change

9.2 Recycle Water Pond

Visual inspections of the RWP include: continuous monitoring of volumes pumped from the LCRS; recording of volumes pumped from groundwater wells RPW-01 and RPW-02; daily recording of the pond surface water elevation; and inspections of the pond liner for signs of compromise.

9.2.1 Leak Collection and Recovery System

The LCRS leak rate design criteria is 492 gallons per day (gpd). In 2011, the daily rate was 0 until the end of June, when it jumped to 500 gpd for most days in the second half of the year (figure 17). The rise in the leak rate did not coincide with the rise in groundwater levels around the RWP, as the initial rise in water levels occurred in May, with water levels slightly lowering in June, before rising again in July (Figure 18). The underliner pump did not operate for 3 days in January due to a frozen line and 3 days in July while the RWP pump conex was relocated. LCRS daily flow rate data is presented in appendix B.

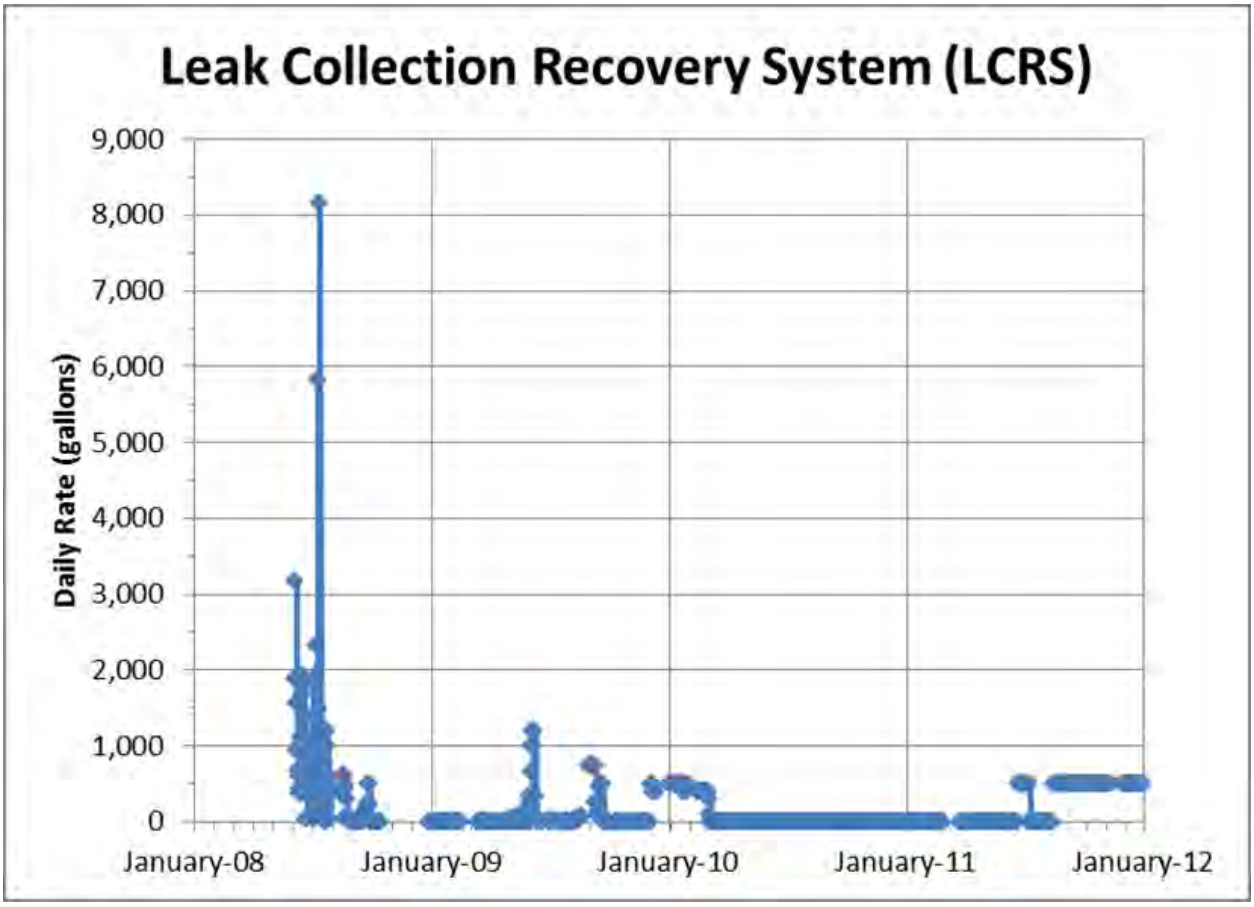

Figure 17: LCRS Daily Recovery

9.2.2 Water Surface

The Rock Creek Tailings O&M Manual specifies the operating water level in the RWP be maintained at an elevation of 139 ft amsl in order to accommodate storm water run-off from the mill site. As shown in Figure 14, the target level of 139 feet was consistently exceeded during 2011. When in operation, this level would be maintained through the recycling of process water throughout the mill plant facility. During temporary closure Care and Maintenance operation, AGC does not maintain continuous pumping of the RWP to the TSF, and therefore, periodically batches RWP pond water to the TSF when higher levels are reached. The RWP level is monitored on a daily basis to ensure adequate storage for any potential storm water run-off.

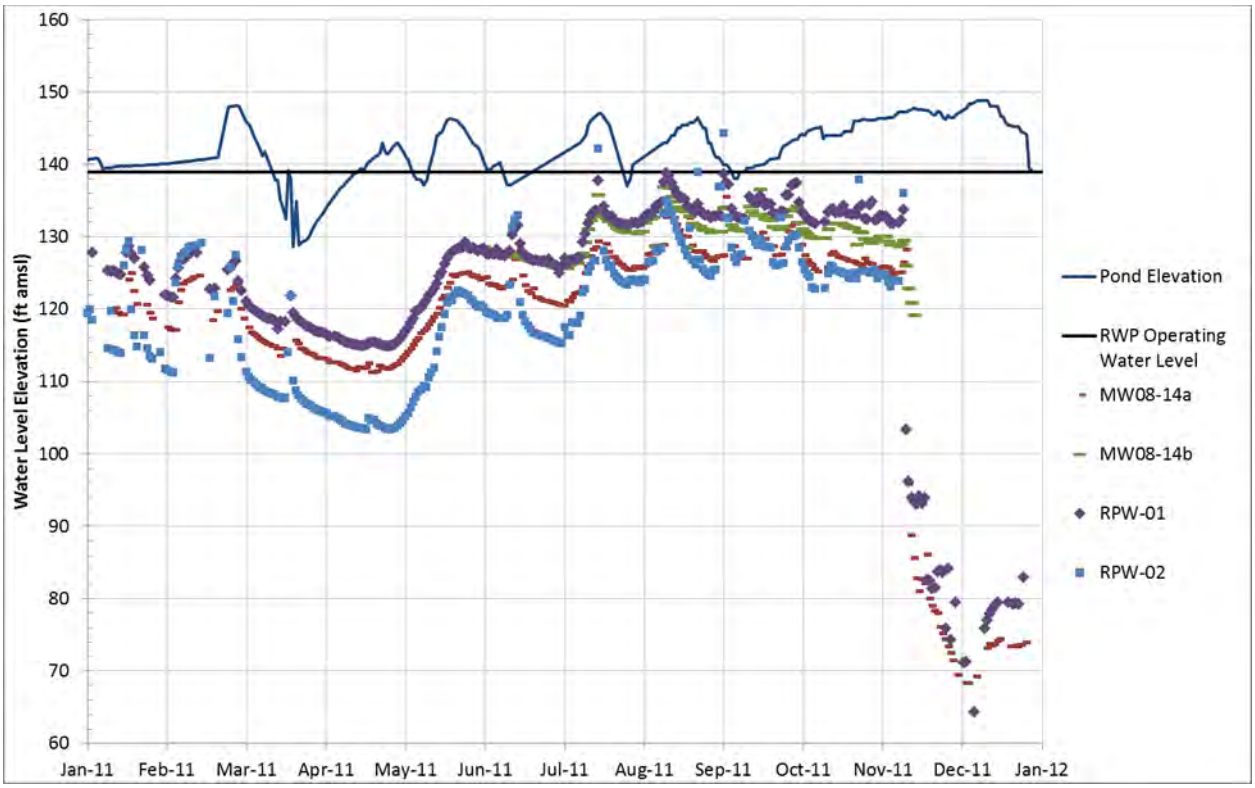

Figure 18: RWP Hydrologic Data

Pumping well RPW-02 was pumped at a fairly consistent rate of around 9 gpm for most of 2011. The pumping rate rose in the middle of November to around 32 gpm for the remainder of the year (figure 19). The increase in pumping rate is directly reflected in the drop in water levels described above and shown in Figure 18. No pumping has occurred at well RPW-01 since 2009.

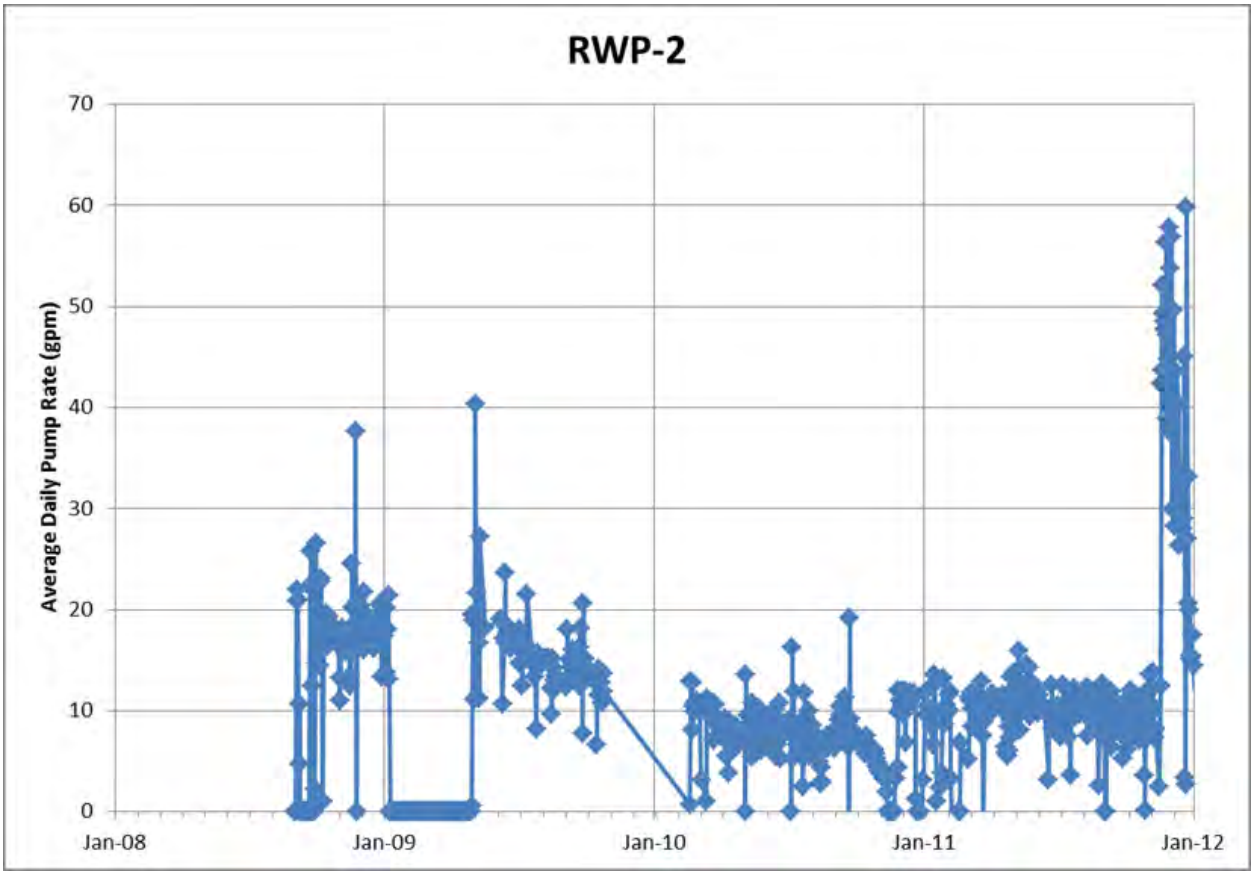

Figure 19: RPW-02 Pumping Rates

9.2.3 Pond Liner

The liner was not evaluated during 2011. AGC staff conducts daily visual inspection of the liner and did not note any adverse conditions.

9.3 Monitoring Wells

There are 18 monitoring wells that are monitored for groundwater elevations at Rock Creek. Table 21 lists the locations of these wells.

Table 21: Groundwater Monitoring Well Locations

Well ID	Location	Description
MW08-14a	Down-gradient RWP (deep)	RWP water table monitoring
MW08-14b	Down-gradient RWP (shallow)	RWP water table monitoring
RPW-01	North side RWP	RWP water table monitoring
RPW-02	East side RWP	RWP water table monitoring
MW06-8a	South of TSF (deep)	TSF water table monitoring
MW06-8b	South of TSF (shallow)	TSF water table monitoring
MW06-9a	West of TSF (deep)	TSF water table monitoring
MW06-9b	West of TSF (shallow)	TSF water table monitoring

MW06-10a	North of TSF (deep)	TSF water table monitoring
MW06-10b	North of TSF (shallow)	TSF water table monitoring
MW07-11	Down-gradient Lower IWF	IWF water table monitoring
MW08-15	Down-gradient Lower IWF	IWF water table monitoring
MW09-16	Down-gradient Lower IWF	IWF water table monitoring
MW09-17	Down-gradient Upper IWF	IWF water table monitoring
MW03-04	Up-gradient Upper IWF	IWF water table monitoring
PW-06	South of Upper IWF	IWF water table monitoring
PW-08	South of Upper IWF	IWF water table monitoring
PH-2006 (JEFF)	Down-gradient Upper IWF	IWF water table monitoring

9.3.1 Visual Inspections

TSF monitoring wells are required to be visually inspected on a quarterly basis. As part of the groundwater monitoring program all sampled monitoring wells are visually inspected at the time of groundwater sampling. No damage or unusual conditions were observed in 2011 during these inspections.

9.3.2 Groundwater Elevations

Down-gradient IWF Water Level Monitoring

AGC monitors groundwater elevations daily at eight wells near the IWF to note any instances of upwelling or other sudden changes in groundwater levels.

Three monitoring wells, MW07-11, MW08-15A, and MW09-16, are located down-gradient of the IWF (figure 9). Two wells (MW08-15A and MW07-11) are converted injection test wells completed in bedrock and are located along the west side of the Glacier Creek Road, north of the mine entrance gate, and down-gradient of the lower IWF. MW07-11 is located north of MW08-15A.

MW09-17 is located southwest of the mine haul road, and down-gradient of the upper IWF. MW09-17 is a replacement monitoring well installed in bedrock which replaces the original monitoring well MW03-07 that collapsed due to permafrost activity. Wells MW03-04, PH-2006 (previously JEFF), PW-06, and PW-08 are also used to monitor groundwater levels in the area of the Upper IWF. Well PW-06 is located west and cross-gradient of the injection wells, and well PW-08 is located down-gradient of the IWF (figure 9). No impacts on long-term water level elevations have been observed in any of the IWF monitoring wells (figure 20).

Figure 20: Groundwater Levels in the Vicinity of the IWF (all wells, period of record)

Injection in well #32 influences water levels in monitoring well MW08-15A. Injection well #32 is the farthest south of the injection wells, and is located immediately up-gradient from well MW08-15A (figure 9). In monitoring well MW08-15A, water levels in 2011vary by more than 20 feet (figure 21). Water levels rose suddenly in May 2011, simultaneously with the start of injection in well #32, and dropped again in October 2011, when injection stopped. The proximity between monitoring well MW08-15A and injection well #32 is used to closely monitor water levels surrounding this injection well. Water levels are monitored daily and injection rates are adjusted accordingly to prevent upwelling above the surface.

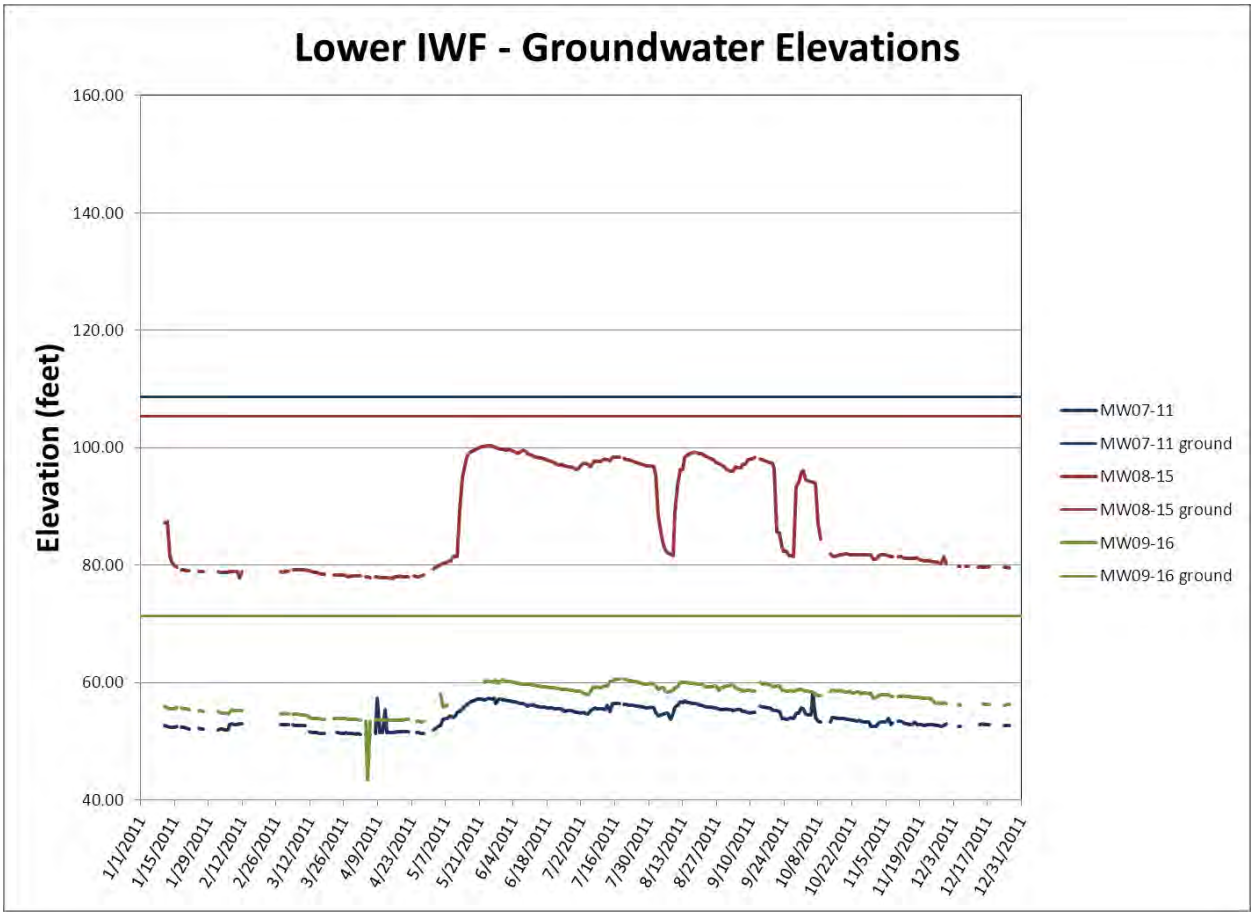

Figure 21: Lower IWF Groundwater Elevations

Monitoring wells MW07-11 and MW09-16 show water levels increasing slightly during the summer months, and decreasing during the winter months during every year monitored. In 2011, the variation in levels was approximately 5 feet between summer and winter (figure 21). Seasonal increases in water levels starting in May are observed in most monitoring wells. Injection in the injection wells also increases in May, thus, increases caused by injection cannot be differentiated from increases due to seasonal water level increases. Overall, historic water levels in monitoring well MW03-04 show seasonal increases in the summers of 2004 and 2005 before any injection started (AGC, 2011). In 2011, water levels increased rapidly from April to May, and decreased at a much slower rate through December (figure 22). As in wells MW07-11 and MW09-16, increases caused by injection cannot be differentiated from increases due to seasonal water level increases.

Water levels in PW-06 and PW-08 also show some increase in water levels during the summer months, with water levels decreasing again in the fall (Figure 22).

Water levels in replacement well MW09-17 (MW03-07) were extremely steady throughout 2011 (figure 22).

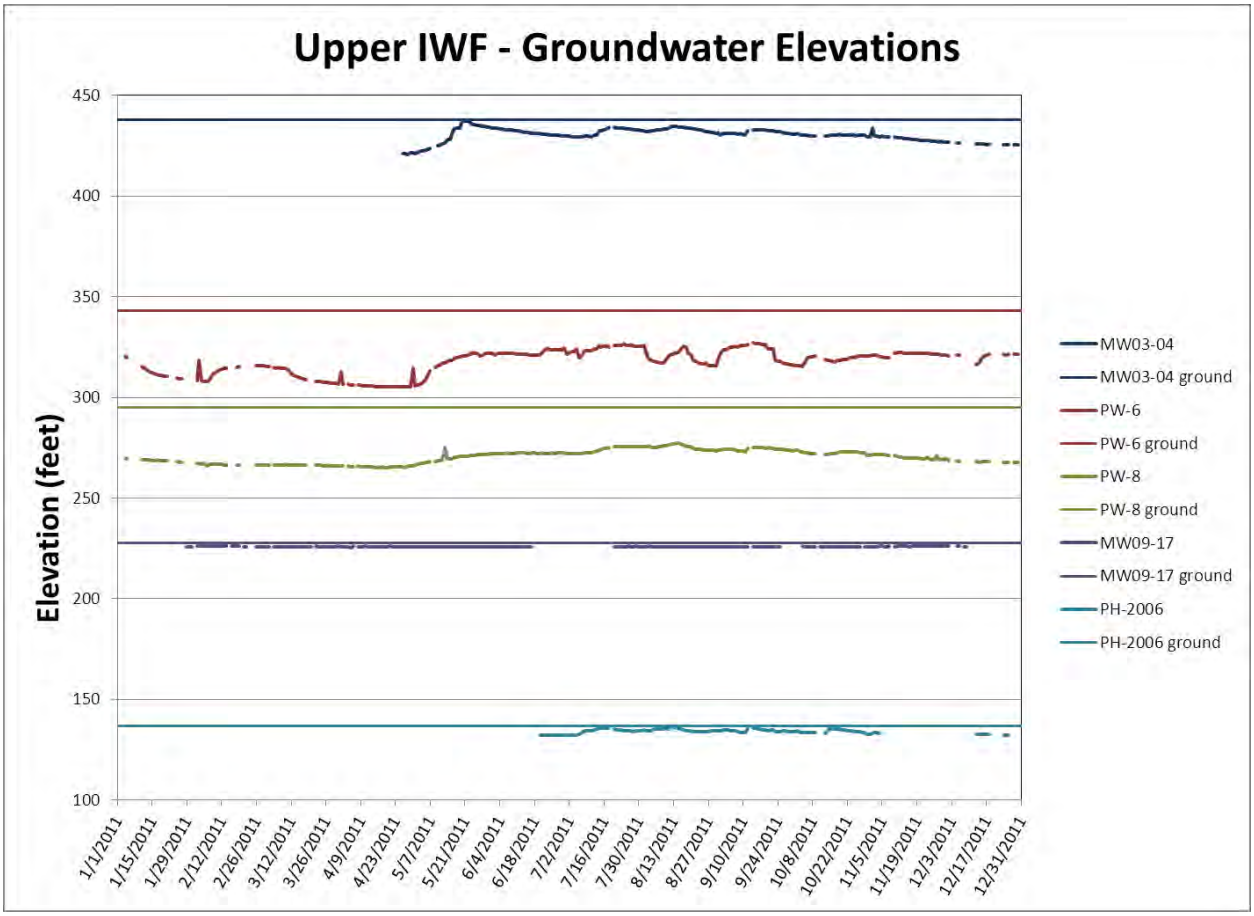

Figure 22: Upper IWF Groundwater Elevations

Water levels in the monitoring wells near the Lower IWF are below the ground surface elevation, indicating that the injection activities have not over-pressurized the groundwater system. In the Upper IWF, water levels in wells MW03-04, PH-2006, and MW09-17 (MW03-07) are close to or at ground elevation. Historic data show that water levels in wells MW03-04 and MW03-07 were at ground level during the summer of 2004, thus, groundwater in this area is naturally very close to the ground surface, and the high water levels are most likely not caused by injection. No historic data are available for well PH-2006; however, its location is close to Rock Creek, and adjacent seeps and bogs, which indicates that groundwater levels are naturally close to the surface.

Down-gradient RWP Water Level Monitoring

Currently, AGC monitors groundwater elevations daily at four wells near the RWP to note any instances of upwelling, decreasing water levels, or other abnormalities. RPW-01 and RPW-02 are pumping wells, MW08-14A is a deep monitoring well screened in bedrock, and MW08-14B is a shallow monitoring well screened mostly in glacial till. Water levels near the RWP depend strongly on pumping from the two pumping wells, RPW-01 and RPW-02. Since 2009, only RPW-02 is being pumped to keep groundwater near the RWP at a lower than natural level. RPW- 02 is also screened in deep bedrock, with the pump about 350 ft below ground. Pumping is needed to keep the water levels below the elevation of the RWP liner to avoid upward

groundwater pressure on the liner. Pre-mining water levels without pumping are probably similar to the highest measured water levels.

Figure 23 shows groundwater elevations for the period of record, and for 2011. Groundwater elevations in 2011 were highest from July through November, and then dropped in response to increased pumping in RPW-2.

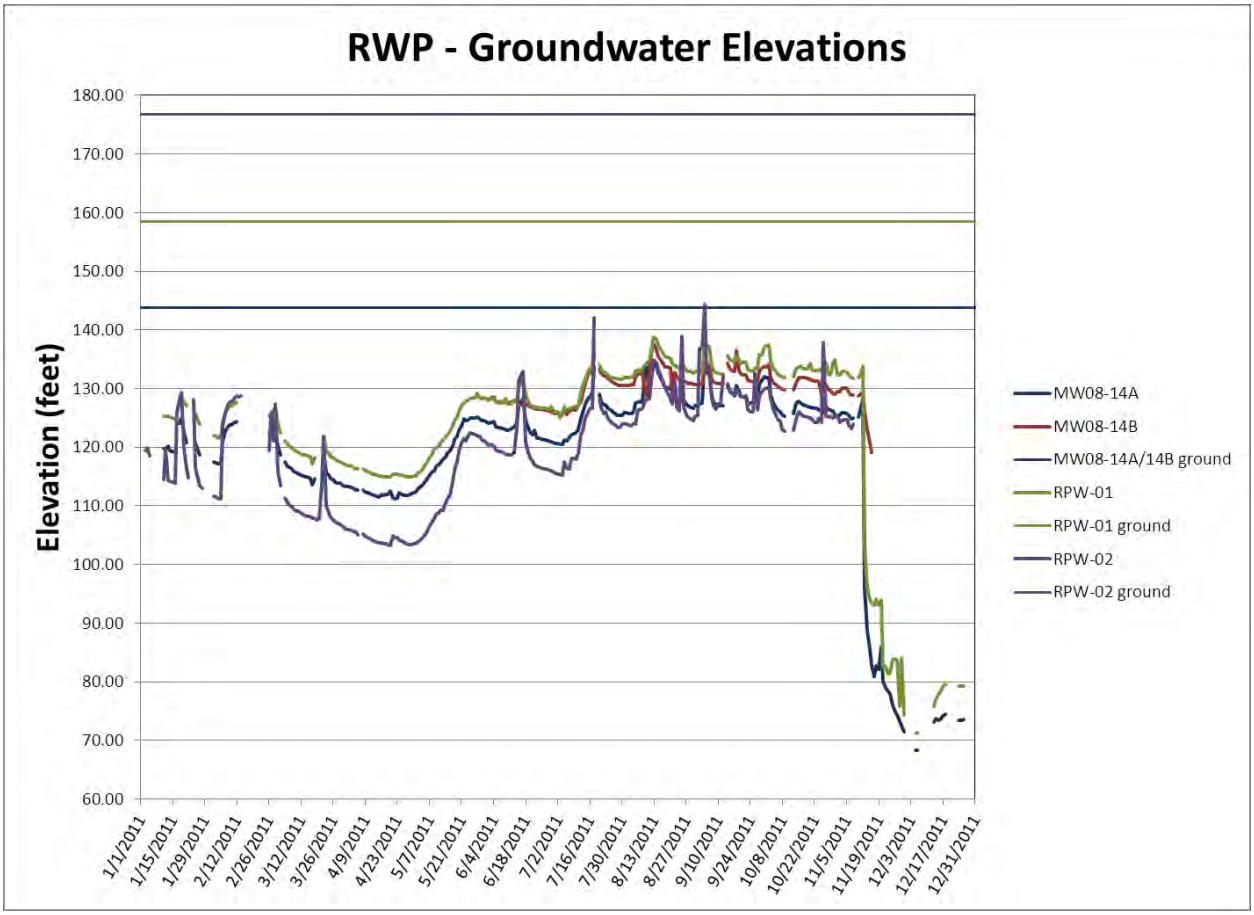

Figure 23: RWP Groundwater Elevations

Down-gradient TSF Water Level Monitoring

Groundwater levels in the monitoring wells down-gradient of the TSF are shown in figure 24. Water levels in the deep well MW06-10A, located west of the TSF and adjacent to Rock Creek, have little seasonal variability and were constant around 111 ft amsl in 2011. The deep well MW06-8A is located near the South Sump and it shows some seasonal variability, varying between 102 and 105 ft amsl in 2011. The shallow well MW06-8B has been dry since 2008. The monitoring wells MW06-9B and MW06-9A are shallow and deep monitoring wells, respectively, located approximately 200 feet south of the center of the Main Sump. The bottom of the deep well, MW06-9A, is at 11.5 feet amsl, the bottom of the shallow well, MW06-9B, is at 85.2 feet amsl. The 2011 water levels are similar to levels in 2010, and vary between 80 ft amsl from February through April 2011 to 90 ft amsl in May and August 2011 for the shallow well MW06-9B, and between 85 ft amsl from February through April 2011 to 95 ft amsl in May and

August 2011 for the deep well MW06-9A. A vertical gradient which was not evident in 2008 now exists between the deep and the shallow wells, with the higher water levels in the deep well. This is likely caused by the TSF dam structure intercepting some of the shallow groundwater. This gradient will cause groundwater to flow upward from the deeper horizon up to the higher shallow areas.

The bottom elevation of the Main Sump is at 65.3 feet amsl, with an average water level of about 72 feet amsl (figure 24). This indicates that the groundwater gradient would be from the monitoring wells towards the Main Sump. This is also true for the water levels in MW06-8A near the South Sump, where water levels are higher than water levels in the South Sump (figure 24).

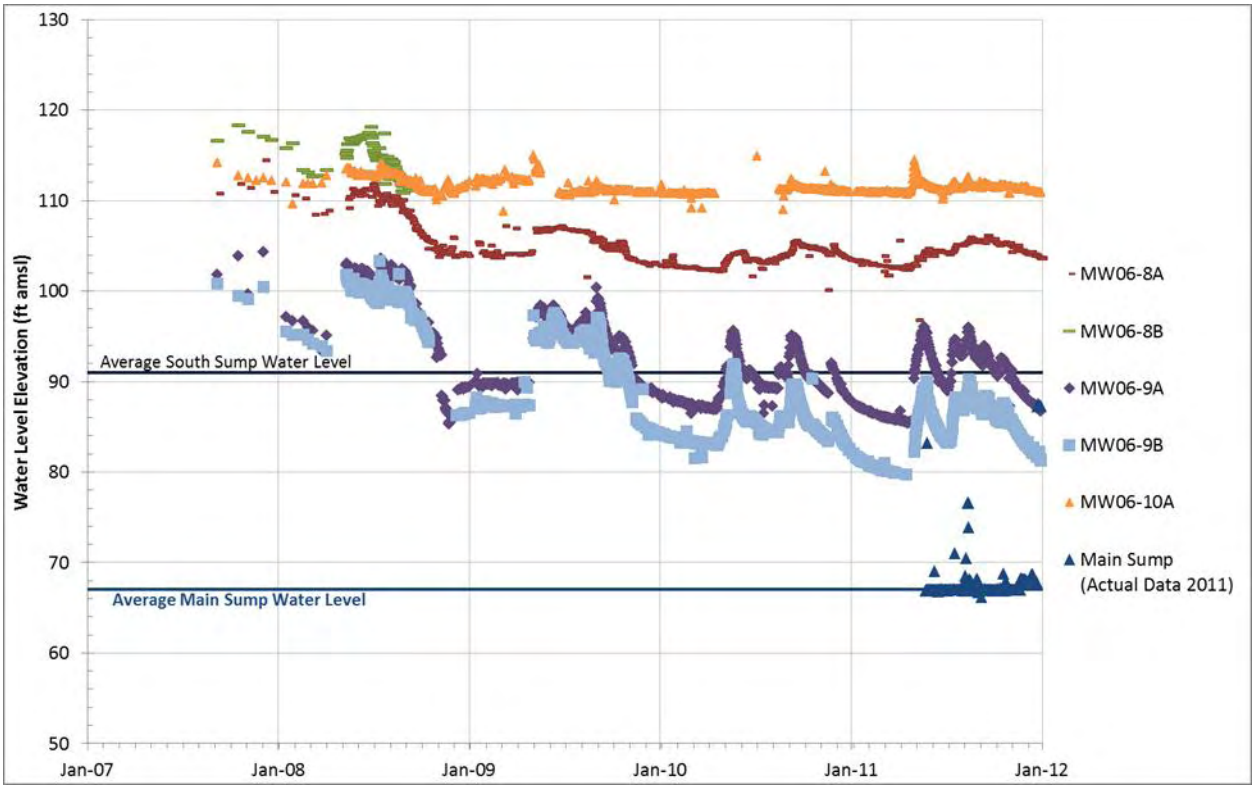

Figure 24: TSF Groundwater Elevations

9.4 Pit Dewatering Wells

The pit dewatering wells are not in operation during the temporary closure period. There are no inspections of the wells at this time.

9.5 SPCC – Containment

Daily undocumented visual checks of fuel containments and monthly documented fuel containment inspections are conducted at Rock Creek. Reports are available at the Rock Creek Environmental Department for review. Overall conditions for containment structures are good

with no damage or physical hazards. Any deficiencies in containment were corrected at the time of observation.

Under the original Spill Prevention Control and Countermeasure (SPCC) Plan (effective June 2006) for the site, Rock Creek was required to conduct an engineering review of its facility by January 2011. AGC contracted SLR International Corp. to conduct this engineering review which was completed in August 2010. As a result of this review, the Rock Creek Mine SPCC plan was updated. The new plan was issued in April 2011.

9.6 Air Quality

Inspections of the ambient air boundary signage are required monthly under the TCP. Any broken signs or signs knocked over by high wind were fixed when identified during routine inspections.

9.7 Wildlife

Numerous wildlife observations were made in 2011, including reindeer, moose, fox, bear, muskoxen, and nesting ravens. There were no observed wildlife mortalities in 2011. Current policy is to contact the Safety or Environmental Office when wildlife is observed. AGC continued to work with the local Fish and Game office in dealing with any potential wildlife problems including: wildlife hazing and rabid fox encounters.

9.8 Climatic Monitoring

Monitoring of climate conditions is achieved through an on-site weather station that records temperatures, precipitation amount, and wind speed and direction. The data is viewable through software installed on environmental department computers and the data is automatically archived.

10.0 Financial Responsibility

AGC originally posted financial assurance in the amount of $6,844,700.00 which is backed by an Irrevocable Standby Letter of Credit between AGC and Wells Fargo Bank. During 2010 and 2011, AGC worked with the State to update the reclamation and closure plan, and associated financial assurance, for the Rock Creek Mine in its current condition. As of the end of 2011, the State of Alaska was preparing to issue for public comment a draft approval of the updated reclamation and closure plan. This approval would require an increase in the financial assurance to $20,272,000. Upon receiving final plan approval and posting the additional financial assurance, AGC anticipates initiating the first phase of closure activities in early 2012.

11.0 References

Alaska Gold Company, 2011. *Rock Creek Mine and Big Hurrah Project ADEC and ADNR Annual Report 2010*.

AMEC Earth & Environmental, Inc., April 2008. *Rock Creek Project Tailings Storage Facility Operations and Maintenance Manual*

AMEC Earth & Environmental, Inc., October 2011. *Rock Creek Tailings Storage Facility NID ID# (AK00309) 2011 Dam Safety Inspection*

HydroGeo, Inc., January 2010. *Rock Creek Mine, Water Quality Issue; TechMemoManganese*

SRK, 2008. *Rock Creek Mine and Big Hurrah Project Nome, Alaska.*

SRK, November 2008. *Monitoring Plan*.

Tetra Tech, 2011. *APDES Construction General Permit Storm Water Pollution Prevention Plan, Revised March 2011*. Alaska Gold Company Rock Creek Project, Nome, Alaska.

Tetra Tech, January 2010, *Rock Creek Mine, Background Baseline Ground Water Quality Statistics*