

August 29, 2006

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Mike Menge, Commissioner  
Alaska Department of Natural Resources  
Office of Project Management & Permitting  
550 W. 7<sup>th</sup> Avenue, Suite 1400  
Anchorage, AK 99501

**RE: Alaska Gold Company (AGC), Nome Rock Creek Mine Project, Permit Decision Appeal**

Dear Mr. Menge,

I have reviewed the DNR's Reclamation Plan Approval F20069578. I am appealing the decision according to 11 AAC 02 per the appeal procedures indicated in the reclamation plan approval dated August 9, 2006. I believe I have standing to appeal the decision as I have commented at every opportunity and wish to indicate my dissatisfaction with DNR's decision. Only now have I had adequate time since the June 1, 2006 public notice to analyze the **ROCK CREEK MINE, PLAN OF OPERATIONS, VOLUMES 4 through 8, Reclamation Plan, Water Management Reports, Thermal and Seepage Evaluation, Monitoring Plan, & Geochemistry & Groundwater Reports for Rock Creek & Big Hurrah, May, 2006**. I feel those volumes are crucial to fully understanding the environmental and human impacts from this project and are the most relevant pieces of information to my appeal and DNR's decision. Because of the additional time allowed under this appeal comment period I was able to enter Big Hurrah and Rock Creek water & geochemistry data into Microsoft® Excel© that I was **NOT** able to do during the Alaska Coastal Management Program's consistency review, DNR and Alaska Department of Environment Conservation extended public comment period, and the Army Corps of Engineers extended public comment period. Those prior comment periods required extensive review of the permit applications and my comments concerning the applicability of appropriate laws and regulations to those respective permit applications were focused upon legal criteria. During this open appeal process I will be able to comment on conceptual ideas proposed by AGC.

**VOLUME 4, RECLAMATION PLAN**

AGC's Volume 4, Reclamation Plan is 269 pages not including the title pages. The table of contents, introductory language, and applicant information comprise 15 pages. The project description including its maps comprise 5 pages. Mining disturbances including several tables comprise 5 pages. The reclamation plan, Section 5 comprises 15 pages. The statement of responsibility comprises two paragraphs on page 31. The estimate of reclamation costs comprises 200 words in 17 paragraphs or bullets on pages 31 & 32. Landowner review comprises one paragraph on page 33. Appendix A, Surface Water

Quality Summary, comprises 97 pages, the surface water quality summary is a repeat of information that was presented in Section 7 of Volume 2, Rock Creek EID and provides no additional information. Volume 4, Appendix B, Pit Lake Water Quality comprises 29 pages, it is less extensive than Section 7.6 of Volume 2 which is 51 pages and explained nearly the same information. Appendix C, Reclamation Cost Estimates comprise the last section of Volume 4 and is 100 pages.

Table 1, Volume 4 page breakdown

Section	Pages	%
Introduction	15	5.6%
Project description	5	1.9%
Mining Disturbance	5	1.9%
<b>Reclamation Plan</b>	<b>15</b>	<b>5.6%</b>
Statement of Responsibility	1	0.3%
Estimate of Reclamation	1	0.3%
Landowner review	1	0.3%
Appendix A, Surface Water	97	36.0%
Appendix B, Pit Lake	29	10.7%
Appendix C, Reclamation Cost Estimates	100	37.2%
<b>TOTAL</b>	<b>269</b>	<b>100%</b>

Table 1 is a summation of the number of pages of information in Volume 4 related to reclamation concepts proposed by AGC. The reclamation plan comprises a small portion of the information in the reclamation document. In my original comments under the ACMP, DNR, & ACOE open comment periods I explained that the Rock Creek Project Plan is inadequate in explaining in sufficient detail how mining operations will be coordinated with environmental protection. I will be providing specific comments in relation to the reclamation practices and analyzing AGC's assumptions related to acid mine drainage and adequacy of reclamation plans and surety estimates. **I believe those factors are relevant to DNR's decision and require my appeal.**

Of the 15 pages provided within Volume 4 dedicated to describing reclamation plans, Section 5.2.1 Prior Land Use, & Section 5.2.2 Alternate Post-Mining Land Use which comprise 2 pages do not contribute to how mining uses will be coordinated with reclamation. Figures 5.4.1, 5.4.2 & 5.4.4 comprise three pages and merely graph the intended reclamation concepts proposed by AGC. The public is left with only 10 pages of material that describe AGC's intended plans and conceptual ideas.

### **Acid Potential**

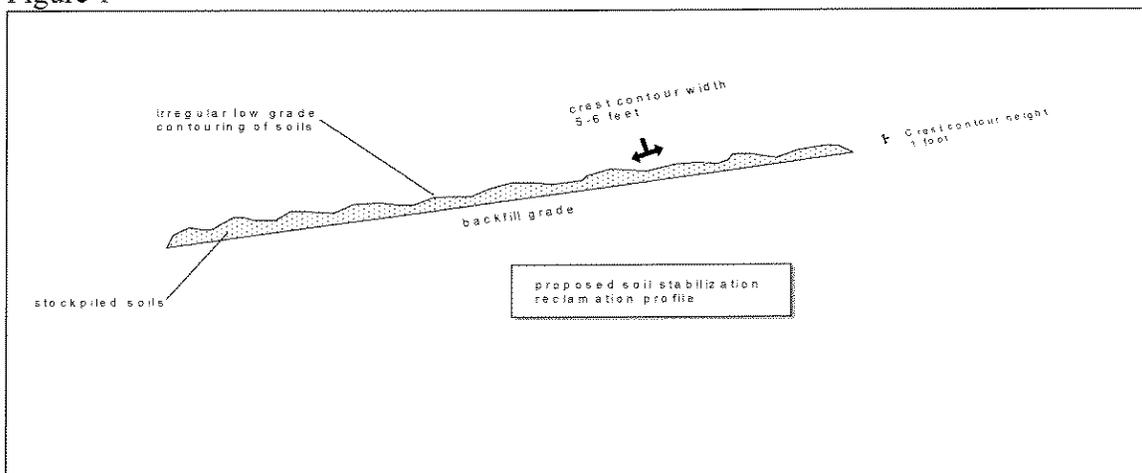
I believe thorough review of AGC's ABA testing is crucial to understanding the potential harmful impacts from acid mine drainage at the Big Hurrah and Rock Creek site. Underlying assumptions by AGC indicating that non-acid generating rock prevails is a common thread of the project plan yet there is no detail within the plan as to how unexpected eventualities will be handled. There are no alternative scenarios developed for possible eventualities and total reliance upon AGC's project plan documents without

detailed analysis is not appropriate for a project of this nature, which is essentially a large chemical facility.

### Soil Stabilization

Soil type is characterized by AGC as thin or non-existent. I believe that statement to be false. Soil may be characterized as any unconsolidated weathered material on top of bedrock that can support plant growth. I believe historic tailings are an excellent example of unconsolidated material that support hardy willow and arctic plants. Those historic tailings support a variety of arctic plants that never received any beneficiation yet they have re-vegetated to form existing stream banks where dredging operations occurred. Historic tailings still experience active erosion but have come a long way without reclamation to establish basic plant communities. I believe AGC may be characterizing soils as only those with organic matter present, as such soil type characterization by AGC is likely flawed. I believe willow and other arctic plants will grow on soils that do not contain organic matter. As such I feel that soil stockpiling must be applied to all material above bedrock for later re-use. Fertilization will enhance re-colonization of arctic plants, but I believe contouring and moderately engineered relief will go much further in establishing arctic plant communities after mine closure.

Figure 1



Solifluction lobes are common land forms in this arctic environment likely due to the impermeability of permafrost zones or shallow bedrock. It is likely that AGC's proposed backfill grades will become frozen and lend themselves to soil movement or slumping down gradient when soils become water saturated; DNR should require low grade contouring with engineered placement of soils to resist slumping. Without engineered placement of soils re-vegetation may become slowed. AGC is proposing grading of top soil cover or backfill on 25 meter benches, DNR should review some other method of protective capping of backfilled waste rock or development rock. Figure 1 is my proposed reclamation profile for reclaimed vegetative foundations. Low grade contouring may result in stronger plant communities and may also prevent runoff perpendicular to contour lines or crests and may prevent slumping.

### Acid mine drainage

Some of the following information comes from my request for informal review and is largely repeated here but may be relevant since my request for informal review went to DEC not DNR and DNR may not have reviewed the following information pertaining to acid potential. The most relevant data for analysis of AGC's reclamation concepts for acid potential comes from Volume 8, Rock Creek and Big Hurrah geochemistry of Ore Rock and Development Rock testing, **NOT** within Volume 4. I entered the pH Saturated Paste data into Excel© and was able to run descriptive statistics. Data taken from the May 26, 2006, memo to Doug Nicholson, AGC, from Brent Johnson & Kenneth Carroll, Water Management Consultants, Attachment 1, ABA results, show that ore & development rock pH ranges from 3.5 to 8.6 for Big Hurrah and 6.3 to 8.8 for Rock Creek. The Water Management Consultants, Technical Memorandum referenced a 1999 US EPA report titled: *EPA and Hardrock Mining: A Source Book for Industry in the Northwest and Alaska*. A more recent version is available and dated January 2003 and would have been available at the time the Rock Creek Project plan was developed. As such any antiquated information based upon the 1999 sourcebook may have mischaracterized Net Neutralizing Potential (NNP), Neutralizing Potential (NP) or Acid Potential (AP). A key finding of the January 2003 sourcebook is that NP and AP must be analyzed consistent with expected waste rock or development rock. AGC's Acid tests were done on drill core samples which is not the likely character of ore and gangue material. Ore material will be extracted utilizing blasting agents to loosen the rock, and then subjected to various landscaping techniques using heavy equipment, and then crushed for cyanidation. AGC's Acid testing did not conform to the January 2003 US EPA sourcebook recommendations for Acid Base Accounting (ABA). The blasted, repositioned, crushed, and/or cyanided waste and/or development rock from Big Hurrah and Rock Creek may have different particle sizes and mineralogy from drill samples that were acid tested. As such the underlying assumption regarding acid potential may be flawed. The January 2003 US EPA sourcebook indicates that rock with uncertain acid behavior should be re-tested via alternate kinetic tests. According to AGC's confirmatory ABA testing it appears that additional alternate tests were done on separate samples to analyze the presence of NP but were not repeated or re-analyzed on rock samples that showed uncertain acid behavior. From page 5 of DNR's response to public comments where DNR indicated that it required an additional round of ABA test work, it is not clear how AGC or DNR analyzed with caution the ABA testing as it is likely that actual waste rock and development rock particle size and mineralogy will be different from what was tested. **DNR did not address the flaws with AGC's acid testing in regards to the length of time between sample collection and sample testing when first flush occurred.** DNR's interest to verify the presence of NP by requiring an additional round of ABA testing raises reasonable concern because NP material at both sites is limited and generally not effective buffers.

Table 2, Big Hurrah Ore Rock Acid Base Accounting

Net Neutralizing Potential	NP:AP
Uncertain behavior + Acid Potential	Uncertain behavior + Acid Potential
25 of 61 (40.9%)	31 of 61 (50.8%)

Table 3, Big Hurrah Development Rock Acid Base Accounting

Net Neutralizing Potential	NP:AP
Uncertain behavior + Acid Potential	Uncertain behavior + Acid Potential
140 of 271 (51.7%)	173 of 271 (63.8%)

Table 4, Rock Creek Ore Rock Acid Base Accounting

Net Neutralizing Potential	NP:AP
Uncertain behavior + Acid Potential	Uncertain behavior + Acid Potential
26 of 89 (29.2%)	64 of 89 (71.9%)

Table 5, Rock Creek Development Rock Acid Base Accounting

Net Neutralizing Potential	NP:AP
Uncertain behavior + Acid Potential	Uncertain behavior + Acid Potential
84 of 318 (26.4%)	173 of 318 (54.4%)

Tables 2 through 5 are summarized pH saturated paste data from Big Hurrah and Rock Creek ABA testing. When uncertain and acid generating rock samples are summated a significant portion of the samples comprise rock that deserve special attention and may contradict the assumptions throughout the project plan indicating that Big Hurrah and Rock Creek rock are not acid generating. As such appropriate reclamation must address acid generation. Contrary to AGC's assertions that acid generation is only a potential issue for Big Hurrah and not an issue for Rock Creek, DNR's approval of the mine permits must be adjusted or reversed. Acid generation tests conducted by AGC do not reflect the type of rock that will likely be generated as waste rock or development rock.

Figure 2

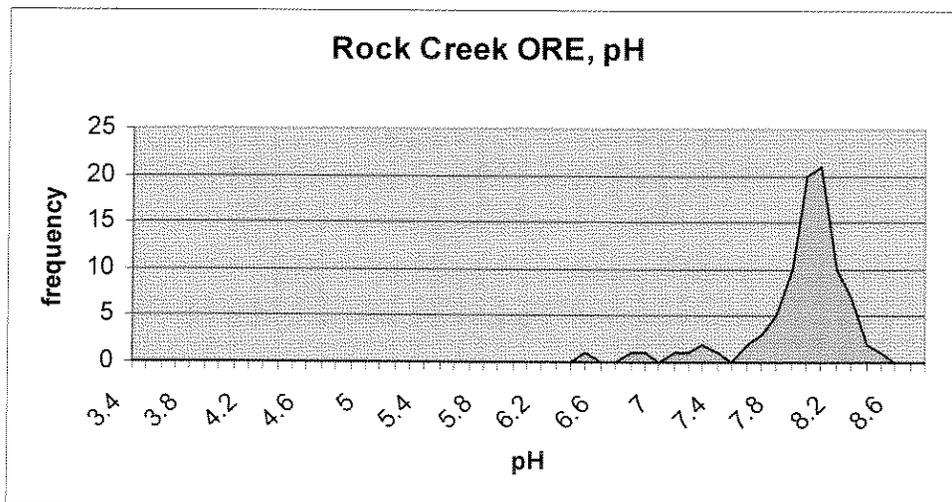


Figure 3

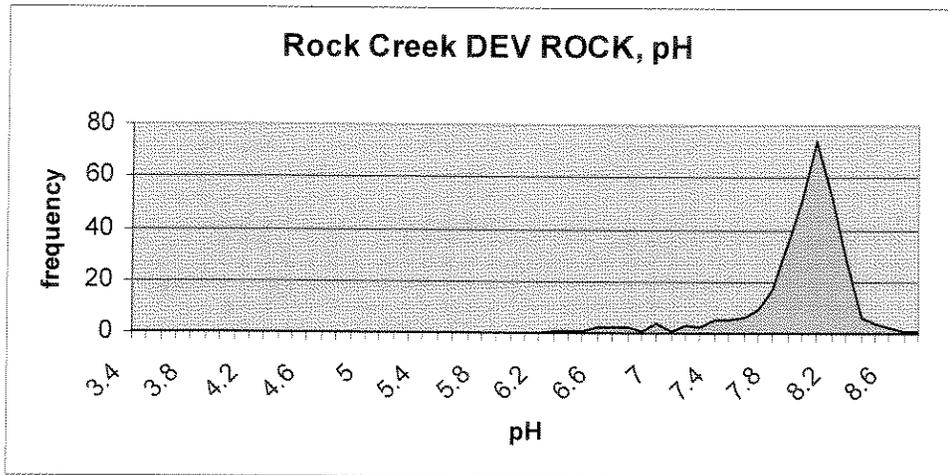


Figure 4

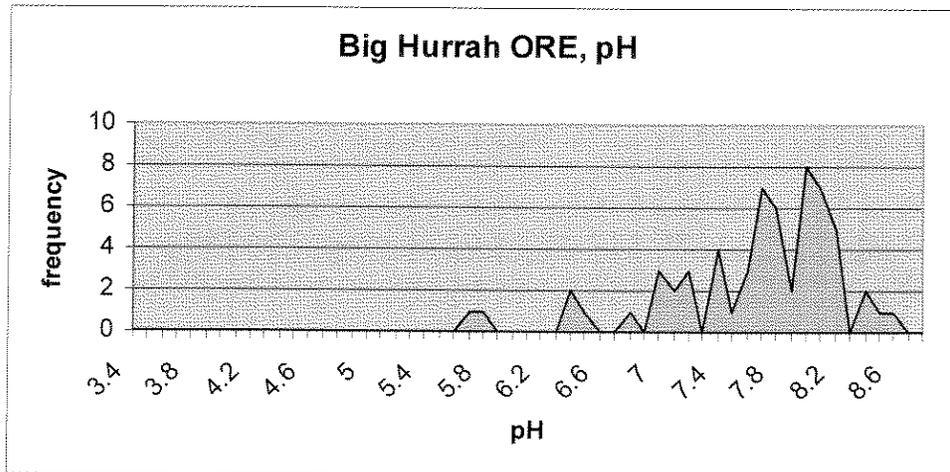
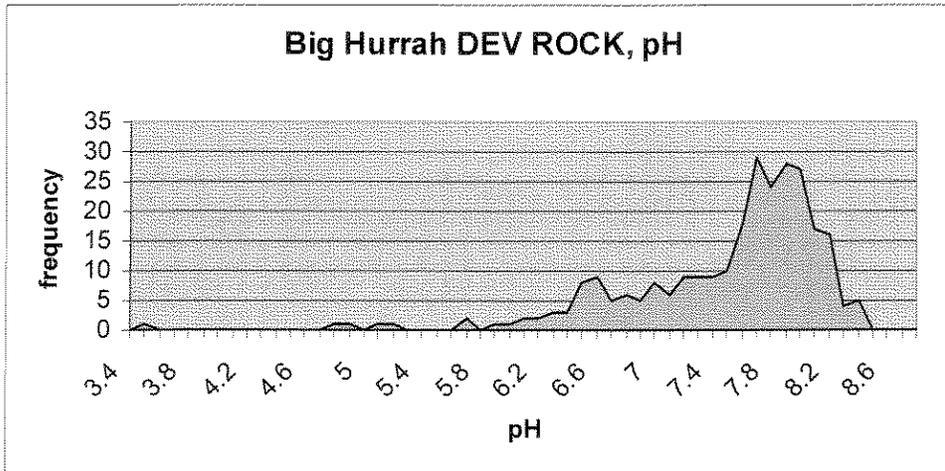


Figure 5



Figures 2 through 5 are frequency diagrams of saturated paste pH of Big Hurrah and Rock Creek ore and development rock. They show a skewed distribution with a majority of measurement between pH 7.8 to pH 8. The presence of acidic material in all rock samples is of concern and may mobilize elemental components in addition to elements that were shown to release immediately such as As, Sb, & Mo.

Merely segregating PAG material at the Big Hurrah site is not an effective measure to reduce the possibility of oxidation. In fact leaving the material as proposed is the most likely way to oxidize the PAG material. Depositing the PAG material in water after it may have oxidized is not an appropriate reclamation plan. DNR indicated on page 6 of its authorization that it is has not approved AGC's handling of Big Hurrah PAG material. It is very peculiar that DNR would approve the proposed plan without that crucial component. DNR citing the adequacy of Volume 8 as corroboration of NP and AP is not appropriate since I have criticized its integrity.

Spatial orientation of the rock samples is also crucial to understanding the acid potential of the mine. DNR should address how the samples are spatially oriented.

Table 6

ABA Sample depths Big Hurrah	
0-99	178
100-199	139
200-299	15
>300	15
blank	12

Table 7

ABA Sample depths Rock Creek	
0-99	150
100-199	164
200-299	71
>300	17
blank	17

Tables 6 & 7 are the result my efforts to understand the spatial relationship of drill samples tested for acidity and development areas within the Big Hurrah and Rock Creek sites. I utilized the "clientid" field identity to categorize drill hole sample depths. It seems to work and fits well with the drill hole sample figures that are shown in ABA testing results in Volume 8. I assigned an "a" to samples that were less then 100 feet in depth, a "b" to samples greater than 100 feet and less than 200 feet in depth, a "c" to

samples that were greater than 200 feet and less than 300 feet in depth, a “d” to samples greater than 300 feet in depth, and no assignment for samples that lacked an apparent depth. The “clientid” field contains numbers and dashes. I applied the last number after the last dash as the depth to test whether or not it indeed could be the depth of the sample.

Table 8

clientid	pH, saturated paste
04-22-030	6.8

Table 8 is an excerpt from the Rock Creek ABA results table. In that case “04-22” appears to be the portion of the “clientid” that identifies the hole number. The “-030” appears to be the depth of the sample. After entering each sample from the ABA results table utilizing the text copy feature of Acrobat® Reader which eliminated entering each sample by hand and was automatic within the Windows® environment I was able to assign the appropriate category. In the case of 04-22-030 the category would be “a”. From Tables 6 & 7 we see that the samples are shallow and less than 200 feet in depth. The Rock Creek pit is planned to have pit wall heights that range around 410 feet (Volume 1, pg 10). None of the samples collected for acidity are within the 400 foot depth range and relatively few are deeper than 300 feet. A significant and perhaps less well known mineralogy exists at the depth of pit wall height is planned. Rock has not been tested for acidity at the expected depth of the pit. Drill samples were taken under some sort of sampling scheme that seems systematic but may not have been applied in an appropriate fashion. DNR should have conducted a power analysis of samples taken and adjusted the permit or reverse its decision on the Rock Creek mine permits. **Without sufficient statistical analysis of rock sample chemistry to sufficiently describe AP and NP the public will not know if DNR is acting with caution or properly scrutinized the drill sample data; the lack of that analysis raises reasonable concern with DNR’s decision.**

Figure 6

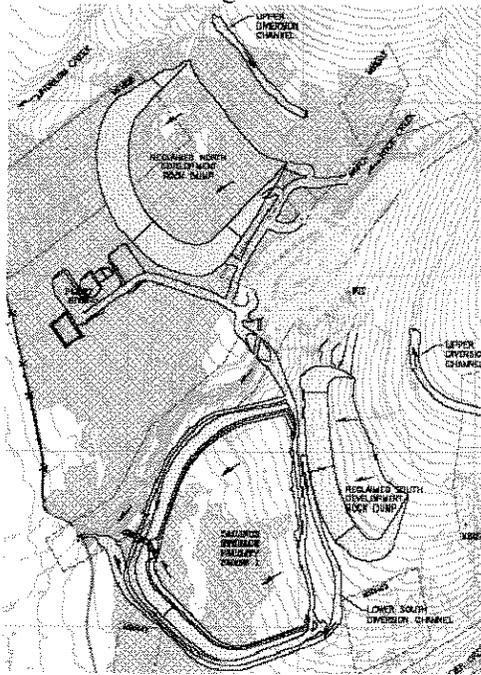


Figure 7

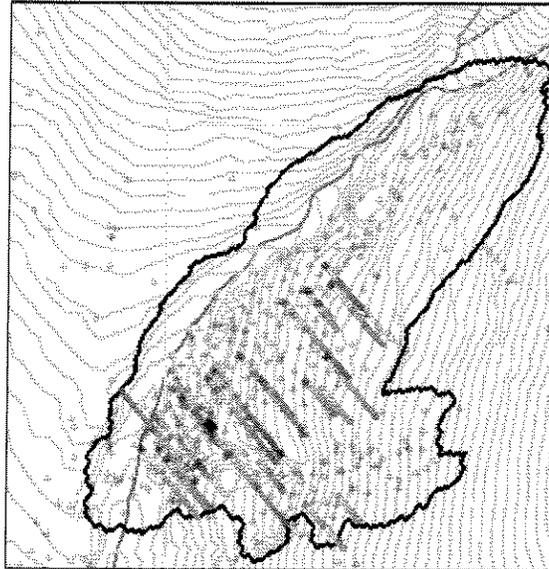


Figure 8

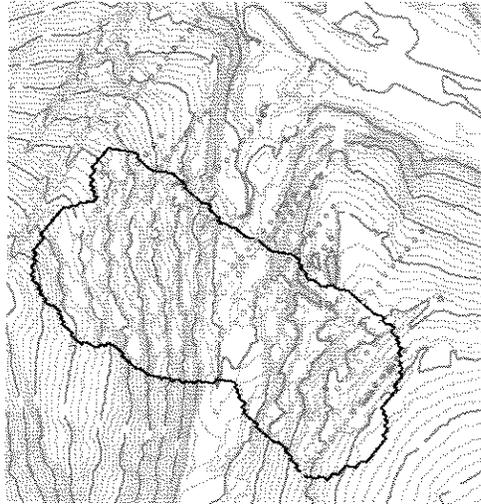
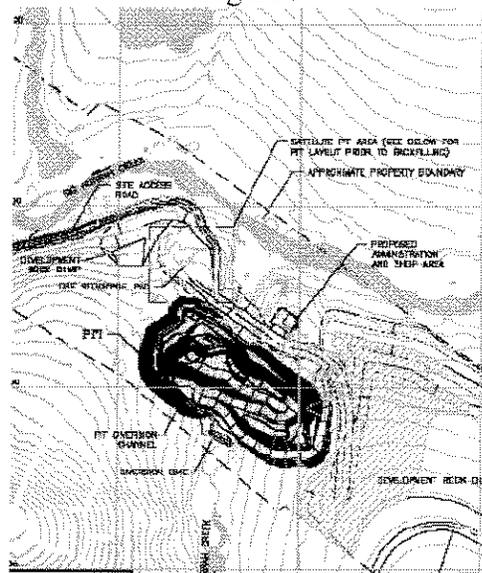


Figure 9



Figures 6 through 9 come from Volume 4 & 8 and show the spatial orientation of drill samples and pit locations. The drill sample locations do not cover the entire area of the pit locations at Big Hurrah or Rock Creek. **DNR should address how the drill locations were placed in relation to the pits and adjust the permit or reverse it decision.** Like the sample depths a power analysis should be done to address the relationship of drill locations and pit locations. Pit locations are approximate and AGC may change or move the pit locations. **Without sufficient statistical analysis of the drill locations the public will not know if DNR is proceeding with caution or appropriately.**

### Net Neutralizing Potential

Net Neutralizing Potential (NNP) of Big Hurrah and Rock Creek rock is generally low but has some limited Neutralizing Potential (NP) such as the presence of  $\text{FeCO}_3$ , however  $\text{FeCO}_3$  does not dominate the rock samples. AGC did NOT confirm the presence of  $\text{CaCO}_3$  and the lack of that effective buffering compound affects the NP:AP ratios that

could be applied for reclamation. AGC does conclude that it does not need to reclaim its lands however it must address how it will maintain water quality of adjacent areas which is a public resource used by all of Nome and requires AGC's reclamation.

### **Pit Lake Reclamation**

Reclamation of the pit lake may not be appropriate until contamination from cyanidation products, acid mine drainage, and non-acidic elemental releases are controlled. The likelihood of the pit lake being contaminated is a reclamation issue that is not detailed. Reclamation without contaminant control may attract wildlife to a contaminated pit lake, and it should NOT be expected that the pit lake will be a healthy lake available for aquatic or terrestrial life until toxic materials have been adequately controlled.

### **Rock Creek Reclamation Estimates**

Rock Creek and Big Hurrah surety estimates may be underestimated based upon the following factors:

1. Soil misclassification
  - a. Soils are any unconsolidated material above bedrock and likely are suitable soils for sub-arctic plant communities. I have argued that engineered soil placement must be a part of the reclamation plan placing those soils in an appropriate manner will raise surety estimates.
2. Neutralizing material not present
  - a. AGC may have to place buffering material with waste and development rock because naturally occurring neutralizing material is not sufficiently present. Based upon the uncertainty of Big Hurrah acid tests it is likely that surety estimates are low and the reclamation plan must address the lack of buffering material in both locations.
3. Pit lake water quality will be lower than applicable standards
  - a. I have argued that pit lake water quality will be degraded and will contain numerous toxic elements and may contain cyanide. The exposed pit walls at the upstream portion of the lake will readily oxidize along its surface or along the blast fractures. Reclamation estimates must take into consideration metals leaching from the pit walls and acid production from the pit walls.
4. Reporting
  - a. A more rigorous monitoring schedule must be in place. Daily monitoring during operational activities was argued for in my informal review request, and should be reflected for operational activities and if temporary closure is required.
  - b. Rigorous monitoring post closure must be planned for well beyond 2016 when Rock Creek will be placed back into its prior location after mining activities have ceased. It has taken many centuries for the geologic material in Big Hurrah and Rock Creek to reach homeostasis and DNR must determine in an appropriate manner how the financial surety estimate reflects a statistically

sufficient model of water quality behavior after mining activities have ceased and monitoring of toxic material.

5. Environmental Audit
  - a. Yearly environmental audits must be done during operational activities and then may be systematic after closure. I have argued that the lack of sufficient statistical analysis has flawed the conceptual ideas posed by AGC and if sufficient audits were done on acid tests, drill sample locations and depths there would be more information for the public to assess the adequacy of mining plans and may have reduced my concern and the publics.
6. Modifications
  - a. Bond review should be immediate when any condition is encountered that results in an increase in emissions or discharges. Not only from a modification to project plans and should be reflected in the modifications category of the reclamation plan.
7. Bench Angles
  - a. I believe that the bench angles of 38 to 52 degrees as proposed and approved by DNR on page 32 of Volume 4 will not be stable and will require modification and possibly major overhaul after mine closure. Slumping which occurs at much lower angles is a common landform where permafrost or shallow bedrock allow solifluction lobes to form. Solifluction lobes are evident at both sites and is an erosional component at both sites at lower angles and will be more prevalent after AGC performs its reclamation landscaping of the benches.
8. Land owner review
  - a. Land owner review is minimal. As is evidenced by my public comments land owner review may become more substantial as leadership within the Native corporations change. I am a shareholder of both Sitnasuak and Bering Straits Native Corporation and sense that shareholders are becoming more concerned for their lands and may pressure the Native Corporations for better sensitivity to their lands.

### **Conclusion**

DNR must re-consider its reclamation plan approval of the Big Hurrah and Rock Creek project. I believe I have presented new information that may not have been considered for this mine. The public is tremendously concerned about the impacts of this mine since the public hearing in Nome.

Thank you for your time and consideration.

Sincerely,



Austin Ahmasuk