

KENSINGTON GOLD PROJECT FINANCIAL ASSURANCE REVIEW

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1.0 Introduction

The Kensington Gold Project is a proposed underground gold mine and mill located approximately 45 miles north of Juneau, Alaska. This project is proposed for operation by Coeur Alaska, Inc., and is currently under review through a Supplemental Environmental Impact Statement (SEIS) (USDA FS, 2004). The mine is anticipated to begin construction upon completion of the SEIS review. With ore reserves estimated at 7 million tons, the Kensington Gold Project is expected to operate for 10 years at a production rate of 2,000 tons per day (tpd) ore and 400 tpd development waste rock.

Facilities proposed at the Kensington Gold Project include an underground mine, mill site, tailings disposal facility (86.1 acres), borrow areas (8.6 ac), development rock storage (4.8 ac), a heliport, marine terminal (6.0 ac), buildings, roads (7.2 ac), topsoil stockpiles (1.5 ac), stormwater diversions and other minor facilities. The project site covers both private land managed by Coeur Alaska, Inc. and public/federal lands managed by the US Forest Service. The total proposed surface disturbance for this mine facility is 195.5 acres.

The gold ore will be removed through 2 portals and conveyed to the surface mill located adjacent to the Jualin Portal. Gold is proposed for recovery in the mill through a flotation circuit generating a concentrate containing calaverite, native gold, pyrite, chalcopyrite and silicate. Concentrate will be transported off-site for processing. Tailings generated will be piped as a slurry to the proposed tailings storage facility located at Lower Slate Lake. Pre-project test work indicates the potential for acid rock drainage (ARD) is relatively low.

Coeur Alaska, Inc. plans to conduct reclamation both concurrent with operations and after mining operations have ceased. The primary goal of reclamation is to return the land to a safe and stable condition consistent with a productive post-mining land use of wildlife habitat and recreational use. Final reclamation will be conducted in three phases. Phase I is planned to last 2 years and includes site closure, final contouring and reclamation immediately after cessation all of mining activities. Phase II, passive reclamation, is anticipated to last 5 to 20 years and includes monitoring and maintenance, and possibly passive water treatment, until closure standards are achieved. Phase III is the period when the agencies accept reclamation and release the bonds in accordance to the terms of the Record of Decision.

The Kensington Gold Project reclamation plan was prepared in accordance with standard engineering cost estimation procedures and is consistent with methods commonly used by industry as well as state and federal agencies. Costs for individual reclamation tasks were based on unit costs developed during a third party reclamation cost estimate conducted in 1998 (Coeur Alaska, 12 Jun 04, Section 3.7). The proposed financial assurance amount is \$3,154,305. Reclamation activities, costs and scheduling will be reviewed by Coeur Alaska, Inc. every 3 years and again 2 years prior to closure.

Current financial assurance amounts proposed for the Kensington Gold Project guarantee that reclamation takes place in the event of bankruptcy, or other circumstances where reclamation is not completed by Coeur Alaska, Inc., are evaluated in this report. This technical review is based on analysis of the existing reclamation plan and financial assurance cost estimate “*Kensington Gold Project Reclamation Principles*” prepared by Coeur Alaska, Inc. in June 2004.

This evaluation was developed to evaluate whether the financial assurance amounts held by the state of Alaska are adequate to cover the costs of reclamation and closure as required by Alaska statutes and regulations. The state of Alaska is required to obtain financial assurances to ensure that the approved reclamation tasks are completed in the event Coeur Alaska, Inc. fails to perform the necessary tasks as outlined in the reclamation plan.

2.0 Methods

If the state of Alaska becomes responsible for reclamation at the Kensington Gold Project it is critical that adequate funding is available for completion of the required tasks. It is well documented at other mine sites (e.g. Summitville Mine in Colorado; Zortman-Landusky, Beal, and Basin Creek mines in Montana; and Brohm Mine in South Dakota) that in the event the operating company files bankruptcy costs incurred by the State to perform reclamation can be significantly higher than those originally estimated (Kuipers 2000). In some cases actual costs incurred by state and federal agencies can be 10 to 100 times higher than those estimated in reclamation plans and financial assurance calculations (Kuipers 2000). For these reasons this review of the Kensington Gold Project reclamation plan and financial assurance takes a conservative approach to cost estimating.

Financial assurance estimates calculated in this review were performed in accordance with standard cost estimation procedures and are consistent with methods commonly used by state and federal regulatory agencies. Site-specific reclamation tasks and associated areas of disturbance were developed from the aforementioned reclamation plan and financial assurance estimate. Assumptions, reclamation tasks and associated costs used in this estimate are the same as those used in the existing reclamation plan and financial assurance, except where noted in the explanations for each scenario.

First, the existing financial assurance estimates were replicated (as Scenario 0) in a format that allows for unit costs (\$/acre) to be determined for specific reclamation tasks. Next, three scenarios were developed where unit costs, indirect costs, and project timelines were evaluated and varied as described in the following sections. Finally, cash flow worksheets were generated for each scenario.

Detailed estimate calculations, and the resulting scenarios and assumptions, are provided as Attachment 1. Table 1 below summarizes the financial assurance amounts calculated for this review.

Table 1. Kensington Gold Project Financial Assurance Costs Summary

	Kensington Gold	CSIP[®] Scenarios			
	Scenario 0	Scenario 1	Scenario 2 (CSIP [®] Preferred Scenario)	Scenario 3	Scenario 4
	Based on 2004 reclamation plan.	Based on 2004 reclamation plan with increased indirect costs.	Based on Scenario 1 with increases to unit costs and additional reclamation tasks.	Based on Scenario 2 with 50 years of water treatment.	Based on Scenario 2 with 100 years of water treatment.
Capital Costs	\$2,423,680	\$2,953,047	\$3,813,946	\$4,527,746	\$5,357,746
Operating Costs	\$680,625	\$903,870	\$5,402,470	\$30,401,330	\$54,425,330
Total	\$3,104,305	\$3,829,692	\$9,216,416	\$34,929,076	\$59,783,076

3.0 Review of Kensington Gold Project Reclamation Plan and Financial Assurance Calculations

3.1 Kensington Gold Project Scenario 0

For Scenario 0 labor costs, equipment costs, material costs, and acreages for specific reclamation tasks used duplicate those provided in the cost estimation worksheets in the Kensington Gold Project reclamation plan. The reclamation plan does not indicate the basis for determining labor, equipment, or material unit costs estimated for reclamation and closure at the Kensington Gold Project. Typically unit costs are determined using Caterpillar Performance Handbook standards for equipment rates and efficiencies, prevailing wage rates from Davis Bacon Wages for Alaska for labor costs, and contractor estimates or mine site experience for material costs.

Scenario 0 was generated to determine unit costs for specific reclamation tasks used in the Kensington Gold Project cost estimate. These unit costs are evaluated and changed in subsequent scenarios. Although data inputs for Scenario 0 were derived from Kensington Gold Project cost estimation worksheets, slight differences in total amounts are observed. The Scenario 0 reclamation plan financial assurance amount differs by \$50,000 (\$3,154,305 - \$3,104,305), which results in a 1.6% difference when compared to the Kensington Gold Project generated financial assurance. This difference can be attributed to a \$200,000 cost for mobilization/demobilization being assigned as a direct cost in the Kensington Gold Project reclamation cost estimate, while mobilization/demobilization costs are treated as an indirect cost in Scenario 0.

The following observations were noted during review of the Kensington Gold Project Reclamation Plan:

- The costs in this 2004 reclamation plan appear to be based on engineered unit costs defined in a 1998 reclamation plan submitted to the US Forest Service. The Kensington Gold Project 2004 reclamation plan does not indicate if the unit costs defined in 1998 were escalated to 2004 dollars. This is not addressed in this review of the financial assurance, but would result in a 17% increase of the contract costs from 1998 to 2004. Escalation should be applied in subsequent financial assurance reviews.

- The administrative principles described state that bonding will be based on actual reclamation costs. It is typical in a financial assurance estimate to apply costs for a third party to conduct reclamation in the event of bankruptcy, which is addressed in the direct and indirect costs assigned in subsequent scenarios.
- Costs for reclamation tasks are preliminary in this 2004 reclamation plan and therefore do not provide much detail on the costs of individual reclamation tasks. For example, demolition costs are presented as a single line item cost for different facilities (Slate Creek Cove facilities, Process Area, Roads, etc.) without explanation of the specific buildings, equipment, or other structures present. Typically for demolition costs the building type and size would be defined so that an appropriate demolition and/or burial costs can be assigned and evaluated.
- There are no costs assigned in the estimate for detoxification and disposal of wastes. For the purposes of this review it is assumed that this reclamation task is estimated as part of the demolition line item costs, but more information should be provided in subsequent reclamation plans.

3.2 **CSP²** Scenario 1

Scenario 1, developed by **CSP²**, duplicates the Kensington Gold Project reclamation plan cost estimate capital and operating costs with changes made to indirect costs as noted below. Scenario 0 indirect costs are calculated at 34% of the estimated contract costs, and Scenario 1 indirect costs are 66% of the estimated contract costs. The difference results from increases in Scenario 1 indirect costs for mobilization/demobilization, engineering redesign, contractor overhead, contractor profit and inflation.

A financial assurance cost estimate should be developed under the assumption that reclamation is performed by a third-party under contract to the appropriate regulatory agency. Factors including contractor ownership, standby, overhead, engineering redesign, etcetera result in higher costs than those typical of reclamation costs when performed by mining companies. Indirect costs represent one of the most common areas in which financial assurance requirements are underestimated (Kuipers 2000). Indirect costs are added to this estimate to account for additional costs incurred in the event of agency management and oversight of reclamation and closure.

The Kensington Gold Project cost estimate included indirect costs for contingency (10%), mobilization and demobilization (\$200,000 or 11%), engineering, procurement, construction management (5%), and contract/agency administration (10%). In this estimate, indirect costs amount to 34% of the operating and capital contract costs.

The following indirect costs were applied to **CSP²** Scenario 1:

- *Contingency.* Contingency costs reflect the level of detail and completeness of the cost estimate, as well as the degree of uncertainty of factors and assumptions used in the cost estimate. A contingency amount of 10% was applied to the estimated contract costs in the Scenario 1 cost estimate, which is the same percentage used in the Kensington Gold Project cost estimate.

- *Mobilization / Demobilization.* Mobilization/demobilization costs account for the transport of equipment and materials to and from the mine site, as well as infrastructure needs. A mobilization/demobilization amount of 10% was applied to contract costs estimated in Scenario 1, while the Kensington Gold Project applied a set dollar amount of \$200,000 which is approximately 11%.
- *Engineering Redesign.* Engineering redesign costs stem from a lack of detailed information and plan development in a financial assurance estimate, as well as the need to account and design for actual conditions at the time of reclamation and closure. An engineering redesign cost of 3% was applied to the estimated contract costs used in Scenario 1. The Kensington Gold Project cost estimate did not include any amount for engineering redesign.
- *Engineering, Procurement, Construction Management.* This indirect cost accounts for the requirement of construction engineering, procurement, and construction management on behalf of the agencies in the event they become responsible for reclamation. An indirect cost of 5% of the contract costs was used in Scenario 1, which is the same percentage applied for the Kensington Gold Project cost estimate.
- *Contractor Overhead.* Contractor overhead accounts for administrating, management, public relations, safety, environmental, legal, performance bonding and other costs associated with doing business. A contractor overhead cost of 15% was applied to the estimated contract costs used in the Scenario 1 cost estimate. The Kensington Gold Project cost estimate did not include any amount for contractor overhead.
- *Contractor Profit.* This indirect cost accounts for contractor profit. A contractor profit amount of 10% was applied to contract costs estimated in Scenario 1, while the Kensington Gold Project did not apply a percentage for contractor profit in their cost estimate.
- *Agency Administration.* Agency administration includes costs incurred by state and federal agencies in situations where reclamation and closure are performed by regulatory agencies. Agency administration costs were accounted for as 10% of the contract costs in both the Kensington Gold Project cost estimate and Scenario 1.
- *Inflation.* Inflation indirect costs account for the difference in the dollar value between the time the estimate was generated and reclamation and closure are performed. An inflation amount of 3% was applied to the contract costs estimated in Scenario 1. The Kensington Gold Project cost estimate did not apply inflation.

Application of these indirect costs in Scenario 1 results in an increase of 23% over Scenario 0. The Kensington Gold Project Reclamation Plan costs were estimated as \$3,829,692 under Scenario 1. Indirect costs for Scenario 1 amount to 66% of the estimated operating and capital contract costs, while indirect costs were 34% for Scenario 0.

3.3 **CSP²** Scenario 2

Scenario 2 includes the addition of indirect costs as described for Scenario 1, as well as changes to unit costs and reclamation tasks as described below.

- *Contouring Costs.* The units cost estimated in the Kensington Gold Project reclamation plan for contouring of development rock sites, buildings, roads and other facilities is \$249/acre. Although this reclamation plan lacks specific information regarding contouring (i.e. grade slopes from 1.5:1 to 3:1 at closure), the unit cost applied seems low when compared to other operations in Alaska. Scenario 2 uses a contouring unit cost of \$1,500/acre. This unit cost is based on the unit cost of contouring activities estimated at the True North Project at \$2,044/acre (Fairbanks Gold Mining, December 2001) and the Fort Knox Mine at \$1,550/acre (Fairbanks Gold Mining, April 2001). These changes increased the contouring costs from \$65,971 in Scenario 1 to \$209,060 in Scenario 2.

- *Revegetation Costs.* The unit cost of \$525/acre estimated in the Kensington Gold Project reclamation plan for revegetation activities includes the establishment of self-sustaining vegetation communities through native reseeding and promotion of natural invasion and succession. The reclamation plan does not mention plans for more than one seeding event or weed control measures.

Scenario 2 uses a revegetation unit cost of \$1,500/acre on flat surfaces. This cost estimate assumes that all surfaces are flat as detailed information is not provided. These unit costs are based on Montana Department of Environmental Quality (MDEQ) financial assurance recommendations based upon agency experience. These changes increased the revegetation costs from \$72,975 in Scenario 1 to \$208,500 in Scenario 2.

- *Mine Facility Unit Area.* There is no unit area provided for the following reclamation tasks to assess the area and costs required for contouring, application of cover or growth media, and revegetation activities after demolition has taken place: Administrative Area Buildings, Power/Telephone Lines, Fuel Storage Tank, Infiltration Gallery, and Earth Retaining Walls. It is assumed that these areas are small compared with those acreages provided for other reclamation tasks, but clarification should be provided in future reclamation plans. No cost was assigned in Scenario 2 for earthwork and revegetation required for these areas.
- *Plug Mine Portals.* The Kensington Gold Project reclamation plan discusses activities associated with plugging the 2 portals at closure, however no costs associated with portal plugging tasks are provided. Scenario 2 uses a unit cost of \$85,000/portal to plug portals based on the Pogo Project Reclamation Plan (Teck-Pogo, 2002).
- *Water Treatment.* The Kensington Gold Project reclamation plan does not provide costs for water treatment during mine operations or post-closure activities, other than earthwork costs associated with the conversion of storage ponds into subsurface flow wetlands as a passive treatment system.

Scenario 2 assumes that active water treatment will be required for 7 years after closure to treat drainage from the tailings impoundment, rock piles, mine portals, and other facilities before discharge off-site. Costs for the operation of a reverse osmosis treatment plant at 1,200 gallons per minute are used in this estimate because it is a proven technology for the removal of both aluminum and total suspended solids. Costs for construction and operation of a reverse osmosis treatment system

provided in a technical memorandum by Ed Cryer of MWH dated 4 June 2004 (Coeur Alaska, 5 August 2004) were used in Scenario 2.

- *Sludge Disposal.* This scenario includes 7 years of active water treatment of mine drainage after closure as discussed above. Scenario 2 includes an annual cost of \$10,000/year for the proper handling and disposal of sludge and/or brine associated with operation of a reverse osmosis treatment system.
- *Surface and Groundwater Monitoring.* Long-term monitoring and maintenance programs are not defined in the Kensington Gold Project reclamation plan, but Coeur Alaska, Inc. plans to develop these programs as part of the final reclamation plan. At a minimum, the reclamation plan commits to monitor surface and groundwater as required by the NPDES or Solid Waste permits. Currently the reclamation plan assumes a cost of \$20,000 per year for 15 years for post closure water monitoring.

Scenario 2 assumes that post-closure water monitoring will occur as defined in Table 2 of the Draft NPDES permit (USEPA, 2004) issued for the Kensington Project at a minimum of 3 surface water quality monitoring locations. In general water quality parameters and metals will be analyzed quarterly with Whole Effluent Toxicity (WET) testing conducted annually. For this Scenario, post-closure monitoring will take place for 22 years after closure (for the 7 year active water treatment period, and 15 years after cessation of water treatment). The assumed cost of \$20,000 per year seems adequate for quarterly surface and groundwater quality monitoring; however actual costs should be applied to the financial assurance estimate once they are determined.

- *Reclamation Monitoring and Maintenance.* Reclamation monitoring and maintenance activities are not specifically defined in the Kensington Gold project reclamation plan, but Coeur Alaska, Inc. plans to develop these programs as part of the final reclamation plan. The 2004 reclamation plan includes 5 years of reclamation monitoring for water and vegetation at \$40,000 per year, and 1 year of hydrocarbon monitoring at \$44,500 per year. A cost for necessary maintenance of facilities post-closure is not included in the reclamation plan for Kensington Gold Project.

Scenario 2 assumes that the \$40,000 per year for reclamation monitoring includes activities described in Table 2-7 of the Draft SEIS (USDA FS, 2004). This includes bioassays, fish surveys, spawning surveys, benthic macroinvertebrate surveys and community comparisons, and sediment monitoring. These surveys are described to take place annually at a minimum of 3 monitoring locations and a maximum of 7 locations. Reclamation monitoring also includes monthly stability inspections of the tailings facility and annual inspections of the waste rock facilities. For the purposes of this estimate it is assumed that completion of these surveys at 5 monitoring locations on an annual basis will cost \$100,000 per year, or \$20,000 per year for each monitoring location. Monitoring is assumed to take place annually for the first 5 years, then once every 5 years for the remaining water monitoring period of 17 years. One year of hydrocarbon monitoring at a cost of \$44,500 is also included in year one of reclamation monitoring. A more accurate cost and schedule for reclamation monitoring should be applied to this financial assurance once determined in the final reclamation plan.

Scenario 2 assumes a cost of \$10,000 per year for reclamation maintenance activities. This is applied annually for the first 5 years, then once every 5 years for the remaining monitoring period of 17 years. A more accurate cost and schedule for reclamation maintenance should be applied to this financial assurance once determined in the final reclamation plan.

Application of these additional costs in Scenario 2 results in an increase of the current financial assurance amount by 197% over Scenario 0. The Kensington Gold Project reclamation plan costs were estimated as \$9,216,416 under this Scenario.

Scenario 2 is the **CSP**² preferred alternative presented in this review. This scenario includes additional costs for indirect expenses, contouring, revegetation, plugging mine portals, water treatment, sludge/brine disposal, water monitoring, and reclamation monitoring and maintenance. The duration of surface and ground water monitoring of 22 years (15 years after cessation of water treatment) seems adequate given the initial description of geology at this site.

3.4 **CSP**² Scenario 3

It must be noted that in recommending this scenario, the duration of active water treatment for 7 years assumes acid generation does not become an issue at this mine. Since water treatment is a major component of closure costs, **CSP**² developed Scenarios 3 and 4 to evaluate the costs of longer-term water treatment for comparison purposes. Scenario 3 utilizes the same assumptions and changes made in Scenario 2, with the addition of 50 years of water treatment.

Scenario 3 was developed to determine the cost differences should water treatment, monitoring, and maintenance need to be extended for 65 years (50 years water treatment plus 15 years monitoring and maintenance). In this case, water treatment plant operation and maintenance costs were increased to reflect an operational period of 50 years. This includes a sludge/brine disposal cost of \$500,000 for 50 years of water treatment. Water treatment plant capital replacement costs totaling \$4,661,000 were also assumed. For capital replacement costs, a water treatment plant capital cost of \$2,661,000 was used based on the costs estimated for construction of a reverse osmosis treatment system provided in a technical memorandum by Ed Cryer of MWH dated 4 June 2004 (Coeur Alaska, 5 August 2004), and a water treatment plant capacity of 1,200 gpm.

Monitoring and maintenance under this scenario is performed as described in Scenario 2 with the time period extended. Surface and groundwater monitoring is assumed to take place for 65 years (50 years during water treatment, 15 years after cessation of water treatment), which increased the cost to \$1,300,000. Reclamation monitoring and maintenance, as described in Scenario 2, was extended to a period of 65 years with annual monitoring the first 5 years, and monitoring once every 5 years for the remaining 60 years. Reclamation monitoring costs increased to \$1,744,500, and reclamation maintenance costs increased to \$170,000.

Application of these additional costs in Scenario 3 results in an increase of the current financial assurance amount by 1,025%. The Kensington Gold Project reclamation costs were estimated as \$34,929,076 under this scenario.

3.5 **CSP²** Scenario 4

Scenario 4 utilizes the same assumptions as Scenario 2, with the addition of 100 years of water treatment to mitigate acid generating drainage – a period that some use to calculate the costs of perpetual treatment.

In this case, water treatment plant operation and maintenance costs were increased to reflect an operational period of 100 years. Water treatment plant capital replacement costs of \$4,661,000 were assumed. Sludge/brine disposal costs for 100 years of treatment were estimated at \$1,000,000.

Monitoring and maintenance under this scenario is performed as described in Scenario 2 with the time period extended. Surface and groundwater monitoring is assumed to take place for 115 years (100 years during water treatment, 15 years after cessation of water treatment), which increased the cost to \$2,300,000. Reclamation monitoring and maintenance, as described in Scenario 2, was extended to a period of 115 years with annual monitoring the first 5 years, and monitoring once every 5 years for the remaining 110 years. Reclamation monitoring costs increased to \$2,744,500, and reclamation maintenance costs increased to \$270,000.

Application of these additional costs in Scenario 4 results in an increase of the current financial assurance amount by 1,826%. The Kensington Gold Project reclamation plan costs were estimated as \$59,783,076 under Scenario 4.

4.0 **Conclusions**

As illustrated by this review, the Kensington Gold Project financial assurance of \$3,104,305 currently estimated may not be adequate to cover the costs of reclamation and closure incurred when these tasks are performed by a regulatory agency. As shown in Scenarios 1 and 2 presented above, financial assurance costs could increase from between 23% and 197% when accounting for additional indirect costs and reclamation tasks.

CSP² recommends a reclamation surety of \$9,216,416, based on the assumptions and calculations presented in Scenario 2.

If water treatment were to be required for 50 years the financial assurance amount could increase by 1,025%, and by 1,826% if water treatment is required for 100 years. This would result in a potential increase of the overall financial assurance amount to between \$3,856,917 and \$59,783,076.

5.0 References

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