BARRICK


Photo taken August 2011

01 December 2014
Final Report

Eskay Creek Gold Mine Site (Closed)
Albino Lake Waste Rock Storage Facility
Dam Safety Inspection Report

DOCUMENT INFORMATION

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EXECUTIVE SUMMARY

As requested by the Ministry of Energy and Mines (MEM) of British Columbia, Barrick Gold Corporation (Barrick) has prepared this written report addressing the requirements of the MEM Guidelines for Annual Dam Safety Inspection Reports for the closed Albino Lake waste rock storage facility (WRSF) at Barrick's Eskay Creek Mine site in northwestern British Columbia. This report incorporates background information and site monitoring data provided by Barrick in addition to observations made by the author during a site visit on 01 October 2014.

Currently there are no engineered embankments, barriers or other structures impounding water or mine waste material in the Albino Lake WRSF. Thus, no Dam Classification is possible for the facility in terms of Table 2-1 of the Canadian Dam Association (CDA) 2013 Dam Safety Guidelines. A concrete wall and wooden stop-log control structure built in the natural outlet channel just downstream of the south end of Albino Lake toward the end of Eskay Creek Mine operating life was taken out of operation in 2010 and can no longer impound additional water in the lake. If the decommissioned control structure were ever to be reinstated and used to impound the maximum, estimated 200,000 m^3 of water above the natural lake level, a Dam Classification of Low would be deemed appropriate, based on consideration of Population at risk (None), Loss of life (Zero), Environmental and cultural values (Minimal short-term loss) and Infrastructure and economics (Low losses). The recommended Low consequence Dam Classification is consistent with that suggested in the 2010 Inspection Report for the facility.

There have been no significant changes in visual monitoring records for the Albino Lake WRSF since the end of mine operations in early 2008. Principally because there are no engineered embankments to monitor, no geotechnical instrumentation installations exist or were ever installed at the site.

There were no changes to the stability of the concrete wall and wooden-log control structure during its brief service life, and the remnant concrete walls of the now-decommissioned structure appear to be in sound condition. Since decommissioning of the control structure in 2010, there have been no changes to surface water control in the Albino Lake WRSF.

Part 10 of the British Columbia Mine Health Safety and Reclamation Code (the Code) defines a major impoundment as *an impoundment that has a maximum depth of material greater than 10 metres at any point, or a maximum height of retaining dam or dike at any point that exceeds 15 metres, or is a storage facility designed to contain more than one million cubic metres of material or is constructed with dams or dikes that contain more than 50000 cubic metres of fill, or any other impoundment or water management facility so declared by the chief inspector.* Understanding that the MEM considers the Albino Lake WRSF to be a major impoundment by virtue of its maximum depth of [submerged] material, the Code requires that a current Operation, Maintenance and Surveillance (OMS) Manual be available. An OMS Plan for the facility was prepared and submitted to the Water Stewardship Branch of the Ministry of Environment (MoE) of British Columbia in April 2009;

that document has been updated to reflect the decommissioned control structure, and is provided in Appendix A of this report.

As there is no tailings dam or any other structure at the Albino Lake WRSF currently impounding water and/or mine waste material, and no plausible failure mechanism by which any significant amount of waste rock or tailings could foreseeably be released from the lacustrine impoundment, no Emergency Preparedness and Response Plan (EPRP) is required for the facility.

Table 5-1 of the CDA 2013 Dam Safety Guidelines provides a schedule for formal Dam Safety Reviews, depending on the Dam Classification of the subject structure. With the decommissioning in 2010 of the concrete wall and wooden-log control structure, there are no engineered barriers impounding water and/or mine waste material in the Albino Lake WRSF and thus no structures to inspect. Were the control structure ever to be reinstated to impound additional water in Albino Lake, the requirement for periodic Dam Safety Reviews would be re-evaluated.

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1. Introduction

1.1. MEM Requirements

In response to the Mount Polley tailings dam failure of 04 August 2014, the Chief Inspector of Mines of the Ministry of Energy and Mines (MEM) of British Columbia ordered on 18 August 2014 all mining companies to conduct a Dam Safety Inspection and an Independent Third-Party Review of the Dam Safety Inspection for every tailings storage facility (TSF), whether active or closed, at permitted mines in British Columbia by 01 December 2014. Under the Chief Inspector's Order (the Order), a third-party review of the stated Dam Classification, as determined from the Canadian Dam Association (CDA) 2013 Dam Safety Guidelines, must be completed and a TSF assigned a High, Very High or Extreme Classification must have a current Emergency Preparedness and Response Plan (EPRP) available, including a dam break inundation study. The MEM has stated that all information obtained under the Order will be provided to First Nations in British Columbia and made public.

Barrick Gold Corporation (Barrick) currently manages its closed Eskay Creek Mine, located in northwestern British Columbia. During the mine's operation, and under regulatory authorization, waste rock and tailings were permanently stored and remain submerged in two natural, non-fish bearing lakes, Albino Lake and [Big] Tom MacKay Lake. There are no tailings dams, engineered embankments, barriers or other structures retaining water or mine waste materials at either lacustrine impoundment.

Barrick requested of the MEM that the closed lacustrine waste rock and tailings storage facilities at the Eskay Creek Mine site be excluded from the Order, on the basis that there were no dams associated with either storage facility and no plausible geotechnical failure mechanism by which waste rock or tailings could be released. In an email response dated 22 September 2014, the MEM agreed that it would accept a written report from Barrick addressing each of the line items in the August 2013 MEM Guidelines for Annual Dam Safety Inspection Reports in lieu of the Dam Safety Inspection and an Independent Third-Party Review of the Dam Safety Inspection. A copy of the printed email correspondence is provided in Appendix B. An MEM representative confirmed in a subsequent telephone conversation requested that a separate written report was required for each lacustrine impoundment at Eskay Creek Mine.

This document addresses the requirements of the August 2013 MEM Guidelines for Annual Dam Safety Inspection Reports for the closed Albino Lake impoundment at the Eskay Creek Mine site. A companion report has been prepared and submitted under separate cover for the closed Tom MacKay Lake impoundment.

1.2. Eskay Creek Mine History

The Eskay Creek Mine site is located approximately 80 km northwest Stewart, a district municipality situated at the head of the Portland Canal in north-coastal British Columbia, and about 300 km southeast of Juneau, Alaska (Figure 1).

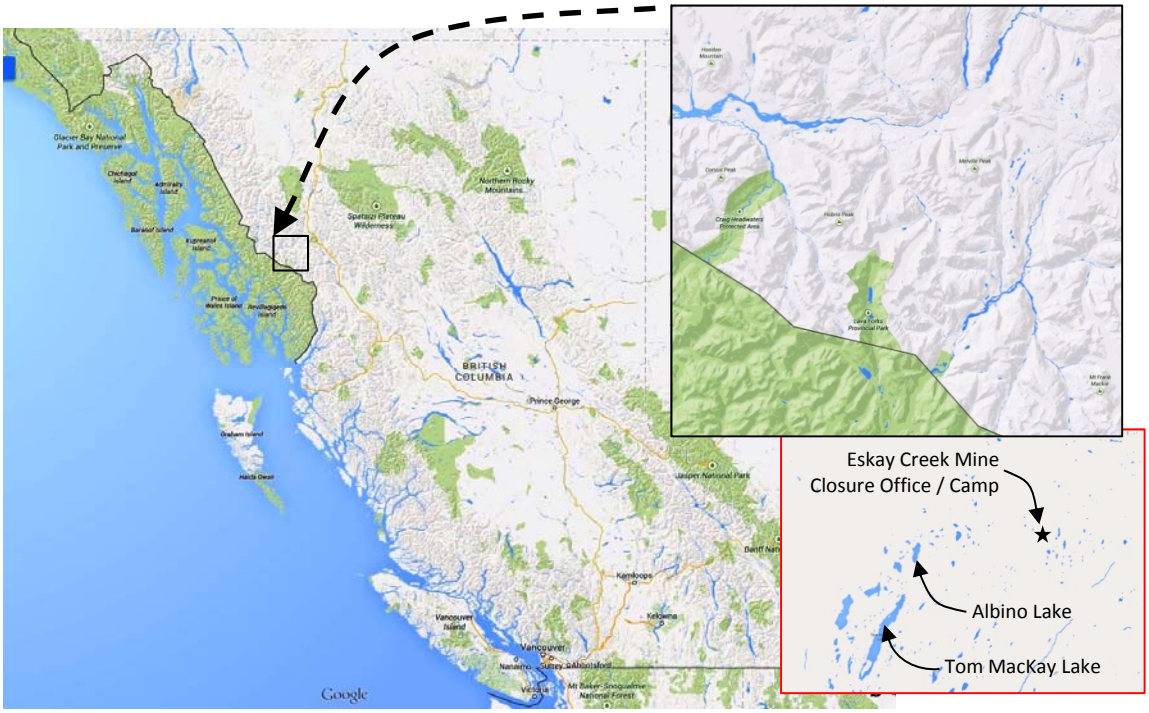


Figure 1. Eskay Creek Mine location in northwestern British Columbia.

The Eskay Creek Mine operated from autumn 1994 to spring 2008, and during that time was the highest-grade gold mine in Canada (over 3.3 million ounces of gold recovered) as well as a significant global producer of silver (over 165 million ounces). Approximately 275,000 metric tonnes (t) per year of gold and silver-bearing ore on average were produced over the mine's fourteen-year operation. Because of the high grades, particularly in the earlier years, much of the ore could be shipped directly to smelters after only blending and primary crushing. The remaining ore was milled and subject to flotation processing to produce a concentrate for shipping.

From the start of mine operations to late 1997, high-grade ore was crushed and shipped for smelting. During this period, lower grade ore was stockpiled for later processing, while waste rock from the underground mining operation was stored underwater in Albino Lake. In late 1997, the processing plant began operation and the filtered tailings generated from the milling and flotation recovery work were trucked to and stored in Albino Lake along with the waste rock. From September 2001 to the end of operations, slurry tailings were instead discharged into Tom MacKay Lake via a dedicated pipeline while waste rock continued to be stored in Albino Lake. A small percentage of slurry tailings were trucked to the Albino Lake waste rock storage facility (WRSF) during maintenance or other events that restricted normal pipeline slurry tailings discharge to Tom MacKay Lake.

Table 1 summarizes the reported annual waste rock and tailings quantities stored in Albino Lake and Tom MacKay Lake during the mine's operation. Not included in Table 1 are the reported 117,556 dry t of waste rock disposed of underground and used to backfill portals

during the mine's operating life, nor the 7,426 dry t of waste rock relocated from the ore storage and transfer facility in Kitwanga, British Columbia to the Albino Lake WRSF in 2009 as part of initial mine closure activities.

Table 1. Reported Annual Waste Rock and Tailings Quantities Stored

	Albino Lake		Tom MacKay Lake	
Year	Waste Rock (dry t)	Tailings (dry t)	Waste Rock (dry t)	Tailings (dry t)
1994	49,035	0	0	0
1995	153,720	0	0	0
1996	44,835	0	0	0
1997	90,460	4,683	0	0
1998	67,410	39,526	0	0
1999	72,870	58,671	0	0
2000	72,000	72,203	0	0
2001	117,000	55,235	0	24,309
2002	137,000	250	0	95,453
2003	134,000	4,410	0	93,815
2004	184,000	4,158	0	88,239
2005	175,000	4,000	0	86,147
2006	153,760	8,536	0	82,768
2007	34,719	5,748	0	91,782
2008	0	0	0	21,944
Total	**1,485,809**	**257,420**	**0**	**584,457**

As indicated in Table 1, the total reported quantities of waste rock and tailings placed in the Albino Lake WRSF are 1,493,235 dry t (including the 7,426 t relocated to the facility in 2009) and 257,420 dry t, respectively.

Lacustrine waste rock and tailings placement at the Eskay Creek Mine provided a secure methodology for permanent, submerged storage of the potentially acid generating mine waste materials. The high-alpine, natural lakes and streams in the Tom MacKay watershed, including Albino Lake and Tom MacKay Lake, are oligotrophic (naturally low in plant nutrients) and barren of fish due to an impassible waterfall as well as stream velocity barriers to some 10 km downstream of the Eskay Creek Mine site (McGurk et al., 2006).

1.3. Albino Lake WRSF Status

The now closed Albino Lake WRSF is situated approximately 8 km west of the Eskay Creek Mine closure office and camp site (refer to Figure 1). Albino Lake is approximately 750 m long and 150 m wide, with a water surface elevation of approximately 1,050 metres above mean sea level (mamsl). According to a project application amendment document regarding waste rock and tailings management at the mine accessed on the British Columbia Environmental Assessment Office website (BCEAO, 2014), baseline

investigations completed before the start of mine operations indicated that the total water (i.e. normal lake basin) volume of Albino Lake was about 1,080,000 m^3. Pre-development bathymetric contours as presented in a condemnation drilling program report (Kuran, 1994) in support of the proposed Albino Lake waste rock disposal site indicated that the maximum water depth was between 20 m and 25 m, in the north-central portion of the lake.

The geologic information provided in Kuran (1994) indicates that Albino Lake's natural outlet channel, located at its south end, is founded on a veneer of conglomeratic lodgement till overlying bedrock or directly on bedrock, likely the massive silty mudstone of the Upper Cretaceous Bowser Lake Group. Outlet flows are measured by a rectangular, sharp-crested weir constructed in the natural channel, some 100 m downstream of the lake. Drainage from Albino Lake flows south and then southeast some 300 m in Albino Creek before entering Tom MacKay Creek approximately 700 m northeast of the north end of Tom MacKay Lake. Tom MacKay Creek enters Ketchum Creek just east of the Eskay Creek Mine office and camp site, from whence Ketchum Creek flows south some 3.5 km to join the Unuk River.

On 31 October 2007, construction was completed of a concrete wall and wooden-log control structure built in the natural outlet channel approximately 10 m downstream of the Albino Lake shoreline. The control structure was designed and built in response to a directive from Environment Canada that Barrick *take reasonable measures to stop the deposit* [discharge] *and prevent further deposit of Albino Lake tailings impoundment effluent… into water frequented by fish or into any place under any conditions where the effluent may enter any such water* [i.e. the Unuk River, some 10 km downstream]. The control structure allowed Barrick to temporarily raise the lake's water surface some 2.2 m (maximum) above its natural level, if and when required to store water during operation of the Albino Lake WRSF that may not meet regulated quality standards. Riprap channel protection was provided upstream and downstream of the control structure. No other embankments, barriers or structures capable of impounding water and/or mine waste have ever been built around the lake perimeter. Appendix C contains a copy of the most recent Dam Inspection Report for the Albino Lake impoundment (Knight-Piésold, 2010), which provides more detail as to the control structure design and as-built condition. (The report mistakenly states that construction of the control structure was completed in 2008, instead of the correct date of 31 October 2007).

The control structure was used during the spring freshets of 2008, 2009 and 2010 to impound additional lake water and therefore assist with the settling out finer-grained material related to the fall and winter-time mechanical reshaping of the previously deposited mine wastes. Prior to the reshaping work, the lake level was drawn down to allow heavy equipment access. As the reshaping work advanced during the initial post-closure period, the need to impound freshet water for settling purposes progressively decreased; in August 2010 the final (lowest level) stop-log and the mechanical hoist mechanism were permanently removed, rendering the control structure incapable of impounding or otherwise restricting the natural release of water from the Albino Lake basin.

As the invert of the flow section of the now-decommissioned control structure was built approximately 60 mm below the natural outlet channel elevation at the lake shoreline, to a width comparable to that of the pre-existing natural channel immediately upstream and downstream of the control structure site, the current Albino Lake water level and outflow rate are not influenced by the control structure and correspond to pre-mining conditions.

2. Summary of Recent Construction

The only recent construction activity at the Albino Lake WRSF was the removal in August 2010 of the final stop-log and the mechanical hoist mechanism from the control structure built in the natural outlet channel at the south end of the lake. The wooden housing for the hoist mechanism was removed in September 2011. There were no problems reported with any of the decommissioning activity. Appendix D contains a copy of the 26 January 2014 letter from Knight-Piésold to the Eskay Creek Environmental Manager suggesting that dam inspection requirements be suspended and showing photographs of the Albino Lake outlet before and after the hoist mechanism removal.

3. Plan and Representative Cross-Sections

Design plan drawings and cross-sections of the now-decommissioned control structure are provided in the Knight-Piésold (2010) Dam Inspection Report (refer to Appendix C of this document). No as-built drawings of the control structure are available, but the invert of the 2.0 m wide stop-log section (i.e. the flow section) of the structure was constructed to elevation 1,050.4 mamsl. Figure 2 shows the remnant control structure at the south end of the Albino Lake WRSF.

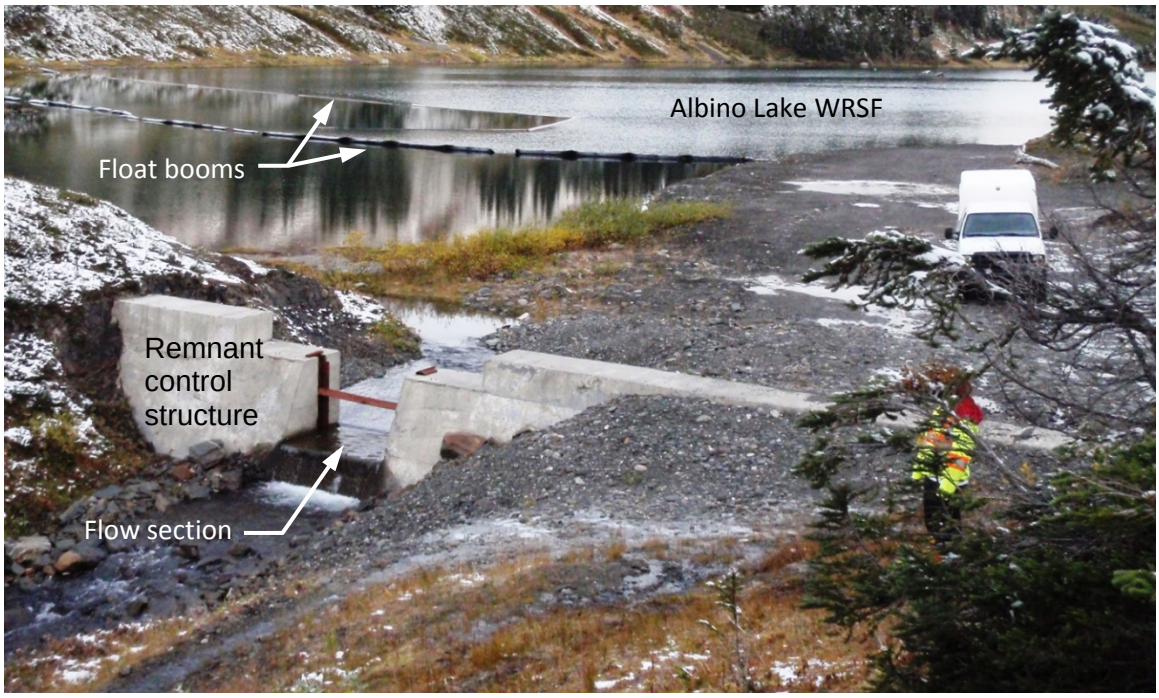


Figure 2. Remnant control structure at the south end of the Albino Lake WRSF.

Figure 3 shows the pre-development bathymetric contour plan for Albino Lake as reported in Kuran (1994) as well as the post-closure bathymetric contours as presented by AMEC (2010). There were no cross-sections generated depicting the completed lacustrine mine waste materials deposit.

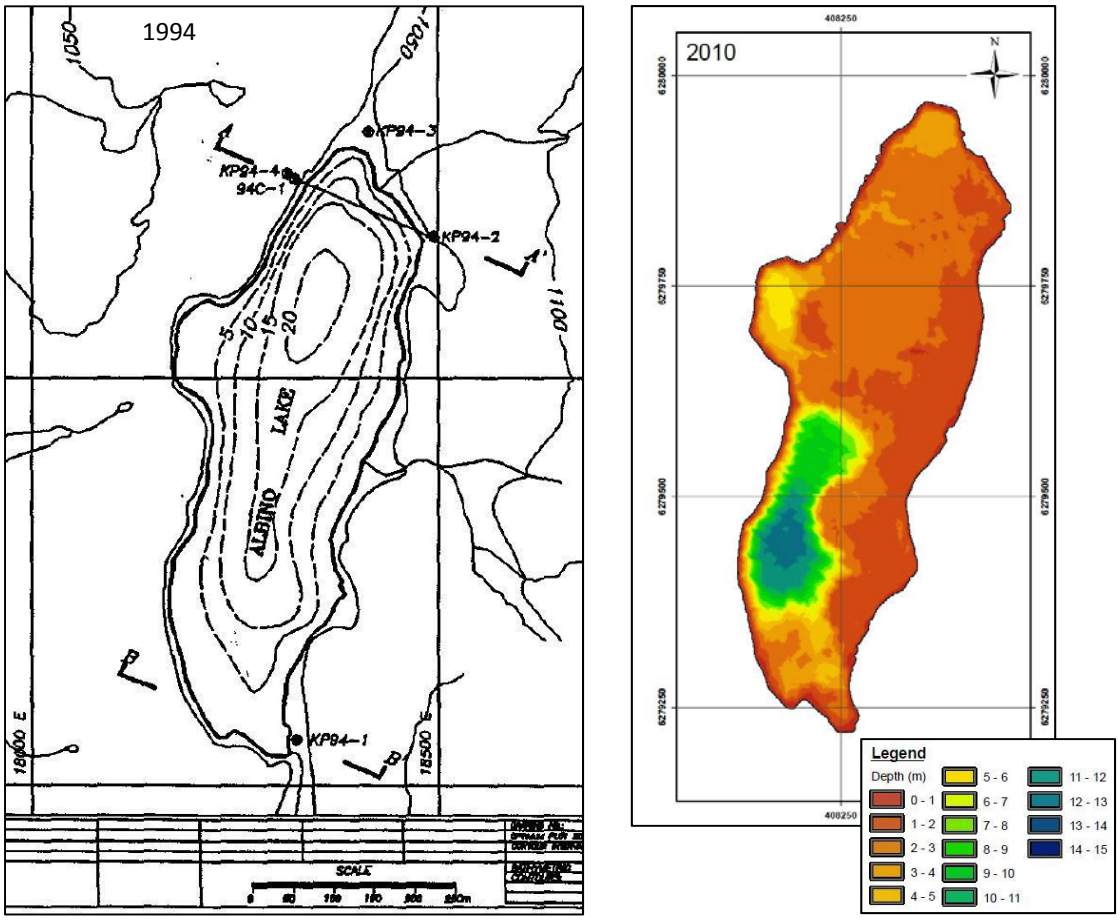


Figure 3. Albino Lake bathymetric contours prior to mine waste storage (left) from Kuran (1994) and after end of operations (right) from AMEC (2010).

Comparison of the post-closure to pre-development bathymetric survey contours indicate a maximum waste material thickness of some 20 m, in the north-central portion of the lake and submerged by 2 m to 3 m of water cover. According to the 2010 bathymetric data, most of the mine waste is submerged by no less than 1 m to 3 m of water, with an estimated 15 m^3 of tailings and/or fine-grained sediment associated with the waste rock having a shallow (< 1 m) water cover.

4. Site Photographs

A selection of photographs taken on 01 October 2014 showing current conditions at the Albino Lake WRSF is provided in Appendix E.

5. Review of Climate Data

Daily readings of maximum temperature, minimum temperature, rainfall and snowfall have been obtained from the Eskay Creek Mine weather station since February 1994, with the only major gap in the records from August 2007 to January 2009. The weather station is located near the mine closure office and camp site, at approximate elevation 780 mamsl, or about 270 m lower in elevation than the Albino Lake WRSF. Consequently, generally greater amounts of precipitation (rain and snow) and cooler temperatures would be expected at Albino Lake than those recorded at the weather station.

Figures 4 and 5 summarize respectively the daily and monthly rainfall values as obtained from the Eskay Creek Mine weather station; Figures 6 to 8 summarize respectively the daily, monthly and seasonal cumulative snowfall values recorded at the weather station.

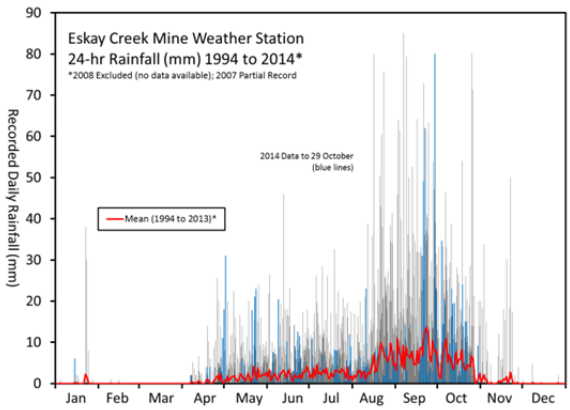


Figure 4. Daily rainfall.

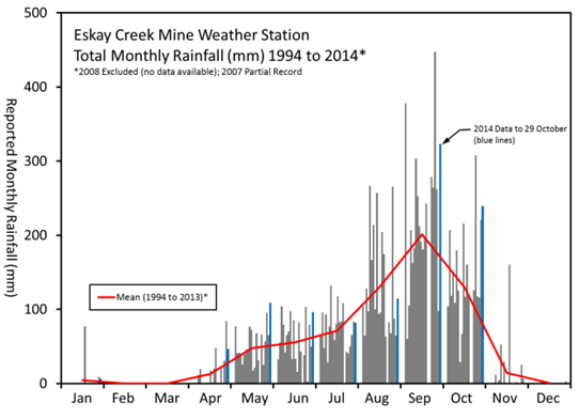


Figure 5. Monthly rainfall.

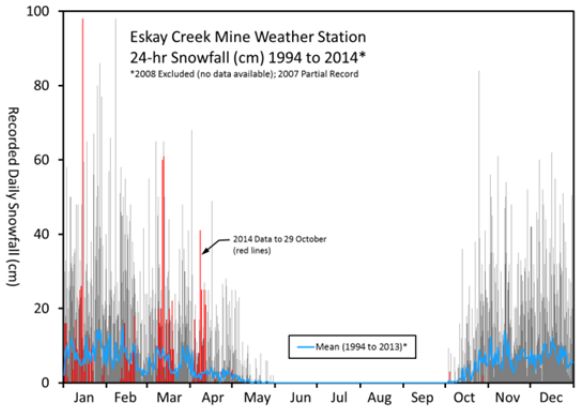


Figure 6. Daily snowfall.

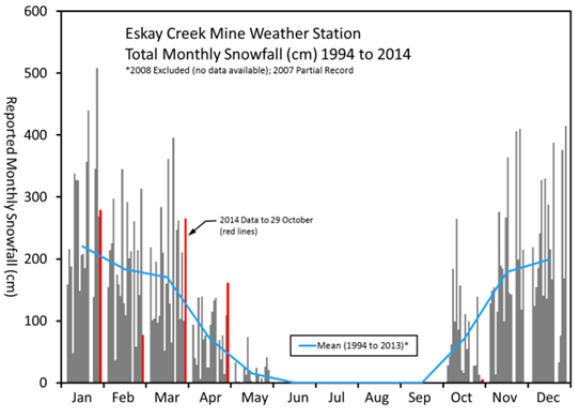


Figure 7. Monthly snowfall.

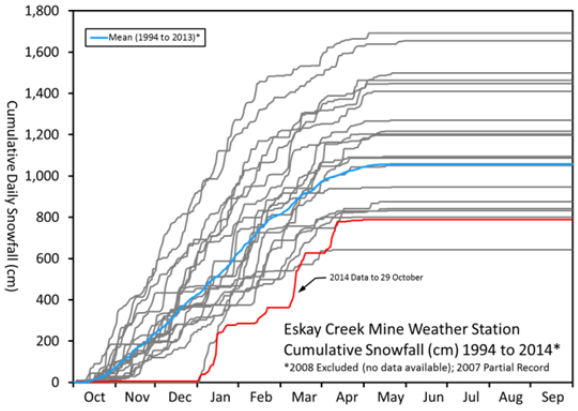


Figure 8. Seasonal cumulative snowfall.

Figures 9 and 10 summarize respectively the minimum and maximum daily temperatures as obtained from the Eskay Creek Mine weather station. On average, day-round freezing conditions at the site camp exist from early November to mid-March. As indicated above, slightly cooler temperatures and greater freezing degree day values would be expected at the Albino Lake WRSF.

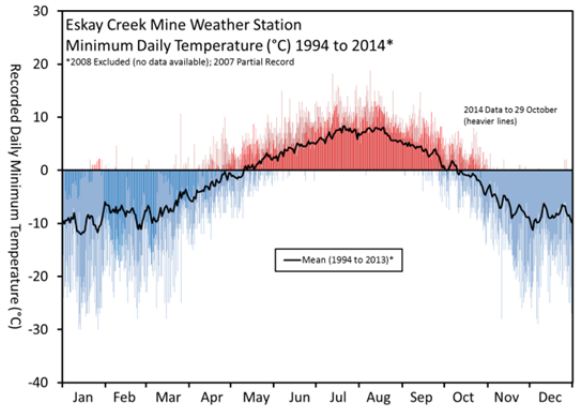


Figure 9. Daily minimum temperature.

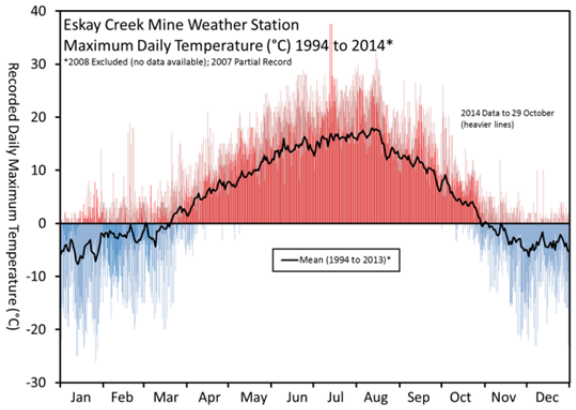


Figure 10. Daily maximum temperature.

Closure care and maintenance personnel continue to record daily temperature, rainfall and snowfall values at the Eskay Creek Mine weather station. This practice is expected to continue for the immediate future, while qualified on-site staff members are available. In the longer term, reading frequencies may be reduced and/or automated data acquisition systems may installed.

6. Water Balance Review

The Albino Lake water surface elevation in September 2010 was 1,049.837 mamsl, compared to values of 1,049.702 mamsl in 2007 and 1,049.700 mamsl in 2006, all reported in AMEC (2010). Seasonal variation in the hydrologic cycle as well as development and operation of the control structure were assumed to be responsible for the slight increase in water level from 2007 to 2010 (AMEC, 2010). A recent (late October 2014) topographic survey at the facility yielded a lake surface elevation of 1,050.559 mamsl, consistent with

increased levels after the fall rainy season. Water levels taken during the same survey at the flow section of the control structure and in Albino Creek midway between the south end of the lake and the control structure were 1,050.482 mamsl and 1,050.514 mamsl, respectively. The survey data verify that the decommissioned control structure invert is below natural shoreline elevation and thus does not control lake level.

Flow out of the Albino Lake WRSF has been measured since 2004 via the contracted rectangular, sharp-crested weir located in Albino Creek, approximately 100 m downstream of the south end of the lake. Figure 11 summarizes the estimated flow rates over the calendar year for the period 2004 to September 2014. The 2004, 2005, 2006 and 2012 data sets are more complete than those for the other years, and after mid-March 2013 readings were taken quarterly rather than daily.

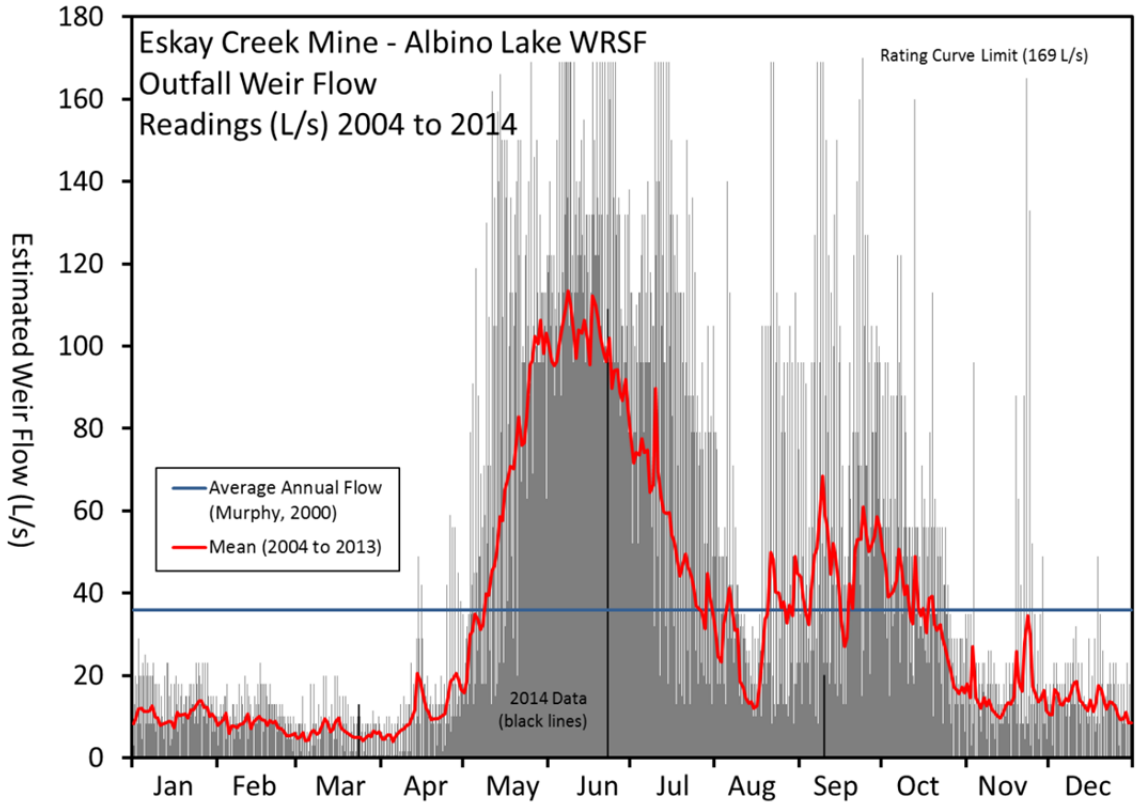


Figure 11. Estimated Albino Lake WRSF outflow rates.

The bimodal distribution of water outflow from the Albino Lake WRSF incorporates the greater contribution from snowmelt in late spring to early summer and the lesser, but still significant, contribution from the release of direct precipitation and runoff water in late summer to early fall. Although the estimated flow rates depicted in Figure 11 are subject to error associated with the imperfect approach channel and nappe (the sheet of water flowing over the weir plate) conditions at the installation, particularly for the high flow events of the

bimodal distribution, the relative differences in seasonal flows are believed to be representative.

The 2004 to September 2014 weir data are entirely consistent with seasonal discharge characteristics for Albino Lake as summarized by Price (2000) as well as the estimated average annual flow rate for the Albino Lake watershed (Murphy, 2000 as cited by Price, 2000). That estimated annual flow is shown in Figure 11.

Barrick intends to continue collecting weir flow readings four times per year while qualified on-site staff members are available. In the longer term, reading frequencies may be reduced and/or automated data acquisition systems may installed.

7. Freeboard and Storage Availability

Detailed bathymetric surveys were conducted in the Albino Lake WRSF in 2007 (as operations were ending) and in 2010 (post-closure). Surveyed lake levels were similar for the two bathymetric surveys (1,049.702 mamsl in 2007; 1,049.837 mamsl in 2010). The estimated, free water volumes in the Albino Lake WRSF by 1 m increment from the 2007 and 2010 bathymetric surveys are shown in Figure 12.

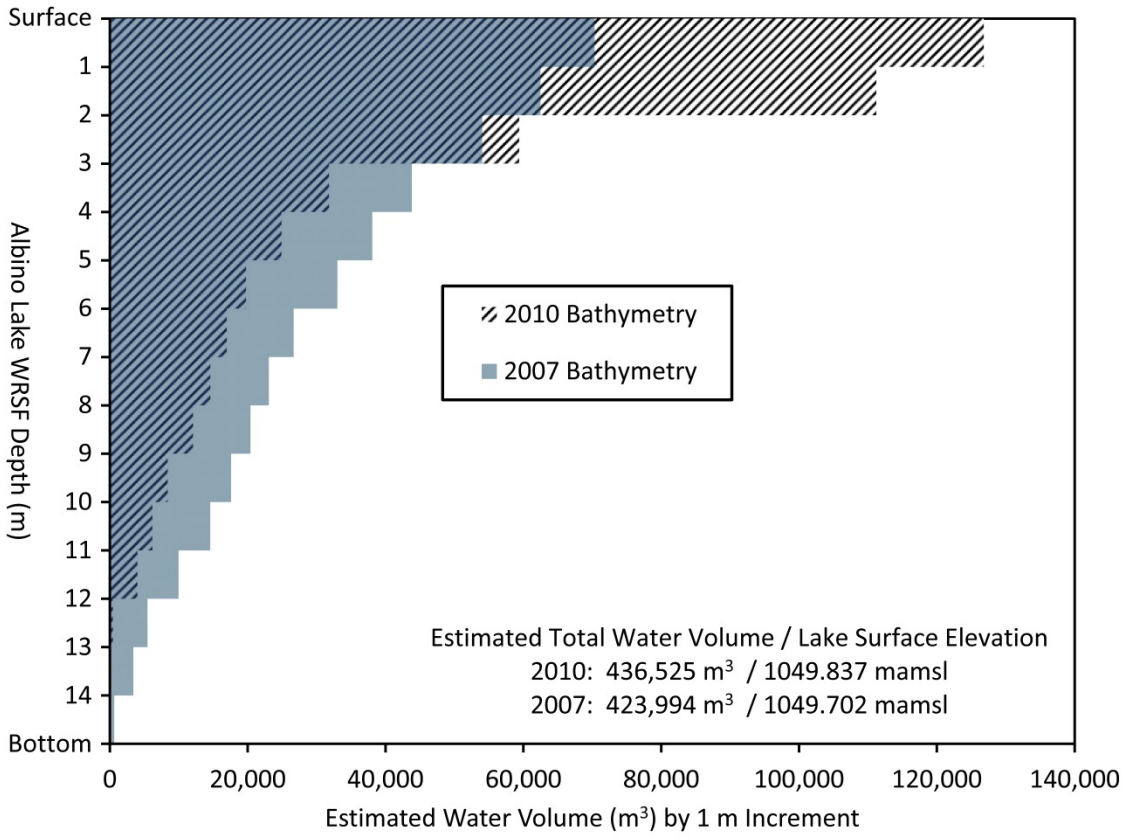


Figure 12. Estimated Albino Lake WRSF water volume by 1 m depth increment from 2010 and 2007 bathymetric surveys, using data from AMEC (2010).

Comparison of the two sets of results suggests no significant change in total free water (i.e. not including water within the waste material pore space) volume between the 2007 and 2010 surveys, after allowing for the +0.135 m difference in lake surface level in 2010 which corresponds to an estimated additional 17,600 m^3 of stored water (AMEC, 2010). The data also suggest less free water (and thus more waste rock and tailings) in the lower portions of the lake basin in 2010 compared to 2007, which would be consistent with regarding efforts to ensure greater minimum water cover at the end of operations and into initial closure, as well as any settlement or consolidation of the waste materials. However, that interpretation must be tempered by consideration of grid coverage differences and potential depth ranging errors between the two survey campaigns.

Comparison of the estimated 2010 total free water volume of 436,525 m^3 to the estimated pre-development total water (i.e. lake basin) volume of 1,080,000 m^3 (BCEAO, 2014), and assuming a similar water surface elevation for the two data sets, suggests that the reported, 1,750,655 dry t of waste rock plus tailings in Albino Lake occupies some 643,475 m^3, corresponding to a dry density of approximately 2.72 t/m^3. Assuming a typical specific gravity of 3.0 for the waste rock and tailings (Morin et al., 1997), the corresponding solids volume and void ratio for the saturated, impounded material would be 583,552 m^3 and 0.103, respectively. These values appear to overestimate the packing efficiency of the constituent waste rock and tailings (e.g. Wickland et al., 2006), given that no particular attempt was made during operation to reduce storage volumes. A contributing factor is the uncertain accuracy of the pre-development lake basin volume.

Data interpretation results presented in the 2010 bathymetric survey report indicated that excluding the shoreline of the Albino Lake WRSF, there was a nominal area encompassing less than 15 m^3 of waste rock and tailings that had a water cover less than 1 m deep (but greater than 0 m); the shoreline was excluded as it was either natural sediment (west side) or imported fill for shoreline access road construction (east side) (AMEC, 2010). Normal seasonal fluctuations in the natural lake water level will result in the water cover becoming marginally less deep or deeper, but the mine waste materials are expected to remain submerged even under unusually dry season conditions. Although additional water cover depth could be obtained by reinstatement of the control structure, prolonged extreme drought conditions would likely defeat that effort and in the interim there would be the undesirable consequences of a permanent, artificial water impounding structure.

8. Water Discharge System

The water discharge system for the Albino Lake WRSF is the natural outlet channel located at the south end of the lake. The 2010 Dam Inspection Report stated that the riprap in the outlet channel bed was in satisfactory condition and that the channel was free of obstructions (Knight Piésold, 2010). Similar conditions were encountered during the site visit of 01 October 2014.

During operation of the Albino Lake WRSF, a series of float booms were established across the lake from which geotextile filter cloth was suspended in the upper water layer to assist

with reducing the release of suspended sediments via the natural outlet channel. Reportedly, the float booms were progressively relocated towards the south end of the lake, as disposal and submergence of the mine waste materials expanded southward. Currently, two of the polystyrene float booms remain at the south end of the lake; the condition of the filter cloth originally suspended from these booms is not known.

With no more active mine waste disposal or post-closure regarding in the facility that would otherwise generate significant quantities of suspended sediments, the float booms no longer serve the purpose for which they were designed. Barrick intends to remove the booms, subject to obtaining any necessary approval from the regulatory agencies.

9. Seepage Occurrence and Water Quality

No groundwater studies or monitoring were conducted to characterize seepage occurrences through the native soil and bedrock basin of the Albino Lake WRSF. Outflow water quality from the impoundment was monitored during Eskay Creek Mine operation and continues to be monitored via visual observations and samples collected for laboratory testing four times per year as part of post-closure obligations. Barrick does not know of any current water quality compliance issues associated with the Albino Lake WRSF. The water quality monitoring program will continue at its present schedule of four times per year as required to meet existing regulatory requirements.

10. Surface Water Control and Surface Erosion

Small, hand-dug surface water diversion ditches were completed along the upper left abutment hill slope above the control structure site in 2007, as temporary measures to divert runoff from the foundation work during construction of the control structure. The ditches were allowed to revegetate naturally thereafter. The 2010 Dam Inspection Report noted that no distinct channels were observed (Knight Piésold, 2010), and this was the condition encountered during the site visit of 01 October 2014. As the lake water level in the Albino WRSF is now controlled by natural hydrologic processes, there is no requirement for surface water control channels anywhere at the facility.

No measurement of, or modification to, natural surface erosion processes has occurred within most of the Albino Lake watershed. The only exceptions are potentially different surface erosion rates associated with the imported fill access road along the east lakeshore, and the riprap placed in the natural outlet channel bed as part of the 2007 control structure installation. The permanent water cover over the waste rock and tailings stored within the facility prevents any significant erosion of those materials. Current surface erosion processes are thus believed to be similar to those prior to development of the Albino Lake WRSF, and are expected to continue to trend to those equilibrium levels with time.

11. Instrumentation Review

There is no geotechnical instrumentation installed at the Albino Lake WRSF. As indicated above, programs are established for recording mine site climate data, measuring downstream weir flow and monitoring lake water quality.

11.1. Phreatic Surfaces and Piezometric Data

There are no piezometric data available, nor inferences of phreatic surfaces in the natural soils and bedrock in the Albino Lake WRSF area.

11.2. Settlement

There are no constructed embankments for which settlement could be measured. Inferences of progressive settlement and consolidation processes within the waste rock and tailings stored in the facility could be derived from successive, future bathymetric surveys of the Albino Lake WRSF, but the need to conduct such work would be not be warranted given the satisfactory post-closure performance of the facility to date.

11.3. Lateral movement

There are no constructed embankments for which lateral movement could be measured.

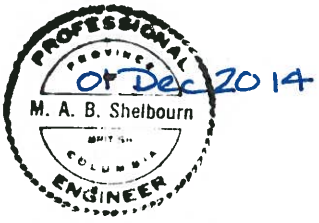
12. Report Use and Closure

This report has been prepared by Barrick Gold Corporation (Barrick), for specific use in responding to the Order of 18 August 2014 issued by the Chief Inspector of Mines of the Ministry of Energy and Mines (MEM) of British Columbia that all mining companies provide a Dam Safety Inspection report and an Independent Third-Party Review of the Dam Safety Inspection report for every tailings storage facility, whether active or closed, at permitted mines in British Columbia by 01 December 2014. Under the Order, the assigned Dam Classification must be that determined by the Canadian Dam Association (CDA) 2013 Dam Safety Guidelines. The MEM has stated that all information obtained under the Order will be provided to First Nations in British Columbia and made public.

The Albino Lake waste rock storage facility (WRSF), the subject matter of this technical report, is a lacustrine impoundment with no dams, engineered embankments, barriers or other structures retaining water or mine waste materials. Barrick thus requested and received written permission from the MEM to prepare and submit this document to address each of the line items in the August 2013 MEM Guidelines for Annual Dam Safety Inspection Reports, in lieu of the Dam Safety Inspection and an Independent Third-Party Review of the Dam Safety Inspection as outlined in the Order. Barrick believes that the data, descriptions and conclusions presented in this report accurately reflect the operating history and post-closure site conditions of the Albino Lake WRSF.

Barrick trusts that the information contained within this report satisfies the requirements of the MEM. Should there arise any questions regarding the content of this report or if further information is required, please contact the undersigned.

Per



Michael Shelbourn, M.E.Sc., P.Eng. (BC)

Manager, Geotechnical Engineering
Technical Services

13. References

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Appendix A

Operation, Maintenance and Surveillance Plan

OPERATION, MAINTENANCE & SURVEILLANCE PLAN

Name: Albino Lake Waste Rock Storage Facility *Water Licence No.: n/a*

Owner's Name: Barrick Gold Inc. *Phone #: (604) 522-9877*

Stream Name: Albino Creek *Reservoir Name: Albino Lake*

Location: ***Latitude:*** *56°38'47" N* ***Longitude:*** *130°29'44" W* ***Map Sheet No.***

LIST INDIVIDUALS WHO ARE RESPONSIBLE FOR:

	Name	*Title*	*Phone #*
Operation:	Robbin Harmati	BC Properties Closure Manger	(604) 515-5227
Maintenance:	As above		
Inspections:	Not required	n/a	n/a
Instrumentation:	None	n/a	n/a

PHYSICAL DESCRIPTION:

Lacustrine waste rock and tailings storage facility used by the Eskay Creek Mine during operations from 1994 to 2008. Albino Lake is a natural fresh-water basin, with no embankments, barriers or other structures currently capable of impounding water and/or mine waste materials. A concrete wall and wooden stop-log control structure built in the natural outlet channel of Albino Lake in 2007 was decommissioned in 2010 and can no longer impound water. All mine waste materials are located below the natural lake water surface.

Reservoir Capacity: 95,000 m^3 (free water volume below nominal lake level)

Reservoir Area: 800 m long x 200 m wide

Spillway Capacity: n/a *Design Flood Inflow: n/a*

Watershed Area: *Purpose of Facility: Waste Rock and Tailings Containment*

Consequence Classification: Not applicable as there is no structure impounding water and/or mine waste material. Low Classification assigned in the 2010 Formal Dam Inspection (based on 2013 CDA Dam Safety Guidelines), when the now-decommissioned control structure was still in operation.

ACCESS TO SITE: *(describe road access to site from nearest center, attach map to this Plan)*

Access to Albino Lake WRSF is by light vehicle in non-snow months and by Snow-Cat or snowmobile in snowpack conditions.

LIST SIGNIFICANT STRUCTURES DOWNSTREAM OF FACILITY: *(i.e., access road, railroad, subdivision etc.)*

There are no significant structures downstream of the Albino Lake WRSF.

LIST ALL HYDRAULIC WORKS: *(i.e., spillway, outlet, stoplogs, gates, valves, etc., including capacity, dimensions, locations, etc.)*

Concrete control structure wall, built into the exposed till and bedrock banks of the natural outlet channel at the south end of Albino Lake. The flow section of the control structure was built essentially at the natural outlet channel bed elevation, to a width comparable to the natural channel, and thus does not impound or restrict the natural hydrologic outflow from Albino Lake.

Float booms used during operation to suspend filter fabric for sediment transport control remain in the southern end of the lake; the booms are no longer required for sediment control and were/are not required for debris control.

A rectangular, sharp-crested weir located approximately 100 m downstream of the south end of Albino Lake is used to measure outflow.

LIST PROCEDURES FOR RESERVOIR OPERATION: *(i.e., how reservoir level is controlled? what is the anticipated reservoir level for any given time of year? when are the drawdown and filling periods? what are the operation procedures during floods?)*

Since decommissioning of the lake outlet control structure in 2010, there is no longer any artificial control on the natural water level in Albino Lake. The lake's water level is set by natural inflow (precipitation and runoff) of the watershed.

LIST ALL ITEMS REQUIRING ROUTINE MAINTENANCE: *(include type of maintenance to be performed, scheduling of maintenance, record keeping, etc.)*

Visual inspection of the access road, the remaining concrete control structure wall and flow section, the float booms and the sharp-crested weir. Maintenance of these items will be scheduled and completed as required, and a report of pre and post-maintenance conditions and work completed will be documented in a designated archive.

LIST ALL INSTRUMENTATION, FREQUENCY OF MONITORING, AND METHOD OF RECORD KEEPING: *(i.e., seepage measurement weir, reservoir level gauge, piezometers, etc.)*

Water quality samples and flow measurements from the weir downstream of the Albino Lake WRSF are collected four times per year. There is no other instrumentation at the site.

LIST OF EQUIPMENT TO BE PERIODICALLY TEST OPERATED: *(i.e., gates, valves, hoists, etc., including frequency of test operation)*

There is no equipment requiring test operation.

LIST ALL COMPONENTS REQUIRING ROUTINE VISUAL INSPECTIONS: *(include schedule, e.g. weekly, monthly, quarterly, annually etc.)*

Visual inspection of the Albino Lake WRSF is currently conducted four times per year, subject to snow conditions allowing for safe access. In general, this means an inspection in early to mid-spring; in late spring to early summer; in mid-summer; and in late summer to mid-fall. The inspection includes review of the site access road, the float booms, the concrete wall and flow section of the now-decommissioned control structure and the weir downstream of the facility.

ANNUAL FORMAL INSPECTIONS BY OWNER: *(include; time of year when performed, special items to be examined, reviewed, and/or test operated)*

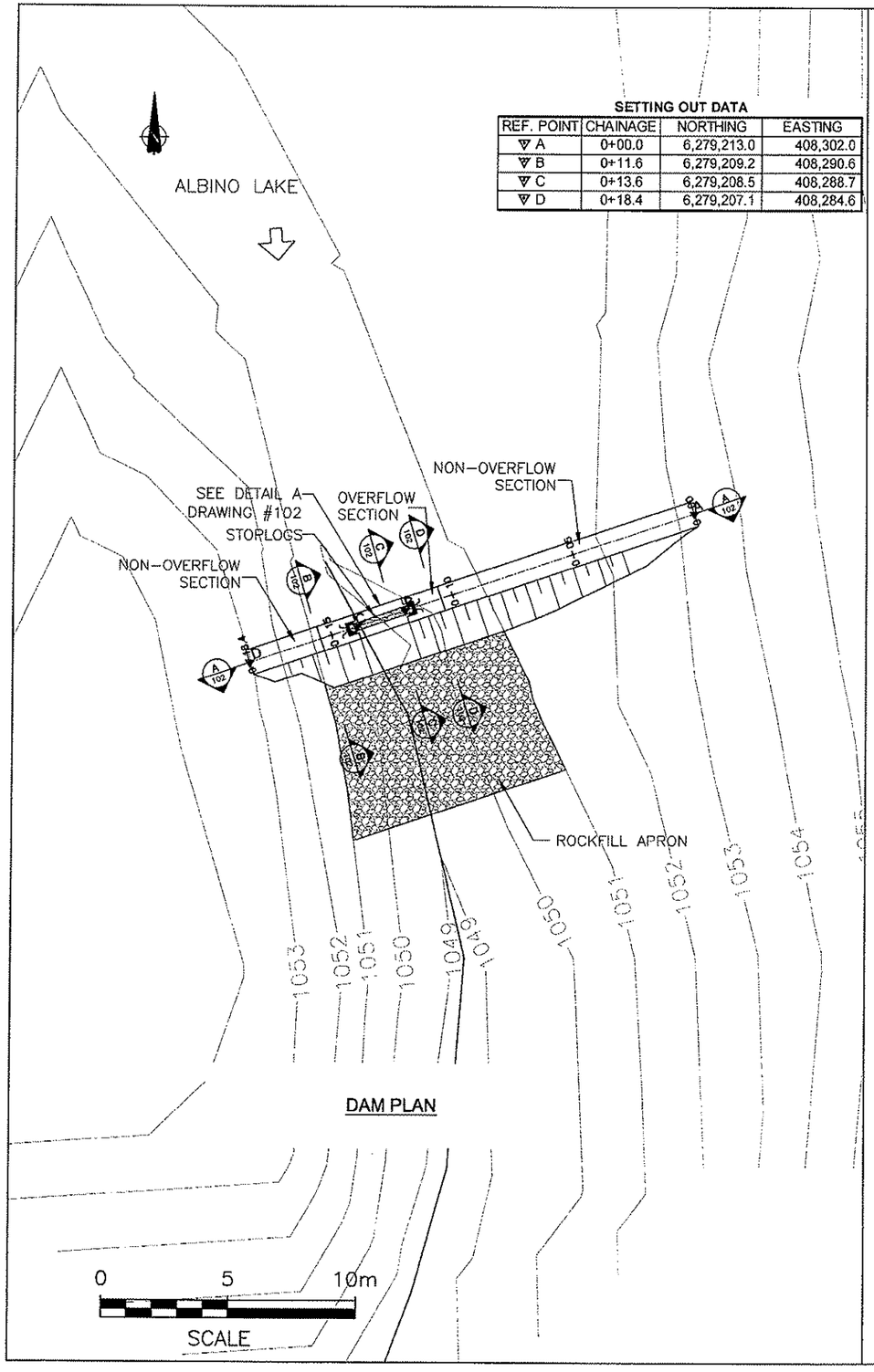
The last formal dam inspection was conducted in 2010, when the lake outlet control structure was operative. Formal Inspections are not required while the control structure remains decommissioned and incapable of impounding water.

ATTACH THE FOLLOWING INFORMATION TO THIS PLAN:

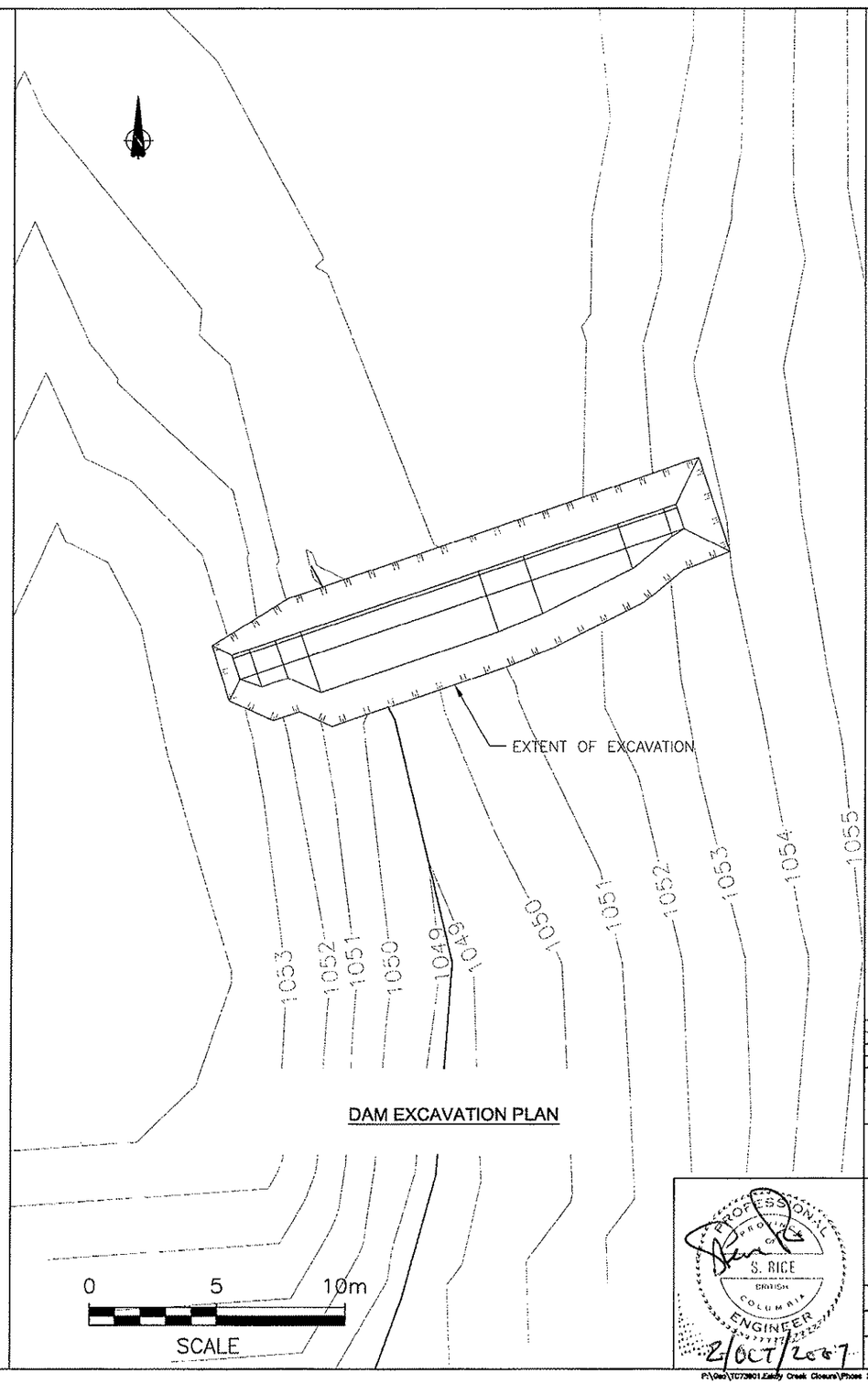
- *All dam design plans including as-built, if available.*
- *A location map showing the dam location relative to major roads and/or communities.*
- *All past inspection reports.*
- *An inspection checklist.*
- *A log showing repairs done and operating problems.*

SETTING OUT DATA

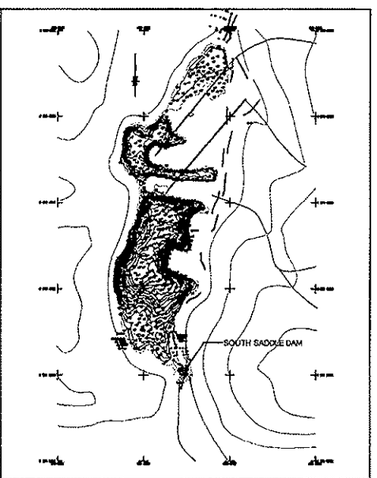
REF. POINT	CHAINAGE	NORTHING	EASTING
▽ A	0+00.0	6,279,213.0	408,302.0
▽ B	0+11.6	6,279,209.2	408,290.6
▽ C	0+13.6	6,279,208.5	408,288.7
▽ D	0+18.4	6,279,207.1	408,284.6



DAM PLAN



DAM EXCAVATION PLAN



KEY MAP

NOTES:

1. ELEVATIONS AND DIMENSIONS ARE IN METERS.
2. CONTOURS SHOWN ARE BASED ON THE TOPOGRAPHIC SURVEYS CARRIED OUT BY BARRICK GOLD IN JULY 2007.
3. THE PROPOSED STRUCTURE HAS BEEN DESIGNED BASED ON LIMITED INFORMATION GATHERED FROM TWO TEST PITS. NO ROCK/OVERBURDEN PERMEABILITY DATA IS AVAILABLE.
4. THE PROPOSED CONCRETE DAM AND STOPLOGS ARE DESIGNED AS TEMPORARY STRUCTURES AND NOT SUITABLE FOR LONG-TERM USAGE.
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6. THE DAM CENTERLINE CO-ORDINATES PROVIDED ARE FOR REFERENCE ONLY AND MAY BE VARIED AT SITE TO SUIT ACTUAL CONDITIONS.
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8. STOPLOG GROOVES AND EMBEDDED PARTS DETAILS MAY VARY DEPENDING UPON STOPLOG MANUFACTURER'S REQUIREMENTS.
9. REINFORCEMENT SHOWN AROUND STOPLOGS ARE FOR CONCRETE CRACK CONTROL ONLY.

REV.	DATE	DESCRIPTION
A	09.2007	ISSUED FOR REVIEW

REVISIONS

amec

BARRICK GOLD INC.

ESKAY CREEK — BRITISH COLUMBIA

PROFESSIONAL ENGINEER — PROVINCE OF BRITISH COLUMBIA — S. RICE

2 OCT 2007

ESKAY CREEK MINE

ALBINO LAKE SOUTH SADDLE DAM PLAN

DATE	SCALE	CHECKED BY:
SEPTEMBER 2007	AS SHOWN	
DRAWN BY: P. LIU	DESIGNED BY: P. HABBU	APPROVED BY:
PROJECT NO. TC73901/203	DRAWING NO. 101	REV.

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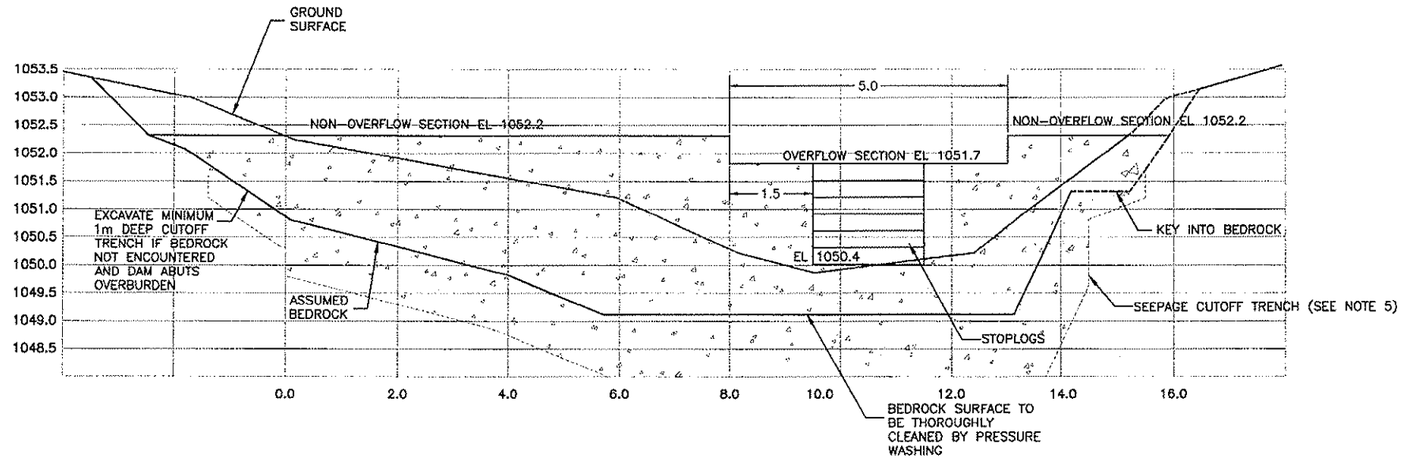

SECTION A-A DAM PROFILE

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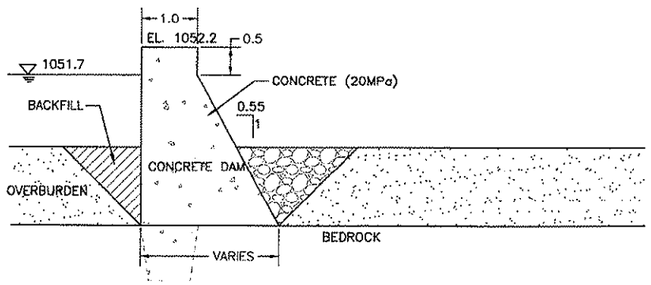

SECTION B-B NON-OVERFLOW SECTION

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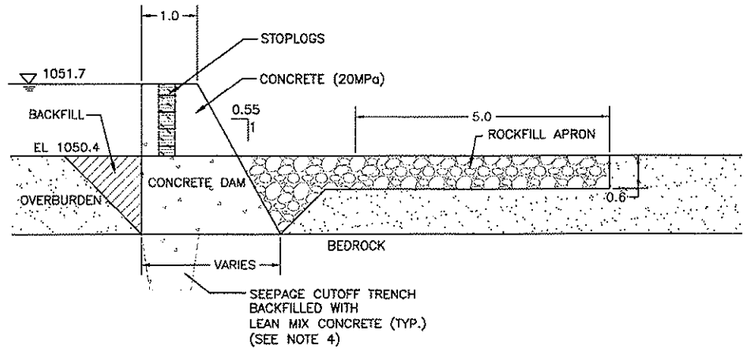

SECTION C-C STOPLOG SECTION

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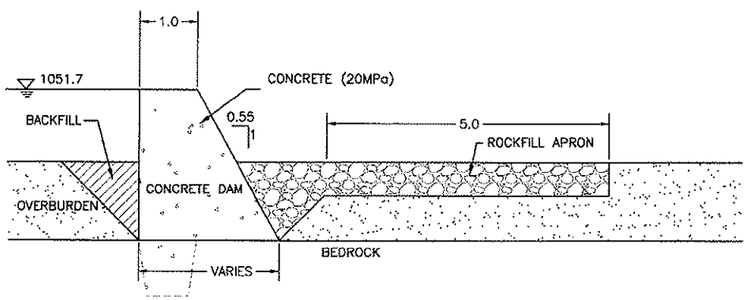

SECTION D-D OVERFLOW SECTION

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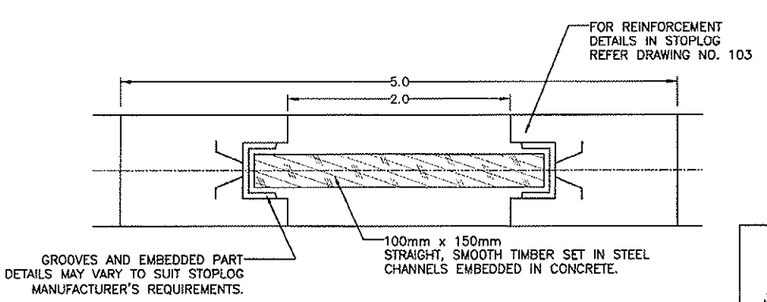

DETAIL 1- STOPLOG PLAN VIEW

N.T.S.

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REV.	DATE	DESCRIPTION
A	09.2007	ISSUED FOR REVIEW

REVISIONS

amec

BARRICK GOLD INC.

ESKAY CREEK — BRITISH COLUMBIA

ESKAY CREEK MINE

ALBINO LAKE SOUTH SADDLE DAM
PROFILE AND SECTIONS

DATE: SEPTEMBER 2007	SCALE: AS SHOWN	CHECKED BY:
DRAWN BY: P. LIU	DESIGNED BY: P. HABBU	APPROVED BY:
PROJECT NO.: TC73901/203	DRAWING NO.: 102	REV.

PROFESSIONAL ENGINEER — PROVINCE OF BRITISH COLUMBIA

2/OCT/2007

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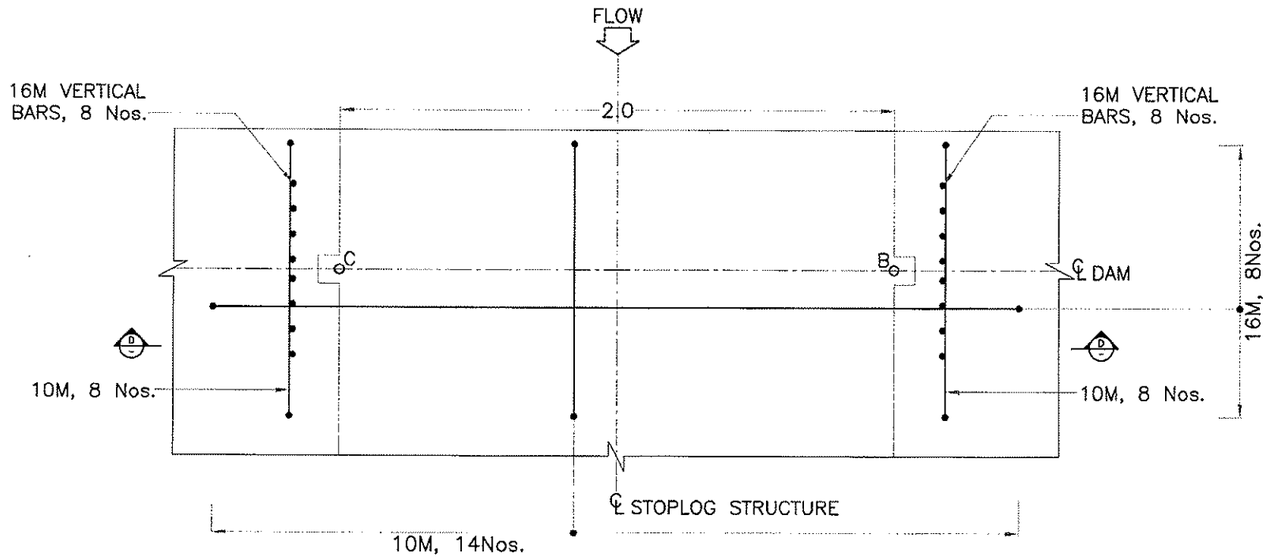
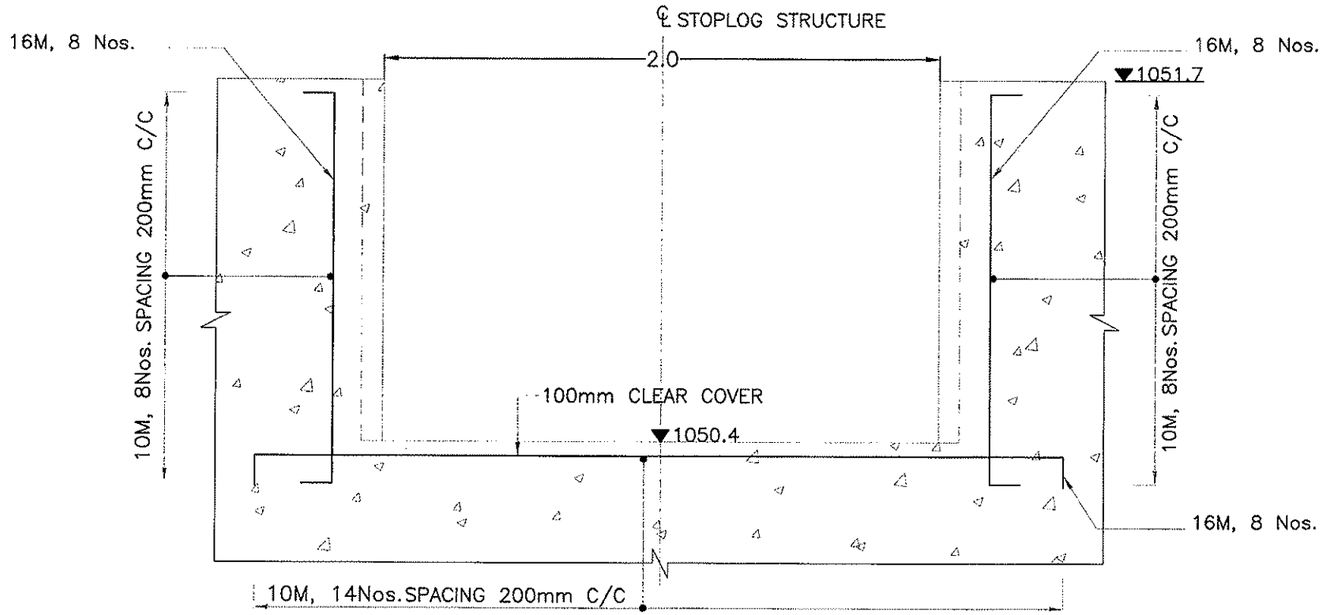


PLAN AT EL 1050.4m



D-D SECTION

NOTES:

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REV.	DATE	DESCRIPTION
A	09.2007	ISSUED FOR REVIEW

REVISIONS

amec

BARRICK GOLD INC.

ESKAY CREEK — BRITISH COLUMBIA

PROFESSIONAL ENGINEER — S. RICE — BRITISH COLUMBIA — 2/Oct/2007

ESKAY CREEK MINE

SOUTH SADDLE DAM

STOPLOG STRUCTURE REINFORCEMENT DETAILS

DATE: SEPTEMBER 2007	SCALE: AS SHOWN	CHECKED BY:	
DRAWN BY: P. LIU	DESIGNED BY: P. HABBU	APPROVED BY:	
PROJECT NO.: TC73901/203	DRAWING NO.: 103	REV.:	

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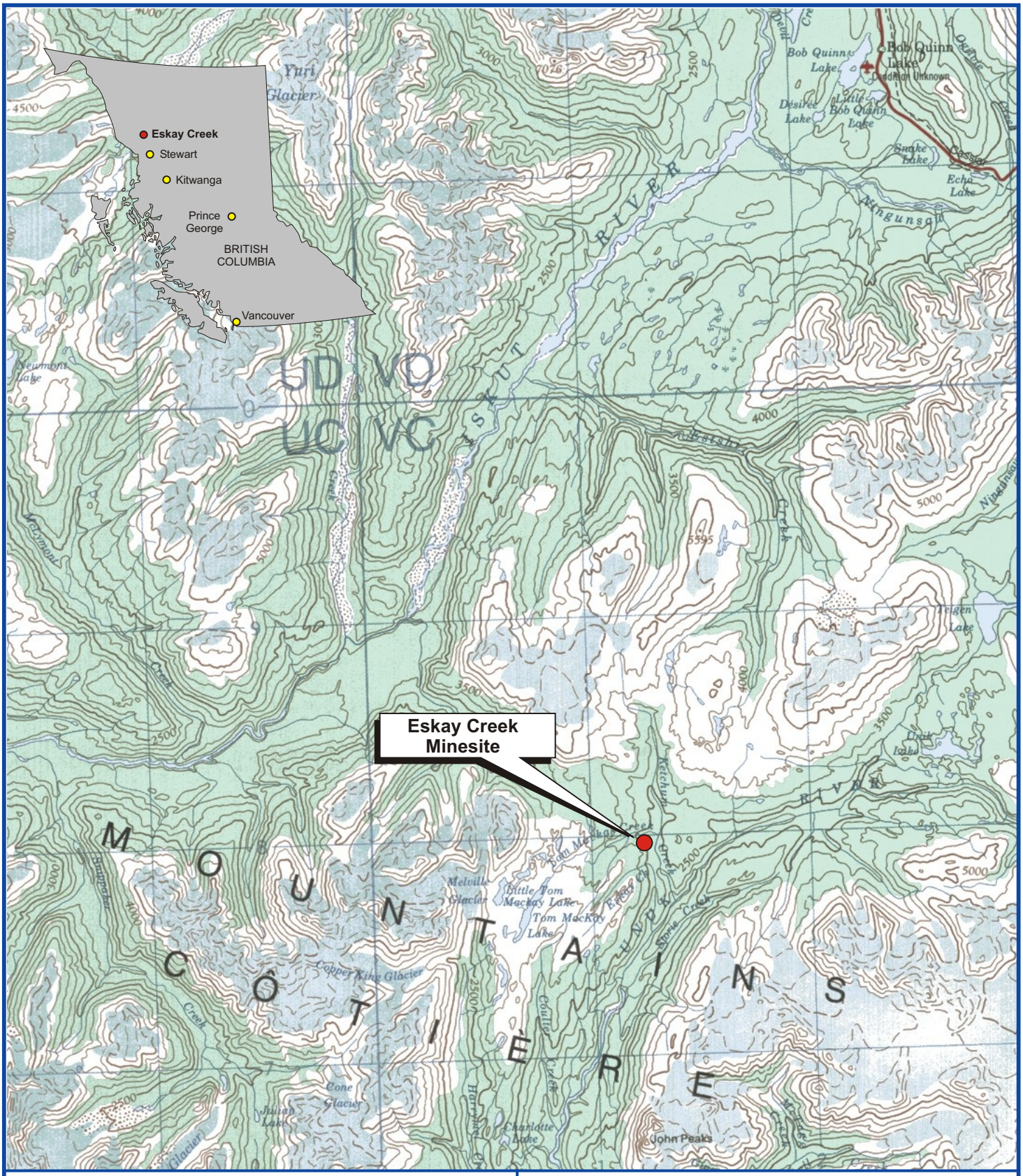


LEGEND:

N
W E
S

MINESITE LOCATION MAP

Site Closure Analysis
Eskay Creek Mine/Mill Complex, British Columbia

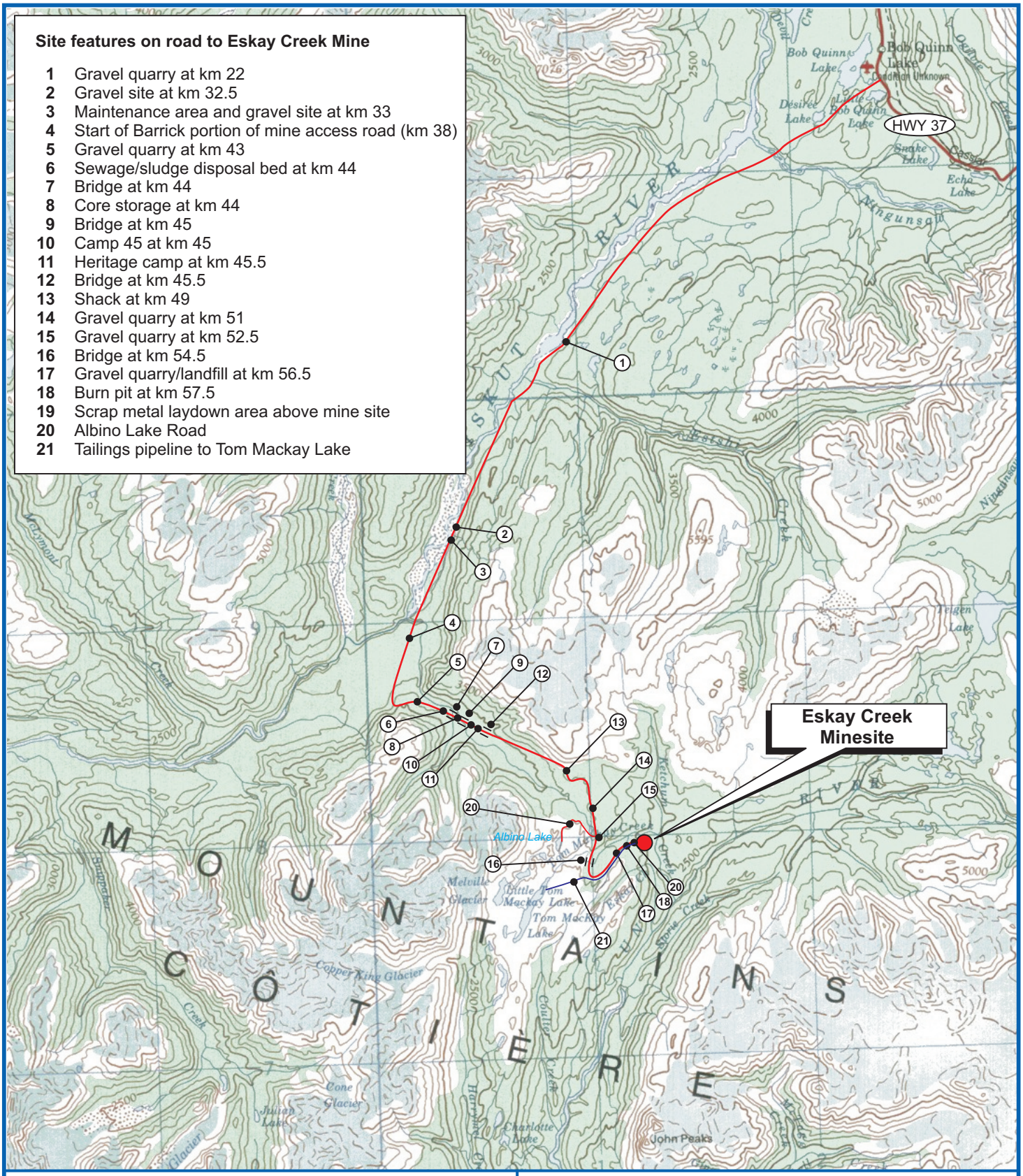
BARRICK GOLD OF NORTH AMERICA, INC.

URS

SCALE: 1:250,000
kilometres
0 2.5 5 7.5

DATE:	PROJECT NO.:	DRAWN BY:	REVISION NO.:	DRAWING NO.:
December 2005	39548644	TS	0	FIGURE 2.1-1

39548644-closure.rpt-figures.f0x site location.cdr



LEGEND:

Approximate Road Location

Approximate Tailings Pipeline Route

N
W E
S

ROAD AREA SURFACE FACILITY SITE LAYOUT

Site Closure Analysis
Eskay Creek Mine/Mill Complex, British Columbia

BARRICK GOLD OF NORTH AMERICA, INC.

URS

SCALE: 1:250,000

kilometres
0 2.5 5 7.5

DATE:	PROJECT NO.:	DRAWN BY:	REVISION NO.:	DRAWING NO.:
December 2005	39548644	TS	0	FIGURE 9.0-1

39548644-closure.rpt-figures.f9.0-1 mine road to highway.cdr

Appendix B

Email Correspondence

From:	Narynski, Heather M MEM:EX
To:	Shelbourn, Michael (Salt Lake City)
Cc:	Harmati, Robbin (Eskay Creek); Warnock, George MEM:EX; Howe, Diane J MEM:EX; Hoffman, Al MEM:EX
Subject:	MEM Response: Eskay Creek Exemption from CI orders
Date:	Monday, September 22, 2014 5:53:57 PM

Michael,

Good speaking with you today.

As discussed, MEM has carefully considered your request (dated September 11, 2014) for exemption from the Chief Inspector's (CI) orders issued on August 18, 2014 to exclude Barrick's Eskay Creek tailings storage facility (TSF).

I understand that during the mine's active life, tailings were disposed in Tom Mackay Lake and that no dams are associated with this lake. As discussed during our phone conversation, in some instances dam safety inspections may apply to impoundments that do not have any associated dams, although these are usually man-made excavations below ground. It is recognized that Tom Mackay Lake is a natural lake, but it would be also considered a "major impoundment" as defined on page 10-2 of the Health, Safety, and Reclamation Code for Mines in British Columbia (Code). As you have noted in your letter request, there is no plausible geotechnical failure mechanism by which the tailings could foreseeably be released from the lacustrine impoundment. I understand that there is a substantial water cover over the tailings, and that Tom Mackay Lake is located above treeline (no potential for logs in the lake or beaver activity blocking the natural outflow channel). However, it is also noted that some aspects of MEM's Guidelines for Dam Safety Inspections (attached) would apply, and should be addressed.

MEM would accept a signed and sealed letter report from yourself (a professional engineer registered in BC) which provides background on the facility and addresses each of the line items as outlined in MEM's Guidelines. Where a particular item does not apply, this can simply be addressed as such with brief rationale.

As MEM has committed to public release of all submissions, it is suggested that the letter report is written in the context of possible questions the public may have regarding the facility (i.e. potential for failure of the impoundment). This may minimize any follow-up questions/concerns (addressed to Barrick or MEM) that may come out of the public release.

As discussed, if any recommendations arise from your review, please include a commitment letter/action plan from Barrick which outlines how and when these will be addressed.

This letter report shall be submitted no later than December 1, 2014 (as per the original CI orders).

If you have any additional questions, please don't hesitate to contact me.

Kind Regards,
Heather

Heather Narynski, P.Eng
Sr. Geotechnical Inspector
Ministry of Energy and Mines
1810 Blanshard St., Victoria, BC V8W 9N3
Wk: 250-387-0883
Cell: 250-893-3396

Appendix C

2010 Dam Inspection Report

Knight Piésold

BARRICK GOLD INC.
ESKAY CREEK MINE

2010 ALBINO LAKE DAM INSPECTION

PREPARED FOR

Barrick Gold Corp (Eskay Creek Mine)
6431 Airport Way
Smithers, BC V0J 2N0

PREPARED BY

Knight Piésold Ltd.
Suite 1400 – 750 West Pender Street
Vancouver, BC V6C 2T8

VA101-2/15-2
Rev 0
November 9, 2010

Knight Piésold
CONSULTING

ISO 9001, ISO 14001
OHSAS 18001

BARRICK GOLD INC.
ESKAY CREEK MINE

2010 ALBINO LAKE DAM INSPECTION
(REF. NO. VA101-02/15-2)

Rev. No.	Revision	Date	Approved
0	Issued in Final	November 9, 2010	

Knight Piésold Ltd.

Suite 1400
750 West Pender Street
Vancouver, British Columbia Canada V6C 2T8
Telephone: (604) 685-0543
Facsimile: (604) 685-0147
www.knightpiesold.com

Knight Piésold
CONSULTING

Knight Piésold
CONSULTING

BARRICK GOLD INC.
ESKAY CREEK MINE

2010 ALBINO LAKE DAM INSPECTION
(REF. NO. VA101-02/15-2)

EXECUTIVE SUMMARY

The Albino Lake Dam is a mine waste management facility for the Eskay Creek Mine. The mine is located northeast of Smithers, BC and is currently being decommissioned. The Albino Lake Dam was constructed in 2008 to provide temporary storage in the event that discharge from the lake is required to be stopped during the months of February, March and April in order to manage water quality issues.

Mr. Donald Trapp, P.Eng. carried out the inspection of the dam on August 26, 2010. A record of the inspection was maintained with notes and photographs to record any defects in the structure, any observed areas of concern, or any areas requiring attention.

The dam body, abutments and discharge channel are in satisfactory condition. A hoist structure for placing and removing stop-logs is located within the overflow portion of the dam body. It is recommended that this structure be relocated so that it does not interfere with the ability of the dam to pass flow in this location. The recommendation to relocate this structure was made during the last inspection in 2008.

The design criteria and dam classification have not been recorded in the available documentation from the dam designers, which was provided by Barrick. KP has performed a preliminary review of the concrete structure and estimate that the Albino Lake Dam meets the definition of a dam under the Canadian Dam Association (CDA) Dam Safety Guidelines and a LOW hazard classification may be appropriate. The dam classification should be established under a formal dam safety review.

It is recommended that a formal dam safety review should be completed within the next year and the next dam inspection should be scheduled to occur in the summer of 2013.

Knight Piésold CONSULTING

BARRICK GOLD INC.
ESKAY CREEK MINE

2010 ALBINO LAKE DAM INSPECTION
(REF. NO. VA101-02/15-2)

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Photo 3 Downstream right abutment.
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Photo 5 Downstream left abutment (buried).
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Photo 7 Honeycombed areas below stop-log slot and next to steel stop-log guide.
Photo 8 Excavation on the left abutment hill slope.

APPENDICES

Appendix A Conceptual Design Drawings
Appendix B Dam Inspection Checklist

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BARRICK GOLD INC.
ESKAY CREEK MINE

2010 ALBINO LAKE DAM INSPECTION
(REF. NO. VA101-02/15-2)

SECTION 1.0 - INTRODUCTION

Knight Piésold Ltd. has completed an inspection of the Albino Lake Dam of the Eskay Creek Mine project. The Albino Lake Dam is a mine waste management facility for the mine, which is currently being decommissioned. The dam was constructed in 2008 to provide temporary storage in the event that discharge from the lake is required to be stopped during the months of February, March and April, in order to manage water quality issues.

The design of the dam was completed by AMEC Earth & Environmental (AMEC) in 2007, and construction was completed in 2008. The last inspection of the dam was completed by AMEC in 2008 following construction. It is the understanding of Knight Piésold Ltd. (KP) that the Ministry requires an inspection of this dam every three years. The timing of this inspection was advanced one year to coincide with inspection at other facilities related to the Eskay Creek Mine.

This report presents the observations made during the site inspection conducted on August 26, 2010, and recommended action items.

SECTION 2.0 - GENERAL DESCRIPTION OF THE DAM

The dam is a concrete gravity structure founded on bedrock with a centrally located stop-log discharge structure and overflow section (Photos 1 and 2). The dam is about 20 m long with a design crest elevation of 1052.2 m. The 20 m length includes a 5 m long overflow section with a crest elevation of 1051.7 m and a 2 m wide slot for stop-logs with a minimum elevation of 1050.4 m. The height of the dam shown on conceptual drawings, prepared and marked "PRELIMINARY" by AMEC (attached as Appendix A), indicate the dam was assumed to be approximately 3.2 m high. No "as-built" drawings were available. Details of the Albino Lake Dam were obtained from the following two letters prepared by AMEC, and provided by Barrick:

- **Subject: Eskay Creek Mine – Albino Lake, Construction of Dam**, dated August 27, 2007.
- **Re: Summary of the Construction Activities at the Albino Lake Temporary Dam**, dated September 03, 2008.

The design standard for major impoundments, water management facilities and dams is specified in Section 10.1.5 of the Health, Safety and Reclamation Code for Mines in British Columbia (2008). This standard is the criteria provided in the Canadian Dam Association's (CDA) Dam Safety Guidelines (2007). The Albino Lake Dam is estimated to be over 3.2 m in height and capable of impounding approximately 200,000 m^3 of water with the stop-logs in place. As such the structure would be classified as a dam under the CDA guidelines.

The available documentation on the Albino Lake Dam does not include the dam classification, or corresponding design criteria related to earthquake and flood events. The design earthquake and flood events are based on the dam classification. It is noted in the letters that the structure is not intended as a permanent structure. It is intended for short term use to facilitate water quality management while Barrick works on final closure of Albino Lake. The design life of the facility, or the expected duration of the short term use are not provided.

A preliminary review of the available documentation indicates that a LOW dam classification may be appropriate. Classification of a dam under the CDA guidelines is carried out by considering the potential incremental consequences of a failure. The incremental consequences of failure are defined as the total damage from an event with dam failure minus the damage that would have resulted from the same event had the dam not failed. The consequences of failure include population at risk, loss of life, environmental and cultural values and infrastructure and economic impacts. A more thorough classification exercise should be carried out as part of a dam safety review process. The criteria used to define the dam classification are reproduced from the CDA guidelines as Table 2.1.

For a LOW dam class, the suggested inflow design flood and earthquake design ground motions have an annual exceedance probability of 1/100 and 1/500, respectively (Table 2.2). The design capacity of the Albino Lake Dam, or the design earthquake ground motions were not provided in the available documentation.

SECTION 3.0 - SITE INSPECTION NOTES

3.1 GENERAL

A site inspection was carried out on August 26, 2010 by Mr. Donald Trapp, P.Eng. The weather was +10°C and partly cloudy.

The condition of the dam appears to be as noted in the previous inspection reports. The concrete is in good condition with no apparent sign of seepage through the dam body below the lake level. The water level at the time of inspection was 0.02 m above the bottom of the stop-log slot.

An inspection checklist of the major features of the dam, including a condition assessment and recommendations is provided in Appendix B.

3.2 CONCRETE DAM

3.2.1 Abutments

The right abutment was found to be in satisfactory condition with a good contact between the concrete and bedrock (Photos 3 and 4). No seepage was observed, which may be attributed to the relatively low lake level. An inspection at higher lake levels, i.e. during times of impounding, would provide a more meaningful characterization of the concrete/bedrock contact.

The left flank of the non-overflow section is backfilled to the crest of the dam (Photos 5 and 6)

3.2.2 Dam Body

The concrete was in good condition and no signs of apparent leakage were noted. Some surface patching of previously noted honeycombed areas was observed on the downstream face and is performing satisfactorily (Photo 7). Some honeycombed areas were noted below the brink of the stop-log slot and also adjacent to the steel channel for the stoplogs. The concrete is sound and satisfactory for the intended purpose.

There were no signs of seepage through the dam body below the lake level. Seepage through the foundation could not be detected as the lower portion of the dam has been backfilled on both the upstream and downstream sides.

3.2.3 Stop-log Hoist Structure

The stop-log hoist structure is a wooden shelter built to protect the wooden stop-logs from the elements and to provide a means for placing and removing the stop-logs. The structure is located within the overflow section of the dam body and spans across the stop-log slot (Photo 1). It was noted in the previous inspection that this arrangement is unsatisfactory as the hoist structure is likely to obstruct the passage of water in the overflow section.

3.3 SURFACE DRAINS

Surface drains on the left abutment hill slope were noted features in the previous inspection report; however, there was no distinct channels observed during this inspection.

3.4 DISCHARGE CHANNEL

The riprap in the channel bed of the discharge channel was in satisfactory condition and the channel was free of obstructions.

SECTION 4.0 - RECOMMENDATIONS

The 2010 inspection showed the Albino Lake Dam to be in satisfactory condition. The following action items are recommended:

1. The surface drains on the left abutment hill slope should be re-established and maintained to divert runoff from the hill away from the dam.

2. The honeycombed areas below the brink of the stop-log slot and next to the stop-log guide do not require maintenance at this time. These areas have been noted for re-evaluation at the future inspections.

3. The hoist structure should be relocated such that it is located above the crest elevation of the non-overflow section and it does not interfere with the ability to pass flow in the overflow section. This recommendation was made previously following the 2008 inspection.

4. A formal dam safety review, done in accordance with the CDA Dam Safety Guidelines, should be completed within the next year, and an appropriate dam classification and corresponding design earthquake and flood events defined for the facility.

5. Schedule the next inspection for the summer of 2013.

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SECTION 5.0 - CERTIFICATION

This report was prepared and approved by the undersigned.

Prepared: _____ Nov 9, 2010

PROFESSIONAL ENGINEER
PROVINCE OF BRITISH COLUMBIA
D. A. TRAPP
29203

Donald A. Trapp, M.Eng., P.Eng.
Senior Geotechnical Engineer

Reviewed: _____

Graham Greenaway, P.Eng.
Specialist Geotechnical Engineer

Approved: _____

Ken J. Brouwer, P.Eng.
Managing Director

Knight Piésold CONSULTING

TABLE 2.1

BARRICK GOLD INC.
ESKAY CREEK MINE

ALBINO LAKE DAM
DAM CLASSIFICATION[1]

Print Nov/08/10 16:11:33

Dam Class	Population at risk [2]	Incremental losses		
		Loss of life [3]	Environmental and cultural values	Infrastructure and economics
Low	None	0	Minimal short-term loss No long-term loss	Low economic losses; area contains limited infrastructure or services
Significant	Temporary only	Unspecified	No significant loss or deterioration of fish or wildlife habitat Loss of marginal habitat only Restoration or compensation in kind highly possible	Losses to recreational facilities, seasonal workplaces, and infrequently used transportation routes
High	Permanent	10 or fewer	Significant loss or deterioration of *important* fish or wildlife habitat Restoration or compensation in kind highly possible	High economic losses affecting infrastructure, public transportation, and commercial facilities
Very high	Permanent	100 or fewer	Significant loss or deterioration of *critical* fish or wildlife habitat Restoration or compensation in kind possible but impractical	Very high economic losses affecting important infrastructure or services (e.g., highway, industrial facility, storage facilities for dangerous substances)
Extreme	Permanent	More than 100	Major loss of *critical* fish or wildlife habitat Restoration or compensation in kind impossible	Extreme losses affecting critical infrastructure or services (e.g., hospital, major industrial complex, major storage facilities for dangerous substances)

M:\1\01\00002\15\A\Report\2 - 2010 Albino Lake Dam Inspection\Tables\[Tables.xls]Table 2.1

NOTES:

1. REPRODUCED FROM TABLE 2-1 OF THE CANADIAN DAM ASSOCIATION'S DAM SAFETY GUIDELINES (2007).
2. DEFINITIONS FOR POPULATION AT RISK:
   NONE - THERE IS NO IDENTIFIABLE POPULATION AT RISK, SO THERE IS NO POSSIBILITY OF LOSS OF LIFE OTHER THAN THROUGH UNFORSEEABLE MISADVENTURE.
   TEMPORARY - PEOPLE ARE ONLY TEMPORARILY IN THE DAM-BREACH INUNDATION ZONE (E.G., SEASONAL COTTAGE USE, PASSING THROUGH ON TRANSPORTATION ROUTES, PARTICIPATING IN RECREATIONAL ACTIVITIES).
   PERMANENT - THE POPULATION AT RISK IS ORDINARILY LOCATED IN THE DAM-BREACH INUNDATION ZONE (E.G., AS PERMANENT RESIDENTS); THREE CONSEQUENCE CLASSES (HIGH, VERY HIGH, EXTREME) ARE PROPOSED TO ALLOW FOR MORE DETAILED ESTIMATES OF POTENTIAL LOSS OF LIFE (TO ASSIST IN DECISION-MAKING IF THE APPROPRIATE ANALYIS IS CARRIED OUT).
3. IMPLICATIONS FOR LOSS OF LIFE:
   UNSPECIFIED - THE APPROPRIATE LEVEL OF SAFETY REQUIRED AT A DAM WHERE PEOPLE ARE TEMPORARILY AT RISK DEPENDS DEPENDS ON THE NUMBER OF PEOPLE, THE EXPOSURE TIME, THE NATURE OF THEIR ACTIVITY, AND OTHER CONDITIONS. A HIGHER CLASS COULD BE APPROPRIATE, DEPENDING ON THE REQUIREMENTS. HOWEVER, THE DESIGN FLOOD REQUIREMENT, FOR EXAMPLE, MIGHT NOT BE HIGHER IF THE TEMPORARY POPULATION IS NOT LIKELY TO BE PRESENT DURING THE FLOOD SEASON.

REV	DATE	DESCRIPTION	PRP'D	CHK'D	APP'D
0	04OCT'10	ISSUED WITH REPORT 101-2/15-2	DT	GRG	KJB

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TABLE 2.2

BARRICK GOLD INC.
ESKAY CREEK MINE

ALBINO LAKE DAM
SUGGESTED DESIGN FLOOD AND EARTHQUAKE LEVELS[1]

Print Nov/08/10 16:11:33

Dam Class[3]	AEP	
	IDF[4]	EDGM[5]
Low	1/100	1/500
Significant	Between 1/100 and 1/1000 [6]	1/1000
High	1/3 between 1/1000 and PMF [7]	1/2500 [8]
Very high	2/3 between 1/1000 and PMF [7]	1/5000 [8]
Extreme	PMF [5]	1/10,000

M:\1\01\00002\15\A\Report\2 - 2010 Albino Lake Dam Inspection\Tables\[Tables.xls]Table 2.1

NOTES:

1. REPRODUCED FROM TABLE 6-1 OF THE CANADIAN DAM ASSOCIATION'S DAM SAFETY GUIDELINES (2007).
2. ACRONYMS: ANNUAL EXCEEDANCE PROBABILITY (AEP); EARTHQUAKE DESIGN GROUND MOTION (EDGM); INFLOW DESIGN FLOOD (IDF); PROBABLE MAXIMUM (PMF).
3. AS DEFINED IN TABLE 2.1: DAM CLASSIFICATION.
4. EXTRAPOLATION OF FLOOD STATISTICS BEYOND 1/1000 YEAR FLOOD (10-3 AEP) IS DISCOURAGED.
5. AEP LEVELS FOR EDGM ARE TO BE USED FOR MEAN RATHER THAN MEDIAN ESTIMATES FOR THE HAZARD.
6. SELECTED ON THE BASIS OF INCREMENTAL FLOOD ANALYSIS, EXPOSURE, AND CONSEQUENCE OF FAILURE.
7. PMF HAS NO ASSOCIATED AEP. THE FLOOD IS DEFINED AS "1/3 BEWTEEN 1/1000 AND PMF" OR "2/3 BETWEEN 1/1000 YEAR AND PMF" HAS NO DEFINED AEP.
8. THE EDGM VALUE MUST BE JUSTIFIED TO DEMONSTRATE CONFORMANCE TO SOCIETAL NORMS OF ACCEPTABLE RISK. JUSTIFICATION CAN BE PROVIDED WITH THE HELP OF FAILURE MODES ANALYSIS FOCUSED ON THE PARTICULAR MODES THAT CAN CONTRIBUTE TO FAILURE INITIATED BY A SEISMIC EVENT. IF THE JUSTIFICATION CANNOT BE PROVIDED, THE EDGM SHOULD BE 1/10,000.

REV	DATE	DESCRIPTION	PRP'D	CHK'D	APP'D
0	04OCT'10	ISSUED WITH REPORT 101-2/15-2	DT	GRG	KJB

PHOTO 1 – Downstream face of Albino Lake Dam.

PHOTO 2 – Upstream face of dam.

BARRICK GOLD INC.
ESKAY CREEK MINE
2010 ALBINO LAKE DAM INSPECTION

PHOTO 3 – Downstream right abutment.

PHOTO 4 – Upstream right abutment.

BARRICK GOLD INC.
ESKAY CREEK MINE
2010 ALBINO LAKE DAM INSPECTION

PHOTO 5 – Downstream left abutment (buried).

PHOTO 6 – Upstream left abutment (buried).

BARRICK GOLD INC.
ESKAY CREEK MINE
2010 ALBINO LAKE DAM INSPECTION

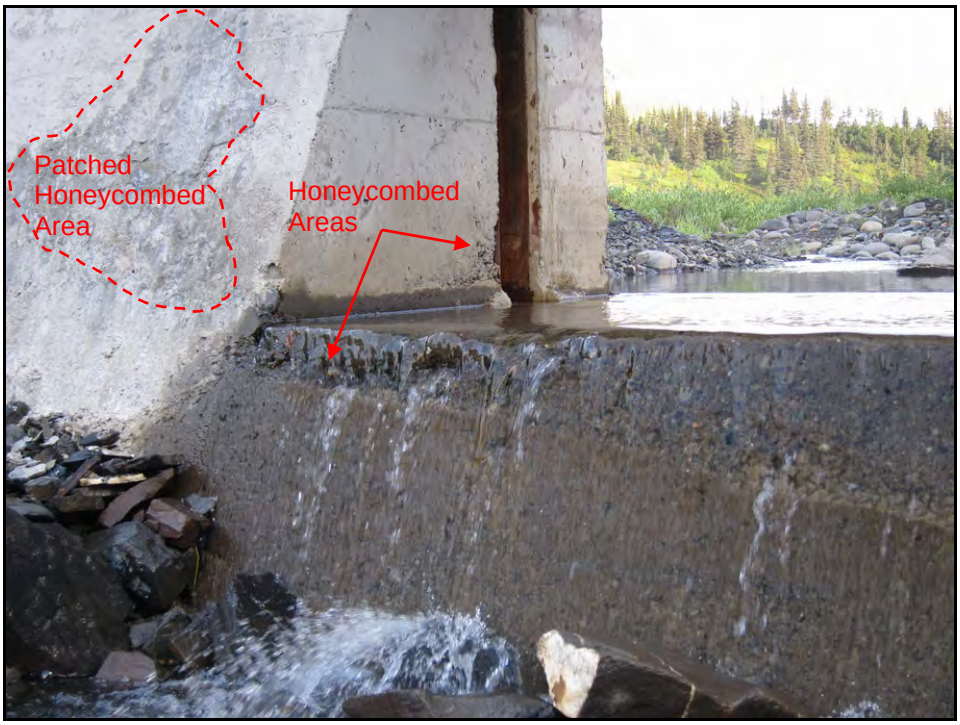

PHOTO 7 – Honeycombed areas below stop-log slot and next to steel stop-log guide.

PHOTO 8 – Excavation on left abutment hill slope.

BARRICK GOLD INC.
ESKAY CREEK MINE
2010 ALBINO LAKE DAM INSPECTION

Knight Piésold
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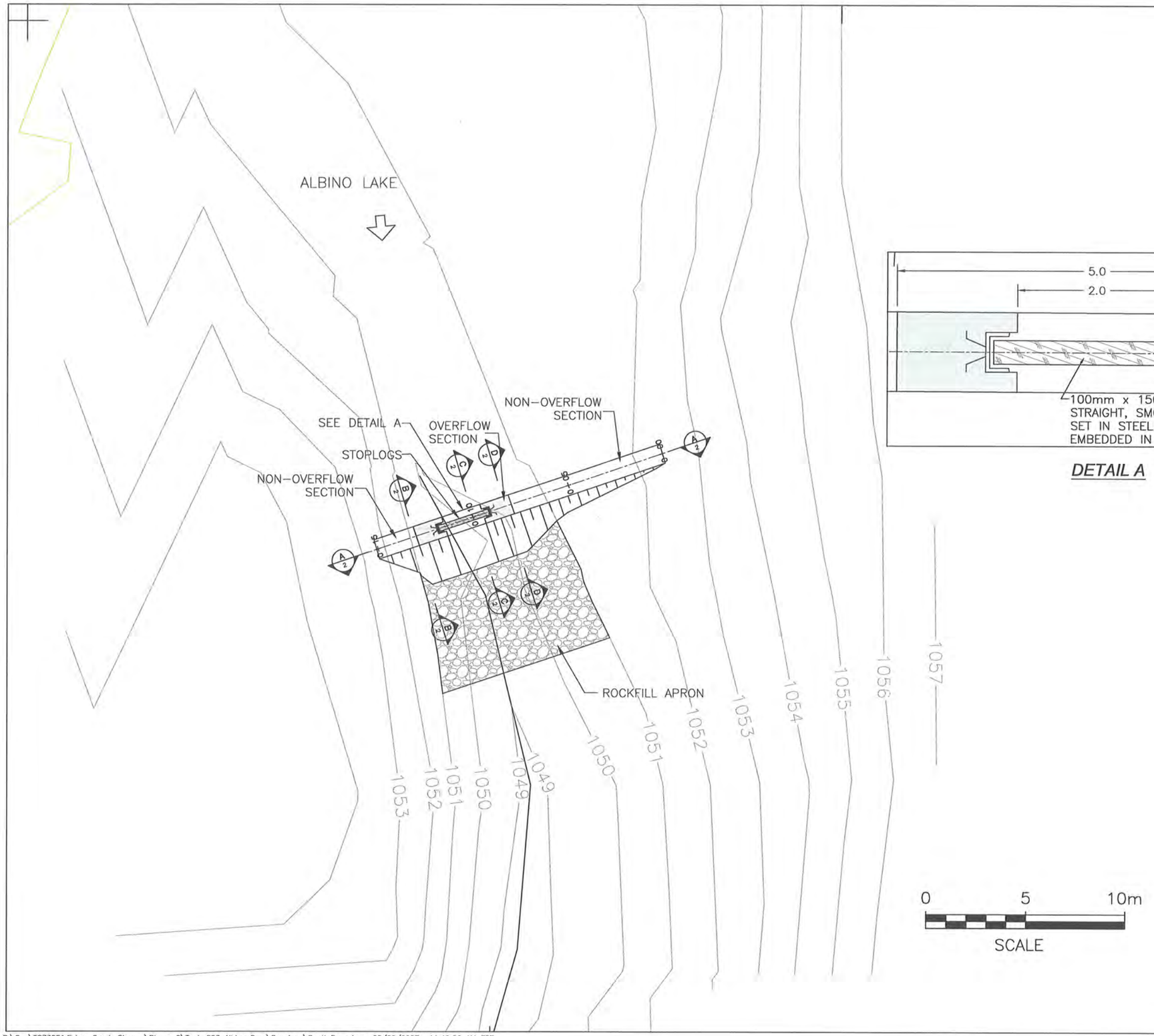
APPENDIX A

CONCEPTUAL DESIGN DRAWINGS

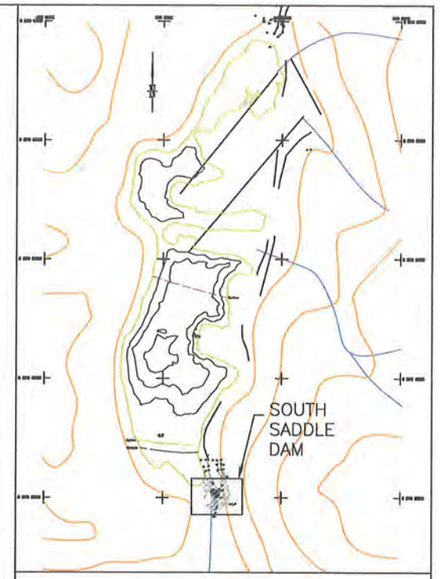
(Pages A-1 to A-2)



DETAIL A

0 5 10m

SCALE



KEY MAP

NOTES:

1. ELEVATIONS AND DIMENSIONS ARE IN METERS.
2. CONTOURS SHOWN ARE BASED ON THE TOPOGRAPHIC SURVEYS CARRIED OUT BY BARRICK GOLD IN JULY 2007.
3. THE PROPOSED STRUCTURE HAS BEEN DESIGNED BASED ON LIMITED INFORMATION GATHERED FROM TWO TEST PITS. NO ROCK/OVERBURDEN PERMEABILITY DATA IS AVAILABLE.
4. THE PROPOSED CONCRETE DAM AND STOPLOGS ARE DESIGNED AS TEMPORARY STRUCTURES AND NOT SUITABLE FOR LONG-TERM USAGE.
5. DURING EXCAVATION OF FOUNDATION IF FAULTED OR FRACTURED MATERIAL IS ENCOUNTERED A SEEPAGE CUTOFF TRENCH AS SHOWN SHALL BE EXCAVATED AND BACKFILLED WITH LEAN MIX CONCRETE.

PRELIMINARY

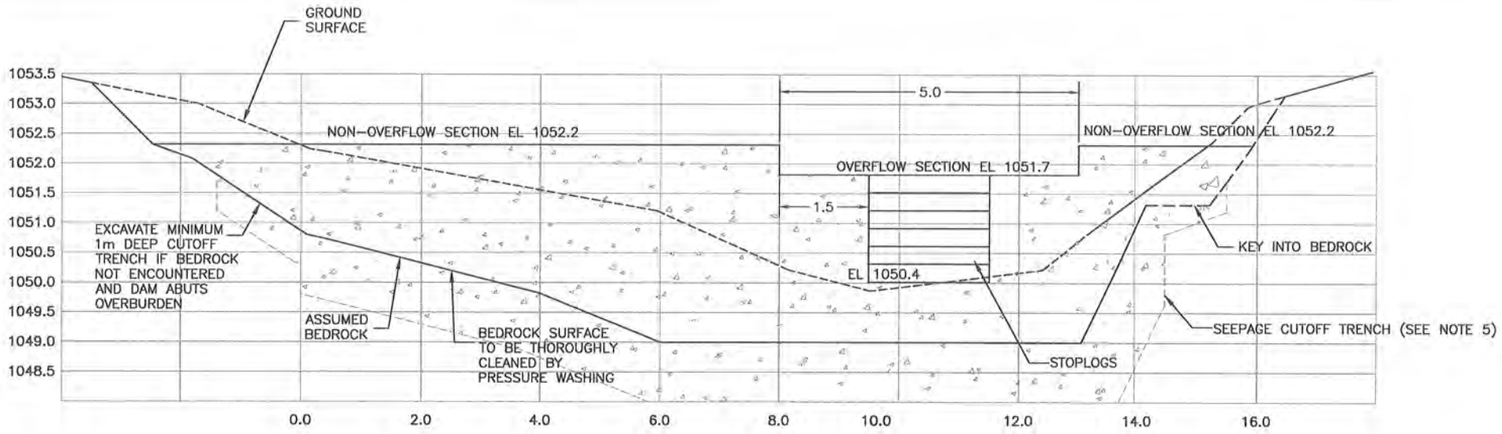
A	AUGUST 2007	CONCEPTUAL DESIGN ISSUED FOR INFORMATION ONLY

amec

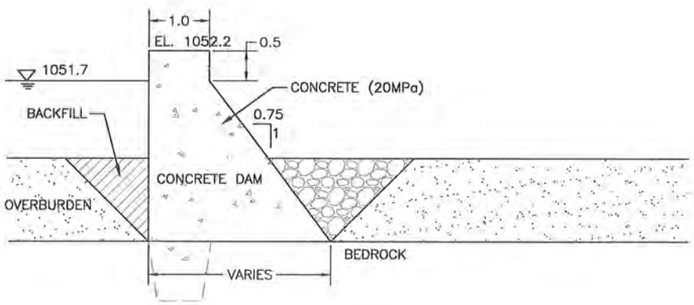
ESKAY CREEK CLOSURE
SOUTH SADDLE DAM
PLAN

SCALE	DATE
AS SHOWN	AUGUST 2007
PROJECT NO.	FIGURE NO.
TC73901/203	1

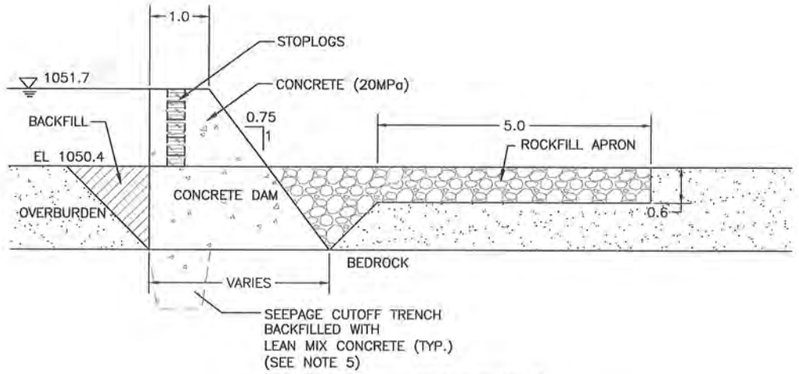
P:\Geo\TC73901.Eskay Creek Closure\Phase 2\Task 203 Albino Dam\Drawings\South.Dam.dwg 08/09/2007 11:49:26 AM EDT



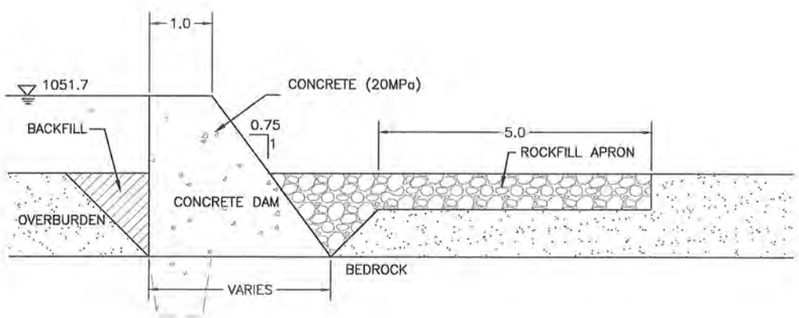
SECTION A–A
DAM PROFILE



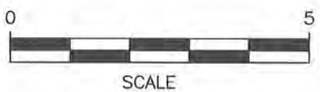
SECTION B–B
NON–OVERFLOW SECTION



SECTION C–C
STOPLOG SECTION



SECTION D–D
OVERFLOW SECTION



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5. DURING EXCAVATION OF FOUNDATION IF FAULTED OR FRACTURED MATERIAL IS ENCOUNTERED A SEEPAGE CUTOFF TRENCH AS SHOWN SHALL BE EXCAVATED AND BACKFILLED WITH LEAN MIX CONCRETE.

PRELIMINARY

A	AUGUST 2007	CONCEPTUAL DESIGN ISSUED FOR INFORMATION ONLY

amec

ESKAY CREEK CLOSURE
SOUTH SADDLE DAM
PROFILE AND SECTIONS

SCALE 1:100	DATE AUGUST 2007
PROJECT NO. TC73901/203	FIGURE NO. 2

P:\Geo\TC73901.Eskay Creek Closure\Phase 2\Task 203 Albino Dam\Drawings\South.Dam.dwg 08/09/2007 11:49:26 AM EDT

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APPENDIX B

DAM INSPECTION CHECKLIST

(Page B-1)

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TABLE B1

BARRICK GOLD INC.
ESKAY CREEK MINE

ALBINO LAKE DAM
DAM INSPECTION CHECKLIST

CONDITION

S = Satisfactory. No significant defects observed.

F = Fair. Will fulfill intended purpose. Maintenance may be required.

P = Poor. May not fulfill intended purpose. Repair or maintenance required.

U = Unsatisfactory. Will not fulfill intended purpose. Repair or maintenance required.

- = Not inspected. Give reasons under Remarks / Recommendations.

Print Oct/26/10 14:10:42

Item No.	Feature	Condition	Remarks / Recommendations
1.0	**INSPECTION DETAILS**		
	Date of Inspection		26-Aug-10
	Weather		Partly Cloudy, +11°C
	Inspected By:		Donald Trapp, P.Eng.
	Date Of Last Inspection		26-Aug-08
2.0	**CONCRETE DAM**		
(a)	Water Level		2 cm overflow with no stop-logs in place
(b)	Stop-logs		
	- stop-logs	S	Stoplogs are stored inside hoist house
	- stop-log guides	S	Some honeycombing noted at bottom of right guide.
	- hoist structure	U	Hoist structure obstructs upper part of overflow section. **RECOMMENDATION: relocate structure keeping it above the crest of the non-overflow section.**
(c)	crest	S	
(d)	right abutment	S	Contact between rock and concrete partially visible on both upstream and downstream sides (lower portion is buried).
(e)	left abutment	-	buried
(f)	downstream face		
	- concrete	S	**RECOMMENDATION: monitor honeycombed area below stoplog channel.**
	- construction joints	S	
(g)	seepage	S	downstream surface is dry
3.0	**SURFACE DRAINS**		
(a)	Left Abutment Drains	F	**RECOMMENDATION: Ditching to divert water to upstream and downstream sides needs to be reestablished.**
4.0	**DISCHARGE CHANNEL**		
(a)	Channel Bed		
	- Riprap Bedding	S	
	- Obstructions	S	

M:\1\01\00002\15\A\Data\[Eskay Creek Annual Dam Inspections.xls]Albino Lake

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	22OCT'10	ISSUED WITH REPORT VA101-02/15-2	DT	GRG	KJB

Appendix D

Recommendation to Suspend Dam Inspection Requirements

January 6, 2014

File No.:VA101-2/16-A.01
Cont. No.:VA13-02063

Mrs. Kerri Harmati
Environmental Manager
Barrick Gold Corp (Eskay Creek Mine)
6431 Airport Way
Smithers, British Columbia
Canada, V0J 2N0

Dear Kerri,

Re: Eskay Creek Mine - Albino Lake Dam

The Albino Lake Dam is a concrete structure located at the western outlet of Albino Lake. The dam is a small, concrete structure constructed in 2008 to provide temporary storage in Albino Lake using stop-logs. The Albino Lake Dam is approximately 3.2 m in height and is capable of impounding approximately 200,000 m^3 of water with the stop-logs in place. The Canadian Dam Association (CDA) guidelines classify a dam as a barrier that is capable of impounding at least 30,000 m^3 of water and is at least 2.5 m high. The Albino Lake structure, with the stop-logs in place, was therefore classified as a dam. A photo of the dam from the 2010 inspection, with the stop-log hoist structure located within the overflow portion of the dam, is shown in Photo 1.

The hoist structure has since been removed and the Albino Lake structure currently has no means to impound water in Albino Lake. A photo of the Albino Lake structure, taken in 2013 without the hoist structure, is shown on Photo 2.

The Albino Lake structure is not capable impounding water in its current state and is no longer performing as a dam. The stop-log hoist structure has been removed and there are no plans to re-install it. It is therefore recommended the operating and inspection requirements for the Albino Lake structure be suspended while the structure is in its current state. However, the dam inspection requirements will be re-established should the structure be modified in the future to allow for the impoundment of water in Albino Lake.

Please do not hesitate to contact the undersigned if you have any questions.

Yours truly,

KNIGHT PIESOLD LTD.

Signed:
Les Galbraith, P.Eng.
Specialist Engineer/Project Manager

Approved:
Ken Embree, P.Eng.
Managing Principal

Attachments:

Photo 1	Albino Lake Structure with Stop-Log Hoist Structure (2010)
Photo 2	Albino Lake Structure without Stop-Log Hoist Structure (2013)

PHOTO 1 – Albino Lake Structure with Stop-Log Hoist Structure (2010).

PHOTO 2 – Albino Lake Structure without Stop-Log Hoist Structure (2013).

BARRICK GOLD CORP
ALBINO LAKE DAM

Appendix E

Albino Lake WRSF Selected Photographs

Albino Lake WRSF looking northwest over decommissioned control structure, with the concrete invert section approximately 160 mm below the lake water surface elevation.

View looking upstream (north) through decommissioned control structure towards Albino Lake WRSF.

View looking downstream (south) through decommissioned control structure.

View looking southeast of natural channel and area downstream of Albino Lake WRSF; red circle indicates location of rectangular, sharp-crested weir station.