From: Malone, Patrick (Salt Lake City) [mailto:pmalone@barrick.com]
Sent: Monday, December 13, 2010 2:41 PM
To: zzMSHA-Standards - Comments to Fed Reg Group
Subject: RIN 1219-AB70

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Please find attached Barrick Gold's response to MSHA's August 13, 2010 ANPR. Also submitted on the Regulations.gov website (Comment Tracking Number: 80bb5629)

Regards,

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AB70-COMM-22

BARRICK

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Via E-Mail

Patricia W. Silvey, Director
Office of Standards, Regulations, and Variances
Mine Safety and Health Administration
1100 Wilson Boulevard, Room 2350
Arlington, Virginia 22209–3939
Email: *zzMSHAComments@dol.gov*

Re: RIN 1219-AB70

Dear Director Silvey:

On behalf of Barrick Gold of North America Inc. (Barrick) and its affiliates, thank you for this opportunity to respond to the Advance Notice of Proposed Rulemaking (ANPR) relating to Metal and Nonmetal Dams that the Mine Safety and Health Administration (MSHA) published on August 13, 2010. We appreciate that MSHA has requested input from the regulated mining community on this issue. At Barrick, the safety of our workers, their families, and the communities in which we operate are always our highest priority.

Barrick operates six (6) producing mines in the United States, some of which have large-scale tailing impoundments. For example, the Goldstrike Mine in Nevada operates a series of tailings impoundments that have a collective surface area of more than 1,300 acres. Additionally, Barrick has responsibility for numerous closure sites across the western United States, including large impoundment areas associated with the historic Homestake Mine near Lead, South Dakota and the McLaughlin Mine in northern California.

Given its significant experience with constructing, operating, and closing large scale tailings impoundments, Barrick is in a good position to provide comments and insights that may prove helpful to MSHA. We hope that the following responses provide useful information and we welcome the opportunity to provide additional assistance to MSHA as it strives to define its role in the oversight of impoundment dams.

General Questions

1. *MSHA is seeking information concerning current dam safety practices at metal and nonmetal mines. What measures do mine operators currently take to design, construct, operate, and maintain safe and effective dams? What measures do mine operators currently take to safely abandon their dams? For mine operators with dams, please provide your experiences.*

   Barrick's impoundment dams are currently subject to both prescriptive state regulations as well as voluntary industry standards. In Barrick's experience, this combination of state regulations and industry standards provides robust protection to workers, communities, and natural environments, while allowing Barrick to account for highly variable geological, meteorological, and topographical conditions.

   We provide the following descriptions of the State of Nevada and the Mining Association of Canada dam safety programs as representative examples.

Summary of Sample State Program Requirements

The majority of Barrick's operating mines are located in the State of Nevada. For these locations, Barrick's impoundment dams are currently regulated by the Nevada Department of Conservation and Natural Resources, Division of Water Resource (NDWR). NDWR has promulgated both general requirements applicable to any dams in Nevada, *see* Nevada Administrative Code (NAC) Chapter 535, as well as specific requirements that apply only to mining facilities that store process water. *See* Nevada Administrative Code (NAC) Chapter 445A.350 - 447 ("Water Controls for Mining Facilities").

Noteworthy aspects of the Nevada dam safety program include:

- Preconstruction approval by the State Engineer of a design report that accounts for earthquake potential and downstream hazards in the event of a failure of the dam or a large release of water;
- Preconstruction approval by the State Engineer of a geotechnical report evaluating the suitability of the site for the proposed project based on site-specific lithology and soil conditions, the foundation bearing capacity of the site, expected settlement, depth to ground water, permeability of foundation materials, and seismic hazards in the area;
- Construction oversight by a professional engineer in compliance with an approved construction quality assurance/quality control plan (CQA/QC);
- Post-construction submission of an as-built record report that includes a summary of any design changes made during construction, summarizes the testing completed during the construction, and provides an overall summary of the construction observation services provided;
- Post-construction maintenance of an Emergency Action Plan (EAP) for all dams that are classified as significant or high hazard as per NAC 535.320;
- Annual inspections of high hazard dams and inspections every three to five years for all other classes of dams; and

- A decommissioning program for dam facilities no longer deemed necessary.

Industry Standards

In 1998 the Mining Association of Canada (MAC) published "A Guide to the Management of Tailings Facilities." MAC published a follow up manual in 2003 titled "Developing an Operation, Maintenance and Surveillance Manual for Tailings and Water Management Facilities." The MAC guidance documents draw on sound industrial practice and procedures and were prepared by tailings experts from mining community. Barrick utilizes the MAC guidance and follows its guidelines at its North American operating sites

http://www.mining.ca/www/media_lib/TSM_Documents/TSM_Publications/tailingsguide.pdf

http://www.mining.ca/www/media_lib/MAC_Documents/omsguideeng.pdf

2. *MSHA is required to inspect every mine in its entirety, which includes dams of all sizes and hazard potential. A common approach for dam safety is to have tiered requirements based on a dam's size and hazard potential. How should MSHA determine safety requirements based on a dam's size and hazard potential? Please include specific recommendations and explain your reasoning.*

   As mentioned above, the State of Nevada, through the Dam Safety program, provides a well-developed inspection system based on hazard ranking and dam size. In addition to State requirements, there are numerous other governmental entities, organizations and industry groups, including the Federal Emergency Management Agency, the Association of State Dam Safety Officials, the Canadian Dam Association, and others, who have directly or indirectly addressed this issue by regulations, guidance, or policy statements.

3. *What non-Federal authority regulates the safety of dams at metal and nonmetal mines in your state, territory, or local jurisdiction? Please discuss the specific requirements, including the principles that they address. If possible, please provide information about relevant non-federal dam safety requirements through a hyperlink or other means.*

   Barrick's operations are subject to the following state programs:

   http://water.nv.gov/Engineering/Dams/ Nevada Dams and Dam Safety (discussed more specifically in response to Question 1)

   http://water.state.co.us/damsafety/dams.asp Colorado Dam Safety Rules

   http://www.ose.state.nm.us/water_info_dam_safety.html New Mexico Dam Safety Rules

   http://www.damsafety.org/media/Documents/STATE_INFO/LAWS_&_REGS/SouthDakota_L&R.pdf South Dakota Dam Safety Rules

   http://www.water.ca.gov/damsafety/ California Dam Safety Rules

   http://dnrc.mt.gov/wrd/water_op/dam_safety/damsafetyrules.asp Montana Dam Safety Rules

4. *What records should be kept of activities related to the safety of dams? Please be specific and include your rationale. What records should be provided to miners if hazardous conditions are found?*

Barrick believes that record requirements dictated by the existing state programs are sufficient. With regard to specific disclosures to mine employees, discussion of potential hazards associated with dams could be included with MSHA Annual Refresher Training.

Design and Construction of Dams

MSHA's existing standards do not include specific requirements for design of dams. MSHA found that inadequate design contributed to some of the metal and nonmetal dam failures. In responding to the following questions, please discuss how any requirements should vary according to the size or hazard potential of a dam, and why.

5. *How should mine operators assure that dams are safely and effectively designed? Please suggest requirements that MSHA should consider for safe design of dams. Please be specific and include your rationale.*

   Barrick believes that the existing state regulations and voluntary industry standards discussed in response to Question 1 are sufficient to accomplish this goal.

6. *Please suggest requirements for review of dam designs by mine operators and MSHA and include your rationale for specific recommendations and alternatives.*

   Barrick believes that the existing state regulations and voluntary industry standards discussed in response to Question 1 are sufficient to accomplish this goal. Barrick believes that existing state programs should be allowed to continue in their current conditions. If additional federal regulations are determined necessary, Barrick believes that the best use of MSHA's time and expertise would be to focus of its rulemaking efforts on those states that do not already have well-developed dam safety programs.

7. *With new standards, operators may need to evaluate and upgrade existing dams. Please elaborate on how the safety of existing dams should be addressed.*

   Although retrofitting may be appropriate in some exceptional circumstances, Barrick does not believe that retrofitting existing structures that were constructed in compliance with existing state regulations and voluntary industry standards, and have been properly maintained, would be either necessary or practical.

8. *MSHA's existing standards for dams at metal and nonmetal mines do not address whether a dam is constructed as designed. What measures are necessary to ensure that mine operators construct dams as designed?*

   Existing state and local rules and regulations commonly require that as-built drawings be submitted and approved prior to operation to ensure that design requirements are met through the construction process. As mentioned previously, we believe that compliance with such existing requirements adequately protects the health and safety of mine workers and the public. Barrick does not believe that additional action by MSHA is necessary, at least in those states that have existing dam safety programs.

9. *How should MSHA verify that dams have been constructed as designed? Please explain your rationale.*

Existing state programs typically require certification of as-built drawings by a licensed Professional Engineer. We believe that compliance with such existing requirements adequately protects the health and safety of mine workers and the public. Barrick does not believe that additional action by MSHA is necessary, at least in those states that have existing dam safety programs.

Operation and Maintenance of Dams

MSHA's existing standards do not contain specific requirements addressing the operation and maintenance of dams.

10. *What should a mine operator do to operate and maintain a safe dam? How should MSHA verify that dams are safely operated and maintained? Please be specific.*

    Barrick believes that the existing state regulations and voluntary industry standards discussed in response to Question 1 are sufficient to accomplish this goal. Barrick believes that existing state programs should be allowed to continue in their current conditions. If additional federal regulations are determined necessary, Barrick believes that the best use of MSHA's time and expertise would be to focus of its rulemaking efforts on those states that do not already have well-developed dam safety programs.

11. *What measures should mine operators take to assure that dams are adequately inspected for unusual conditions and signs of instability?*

    Barrick believes that the existing state regulations and voluntary industry standards discussed in response to Question 1 are sufficient to accomplish this goal. Barrick believes that existing state programs should be allowed to continue in their current conditions. If additional federal regulations are determined necessary, Barrick believes that the best use of MSHA's time and expertise would be to focus of its rulemaking efforts on those states that do not already have well-developed dam safety programs.

12. *How often are routine inspections of dams conducted? How often should they be conducted? What determines the frequency? Who conducts the routine inspections? Please be specific and include your rationale.*

    Barrick inspects its tailings dams in accordance with existing state programs and prevailing industry standards. For dams that are located at the mine site and are considered a part of the process components at the mine, inspections of the work place are generally conducted at the beginning of each shift or during the shift during routine operations. Operators who work on the dam are instructed on basic observations they can make while working on the dam to identify potential signs of instability.

    The frequency of routine inspections is driven in large part by the downstream risk (hazard ranking) and the likelihood of changed conditions at the dam. Dams where conditions are likely to change rapidly are inspected more frequently. In addition, if site access becomes an issue (seasonally due to snow), inspections are scheduled to occur right before access is limited and again following the annual freshet to document the dam's response to the changed condition. Routine inspections are performed by operators and mine personnel working on the dam as well as by staff within the Engineering or Environmental Department

who are trained in the gathering of data from instrumentation contained on or within the dam. Personnel from third party engineering consultants are also trained in data collection and routine inspection techniques.

13. *Instruments, such as weirs, provide information on the performance of a dam. How frequently should mine operators monitor dam instrumentation? Please provide your rationale.*

    Monitoring frequency is largely driven by activities on or around the dam. If routine operations are occurring on or behind the dam, data are collected quarterly and summarized in a data monitoring report. Increased monitoring is sometimes appropriate during activities that have the potential to impact the stability of the embankment.

14. *What information should be documented during routine dam inspections? Please provide your rationale.*

    Routine inspections consist of visual inspection of the dam and collection of monitoring data. In accordance with state and industry standards, Barrick generally keeps a record of dam inspection data and monitoring reports produced quarterly. Identified deficiencies or areas of concern are documented during routine inspections with notification to the responsible party at the mine.

    Specific inspection parameters typically include:

    - Visual inspection of the main dam crest, slopes, and abutments for signs of changes in seepage, erosion, or instability.
    - Visual inspections of the integrity of pumpback systems, groundwater sumps, monitoring systems, overflow ponds, outlet works, and spillways
    - Visual inspection of the integrity and maintenance requirements for critical sections of storm water diversion channels

15. *Does a competent engineer inspect your mine's dam? If so, at what frequency? Please explain the rationale for these inspections and what is evaluated.*

    As required by state and industry standards, a professional engineer with experience in the design, construction, operation, maintenance, and inspection of dams inspects each dam on a schedule consistent with the dam's hazard ranking. In the State of Nevada, high hazard dams are inspected annually; significant hazard dams at least once every three years; and low hazard dams are inspected at least once every five years. In addition, detailed inspections are done on a more frequent basis if there is a significant seismic event (M=4.0 within 75 miles of the site) or any identified condition that raises the issue of overall dam safety. During the detailed inspection, monitoring data are reviewed and a detailed visual inspection of the dam and all appurtenant structures is completed.

16. *How often should detailed inspections be conducted? Please include your rationale.*

    Barrick believes that the Nevada inspection program outlined above is appropriate.

17. *What information and findings should be documented during detailed dam inspections. Please be specific and include your rationale.*

As required by existing state regulations and voluntary industry standards, detailed dam inspections should include an overall summary of observations made by the reviewer; identify any deficiencies noted by the reviewer, and present recommendations for corrective actions.

Barrick typically provides the following information in its annual monitoring report:

- Summary of the monitoring data collected since submittal of the previous Report;
- Summary of any additional monitoring points installed or monitoring points abandoned since submittal of the previous Report;
- Interpretation of monitoring data and identification of data showing unusual readings changes over the last reading period;
- Conclusions and/or confirmations for facilities, or portions of facilities, that show changes of monitoring data over the past reading period;
- Explanation of possible cause(s) of unusual trends in the recent monitoring point data;
- Recommendations for additional monitoring, or response (if needed), for portions of facilities where recent monitoring data indicates unusual trends;
- Figures showing plan locations of all active monitoring points, as well as locations of new or abandoned points;
- Data collection sheets with movement, water level, and flow readings, showing historic data as well as new data;
- Visual inspection sheets with notes of field observation of site conditions and instrument conditions; and
- Any unusual meteoric or earthquake events that occur over the past reading period.

18. *How should MSHA verify that mine operators conduct routine and detailed inspections? Please explain how your suggestion would work.*

Barrick believes that the existing state regulations and voluntary industry standards discussed in response to Question 1 are sufficient to accomplish this goal. These existing state programs should be allowed to continue in their current conditions. If additional federal regulations are determined necessary, Barrick believes that the best use of MSHA's time and expertise would be to focus of its rulemaking efforts on those states that do not already have well-developed dam safety programs.

Qualifications of Personnel

A mine operator is responsible for the design, construction, operation, and maintenance of dams. For an effective dam safety program, an operator must use personnel who are knowledgeable about dam safety.

19. *What qualifications do mine operators currently require of persons who design, inspect, operate, and manage dams? In what capacities are engineers used? Please be specific in your response.*

In accordance with existing state regulations and voluntary industry standards, the design of dams at Barrick mines in the United States is conducted under the direction of a professional engineer registered in the individual who has experience with the design, operation, maintenance, inspection, and closure of dams. Mine personnel provide input into the design

process and provide valuable information regarding the operational aspects that the design must address. Construction of the dams is completed by contractors licensed within the various states for the specific disciplines required (primarily civil and mechanical). Operation and maintenance is conducted by mine personnel who receive task training to make them aware of the specific activities for which they are responsible. Inspection personnel are task trained on data collection and completing visual inspections of the workplace during routine work activities on the dam. A professional engineer registered in the individual state with experience in the design, operation, maintenance, and inspection of dams provides overview of all activities (design, inspect, advise/consult, and certify) related to the dam.

20. *The Guidelines recommend that dams be designed by competent engineers. What specific qualifications or credentials should persons who design dams possess? Please include your rationale.*

    State and industry standards generally require that dams are designed under the direction of a licensed Professional Engineer (PE). Barrick believes PE status is generally sufficient to ensure that competent individuals incorporate appropriate engineering methodology and practices in the design process.

21. *The Guidelines recommend that a dam be constructed under the general supervision of a competent engineer knowledgeable about dam construction. What specific qualifications or credentials should a person have who verifies that a dam is being constructed as designed? Please provide your rationale.*

    State and industry standards generally require that dams are designed under the direction of a licensed Professional Engineer. Barrick believes PE status is generally sufficient to ensure that competent individuals incorporate appropriate engineering methodology and practices in the design process.

22. *What training should personnel receive who perform frequent, routine inspections and who monitor instrumentation at dams? In your response, please suggest course content and the frequency of the training, including the rationale for your recommendations.*

    Under applicable state and industry standards, dam operators are typically required to provide task training to individuals who perform routine inspections and monitor instrumentation at dams. The specific content of such training, however, will vary widely based on the particular circumstances of a particular facility. Rather than prescribing the content and frequency of training by regulation, Barrick believes that these are most appropriately developed based on site-specific circumstances. Dam operators would then incorporate such training into the standard operating procedures for each dam.

23. *What qualifications or credentials should be required of persons who perform detailed inspections to evaluate the safety of a dam? Please be specific and include your rationale.*

Barrick believes that the qualifications or credentials of inspectors should be tailored based on the complexity and risk factors of each particular dam facility. Rather than prescribing qualifications or credentials by regulation, Barrick believes that these are most appropriately developed based on site-specific circumstances.

Abandonment of Dams

24. *Some regulatory authorities require that dam owners obtain approval of a plan to cap, breach, or otherwise safely abandon dams. What actions should mine operators take to safely abandon dams? Please include specific suggestions and rationale.*

Barrick believes that the existing state regulations and voluntary industry standards discussed in response to Question 1 are sufficient to accomplish this goal. Barrick believes that existing state programs should be allowed to continue in their current conditions. If additional federal regulations are determined necessary, Barrick believes that the best use of MSHA's time and expertise would be to focus of its rulemaking efforts on those states that do not already have well-developed dam safety programs.

By way of example, the State of Nevada (as per NAC 535.220) requires a dam operator to prepare a formal decommissioning plan and submit it to the State Engineer for approval prior to commencement of decommissioning activities. The decommissioning plans must be prepared under the direction of a Nevada licensed P.E. Barrick believes that dams should be decommissioned in a manner that results in a stable non-impounding landform. In the case of water dams, the dams should be altered to result in a non-impounding structure. With regard to tailings dams, the tailings should be capped to isolate the tailings from the environment and the dam should be left in a condition that provides long-term stability.

Within the State of Nevada, the closure of tailings dams is not only regulated by the State Engineer (Nevada Division of Water Resources), but because tailings dams are considered process components, the Nevada Division of Environmental Protection (NDEP) also has requirements to ensure the long-term protection of waters of the State. Facility-specific final permanent closure plans (FPCP) must be prepared and submitted to the NDEP at least two years prior to closure as per NAC 445A.447. The NDEP reviews the design for closure from the aspect of long-term protection of Waters of the State, while the State Engineer reviews the design from the perspective of long-term stability and impacts on dam safety.

25. *How can MSHA verify that a mine operator has safely abandoned a dam?*

Barrick believes that the existing state regulations and voluntary industry standards discussed in response to Question 1 are sufficient to accomplish this goal. Barrick believes that existing state programs should be allowed to continue in their current conditions. If additional federal regulations are determined necessary, Barrick believes that the best use of MSHA's time and expertise would be to focus of its rulemaking efforts on those states that do not already have well-developed dam safety programs.

Economic Impact

MSHA seeks information to assist the Agency in deriving the costs and benefits of any regulatory changes for dams at metal and nonmetal mines. In answering the following questions,

please indicate the dam's storage capacity, height, and hazard potential and characterize the complexity of each dam referenced. Also, please include the state where each dam is located, and the number of employees at the mine.

26. *What are the costs of designing a new dam? Please provide details such as hours, rates of pay, job titles, and any contractual services necessary. How often is the design of an existing dam changed? What are the costs of a redesign?*

    Design and construction costs vary depending on the size of the dam as well as a number of other factors such as availability of multiple or few consulting dam design engineers, hazards to downstream residents, potential geotechnical issues and nature of available fill material. It is impossible to generalize such costs.

27. *What are the costs of constructing a dam? Please provide details based on: size of dam; labor costs, including hours, rates of pay, job titles; costs of equipment and materials; and any contractual services necessary.*

    See response to question 26 above.

28. *Please describe the oversight you provide during dam construction to assure it complies with the design plan. How much does it cost per year per dam for oversight and quality control? What special knowledge, qualifications, or credentials do you require of those who provide oversight?*

    See responses to questions 9 and 26 above.

29. *How often do you add height to an existing dam or modify it in some other way? Who supervises the design and construction of these modifications, for example, a professional engineer, competent engineer, contractor, etc? Please be specific and provide rationale for your answer. How much does it cost? Please provide details such as labor costs, including hours, rates of pay, job titles, and costs of equipment and materials and any contractual services necessary.*

    Additional dam lifts are added as necessary based on site specific conditions and considerations. Such modifications are generally subject to the same state and industry standards discussed in response to questions 1 and 5-9 above. With regard to costs, see response to question 26 above.

30. *How much does it cost per year per dam for routine inspections? If you incur separate costs for monitoring instrumentation, how much is that cost? How often do you have a detailed inspection conducted? How much does it cost per year for these inspections?*

    Inspections costs vary depending on the size of the dam as well as a number of other factors such as availability of qualified in-house personnel or outside consultants. It is impossible to generalize such costs.

31. *Does the state or local jurisdiction in which you operate require you to use a professional engineer? If so, when is a professional engineer specifically required? (If you have dams in more than one state please identify which states require a professional engineer and which do not).*

As discussed in the above responses, state and industry standards typically require licensed professional engineers for design and construction as well as for annual detailed inspections.

32. *What are the costs associated with training personnel who conduct frequent, routine inspections and monitor instrumentation at dams?*

Such costs vary depending on a number of factors, including availability and experience of in-house human resources as well as the size and complexity of the dam sites. It is impossible to generalize such costs.

33. *What costs are involved in capping, breaching, or otherwise properly abandoning a dam? Please provide details of your experience and what was involved when you properly abandoned a dam. Describe any impact of a properly abandoned dam.*

These costs vary from site to site and are dependent on site specific issues. It is impossible to generalize such costs.

34. *What are the costs to a mine operator if a dam fails? Please characterize other impacts such as loss of life, environmental damage, etc.*

These costs vary depending on the circumstances. It is impossible to generalize such costs.

35. *Do you have insurance against a dam failure? If so, please specify cost and coverage. Does the insurance carrier require the use of a professional engineer for specific dam activities? If a professional engineer is not required, does the insurance carrier give a discount if one is used? Does your insurance company have any other requirements related to dam safety?*

Barrick maintains liability insurance to cover third party losses resulting from tailings dams, including losses subject to endorsements for "sudden and accidental pollution." Our current insurer does not require the use of professional engineer for any particular activities unless required by applicable state regulations. The cost of such coverage is not split out from other coverage and is an integral part of the policy.

36. *What quantifiable and non-quantifiable costs and benefits for the downstream community are involved when a dam is properly designed and constructed? In addition, MSHA welcomes comments on other relevant indirect costs and benefits.*

Such costs and benefits vary based on the various local circumstances and conditions. Because it is impossible to generalize such costs and benefits, Barrick believes that they are balanced best by state, local and voluntary industry programs rather than by federal rulemaking. As stated previously, Barrick believes that this combination of state regulations and industry standards provides a flexible and functional approach to dam safety that should not be disturbed by nascent federal programs.

We thank you again for this opportunity to provide this information to MSHA. We hope that these comments will prove helpful as MSHA explores this important issue.

Sincerely,

Bill Ferdinand
Director of Environment
Barrick Gold of North America