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Your File: NWB1LUP00008

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Via Email at licensing@nwb.nunavut.ca

Dear Mr. diPizzo:

RE: Kinross Gold Corp., Lupin Mine - 2005 Final Abandonment and Restoration Plan – Technical Meeting Follow-up

As requested in your letter dated April 18, 2006, Environment Canada (EC) has reviewed the information and supporting documents regarding the Abandonment and Reclamation (A&R) of the Tailings Containment Area (TCA) at the Lupin Gold Mine submitted by Kinross Gold Corp. in their response dated March 31, 2006, as well as the information presented at the Technical Meetings held in Yellowknife on April 11, 2006,. It is noted that copies of the presentation made by Kinross at the Technical Meeting have not been made available to participants. Therefore, the information included below is limited to notes taken during the presentation. Copies of the presentation should be made available in advance of any public hearings. Environment Canada has compiled the following list of information requirements, and requests that they be addressed in advance of a final hearing.

Water Quality

- Kinross should clearly state in the final A&R Plan that Dam 1A or 2 will not be breached until water quality within the TCA is able to meet the general prohibition under the *Fisheries Act*. The Plan currently calls for "post-closure" monitoring to begin in 2007. However, given current water quality, it is unlikely that breaching of the TCA can occur that soon. Environment Canada recommends that the final A&R Plan not specify the specific years in which monitoring phases will be implemented, but that use more generic terms, such as "x years after breaching of the dams".

- Further information is required regarding the potential need for *in-situ* treatment in Ponds 1 and 2. It is noted that the results from the "Lupin Gold Mine Environmental Effects Monitoring Interpretative Report, 2005" (March 2006) indicate that concentrations of six metals (Al, As, Cd, Cu, Ni, Zn) in Dam 1a Lake, and five metals (Cd, Cu, Pb, Ni, Zn) in Seep Creek Ponds 1&2 exceeded the Canadian Environmental Quality Guidelines for the Protection of Freshwater Aquatic Life at the time of sampling. Further, many of the parameters in the exposure areas were significantly elevated over those measured in the reference areas. Given that water quality will have to be able to meet the general prohibition under the *Fisheries Act* once the dams are breached, the final A&R Plan should include a contingency plan for water quality treatment, if required in the future.

- The presentation made by Kinross at the Technical Meeting indicated that erosion will be limiting factor to the performance of the saturated granular cover. Therefore, EC recommends that information be provided regarding the implementation of visual monitoring of the cover and the implementation of corrective action, if required, in the post-closure monitoring plan.

- The Final A&R Plan should include further information regarding the justification for the adoption of a five year post closure monitoring period. The information presented at the Technical Meeting regarding the long-term monitoring and performance of the saturated granular cover should be presented to substantiate Kinross' assertion that a five year monitoring period is sufficient. Environment Canada strongly recommends that the final A&R Plan also clearly indicate that if, as a result of monitoring, predictions regarding performance are not being met, the length of the monitoring period will be extended.

- The current A&R Plan indicates that Dam 1A will be breached to restore natural flows through the TCA. However, the supplemental information submitted on March 31, 2005 indicates that Dam 2 may be breached rather than Dam 1A. This will result in Seep Creek being "redirected" from its natural flow through the area of Dam 1A. This could result in sedimentation of Seep Creek at the location where the new channel intersects the old channel, as the sediment in the new channel is washed downstream. If Dam 2 is chosen as the preferred location for breaching, additional information is required regarding measures that will be taken to prevent sedimentation and erosion from occurring in the new channel.

- It is noted that the post-closure monitoring plan put forth be EC in the letter dated October 31, 2005 overlooked the inclusion of SNP station 925-21. This station should also be included in the post-closure monitoring program.

Ecological Risk Assessment

The Canadian Wildlife Service (CWS) of Environment Canada has completed their review of the Ecological Risk Assessment submitted in support of the A&R Plan. The following comments are provided to assist Kinross in the development of an A&R Plan that ensures that the water quality in Ponds 1 and 2 is not adversely affecting the environment.

- The exposure ratios for arsenic and cyanide were very high compared to the expected exposure ratio of less than 1. For the long-tailed duck, the exposure ratio for arsenic was almost 100 and for cyanide it was almost 10,000 (Figure 4, pg 34). For common snipe, the exposure ratio for arsenic was slightly greater than 100 and for cyanide slightly greater than 10,000 (Figure 5, pg 35). Although CWS agrees with the report in that "uncertainties in the assessment of risk to waterfowl and shorebirds be reduced" (page ix) and further analysis done, given the high exposure ratios to arsenic and cyanide it is unclear whether further refinement of the analysis would result in an exposure ratio of less than one. The suggested refinements to the Ecological Risk Assessment should be carried out and the results of the refinements presented.

- Canadian Wildlife Service agrees with the statement in the report that "When information is uncertain, it is standard practice in a risk assessment to make assumptions that are biased towards safety, so that even if there is uncertainty, human and wildlife health will still be protected" (page vi). Following this same line of reasoning, **Canadian Wildlife Service recommends that the precautionary principle be applied and that permanent measures be undertaken to ensure that wildlife are not being exposed to unacceptable levels of arsenic and cyanide.**

- The report states that "The only exposure pathway evaluated for the human health risk assessment was ingestion of caribou meat" (page ii). However, waterfowl that migrate through the area may also be hunted and later eaten by humans both in northern Canada and in southern areas during fall migration and winter. Therefore, there is a potential risk that waterfowl using the tailing ponds may be ingested by humans.

- The report states that "For this assessment the acceptable risk threshold for the human health risk assessment was an ER of 0.2 because it is assumed that people are exposed to metals from multiple sources. For wildlife, the acceptable risk threshold is an ER of 1 since the risk assessment conservatively assumed wildlife obtained all of their food, water and soil from the Lupin Gold Mine." (page 7). Waterfowl and shorebird are migratory; they spend the summer month in northern Canada and migrate south for the winter. They do not obtain all of their food, water and soil from the Lupin Gold Mine. Like humans, they are likely exposed to metals from multiple sources throughout their life. Thus, the discrepancy between using use of a lower ER of 0.2 for humans but not for migratory birds should be clarified.

- The report states that "The Lupin area is on the path of a major bird migratory route; therefore, many individuals may have short-duration exposure to the site. However, it is likely that very few individuals or breeding pairs would spend the entire breeding season at the site. Therefore, it is unlikely that sufficient numbers of individuals would be affected to pose a risk to populations" (page 42). However, consideration should also be given to the fact that some species of waterfowl are long-lived (e.g., geese may live 10 years or more). Although exposure to the contaminated area may be short each year, there may be long-term lifetime exposure to the contaminants in the tailing ponds if individual birds stop at the tailing ponds for multiple years.

- No rationale is given as to why common snipe or long-tailed ducks were chosen as the representative shorebird and waterfowl species, respectively. Have these birds been noted on the mine site? Have these species been noted on the tailing ponds? Do these species nest in the area? Would there be more appropriate bird species to use? For example, red-necked phalarope is a shorebird species that may also use ponds such as these and there might be other waterfowl species that also frequently use the area. The report states that "wild waterfowl have been observed using these water bodies as feeding areas" (page I-24), but does not give details on the actual species, the timing and frequencies of use, and the feeding behaviour of the waterfowl on the ponds. Nor is there an adequate descriptive of the pond habitat so that inferences can be made regarding what species might use the ponds. Although these may be appropriate species for the analysis, a justification for why common snipe and long-tailed duck were the most appropriate species should be provided.

- Shallow Bay was the only reference site (page I-4) from which reference samples were collected for the sediment analysis. Why were sediment samples not collected at more than one reference site?

- The report states that wildlife receptors that "have intrinsic ecological significance (i.e., endangered species, key species in the food web)" (page 17) should be considered. One of the rationales for choosing grizzly bears and wolverines was because of their status of special concern by COSEWIC (page II-24). Peregrine falcon (tundrius subspecies) and short-eared owls may be found in the area and are listed as special concern by COSEWIC and on Schedule 3, Special Concern, in the *Species at Risk Act*. A rationale should be provided as to why these species were excluded from the analysis.

Environment Canada appreciates the opportunity to review the TCA A&R Plan for the Lupin Gold Mine, and looks forward to continuing to work with Kinross Gold Corp. and the Nunavut Water Board in the development of a closure plan that is environmentally sound. Please do not hesitate to contact me with any questions or comments with regards to the foregoing at (867) 975-4639 or by email at colette.spagnuolo@ec.gc.ca.

Yours truly,

Original signed by

Colette Spagnuolo
Environmental Assessment / Contaminated Sites Specialist

cc: (Mike Tansey, Reclamation Manager, Lupin Mine, Kinross Gold Corp.)
(Stephen Harbicht, Head, EA North, Environment Canada, Yellowknife)
(Myra Robertson, EA Coordination, Canadian Wildlife Service, Environment Canada, Yellowknife)