

# **Kinross Gold Corporation George Lake Project**

## **Mineral Exploration Operations Nunavut Territory**

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# **KINROSS GOLD CORPORATION**

## **George Lake Project**

### **Section 1.0 – Application for Renewal of Water License**



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NUNAVUT WATER BOARD

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## WATER LICENSE

### APPLICATION FORM

Application for: (check one)

☐ New ☐ Amendment ☒ **Renewal** ☐ Assignment - **License No. NWB2GEO9702**

#### LICENCE NO:

(for NWB use only)

#### 1. NAME AND MAILING ADDRESS OF APPLICANT/LICENSEE

**Kinross Gold Corporation**  
802 E. Winchester, Suite 100  
Murray, Utah 84107

Phone: (801) 290-1112

Fax: (801) 290-1102

e-mail: jbokich@kinross.com

#### 2. ADDRESS OF CORPORATE OFFICE IN CANADA (if applicable)

**Kinross Gold Corporation**  
Scotia Plaza, 52<sup>nd</sup> Floor  
40 King Street West  
Toronto, Ontario M5H 3Y2  
Canada

Phone: (416) 365-5123

Fax: (416) 363-6622

e-mail: rthomas@kinross.com

#### 3. LOCATION OF UNDERTAKING (describe and attach a topographical map, indicating the main components of the Undertaking)

**Kinross Gold's George Lake Project, Water License No. NWB2GEO702**, is located in Nunavut Territory, approximately 470 kilometers Northeast of Yellowknife. A topographical map is attached as Figure 1.

Latitude: 65° 56' North Longitude: 107° 30' West NTS Map No. 75 G/14 Scale 1:50,000

#### 4. DESCRIPTION OF UNDERTAKING (attach plans and drawings)

See Attachment A.

#### 5. TYPE OF UNDERTAKING (A supplementary questionnaire must be submitted with the application for undertakings listed in "**bold**")

☐ Industrial

☐ Remote/Tourism Camps

☐ Mine Development

☐ Municipal

☒ **Advanced Exploration**

☐ Power

☒ **Exploratory Drilling**

☐ Other (describe): \_\_\_\_\_

**6. WATER USE**

- |   |  |
|---|--|
| <input checked="" type="checkbox"/> To obtain water                 | <input type="checkbox"/> To divert a watercourse |
| <input type="checkbox"/> To modify the bed or bank of a watercourse | <input type="checkbox"/> Flood control           |
| <input type="checkbox"/> To alter the flow of , or store, water     | <input type="checkbox"/> Other (describe): _____ |
| <input type="checkbox"/> To cross a watercourse                     |  |

**7. QUANTITY OF WATER INVOLVED** (litres per second, litres per day or cubic metres per year, including both quantity to be used and quality to be returned to source)

**RESPONSE:** Maximum water usage for this phase of mineral exploration activities for the George Lake project will be 36,500 cubic meters per year. There will be no water returned to the source, George Lake, during this phase of operations. See Attachment A for further detail.

**8. WASTE** (for each type of waste describe: composition, quantity, methods of treatment and disposal, etc.)

- |   |  |
|---|--|
| <input checked="" type="checkbox"/> Sewage                  | <input checked="" type="checkbox"/> Waste oil    |
| <input checked="" type="checkbox"/> Solid Waste             | <input checked="" type="checkbox"/> Greywater    |
| <input checked="" type="checkbox"/> Hazardous               | <input checked="" type="checkbox"/> Sludges      |
| <input checked="" type="checkbox"/> Bulky Items/Scrap Metal | <input type="checkbox"/> Other (describe): _____ |

**RESPONSE:**

- Sewage is from the camp and ranges from that generated from between 25 and 50 people. All sewage, that is toilet waste, is disposed of in two latrines located on the west side of the George Lake airstrip, as shown on Figure 1. They have a substantial capacity of approximately 30 cubic metres. Both are completed in well drained eskerine sands and gravels.
- Solid wastes consists of paper, container materials, and general refuse. All solid waste is incinerated in 200 litre drums, and ashes stored in 200 litre drums. The ash is then shipped out by aircraft and deposited in licensed landfills in Yellowknife.
- Only small volumes of Hazardous wastes, including paints, solvents and other materials are utilized in the exploration process. These materials are stored in 200 litre drums (used fuel drums), and maintained in a closed condition. Drums are then removed from the site by aircraft and transported to Yellowknife for proper disposal in licensed facilities.
- Bulky items / scrap metals are accumulated and then transported out by aircraft to Yellowknife for disposal or recycling.
- Waste oil is used in incinerator to help burn solid wastes.
- Greywater is planned to be drained into a natural depression. The area of greywater deposition will be located to the west of the camp on the side away from George Lake.
- Drill cuttings are collected at each exploration drill and transported to a natural depression for deposition. The area of deposition of drill cuttings will be located to the west of the camp away from George Lake.

**9. PERSONS OR PROPERTIES AFFECTED BY THIS UNDERTAKING** (give name, mailing address and location; attach if necessary)

**Land Use Permit**

KIA Lands Division	<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No	Permit No. KTL200CO10 – Class II License
DIAND	<input type="checkbox"/> Yes	<input checked="" type="checkbox"/> No	If no, date expected <u>Not Applicable</u>
Regional Inuit Association	<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No	If no, date expected _____
Commissioner	<input type="checkbox"/> Yes	<input checked="" type="checkbox"/> No	If no, date expected <u>Not Applicable</u>

**10. PREDICTED ENVIRONMENTAL IMPACTS OF UNDERTAKING AND PROPOSED MITIGATION MEASURES** (direct, indirect, cumulative impacts, etc.)

NIRB Screening Unknown ☐ Yes ☐ No If no, date expected \_\_\_\_\_

*RESPONSE:* It is not known by Kinross if NIRB Screening has been completed for the George Lake Project. The project has been under permit by the Nunavut Water Board and KIA for Land Use Permits since 1992, however, Kinross was not provided information by the previous owners indicating whether or not NIRB Screening was completed. It is difficult to believe that NIRB Screening has not been completed however, due to the length of time it has been permitted, and based on the information for other related projects such as Goose Lake. The current plan is consistent with the plans submitted for those previously approved permits, and Kinross Gold has retained the same operating conditions and practices as approved by the NIRB in their screening approvals for the Goose Lake Project, also operated by Kinross.

**11. INUIT WATER RIGHTS**

Will the project or activity substantially affect the quality, quantity, or flow of water flowing through Inuit Owned Lands and the rights of Inuit under Article 20 of the Nunavut Land Claims Agreement?

*RESPONSE:* The project will not substantially affect the quality, quantity or flow of water flowing through Inuit Owned Lands and the rights of Inuit.

If yes, has the applicant entered into an agreement with the Designated Inuit organization to pay compensation for any loss or damage that may be caused by the alteration. If no compensation agreement has been made, how will compensation be determined?

**12. CONTRACTORS AND SUB-CONTRACTORS** (name, address and functions)

*RESPONSE:* Bradley Brothers Drilling Ltd., 98 14<sup>th</sup> Street, Rouin Noranda, Quebec – Drilling Contractor (819)797-0755

**13. STUDIES UNDERTAKEN TO DATE** (list and attach copies of studies, reports, research, etc.)

*RESPONSE:* Studies undertaken to date include the initiation of baseline studies by companies preceding Kinross, including Homestake Minerals, Kit Resources and Wheaton River Resources. Environmental baseline studies commenced in 1993 when the George Lake camp was built. During 1993 and 1994 environmental monitoring included water quality sampling and analyses from seven sites plus a blind duplicate, taken twice each year. Bathymetry, acid base accounting and limited hydrological studies were also conducted. Daily records were maintained regarding climate and local wildlife sightings.

There is no baseline data for 1995 or 1996 because no exploration work was conducted on the property during that time.

In 1997, Kit Resources NWT Ltd. Increased the frequency of the collection of water quality samples and implemented an automated system for recording hydrological measurements. The Proponent also completed an aerial wildlife survey, an aquatic resource and habitat survey, a socio-economic study of the communities of the Kitikmeot Region, and an archaeological and heritage resource impact assessment. Additional acid base accounting was also completed. Climate and local wildlife sightings information was also recorded.

Kit Resources NWT Ltd. also participated in the Naonayaotit Traditional Knowledge Study conducted by the Kugluktuk Angoniatit Association. The NTK study was expanded in 1997 due to involvement of the Proponent to include additional interviews with people in the communities of Bathurst Inlet and Umingmaktok.

The George Lake Environmental Baseline Studies Report for a compilation of these data and reports was submitted in 1997 with the reapplication by Kit Resources.

This information is included as Attachment B.

**14. THE FOLLOWING DOCUMENTS MUST BE INCLUDED WITH THE APPLICATION FOR THE REGULATORY PROCESS TO BEGIN**

Supplementary Questionnaire(where applicable: see section 5) X Yes \_\_\_ No If no, date expected \_\_\_\_\_

Inuktitut/English Summary of Project \_\_\_ Yes X No If no, date expected: Jan 5, 2002

Application fee \$30.00 (c/o of Receiver General for Canada) X Yes \_\_\_ No If no, date expected \_\_\_\_\_

**15. PROPOSED TIME SCHEDULE**

\_\_\_ Annual (or) X Multi Year See Attachment A

Start Date: January 2002

Completion Date: To be Determined

<u>John Bokich</u> <b>2001</b>	<u>Manager, Environmental Compliance</u>	<u></u>	<u>December 18,</u>
<b>Name (Print)</b>	<b>Title (Print)</b>	<b>Signature</b>	<b>Date</b>

**For Nunavut Water Board use only**

## APPLICATION FEE

**Amount: \$**\_\_\_\_\_

**Receipt No.:**

## WATER USE DEPOSIT

**Amount: \$**

**Receipt No.:**

**KINROSS GOLD CORPORATION**  
**George Lake Project**  
**Section 2.0 – Application for Renewal of Water License – Supplemental**  
**Questionnaire for Camp**





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**NUNAVUT WATER BOARD**

**NUNAVUT IMALIRIYIN KATIMAYINGI**

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**EXPLORATION/ REMOTE CAMP  
SUPPLEMENTARY QUESTIONNAIRE**

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**Applicant:** Kinross Gold Corporation **Licence No:** NWB2GEO9702  
(For NWB Use Only)

**ADMINISTRATIVE INFORMATION**

1. Environment Manager: John Bokich Tel: 801-290-1112 Fax: 801-290-1102  
Email: jbokich@kinross.com
2. Project Manager: Rodney N. Thomas Tel: 416-365-1076 Fax: 416-363-6622  
E-mail: rthomas@kinross.com

3. Does the applicant hold the necessary property rights? Yes
4. Is the applicant an 'operator' for another company (i.e., the holder of the property rights)?  
If so, please provide letter of authorization.

*RESPONSE:* Kinross Gold has acquired a 100 percent interest in the George Lake Project.

5. Duration of the Project  
☐ Annual  
☒ Multi Year:  
If Multi-Year indicate proposed schedule of on site activities

*RESPONSE:* Start: January 2002 Completion: Undefined – Ongoing at least through 2010 - Annual Work Schedule is year round

**CAMP CLASSIFICATION**

6. Type of Camp  
☐ Mobile (self-propelled)  
☐ Temporary  
☐ Seasonally Occupied: \_\_\_\_\_  
☐ Permanent  
☒ Other: Mineral Exploration Camp – Term Unknown

7. What are the design population of the camp and the maximum population expected on site at one time? What will be the fluctuations in personnel?

*RESPONSE:* The current design population of the George Lake camp is for 25 to 50 people. The camp has not been used by Kinross personnel over the last two year period, but has been used by another entity for a base camp for baseline environmental studies to be conducted on a potential road corridor in the area. It is not planned at this time that the camp will be utilized by Kinross in the 2002 season, but it is anticipated that it may serve as a base camp for additional environmental studies in 2002. Activities by Kinross at the camp this year will include clean up and consolidation of facilities, and removal of unwanted / unneeded items. However, Kinross does anticipate ongoing use of the camp for mineral exploration activities in future years, and fluctuations in personnel will range from none to fifty.

8. Provide history of the site if it has been used in the past.

*RESPONSE:* The camp was established in 1992 by Homestake Minerals, and has been maintained since that time. Exploration activities and occupation has been intermittent, with the project and camp ownership/management being assigned from Homestake to Arauco to Kit Resources to Wheaton Group and to Kinross Gold Corporation.

## **CAMP LOCATION**

9. Please describe proposed camp location in relation to biogeographical and geomorphological features, and water bodies.

*RESPONSE:* The existing camp has been in place since 1992, and is located about 50 metres west of George Lake on a small hill. Other information on location and setting is described in detail in the NWB application and supplemental information.

10. How was the location of the camp selected? Was the site previously used? Was assistance from the Regional Inuit Association Land Manager sought? Include maps and/or aerial photographs.

*RESPONSE:* The site has been previously used, since 1992, and has been inspected and approved by the KIA Land Division.

11. Is the camp or any aspect of the project located on:  
[ ] Crown Lands Permit Number (s)/Expiry Date: \_\_\_\_\_  
[ ] Commissioners Lands Permit Number (s)/Expiry Date: \_\_\_\_\_  
[X] Inuit Owned Lands Permit Number(s) / Expiry Date: KTL200C010/ Apr. 31, 2002

12. Closest Communities (distance in km):

*RESPONSE:* The closest community is Bathurst Inlet, which is approximately 70 to 120 kilometers to the northwest of the project.

13. Has the proponent notified and consulted the nearby communities and potentially interested parties about the proposed work?

*RESPONSE:* Kinross Gold and its predecessors on the George Lake and associated projects, have communicated openly with the nearby communities through employees on the project who are from the local communities and act as project liaison as well as project employees. In addition, Kinross and its predecessor companies on the project have dealt openly with the Nunavut Territory governmental officials that represent the communities in the region of the project. There has been full communication with the Nunavut Water Board (NWB), the Kitikmeot Inuit Association (KIA) and the Department of Indian Affairs and Northern Development (DIAND). Homestake Minerals and Kit Resources both met with the community at Bathurst Inlet, and Kinross is also planning to do so at some point in the future, depending upon project development.

14. Will the project have impacts on traditional water use areas used by the nearby communities? Will the project have impacts on local fish and wildlife habitats?

*RESPONSE:* There will be no effects from the Kinross Gold George Lake Project on traditional water use in the area of the project. Operational procedures and controls will prevent effects to the waters of the area.

#### **PURPOSE OF THE CAMP**

- ☒ Mining – Exploration activities associated with potential future mining operations.
  - Tourism (hunting, fishing, wildlife observation, adventure/expedition, etc.)(Omit questions # 16 to 21)
  - Other \_\_\_\_\_ (Omit questions # 16 to 22)
  - Preliminary site visit
  - ☐ Prospecting
  - ☐ Geological mapping
  - ☐ Geophysical survey
  - ☐ Diamond drilling
  - ☐ Reverse circulation drilling
  - ☐ Evaluation Drilling/Bulk Sampling (also complete separate questionnaire)
  - ☐ Other: \_\_\_\_\_
17. Type of deposit:
- ☐ Lead Zinc
  - ☐ Diamond
  - ☒ Gold
  - Uranium
  - ☐ Other: \_\_\_\_\_

## DRILLING INFORMATION

18. Drilling Activities  
☒ Land Based drilling  
☒ Drilling on ice

19. Describe what will be done with drill cuttings?

*RESPONSE:* As required by the Nunavut Water Board License NWB2GEO9702, Section E, all drill cuttings will be disposed of in a sump or natural depression located on land, at least 30 metres from the high water mark of a water body.

20. Describe what will be done with drill water?

*RESPONSE:* Drill water will be recirculated to the maximum extent possible. Drill water that is retained with the cuttings and excess drill mud will be disposed of in the above identified area with the drill cuttings.

21. List the brand names and constituents of the drill additives to be used? Includes MSDS sheets and provide confirmation that the additives are non-toxic and biodegradable.

*RESPONSE:* Drill additives used are listed below, and their MSDS sheets are provided as Attachment C.

- Visco L drilling mud additive
- Vibra Stop – drilling mud
- Peladow - calcium chloride drilling additive

22. Will any core testing be done on site? Describe.

*RESPONSE:* Core drilling will be performed, and core may be split on site and samples taken. Core may be observed by hand lens and may be tested with a few drops of a low pH solution to determine calcareous content.

## SPILL CONTINGENCY PLANNING

23. Does the proponent have a spill contingency plan in place? Please include for review.

*RESPONSE:* An updated 2002 Kinross Gold Spill Contingency Plan is in place and included as Attachment D to this submittal.

24. How many spill kits will be on site and where will they be located?

*RESPONSE:* There will be one spill kit on site during the current level of activities at George Lake. It will be maintained at the materials storage area. During drilling operations, there will be a spill kit located at each drill rig, fuel storage areas and other locations, as needed.

25. Please describe the types, quantities, and method of storage of fuel and chemicals on site, and provide MSDS sheets.

*RESPONSE:* The primary fuel used on the Kinross Gold George Project is P50 diesel fuel. As many as 1,000 drums of 200 litre capacity may be on site at a time. If activities are expanded, this number could increase to as many as 2,000 drums, or equivalent capacity bulk storage tanks may be utilized instead. These drums are stored on the western area of the airstrip, near the camp, shown on Figure 1, in a location designated and approved by the KIA. Fuel barrels are stored horizontally, with bungs up, and in rows of two, end to end, with access between rows to allow visual inspection to ensure that bungs are in place and there are no leaking barrels or spills. Other chemicals on site are drilling fluids, as described in Item 21 above, and motor and hydraulic oils for the equipment, and antifreeze solution for motors. There are other miscellaneous materials on site used for cleaning, lubrication, etc., but they are maintained in small quantities only. Calcium chloride, under the product name of Peladow, is also used as a drilling additive to reduce freezing of drilling fluids.

MSDS sheets for all fuels and chemicals used in significant quantities are included as Attachment C.

## **WATER SUPPLY AND TREATMENT**

26. Describe the location of water sources.

*RESPONSE:* Water will be pumped from through and existing water line taken from George Lake, as shown on Figure 1.

27. Estimated demand (in L/day \* person):

- ☐ Domestic Use: 20 m<sup>3</sup> Water Source: George Lake
- ☐ Drilling Units: 80 m<sup>3</sup> Water Source: George Lake
- ☐ Other: \_\_\_\_\_ Water Source: \_\_\_\_\_

28. Describe water intake for camp operations? Is the water intake equipped with a mesh screen to prevent entrapment of fish? Describe:

*RESPONSE:* The intake is a water pipe placed in George Lake. The pipe intake is equipped with a mesh screen with openings of approximately 1 mm in size to prevent entrapment of fish.

29. Will drinking water quality be monitored? What parameters will be analyzed and at what frequency?

*RESPONSE:* Drinking water quality will be monitored for fecal coliforms approximately 1 time per month during periods when the camp is in operation. Camp operation could be at any time of year, however it is currently active primarily during spring and summer

months. In addition, baseline water samples are taken and analyzed for a full suite of constituents, as included in Attachment B of the NWB Application for Renewal of the License – Environmental Baseline Summary.

30. Will drinking water be treated? How?

*RESPONSE:* It is not anticipated that there will be a requirement to treat water for drinking water purposes. However, if it is determined that there is a need to treat drinking water, a method of treatment will also be prescribed based on what the water is determined to require in order to meet drinking water standards.

31. Will water be stored on site?

*RESPONSE:* There is temporary storage of water on site, generally on a daily basis. Water is pumped from George Lake into the holding tanks and refilled daily.

## **WASTE TREATMENT AND DISPOSAL**

32. Describe the characteristics, quantities, treatment and disposal methods for:

- Camp Sewage (blackwater)

*RESPONSE:* Camp Sewage (toilet wastes) are deposited in two latrines located just west of the airstrip as shown on Figure 1. The latrines are of adequate capacity for anticipated personnel numbers for the time of this permit term, being greater than 30 cubic metres. The latrines are completed in well drained eskerine sands and gravels.

- Camp Greywater

*RESPONSE:* All greywater will be pumped to a sump / natural depression away from George Lake, to allow for evaporation, infiltration and dispersion.

- ☐ Solid Waste

*RESPONSE:* All solid waste is either incinerated in 200 litre drums, or hauled away from the site by aircraft

- Bulky Items/Scrap Metal

*RESPONSE:* All bulky items and scrap metal are hauled away from the site by aircraft

- Waste Oil/Hazardous Waste

*RESPONSE:* All waste oil is incinerated on site, and hazardous waste is hauled away from the site by aircraft

- Empty Barrels/Fuel Drums

*RESPONSE:* All empty barrels/fuel drums are hauled away from the site by aircraft

- Other:

*RESPONSE:* All other materials are either incinerated if they are flammable and not hazardous, and all other materials are hauled away from the site by aircraft

33. Please describe incineration system if used on site. What types of wastes will be incinerated?

*RESPONSE:* Until such time as the camp is used as a base for drilling operations, combustible materials will be incinerated in 200 litre drums. At the time that the camp is occupied for drilling operations, a commercial incineration system will be installed that burns diesel fuel and waste oil to combust camp wastes. Camp wastes include sewage and all other non-hazardous combustible materials.

34. Where and how will non-combustible waste be disposed of? If in a municipality in Nunavut, has authorization been granted?

*RESPONSE:* Non-combustible waste is air transported to Yellowknife, and managed at licensed facilities.

35. Describe location (relative to water bodies and camp facilities) dimensions and volume, and freeboard for sumps (if applicable).

*RESPONSE:* The sump to be utilized is the former bulk sample trench. This feature is a depression and will serve well for cuttings disposal until such time as the trench is permanently closed. This site for the drill cuttings will be located west of the camp area approximately 200 metres west of George Lake. Dimensions of the area of cuttings deposition trench are approximately 20 metres wide by 80 metres long and 2 metres deep, with an approximate capacity of 3200 cubic metres. With deposition in this depression, there is an overabundance of capacity and freeboard will be maintained at more than a metre.

36. Will leachate monitoring be done? What parameters will be sampled and analyzed, and at what frequency?

*RESPONSE:* It is not planned to do any monitoring of potential leachate seepage. Since the project is located in an area of permafrost, there is little potential of leachate movement.

## **OPERATION AND MAINTENANCE**

37. Have the water supply and waste treatment and disposal methods been used and proven in cold climate? What known O&M problems may occur? What contingency plans are in place?

*RESPONSE:* Yes. The camp and project have been ongoing for more than 10 years, and there has been effective management of water supply and waste treatment during this time.

## **ABANDONMENT AND RESTORATION**

38. Provide a detailed description of progressive and final abandonment and restoration activities at the site.

*RESPONSE:* Not applicable at this time. Operations are still in the active and potential growth phases. If it is determined at some time in the future to discontinue activities, all materials, drums, wastes, structures and non-combustible materials will be transported out to Yellowknife.

Sumps and other areas of disturbance will be backfilled or otherwise appropriately treated, graded to blend with surrounding topography, and otherwise stabilized.

## **BASELINE DATA**

39. Has or will any baseline information be collected as part of this project? Provide bibliography.
- ☐ Physical Environment (Landscape and Terrain, Air, Water, etc.)
  - ☐ Biological Environment (Vegetation, Wildlife, Birds, Fish and Other Aquatic Organisms, etc.)
  - ☐ SocioEconomic Environment (Archaeology, Land and Resources Use, Demographics, Social and Culture Patterns, etc.)
  - ☐ Other:

*RESPONSE:* A significant amount of baseline information has been compiled for the project to date. This information is summarized in Attachment B – Environmental Baseline Summary, of the NWB Water License Renewal Application.

## **REGULATORY INFORMATION**

40. Do you have a copy of
- Article 13 - Nunavut Land Claims Agreement
  - NWB - Water Licensing in Nunavut - Interim Procedures and Information Guide for Applicants
  - NWB - Interim Rules of Practice and Procedure for Public Hearings
  - NWTWB - Guidelines for the Discharge of Treated Municipal Wastewater in the NWT
  - NWTWB - Guidelines for Contingency Planning
  - DFO - Freshwater Intake End of Pipe Fish Screen Guideline
  - Fisheries Act - s.35
  - RWED - Environment Protection- Spill Contingency Regulations
  - Canadian Drinking Water Quality Guidelines
  - Public Health Act Camp Sanitation Regulations



- Public Health Act Water Supply Regulations
- Territorial Land Use Act and Regulations

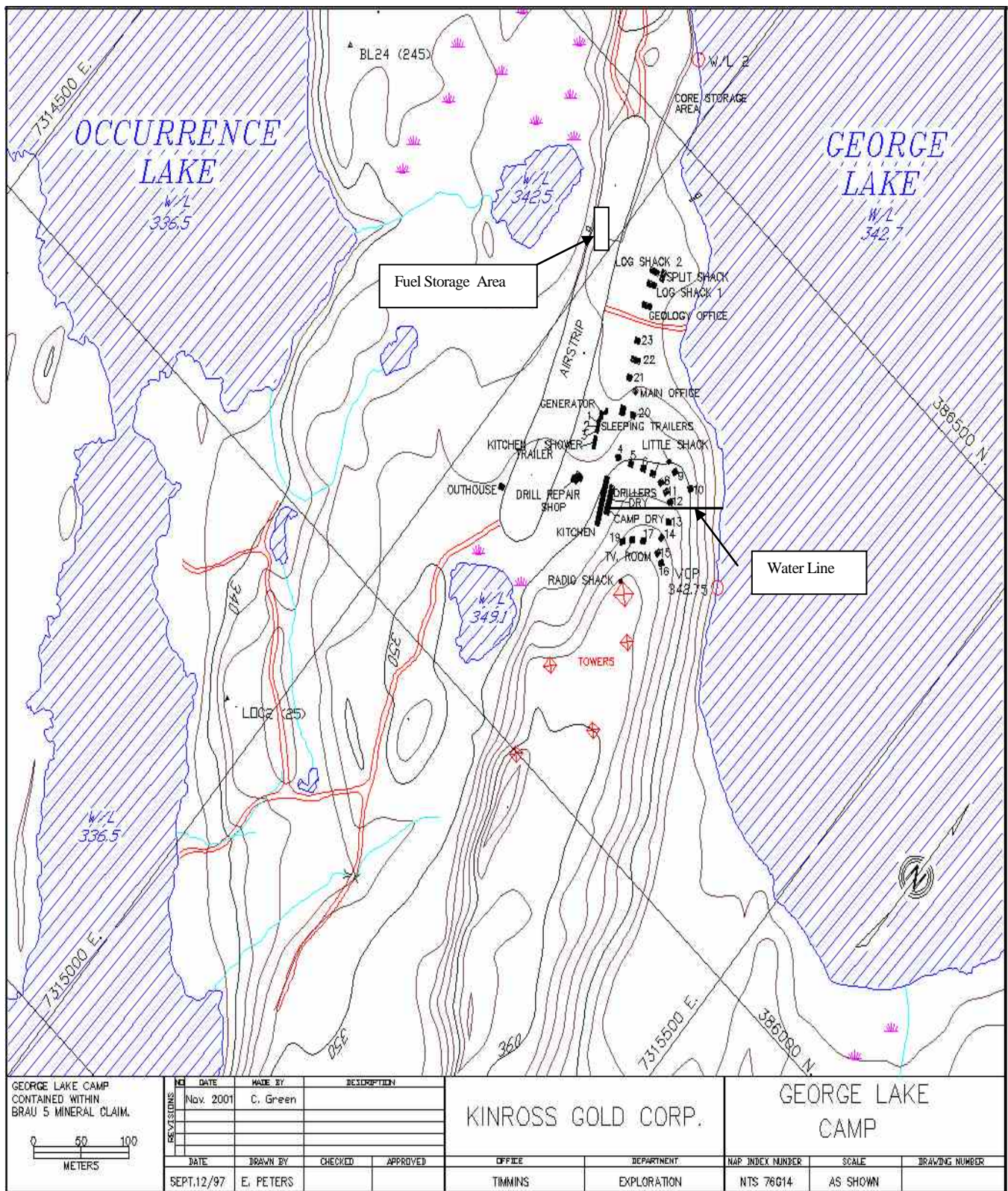
*RESPONSE:* Yes. A copy of all the above documents, guidelines and legislation for compliance with existing regulatory requirements have been obtained, and consulted. Requirements will be complied with.

You should consult the above document, guidelines, and legislation for compliance with existing regulatory requirements.

# **KINROSS GOLD CORPORATION**

## **George Lake Project Application for Renewal of Water License**

### **Section 3.0 – Site Plan for George Lake Camp**



**Figure 1: George Lake Project Camp Facilities**

# **KINROSS GOLD CORPORATION**

## **George Lake Project Application for Renewal of Water License**

### **Section 4.0 – Project Executive Summary**

## **Kinross Gold Corporation George Lake Project Project Executive Summary**

Over the eight year period between February 2002 and February 2010, Kinross Gold Corporation is planning an exploration program which will attempt to define and expand the total inventory of gold mineralization at the George Lake project area, as well as identify possible new deposits within the property limits. During the course of this exploration program, less than 30 cubic meters of water will be pumped from George Lake per day during period in which the camp is occupied. Exploration activities, and camp occupation, generally occur on an intermittent basis, often once in winter, January to March, and again in the summer, June to August. Periods of exploration and camp occupation are generally one to two months. These periods could be extended should project implementation proceed to the feasibility or further development stages.

Personnel involved with the exploration effort will be located at a camp situated on the southwest shore of George Lake. The camp is likely to be utilized by no more than 25 persons in the near future, unless mineral development proceeds to the next level. Water use will be minimal over this period, and disposal of camp greywater will be controlled and allowed to seep into the tundra or evaporate.

During 2002, Kinross has potential plans to conduct exploration consisting of mapping and other geologic analysis not requiring land disturbance within the George Lake project land package. In addition, work will be done on maintenance and clean up of the George Lake campsite, in conjunction with requirements of the Kitikmeot Inuit Association.

During 2003 through 2010, plans are to follow up on any exploration programs initiated in 2002, potentially including: reconnaissance mapping, sampling and geophysics in several other areas of the George Lake property. Additional work during this time frame could include diamond drilling and bulk sampling. Environmental monitoring and data collection will be ongoing during periods of camp occupation.

# **George Lake Executive Summary**

## **Inuit Translation**

# **KINROSS GOLD CORPORATION**

## **George Lake Project Application for Renewal of Water License**

### **Section 5.0 – Attachment A – Project Description**

## **Attachment A**

### **Kinross Gold Corporation George Lake Project**

#### **Project Description**

Over the eight year period between February 2002 and February 2010, Kinross Gold Corporation is planning an exploration program which will attempt to define and expand total inventory of gold mineralization at the George Lake project area, as well as identify possible new deposits within the property limits. During the course of this exploration program, less than 30 cubic meters of water will be pumped from George Lake per day during period in which the camp is occupied. Exploration activities, and camp occupation, generally occur on an intermittent basis, often once in winter, January to March, and again in the summer, June to August. Periods of exploration and camp occupation are generally one to two months. These periods could be extended should project implementation proceed to the feasibility or further development stages.

Personnel involved with the exploration effort will be located at a camp situated on the southwest shore of George Lake which was set up initially by Homestake Mining during an exploration program in 1992. Although, the camp is currently capable of accommodating up to 50 personnel, it is not likely that more than 25 would utilize the camp in the near future. A maximum of 20 cubic meters of potable water per day will be required for camp use, cooking and personal hygiene. Greywater from the camp will be allowed to flow into a shallow basin 50 m southwest of George Lake camp and 100 m southwest of George Lake.

Types of potential activities envisioned over the next eight year period include: 1) mapping and sampling of soils and bedrock, 2) geophysics, 3) diamond drilling, 4) air-track drilling 5) overburden removal and bulk sampling from the main deposit area, 6) construction of an overburden pad which will be utilized as a site for sample processing, fuel and equipment storage, 7) installation of a sampling tower and site for bulk sample processing, 8) installation of fuel storage tanks, 9) environmental monitoring.

During 2002, Kinross has potential plans to conduct exploration consisting of mapping and other geologic analysis not requiring land disturbance within the George Lake project land package. In addition, work will be done on maintenance and clean up of the George Lake campsite, in conjunction with requirements of the Kitikmeot Inuit Association.

During 2003 through 2010, plans are to follow up on any exploration programs initiated in 2002, potentially including: reconnaissance mapping, sampling and geophysics in several other areas of the George Lake property. Additional work during this time frame could include diamond drilling and bulk sampling.



# **KINROSS GOLD CORPORATION**

## **George Lake Project Application for Renewal of Water License**

### **Section 6.0 – Attachment B – Summary of Environmental Baseline Survey Work**

## **Baseline Environmental Studies – George Lake Project**

Baseline Environmental Studies for the George Lake Project include information gathered for studies conducted at the Goose Lake Project, which is also owned by Kinross Gold Corporation. The George Lake Project is located approximately 35 kilometres northwest of the Goose Lake Project, and the topography, geomorphology, geology and environmental conditions are very similar for both Project Areas. To provide a comprehensive set of information on the George Lake Project, information collected for the Goose Lake Project Area is therefore provided here as well.

### **DEPTH OF PERMAFROST**

#### **1. STUDY SCOPE**

Depth of permafrost is important for mine construction and operation because it defines the depth of the active layer (freeze-thaw layer) and the potential for movement of shallow groundwater during the summer season. Thermistor strings to measure temperature were targeted for both the George and Goose lake areas; however only the Goose Lake site was examined in 1997.

#### **2. METHODS**

Thermistor strings were installed at 4 foot (1.2 m) intervals to a depth of 25 feet down an open (unfrozen) drill hole at Goose Lake in late summer 1997. The drill hole is designated 97GO-014. The approximate location is shown on Figure 4.1-1. Actual depths below the surface will be adjusted for the slope of the diamond drill hole prior to data evaluation. Thermistors were connected to a junction box grouted in place on a stand above the drill hole. The thermistor resistances were measured on two occasions with a digital ohmmeter and converted by means of a calibration chart supplied by the manufacturer, R Technical, to temperatures.

### 3. RESULTS

Table 1 lists results of the two measurements made in early and mid September 1997. The table indicates permafrost was at 1.5 m.

**Table 1 - Goose Lake Thermistor Data**

Location: Drill Hole: 97GO-014			
Date	Depth (m)	Resistance (ohms)	Temp (°C)
05-Sep-97	1.2	5.16	7.1
	2.4	6.14	3.8
	3.6	7.09	0.8
	4.8	7.63	-0.8
	12	8.52	-2.0
	14.2	8.90	-3.0
21-Sep-97	1.2	6.28	3.1
	2.4	6.88	1.7
	3.6	7.15	0.8
	4.8	7.56	-0.8
	12	8.03	-1.7
	14.2	8.39	-2.6

## **FISH AND AQUATIC HABITAT STUDIES**

### 1. INTRODUCTION

This section describes methods used and information obtained by NDM during August 1997 fisheries studies in the Goose Lake area of Nunavut. As many samples of fish tissues, benthic invertebrates, periphyton and sediments have yet to be analyzed by laboratories, the quantified results are not reported here. Instead, the kinds of data that will be generated are reviewed, with comments on likely results, based on our experience with surveys of this kind. Results are discussed in the context of their adequacy for CEAA, Inuit and DFO requirements, and recommendations provided on further aquatic environmental work for the project.

### 2. METHODS

Field work was conducted August 11-22, 1997 and included sampling of fish, benthic invertebrates, periphyton (attached algae) and sediments from Goose Lake, several tributary streams and from Big Lake to the northwest (which served as a control or reference lake).

Fish sampling was conducted primarily with gillnets, electrofishing gear and minnow traps. Gill nets were set in a gang of four (4) 8 foot (2.4 m) by 50 foot (15.2 m) nets of 1, 1.5, 2 and 2.5 inch

stretched mesh sizes. A single net of 2.5 inch monofilament mesh that was 25 feet deep was set in the canyon area of Goose Lake in the “head” and “beak” of the lake (Figure 1). Electrofishing, with a Smith Root backpack electrofishing unit was used for tributary creeks. Minnow trapping with canned shrimp and tuna as bait was used in creeks, ponds and lakes.

Benthic invertebrates were sampled in creeks with a 30 cm diameter by 30 cm tall Waters and Knapp sampler, while those from the lakes were taken from a boat with a 6 inch square (232.26 cm<sup>2</sup>) Ponar grab. Seven (7) replicate samples were taken at each of five (5) sites sampled. Five (5) of these are being analyzed at a taxonomic laboratory for species identification and enumeration.

Periphyton (algae, mainly single-celled “diatoms”, on rocks) were sampled with a toothbrush from 5 cm by 5 cm areas on five (5) randomly selected rocks at each site. The five subsamples were combined to form one sample from 125 cm<sup>2</sup> of surface area. This procedure was repeated at each station, with one sample preserved in Lugol’s solution for taxonomic identification and the other sample frozen for subsequent chemical analyses, for total organic carbon (TOC) and chlorophyll a content.

Sediments were taken with large plastic jars in depositional areas at or near each available (wetted) water quality monitoring site. One large sample was taken from each site for particle size analysis and TOC.

Aquatic habitat surveys were completed from aerial, on-ground and in situ (wading, boat and diver) observations and measurements. Standard DFO Stream Survey Forms were used to record information on habitat characteristics in the field. Key information on wetted areas, depths, flow types, substrate types, gradients and fish species was also mapped in accordance with standard DFO procedures for FISS (Fisheries Information Summary System) and British Columbia Resources Inventory Committee (RIC) standards. Photographs were taken of many areas in the field to illustrate habitat types and conditions during the August 1997 field program.

### **3. RESULTS**

#### **3.1 Habitat**

The primary observation on aquatic habitat conditions in Goose Lake in August 1997 was that the lake was “landlocked” with no (fish-navigable) surface flow into the lake (at the “beak”) from the mainstem stream and none from Goose Lake to Propeller Lake downstream. The small tributaries to Goose Lake were also at very low water levels with some large ponds and stream sections isolated, or dry. Big Lake, which was used as a “control” or reference lake for future monitoring purposes, is upstream in the same drainage system as Goose Lake, and was also “landlocked” during the field study period. There is likely subsurface flow along the mainstem and some tributary streams, but fish populations are clearly isolated for some parts of the year (winter and late summer, at least).

Goose Lake had a maximum depth of approximately 8 m, as did Big Lake. Both lakes have soft silt/mud substrate at depth (4-8 m) and large boulder with scattered sands in shallower areas (<4 m). Both lakes also have some areas of sand/gravel beach with scattered boulders. Tributary creeks near the proposed minesite (Creeks 1 and 2) have soft-bottom ponds in their lower reaches

and very small (<0.5 m wide) headwater streams, some formed along caribou trails. Ponds in lower reaches of Creeks 1 and 2 are accessible to fish from Goose Lake, while other ponds around the lake are often inaccessible due to low water levels (and freezing in winter), and are likely too shallow and isolated to support fish. There is a small area of gravels suitable for fish spawning in Creek 2 but none in Creek 1. Other creeks were dry and had mainly “soil” (fine) substrate types and/or large rock.

Key habitat requirements for fish, including spawning areas, juvenile rearing areas and overwintering habitat, all exist in limited quantities in the Goose Lake system. Spawning areas for resident lake trout, whitefish, grayling and burbot likely includes some littoral (shallow-water) areas of the lake. This is especially true for lake trout and whitefish, which are fall-spawners whose eggs incubate over winter under the ice. Grayling and burbot, as well as sculpins and stickleback, are spring and summer spawning species that likely also utilize the creeks. Juvenile rearing areas exist in lake shallows as well as in some of the ponds in the lower reaches of tributary creeks. Overwintering habitat is limited to lake depths over 2-3 m, which occurs in Goose Lake in the main body and “head/beak” of the lake. All of the small tributary ponds are too shallow to provide viable year-round fish habitat.

### **3.2 Fish**

#### **Species Composition**

Fish species captured in the Goose Lake area (including in-flowing tributaries) included:

- lake trout (*Salvelinus namaycush*);
- round whitefish (*Prosopium cylindraceum*);
- Arctic grayling (*Thymallus arcticus*);
- burbot (*Lota lota*);
- slimy sculpin (*Cottus cognatus*); and
- ninespine stickleback (*Pungitius pungitius*).

In Big Lake, fish species encountered included only lake trout, whitefish, burbot and sculpins, the last two of these only in stomach contents of lake trout. Minnow traps in Big Lake consistently showed no catches. No wetted area suitable for sampling was found in Big Lake tributary streams.

Catch, size, age and sexual condition data are being compiled, along with those for metals content, in tabular form.

#### **Relative Abundance**

Relative abundance of large fish species showed lake trout as the dominant species by numbers in both lakes. Those creeks where fish were caught showed sculpins, stickleback and juvenile burbot, in decreasing order of abundance. Relative abundance of fish species in Goose and Big lakes is approximately the same as found by Sekerak (1990) in the George Lake area, where lake trout were also the predominant species captured, followed by round whitefish.

## **Size and Condition**

The length, weight, condition factor ( $K = W \cdot 10^5 / L^3$ ) and length:weight relationship (expressed as  $\log_{10} W = a + b(\log_{10} L)$ ) are being calculated for fish sampled in August 1997. The condition factors (K, which should be approximately 1.0 for a “normally shaped” fish) showed that most of the fish in both Goose and Big Lake areas were within the norm for the species. The length:weight relationships will be determined, but should also be typical of the species.

## **Age and Growth**

Ages of fish have not yet been determined (laboratories at AMC Technical Services, Nanaimo, and North/South Consultants Inc, Winnipeg). The former lab has scales and otoliths for the completely sampled fish (those also taken for metals analyses), while the latter laboratory has pelvic fin rays. Results should be available by November.

## **Maturity and Reproduction**

Several large (adult) lake trout and round whitefish showed ripening gonads in August 1997, indicating that they would spawn in the fall (September) of that year. Other large adult fish showed very small gonads, indicative of fish populations that do not spawn every year, as many do not in northern regions due to slow development in cold temperatures. Sekerak (1990) noticed the same regimen in George Lake samples.

Once age data have been received, NDM will estimate approximate age at maturity of large species, especially lake trout, for which the greatest numbers of samples were obtained.

### **3.3 Benthic Invertebrates**

#### **Stream Benthos**

Stream benthic samples are being analyzed. From field observations, there were relatively few organisms in most samples, with mayflies, caddisflies and dipterans (two-winged flies, including black flies and mosquitoes) and round worms (nematodes) the predominant taxa in shallow, slow-flowing streams with gravel/sand substrates. Laboratory results will provide sufficient data for statistical work on numbers, for future comparison.

#### **Lake Benthos**

Lake benthic samples are also still being analyzed, but appeared from field observations to contain very few organisms in soft silt/mud substrates sampled with the Ponar grab in both Goose and Big lakes. Organisms noted in the field included round worms and dipteran larvae. There are likely several microscopic species also in lake bottoms.

### **3.4 Periphyton**

Periphyton samples from the lakes and streams are still being analyzed for species composition, abundance, total organic carbon (TOC) and chlorophyll a. There was considerable growth on rocks in most areas sampled. The TOC data may be confused by detritus in the samples.

### **3.5**     **Sediments**

The large, single samples of sediments taken in several sampling areas (notably Creeks 1 and 2) are also being analyzed for particle size and TOC, although the latter parameter may not be possible due to use of plastic jars.

## **4.     DISCUSSION**

Results of August 1997 baseline fisheries studies for the Goose Lake project indicate that:

- Lake trout, round whitefish, Arctic grayling and burbot are large fish species in Goose Lake, while slimy sculpins and ninespine stickleback comprise small species. Big Lake also shows lake trout to be the dominant species, followed by whitefish. Sculpins also exist in Big Lake, and likely other species (e.g. burbot and/or grayling) exist there as well;
- Fish in both Goose and Big lakes appear to be typical for the species in northern latitudes with respect to size, body shape, community structure, reproductive development, age and growth (data will likely confirm);
- Year-round habitat available to fish is limited in both Goose and Big lakes to the lakes and lowermost reaches of a few small tributary streams, as the small streams, including inlet and outlet mainstem creeks, are either frozen in winter, or dry in late summer. Spawning habitat for fall spawners (trout, whitefish) is very likely in boulder/gravel areas in the lake shallows (2-4 m). Spring/summer spawners (burbot, grayling, sculpin, stickleback) likely use both the lake shallows, where gravels and cobbles exist in some areas, and lower reaches of some tributary creeks;
- Both stream and lake benthic invertebrate populations are comprised of relatively few species and individuals per unit area (subject to revision after laboratory results). The diver surveys revealed several planktonic invertebrate species (e.g. copepods, dipterans) in the water column in seemingly low numbers (relative to other lakes surveyed). Plankton production may be a limiting factor to fish production in the lakes. If so, the key limiting factor may be nutrients (nitrogen and phosphorous compounds) in the water column; however, this has not been confirmed;
- Periphyton communities were likely at their peak annual standing crop and biomass when sampled in August 1997, judging by the degree of build-up observed. Periphyton (and, in the lakes, phytoplankton) are the primary producers in the systems and provide food for herbivorous benthic (and planktonic) invertebrates. As there was a dense growth of periphyton on most rocks in the euphotic zone of the lakes and streams, primary production does not appear to be a limiting factor in fish production in the lake. As periphyton depend to a large degree on sunlight and inorganic nutrients (especially N and P compounds), nutrients associated with the substrates appear (from the algal growth) to be sufficient for good algal growth;

# **KINROSS GOLD CORPORATION**

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### **Section 7.0 – MSDS Forms for Materials Used on Site**

#### **Attachment C**

##### **List of MSDS Forms for Materials Utilized on Site**

<b>Product Name</b>	<b>General Description</b>
Visco L	Drilling Mud
Vibra Stop	Drilling Mud
Peladow	Drilling Additive
TELLUS* T22	Low Temperature Hydraulic Fluid
ROTELLA* T XLA 15W-40	Automotive Engine Oil
Low Sulphur Diesel Fuel	Diesel Fuel
Formula Shell Bronze Gasoline	Gasoline
Shell Jet B with Anti-Icing Additive	Aircraft fuel
Propane	Propane fuel
Peak Antifreeze & Coolant	Antifreeze & Coolant



# **KINROSS GOLD CORPORATION**

## **George Lake Project Application for Renewal of Water License**

### **Section 8.0 – Spill Contingency Plan**

# Kinross Gold Corporation George Lake Project

## Spill Contingency Plan

### INTRODUCTION

This contingency plan has been compiled to assist site personnel to respond in an appropriate and expeditious manner to an accidental spill at the George Lake exploration project. The plan follows the Northwest Territories Water Board "Guidelines for Contingency Planning" (1987) suggested format, and will be updated to be consistent with a Nunavut Territory Water Board Contingency Planning document, should it become available. The plan is divided into five sections:

- 1) Introduction – Purpose and background of plan.
- 2) Response Organization - lists the duties of personnel responsible for responding to spills.
- 3) Initial Action - lists steps to be taken immediately if a spill occurs
- 4) Reporting Procedure- details how to report a spill
- 5) Environmental Mapping- identifies the areas where fuel and other materials requiring management will be stored

Presently the only combustible materials stored on site consist of propane, acetylene, gasoline, jet B fuel and diesel fuel. Propane and acetylene are supplied in 100 lb. cylinders and one 500 lb tank. All other fuels are contained in 45 gallon (202 l) barrels. The propane and fuel will be transported from Yellowknife via aircraft to the landing strip, or on the lake if a float plane is used, at George Lake. Fuel barrels and propane tanks will be transferred by hand or by mechanical equipment from the aircraft to the designated storage area north of the camp. See Figure 1 of Application Camp Questionnaire.

During the exploration program, fuel drums and propane tanks may be transported around the site using a helicopter long-line, a front-end loader, a snowmobile, a skimmer towed by a snowmobile and trailer, or manually. Sufficient fuel for up to 48 hours of operation will be available at each drill rig. There will also be sufficient fuel supplies adjacent to each building structure for day-to-day camp operations. There will be a limited amount of fuel at the George Lake airstrip for occasional use by fixed wing planes. Helicopter refueling will be done directly from barrels located at the storage area on the helicopter pad.

A supply of spill absorbent is readily available at the site. Absorbents consist of sawdust, peat moss and synthetic material. Empty barrels and a pump will be available at the fuel storage area to be used for the transfer of fuel from any leaking container should this occur.

It is the policy of Kinross Gold Corporation to comply fully with existing regulations to provide such protection to the environment as is technically feasible and economically practical.

- 1) **RESPONSE ORGANIZATION** - The Project Manager is ultimately responsible for all activities on site, including spill response at the George Lake camp. In his absence, his designatee will assume responsibility. Crews handling fuel and propane are instructed in the proper and safe handling of these materials and in fire and explosion prevention, and will constitute the initial response team should a spill of fuel occur, or a propane tank leak.
- 2) **INITIAL ACTION** - The initial action required depends on where the spill or leak is located.

- ***Spill from a fuel storage barrel:***

- If a barrel is leaking, transfer the fuel into a non-leaking empty drum in the fuel storage area by means of a pump.
- Spread absorbent material on the spilled area to soak up spilled fluid. When the absorbent material is saturated, or the spill material is soaked into the absorbent material as much as it will be, then collect the absorbent material and place into a suitable, non-leaking container.
- Transport the container with the absorbent material with the collected material to the incinerator, or to the fuel storage area for storage until the incinerator is next operated.
- Any soil or earth effected by the spilled material should also be dug out and incinerated to burn off any volatile materials. Soil or earthen materials that have been incinerated such that all volatiles have been combusted shall be placed back on the fuel storage area and spread out to form part of the fuel storage pad.
- If the leak or spill was significant, report the spill to the Project Manager and complete a Spill Report Form. The Project Manager will report the spill, and actions taken to address it, to the Nunavut Water Board (NWB) and the Kitikmeot Inuit Association (KIA) at the number listed under, "Reporting Procedure".
- Mark the defective barrel and return to supplier once emptied of fuel or other material, or use to contain non-liquid, non-hazardous material.

- 3.) **REPORTING PROCEDURES** – All spills must be reported to the Project Manager, who will then determine whether the spill was significant. The determination will be based upon the amount of fuel spilled and the location of the spill. For instance, a small amount of fuel spilled which has leaked towards a stream or lake containing fish is more significant than a larger volume spill which is contained within the fuel storage area and where the fuel is recovered.

**Significant spills must be reported to the 24-hour Spill Report Line and to Kinross Corporate Office in Salt Lake City to John Bokich, Kinross Manager Environmental Compliance at (801) 290-1112 (Direct Office Line), or (801) 557-8200 (cellular phone).**

- 1) Complete a Spill Report Form.
- 2) Call the NWT 24-hour spill report number (867) 920-8130 in Yellowknife, and report the spill using the information on the Spill Report Form.

- 3) Forward a copy of the Spill Report Form to:

Government of the Northwest Territories  
Pollution Control Division  
Yellowknife, Northwest Territories X1A 2L9

John Bokich, Manager Environmental Compliance  
Kinross Gold Corporation  
802 E Winchester, Suite 100  
Murray, Utah 84107  
Telephone: (801) 290-1112  
Fax: (801) 290-1102  
email: [jbokich@kinross.com](mailto:jbokich@kinross.com)

- 4) Additional information or assistance may be obtained from John Bokich or:  
Environment Canada, Yellowknife: (867) 873-3456

**4. ENVIRONMENTAL MAP:** Figure 1 shows the location of the fuel storage area and the camp in respect to George Lake. All fuels will be stored within this area, at a distance of more than 100 metres from George Lake.

There are no parks, game preserves, known resource harvesting areas fish spawning areas or other environmentally sensitive areas within the immediate area of the designated fuel storage area.