**STATE OF ALASKA**
**DEPARTMENT OF ENVIRONMENTAL CONSERVATION**
**610 UNIVERSITY AVENUE**
**FAIRBANKS, AK 99709-3643**

# WASTE MANAGEMENT PERMIT

**for**

**Fairbanks Gold Mining Inc.**

**Permit No. 2014DB0002** **Date: March 28, 2014**

This Waste Management Permit is issued to Fairbanks Gold Mining Inc. (FGMI), P.O. Box 73726, Fairbanks, AK 99707-3726 for the disposal of wastes from the Fort Knox Mine as defined in permit section 1. The Fort Knox Mine facilities are located 26 miles northeast of Fairbanks, AK within sections 9, 10, 14, 15, 16, 21, 22, 23, T.2 N, R.2 E. Fairbanks Meridian. This permit is authorized under the provisions of Alaska Statutes (AS) 46.03, and the Alaska Administrative Code (AAC), 18 AAC 15, 18 AAC 60, 18 AAC 70 and 18 AAC 72, as amended or revised, and other applicable state laws and regulations. This permit is effective **March 28, 2014** and expires after **March 27, 2019**. This permit may be terminated or modified according to AS 46.03.120. This permit succeeds Waste Management Permit No. 2006-DB0043.

This permit is subject to the conditions and stipulations contained in sections 1 through 6. This permit incorporates by reference Fort Knox Mine's Waste Management Permit Renewal Application May 2012, *Fort Knox Mine Plan of Operations Modification Request* February 2014, *Fort Knox Mine Reclamation and Closure Plan* November 2013 R2, *Fort Knox Mine Solid Waste Management Plan* January 2014, *Fort Knox Gold Mine Monitoring Plan* October 2012, *Walter Creek Valley Fill Heap Leach Pad Operations & Maintenance Manual Revision 4* January 2014, and Pit Lake Evaluation February 2013. Changes to the documents incorporated herein must be approved by the Alaska Department of Environmental Conservation (Department) if they affect this permit. When the Department approves the changes, they become part of this permit.

After completing reclamation activities and terminating active wastewater treatment, the Department requires the permittee to conduct post-closure maintenance and monitoring for a minimum of 30 years. The permittee shall assess the conditions at the facility and respond accordingly throughout the post-closure care period. At the end of the post-closure period, the Department will determine whether post-closure care and monitoring should be extended beyond 30 years based upon the information collected by that time.

Wade Strickland
Program Manager

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# 1 PERMIT COVERAGE & ADOPTED REFERENCES

## 1.1 COVERAGE

Ore mined from the Main Pit is either processed in the mill or heap leached. At the mill, higher grade ore is crushed, followed by gravity separation, cyanide leaching with a carbon in-pulp circuit, and gold doré is produced on site. As required to meet the conditions of this permit, tailings may be subject a cyanide detoxification prior to disposal in the TSF. At the heap leach pad, lower grade run-of-mine ore is stacked on an impermeable liner, followed by cyanide leaching with a carbon-in-column circuit that involves rinsing ore with a barren cyanide solution, capturing the pregnant solution containing leached gold, and removing the gold from solution. After heap leach ore is processed, it remains in place for permanent disposal.

1.1.1 This permit covers disposal of waste or monitoring at the following sites.

1.1.1.1 Tailings Storage Facility (TSF)

The TSF consists of deposited tailings, decant pond, dam, seepage interception system, and the seepage monitoring system. The TSF decant pond is located within the tailings deposition area upstream of the TSF dam. The TSF decant pond fluctuates in size but typically ranges between 300 to 400 acres depending on mine operations and climatic influences. The TSF dam is a rock-filled structure with a projected ultimate size of approximately 4,600 feet along the crest and 365 feet high. It impounds all tailings generated by the mill, as well as surface runoff and process water. Impoundment water is not discharged but is recycled to the mill for reuse in the gold ore beneficiation process. Seepage that passes beneath the TSF is captured by pump-back and interceptor systems. The pump-back system includes a pump-back sump together with a pumping and piping system designed to return the seepage to the TSF. Most seepage passing beneath the dam feeds into a large lined sump from which the seepage is pumped back to the decant pond. Any seepage not captured directly by the pump-back system is captured by the interceptor system, which depresses the phreatic surface below the dam. It creates a hydraulic barrier preventing seepage from migrating down-gradient and assuring the TSF operates as a zero discharge facility.

1.1.1.2 Walter Creek Valley Heap Leach Facility (heap leach pad)

Lower grade run-of-mine ore from the main pit is deposited onto the heap leach pad, which measures about 485 acres in area. Drip or sprinkler emitters apply a cyanide containing solution to the material placed on the heap. The solution is collected and processed in carbon in-pulp columns next to the mill for gold recovery.

1.1.1.3 Inert Solid Waste Landfills

These facilities are intermittent inert solid waste landfills located in waste rock piles, which are otherwise exempt from Solid Waste Regulations. Non-hazardous incidental solid waste created from mine operation is disposed in these cells.

1.1.1.4 Main Pit

The active open-pit mine is located in the southwestern portion of the Fort Knox

layout. Mining operations are conducted 24 hours a day, seven days a week. The pit is actively dewatered via a system of dewatering wells, which continuously pump groundwater from beneath the pit and its surrounding area to maintain dry conditions. Pit dewatering water is discharged to the TSF. The mine plans to discharge wastewater to the Main Pit when mining is terminated.

1.1.1.5 Surface Water Monitoring Sites

Surface water downgradient of the TSF dam is monitored at the upper wetlands complex (just downgradient of the TSF), lower wetlands complex (just upgradient of the freshwater reservoir), and the freshwater reservoir, and surface water downgradient of the TSF in the Pearl Creek drainage is monitored at upper Victoria Creek.

1.1.1.6 Groundwater Monitoring Sites

Groundwater monitoring wells associated with the heap leach pad include the heap underdrain system consisting of three collinear monitoring wells in the following locations: the base platform (HL-1), the bench of the in-heap storage pond embankment (HL-2), and the crest of the in-heap storage pond embankment (HL-3), and the old batch plant well.

There are three groundwater monitoring wells, MW-5, MW-6, and MW-7, downgradient of the TSF dam, four between the TSF and Victoria Creek, PB-2D, PC-1GW, PC-2GW, and PC-3GW, and several dewatering wells around the main pit.

1.1.1.7 Process Water Monitoring Sites

Process water monitoring associated with the TSF includes the tailings waste slurry, TSF decant, TSF interceptor well system, and seepage pump-back system. Process water monitoring associated with the heap leach pad includes the Process Component Monitoring System (PCMS) and Leachate Collection and Recovery System (LCRS).

1.1.2 This permit also covers monitoring requirements for the main pit and development rock (overburden and waste rock) for characterization of acid rock drainage, monitoring of the heap leach facility solution, and hazardous chemical storage and containment.

1.1.3 This permit covers reclamation and closure activities of the TSF, inert solid waste landfills, and the heap leach facility, including disposal of wastewater to the main pit at closure after Department approval.

1.1.4 The Department may set or modify permit conditions based on monitoring results or changes in facility processes according to permit amendment or modification procedures.

## 1.2 ADOPTED REFERENCES

1.2.1 In addition to the stipulations in this permit, the permittee shall adhere to the requirements of 18 AAC 15 Administrative Procedures,18 AAC 60 Solid Waste Management Regulations, 18 AAC 70 Alaska Water Quality Standards (WQS), and 18 AAC 72.500 – 72.600 Non-Domestic Wastewater Disposal. The permittee shall also adhere to Department-approved plans authorized under the permit. When the terms of this permit differ from the terms of the project documents adopted by

reference in this section, the terms of this permit override the terms contained in the project documents. Project documents must also be updated incorporating any changes necessary to be consistent with the terms of this permit. Department-approved plans adopted by reference into this permit include the following documents:

1.2.1.1 Fort Knox Mine's Waste Management Permit Renewal Application May 2012,

1.2.1.2 *Fort Knox Mine Plan of Operations Modification Request* February 2014 (plan of operations),

1.2.1.3 *Fort Knox Mine Reclamation and Closure Plan* November 2013 R2 (reclamation and closure plan),

1.2.1.4 *Fort Knox Mine Solid Waste Management Plan* January 2014 (solid waste management plan),

1.2.1.5 *Fort Knox Gold Mine Monitoring Plan* October 2012 (monitoring plan),

1.2.1.6 *Walter Creek Valley Fill Heap Leach Pad Operations & Maintenance Manual Revision 4* January 2014, and

1.2.1.7 Pit Lake Evaluation February 2013.

# 2 SPECIFIC CONDITIONS

## 2.1 WASTE DISPOSAL FACILITIES

2.1.1 <u>All Waste Disposal Facilities</u> - Waste disposal is permitted in the four areas (TSF, heap leach pad, inert solid waste landfills, and the Pit Lake) listed in section 2.1 provided that the conditions of this permit are satisfied.

2.1.1.1 Limitations

2.1.1.1.1 The permittee shall control and treat onsite surface water, groundwater and seepage as necessary to prevent offsite water quality exceedances.

2.1.1.1.2 Activities at the site which will cause a greater amount of waste material to be treated and disposed than considered in this section of the permit are prohibited without the prior approval by the Department.

2.1.1.1.3 The following materials shall not be disposed onsite, unless approved in writing by the Department:

2.1.1.1.3.1. Treated or untreated process water in quantities or concentrations exceeding cyanide and pH limitations in sections 2.1.2.2 and 2.1.2.3 of this permit,

2.1.1.1.3.2. Chemical containers (unless triple-rinsed) and discarded, unused chemicals,

2.1.1.1.3.3. Discarded, unused chemicals not associated with the beneficiation process; however, discarded, unused chemicals associated with the beneficiation process may be discarded into the TSF as long as they are in concentrations that would not violate the limits of sections 2.1.2.2 and 2.1.2.3,

2.1.1.1.3.4. Contaminated soils, spill boom, liners used for the containment of spilled materials, chemicals used in the cleanup of spills or other spill cleanup wastes other than chemicals used in the beneficiation process,

2.1.1.1.3.5. Uncombusted household waste,

2.1.1.1.3.6. Laboratory wastes other than wash waters, neutralized acids and neutralized bases, however disposal or recycling of refinery slag, fire assay crucibles and cupels through the grinding and leaching circuit is permitted,

2.1.1.1.3.7. Untreated sewage solids,

2.1.1.1.3.8. Asbestos waste,

2.1.1.1.3.9. Acute hazardous wastes, as defined by 18 AAC 60.990(157), including radioactive material, explosives, strong acids and untreated pathogenic waste, however, this prohibition does not preclude disposal of natural minerals found in mine rock or residual wastes included as byproducts of the beneficiation process due to recycling of refinery slag, fire assay crucibles and cupels,

2.1.1.1.3.10. Fuels, oil, transformers, paint, or associated equipment and packing material,

2.1.1.1.3.11. Glycol and solvents, and

2.1.1.1.3.12. Batteries.

2.1.2 TSF - The TSF must operate as a zero discharge facility preventing any discharge of solids or liquids. The following conditions under section 2.1.2 apply to the TSF and its appurtenances.

2.1.2.1 Waste materials disposed in the TSF are limited to no more than 50,000 tons per day as a monthly average of mill processed and neutralized ore.

2.1.2.2 Prior to entering the TSF, the tailings waste slurry water shall be neutralized to contain a monthly average no greater than 10 milligrams per liter (mg/L) of cyanide measured as weak acid dissociable (WAD). The maximum concentration of WAD cyanide in the slurry discharge shall be 25 mg/L. These discharge limits may change as indicated in section 2.1.2.7.2.

2.1.2.3 The pH of the slurry entering the TSF shall be between 6.0 and 11.0 standard units. The pH of the tailings decant from the TSF, after mixing of the slurry discharge, shall be between 6.0 and 11.0 standard units.

2.1.2.4 Discarded, unused chemicals associated with the beneficiation process may be discarded into the TSF as long as they are in concentrations that would not violate the limits of sections 2.1.2.2 and 2.1.2.3.

2.1.2.5 Dry methods must be used for initial cleanup of oil spills in the maintenance shop. When wash water is generated at the vehicle maintenance shop, it must be processed through an oil/water separator before discharge to the TSF.

2.1.2.6 TSF Containment - The following conditions in section 2.1.2.6 apply to operation and maintenance of the TSF, interceptor well, and water containment system.

2.1.2.6.1 The permittee shall construct and maintain a seepage collection system below the TSF according to plans approved by the Department. This seepage collection system below the TSF shall be constructed and maintained such that all seepage and runoff water from the TSF will be captured and pumped back to the TSF. The seepage and runoff collection system shall be operated to ensure that the TSF operates as a zero discharge facility.

2.1.2.6.2 The permittee must operate the TSF in conformance with the current *Certificate of Approval to Operate a Dam* issued by Alaska Department of Natural Resources (ADNR), Division of Mining, Land and Water, Dam Safety and Construction Unit.

2.1.2.6.3 The permittee shall ensure that wastes are deposited into the TSF in a manner that will not damage or otherwise jeopardize the integrity of the containment of the TSF.

2.1.2.6.4 The water in monitoring wells PB-2D, PC-1GW, PC-2GW, and PC-3GW must not demonstrate a statistically significant increase in constituent concentrations above background groundwater quality. Statistical significance shall be determined using one of the methods outlined in 18 AAC 60.830(h). If there is a statistically significant increase, then corrective action as designated in section 2.5.3 must be implemented.

2.1.2.6.5 Water in the TSF monitoring well system, located below the toe of the TSF dam and the TSF interceptor well system, must not exceed the upper tolerance limits listed in Table 1 Three monitoring wells, MW-5, MW-6, and MW-7, serve to detect escape of water from the TSF, which is a zero discharge facility. If any of the upper tolerance limits in Table 1 are exceeded, then corrective action as designated in section 2.5.3 must be implemented.

**Table 1: Upper Tolerance Limits for Monitoring Wells below the TSF**

| Parameter [1] | Upper Tolerance Limit (mg/L [2]) | |
|---|---|---|
| | MW-5 & MW-6 | MW-7 |
| ammonia as nitrogen | 0.33 | 0.36 |
| antimony | 0.002 | 0.0155 |
| arsenic | 0.005 | 0.002 |
| chloride | 17 | 26 |
| copper | 0.02 | 0.02 |
| cyanide, WAD [3] | 0.020 [4] | 0.020[4] |
| nitrite as nitrogen | 1 | 1 |
| nitrate as nitrogen | 3.87 | 13 |
| sulfate | 70 | 910 |

[1] dissolved concentrations, because samples come from monitoring wells where non-dissolved constituents are negligible
[2] milligrams per liter
[3] weak acid dissociable
[4] For cyanide, WAD analytical methods, 0.020 mg/L is minimum level of quantification and the compliance level and 0.005 mg/L the method detection level.

2.1.2.6.6 The upper and lower wetlands surface water monitoring sites located downgradient of MW-5, MW-6, and MW-7 must not exceed the upper tolerance limits listed in Table 2. If any of the upper tolerance limits in Table 2 are exceeded, then corrective action as designated in section 2.5.3 must be implemented.

**Table 2: Upper Tolerance Limits for Surface Water Monitoring Locations below the TSF**

| Parameter[1] | Upper Tolerance Limit (mg/L [2]) Upper & Lower Wetlands |
|---|---|
| ammonia as nitrogen | 1.1 |
| antimony | 0.005 |
| arsenic | 0.0437 |
| chloride | 2.5 |
| copper | 0.01 |
| cyanide, WAD[3] | 0.020[4] |
| nitrite as nitrogen | 1 |
| nitrate as nitrogen | 1.4 |
| sulfate | 53 |

[1] total recoverable concentrations
[2] milligrams per liter
[3] weak acid dissociable
[4]For cyanide, WAD analytical methods, 0.020 mg/L is minimum level of quantification and the compliance level and 0.005 mg/L the method detection level.

2.1.2.7 Interceptor Well Water Quality -The following conditions in section 0 apply to water quality in the TSF interceptor well system.

2.1.2.7.1 If during routine quarterly sampling the WAD cyanide concentration in the interceptor water from the interceptor wells exceeds 1.0 mg/L, a confirmation sample will be taken as soon as reasonably possible to verify the results. If the confirmation sample is also above 1.0 mg/L, then weekly sampling will begin for WAD cyanide in the interceptor water and will continue until the average of the previous six samples is less than or equal to 1.0 mg/L, at which time the frequency shall reduce to monthly. When the average from the most recent six consecutive months of samples does not exceed 1.0 mg/L, quarterly sample frequency may be restored.

2.1.2.7.2 If the average concentration of the WAD cyanide in the previous six samples of the interceptor well water system exceeds 2.0 mg/L, the tailings waste slurry WAD cyanide limits in section 2.1.2.7.1 are automatically changed to a monthly average of 2.0 mg/L, and a maximum of 10 mg/L.

2.1.2.7.3 If the average concentration of the WAD cyanide in the previous six months of the interceptor well water is less than 1.0 mg/L, the tailings waste slurry WAD cyanide limits in section 2.1.2.2 revert back to a monthly average of 10 mg/L, and a maximum of 25 mg/L.

2.1.3 <u>Heap Leach Pad</u> – The following conditions in section 2.1.3 apply to the heap leach pad.

2.1.3.1 No more than 307 million tons of run-of-mine material from the Fort Knox pit may be deposited in the heap leach pad.

2.1.3.2 The overall leach solution flow rate is limited to no more than 16,000 gallons

per minute.

2.1.3.3 The heap leach pad must be closed before the TSF.

2.1.3.4 Surface, groundwater, heap process water, and any other water originating from the heap leach pad must meet the following requirements.

2.1.3.4.1 All water shall be discharged to the TSF or main pit according to sections 2.7.1 and 2.7.2.

2.1.3.4.2 Maintain a hydraulic head of no more than seven feet on the secondary liner in the LCRS sump.

2.1.3.4.3 The LCRS flow rate through the primary liner into the secondary liner shall not exceed the design flow rate of 525 gallons per minute or exhibit a statistically significant, according to 18 AAC 60.830(h), increase in the flow rate. If these conditions are exceeded, report according to section 2.4.2.

2.1.3.4.4 If WAD cyanide concentration above 10 mg/L is detected in the heap's PCMS sumps, then all sump water must remain contained within heap leach system, the Department must be notified within one working day of discovery according to section 2.5.3.1, and the frequency and location of monitoring in the underdrain system must be expanded as approved by the Department. Limits as they apply to the underdrain monitoring system are specified in section 2.1.3.4.5.

2.1.3.4.5 If WAD cyanide concentration above 0.2 mg/L is detected in the underdrain system, the permittee must notify the Department within one working day of discovery. The permittee must then demonstrate to the Department's satisfaction that all water identified in section 2.1.3 is directed to the TSF.

2.1.3.4.6 Except as provided in section 2.1.3.4.5 and until closure of the TSF, any water identified in section 2.1.3 and discharged to the TSF must satisfy the conditions of sections 2.1.2.2 and 2.1.2.3. If either of those conditions is exceeded, report according to section 2.5.3.1.

2.1.3.4.7 At closure of the TSF, all water draining from heap leach pad into the TSF must comply with the WQS.

2.1.3.4.8 Ponding or pooling of process solution water on the heap leach pad is prohibited. If ponding or pooling of process solution is discovered on the heap leach pad, immediate action must be taken to protect wildlife from exposure to the solution.

2.1.3.5 The heap liner may not be punctured before heap closure and without written Department approval. At heap closure, the water quality from the heap must be evaluated based upon "rebound potential," an increase in cyanide concentration without further addition of cyanide, and may not be drained until projected rebounding concentrations meet WQS.

2.1.3.6 The permittee must operate the heap leach pad in conformance with the current *Certificate of Approval to Operate a Dam* issued by ADNR, Division of Mining, Land and Water, Dam Safety and Construction Unit.

2.1.3.7 All work associated with the construction of the heap, heap liner, and appurtenances must comply with the approved plans, drawings and specifications, and for developing the construction completion report. Construction must be observed and inspected according to the project construction quality assurance/quality control plan by a qualified engineer according to 18 AAC 72.600 and 72.990(29).

2.1.4 Inert Solid Waste Landfills - The following conditions under section 2.1.4 apply to inert solid waste landfills.

2.1.4.1 Disposal of non-hazardous incidental wastes is allowed, including:
(i) settled solids from sumps, ditches, and degritting basins;
(ii) ash and residue from a SmartAsh cyclonic barrel burner;
(iii) ash from combustion of scrap wood material;
(iv) iron (drill steel, balls, empty cans, etc.);
(v) empty plastic and glass containers;
(vi) inert, non-putrescible, domestic waste;
(vii) construction debris;
(viii) tires;
(ix) spill cleanup debris approved by the Department;
(x) non-terne plated used oil filters that have been gravity hot-drained; and
(xi) such other material as would otherwise be disposed of in an inert solid waste landfill facility without special handling.

2.1.4.2 The permittee shall comply with the provisions in the most recent Department-approved solid waste management plan.

2.1.4.3 The permittee shall conduct weekly visual inspections to ensure the active landfills are being operated in accordance with the most recent Department-approved solid waste management plan.

2.1.4.4 The permittee shall close the inert solid waste landfill trenches within 60 days after waste is last deposited in that area, using a soil or rock material at least two feet thick and graded to prevent water from ponding.

2.1.4.5 The permittee shall not place solid waste in water in the inert solid waste landfill facilities, and shall not allow solid waste to wash or blow away from the facility.

2.1.5 Main Pit – Upon termination of mine operations and the beginning of reclamation and closure activities, wastewater may be disposed in the main pit provided that the Department determines that there will be insignificant impact on long-term water quality, written Department approval is given, and the following requirements are satisfied. Based on the Department-approved reclamation and closure plan, the main pit will fill with water and be a part of the post-closure long-term water treatment system that is referred as the “pit lake” throughout the remainder of this section.

2.1.5.1 Only wastewater may be disposed into the pit lake.

2.1.5.2 Samples from each water source proposed to be discharged to the pit lake shall be collected at the frequency prescribed in the Department-approved monitoring plan in section 2.3.1, and shall be analyzed for analytical Profile I constituents in the monitoring plan.

2.1.5.3 At a minimum, the Department-approved long-term pit lake water quality model

shall include those parameters evaluated in the February 2013 Fort Knox Pit Lake Evaluation. The pit lake water quality model shall be updated and reported biennially, during odd numbered years, according to sections 2.1.5.1 and 2.4.4.3. Once wastewater has been discharged to the main pit, the pit lake water quality model shall be updated annually according to sections 2.4.3 and 2.4.4.3.

2.1.5.4 Before any water is pumped to the pit lake and annually after that, an update of the long-term pit lake water quality model required in section 2.1.5.3 shall be approved by the Department. Document updates shall include: pit lake volume and quality; volumes and qualities of water entering the pit lake, including TSF decant and heap leach drainage volumes, that consider all closure scenarios; and a predicted discharge date for the pit lake.

2.1.5.5 If the long-term pit lake water quality model required in section 2.1.5.3 predicts that WQS will not be achieved by the time the pit lake is expected to discharge, the permittee shall propose a plan for water treatment or other corrective actions that achieves WQS by the time the pit is expected to discharge. The proposed plan must be approved by the Department and implemented as approved.

2.1.5.6 As part of annual reporting required in section 2.4.4, submit each of the above to the Department for review to receive Department approval for the next year's discharge to the pit.

## 2.2 SITE CONSTRUCTION, MAINTENANCE, & OPERATION

### 2.2.1 General

2.2.1.1 Changes that may have a significant impact on mine closure, reclamation, or water quality, information on engineering changes to the mill, new waste treatment processes, changes to solid waste disposal facilities, changes to the groundwater interception and monitoring well system, and the addition of new waste streams that discharge to the TSF or pit must be submitted to the Department and approval must be obtained prior to any such changes or discharges.

2.2.1.2 The permittee shall develop the site in accordance with Department-approved plans and amendments thereof, which are submitted by the applicant as required by this permit. Pollution prevention concepts shall be incorporated into operations plans for the project.

2.2.1.3 Any area of open water in the permitted disposal area must not become an attractive area for waterfowl or shorebirds.

### 2.2.2 Secondary Containment

2.2.2.1 Secondary containment of all hazardous substances, as defined at AS 46.03.826(5), must be impermeable to those stored hazardous substances.

2.2.2.2 The permittee shall provide and maintain secondary containment for all process piping and chemical mix tanks containing hazardous or toxic materials. Secondary containment is considered to be 110% of the largest tank within a containment area or the total volume of manifolded tanks. The permittee must design and install secondary containment structures in a manner that ensures that solid waste and leachate will not escape from the structures. To prevent such discharges, facilities shall be maintained in good working condition at all times by the permittee.

2.2.3 Notification

2.2.3.1 The permittee shall notify the Department in writing at least 15 days before the introduction of a new chemical into the process or waste treatment streams. Safety Data Sheets on new chemicals must be forwarded to the Department at time of notification and maintained onsite. Introduction of new chemicals into the process requires written Department approval.

2.2.3.2 Under 18 AAC 72.600, the permittee shall submit engineering plans to the Department at least 60 days before construction or modification of an applicable system, and receive Department approval of any changes that will significantly modify the quality or quantity of a discharge, the operation of a waste treatment component, or the disposal facilities.

2.2.3.3 The permittee must submit to the Department within 90 days after completing construction of a significant modification to an existing process component:

2.2.3.3.1 As-built drawings of the process component(s) which show any changes of those aspects that would affect performance of that process component as required in 18 AAC 72.600,

2.2.3.3.2 A summary of the quality control activities that were carried out during construction, and

2.2.3.3.3 The revised operating plans that reflect modifications made during construction.

2.2.4 Fuel and Hazardous Substances

2.2.4.1 The permittee shall design all process piping and chemical mix tanks to allow for routine inspections for leaks. Process piping outside of the mill building must not be buried unless secondary containment is used that provides the ability to inspect for leaks. This stipulation does not apply to the recycle water return lines leading from the TSF to the mill.

2.2.4.2 The permittee shall maintain fuel handling and storage facilities in a manner that will prevent the discharge of hazardous substances.

2.2.5 Satellite Pits - Ore from satellite pits may be processed and disposed at Fort Knox provided that the following conditions in section 2.2.5 are satisfied, and the Department determines that there will be insignificant impact on mine closure, reclamation, and water quality. The permittee must submit a report containing each of the following:

2.2.5.1 A comparison of the chemistry of new ore to the chemistry of currently mined Fort Knox ore and add any additional constituents found in the new ore to analytical Profile II in the monitoring plan; where required under this permit, use this revised Profile II for all monitoring.

2.2.5.2 A determination of the ore ratio (tons of ore being processed from Fort Knox ore to tons of satellite pit ore) and perform a Meteoric Water Mobility Procedure (ASTM E2242) on mixed ore samples prior to beneficiation. The permittee must analyze rinse water and leachate using Profile II.

2.2.5.3 An acid base accounting on mixed ore (ratios) prior to beneficiation. If net neutralization potential (NP) to acid generating potential (AP) is less than 3:1, then a humidity cell (kinetic) test of adequate duration will be required; leachate

analysis will use Profile II.

2.2.5.4 A characterization of the processed tailings liquor (post cyanide detoxification) using Profile II; the results must be compared to the original Fort Knox liquor.

2.2.5.5 The results of a Meteoric Water Mobility Procedure (ASTM E2242) on processed tailings solids (after cyanide detoxification) using Profile II, the results must be compared to the original Fort Knox data.

2.2.5.6 All changes to the beneficiation or treatment processes which may affect monitoring, closure, tailings, water quality, or any other permit condition.

## 2.3 MONITORING

2.3.1 The monitoring plan dated October 2012, submitted by FGMI and approved by the Department, is incorporated into this permit. Future Department-approved changes to project monitoring will be included as modifications to the monitoring plan and do not require re-issuance or modification of this permit. The monitoring plan shall maintain monitoring procedures to include the following and must be updated within 60 days of permit issuance.

2.3.1.1 Visually monitor the facilities for signs of damage or potential damage from settlement, ponding, leakage, thermal instability, frost action, erosion, thawing of the waste, or operations at the site. Visual monitoring shall be weekly and documented.

2.3.1.2 Monitor surface and groundwater near the site to ensure that WQS are not exceeded and that sample results are statistically valid.

2.3.1.3 Required monitoring locations include the following:

- process stream slurry prior to it being discharged to the TSF,
- interceptor water returned to the TSF, any discharge over the spillway at the TSF,
- groundwater observation wells below the interceptor system,
- surface water at the upper end of the developed wetlands,
- surface water in upper Victoria Creek,
- groundwater observation wells between the TSF and Victoria Creek,
- wetlands flow immediately prior to entering the freshwater reservoir,
- freshwater reservoir,
- pit lake and contributing waters to the pit lake,
- heap leach pad discharges, which include heap water to the TSF and leak detection monitoring in the LCRS and PCMS sumps, and
- heap underdrain system consisting of three collinear monitoring wells in the following locations: the base platform (HL-1), the bench of the in-heap storage pond embankment (HL-2), and the crest of the in-heap storage pond embankment (HL-3), and groundwater monitoring wells including the old batch plant well.

2.3.1.4 To maintain limits established in sections 2.1.3.4.2 and 2.1.3.4.3, continuously

monitor the LCRS including hydraulic head on the secondary liner in the sump, flow from the sump, and the hydraulic head on the primary liner in the pregnant solution pond. Compile monthly summaries of data including maximums, ranges, and trends, and report according to section 2.4.

2.3.1.5 Geochemical monitoring of overburden, development rock, run-of-mine ore that is placed on the heap leach pad, and tailings samples from the Fort Knox Mine is required to ensure that there is low potential for production of leachate that is acidic or contains levels of metals that would contaminate surface or groundwater. In the event that humidity cell (kinetic) tests are performed, Department approval is required before termination of those tests.

2.3.1.6 Monitoring of the tailings prior to placement in the TSF to ensure that the limitations contained in sections 2.1.2.2 and 2.1.2.3 are met.

2.3.1.7 Water quality, flow, and management monitoring is required to account for process water discharged to the TSF, process water recycled to the mill, water entering the pit, water entering the interceptor well system, water used in the heap leach pad, including the LCRS and each PCMS sump, and water levels in the underdrain monitoring wells.

2.3.1.8 Wildlife monitoring must be conducted as required in section 2.2.1.3.

2.3.2 The permittee must develop a quality assurance project plan (QAPP) for all monitoring required by this permit. The QAPP may be contained in an overall monitoring plan for the entire project. The QAPP, or the QAPP portion of an overall monitoring plan, must be completed within 60 days of the effective date of this permit and made available upon request. Any changes made to the existing QAPP shall be completed according to section 2.3.2.3.

2.3.2.1 The QAPP must be designed to assist in planning for the collection and analysis of water samples in support of the permit and in explaining data anomalies when they occur and the QAPP must be formatted as specified in the most recent edition of Elements of a Tier 2 Water Quality Monitoring Quality Assurance Project Plan (QAPP) by DEC, Division of Water, Water Quality Standards, Assessments and Restoration Program.

2.3.2.2 Throughout all sample collection and analysis activities, the permittee must use chain-of-custody procedures described in the most recent edition of Elements of a Tier 2 Water Quality Monitoring Quality Assurance Project Plan (QAPP) by DEC, Division of Water, Water Quality Standards, Assessments and Restoration Program.

2.3.2.3 The permittee must amend the QAPP whenever there is a modification in sample collection, sample analysis, or other procedure addressed by the QAPP.

2.3.2.4 A copy or copies of the QAPP must be kept onsite and made available to the Department upon request.

2.3.3 The permittee must monitor the TSF and the heap leach pad in conformance with current *Certificates of Approval to Operate a Dam* issued by ADNR, Division of Mining, Land and Water, Dam Safety and Construction Unit.

2.3.4 Samples taken as required by section 2.3 shall be analyzed in conformance with the most recent monitoring plan and QAPP submitted by FGMI, as approved by the Department.

2.3.5 A sample from any compliance well or surface water compliance location that detects WAD cyanide shall be reported to the Department as soon as possible, but no later than the end of the next working day. Re-sampling for measurement confirmation shall be performed as soon as practical.

2.3.6 The permittee shall track cells of inert solid waste by surveying and recording the location of each cell and at closure of each cell, recording the total volume of the cell. A map indicating the locations of all the cells shall be included in the annual report required in section 2.4.4.

2.3.7 Maintenance of inspection and sampling logs and procedures for processing, consolidating, and reporting inspection and sampling data shall be in conformance with the most recent monitoring plan and QAPP submitted by FGMI, as approved by the Department.

2.3.8 Groundwater and surface water monitoring and corrective action monitoring shall be in accordance with section 2.5, 18 AAC 60 Solid Waste Management Regulations, and the most recent monitoring plan and QAPP submitted by FGMI, as approved by the Department or modified by amendment to this permit.

2.3.9 The Department may modify monitoring requirements, including the establishment of additional compliance points in response to trends showing changes in the concentration of parameters being monitored.

2.3.10 If the permittee monitors any influent, effluent, receiving water, or solid waste characteristic in addition to those identified in this permit, or more frequently than required, the permittee shall notify the Department that the additional monitoring has occurred in the next quarterly report after the monitoring has occurred. The results of such monitoring shall be available for inspection by the Department at the project site, or other location proposed by the permittee and agreed upon by the department. The permittee shall provide copies of the results to the Department upon request.

2.3.10.1 Results detecting WAD cyanide shall be reported in accordance with section 2.3.5.

2.3.10.2 All exceedances of WQS shall be reported according to section 2.4.2.

## 2.4 REPORTING

2.4.1 Monitoring results shall be reported, as applicable, according to sections 2.1.3.4.4, 2.1.3.4.5, 2.3.5, 2.4.2, 2.4.3, 2.4.7, and 2.5.3.1.

2.4.2 When an exceedance of a WQS is discovered at a groundwater or surface water monitoring location, or if noncompliance with a requirement set out in sections, 2.1, 2.2 is discovered, the permittee shall verbally notify the Department no later than the end of the next working day after discovery, and shall conduct corrective actions according to section 2.5.3.

2.4.3 The permittee shall provide the Department with quarterly monitoring reports summarizing inspection and monitoring results required in section 2.3. Reports shall satisfy the following conditions.

2.4.3.1 <u>Due Dates</u> - Reports for the first three calendar quarters are due within 60 days after the quarter ends, and the report for the fourth calendar quarter shall be submitted by March 1st of the following year.

2.4.3.2 <u>Form</u> – Reports shall be provided in electronic form using commercially available software or according to other electronic reporting requirements approved by the Department. Paper copies of the reports are not required unless

specifically requested.

2.4.3.3 Content - Reports shall contain a narrative portion discussing data and information collected during the preceding quarter.

2.4.3.4 Graphing - Reports shall present water quality data in graphical form indicating trends as well as the margin of compliance with limits.

2.4.3.4.1 Graphs of concentration measurement versus time must including the past five years of data, if available, and may contain all historic data.

2.4.3.4.2 The graphs must also include the parameter, units, and applicable permit limit or WQS.

2.4.3.4.3 Multiple stations, identified using symbols in a legend, may be included in the same graph.

2.4.3.4.4 Scales shall be proportioned to display the limit or WQS, as indicated by a highlighted line, near the top of the graph or when data exceeds the limit, the maximum value shall be near the top of the graph.

2.4.3.4.5 Formatting shall allow addition of new data to each graph's cumulative data when producing the next quarterly report.

2.4.3.4.6 For graphical purposes, non-detect values shall be plotted at one half the method detection limit (MDL), and values between the minimum level of quantification (ML) and MDL shall be plotted at the value of the qualified measurement.

2.4.4 Annual Report - In addition to satisfying the requirements of sections 2.1, 1.3, 2.3, and 2.4.3, the fourth calendar quarter report serves as the annual report. The annual report shall:

2.4.4.1 Be submitted to the Department by March 1st of the following year;

2.4.4.2 Contain an electronic copy (preferably Excel) of the water quality data for the reporting year, including the past five years' data, if available, and may contain all historic data in spreadsheet form. When a value is less than the ML, it must be identified as less than the ML, and the ML must be provided. Non-detect values must be identified as less than the MDL or non-detect and the MDL must be provided in the electronic water quality data spreadsheets;

2.4.4.3 Address the adequacy of the long-term pit lake water quality model required under section 2.1.5.3 and include tables similar to those presented in the February 2013, Fort Knox Pit Lake Evaluation;

2.4.4.4 Address the adequacy of the financial responsibility including, but not limited to, inflation, significant changes in reclamation activity costs, concurrent reclamation, expansion or other changes to the operation of the facility;

2.4.4.5 Be presented at an annual meeting with the Department and ADNR and open to the public; and

2.4.4.6 Be submitted to the Department at least two weeks prior to the annual meeting.

2.4.5 The permittee shall maintain an updated plan of operations and reclamation and closure plan, as required by ADNR, showing site use and development plans and provide the Department with copies of any amendments to that plan of operations

affecting the waste disposal operations authorized by the permit.

2.4.6 All records and information and reports resulting from the monitoring activities required by this permit, including but not limited to all records of analyses performed, calibration and maintenance of instrumentation, and recordings from continuous monitoring instrumentation, shall be retained in Alaska for observation by the Department for a minimum of five years. Upon request from the Department, the permittee shall submit certified copies of such records.

2.4.7 Any onsite wildlife casualties shall be reported within one working day of discovery to the appropriate state agencies, including the Department.

2.4.8 All written reports submitted under the requirements of this permit shall be sent to:

Dept. of Environmental Conservation
Division of Water, Compliance Program
555 Cordova St.
Anchorage, AK 99501

2.4.9 Knowingly making a false statement, by the permittee, the operator or other employees, including contractors, on any such report may result in the imposition of criminal penalties as provided under AS 46.03.790.

## 2.5 CORRECTIVE ACTIONS

2.5.1 The permittee shall comply with 18 AAC 60.815 if the visual monitoring program in section 2.3.1.1 discovers damage or potential damage to the waste disposal-related facility that could lead to water quality violations.

2.5.2 The permittee shall comply with 18 AAC 60.820-860 if a statistically significant increase in a constituent concentration above background water quality in any of the water sampling locations is discovered. Statistical significance shall be determined using one of the methods outlined in 18 AAC 60.830(h). The permittee shall comply with the notification requirements in 18 AAC 60.850(c) upon determining a statistically significant increase in a constituent concentration.

2.5.3 For a single constituent, when a statistically significant increase in concentration is discovered at a water monitoring station or if noncompliance with a requirement set out in sections 2.1 or 2.2 is discovered, the permittee shall:

2.5.3.1 Orally notify the Department no later than the end of the next working day.

2.5.3.2 Determine the extent of the exceedance or noncompliance.

2.5.3.3 In consultation with the Department and documented in writing, implement a plan to determine the cause and source of the exceedance or noncompliance.

2.5.3.4 Submit to the Department, within seven working days after an exceedance or noncompliance is verified by the permittee, a plan for corrective actions to prevent adverse environmental impacts and avoid future exceedances of a similar nature.

2.5.3.5 Implement the corrective action plan as approved by the Department.

## 2.6 SUSPENSION OF OPERATIONS

2.6.1 Suspension of operations is defined as a suspension of mining and milling/processing activities for more than 90 days but less than three years. The length of time for the period of suspension may be extended beyond three years by written authorization from the Department. The permittee shall submit a conceptual

suspension of operations plan to the Department within 90 days of permit issuance.

2.6.2 The permittee must notify the Department within three days of suspending operations. The notice shall provide the nature of and reason for the suspension and its anticipated duration.

2.6.3 No later than ten days after operations have been suspended, the permittee shall submit a detailed suspension of operations plan that replaces the suspension of operations conceptual plan required by section 2.6.1 with current information and specific details. The suspension plan shall address the following:

2.6.3.1 Explanation of what would reasonably result in resuming or permanently terminating mining or milling/processing activities;

2.6.3.2 Reclamation or construction activities during the period of temporary suspension;

2.6.3.3 Procedures, methods, and schedule to be implemented for the treatment, disposal, or storage of process water;

2.6.3.4 The control of surface and groundwater drainage to and from the facility and the surrounding area;

2.6.3.5 The control of erosion from the drystack, waste rock disposal areas, mill and camp site, and any other disturbed areas within the facility boundary;

2.6.3.6 The secure storage of chemicals during the period of suspended operations; and

2.6.3.7 Procedures for maintaining and monitoring the TSF dam and water balance.

2.6.4 The Department shall have 15 days to review and approve or request modifications to the suspension plan.

2.6.5 Once a suspension of operations plan has been approved, it becomes enforceable under the conditions of this permit and full implementation of the approved suspension plan is required. The plan can be amended by submitting a revised plan to the Department for approval.

2.6.6 During suspension of operations, the permittee shall:

2.6.6.1 Continue pollution control activities associated with the TSF, heap leach pad, and inert solid waste landfills including, but not limited to, dust control, placement of interim cover, maintenance of the drainage diversion structures, maintenance of all discharge and leakage control structures and processes, and maintenance of the TSF as specified by the current *Certificate of Approval to Operate a Dam* and the suspension plan.

2.6.6.2 Continue monitoring and reporting activities of all active portions of the site as specified by this permit or the suspension plan.

2.6.6.3 Continue reclamation and corrective action requirements under the reclamation and closure plan in light of the nature of the closure.

2.6.7 Written Department approval is required before resuming operations after a period of temporary closure.

## 2.7 TERMINATION OF MINING & MILLING

2.7.1 Termination of mining and milling/processing activities is defined as the permanent cessation of those activities. Updated reclamation and monitoring plans must be submitted for approval within 90 days after initiating termination of mining and milling/processing. The updated plans must address current conditions at the facility.

Updates and changes to those plans must be approved in writing by the Department.

2.7.2 Termination of mining and milling at the site must be implemented and completed according to the conditions of this permit and with the reclamation and closure plan approved by the Department and incorporated by reference into this permit.

2.7.3 Closure of the waste disposal facilities will be complete when the following criteria are met:

2.7.3.1 Department-approved covers are installed on the TSF, heap leach pad, and inert solid waste landfills and drainage channels are constructed and stable;

2.7.3.2 A stable vegetative cover is established on the waste rock, re-contoured areas, and other infrastructure or other facilities as prescribed in reclamation and closure plan approved by the Department and incorporated by reference into this permit; and

2.7.3.3 The Department determines that active water treatment is no longer required for any water discharged from the facility.

2.7.4 Closure must be achieved before terminating any care and maintenance activities required by section 2.6.6.1 and the approved suspension plan if a period of suspended operations immediately preceded termination of mining and milling.

2.7.5 The permittee shall maintain the facility correcting any erosion or settlement of the TSF, heap leach pad, inert solid waste landfills, waste rock disposal sites, and drainage channels that may impair water quality or otherwise threaten the environment, up until the time that this permit, or any successor permit, is transferred to another entity or terminated by the Department.

2.7.6 Disposal of demolition debris onsite may be approved during closure activities according to a plan approved by the Department.

2.7.7 Post-closure monitoring of ground and surface water quality and visual monitoring for settlement, seeps, and erosion is required in years 1, 2, 5, 10, 15, 20, and 30 after satisfying the criteria in section 2.7.3. Post-closure monitoring shall be performed according the reclamation and closure plan approved by the Department. This schedule and the parameters monitored may be modified by the Department based on the monitoring results received.

## 2.8 FACILITY AUDIT

A periodic third-party environmental audit shall be conducted and completed during the final year of the permit term or sooner if final closure starts during the permit term. The audit will include all aspects of this Waste Management Permit. The environmental audit is required to verify FGMI's compliance with applicable environmental laws associated with this permit. The third party contractor should be mutually agreed on by the state and FGMI, but in the event that agreement cannot be reached, the state retains the final contractor selection decision. Costs for the third-party contractor shall be borne by FGMI. The intent of the audit is to evaluate whether both FGMI management and DEC permit administration provide reasonable assurances that the facility and environmental controls are functioning as intended. The environmental audit shall include an evaluation of the adequacy of the approved financial assurance.

# 3 GENERAL CONDITIONS

## 3.1 ACCESS AND INSPECTION

The permittee shall allow the Commissioner or his/her representative access to the permitted facility at reasonable times to conduct scheduled or unscheduled inspections or tests to determine compliance with this permit, state laws, and regulations.

## 3.2 INFORMATION ACCESS

Except where protected from disclosure by applicable State or Federal law, all records and reports submitted in accordance with the terms of this permit shall be available for public inspection at the State of Alaska, Department of Environmental Conservation, Fairbanks, Alaska.

## 3.3 CIVIL AND CRIMINAL LIABILITY

Nothing in this permit shall relieve the permittee from any potential civil or criminal liability for noncompliance with the permit or with applicable laws.

## 3.4 AVAILABILITY

The permittee shall post or maintain a copy of this permit available to the public at the facility.

## 3.5 ADVERSE IMPACT

The permittee shall take all necessary means to minimize any adverse impacts to the receiving waters or lands resulting from noncompliance with any limitation specified in this permit, including any additional monitoring needed to determine the nature and impact of the noncomplying activity. The permittee shall cleanup and restore all areas adversely impacted by the noncompliance.

## 3.6 CULTURAL OR PALENTOLOGCAL RESOURCES

Should cultural or paleontological resources be discovered as a result of this activity, work, which would disturb such resources, is to be stopped, and the State Historic Preservation Office, Division of Parks and Outdoor Recreation, ADNR (907-465-4563), is to be notified promptly.

## 3.7 APPLICATIONS FOR RENEWAL

In accordance with 18 AAC 15.100(d), an application for renewal or amendment of this permit <u>must</u> be made no later than 30 days before the expiration date of the permit or the planned effective date of the amendment.

## 3.8 OTHER LEGAL OBLIGATIONS

This permit does not relieve the permittee from the duty to obtain any other necessary permits from the department or from other local, state, or federal agencies, and to comply with the requirements contained in any such permits. All activities conducted and all plans implemented by the permittee pursuant to the terms of this permit shall comply with all applicable local, state, and federal laws and regulations.

## 3.9 TRANSFER OF OWNERSHIP

In the event of any change in control or ownership of the permitted facility, the permittee shall notify the succeeding owner or controller of the existence of this permit by letter, a copy of which shall be forwarded to the Director of the Division of Water. The original permittee remains responsible for permit compliance unless and until the succeeding owner or controller agrees in writing to assume such responsibility, and the department approves assignment of the permit. The Department will not unreasonably withhold such approval.

As between the State and the permittee, no transfer of this permit shall relieve the permittee of any liability arising out of operations conducted prior to such transfer, regardless of whether such liability accrues before or after such transfer.

## 3.10 TOXIC POLLUTANTS

If during the life of this permit a new or revised toxic pollutant (including oil, grease, or solvents) concentration standard is established in accordance with 18 AAC 70 for a pollutant managed at this facility and that standard is more stringent than previously, then upon the effective date of the new rule, this permit automatically adopts the new toxic pollutant concentration standard and applies it to management of facility wastes.

## 3.11 POLLUTION PREVENTION

In order to prevent and minimize present and future pollution, when making management decisions that affect waste generation, the permittee shall consider the following order of priority options as outlined in AS 46.06.021:

1st waste source reduction,
2nd recycling of waste,
3rd waste treatment, and
4th waste disposal.

# 4 FINANCIAL RESPONSIBILITY

## 4.1 PROOF OF FINANCIAL RESPONSIBILITY

Under AS 46.03.100(f), 18 AAC 15.090, and 18 AAC 60.265, it assigns the Department authority and responsibility requiring proof of financial responsibility for closure of the facility and post-closure monitoring.

4.1.1 The permittee shall provide the Department with proof of financial responsibility for reclamation and closure of the facilities and post-closure monitoring. The proof of financial responsibility shall cover costs incurred for reclamation and closure and post-closure monitoring of TSF, the heap leach pad, the pit lake, the inert solid waste landfills, and related facilities, shall cover the activities set out in section 4, and shall be in the amount shown in section 4. The area covered by the financial responsibility required in this section is shown on the map attached as section 6.

4.1.2 The Department will review and modify if necessary, the financial responsibility requirements including adjustments for inflation, concurrent reclamation, expansion, or other changes to the operation of the facility. The permittee shall address the adequacy of the financial responsibility in the annual report required in section 2.4.4.4.

4.1.3 The proof of financial responsibility may be in the form of a trust fund, surety bond, letter of credit, insurance, or another Department-approved mechanism.

4.1.4 Approved proof of financial responsibility must remain available through the post-closure period, up to 30 years, and may not be released in its entirety until the Department certifies in writing that closure of the facility and the required post-closure monitoring have been successfully concluded or that another entity has assumed responsibility for permit compliance, reclamation and closure activities, and post-closure monitoring.

4.1.5 The permittee must provide acceptable proof of financial responsibility within 60 days of the permit's effective date. The Department will accept or reject the financial surety as expeditiously as possible but in no event later than 30 days after its receipt.

4.1.6 If the permittee is unable to provide acceptable proof of financial responsibility to the Department, as approved by the Department in writing, within the time period stated above, this permit will expire automatically at that time, notwithstanding any other approvals to the contrary, unless the Department's failure to act is responsible for the delay in accepting or rejecting this proof.

4.1.7 If the permittee fails to comply with the terms and conditions of this permit and if the Department concludes that such failure may prevent, inhibit or delay satisfactory reclamation and closure or post-closure monitoring of the facility, then the Department may exercise its rights, under an approved mechanism, to access financial responsibility funds and use them for reclamation and closure and post-closure activities.

4.1.8 The permittee can apply to have the amount of the financial responsibility adjusted during the life of the permit, if for example concurrent reclamation has been completed.

## 4.2 AMOUNT OF FINANCIAL RESPONSIBILITY

The total proof of financial responsibility for the life of this permit, unless modified, shall be **$96,164,867**. A detailed breakdown of the financial responsibility cost estimate can be

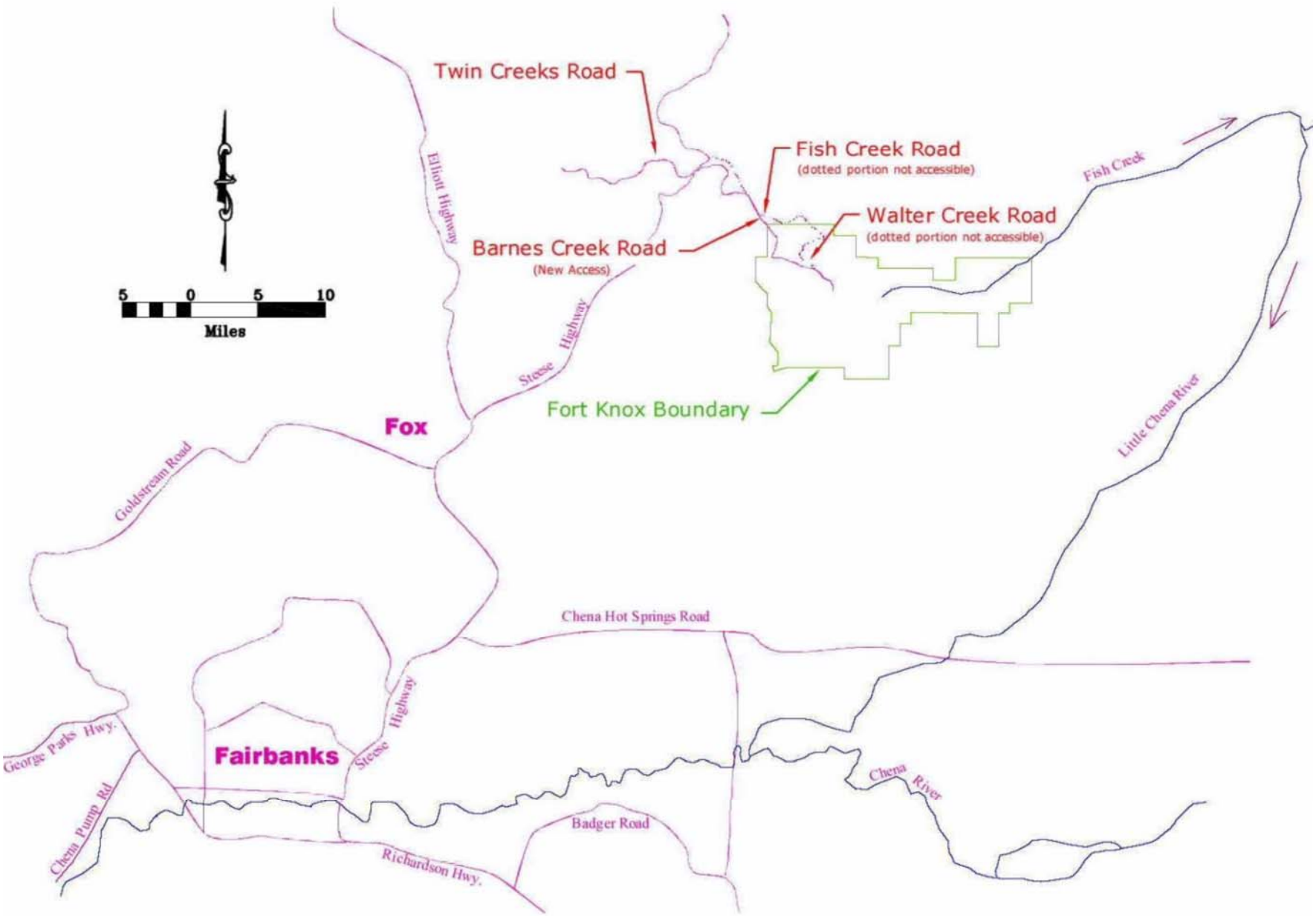
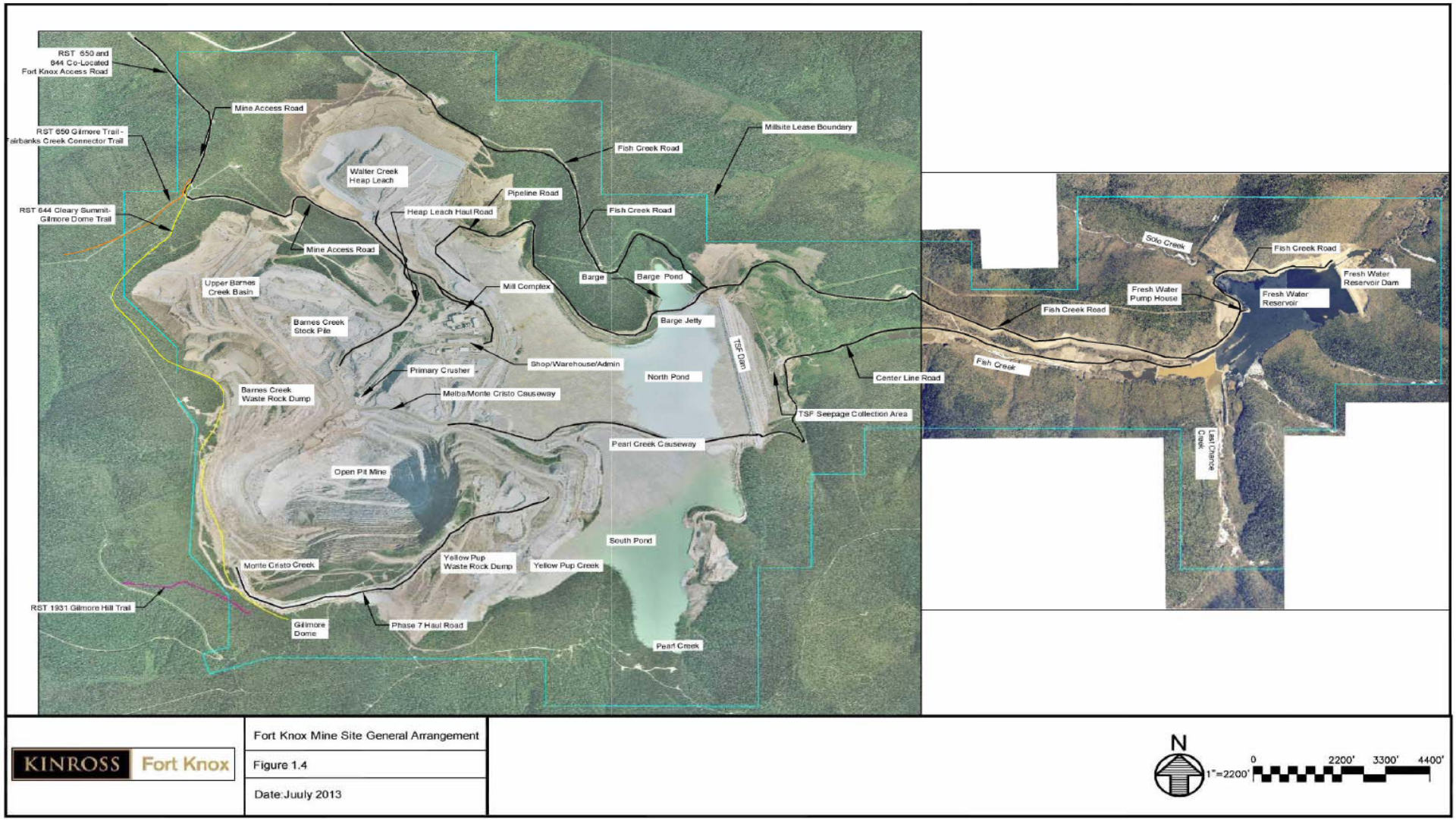
found in the reclamation and closure plan. The Fort Knox Mine financial responsibility is based on the following.

| DIRECT COSTS | | | |
|---|---|---|---|
| Waste Rock Dumps | | $6,525,813 | |
| Heap Leach | | $2,508,837 | |
| Building Demo | | $860,795 | |
| Roads & Laydown Yards | | $633,307 | |
| North Wetlands Complex and Spillway | | $2,772,751 | |
| Growth Media Stockpiles | | $50,675 | |
| Pit Safety Berm | | $122,849 | |
| Water Management | | $42,417,979 | |
| TSF Earthwork | | $4,136,806 | |
| Closure Studies and Reports | | $1,177,000 | |
| Pipeline & Powerline Removal | | $1,423,918 | |
| Fence Removal | | $12,050 | |
| Well Closure | | $526,103 | |
| Post Closure Monitoring | | $616,193 | |
| Road Maintenance | | $538,608 | |
| Pit Water Treatment | | $2,059,504 | |
| Tailings Storage Facility Maintenance | | $1,052,925 | |
| Water Supply Reservoir Maintenance | | $518,830 | |
| Pit Rim Warning Signs and Maintenance | | $241,307 | |
| Dam Security Gate Installation | | $11,002 | |
| Mobilization & Demobilization | | $349,861 | |
| | | **DIRECT COSTS SUBTOTAL** | $68,557,113 |
| INDIRECT COSTS (% x direct costs subtotal) | | | |
| Engineering & Redesign | 4% | $2,742,285 | |
| Contractor Profit & Overhead | 15% | $10,283,567 | |
| Performance Bond | 3% | $2,056,713 | |
| Contract Administration | 8% | $5,484,569 | |
| Contingencies | 10% | $6,855,711 | |
| Insurance Premiums (labor = $12,327,246) | labor x 1.5% | $184,909 | |
| | | **INDIRECT COSTS SUBTOTAL** | $27,607,754 |
| **TOTAL FINANCIAL RESPONSIBILITY** | | | **$96,164,867** |

# 5 GLOSSARY OF TERMS

| | |
|---|---|
| AAC | Alaska Administrative Code |
| ADNR | Alaska Department of Natural Resources |
| AP | Acid Generation Potential: calculated from Acid Base Accounting |
| AS | Alaska Statutes |
| CN WAD | Cyanide, Weak Acid Dissociable |
| FGMI | Fairbanks Gold Mining Inc. (permittee) |
| LCRS | Leachate Collection and Recovery System |
| MDL | Method Detection Limit |
| ML | Minimum Level of Quantification |
| NP | Neutralization Potential: calculated from Acid Base Accounting |
| NP/AP ratio | Ratio of Net Neutralization Potential to Acid Generation Potential |
| PCMS | Process Component Monitoring System |
| Permittee | Fairbanks Gold Mining Inc. |
| QAPP | Quality Assurance Project Plan |
| TSF | Tailings Storage Facility |
| WAD | Weak Acid Dissociable |
| WQS | Alaska Water Quality Standards |

# 6 Fort Knox Mine Location



# Fort Knox Mine Layout