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FORT KNOX MINE

RECLAMATION AND CLOSURE PLAN AMENDMENT 2 GIL PROJECT ADDITION REVISION 1

Prepared By:

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Submitted to:

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1 INTRODUCTION

1.1 Purpose

Fairbanks Gold Mining Inc. (FGMI), a wholly owned subsidiary of Kinross Gold U.S.A. Inc (KGC), is requesting an amendment (Amendment 2) to the Reclamation and Closure Plan (RCP) Dated January 2020 (F20209852RPA). Modifications to the mine plan include development of the Gil Project consisting of multiple small satellite pits, two waste rock dumps and a haul road connecting the project area with the main Fort Knox operations mining area.

Amendment 2 includes a description of the proposed construction, reclamation activities and updated financial assurance (FA) costs. The FA model is calculated using Standardized Reclamation Cost Estimator (SRCE). The basis of the FA model is the most current SRCE model with updated inputs and costs for Amendment 1 P. The FA costs for Amendment 2 assume a premature closure scenario in 2021 and assumes all development is complete, which is conservative. The anticipated schedule of development for the proposed activities assumes all mining will be complete in year 2024 with reclamation activities commencing in years 2025 and 2026. The RCP will be updated in 2025 to include all amendments and any changes in the future mine plan(s).

This document will be submitted to:

- Alaska Department of Natural Resources, Division of Mining (ADNR) in accordance with AS 27.19.010 et. seq. and 11 AAC 97.100 et. seq.
- Alaska Department of Environmental Conservation (ADEC), Division of Water, as required by Waste Management Permit 2014-DB0002, Modification #2
- U.S. Army Corps of Engineers (ACOE) as required by the Clean Water Act Section 404 Permit No. N-920574, Fish Creek.

1.2 Location and Land Status

Fort Knox Mine is located approximately 15 air miles northeast of Fairbanks, Alaska in the Fish Creek drainage, more specifically, the mine is in portions of Sections 4-5, 7-12, 13-23, and 26-27, T2N, R2E, Fairbanks Meridian; and Sections 7-8 and 17-19, T2N, R3E, Fairbanks Meridian.

Amendment 2 increases mining activity into Sections 2-3, and 10-11 T2N, R3E, Fairbanks Meridian. An access road will connect current mining operations, traversing sections15-16 and 20-21 T2N, R3E, Fairbanks Meridian. **Figure 1-1** illustrates the location of the development and current mine operations.

Amendment 2 requires two Mineral Leases: Gil Millsite Lease (438.5 acres) and Alaska Trust Land Office (TLO) lease (173.5 acres). These leased areas increase the leased area by approximately 612 acres. The total project leased area increases from 9,463 acres to 10,075 acres. Appendix A of the 2020 Reclamation and Closure plan contains the claim descriptions for Fort Knox Mine. **Figure 1-2** illustrates the lease boundary of the project areas. **Appendix A** of this document includes a list of claims and map depicting the lease and claim boundaries within the vicinity of the Gil Project.

The mine plan has been modified to accommodate a satellite operation including pits and waste rock storage within three small tributaries to Fish Creek (All Gold Creek, Slippery Creek, and a Wilson Creek). This amendment summarizes new construction activities and planned reclamation for the proposed satellite operation.

Figure 1-1: Project Location



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Figure 1-2: Surface Ownership



2 PROJECT DESCRIPTION

2.1 Existing Conditions

2.1.1 Previous exploration work

Exploration work has been conducted in the Gil Project area on and off for the last 20 years, including exploration drilling and test pitting and subsurface investigations for resource estimating. Access roads and drill pad disturbances exist throughout the project area, many of which have been reclaimed or vegetation has naturally reinvaded access road and pad disturbances. No other surface disturbance has been performed in the area.

2.1.2 Existing Placer Workings

Placer workings both historic and active, exist immediately downstream of the project along Fish Creek. Historic placer workings are likely to have occurred along the streams adjacent to the site, but visual evidence is not obvious near the proposed developments.

2.1.3 Geology

The Fort Knox mine is located in the Fairbanks Mining District in the northeast part of the Yukon-Tanana Upland. The mining district is divided into four metamorphosed stratigraphic groups: the Chatanika sequence, Fairbanks Schist, Chena River sequence, and Birch Hill sequence.

The Gil Project is located in a geologic formation similar to that of the Fort Knox deposit and is underlain by the Fairbanks Schist unit. The Fairbanks Schist consists largely of quartz muscovite schist, quartzite and chlorite quartzose schist (Zf) of the Early Proterozoic and comprises the majority of the bedrock across the study area. The exposed bedrock within the Project area is light to medium gray, fine to coarse grained, quartzite, quartz muscovite schist, and garnet-biotite-quartz-muscovite schist. This unit is moderately resistant to weathering due to its relatively high quartz content (KP 2015).

Gold mineralization at Gil primarily occurs in quartz-sulfide and quartz-carbonate veins, clay-filled shear zones, and limonite-stained fractures, which crosscut nearly all lithologies. Gold mineralization is widespread, but grade and continuity are related to complex interactions among hydrothermal fluids, host rocks, and structures.

At Main Gil and South Sourdough, gold mineralization largely appears stratabound within calcsilicate units, however field-level observations show that gold mineralization is predominately localized within veins and joints in highly fractured rock. Veins are discrete (up to 30 cm wide) and consist of white quartz veins and late-stage thin, discrete quartz-calcite (± actinolite/pyroxene) veins. Both sets of veins tend to be steeply dipping and crosscut foliation. Alteration in the Main Gil zone is represented by an intense retrograde assemblage of calc-silicate minerals. Hydrothermal fluid interaction with a carbonate-rich protolith and calc-silicate minerals enhanced the precipitation of gold and sulfides.

At North Gil and North Sourdough, gold is almost exclusively associated with quartz veining. These veins occur within quartz-mica schist, feldspathic schist, and calcareous biotite-chloritequartz schist. The quartz veins are typically less than 5.1 cm in width and consist of milky-white quartz-arsenopyrite, quartz-calcite, and quartz-feldspar veins. Alteration is vein-controlled and consists of sericitic to potassic (secondary biotite) alteration along vein margins. Pyrite and/or arsenopyrite are the most common accessory minerals observed in the veins, typically in concentrations of <1%.

2.1.4 Permafrost

Permafrost and ice-rich soils are present within and near the proposed Gil Project. The presence of permafrost primarily occurs in the silty loam soils of the NRCS identified units associated with the Ester, Goldstream, Pergelic Cryochemists, Histic Pergelic Cryaquepts and Saulich soils. Thaw stability, i.e., the tendency for a soil to maintain shear strength and stiffness during and after thawing, is dependent not only on soil type but also natural moisture content (KP 2015).

Fine grained soils with elevated moisture content, due to the materials ground ice content, have been identified as not thaw-stable once the organic mat is removed or disturbed and permafrost thaw initiates. Areas of potentially unstable soils have been identified in the lower reaches of the All Gold and Slippery Creek near the project disturbance, but not within the proposed footprints of the waste rock dumps (KP 2015). The presence of permafrost is likely within the WRD foundation footprints however, surficial organics and soils will be striped to competent soils or bedrock prior to placement of waste rock. Unstable soils are not anticipated within the WRD footprints.

2.1.5 Surface Water

The project is located within the Fish Creek Watershed and along the headwaters of minor tributaries to Fish Creek including All Gold, Slippery and Lohr Creeks (**Figure 2-1**). All development will occur within the Fish Creek watershed, runoff will be managed for sediment prior to discharge into the watersheds.

2.1.6 Ground Water

Overburden is relatively thin at the pits, with groundwater relatively deep (50-150 feet BGS) in the pit areas on the ridgelines and the water table likely intersecting ground surface in the stream valleys adjacent to the pits. Water levels are monitored in four wells within close proximity to the Gil Pits. Hydraulic conductivity of the bedrock within the pit areas is relatively low (1.2x10-8 m/sec) (KP 2015). Available information was used to develop a conceptual-level ground water model to determine probable pit inflows and pit lakes at closure.

2.1.7 Background Water Chemistry

The mean and 95% Upper Confidence Limit (UCL) surface water chemistry data from the Slippery Creek drainage, collected from 2011 through 2019, shows no exceedances of Alaska Water Quality Standards. The surface water sample from Slippery Creek on June 28, 2016 had a detection of Total Aluminum at 96.60 mg/L, with reported Hardness (Mg as CaCO3) of 155 mg/L, Hardness (Ca as CACO3) of 100 mg/L, and a Total Hardness of 255 mg/L.

Aluminum was detected in 21 other monitoring samples with concentrations ranging from 0.027 to 24.8 mg/L; based on these results, the single exceedance of the aluminum water quality standard observed in June 2016 is considered an anomaly. The most stringent criterion for total aluminum is for Aquatic Life-Fresh Water Chronic guideline, which is 87 mg/L. Values for Total Dissolved Solids (TDS) ranged from 96 to 340 mg/L, with alkalinity as bicarbonate ranging from 24 to 157 mg/L, and total alkalinity ranging from 24 to 170 mg/L.

Groundwater in the Slippery Creek drainage from monitoring points MW-4, MW-5 and Slippery Creek (**Figure 5-1**). Metals parameters at Slippery Creek were for total metals only, no dissolved metals were collected for the Slipper Creek surface water location. Note that for Monitoring Wells MW-4 and MW-5, in general, the analytical suite was for dissolved metals with no total metals, with the exception of calcium and magnesium, which were analyzed also analyzed for dissolved.

The analytical suite at Slippery Creek Monitoring Location are included in **Table 2-1**. A total of 24 sampling events (excluding when frozen) were conducted between 5-11-2011 and 9-24-2019 (for the sampling period analyzed).

The groundwater had consistently higher Total alkalinity, ranging from 151 to 196 mg/L, and TDS ranging from 580 to 670 mg/L. It is likely that shallow alluvial groundwater has hydraulic connectivity to lower surface waters within the Slippery Creek drainage due to steepness of terrain.

Alkalinity, Bicarbonate (mg/l as CaCO3)	Hardness Ca as CaCO3 mg/L	Selenium, Total (mg/l)
Alkalinity, Carbonate (mg/l as CaCO3)	Hardness Mg as CaCO3 (mg/L)	Silica Total
Alkalinity, Hydroxide (mg/l as CaCO3)	Hardness, Total (mg/l as CaCO3)	Silicon Total mg/l
Alkalinity, Total (mg/l as CaCO3)	Iron, Total (mg/l)	Silver, Total (mg/l)
Aluminum, Total (mg/l)	Lead, Total (mg/l)	Sodium, Total (mg/l)
Ammonia (mg/l as N)	Magnesium, Total (mg/l)	Solids Settleable ml/L
Antimony, Total (mg/l)	Manganese, Total (mg/l)	Solids, Dissolved-sum Of Constituents (mg/l)
Arsenic, Total (mg/l)	Mercury, Total (mg/l)	Specific Conductance (umhos/cm @ 25C)
Barium, Total (mg/l)	Nickel, Total (mg/l)	Specific Conductance, Field (umhos/cm @ 25C)
Bicarbonate as HCO3	Nitrate Nitrogen, Dissolved (mg/l as N)	Sulfate (mg/l)
Bismuth, Total (mg/l as Bi)	Nitrate Nitrogen, Total (mg/l as N)	Sum of Anions, Total (meq/l)
Cadmium, Total (mg/l)	Nitrite (mg/l as N)	Sum of Cations, Total (meq/l)
Calcium, Total (mg/l)	Nitrite Nitrogen, Dissolved (mg/l as N)	Temperature, Water (Degrees Centigrade)
Cation & Anion Sum, Total In Water, meg/l	Nitrite Plus Nitrate, Dissolved mg/l as Nitrogen	Temperature, Water (Degrees Fahrenheit)
Cation Anion Balance, % difference	Nitrite Plus Nitrate, mg/l as Nitrogen	Total Dissolved Solids (mg/l)
Chloride (mg/l)	OTP %	Total Petroleum Hydrocarbons mg/l
Chromium, Total (mg/l)	pH (Lab-su)	Total Suspended Solids (mg/l)
Copper, Total (mg/l)	pH, Field, Standard Units	Turbidity, lab Nephelometric Turbidity Units, Ntu
Cyanide, Total (mg/l)	Phosphorus (mg/l as P)	Weak Acid Dissociable Cyanide, mg/l
Fluoride (mg/l)	Potassium, Total (mg/l)	Zinc, Total (mg/l)

Table 2-1:Analytical Suite

Figure 2-1: Project Area Conditions



2.2 Proposed Development

The Gil Project is located approximately six miles east of the Freshwater Reservoir at Fort Knox. The project will be connected by improving an existing access road into a production haul road. The haul road will originate near the TSF dam at Fort Knox and end at the project site near the laydown area. **Figure 2-2** depicts the proposed configuration of the Gil Project development and associated facilities in relation to the existing mining operations at Fort Knox.

2.2.1 Access and Haul Roads

Connection between the mine and the Gil Project will include upgrading an existing access road to accommodate off-road mining trucks. The road will be constructed using cut-to-fill construction with a stable non-erodible surface course. The road will be approximately eighty feet wide with safety berms as required, with a running/driving width of approximately sixty feet wide.

2.2.2 Pits

The pits will be developed in phases, the Main Gil Pit will be developed initially followed by the smaller Northwest and North Gil pits and the three Sourdough Pits in year 2 of operation. The footprints will be stripped of organics and suitable growth media and stockpiled accordingly. Overburden and waste rock will be placed in one of the two WRD, and ore will be hauled to the mill at Fort Knox.

2.2.3 Waste Rock Dumps

Waste rock from development of the pit is anticipated to be classified as non-acid generating and will be placed in either the Gil or Sourdough WRDs. Construction of all WRDs is similar and generally involves end dumping truck loads in a benched configuration. The benches are developed to allow for regrading at closure and provide a consistently sloped surface from top to bottom of the dump. **Figure 2-3** depicts the end of mining configuration and locations of the WRDs.

<u>Gil WRD</u>

The Gil WRD is located immediately upstream and adjacent to of the Main Gil Pit and will accept waste rock from the Main Gil, North Gil and Northwest Gil pits. The dump will reach an ultimate elevation of approximately 1575 fmsl and will have a footprint of approximately 75 acres. The footprint of the WRD will be stripped of organics and growth soils prior to placement of waste rock.

Sourdough WRD

The Sourdough WRD is located immediately upstream of the Sourdough Pits. The dump will reach an ultimate elevation of approximately 1425 fmsl and will have a footprint of approximately 26 acres. The footprint of the WRD will be stripped of organics and growth media prior to placement of waste rock.

2.2.4 Ore Stockpile Pads

Two ore stockpile pads will be developed during initial development, one near the Main Gil Pit and one near the laydown yard located on the ridgeline near the laydown yard. The pads will be constructed using fill material sourced within pad footprint, overburden striped from the pit or WRD footprints. The stockpile sizes will vary throughout operations and upon conclusion of mining operations, all ore will be removed from the pads and either milled or placed in on one of the WRDs. **Figure 2-3** depicts the final configuration and locations of the Ore Stockpile Pads.

2.2.5 Growth Media Stockpiles

Prior to placement of waste rock and development of the pits, organics and suitable growth media will be striped and stockpiled for later use during reclamation. An estimated average depth of one foot of growth media will be striped and stockpiled in one of four growth media stockpile locations. **Figure 2-3** depicts the location of the proposed stockpile areas.

2.2.6 Ice-rich Overburden

Ice rich or unsuitable foundation soils encountered during stripping of growth media will be stockpiled and placed within the footprints of the growth media stockpiles or in within the footprint of the waste rock dumps for reuse as cover at closure. Until thawed and drained, ice-rich soils are not suitable for construction of stockpile foundations. Pore-water released from thawing will be captured and treated using BMPs.

2.2.7 Laydown Yards and Miscellaneous Structures

A single laydown yard will be constructed for the development. The yard will be located on the ridgeline separating Phil Creek from Fish Creek. The laydown yard will be used to store equipment when not in use, provide an area for temporary tent structures for personnel and equipment storage, and temporary fueling station (fuel island) for equipment. The laydown yard and fuel island is shown on **Figure 2-3**.

2.1 Surface Disturbance

The two-dimensional area listed in **Table 2-2** include areas disturbed during operations at Fort Knox, Amendment 1 (Victoria Creek WRD addition), and Amendment 2 (Gil Project). Amendment 2 will increase the total disturbance limit by approximately 406.3 acres. The total disturbance, including Amendment 1 is 5,866.1 acres. **Figure 2-2** and **Figure 2-3** illustrates the disturbance areas for the Gil Project (Amendment 2).

Location	2020 Reclamation Plan Acres Disturbed	Amendment 1 Acres Disturbed	Amendment 2 Acres Disturbed
Waste Rock Dumps	987.3	+391.3	+95.0
Heap Leach	731.7		
Roads	301.2	(-5.1) ^a	+161.1
Pit	893		+93.7
Buildings Complexes and Laydown yards	252.2		+18.6
GM Stockpiles and GM Borrow areas	208.2	+1.4 –(0.9) ^b = 0.5	+22.2
Borrow Areas	163.1	(-84.6) ^c	
TSF Surface	897.9		
Phase 1 Causeway	85		
TSF Dam Crest and Surrounding Area	115.9		
Ore Stockpiles	55.9		+15.7
FGMI Power Lines	40.7		
Developed Wetlands	218.5		
Water Supply Reservoir & Dam	207.1		
subtotal	5,157.7	302.1	406.3
Total = 2020 RCP + Amendments (excludes Amendment 1)	5,157.7	5,459.8	5,866.1 (5,564.0)

Table 2-2: Disturbance Area at Life of Mine

^a The Victoria Creek WRD development footprint integrates a portion of an existing access road – The road footprint was reclassified as WRD and included in the WRD footprint

^b The growth media stockpile located in the Tailings South Borrow areas was consumed in reclamation

^c Reclamation of the Tailings South Borrow Areas 1 and 2

Figure 2-2: Development Location



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Figure 2-3: General Arrangement



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2.3 Schedule of Operations

Construction of the main haul road connecting Fort Knox to the Gil Project will commence in mid-2021, development associated with the Main Gil Pit and Gil Waste Rock Dump will begin in late 2021 and mining will end in the Main Gil Pit in 2023. The smaller satellite pits (NW & N Gil, and NE, SE, SW Sourdough) and the Sourdough WRD will be developed and mined in 2023 and end in 2024. Reclamation will begin in 2025 and finish in 2026. **Table 2-3** summarizes the schedule for mining and reclamation activities for the Gil project

Activity	2021	2022	2023	2024	2025	2026	2027
Construction of Main Access Haul Road							
Mining Main Gil Pit							
Mining Northwest and North Gil Pits							
Construction of the Gil WRD							
Mining Sourdough Pits							
Construction of the Sourdough WRD							
Reclamation of Pits							
Reclamation of WRD							
Reclamation of Haul Roads							
Reclamation of BMPs and Maintenance							

Table 2-3: Mining and Reclamation Schedule

3 WETLANDS

3.1 Department of the Army Section 404 Permit

Wetlands have been identified and mapped in the development footprint and the surrounding area. The proposed development avoids and minimizes fill in wetlands to the maximum extent practical. Wetland avoidance within mine pits are unavoidable, but minor. The majority of wetland impacts are due to fill placement for the construction of internal mine haul roads. Internal mine roads also include temporary work areas. Activity in temporary work areas consists of vegetation clearing to manage stormwater runoff to meet State Water Quality Standards. During reclamation internal mine roads will be regraded to establish surface drainage, scarified, and seeded. **Figure 3-1** illustrates the wetland locations and disturbance and fill limits. FGMI is currently working with the Corps of Engineers on permit and mitigation measures.

Figure 3-1: Wetlands



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4 **RECLAMATION PRACTICES**

4.1 Water Management

Water management for the Gil Project is anticipated to consist of managing storm water only. Pit dewatering is not required for the development of any of the pits. Seepage and runoff from the waste rock dumps and ore stockpiles, at this time, is not expected to require capture and treatment prior to discharge to the environment.

4.2 Drainage

The overall site drainage plan remains unchanged from existing conditions. WRDs will be placed on the crest of two ridgelines dividing the surface runoff more or less in similar quantities as predevelopment conditions. Runoff will flow into All Gold, Slippery Creeks before discharging into Fish Creek.

Best management practices (BMPs) will be employed during operations and until the site is reclaimed and stabilized to minimize erosion and sediment accumulation downstream. BMPs may include vegetated buffers, sediment collection ponds and sumps, or methods to reduce erosion potential during operations such as temporary grading or seeding. The current operational surface water management concept includes installation of diversion channels along the downstream boundary of the WRDs and sediment basins located in key locations. A riprap lined swale along the southern groin of the final graded surface of the Gil WRD within the All Gold watershed to reduce erosion potential of existing and reclaimed soils. Runoff generated and collected along this channel is expected to be minor, and erosion potential is expected to be low once vegetation has been reestablished. The WRDs will be graded to minimize concentration of runoff and shed water across a large face, reducing concentration of runoff and thus erosion potential. **Figure 4-1** represents a drainage plan for the reclaimed site.

The pits are not anticipated to collect excess quantities of surface runoff. The Main Gil and North Gil Pits may fill before seeping into fractured bedrock and alluvium and discharging to surface waters downgradient. **Figure 4-1** depicts the potential maximum WSE of pit lakes. **Figure 4-2** depicts typical sections through the pits and waste rock dumps.

Geochemical analysis is pending to identify potential for acid rock drainage and metal leaching of pit walls. If the waste rock and pit walls have low metal leaching and acid rock drainage potential, the runoff from the WRDs and pit walls is not expected to impact water quality or deviate from previous assumptions of runoff from waste rock included in the 2020 Reclamation Plan. However, pending results of the waste rock analysis, the water management scheme, waste rock storage and pit water management may be modified to address potential water impairment. The cost for physical reclamation for haul roads and waste rock facilities will likely remain similar, however long-term water management and treatment costs could increase.

The site wide water balance for the Gil Project is not required, because water is not currently anticipated to require treatment or be used for processing. The treatment assumption will be revisited when the potential for ARD and ML is determined. Water management is comprised of managing stormwater only. Stormwater runoff may be attenuated through sediment basins to reduce suspended solids prior to discharge into the environment on an as needed basis. Discharge locations will be into vegetation well upstream of any flowing waters or wetlands further reducing potential of sedimentation downstream or impacts to wetlands. No stormwater will be directly discharged into waters of the US without routing through a BMP. After reclamation is complete, runoff and drainage patterns will be returned similar pre-mining conditions.

Figure 4-1: Drainage Plan

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Figure 4-2: Typical Sections

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4.3 Pit Lakes

Potential for pit lake formation was estimated using a water balance. The water balance included groundwater and surface water flows. Groundwater information from monitoring wells located near the Main Gil Pit was used to guide estimates for all pits (**Figure 4-1**). The water balance was used to estimate inflow rates and time to fill.

Inflows into the Main and North Gil pits are expected to consist of direct precipitation, pit wall runoff, surface runoff, and natural groundwater inflow. The following assumptions were used:

- Average annual precipitation (HydroGeoLogica, 2019) 17.5 inches/year
- Average annual pan evaporation (HydroGeoLogica, 2019) 14.1 inches/year
- A pit wall runoff coefficient of 35 percent of mean annual precipitation (HydroGeoLogica 2019).

Average surface runoff volumes were estimated by applying surface runoff coefficients from the Fort Knox Climate/Hydrologic Characterization Report (KP 2016) to the catchment areas around the pits. The surface runoff coefficients are as follows:

- Natural ground: 6.0 inches/year
- Disturbed ground: 7.0 inches/year
- Waste rock: 4.0 inches/year

Groundwater inflow was estimated by using the Dupuit–Forchheimer discharge equation, which derives lateral inflow to a fully penetrating feature in an unconfined hydrogeologic setting. The variables listed below were used to calculate groundwater flow rate. **Figure 4-3** graphically represents the input parameters for the equation.

- Hydraulic conductivity (K): 1.2x10-8 m/s
- Initial steady state head: 1250 ft
- Head at pit lake: 1125 ft
- Length: 3000 ft
- Recharge: 2.6 in/yr

Figure 4-3: Dupuit–Forchheimer - Diagram

Time to fill was estimated by dividing the pit volume at the spill point by the sum of inflows and outflows. **Table 4-1** summarizes results.

	Avera	ge Inflows	to Pit Lake	e (gpm)	Outflows (gpm)	Net Flow	Pit volume at spill point (acre-ft)	Time to Fill (years)
Pit	Direct Precipitation to Lake	Pit Wall Runoff	Surface Water Runoff	Groundwater Inflow	Pan Evaporation from to Lake	(gpm)		
Main Gil	13.4	7.7	4.4	10.8	-10.6	25.7	396	10
North Gil	5.1	1.7	1.3	3.9	-4.2	7.8	191	15

Table 4-1:	Main and North Gil Pit Water Balance and Time to Fill Summary
	······································

Estimated groundwater flow rates were low, about 10 gpm in the Main Gil Pit, and <5 gpm in the North Gil Pit; low flow rates are a function of the low saturated bedrock hydraulic conductivity (1.2x10-8 m/sec) (KP 2015). Due to the low hydraulic conductivity of the rock within the pits, the groundwater outflow from a pit lake would be minor, barring the presence of major permeable structures, but even if present would likely result in less of a pit lake. Groundwater inflow is sensitive to changes in hydraulic conductivity, but available information suggests estimated inflows will be dominated by precipitation, runoff, and recharge.

4.3.1 Main Gil Pit

With the estimated inflows of ~25 gpm, the Main Gil pit lake could continue to fill up to the elevation of the west pit wall spill point at 1,165 ft amsl (pit volume of approximately 396 acre feet), at which point there is the possibility that the pit lake could flow into the All Gold Creek catchment area. Subsurface groundwater pathways and connections are unknown; however due to low flow rates, loss through seepage via subsurface pathways rather than spilling over the pit rim is a possibility, assuming permafrost is not present near surface. Should a pit lake form in the future, surface outflow is most likely during spring freshet or large storm events. The pit lake water balance calculations indicate that the pit lake will fill to the spill point elevation in approximately 10 years.

4.3.2 North Gil Pit

With the estimated inflows of ~8 gpm, the North Gil pit lake could continue to fill up to the elevation of the west pit wall spill point at 1,068 ft amsl (pit volume of approximately 191 acre feet), at which point there is the possibility that the pit lake will decant and could spill over into nearby wetlands, either over the surface or through groundwater pathways. Should a pit lake form in the future, surface outflow is most likely during spring freshet or large storm events. The pit lake water balance calculations indicate that the pit lake will fill to the spill point elevation in approximately 15 years.

4.3.3 Sourdough Pits

The Sourdough Pits are similar in the size to the North Gil Pit, but have smaller potential pit lake volumes. Inflow conditions would likely be similar including direct precipitation, pit wall runoff, and natural groundwater inflow. Surface runoff is expected to be lower in volume than at the North Gil Pit due to the location of the Sourdough pits along the top of a ridge. The time to fill for the Sourdough pits would likely be less than the North Gil Pit due to the pit volume below the spill points. Water spilling from the pits would flow towards Slippery Creek or Fish Creek, either over the surface or through groundwater pathways.

4.4 Acid Rock Drainage Potential

A geochemical characterization study is currently underway to better understand the ML/ARD potential of the waste rock and ore material at Gil.

Based on a previous geochemical characterization study completed in 2015, it was indicated that an ICP sulfur concentration greater than 0.3% indicates PAG rock (SRK, 2015). Downhole ICP assay data collected to date suggest that the point at which sulfur concentrations in the Project area exceed 0.3% coincides with the modeled redox boundary for the site. During the first year of operations at Gil, only the Main Gil pit will be mined. As shown in the Leapfrog image below (**Figure 4-4**), the majority of the Main Gil pit is situated above the modeled redox boundary. This suggests that PAG rock will not be encountered during the first year of mining. This finding is preliminary and will be supported by additional geochemical characterization data (i.e., acid base accounting, mineralogy, and additional ICP assay data) which are currently pending. The closure plan will be revised as necessary depending on the results of the current geochemical characterization program.

The metal leaching properties of the materials at Gil are currently being evaluated as part of the geochemical characterization program. Although arsenic is known to be enriched at Gil, the actual leachability of the arsenic is currently unknown. The closure plan will be updated to reflect the results of the geochemical characterization program as soon as they are available.

Figure 4-4: Spatial Distribution of ICP Sulfur Results Relative to Modeled Redox in North and Main Gil Pit Shells

4.5 **Reclamation Practices**

4.5.1 Reclamation practices for Addendum 2 will be consistent with the approved methods detailed in the 2020 RCP. The schedule for reclamation of the Gil Project will be concurrent with the reclamation activities at the mine and will not delay the reclamation timeline. The anticipated reclamation schedule for the Gil Project will begin immediately following completion of mining in 2025 and be complete in 2026. Conservatively, the FA calculation assumes that the Gil Project is fully constructed at end of year 2021 and costs are estimated for all reclamation activities associated with the development. The design as presented in Ore Stockpile Pads

The ore stockpiles will be reclaimed when no longer needed for mining activities. Any remaining ore will be hauled to the mill at Fort Knox for processing or placed on one of the WRD and reclaimed accordingly. The pads will be regraded to provide positive drainage, scarified and seeded. Reclamation of the ore stockpile pads will be concurrent with haul road reclamation or before.

Figure 4-5 and Figure 4-6 include the following reclamation elements.

4.5.2 Waste Rock Dumps

The Gil and Sourdough WRDs will be graded, contoured, and revegetated. A minimum of one foot of growth media will be applied to the graded and contoured slopes; slopes will be scarified and seeded for stabilization. Generally, slopes will be graded to a maximum slope of 2.5H:1V or flatter, the design and estimate include slopes at 3H:1V.

4.5.3 Pits

Safety berms will be placed around the rim of all pits, and exclusion berms will be constructed at the entrance to all pits. The berms will be constructed from native soils located in close proximity or waste rock. Berms made from waste rock will be covered with growth media and seeded as needed. The highwall boundaries will be signed periodically in obvious access locations or areas where the general public could encounter them.

4.5.4 Haul Roads

Haul roads and access roads will be reclaimed using the same methods outlined in the 2020 Reclamation and Closure Plan. Cut and fill slopes will be reduced to a minimum of 2H:1V placing fill material on the road surface to fill in cut slopes. Berms and any water diverting structures and ditches will be removed to reestablished existing drainage patterns. A narrow 12 ft. +/- access road will remain along the alignment of the haul roads for monitoring and maintenance activities.

4.5.5 Laydown Yards and Miscellaneous Structures

Laydown yards and stockpiles footprints will be regraded as needed to provide positive drainage and prevent ponding. The areas will be scarified and seeded. Erosion and sediment control structures such as temporary diversion channels and sediment collection ponds will be breached, regraded scarified and seeded once all upstream surfaces have been stabilized with vegetation.

All temporary structures, foundations, fuel islands and any equipment will be removed from the project area, disposed of properly or buried in an approved landfill.

4.5.6 Ore Stockpile Pads

The ore stockpiles will be reclaimed when no longer needed for mining activities. Any remaining ore will be hauled to the mill at Fort Knox for processing or placed on one of the WRD and reclaimed accordingly. The pads will be regraded to provide positive drainage, scarified and seeded. Reclamation of the ore stockpile pads will be concurrent with haul road reclamation or before.

Figure 4-5: Post Reclamation - Area Wide

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Figure 4-6: Post Reclamation – Project Area

4.6 Growth Media

Prior to construction of the Gil and Sourdough WRDs, suitable growth media will be stripped and stockpiled for later use during reclamation in Gil GM 1 and Gil GM 2 stockpiles. It is anticipated that a minimum of one foot of growth media will be stripped within the footprint of the proposed development for each of the WRDs. The volumes indicated in **Table 4-2** are estimated either by calculating by multiplying the stripping depth by the two-dimensional (2D) area, or the volume is based on surveyed and computed stockpile dimensions.

4.6.1 Growth Media Inventory

The SRCE model computes a three-dimensional (3D) slope volume for covers and growth media after grading is complete. The 3D sloped volume for surfaces with slopes ranging from 2.5-3H:1V are generally more than a 2D volume by approximately 5-7%. Additional growth media will be salvaged from suitable soils located within the pit footprints as needed for reclamation (see estimated topsoil volume required in **Table 4-3**). **Table 4-2** provides a summary of growth media salvaged and potential borrow or salvage sources.

Site (Stockpile or Borrow Area)	2020 REC Plan Available (CY)	Amendment 1 Available (CY)	Amendment 2 Available (CY)
Gil GM 1 (estimated) ¹	N/A	N/A	115,500
Gil GM 2 (estimated) ¹	N/A	N/A	44,700
Gil – Pit pre-strip potential borrow (estimated) ¹	N/A	N/A	152,000
Victoria Creek GM (estimated) ¹	N/A	630,900	
WC Heap Leach GM 1 (stockpile)	782,400	782,400	
Barnes Creek GM 1 (stockpile)	377,600	377,600	
Barnes Creek GM 2 (stockpile)	240,800	240,800	
Barnes Creek GM 3 (stockpile)	200,300	200,300	
Barnes Creek GM 4 (stockpile)	14,170	14,170	
Yellow Pup GM 1 (stockpile)	844,500	844,500	
Yellow Pup GM 2 (stockpile)	13,100	13,100	
Yellow Pup GM 3 (stockpile)	37,900	37,900	
TSF South GM 1 (stockpile)	291,400	291,400	
TSF South GM 2 (stockpile) ²	26,800	0	
TSF North GM (borrow area)	3,186,400	3,186,400	
WC Heap Leach GM 2 (borrow area)	1,625,000	1,625,000	
Total Stockpile	2,828,970	3,433,070	160,200
Total Borrow Available	4,811,400	4,811,400	152,000
Total Available	7,640,370	8,244,470	312,200

Table 4-2: Estimated Growth Media Volumes

1 - Estimated volumes assuming one foot of material stripped within facility footprint during construction

2 - Stockpile consumed for reclamation activity in 2020

4.6.2 Growth Media Requirements

A detailed summary of the growth media volume required for reclamation calculated using SRCE is found in **Table 4-3**. Growth media stockpiles and borrow areas exceed calculated volumes required for reclamation. A minimum of an additional 6,000-7,000 CY of growth media will be stripped and stockpiled from with the pit or other development footprints to account for the deficiency in volume.

Facility	2020 REC Plan Volume Required (CY)	Amendment 1 Volume Required (CY)	Amendment 2 Volume Required (CY)
Waste Rock Dumps	1,735,523	2,547,962	166,600
Tailings Storage Facility	1,565,081	1,572,629	
Heap Leach Pads	1,202,757	1,202,757	
Yards/Laydown Areas	159,024	159,024	
Wetland Areas	17,424	17,424	
Total	4,679,809	5,499,796	166,600

 Table 4-3:
 Topsoil Requirement Premature Closure

5 MONITORING

Monitoring for the Gil Project site will be done in the same intervals as stated in the 2019 Fort Knox Monitoring plan (FGMI 2019). Monitoring for the Gil Project will include:

- 1. Water quality sampling procedures and analytical profiles and sampling schedules;
- 2. Characterization of acid rock drainage;
- 3. Monitoring of solid waste landfills;
- 4. Potable water monitoring requirements;
- 5. Wildlife mortality reporting procedures;
- 6. Documentation, record keeping and reporting requirements; and
- 7. Quality assurance/quality control manual.

The closure monitoring plan will include water quality sampling, water level measurements, and observations of the success of revegetation. The frequency of sampling events will be adjusted as appropriate between the reclamation and closure, and post-closure phases based on observed improvements in water quality. **Table 5-1** summarizes the monitoring program. Current monitoring points are shown on **Figure 5-1**.

During the closure process, groundwater quality will continue to be assessed at the existing monitoring wells.

Table 5-1: Gil Monitoring Points

Monitoring Point	Frequency	Parameter
Compliance Well	Monthly	Indicator
Surface Water Compliance Point	Annual	Complete

Groundwater Level Monitoring

Groundwater levels will be monitored in monitoring wells on a quarterly basis. The following wells will be monitored: MW-1, MW-3, MW-4 and MW-6.

Surface Water Monitoring

Surface waters will be monitored during operations and after reclamation has been complete. The following surface water points will be monitored: Slippery Creek, All Gold Creek, Lower Fish Creek, Clark Creek and Wilson Creek

Inspection of Surface Stabilization

Visual observation of revegetation success will be performed on an annual basis during the prestabilization phase. Inspection for erosion and formation of gullies will be completed quarterly.

5.1 Post Reclamation Maintenance

Once physical reclamation has started, temporary diversions and sedimentation control systems will be monitored on a routine basis by FGMI personnel. These systems will be cleaned, repaired, and altered as necessary. Long-term or permanent diversions and the signage will be monitored and maintained as needed until the FA is released.

Success of reclamation will be monitored by visual observation to identify erosion problems. Remedial action to correct instability will be taken as soon as feasible following detection of substantial erosion or loss of growth media. Vegetation success will be monitored qualitatively by visual inspection on an on-going basis by FGMI and ADNR personnel. When warranted, quantitative data will be collected. Quantitative analyses will be conducted late in the growing season (August).

Figure 5-1: Gil Monitoring Locations

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6 ESTIMATE OF RECLAMATION AND CLOSURE COSTS

6.1 Reclamation Cost Estimate Update

The reclamation estimate compiled in the 2020 for Fort Knox Reclamation and Closure Plan has been updated to include additions for Amendment 1. The Amendment 1 SRCE model was again updated to include the disturbance and reclamation costs for the Gil Project (Amendment 2). **Table 6-1** summarizes the costs for each model.

Table 6-1:	SRCE Model Results
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SRCE Model	Total Estimated Cost	Estimated Increase (Decrease)
2020 RCP (Base estimate)	\$100,619,434	N/A
Amendment 1	\$100,058,382	(\$561,052)
Amendment 2	\$102,234,717	\$2,176,330

Amendments 1 and 2 assume the premature closure scenario is in year 2021 and long-term post closure agreement extends for 100 years. The cashflows for post closure years 11-100 are discounted at a rate of 4.3% as noted below. For the 2020 Reclamation Plan, FGMI reviewed the mine plans for 2019-2023, (five-year permit cycle) and determined the largest liability is in year 2020. Now that 2020 has passed, the next highest liability anticipated is in year 2021 and will decline until cover is placed on the TSF. As mining activities continue following year 2021 and throughout the LOM plan, reclamation quantities will decrease as closure actives are executed, or facilities mature towards their designed closure form. When facilities mature, the cost of reclamation will decrease (e.g. cover placement on the TSF, regrading the HLPs, and WRD, etc.).

6.2 SRCE Model Update

The Amendment 1 SRCE model was updated and now includes all work associated to reclaim the fully developed Gil Project site. A summary of additions to the SRCE model include:

- 1. Reclamation of the Gil and Sourdough Waste Rock Dumps;
- 2. Reclamation of all haul roads associated with the Gil Project;
- 3. Reclamation of the laydown yard, growth media and ore stockpiles;
- 4. Reclamation of pits; and
- 5. Miscellaneous temporary structures and wells.

6.3 Cost Summary

Table 6-2 provides a summary of activity costs comparing Amendment 1 and Amendment 2 SRCE models. A detailed FA model for the 2020 Reclamation plan can be found in Appendix C of the 2020 Reclamation Plan. A detailed SRCE estimate has been provided electronically for Amendment 2. Figures for the SRCE model are included in **Appendix B**.

Table 6-2: Reclamation and Closure Cost Estimate Comparison

	Amendment 1		Amendment 2					
Facility	Phase I Costs (undiscounted)	Phase II Costs (discounted)	Total	Phase I Costs (undiscounted)	Phase II Costs (discounted)	Total	Change in Total Costs	
Waste Rock Dumps	\$11,721,505	\$0	\$11,721,505	\$12,123,380	\$0	\$12,123,380	\$401,875	Gill Add
Heap Leach Pad	\$3,108,537	\$0	\$3,108,537	\$3,108,537	\$0	\$3,108,537	\$0	
Solution Management	\$10,799,168	\$945,917	\$11,745,085	\$10,799,168	\$945,917	\$11,745,085	\$0	
Pit	\$214,822	\$27,527	\$242,349	\$299,083	\$27,527	\$326,610	\$84,261	Gill Add
Yards	\$987,952	\$0	\$987,952	\$1,035,570	\$0	\$1,035,570	\$47,618	Gill Add
Roads	\$105,889	\$0	\$105,889	\$376,776	\$0	\$376,776	\$270,887	Gill Add
Borrow Area	\$30,250	\$0	\$30,250	\$30,250	\$0	\$30,250	\$0	
Tailings	\$8,928,476	\$0	\$8,928,476	\$8,928,476	\$0	\$8,928,476	\$0	
Buildings	\$3,827,323	\$0	\$3,827,323	\$3,827,323	\$0	\$3,827,323	\$0	
Other Demo	\$603,918	\$0	\$603,918	\$640,809	\$0	\$640,809	\$36,891	Gill Add
Sediment and Drainage Control	\$11,351,777	\$0	\$11,351,777	\$11,600,261	\$0	\$11,600,261	\$248,484	Gill Add
TSF Spillway	\$2,941,852	\$0	\$2,941,852	\$2,941,852	\$0	\$2,941,852	\$0	
Linear Structures	\$5,938	\$734,216	\$740,154	\$12,438	\$734,216	\$746,654	\$6,500	Gill Add
Monitoring	\$1,910,229	\$414,411	\$2,324,640	\$2,224,039	\$519,609	\$2,743,648	\$419,008	Gill Add
Road Maintenance	\$215,501	\$0	\$215,501	\$215,501	\$0	\$215,501	\$0	
Well Abandonment	\$438,165	\$0	\$438,165	\$463,015	\$0	\$463,015	\$24,850	Gill Add
Water Fees	\$1,650	\$0	\$1,650	\$1,650	\$0	\$1,650	\$0	
Long-term Maintenance and Repair	\$217,240	\$1,798,945	\$2,016,185	\$217,240	\$1,798,945	\$2,016,185	\$0	
Mobilization-demobilization	\$1,807,875	\$0	\$1,807,875	\$1,807,875	\$0	\$1,807,875	\$0	
Active Reclamation	\$6,566,798	\$0	\$6,566,798	\$6,566,798	\$0	\$6,566,798	\$0	
Closure Monitoring	\$463,600	\$137,101	\$600,701	\$463,600	\$137,101	\$600,701	\$0	
Solid Waste Disposal	\$765,289	\$0	\$765,289	\$800,641	\$0	\$800,641	\$35,352	Gill Add
Reclamation Maintenance	\$1,076,021	\$0	\$1,076,021	\$1,104,237	\$0	\$1,104,237	\$28,216	Gill Add
Tanks	\$626,864	\$0	\$626,864	\$626,864	\$0	\$626,864	\$0	
Total Direct	\$68,716,638	\$4,058,114	\$72,774,752	\$70,215,382	\$4,163,313	\$74,378,695	\$1,603,943	
Contractor Drofit	\$6 741 350	\$284.067	\$7 025 417	\$6 883 225	\$291 433	\$7 174 658	\$149 241	
Contractor Profit	\$3 435 832	\$202,908	\$3,638,740	\$3,510,769	\$208 165	\$3 718 934	\$80 194	
Contractor Overnead	\$2,061,499	\$121 745	\$2 183 244	\$2 106 461	\$124 899	\$2,231,360	\$48,116	
	\$192.407	\$11 364	\$203 771	\$196.603	\$11,657	\$208,260	\$4.489	
	\$1 374 333	\$81 161	\$1 455 494	\$1 404 308	\$83,266	\$1 487 574	\$32.080	
	\$1 996 342	\$60.871	\$2 057 213	\$2 037 305	\$62.445	\$2 099 750	\$42 537	
	\$5 923 869	\$121 745	\$6 045 614	\$6 042 759	\$124 800	\$6 167 658	\$122,007	
Rid Contingonov	\$4 592 975	\$81 161	\$4 674 136	\$4 684 555	\$83,266	\$4 767 821	\$93.686	
Grand Total	\$95,035,245	\$5,023,137	\$100,058,382	\$97,081,367	\$5,153,350	\$102,234,717	\$2,176,330	Total A

Note: See User Sheet 5 in SRCE model. Fort_Knox_Gil_Amend-2_SRCE 226900_040_v4_20210505.xlsm

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KP 2015, Report on Pre-Feasibility Level Geotechnical Investigations, Knight Piesold Consulting, 2015

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Appendix A Gil Project Mining Claims

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ADL	CLAIM_NAME	Location Date	Acres
ADL 352234	GIL 211	28-Aug-82	40
ADL 352242	GIL 311	28-Aug-82	40
ADL 352304	GIL 1120	28-Aug-82	40
ADL 352339	GIL 1422	28-Aug-82	40
ADL 352340	GIL 1423	28-Aug-82	40
ADL 352359	GIL 1522	28-Aug-82	40
ADL 352360	GIL 1523	28-Aug-82	40
ADL 352378	GIL 1622	28-Aug-82	40
ADL 352379	GIL 1623	28-Aug-82	40
ADL 352380	GIL 1624	28-Aug-82	40
ADL 352381	GIL 1625	28-Aug-82	40
ADL 352382	GIL 1626	28-Aug-82	40
ADL 352396	GIL 1721	28-Aug-82	40
ADL 352397	GIL 1722	28-Aug-82	40
ADL 352398	GIL 1723	28-Aug-82	40
ADL 352399	GIL 1724	28-Aug-82	20
ADL 352400	GIL 1725	28-Aug-82	40
ADL 352401	GIL 1726	28-Aug-82	40
ADL 352414	GIL 1821	28-Aug-82	40
ADL 352415	GIL 1822	28-Aug-82	40
ADL 352416	GIL 1823	28-Aug-82	40
ADL 352417	GIL 1824	28-Aug-82	5

ADL	CLAIM_NAME	Location Date	Acres
ADL 352418	GIL 1826	28-Aug-82	40
ADL 352430	GIL 1926	28-Aug-82	40
ADL 518509	CLARK 55	15-Dec-87	40
ADL 518510	CLARK 56	15-Dec-87	40
ADL 556917	GIL 117	15-Apr-92	40
ADL 556918	GIL 118	15-Apr-92	40
ADL 556919	GIL 119	1-Apr-92	40
ADL 556920	GIL 120	1-Apr-92	40
ADL 556924	GIL 216	16-Apr-92	40
ADL 556925	GIL 217	13-Apr-92	40
ADL 556926	GIL 312	3-Apr-92	20
ADL 556930	GIL 316	13-Apr-92	40
ADL 556931	GIL 412	3-Apr-92	40
ADL 556932	GIL 413	3-Apr-92	40
ADL 556933	GIL 414	13-Apr-92	40
ADL 556934	GIL 415	13-Apr-92	40
ADL 556935	GIL 416	13-Apr-92	40
ADL 556940	GIL 1020	1-Apr-92	40
ADL 556941	GIL 1021	1-Apr-92	40
ADL 556942	GIL 1121	1-Apr-92	40
ADL 556943	GIL 1221	2-Apr-92	40
ADL 556944	GIL 1222	1-Apr-92	40

ADL	CLAIM_NAME	Location Date	Acres
ADL 556945	GIL 1223	1-Apr-92	40
ADL 556948	GIL 1323	2-Apr-92	40
ADL 556949	GIL 1324	4-Apr-92	40
ADL 556950	GIL 1424	4-Apr-92	40
ADL 556951	GIL 1425	4-Apr-92	40
ADL 556952	GIL 1524	4-Apr-92	40
ADL 556953	GIL 1525	4-Apr-92	40
ADL 556954	GIL 1526	6-Apr-92	40
ADL 556955	GIL 1527	6-Apr-92	40
ADL 557860	GIL 1122	4-Nov-92	40
ADL 557872	GIL 1325	9-Nov-92	40
ADL 557876	GIL 1426	9-Nov-92	40
ADL 557879	GIL 1825	15-Dec-92	34
ADL 559459	SOUTH SLOPE 144	30-Sep-94	40
ADL 570230	SOUTH SLOPE 195	18-Mar-95	40
ADL 570242	SOUTH SLOPE 216	10-Mar-95	40
ADL 616892	JIC 6	22-Mar-12	4
ADL 616893	JIC 7	27-Mar-12	10
ADL 616894	JIC 8	27-Mar-12	10
ADL 616895	JIC 9	27-Mar-12	10

Appendix B SRCE Figures

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