EAGLE GOLD PROJECT

GENERAL SITE PLAN — STAGE 1 CONSTRUCTION PLAN

Version 2013-01

SEPTEMBER 2013

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List of Acronyms and Abbreviations

% ..... percent
~ ..... approximately
< ..... less than
> ..... greater than
µ ..... micro
µg/m^3 ..... micrograms per cubic metre
µg/L ..... micrograms per litre
µm ..... micrometre
ADR ..... adsorption, desorption and recovery
AG ..... Ann Gulch
ANFO ..... ammonium nitrate-fuel oil
AP ..... acid potential in kg $CaCO_3$/t equivalent
ARD ..... acid rock drainage
As ..... arsenic
asl ..... above sea level
BC ..... British Columbia
BGC ..... BGC Engineering Ltd.
BH ..... borehole
BMP ..... Best Management Practice
$CaCO_3$ ..... calcium carbonate
CCRP ..... Conceptual Closure and Reclamation Plan
Cd ..... cadmium
CDP ..... cyanide detoxification plant
cm ..... centimetre
CRP ..... Closure and Reclamation Plan
CSA ..... Canadian Standards Association
CSR ..... Contaminated Sites Regulation

DAB ..... Development Assessment Branch
DCZ ..... desirable clear zone
DDH ..... diamond drill hole
DEM ..... digital elevation model
DFO ..... Fisheries and Oceans Canada
DG ..... Dublin Gulch
DGDC ..... Dublin Gulch diversion channel
DH ..... drill hole
DO ..... dissolved oxygen
DOC ..... dissolved organic carbon
EAMP ..... Environmental Assessment and Major Projects
EC ..... Environment Canada
ECDEV ..... Yukon Department of Economic Development
ECO ..... Yukon Executive Council Office
EMR ..... Yukon Department of Energy, Mines, and Resources
EP ..... Eagle Pup
ERP ..... Emergency Response Plan
ERT ..... Emergency Response Team
EY ..... Environment Yukon or Department of Environment, Yukon Government
FHCP ..... Fish Habitat Compensation Plan
FN ..... First Nations
FNNND ..... First Nation of Na-Cho Nyäk Dun
ft ..... feet
FS ..... factor of safety
g/t ..... grams per tonne
GLC ..... ground level concentrations
GPS ..... Global Positioning System
GSC ..... Geological Survey of Canada
GIS ..... Geological Strength Index

ha ..... hectares
HCR ..... Haggart Creek Road
HLF ..... heap leach facility
hp ..... horsepower
HPW ..... Yukon Department of Highways and Public Works
HRIA ..... Heritage Resource Impact Assessment
HSS ..... Yukon Department of Health and Social Services
HV ..... high voltage
HVAC ..... heating, ventilation and air conditioning
HWM ..... high water mark
IEE ..... Initial Environmental Evaluation
IEEE ..... Institute of Electrical and Electronics Engineers Standards Association
in ..... inches
K ..... hydraulic conductivity
km ..... kilometres
km/km^2 ..... kilometres per square kilometres
km^2 ..... square kilometres
kPa ..... kilopascals
kV ..... kilovolt
kW ..... kilowatt
LOM ..... Life of Mine
MASL. ..... metres above sea level
m ..... metres
m^2 ..... square metres
m^3/ha ..... cubic metres per hectare
m^3/s ..... cubic metres per second
MBR ..... membrane bio-reactor
MCC ..... motor control centre
MDRRC ..... Mayo District Renewable Resources Council

MEMPR ..... Ministry of Energy, Mines and Petroleum Resources

ML ..... metal leaching

MMER ..... Metal Mining Effluent Regulations

Mpa ..... megapascal

MPMDD ..... modified proctor maximum dry density

MSDS ..... Materials Safety Data Sheet

Mt ..... megatonnes (million tonnes)

Mt/y ..... megatonnes per year

MTA ..... Yukon Mine Training Association

MW ..... megawatt (million watts)

MWh/y ..... megawatt hours per year

MWTP ..... mine water treatment plant

N/A ..... not applicable

NA. ..... data not available

NBCC ..... National Building Code of Canada

ND ..... not detected

NM ..... not measured

NND ..... Na-Cho Nyäk Dun

Non-PAG ..... Non-potentially acid generating

NP ..... neutralization potential in kg $CaCO_3$/t equivalent

NP/AP ..... neutralization potential to acid potential ratio

PAG ..... Potential Acid Generation

pH ..... potential of hydrogen (measure of acidity)

PLS ..... pregnant leach solution

PM ..... particulate matter

$PM_{2.5}$ ..... particulate matter with diameter < 2.5 microns

PMF ..... probable maximum flood

PPE ..... personal protective equipment

Project ..... Eagle Gold Project

QA/QC.....quality assurance/quality control
QMA..... Quartz Mining Act
QML ..... quartz mining licence
RCSA .....road corridor study area
RISC.....Resource Information Standards Committee
RMR .....rock mass rating
RoW .....right of way
RQD ..... rock quality designation
RTC.....Registered Trapline Concession
SARA ..... Species at Risk Act
SARPR..... Species at Risk Public Registry
SBA ..... Silt Borrow Area
SCP..... sediment collection pond
SCS..... Site Construction Supervisor
SD .....standard deviation
Se.....selenium
SE ..... standard error of the mean
SEEA.....Socio-economic Effects Assessment
SGC ..... StrataGold Corporation
SIR ..... supplementary information request
SMA .....Special Management Area
SMR .....South McQuesten Road
SRK.....SRK Consulting (Canada) Inc.
SSS..... Site Safety Supervisor
st ..... short ton
SWBR .....surface water balance model
SWE.....Snow Water Equivalent
t/d ..... tonnes per day
t/h .....tonnes per hour

TAC ..... Transportation Association of Canada
TC ..... Transport Canada
TDGA ..... Transportation of Dangerous Goods Act
TDGR ..... Transportation of Dangerous Goods Regulations
TDS ..... total dissolved solids
TEM ..... Terrestrial Ecosystem Mapping
TK ..... traditional knowledge
TOC ..... total organic carbon
TS ..... terrain stability
TSM ..... terrain stability mapping
TSP ..... total suspended particulates
TSS ..... total suspended solids
UFA ..... umbrella final agreement
USFWS ..... United States Fish and Wildlife Service
UTM ..... Universal Transverse Mercator
YCS ..... Yukon Conservation Society
VIT ..... Victoria Gold Corp.
VoM ..... Village of Mayo
WA ..... Waters Act
WAD ..... weak acid dissociable
WCB ..... Workers Compensation Board
WHMIS ..... Workplace Hazardous Materials Information System
WMP ..... Water Management Plan
WQM ..... water quality model
WRSA ..... waste rock storage area
WUL ..... Water Use Licence
WWTP ..... waste water treatment plant
YESAA ..... Yukon Environmental and Socio-economic Assessment Act
YESAB ..... Yukon Environmental and Socio-economic Assessment Board

YG ..... Yukon Government

YGS ..... Yukon Geological Survey

YISC ..... Yukon Invasive Species Council

yrs ..... years

YT ..... Yukon Territory

YWB ..... Yukon Water Board

YWCHSB ..... Yukon Workers' Compensation Health and Safety Board

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1 INTRODUCTION

This Stage 1 Construction Site Plan has been prepared in accordance with the Plan Requirements for Quartz Mine Licensing (February 2012) and is submitted for review by the Yukon Government Department of Energy Mines and Resources as application for a Quartz Mining Licence (QML).

The scope of this plan describes the first stage of construction of the Eagle Gold Project (the Project). The Stage 1 Construction phase of the Project is limited to activities that do not require a Type A Water Use Licence. StrataGold Corporation plans to submit application for additional construction and operation activities regulated by the *Quartz Mining Act* and *Yukon Waters Act* subsequent to the approval of this Stage 1 Construction Plan and issuance of a Quartz Mining Licence that authorizes the activities outlined in this plan.

1.1 PROJECT OVERVIEW

StrataGold Corporation (SGC), a directly held, wholly owned subsidiary of Victoria Gold Corp., has proposed to construct, operate, close and reclaim a gold mine in central Yukon. The Project is located 85 km from Mayo, Yukon using existing highway and access roads. The Project will involve open pit mining at a production rate of approximately 10 million tonnes per year (Mt/y) ore, an average strip ratio (amount of waste: amount of ore) of 1.45:1.0 and gold extraction using a three stage crushing process, heap leaching, and a carbon adsorption, desorption, and recovery system over a 10 year mine life.

Construction of the mine will occur over approximately two years from Q2 2013 – Q2 2015 pending issuance of required licences and permits. The construction phase has been divided into two stages to accommodate permitting assumptions and seasonal constraints.

During operations, the open pit will be developed using standard drill and blast technology. Ore will be transported from the open pit by haul truck and delivered to the first stage crushing plant (the primary crusher), situated on the north side of the open pit rim. Waste rock will be removed from the open pit by haul truck and delivered to one of two waste rock storage areas (Platinum Gulch or Eagle Pup WRSAs) or will be used as haul road and infrastructure construction material. Figure 1.1-1 shows the General Site Arrangement for the Project (all figures and drawings are provided in Appendix A).

Figure 1.1-2 provides the overall process flow sheet for the Project. Ore will be crushed to a passing 80 percent (P80) particle size of 6.4 mm in a 3-stage crushing process. All three crushing stages will be located north of the open pit. Ore will be conveyed between the primary crushing station and the secondary and tertiary crushing stations by covered conveyor or enclosed conveyor gallery. After the tertiary crushing stage, ore will be transported by covered conveyor to the Heap Leach Facility (HLF) area where the ore will be stacked on the heap leach pad via a series of portable conveyors and finally a radial stacking conveyor.

Gold extraction will utilize cyanide heap leaching technology as described in the Project Proposal. Similar technology was employed in Yukon at the Brewery Creek mine in the late 1990s, and has been employed successfully in other cold climates such as the United States of America (Alaska), Chile, Argentina, Turkey and Russia. Process solution containing cyanide will be applied to the ore to extract gold and then collected by the HLF leachate collection and recovery system.

Gold-bearing “pregnant” solution (pregnant leach solution [PLS]) will be pumped from the heap to the gold recovery plant. Gold will be recovered from the PLS by activated carbon adsorption and desorption, followed by electro-winning onto steel cathodes, and on-site smelting to gold doré. This process is referred to as the adsorption, desorption, and recovery (ADR) process. The gold-barren leach solution that remains after passing through the carbon columns will be re-circulated back to the HLF.

1.2 PROJECT LOCATION

The proposed Project is located in central Yukon in the Traditional Territory of the FNNND, approximately 350 km north of Whitehorse, and 45 km (85 km by existing access roads) north-northeast of the Village of Mayo. Ecologically the Project is situated within the Yukon Plateau North Ecoregion, in the Boreal Cordillera Ecozone, which encompasses the Stewart, MacMillan and Pelly plateaus and southern part of the Selwyn Mountains. The majority of the Project site lies within the Dublin Gulch watershed. The Dublin Gulch watercourse is a tributary to Haggart Creek which flows to the South McQuesten River within the Stewart River sub-basin of the Yukon River Watershed. Elevations in the vicinity of the Project range from 765 m above sea level near the confluence of Dublin Gulch and Haggart Creek, to 1,525 m above sea level at the base of the Potato Hills, which forms the eastern boundary of the Dublin Gulch watershed.

Historically, Yukon and the Tintina Gold Belt specifically, has been a productive region for gold. The Dublin Gulch area has a rich history of exploration and mining since 1898. As a result, Dublin Gulch watershed and the upper reaches of the Haggart creek watershed have been heavily impacted by placer mining activity. The ecological function of the Project area has been altered by this previous activity and is well documented via past environmental studies that date back to the mid-1990s. From this extensive baseline work, the existing environmental and socio-economic conditions are well known and documented in the Project Proposal submitted to the Yukon Environmental and Socio-Economic Assessment Board (YESAB) in July 2011.

Figure 1.2-1 provides a Property Location Map and Photo 1.2-1 depicts the site location and existing conditions including SGC’s advanced exploration camp and historic placer mining areas.

Photo 1.2-1: Site Location

1.3 PROJECT SCHEDULE

The Project is presently in the permitting stage. YESAB issued a Final Screening Report on February 19, 2013 that recommended that the Project proceed subject to recommended terms and conditions. Yukon Government issued a Decision Document accepting the recommendation of YESAB on April 8, 2013 pursuant to the 123 terms and conditions listed in the Final Screening Report. The Government of Canada issued a coordinated Decision Document on April 19, 2013 that accepted the recommendation of YESAB. The completion of the Final Screening Report and Decision Documents represents a key milestone by allowing for application for and issuance of licences and permits required to construct and operate the Project. A Quartz Mining Licence (QML) is the key regulatory requirement for permitting a quartz mine. The licence serves as a regulatory and decision making framework that delineates how a company will develop and manage the mine over the life of the project. The *Quartz Mining Act* allows for phased licensing where initial development plans may be submitted as a "Part 1 Application" which provides companies with permission to proceed with initial site construction activities that do not require a Water Use Licence; and a "Part 2 Application" which enables proponents to proceed with mine construction and operation after the issuance of the Type A Water Use Licence (WUL).

It is understood that a phased Quartz Mining Licence is possible to permit initial construction activities prior to issuance of the Type A Water Use Licence.

To support the phased licensing of the Project, construction has been planned in two stages. Stage 1 construction will be carried out pending approval of a "Part 1" Quartz Mining Licence and prior to receipt of the Type A Water Use Licence. Stage 2 construction will be carried out upon receipt of the Type A Water Use Licence. In general, Stage 1 represents construction activities that are "non-water" related and do not require a Type A Water Use Licence or other authorizations issued by Federal Departments pursuant to the *Fisheries Act* and *Navigable Waters Protection Act.* Stage 2 includes all remaining construction of infrastructure and facilities that involves the use of water, alteration of watercourses and/or discharge of a waste to waters. Project Development and Operational plans will be submitted to Yukon Government for review via an updated General Site Plan concomitant with the application for a Type A Water Use Licence to the Yukon Water Board.

Stage 1 Construction will begin in 2013 pending receipt of the Quartz Mining Licence and will continue throughout 2014 until receipt of the Type A Water Use Licence. For planning purposes, SGC anticipates receipt of the Type A Water Use Licence in mid-2014. Stage 2 construction will commence upon receipt of a Type A Water Use Licence and updated Quartz Mining Licence to enable additional construction activities and operations. A summary of the Project schedule is provided in Table 1.3-1. A construction schedule including Stage 1 and Stage 2 is provided in Table 1.3-2. This construction schedule is tentative and dependent upon receipt of the regulatory approvals, project financing, contractor availability and seasonal limitations.

Table 1.3-1: Tentative Project Schedule

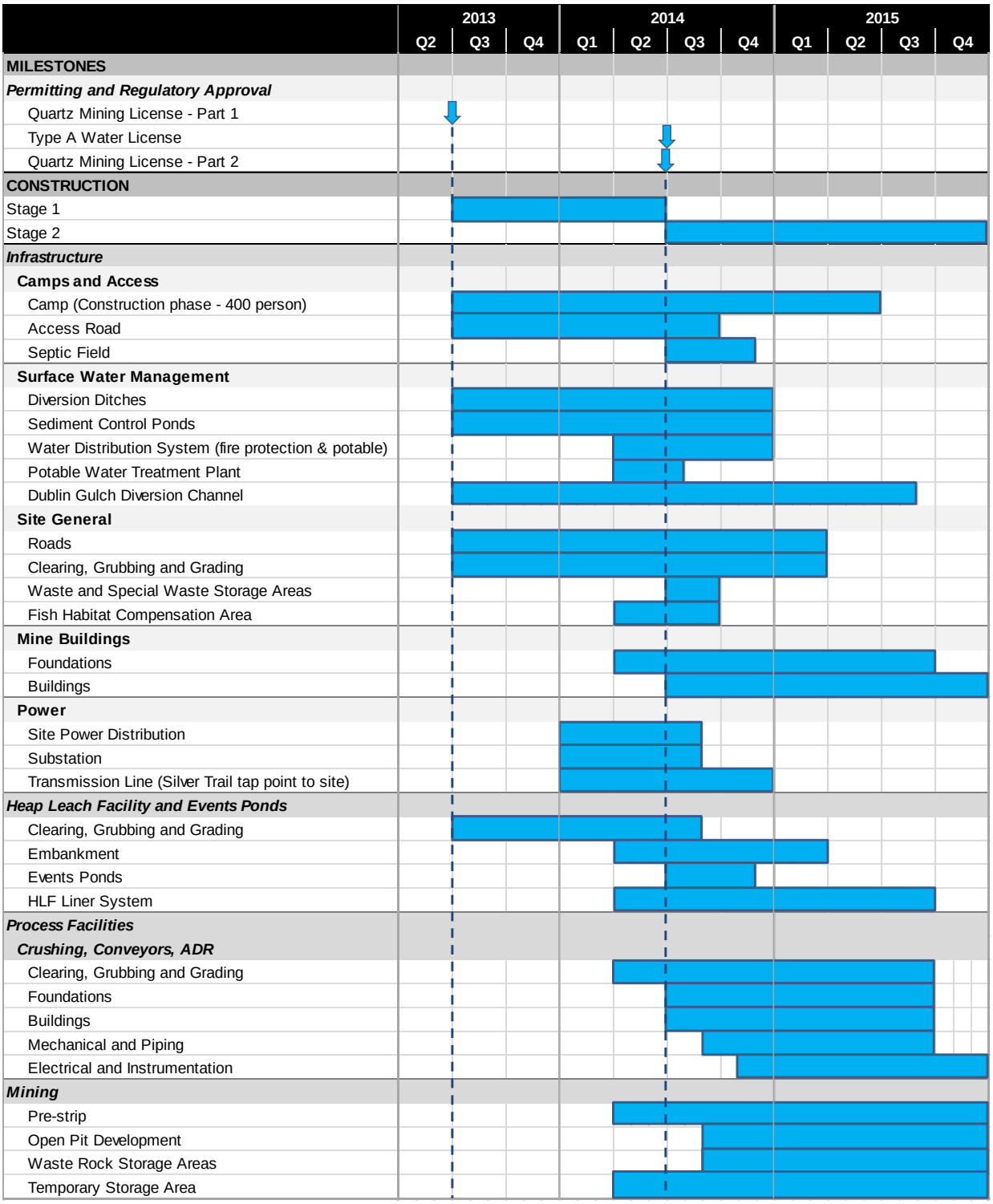
Phase	Schedule
Construction	Q3 2013 – Q4 2015
Operations (9.2 years)[1]	Q1 2016 – Q1 2025
Reclamation and Closure (10 years)[2]	Q2 2025 – Q2 2035
Post-Closure Monitoring (5 years or as required)	Q3 2035 – Q3 2040

NOTE:

[1] limited to active mining operations (ore loading) and does not include residual leaching phase prior to HLF drain-down

[2] includes drain-down of HLF to steady state seepage – estimated to be approximately 10 years conservatively estimated to allow for active water treatment. Reclamation earthworks such as re-contouring, revegetation and facility capping will be complete within 2-3 years of start of reclamation phase.

Table 1.3-2: Construction Schedule



1.4 PERMITS AND LICENCES

The Project is presently in the permitting stage after the positive completion of the environmental assessment process. YESAB issued a Final Screening Report on February 19, 2013 that recommended that the Project proceed subject to 123 recommended terms and conditions. Yukon Government issued a Decision Document on April 8, 2013 and the Government of Canada issued a coordinated Decision Document on April 19, 2013 that accepted the YESAB recommendation.

1.4.1 Currently Held Regulatory Approvals

- The Project currently has an approved Class 4 Operating Plan under the *Quartz Mining Act* and *Quartz Mining Land Use Regulations* for advanced exploration activities including camp operations. The current Operating Plan is in effect until 2021 and includes drilling, trenching, trail construction, establishing new access roads, fuel storage, camp construction and use, and other activities to support ongoing exploration. The Operating Plan involves exploration activities within the Dublin Gulch Property at a number of target areas including, but not limited to, the Eagle Gold Project.
- A Type B Water Use Licence pursuant to the *Waters Act* and Waters Regulations is also held by SGC in relation to the ongoing hard rock exploration activities. This Licence is in effect until 2016 and authorizes the use of up to 432m^3/day of water from watercourses and groundwater to supply drill equipment, the use of up to 35m^3/day of water from groundwater for supplying the camp, the construction, operation, maintenance and decommissioning of a Membrane Bio-Reactor wastewater treatment system, septic tank and absorption field for discharge of sewage waste to ground, the use of existing fords and construction of new fords, construction of earthworks and erosion protection, and the discharge of drill waste to constructed sumps.
- Pursuant to the *Waters Act* and Waters Regulations, and the *Placer Mining Act* and *Placer Mining Land Use Regulations* SGC holds a Type B Water Use Licence for Placer Undertakings and a Class 4 Operating Plan for Placer Mining. These approvals are valid until 2017 and allow placer mining, water use for placer mining, stream diversions, storage and alteration of water flows, modification of bed or banks, crossings, and the deposit of waste, on Dublin Gulch, Eagle Creek, and Haggart Creek. Placer exploration activities are also included within the scope of these permits and allow for drilling, trenching, and trail construction on Dublin Gulch, Eagle Creek, Haggart Creek, Gil Gulch, Suttles Gulch, Ann Gulch, Eagle Pup, Stewart Gulch, Olive Gulch, Bawn Boy Gulch and Cascallen Gulch.
- SGC also holds a number of other permits to support exploration activities, camp operation, and road maintenance including permits, licences and authorizations issued pursuant to the *Environment Act*, the Solid Waste Regulations, the Air Emissions Regulations, the Special Waste Regulations, the Storage Tank Regulations, the *Highways Act*, the *Forest Resources Act*, and the *Building Standards Act*.

1.4.2 Additional Regulatory Applications

In addition to a Quartz Mining Licence, the Project will require a number of permits, licences and authorizations. Stage 1 of the Construction phase does not include activities that require each of these authorizations, however; they are listed here for information purposes.

Applications will be submitted for the following major regulatory instruments:

- Type A Water Use Licence for the use of water, discharge of wastes, and alterations of watercourses pursuant to the *Yukon Waters Act* and regulated by the Yukon Water Board
- authorization for the harmful alteration, disruption or destruction (HADD) of fish habitat – required under s.35(2) of the *Fisheries Act* and administered by Fisheries and Oceans Canada (DFO)
- authorization for work in navigable waters – required under the *Navigable Waters Protection Act* and administered by Transport Canada
- Explosives Factory and Storage Licence – required under the *Explosives Act* and administered by Natural Resources Canada (NRCan).

Table 1.4-1 provides a list of all anticipated permits, licences and authorizations required for the Project which have been identified, including the major permits, licences and authorizations listed above. There are a number of additional territorial and federal approvals, permits and authorizations which will be required for the access road, mine infrastructure and mine operations, which are considered to be predominantly technical in nature.

Table 1.4-1: Federal and Territorial Permits required for the Project

Authorization	Regulation	Authority	Description
QML	*Quartz Mining Act*	Energy Mines and Resources, Yukon Government	Mine construction, operation, decommissioning and closure
WUL – Type A	*Yukon Waters Act*, Waters Regulation	Yukon Water Board	Water use and deposit of waste
Section 35(2) Authorization	*Fisheries Act*	DFO	Stream works and works related to water and fish habitat
Section 5(2) Approval	*Navigable Water Protection Act*	Transport Canada	Working in relation to navigable water crossings
Work in Highway Right of Way Permit	*Highways Act*, Highways Regulation	Highways and Public Works, Yukon Government	Potential work on the access road or in the road right of way; may also require signage permits
Land Use Permit Quarry Permit or Quarry Lease	*Territorial Lands (Yukon) Act*, Land Use Regulations	Energy Mines and Resources, Yukon Government	Land use related works not covered by the QML (such as access road work or to utilize borrow pit resources
Commercial Timber Permit	*Territorial Lands (Yukon) Act*, Timber Regulations	Energy Mines and Resources, Yukon Government	Cutting timber - clearing and grubbing
Air Emissions Permit	*Environment Act*, Air Emission Regulations	Environment Yukon, Yukon Government	Potential emissions (diesel generator, fuel use, or quarry use over 4 ha)
Burning Permit	*Forest Protection Act*, Forest Protection Regulation	Department of Community Services, Yukon Government	Burning (waste from clearing and grubbing; may be seasonal requirements)

Authorization	Regulation	Authority	Description
Highways Hauling	*Highways Act*, Bulk Commodity Haul Regulations, Highways Regulation	Highways and Public Works, Yukon Government	Hauling of equipment and supplies, including for overweight loads
Archaeological Sites Permit	*Yukon Historic Resources Act*	Department of Tourism and Culture, Yukon Government	Search for and research at archaeological/ paleontological sites
Storage Tank Systems Permit	*Environment Act*, Storage Tank Regulation	Department of Community Services, Yukon Government	Storage and handling of petroleum products (fuel)
Solid Waste Disposal Permit	*Environment Act*, Solid Waste Regulation	Environment Yukon, Yukon Government	Waste disposal for construction and for site facilities
Special Waste Permit	*Environment Act*, Special Waste Regulations	Environment Yukon, Environmental Programs, Yukon Government	Special waste handling, disposal, and storage
Permit/Certificate for Transport of Dangerous Goods	*Dangerous Goods Transport Act*	Highways and Public Works, Yukon Government	For waste storage, may also need permit for Bill of Lading, driver training, placarding; federal transport legislation may also apply
Temporary Magazine Licence, Factory Licence, ANFO permit	*Explosives Act*	NRCan, Explosives Regulatory Division and Minerals and Metals Sector	Manufacture and storage of explosives
Blasters Permit	*Occupational Health and Safety Act*, Blasting Regulations	Workers' Compensation Health and Safety Board	Use of explosives
Registered or Certified Helidrome	*Aeronautics Act*, Canadian Aviation Regulations	Transport Canada, Civil Aviation, Regulatory Affairs	Use of Helipad
Building Permit, Plumbing Permit	*Building Standards Act, Electrical Protection Act*	Department of Community Services, Yukon Government	Building outside of a municipality, plumbing, electrical work
Gas Installation Permit, Gas Burning Devices Permit	*Gas Burning Devices Act*	Department of Community Services, Yukon Government	Gas piping and burning (infrastructure)
Pressure Vessel Boiler Permit	*Boiler and Pressure Vessel Act*	Department of Community Services, Yukon Government	Boilers (infrastructure)
Compliance with Public Health Regulations	*Yukon Public Health and Safety Act*, Regulations Respecting Public Health	Department of Health and Social Services, Yukon Government	Public health, sanitation, facilities, will also need a permit to operate a food premise
Registration with the Yukon Workers' Compensation Health and Safety Board	*Workers' Compensation Act,* Occupational Health and Safety Act and Regulations	Yukon Workers' Compensation Health and Safety Board	Work site and employees

NOTE:
The table also includes a number of non-environmental authorizations, such as building permits for reference purposes.

In addition to a Quartz Mining Licence various permits will be required during the construction phase of the Eagle Gold Project – these permits will have specific terms and conditions pertaining to installation and construction of facilities. Some typical permits required (but not limited to) are described below:

- A Special Waste Permit is required from YG Environment in accordance with the Environment Act Special Waste Regulations for burning waste oil, generating and/or storing waste batteries, waste oil, waste solvents, and other special wastes.
- A Storage Tank System Permit is required from YG Environment in accordance with the Environment Act Storage Tank Regulations for installation and operation of fuel storage tanks.
- Various permits will be required for building construction from YG Community Services.

2 MINERAL CLAIMS

The site is situated within the Dublin Gulch Property, which refers to a large contiguous block of 1,914 quartz claims, 10 quartz leases, and 1 federal Crown grant located within the Mayo Mining District (Property Location Map - Figure 1.2-1). The Dublin Gulch Property is rectangular in shape and extends approximately 26 km in an east-west direction and 13 km in a north-south direction.

A complete listing of mineral claims, held in the name of StrataGold Corporation that will overlap with Stage 1 Construction activities, is provided in Appendix B.

3 CONSTRUCTION OVERVIEW

3.1 STAGE 1

Stage 1 construction activities are scheduled for approximately Q3 2013 – Q3 2014 and include camp expansion, access road and bridge upgrades, site road construction, clearing and grubbing, civil earthworks, concrete foundations, and borrow source development. The remaining construction activities that will commence after issuance of a Type A Water Use Licence and a QML Part 2 Licence will take place over the remainder of 2014 and 2015, with a target construction completion date and mine commissioning in late 2015 or early 2016. A simplified schedule is shown in Table 1.3-2.

The scope of the Stage 1 Construction Plan includes:

- Upgrades to the Haggart Creek Road that includes minor realignments, construction of pull outs, grading, resurfacing, bridge upgrades and drainage improvements.
- Camp expansion.
- Upgrade of existing site access roads by widening and grading to provide access to construction areas.
- Construction of new site access roads to provide access to construction areas.
- Construction of a solid waste storage area that includes an incinerator.
- Construction of a hazardous waste storage area for temporary storage of hazardous waste prior to hauling offsite for final disposal in approved facilities.
- Clearing, grubbing and grading for roads, infrastructure and facilities including the following:
    - Camp expansion
    - Solid Waste and Special Waste Storage Areas
    - Sub-station
    - Transmission Line Right-of-Way
    - Open Pit initial pre-stripping (and diversion ditches)
    - Permanent Crushing and Screening Plant
    - Temporary (for construction purposes) crushing and screening plant(s)
    - Cement and Lime Silos
    - Overland Conveying System
    - Dublin Gulch Diversion Channel
    - Heap Leach Facility Phase I
    - Heap Leach Facility Embankment and Spillway

  - Adsorption, Desorption and Recovery Plant, Metallurgical Laboratories, Administration Office and Reagent Storage Buildings
  - Mine Water Treatment and Cyanide Detoxification Plant
  - Lower Dublin South Pond
  - Lower Dublin North Pond
  - Eagle Pup Pond
  - Platinum Gulch Pond
  - Diversion Ditches and Sediment and Erosion Control Facilities
  - Truck Shop, Mine Offices and Fuel Storage
  - ANFO, Emulsion Plant and Detonator Storage
- Excavation and bulk earthworks for the following facilities:
  - Ice-rich overburden storage facility
  - Dublin Gulch Diversion Channel
  - Sub-station
  - Heap Leach Facility Phase I
  - Heap Leach Facility Embankment and Spillway
  - Permanent Crushing and Screening Plant
  - Temporary (for construction purposes) crushing and screening plant(s)
  - Overland Conveying System
  - Cement and Lime Silos
  - Adsorption, Desorption and Recovery Plant, Refinery, Security/Administration Office and Reagent Storage Buildings
  - Assay and Metallurgical Lab
  - Mine Water Treatment and Cyanide Detoxification Plant
  - Open Pit initial pre-stripping
  - Lower Dublin South Pond
  - Lower Dublin North Pond
  - Truck Shop, Mine Offices and Fuel Storage
  - ANFO, Emulsion Plant and Detonator Storage
- Concrete foundations for the following infrastructure and facilities:

- Solid Waste Storage Areas
- Sub-station
- Crushing and Screening Plant
- Overland conveyor support footings
- Cement and Lime Silos
- Adsorption, Desorption and Recovery Plant, Refinery, Security/Administration Office and Reagent Storage Buildings
- Assay and Metallurgical Lab
- Mine Water Treatment and Cyanide Detoxification Plant
- Truck Shop and Mine Offices
- ANFO, Emulsion Plant and Detonator Storage Facilities
- Guard house

3.2 STAGE 2

Stage 2 construction activities are currently scheduled to begin upon issuance of a Type A Water Use Licence and a QML Part 2 Licence. These activities will be described in an updated General Site Plan and/or development and operations plans as required by Yukon Government and are listed here for information purposes only.

The scope of the Stage 2 Construction Plan will include:

- Septic field expansion - Installation and commissioning of septic field to accommodate peak construction and operations labor force
- Potable water treatment plant - Installation and commissioning
- Site access and haul road construction – remaining roads not previously completed
- Transmission line from Silver Trail tap point to site including clearing and grubbing of right of way (RoW), pole installation, conductors and substation
- Construction of the sub-station and the site electrical distribution system
- Erection of buildings including installation of mechanical, piping, electrical and instrumentation for the following:
    - Crushing and Screening Plant
    - Overland Conveying System
    - Cement and Lime Silos
    - Adsorption, Desorption and Recovery Plant, Metallurgical Laboratories, Administration Office and Reagent Storage Buildings

  - Mine Water Treatment and Cyanide Detoxification Plant
  - Eagle Pup Pond
  - Truck Shop, warehouse and mine offices
  - ANFO, Emulsion Plant and Detonator Storage
- Water Distribution Systems
  - Process water for ADR
  - Crusher dust suppression systems
  - Water for road dust control
  - Potable water for facilities
  - Fire water including ring main, hydrants, and pumps
- Fuel Storage and Distribution Systems
  - Propane
  - Diesel
  - Gasoline
  - Waste Oil
- Dublin Gulch Diversion Channel
  - velocity reduction ponds
  - drop structures
  - install channel armouring
  - connect channel to flow post 2014 freshet
- Open pit pre-stripping
- Eagle Pup Waste Rock Storage Area
  - Clearing and grubbing
  - Bulk earthworks
  - Rock drain and toe berm construction
- Platinum Gulch Waste Rock Storage Area
  - Clearing and grubbing
  - Bulk earthworks
  - Rock drain and toe berm construction
- Temporary (100 Day) Ore storage pad

  - Clearing and grubbing
  - Bulk earthworks
- Events Ponds
  - Groundwater drainage system installation (geotextile, gravel and piping)
  - Subgrade preparation
  - Bedding layer placement
  - Primary geomembrane liner installation
  - Pumps and sampler installation
  - Leak detection and recovery system
  - Upper secondary geomembrane liner installation
- Heap Leach Facility Phase I
  - Temporary upstream runoff interceptor ditch construction
  - Groundwater drainage system installation (geotextile, gravel and piping)
  - Subgrade preparation
  - Geosynthetic Clay Liner installation
  - In-heap pond secondary geomembrane liner installation
  - Leak Collection and Recovery System installation
  - Overliner installation (crushed rock for drainage and cushion layer)
  - In-heap pond primary geomembrane liner installation
  - In-heap pond upper secondary geomembrane liner installation
  - Phase 1 heap leach piping installation
  - Solution collection system (primary and secondary piping) installation

4 SURFACE WATER MANAGEMENT

The objective for water management during the construction phase is to safely convey and/or store as necessary, all freshet and rainfall runoff through the Project site, while maintaining water quality at background levels or meet water quality standards in the receiving environment. The primary means to achieving this objective will require the diversion of non-contact runoff, and minimizing total suspended sediment levels in runoff from construction areas. During the first year of construction (Stage 1), surface water management will be restricted to controlling runoff and seepage from specific work areas (including pads and roads), but there will be no diversions of existing watercourses authorized under the QML Part 1 (except those associated with the existing and amended placer licences) nor any discharge of collected runoff into watercourses. While this document focuses on surface water management during Stage 1 only, during Stage 2 Construction, surface water management will include the active management of watercourses and work areas to mitigate the discharge of sediment–laden waters into streams. Further, surface water management during construction of both stages will address conditions during two spring freshet periods and two summer-fall rainfall-runoff periods, including storm events, and low flow periods. Thus, construction activities will also need to address winter conditions, and water management facilities such as sediment ponds and ditches will need to maintain stability over the winter.

Water will be controlled in a manner that minimizes erosion in areas disturbed by construction activities and prevents the release of construction water, which could adversely affect the quality of receiving waters (namely Dublin Gulch, Haggart Creek, and Eagle Creek).

Water management during construction will include diversion of non-contact water to reduce the total volume of water to manage via cut-off ditches, construction of sediment control ponds, stabilizing disturbed land surfaces to minimize erosion and re-establishing vegetative cover. Where final slopes are created, native vegetation will be planted per the Decommissioning and Reclamation Plan. Sediment laden water during Stage 2 construction will be collected in sediment basins and then released to ground or watercourses after total suspended solids are settled to meet discharge standards. Stage 1 Construction will not include the discharge of collected water to watercourses, nor the use of reagents, industrial chemicals or active mining; thus active water treatment is not included in this plan.

4.1 PERMITTING CONSIDERATIONS

Currently SGC holds the following licences with respect to the use of water and watercourses:

- A Type B Water Use Licence in effect until 2016. The Type B Water Use Licence authorizes the use of water up to 432m^3/day from various creeks and groundwater for exploration activities, the use of water of up to 35m^3/day from groundwater for supplying the camp, the construction, operation, maintenance and decommissioning of a Membrane Bio-Reactor wastewater treatment system, septic tank and absorption field for discharge of sewage waste to ground, the use of existing fords and construction of new fords, construction of earthworks and erosion protection, and the discharge of drill waste to constructed sumps.

- Pursuant to the *Waters Act* and Waters Regulations, and the *Placer Mining Act* and Placer Mining Land Use Regulations SGC holds a Type B Water Use Licence for Placer Undertakings and a Class 4 Operating Plan for Placer Mining. These approvals are valid until 2017 and allow placer mining, water use for placer mining, stream diversions, storage and alteration of water flows, modification of bed or banks, crossings, and the deposit of waste, on Dublin Gulch, Eagle Creek, and Haggart Creek. Placer exploration activities are also included within the scope of these permits and allow for drilling, trenching, and trail construction on Dublin Gulch, Eagle Creek, Haggart Creek, Gil Gulch, Suttles Gulch, Ann Gulch, Eagle Pup, Stewart Gulch, Olive Gulch, Bawn Boy Gulch and Cascallen Gulch.

SGC will not commence activities that are not currently licenced under the *Yukon Waters Act*. In 2013, SGC will apply for a Type A Water Use Licence that includes request for authorization of all water uses, watercourse diversions, and construction and operation of water conveyance infrastructure. SGC has assumed issuance of a Type A Water Use Licence in early 2014 to allow for Stage 2 Construction (to commence after spring freshet) and Operations phases of the Project.

Stage 1 Construction will commence prior to receipt of a Type A Water Use Licence and therefore will not include the following:

- Use of water in addition to what is allowed for by licences currently held by SGC
- Watercourse crossings including pipelines, bridges and roads in addition to what is allowed for by licences currently held by SGC
- Watercourse training in addition to what is allowed for by licences currently held by SGC
- Flood control in addition to what is allowed for by licences currently held by SGC
- Diversions in addition to what is allowed for by licences currently held by SGC
- Alteration of flow or storage by means of dams or dikes in addition to what is allowed for by licences currently held by SGC
- Deposit of waste in addition to what is allowed for by licences currently held by SGC

4.2 PLACER MINING ACTIVITIES

As described above, SGC currently holds a Type B Water Use Licence for Placer Undertakings and a Class 4 Operating Plan for Placer Mining. SGC is planning to engage in placer mining activities beginning post freshet 2013.

On February 19, 2013 SGC submitted a Project Proposal to YESAB to request amendment to the existing placer mining licences. The requested amendment includes additional mining areas and slightly expands the geographic scope of work eastward in the Dublin Gulch valley. Please see YESAB Project Number 2013-0030 for additional details regarding placer mining activities. The amendment does not include any additional watercourses outside of the Dublin Gulch catchment.

Although not within the scope of this construction plan nor included in SGC's application for a Quartz Mining Licence, the spatial extent of placer mining activities will overlap with Stage 1 Construction activities. Specifically, Stage 1 Construction includes the clearing, grubbing, and bulk earthworks in the Dublin Gulch

valley to allow for the construction of the Phase 1 of the HLF pad, HLF Embankment, and Dublin Gulch Diversion Channel (DGDC). Therefore placer mining operations will occur in this area prior to construction of these facilities but will be active during clearing, grubbing, grading, excavation and bulk earthworks.

Placer mining activities will include the temporary diversion of Dublin Gulch, Eagle Pup, Ann Gulch and Suttles Gulch.

The overall scope of work for placer mining activities currently permitted and under review includes:

- Construction of settling ponds in the lower section of Dublin Gulch which will also act as supply reservoirs for the wash plant
- Diversion of Dublin Gulch to access pay gravels on north areas of Dublin Gulch valley downstream of the confluence of Dublin Gulch and Ann Gulch
- Re-establishing the flow path of Dublin Gulch in mined area after mining is complete
- Diversion of Eagle Pup into Dublin Gulch channel and subsequent dewatering of Eagle Creek to access pay gravels on the south eastern areas of Dublin Gulch Valley
- Diversion of Eagle Pup and Dublin Gulch channels into a new channel in the mined area to access pay gravels on the north eastern areas of Dublin Gulch valley

The geographic extent of placer activities in the Dublin Gulch valley is represented by Figure 4.2-1. For consistency this figure includes Quartz Mining facilities and infrastructure to indicate the spatial overlap of the placer activities with the Eagle Gold (Quartz Mining) Project.

Placer mining operations will commence in 2013/14 and temporarily divert these watercourses which will allow for Stage 1 Construction activities associated with the HLF Embankment and Pad (Phase 1) to commence without further diversion of watercourses prior to receipt of a Type A Water Use Licence. Upon approval of a Type A Water Use Licence, Dublin Gulch will be permanently diverted into a constructed diversion channel that conveys non-mine influenced water around the HLF and embankment and into Eagle Creek which accounts for the primary Fish Habitat Compensation Area and eventual discharge into Haggart Creek.

4.3 EROSION AND SEDIMENT CONTROL

The objective of erosion and sediment control measures during Stage 1 Construction will be to minimize erosion and sediment mobility by limiting precipitation runoff contact with disturbed areas, re-establishing temporary vegetation cover and stabilizing disturbed land surfaces. This will be achieved by establishing diversions up-gradient of work areas to minimize overland runoff from contacting work areas, establishing collection ditches at the down-gradient extent of work areas and routing any runoff to infiltration basins for zero-discharge to watercourses.

Activities that have the potential to result in erosion during Stage 1 Construction include:

- Vegetation clearing and topsoil stripping
- Bulk earthworks
- Stockpiling of topsoil

- Management of ice-rich material
- Construction of roads and infrastructure

Sediment mobilization and erosion will be minimized by:

- Limiting the extent of the disturbance to the practical minimum
- Minimizing sediment concentration and build-up of runoff into streams across exposed ground surfaces by constructing and maintaining berms that divert rainfall-runoff or seepage from roads or construction pads into forested areas
- Progressively rehabilitating disturbed land and constructing drainage controls
- Installation and use of temporary measures (e.g. hay bales and silt fences) in designated areas.

Installation of temporary erosion and sediment control features and implementation of Best Management Practices (BMPs) will be the first step towards controlling erosion and sedimentation during construction. All temporary sediment and erosion control features will require regular maintenance and inspection after each significant rainfall. These temporary features will be reclaimed after achieving soil and sediment stabilization.

A Construction Sediment and Erosion Control Plan has been developed for the construction stages of the Project. The plan has been developed to proactively manage erosion and sedimentation throughout the construction of the Eagle Gold Project development and is appended to this Stage 1 Construction Plan (Appendix C). The Construction Sediment and Erosion Control Plan provides BMPs and site-specific methods to control erosion and sedimentation.

5 SITE PREPARATION

This section provides a general description of site preparation activities during Stage 1 Construction. Detailed descriptions of construction activities, methods and sequence are provided for each Project component in Section 6.

Site preparation activities during Stage 1 Construction include:

- Vegetation clearing and grubbing for infrastructure and mine site facilities
- Bulk earthworks
- Development of one or more construction borrow source sites
- Construction of gravel pads or concrete infrastructure foundations
- Preparation of reclamation material storage areas

5.1 VEGETATION CLEARING AND GRUBBING

Vegetation will be cleared as required from infrastructure and facility areas prior to earthworks and or construction activities. Clearing will done on an as needed basis sequentially to reduce erosion and sediment as well as permafrost degradation during construction. Figure 5.1-1 depicts the maximum extent of cleared area that will occur during Stage 1 Construction as part of site preparations.

Tree species that are present within the Project footprint include black spruce, white spruce, subalpine fir, aspen, and Alaskan birch. It is estimated that a volume of approximately 20,000 m^3 of timber will be available from areas cleared for Project activities. This includes approximately 15,000 m^3 of wood cleared during site construction and 5,000 m^3 of wood associated with clearing of the road and transmission corridor. Timber estimates have been prepared through use of the terrestrial ecosystem mapping created for the Project. Each mapping polygon within the mine clearing boundary was assigned a crown closure class (i.e., sparse, open, dense) and a timber salvage class. Timber volume classes were also assigned to each ecosystem type based on structure, crown closure and the salvage class. Volume was then calculated by multiplying the areas (ha) of the ecosystems to be cleared with a timber volume (m^3/ha) related to crown closure and salvage potential.

Trees will be cleared and harvested using best management practices and methods suitable to the terrain and timber size. The majority of timber will be harvested by mechanical methods. Hand falling (chainsaws) may be used in specific areas as required (i.e., steep slopes, riparian areas).

Construction of the Fish Habitat Compensation works will require the salvage of 500 large diameter logs with a diameter of between 25-40 cm that are between 4 and 5 meters in length and 50 large rootwads from these trees. This timber will be salvaged and hauled to the Fish Habitat Compensation area and stockpiled for use after an Authorization under Section 35(2) is received from Fisheries and Oceans Canada.

Timber not required for Fish Habitat Compensation Area construction will be removed from the cleared areas within the mine site, road, and transmission line corridor and placed in temporary piles. These temporary timber stockpiles on the mine site will be chipped or ground in-situ prior to hauling wood chips or mixed material to the

reclamation material storage areas on site. During the period of construction when grubbing and clearing of vegetation will take place along the access road and transmission line SGC will work with their contractors to, where logistically feasible, stockpile timber deemed appropriate for fuel wood. Upon completion of construction and/or when the SGC Manager of Health and Safety and / or Site Manager determines that is safe for the public to access the timber stockpiles, SGC will provide written notification to NNDFN and the village of Mayo so that interested parties may salvage timber for fuel wood. The notification will include driving directions or a map showing the location of timber stockpiles.

Timber and brush cleared from the mine site and not claimed for fuel wood from the access road right of way will be processed using standard methods including whole tree drum chippers, tub grinders or horizontal wood grinders. Mixed wood and topsoil feedstock will provide a blend of organic material that will be transported to the reclamation storage areas.

Topsoil and organic matter will be stripped and hauled to designated reclamation material storage areas. Further detail with reclamation uses for this material is provided in the appended Decommissioning and Reclamation Plan (Appendix D).

5.2 BULK EARTHWORKS

Bulk earthworks during Stage 1 Construction will include general cut excavation, rock blasting excavation, general fill, structural fill, screening and stockpiling of surfacing and concrete aggregate, and grading. General cut excavation shall include the excavation of roads, pads, embankment foundations, diversion channels, embankment abutments, placer tailings and placer material. General cut will include rippable rock, which is defined as material that can be ripped with a D10T track-type Tractor or equivalent. Non-rippable rock will be blasted using drilling and blasting followed by excavation. Blasted rock will be sized and stockpiled for rip rap.

Construction of infrastructure pads (crushers, process plant, camp, and administration buildings) will involve clearing the overburden soil and, if required, blasting the bedrock to the desired elevation. Gravel and broken blast rock fill will be used to extend the desired pad width and to grade the pad to the design elevation. The fill used to create the infrastructure pads will be placed and compacted to support foundations for buildings and equipment. Slope geometry for cut slopes are provided in Table 5.2-1 and Table 5.2-2.

General fill will be hauled and placed as required in suitable locations. Temporary, portable crushing and screening plant(s) will be located in the Dublin Gulch valley to produce suitable structural fill, surfacing aggregate and concrete aggregate to design specifications. Structural fill will be constructed in layers of uniform thickness and compacted to a desired unit density in a manner to control the compressibility, strength, and hydraulic conductivity of the fill. Structural fill will be produced via crushing and screening of excavated on site material. Surfacing and concrete aggregate will be sourced on site via multiple borrow sources, crushed screened, stockpiled and placed as required.

Estimated cut and fill volumes are provided in Tables 5.2-3 and 5.2-4. Quantities are based on previous geotechnical site investigations and are subject to change based on site conditions during construction. Design Criteria and Civil Drawings are provided in Appendix E and Appendix A respectively.

Table 5.2-1: Permanent Cut Slope Angeles – Area Specific

Area	Overburden		Slope Below Overburden		Comments [2]
	Thickness (m)	Steepest Cut Angle	Material	Steepest Cut Angle [1]	
Primary Crusher	2 - 4	2.5H:1V	Type 1, 2, 3 Rock	1.75H:1V	Preliminary Design FS = 1.5; maximum slope height ~107 m; slope angle controlled by dip of foliation at about 30 to 32 degrees; benched slope design recommended; 8 m maximum bench height; 13 m minimum bench width; 0.25H:1V bench face angle.
Temp – 100 d Storage Pad	3 - 4	2.5H:1V	Type 2, 3 rock	1.75H:1V	[3] Preliminary Design FS = 1.5; slope angle controlled by dip of foliation at about 30 to 32 degrees; minimum distance of 80 to 100 m required between slope crest and toe of haul road/crusher platform fill slopes. Benched slope design is recommended as detailed above for primary crusher.
Truck Shop	5 - 8	2.5H:1V	Type 3 rock	1.75H:1V	Preliminary Design FS = 1.5; maximum slope height = ~22 m; slope angle controlled by dip of foliation. Recommend 5 m wide bench at rock-overburden contact to contain potential slumping of ice-rich overburden and slope maintenance.
Plant Site	3 - 7	2.5H:1V	Highly to completely weathered rock	2H:1V	Preliminary Design FS = 1.5; maximum slope height ~35 m; Recommend 5 m wide bench at rock-overburden contact to contain potential slumping of ice-rich overburden and slope maintenance.
Dublin Gulch Diversion Channel	2 - 5	2.5H:1V	Till	2H:1V [3]	Preliminary Design FS = 1.5; maximum slope height ~28 m; maximum cut angle assumes that the cut slope is dry.

NOTES:

[1] Preliminary design factor of safety recommended will be re-evaluated by the engineer of record during the detailed design stage.

[2] Maximum overall slope angle in the slope materials below the overburden depth. Overall slope angle defined by the line that connects the toe of the slope with the slope crest at the rock-overburden contact.

[3] Recommended FS for the 100 d storage cut is 1.5 due to proximity to crushers and potential to undermine them in case of failure. FS = 1.3 could be considered when the cut is moved 80 to 100 m further from the crushers, however, the overall slope angle will still be controlled by the dip of the foliation and cannot be steepened significantly.

[4] Assumed groundwater level is greater than 6 m below existing ground surface.

Table 5.2-2: Permanent Cut Slope Angles – General

Slope Material	Maximum Cut Slope Angle [1]	Maximum Cut Slope Height	Notes
Colluvium	2.5H:1V	10 m	-
Till	2H:1V	10 m	-
Highly to completely weathered rock (excavatable)	2H:1V	10 m	-
Type 3 rock (generally excavatable)	1.5H:1V	10 m	May have to decrease to as flat as 1.75H:1V to avoid undercutting adverse geologic structure, if it is encountered
Type 2 rock (generally rippable)	1H:1V	10 m	May have to decrease to as flat as 1.75H:1V to avoid undercutting adverse geologic structure, if it is encountered
Type 1 rock (may require blasting)	0.5H:1V	10 m	May have to decrease to as flat as 1.75H:1V to avoid undercutting adverse geologic structure, if it is encountered

NOTES:

[1] Maximum cut slope angles assume the slope is <10 m high, unsaturated, and without adverse geologic structure. Site specific conditions will be assessed during construction by field engineer and may result in changes to cut slope angles as required.

Table 5.2-3: Estimated Cut and Fill Volumes - Road

Road (Haul or Secondary)	Width	Length	Top soil	Ice rich material	Rock Cut	General Cut	Total Cut	Total Fill
	(m)	(m)	(m^3)	(m^3)	(m^3)	(m^3)	(m^3)	(m^3)
Pit - Primary Crusher Haul Road	30	422	5,892	11,126	9,762	28,358	49,246	53,324
Truck shop – Pit Haul Road	30	2,151	26,026	12,545	30,259	266,027	308,831	201,529
Secondary Crusher Access Road	6	2,467	9,107	38,168	4,277	31,613	74,058	75,080
Conveyor RoW Secondary to Tertiary Crusher	26.25	132	1.118	4,686	0	1,908	6,594	7,941
Explosives Storage Facility Access Road	6	657	2,308	0	0	10,945	10,945	5,556
Magazine Storage Facility Access Road	6	329	1,011	0	0	2,232	2,232	3,319
Camp / Recreation Area Access Road	6	195	n/a	0	0	0	0	0
Process Building Access Road	6	745	2,982	12,572	0	9,979	22,551	6,091
Heap Leach Access Road – Phase 1	6	1,251	6,312	22,100	0	9,896	31,996	0
Laydown Area to Truck Shop Access Road	6	467	1,761	7,373	0	0	7,373	0
Secondary Access to Truck Shop/Laydown from Access Road	6	645	3,567	14,935	0	9,265	24,200	26,309
Waste Storage Access Road	8	195	1,005	0	0	2,236	2,236	2,664
Haggart Creek Road	8	23,000	16,480	0	0	15,400	15,400	14,100

Table 5.2-4: Estimated Cut and Fill Volumes – Facilities

Pad	Elevation	Area	Top Soil	Ice rich material	Rock Cut	General Cut	Total Cut	Total Fill
	(masl)	(m^2)	(m^3)	(m^3)	(m^3)	(m^3)	(m^3)	(m^3)
Primary Crusher	1027.2 - 1050.0	26,500	5,301	9,994	159,427	82,776	252,197	9,736
Secondary Crusher	1008	9,433	1,887	3,545	17,045	65,529	86,119	28,050
Tertiary Crusher	986	9,166	1,833	3,470	5,062	17,918	26,450	15,756
Explosives Storage Facility	932	13,062	2,612	0	0	21,448	21,448	17,100
Magazine Storage Facility	942	8.843	1,769	0	0	38,492	38,492	4,737
Waste Storage Facility	809	7,100	2,434	0	0	11,690	11,690	10,640
Truck Shop Pad	855	60,100	12,020	34,681	4,00	102,231	140,912	14,717
Laydown Area Pad	820	90,649	18,130	0	0	13,906	13,906	157,333
Camp / Recreation Area	811	54,613	10,923	0	0	89,179	89,179	89,650
Process Building, Detox Area, Assay Lab, and Water Treatment Plant	860	40,637	8,127	5,752	0	155,218	160,970	45,582
Substation	790	14,577	2,915	17,071	0	31,564	48,635	1,248
100-day Storage	953-990	222,400	44,480	148,648	0	1,558,022	1,706,670	727.945
Dublin Gulch Diversion Channel	847	136,925	27,482	111,000	n/a	356,847	521,254	6,770

5.3 BORROW

Bulk earthworks during Stage 1 Construction will require multiple material types that meet specific geotechnical criteria. Construction materials will be sourced from available placer spoils, overburden, silt borrow pits and rock excavations located on site and from the access road alignment as required.

5.3.1 Borrow Requirements

In the summer of 2011, field investigations in support of geotechnical recommendations for mine site infrastructure were completed (BGC 2011a and 2012a). That work involved the excavation of ninety-six test pits, drilling forty-six test holes (29 diamond drillholes and 17 auger holes), and mapping of fifty-nine outcrops (natural exposures, existing road cuts and drill pads cuts) to characterize subsurface conditions relevant for foundation and earthworks design. Samples were taken from selected test pits and drillholes for index testing of soil and rock. Bulk samples of rock and placer tailings were also analyzed for a range of parameters related to the potential for re-use as select fill or aggregate. Downhole and surface geophysical investigations were completed, and plate load tests were conducted at selected locations of proposed building and equipment foundations.

Borrow material types and estimated quantities (estimated conservatively high) required for the Project include the following.

Silt

These are fine-grained fills used as a barrier for chemical and physical migration of fluids. Preliminary design criteria for silt liner materials will contain a minimum of 35% passing the No. 200 sieve and be free of all deleterious materials including oversize clasts of 75 mm or greater, frozen soils, and organics.

It is estimated that approximately 128,000 m^3 of silt/fines will be required during construction. Of this total, approximately 7,500 m^3 of silt/fines will be required for heap leach pad liner construction during Stage 2 Construction.

Rock Fill

Rock fill can be classified as one of two types: 1) that derived from strong rock, yielding durable rock fragments larger than gravel size and containing sand and gravel with minimal fines when excavated/blasted; and, 2) that derived from weak, fissile rock, generating non-durable rock fragments. The first type may be placed and compacted as a rock fill in 1 m lifts, whereas the second type placed and compacted in thinner lifts, with watering and compaction similar to that required for an earth fill.

For the purpose of this Plan, rock fill has been divided into two categories - durable rock fill; and, non-durable rock fill - each with different anticipated engineering properties, sources, and placement and compaction requirements. Most of the meta-sedimentary rock excavated at the site near surface will yield non-durable rock fill. Relatively un-weathered granodiorite from the pit area, and quartzite from the hornfels aureole around the granodiorite intrusion, are expected to yield durable rock fill.

It is estimated that a total of 2,000,000 m^3 of durable rock fill and 1,100,000 m^3 of non-durable rock fill will be required. Of this total, approximately 2,000,000 m^3 of rock fill will be required for the HLF embankment.

Structural Fill

Structural Fill is an engineered soil material placed and compacted for use beneath lightly to moderately loaded structures to provide a uniform bearing surface with tolerable movements under load through the life of the structure.

Materials that do not satisfy the specifications for structural fill may be used as structural fill in specific applications, at the discretion of a qualified geotechnical engineer. For example, locally excavated weathered rock that contain more than 8% fines may serve as structural fill provided compaction objectives can be met and drainage/frost susceptibility issues are less important, e.g., used only at depth in thick fills.

It is estimated that approximately 2,170,600 m^3 of structural fill will be required.

General Fill

General Fill is an inorganic granular material used for general site grading, thermal insulation cover and/or protection of pipes, or similar applications. General fill will be compacted to yield a stiff surface and will not be used for support of settlement-sensitive structures.

It is estimated that 2,392,100 m^3 of general fill for various earthworks structures, including pond berms, building pads and similar structural applications will be required.

Grading Fill

This is a soil material used as an intermediate layer between in-situ soil or rock subgrade and higher quality engineering materials above, such as road base, for example. Any granular material that can be placed and compacted to 95 % MPMDD to provide a uniform bearing surface may be suitable for this purpose. Selected materials should have a maximum particle size of 150 mm. Oversize materials may be screened out, or can be removed from the surface of placed materials by hand. Suitable materials would include materials identified as suitable for structural fill or general fill, and may include local colluvium.

It is estimated that approximately 75,000 m^3 of grading fill will be required.

Rip rap

Riprap consists of cobble and boulder size rock fragments, typically angular or sub-angular as derived from blasting or crushing, and is used as a protective barrier from erosion and scour due to water currents and/or ice. Material should consist of hard, durable rock fragments free from splits, seams or defects that could impair its soundness. Thicknesses of riprap layers typically vary from 1.0 to 1.5 times the maximum rock size. Riprap is typically specified by the median particle size, D50. Additional grain size criteria may be presented if the riprap needs to be either well graded or uniformly graded, depending on the specific application.

It is estimated that approximately 13,000 m^3 of rip rap will be required.

Drainage Material

This is an open or gap-graded granular material intended for allowing free drainage of fluids to pipes and/or seepage collection systems. Drainage material should consist of crushed or uncrushed screened rock or gravel free of fines and flat, elongated particles. Grain size requirements depend on the specific drainage application.

It is estimated that approximately 49,000 m^3 of drainage material will be required.

Filter/transition Material

Filters are a transition zone material used for preventing soil migration due to fluid flow between granular materials, and/or between rock fill and finer silt and clay layers. Filter material gradations are generally designed based on the specific material gradations that they will transition. Filter materials can be derived from rock excavations or gravel borrow areas, and may require crushing, screening and/or washing to attain the necessary gradations.

It is estimated that approximately 65,000 m^3 of drainage material will be required.

Concrete Aggregate

Concrete aggregate includes fine and coarse aggregate meeting CSA A23.1 specifications for designing and proportioning concrete mix. Aggregates can be derived from crushed durable rock or gravel such as placer tailings.

It is estimated that approximately 10,000 m^3 of coarse concrete aggregate and 7,000 m^3 of fine concrete aggregate will be required.

Road Base and Surfacing Material

This is an engineered material, consisting of a well-graded, hard, durable, sand and gravel or rock. Material should be free of flat and elongated pieces.

It is estimated that approximately 175,000 m^3 of road base will be required.

Heap Leach Pad Overliner Material

The heap leach pad will include a protective layer of crushed gravel over the primary liner and solution collection piping system, known as the heap overliner. The overliner drain layer, approximately one meter thick, should consist of free-draining granular material with 38 mm maximum particle size and a maximum of 5% fines passing the No. 200 ASTM sieve size (0.075-mm). The material should be free of organic matter and soft, friable particles in quantities acceptable to the geotechnical engineer. It is estimated that approximately 420,000 m^3 of heap overliner material will be required for Phase 1.

5.3.2 Borrow Sources

SGC and predecessor companies involved with development of quartz mining at Dublin Gulch have engaged in numerous and extensive site investigations which have examined subsurface conditions at the locations of proposed mine site infrastructure, using a variety of field and laboratory techniques. Given the presence of discontinuous permafrost in the area, close attention was given to observing and describing frozen ground in all of these investigations, including observations of excess ice where encountered. These investigations have resulted in reasonably accurate volume estimates of borrow sources and ice-rich material throughout the Project site.

Site subsurface conditions observed at the Project site prior to 2012 have been described in several reports as follows:

- Report on 1995 Geotechnical Investigations for Four Potential Heap Leach Facility Site Alternatives, First Dynasty Mines, Dublin Gulch Property. (Knight Piésold, 1996a).

- Report on Feasibility Design of the Mine Waste Rock Storage Area, First Dynasty Mines, Dublin Gulch Property. (Knight Piésold, 1996b).
- Field Investigation Data Report, Dublin Gulch Project, New Millennium Mining. (Sitka Corp, 1996).
- Hydrogeological Characterization and Assessment, Dublin Gulch Project, New Millennium Mining. (GeoEnviro Engineering, 1996).
- BGC Engineering Inc. 2009. Site Facilities Geotechnical Investigation Factual Data Report. Eagle Gold Project, Victoria Gold Corporation.
- Stantec. 2011. Project Proposal for Executive Committee Review. Pursuant to the Yukon Environmental and Socio-Economic Assessment Act. Eagle Gold Project, Victoria Gold Corp. June 2011.
- BGC Engineering Inc. 2011a. 2010 Geotechnical Investigation for Mine Site Infrastructure, Factual Data Report. Eagle Gold Project, Victoria Gold Corporation.
- BGC Engineering Inc. 2011b. Eagle Gold – Borrow Evaluation Report, Project Memorandum, April 21, 2011; Appendix 34 in Stantec 2011. Eagle Gold Project, Victoria Gold Corporation.
- BGC Engineering Inc. 2012a. 2011 Geotechnical Investigation for Mine Site Infrastructure, Factual Data Report. Eagle Gold Project, Victoria Gold Corporation.
- BGC Engineering Inc. 2012b. 2012 Geotechnical Investigation for Mine Site Infrastructure, Factual Data Report. Eagle Gold Project, prepared for Victoria Gold Corporation, December 2012.

Sources of borrow material have been identified via previous geotechnical investigations. Available data and terrain analysis suggests approximately 500,000 m^3 of silt is available on the east side of Haggart Creek, close to the mine site and within the current Project footprint. Sufficient silt material will be available within the site boundaries to satisfy the needs of the Project.

The required quantities of rock fill can be sourced from the open pit area, and from the excavation of cuts for major facility platforms (i.e., plant site, crushers, and ore stockpile).

The remaining construction materials can be derived from other local sources, including placer tailings and overburden stripped during mine development. Some processing will be required to manufacture select materials, including crushing, screening and/or washing. Some of the placer tailings are suitable for use as concrete aggregate.

Borrow sources include:

- Silt near the proposed laydown area
- Sand, gravel and a variety of material types from the historic placer tailings in the Dublin Gulch and Haggart Creek valleys
- Rock that will be removed from the open pit area prior to commercial mining operations, Ann Gulch, and an area of intrusive rock referred to as the Steiner zone near the proposed locations of the Temporary (100 day) Ore storage pad and secondary site road from the truck shop to the crushing facilities.

The sources and approximate volumes of borrow materials are listed in Table 5.3-1. Borrow material sources are depicted in Figure 5.3-1. Borrow sources from placer tailings are shown on Figure 5.3-2.

Table 5.3-1: Summary of Borrow Material Availability

Borrow Source	Material Types	Estimated Volumes (in situ volumes, except where noted)	Comments
Open Pit Pre-Strip	Durable rock fill Non-durable rock fill Concrete aggregate Heap overliner Rip rap	Very large.	Source consists of weathered granodiorite and weathered silicified metasedimentary rock (i.e. typically quartzite). Materials to be sourced prior to mining activities. Most near surface weathered rock suggests majority of excavated block size of approximately 100-300 mm. Larger block size for rip-rap may be possible.
Ann Gulch Central Knob	Non-durable rock fill	Up to approximately 900,000 m^3	None
Steiner Zone	Durable rock fill Non-durable rock fill Concrete aggregate Heap overliner Rip rap	Up to approximately 200,000 m^3	Assumes quarry depth of 5 m.
Dublin Gulch Placer Tailings	General Fill Structural Fill Concrete Aggregate Heap overliner Rip rap	Approximately 2.0 million m^3	Material types from placer tailings are highly variable, and will require processing through screening, crushing, and/or washing to develop the required material specifications. Oversized materials (> 75 mm) screened from the tailings may be suitable for use after crushing, as heap overliner, or concrete aggregate.
Haggart Creek Placer Tailings	General Fill Structural Fill	Approximately 750,000 m^3 available above the elevation of Haggart Creek.	Rip rap is expected from the screened oversize material; however the quantity of 500-600 mm particles is expected to be small.
Silt Borrow	Silt liner	Approximately 220,000 m^3	Available silt materials are frozen and ice-rich, and will require thawing and drying prior to use.

5.3.3 Geochemical Characterization of Construction Materials

SGC contracted SRK to characterize the metal leaching and acid rock drainage (ML/ARD) potential of materials that will be used as borrow sources or excavated during construction of site roads and other infrastructure. Details of the methods used to characterize borrow sources are provided in the SRK 2013 Report, *Geochemical Characterization of Proposed Excavation Areas and Borrow Sources from the Eagle Gold Project*, appended to this Stage 1 Construction Plan (Appendix F) which is summarized here.

Samples representing the excavation and borrow areas were selected for testing from a set of samples collected from test pits and drill holes in 2011 by BGC Engineering Inc. as part of the geotechnical investigation for the Project. Additional road and borrow samples were collected by SGC site staff in July 2012. Where possible, road sampling was completed at existing exposures to limit the disturbance of woodland environments. In all cases, the sampling objective was to determine the potential for ML/ARD in materials that may be used for construction purposes in the future.

SRK assessed the acid rock drainage (ARD) potential of the samples using the following criteria:

- Where the total sulphur content was less than 0.02% (corresponding to an acid potential (AP) of 0.6 kg $CaCO_3$ eq/t), the samples were classified as non-reactive.
- Where the total sulphur content was greater than 0.02%, and the NP/AP ratio or TIC/AP ratio was greater than 3, the samples were classified as non-potentially acid generating (non-PAG).
- Where the total sulphur content was greater than 0.02% and the NP/AP or TIC/AP ratio was between 1 and 3, the samples were classified as having an uncertain potential for ARD.
- Where the total sulphur content was greater than 0.02% and the NP/AP or TIC/AP ratio was less than 1, the samples were classified as potentially acid generating (PAG).

The total sulphur cut-off of 0.02%, used to define non-reactive samples in this classification scheme is considered highly conservative, particularly given that many of these samples were surficial material that have been exposed to air and water throughout their geological history.

Detailed sample descriptions are found in SRK (2013). Table 5.3-2 provides a summary of results according to material type and ARD classification.

Table 5.3-2: ARD Classification for Each Group of Samples

Group	Number of Samples	ARD Classification (% of Samples)						
		Non-Reactive S <0.02%	Non-PAG		Uncertain		PAG	
			NP/AP	TIC/AP	NP/AP	TIC/AP	NP/AP	TIC/AP
Site Roads	34	76%	9%	0%	12%	3%	3%	21%
Placer Tailings	19	63%	5%	16%	21%	16%	11%	5%
Excavation Areas (surficial materials)	14	57%	29%	21%	7%	21%	7%	0%
Excavation Areas (rock)	5	20%	40%	20%	20%	20%	20%	40%

In total, 72 samples were collected and analyzed for this study, including 32 from the proposed site roads, 19 from placer tailings and alluvium borrow sources, and 19 from potential cut and fill (excavation) areas. Most of these samples (n=66) were from surficial materials, five were from meta-sedimentary bedrock, and one was from a granodiorite outcrop.

The paste pH for the samples ranged from 4.6 to 8.6 (median values of 6.6). The samples typically had low sulphur and low NP and TIC levels. This is in contrast to the characterization work from the deposit area that states NP in the form of carbonate minerals was present in modest amounts throughout the deposit area. Based on having a sulphur content of <0.02%, 65% of samples were considered non-reactive. For the remaining samples, based on NP/AP or TIC/AP ratios, 7 to 14% were PAG, 11 to 14% had an uncertain potential for ARD, and 10 to 14% were non-PAG.

The majority of these samples represent surficial materials such as soils, weathered bedrock (colluvium), or gravels (alluvium or placer tailings). These differ from blasted rock from rock quarries or mine workings because their particle surfaces have already been exposed to air and water. Therefore, whether these remain *in situ* or

are moved to a new location, they will continue to weather and oxidize at rates comparable to current weathering rates, which are quite slow.

In addition, it is likely the sulphides present in these materials were largely encapsulated within larger gravel to cobble size particles and would be unavailable for reaction. The result of moving these materials and using them for construction is not expected to result in any change relative to their current locations. In other words, while 7 to 14% of samples are PAG, and an additional 11 to 14% are classified as having an uncertain ARD potential, these materials still pose a relatively low risk for ARD potential and are considered suitable for use as construction material.

There were five meta-sedimentary rock samples taken from proposed excavation areas, and one granodiorite sample from one existing site road. Three of the meta-sedimentary samples and the one granodiorite sample were non-reactive or non-PAG, while two of the meta-sedimentary samples were PAG by either or both NP/AP ratios and TIC/AP ratios. Although the volumes of rock that would need to be excavated within construction areas are expected to be relatively small, these results indicate excavations within the meta-sedimentary rock unit will need to be monitored for ARD potential. Monitoring methods are described in the Construction Phase Environmental Monitoring Plan (Appendix L).

Where present, materials with elevated sulphide content will be managed. Because of the low proportion of this type of material, such material can be diluted with construction rock material where excess NP from the majority of the rock material would be sufficient to maintain neutral pH conditions.

Solid-phase metal analyses were also completed on borrow and excavation samples. Metals that showed consistent enrichment across the data set were silver, arsenic, and bismuth. To a lesser extent, enrichment was also seen in lead, gold, cadmium, antimony, potassium, and tungsten. SRK 2011 identifies those same metals, but also indicates elevated concentrations of manganese, uranium, copper, fluoride, molybdenum, nickel, and zinc may also be present in seepage from waste rock storage areas and pit walls. However, elevated concentrations of these last eight metals are not observed in the current sample set, likely reflecting differences in the geology (i.e., predominantly granodiorite versus meta-sedimentary rocks), increased distances from the ore mineralization, and weathering processes already occurred in the surficial materials.

5.4 OVERBURDEN MANAGEMENT

The topography of the Property area is characterized by rolling hills and plateaus and is drained by deeply incised creeks. The ground surface is covered by colluvium, weathered rock, and felsenmeer. Outcrops are rare - generally, less than two percent of the surface area, and are limited to ridge tops and creek walls. Lower elevations are vegetated with black spruce, willow, alder and moss, and higher elevations by sub-alpine vegetation.

Construction will require the management of various types of overburden including organic top soil, colluvium, weathered metasedimentary and granodiorite bedrock, durable rock, placer tailings (poorly sorted cobble to silt materials), silt, and ice-rich permafrost.

5.4.1 Ice-Rich Overburden

The Project will be constructed and operated in a region of widespread discontinuous permafrost. Previous geotechnical investigations have confirmed the sporadic presence of frozen ground, some of which contains

excess ice (i.e. “ice-rich”) that will require some level of management depending on ice content during construction.

An ice-rich materials management plan has been developed to support Stage 1 and Stage 2 Construction (BGC 2013, included as Appendix G). The plan provides the sources and estimated volumes of topsoil and ice-rich materials.

Project design has been optimized to minimize disturbance of ice-rich soils during construction, and ice-rich materials that are excavated will be drained and dried and re-used as much as possible. The excavated ice-rich materials will derive from several different lithological units, including till, colluvium, alluvium and weathered rock. These materials vary in grain size and natural moisture content, or ice content. Difficulties in handling thawing ice-rich materials will vary depending primarily on grain size and ice content. Coarser soils, like sand and gravel, will tend to drain more freely on thawing, and will thus be less difficult to handle than finer soils, which will drain more slowly, and retain excess pore pressures, and lower strength, for longer periods.

The ice-rich material estimate was made on the basis of functional areas within which construction activities and site conditions are expected to be relatively similar. Table 5.4-1 lists the estimated ice-rich material volumes by functional area that will be removed during the first year of construction. The total amount of ice-rich material estimated to be excavated during Stage 1 construction is 369,000 m^3.

Table 5.4-1: Amount of Ice-Rich Material Removed During Stage 1 Construction

Functional Area	Volume (1000 m^3)
Heap Leach Pad Phase 1	67
Heap Embankment	26
Upper DGDC	6
Middle DGDC	105
Events Pond and Lower DGDC	0
Crushers	28
Plant Site	6
Truck Shop	35
DG South Pond	66
Haul Road Truck Shop to Pit	13
Laydown Area	17
TOTAL	369

Ice-rich material will be generated in Stage 2 Construction and the first year of operations due to continued development of the HLF phases resulting in an expected additional volume of 235,000 m^3 and 165,000 m^3 respectively. To ensure adequate storage is available throughout both construction stages, a conservative estimate was provided that includes a total quantity of approximately 1,000,000 m^3 of ice-rich material generated during site development which will require management, assuming a swell factor of 1.3.

Materials requiring long-term storage will be hauled to the proposed Haggart Creek ice-rich overburden storage area as presented in the Ice-rich Materials Management Plan (Appendix G). Ice-rich overburden will be hauled

to the storage area in conventional haul trucks while it is in a frozen state. This requires that a limited amount of ice-rich material can be excavated and in-situ permafrost exposed at any one time. This also requires that only contractors experienced and familiar with the handling of permafrost be used. Ice-rich overburden with up to 10% excess ice may be managed on site either by blending with other suitable non ice-rich material or in situ where the soils are free draining. The construction management team will be responsible for identifying and directing the management of ice-rich soils.

The Haggart Creek ice-rich overburden storage area will be capable of storing 1,170,000 m^3 of ice-rich material, assuming placement behind a containment berm at a nominal grade of 15H:1V. It is therefore intended that the Haggart Creek ice-rich overburden storage area will receive all the ice-rich material generated during site development, with allowance for a significant contingency for unexpected ice-rich materials. A proposed additional ice-rich overburden storage option located in Suttles Gulch will be used as contingency in the event that quantities of excavated ice-rich materials are greater than expected. If necessary, the Suttles Gulch ice-rich overburden storage area will be capable of storing 263,000 m^3 of ice-rich material. Based on estimated total quantity of ice-rich overburden that will be excavated for the Project, the requirement to develop the Suttles Gulch facility is considered unlikely.

5.4.2 Non Ice-Rich Overburden

As described, bulk earthworks during Stage 1 Construction will require multiple material types that meet specific geotechnical criteria. Construction materials will be sourced from available placer spoils, overburden, silt borrow pits and rock excavations located on site and from the access road alignment as required. Top soil will be salvaged and transported for storage at reclamation material stockpiles in the Dublin Gulch valley for reclamation purposes.

Non ice-rich overburden produced by construction will be transported for use as fill for cut/fill balance in excavation areas and/or an area for screening and temporary storage for construction material. The material will be further processed (crushed or screened) and used as engineered fill where this is required. An area within the northeast reclamation material stockpile area will be utilized for non-ice-rich overburden management. This area will include a screening plant, crusher plant, bins and feeders along with portable transfer and stacking conveyors. The area will be used to process materials and temporarily store them by material type. Screened materials will then be used in various construction applications. Borrow material types stored in this location include rock fill, silt, general fill, rip rap, road base and resurfacing material, concrete aggregate etc. as described in Section 5.3.1.

5.5 FOUNDATIONS

Buildings will be founded on horizontal conventional spread footings or other mass concrete foundations constructed below the maximum estimated 3 m depth for frost protection, or be insulated by sufficient backfill or appropriate insulation materials. Buildings should be set back a minimum of 10 m from the crest of fill slopes. Conveyor foundations will be constructed on bed-rock, if appropriate, or on concrete-filled steel pipe piles socketed into rock.

Figure 5.5-1 depicts the concrete foundation work to be completed in Stage 1 Construction. Table 5.5-1 provides the estimated concrete required for each facility / infrastructure foundation. Concrete sections and details are provided in Appendix A.

Table 5.5-1: Concrete Requirements – Stage 1 Construction

Functional Area	Volume (m^3) Concrete	Volume (m^3) Lean Concrete
Camp (modular building footings)	58	0
Solid Waste Storage Area	267	10
Sub-Station	1,000	0
Crushing Facilities	7,275	107
Conveyor Footings	915	50
ADR Process Plant and Reagent Storage	4,461	236
Cement and Lime Silos	84	10
Assay Lab	357	0
Process Shop Warehouse	298	0
Administrative Building	357	0
Mine Water Treatment Plant	900	0
Fuel Storage	131	0
Truck Shop	2,105	138
Explosives / Magazine Storage	222	50
Dublin Gulch Diversion Channel	0	4,000
Miscellaneous	3,382	30
TOTAL	21,812	4,631

It is estimated that the following quantities of concrete materials will be required:

- Portland Cement – 2,862 m^3
- Coarse Aggregate - 10,079 m^3
- Fine Aggregate - 7,178 m^3
- Water – 4,230 m^3
- Admixture – 257 m^3
- Air Content – 1,322 m^3
- Reinforcement – 513 m^3

A concrete batch plant consisting of a bulk storage silo, cement weigh batcher, twin shaft mixer, controls and motor control center, water weigh batcher and holding tank, mixer charging conveyor, aggregate feed system and generator will be located at the site of the future landfill. Sumps will be constructed to contain all concrete wash water to ensure zero discharge to watercourses.

The primary crusher will be located on Type 1 rock sub-grade. The secondary and tertiary crushers will be located on Type 2 rock sub-grade. Conveyors from the tertiary crusher to the HLF will be placed on bents on concrete sleepers some of which may be precast. The head and tail conveyor sections will be placed on Type 2 sub-grade with allowable bearing pressures of 400kPa. Portable and stacking conveyors on the heap leach pad will not require foundations.

Rock type definitions and allowable bearing pressures for ancillary facilities are provided in Table 5.5-2 and Table 5.5-3, respectively.

Table 5.5-2: Rock Type Definitions

Rock Type	Weathering Grade	Intact Rock Strength	GSI - RMR76 - RQD*	Core Recovery	Comments
3	W4 or better for all rock types 1, 2 or 3	> R0, i.e. UCS ≥ 1 MPa for all rock types 1, 2 or 3	N/A	N/A	It is expected that Type 3 rock can be excavated with normal excavating equipment.
2			GSI or RMR76 ≥ 30; OR RQD ≥ 10	≥50% for rock types 1 or 2	It is expected that Type 2 rock will require ripping.
1			GSI or RMR76 ≥ 40; OR RQD ≥ 40		It is expected that Type 1 rock may require blasting.

NOTE:
(*) RQD criterion can be used on the absence of Geological Strength Index (GSI) or Rock Mass Rating 1976 (RMR76).

Table 5.5-3: Allowable Bearing Pressures for Ancillary Facilities

Bearing Stratum	Allowable Bearing Capacity (kPa)	
	Up to 2 m x 2 m Pad Footing	Up to 2 m x 20 m Strip Footing
Structural Fill[1]	250	150
Highly to Completely Weathered Rock	250	150
Type 3 Rock	500	300
Type 2 Rock	1,000	600
Type 1 Rock	1,500	1,000

NOTES:
[1] Footings founded on structural fill require a minimum of 1.5 m of embedment (depth of bottom of footing below surrounding grade) to obtain the indicated allowance bearing capacity. Separate consideration of frost protection may be necessary.

Concrete designs will reflect local ground bearing conditions with footings sized as required.

6 CONSTRUCTION PLAN

This section provides a description of Project facilities and infrastructure followed by a description of construction activities. To provide a clear understanding of construction sequencing, construction activity descriptions are provided for Stage 1 (2013-2014) and Stage 2 (2014 - 2015). Additional permits required prior to works are listed where required with anticipated application and issuance timelines.

6.1 CAMP

The current exploration camp consists of modular buildings and accommodates 100 people. During Stage 1 Construction, the existing exploration camp will be expanded using modules to accommodate an additional 100 people. Modular trailers will be leveled on cribbing, assembled into building units and skirted. The expanded camp will include a kitchen, recreation and exercise facilities which will be connected to the accommodation and kitchen trailers via arctic corridors. The overall site general arrangement (Figure 1.1-1) depicts the camp facilities including the existing exploration camp, new modules, solid waste storage area, helipad and incinerator.

During Stage 2 construction, the camp will be expanded again to accommodate up to a total of 400 people using similar modular units connected by enclosed walkways. Once Stage 2 construction is complete in 2015, the construction camp modules will be removed to allow for accommodation of up to 250 people and the remaining accommodations will be refurbished for use during operations.

6.1.1 Power

Electrical power for the 200 man camp is supplied from two 0.3 MW diesel generator units currently installed adjacent to the existing advanced exploration camp. One of these units is in operation while the second is used for back–up. An additional 0.3 MW diesel generator unit will be required when the camp capacity reaches 400 people. These units will be removed once construction is complete and permanent power is supplied to the site.

6.1.2 Potable Water Treatment

During Stage 1 Construction, potable water usage will remain within the limits permitted by the Type B Water Use Licence QZ11-013 of up to 35 m^3/day.

A potable water treatment plant will be located near the camp and water will be pumped from nearby existing wells. Water for the camp will be sourced from ground wells and pumped to the fresh water storage tanks in the camp. It is expected that the water usage for the camp during construction will be approximately 300 L per person per day for a total of 120,000 L per day at peak capacity. Water will be purified by a packaged treatment unit located in a trailer adjacent to the camp. The packaged treatment unit will be suitable to treat up to 300 L/person/day.

6.1.3 Sewage

Currently sewage from the advanced 100 man exploration camp is pre-treated in a modular Membrane Bio-Reactor (MBR) wastewater treatment plant housed in a refurbished shipping container which is insulated and

heated for year round use. Grey and black water is pumped into flow equalization tanks prior to digestion in anoxic tanks. The anaerobic treatment is followed by aerobic treatment and finally the water passes through a membrane reactor. The membrane reactor utilizes a fixed growth bacteria process whereby bacteria are grown on a media surface that is rotated into and out of the wastewater. The treated wastewater flows through separate zones each with a progressively higher standard of treatment. The media on which bacteria grow are engineered plastic disks made from grid extruded medium density polyethylene material with UV light inhibitors. The grid pattern promotes oxygen transfer into the wastewater. The system digests sludge efficiently as a result of the process design. The sludge remains in the primary settling tank during normal operation and will be pumped out every six to nine months depending on the influent total suspended solids level. Currently, the sludge is pressed to remove additional liquids resulting in sludge cake production of approximately 0.04 m^3 per day that is disposed of at the Mayo sewage lagoons operated by the Village of Mayo. The effluent produced by the unit is discharged into an equalization holding tank prior to discharge to a conventional below ground tile field. The MBR is able to process in excess of 35 m^3 of waste water per day and when operating at that level produces approximately 570 L of sludge from the treatment process.

Sewage from the expanded camp used during Stage 1 Construction will not be treated using the methods described above prior to receipt of the Type A Water Use Licence. In the interim during Stage 1 Construction, grey and black water will be pumped into holding tanks, and trucked to the Mayo sewage lagoons for disposal and treatment. Sewage discharge to ground from the existing advanced exploration camp will remain within the limits permitted by the Type B Water Use Licence QZ11-013, which includes sewage produced by up to 100 individuals.

Upon receipt of the Type A Water Use Licence and approval from Yukon Government Environmental Health Services, sewage from the permanent camp will be treated via a conventional septic tank and below ground tile field. Details for this septic system expansion will be provided via an updated General Site Plan to support Stage 2 Construction and application for a Type A Water Use Licence.

6.2 HELIPAD

A helicopter landing site will be located adjacent to the camp area to provide emergency air access/egress if necessary. The helipad will include a windsock for wind direction reference and be located over 100 meters from the camp and any other facilities or infrastructure.

6.3 SOLID WASTE STORAGE AREA

The non-hazardous solid waste storage and transfer facility will be located adjacent to the camp accommodations. The facility is located downwind of the prevailing wind direction from the north/northwest and will be at least 200 m from camp accommodations. Non-hazardous solid wastes will be stored in dedicated, commercially available skips or bins. Putrescible waste and waste that will attract wildlife will be stored in commercial bear-proof containers. These containers will have robust hinges with secure lids and bear-proof locking mechanisms. In addition, the solid waste storage facility will be surrounded by an electric fence, which will be used during times when bears are most active.

The solid waste storage area will include a dual chambered industrial incinerator and ash bin. Bottom ash from the incinerator will be disposed of in the on-site landfill area. The incinerator will incinerate household waste

generated on site, including putrescible waste, domestic waste, hydrocarbon-contaminated absorbent pads, and some industrial wastes. Recyclable materials, bio-medical wastes and other special wastes will be removed from the incinerator waste stream and be disposed of via methods described by the special waste management plan or recycled off site. Office and dormitory garbage bins will be emptied daily by cleaning staff and transferred to bear proof containers located in the solid waste storage area. Putrescible waste from the camp kitchen facilities will be placed into the bear-proof containers by kitchen staff. Putrescible waste will not be stored for a period of greater than seven days prior to incineration.

The solid waste storage and transfer facility will be constructed on a concrete pad. The pad will have berms and be sloped to contain potentially contaminated run-off within the storage facility. The facility will be designed to safely contain:

- Non-hazardous wastes from the camp accommodations, offices and operational areas
- Putrescible waste in bear-proof containers
- Non-hazardous recyclable materials in dedicated recycling bins
- Incinerator and ash bin

SGC personnel and contractors handling wastes will be trained on the segregation of wastes during storage within the solid waste storage facility. The types of containers used will be matched to the types of wastes to be stored prior to being transported to the Mayo waste disposal facility.

Additional details regarding operation of the solid waste storage area and incinerator and waste management methods are provided in the Solid Waste and Hazardous Materials Management Plan (Appendix H).

6.4 LANDFILL

Non-putrescible, inert, non-hazardous waste not incinerated will be transported to an on-site landfill area. The landfill will be used throughout the life of the Project and will be operated in a manner that will facilitate landfill closure at the cessation of operations.

The landfill area is a flat cleared area with cells for the burial of material and has been located according to the siting requirements for Commercial Dumps provided by Environment Yukon (November 2011). The landfill area is not located on permafrost, and meets setback requirements outlined by Environment Yukon. The landfill will contain a sea-can container to temporarily house waste generated by contractors and/or operations personnel until it is segregated for either incineration or off-site disposal or recycling.

A sign at the entrance to the landfill will list conditions for use, emergency contacts and procedures, and items that may not be disposed of within the facility such as: batteries, special (hazardous) wastes, acids, corrosives, solvents, oily wastes, explosives, or unsterilized medical waste. As per *Environment Act* Permit 4201-43-061, a gated electric exclusion fence will surround the landfill and will be operational from May 1 to October 31 to prevent wildlife from entering the encompassed areas of the site. If there are tracks or other signs of dangerous wildlife attempting to access the landfill, the fence will be activated between November 1 and April 30.

6.5 LAND TREATMENT FACILITY

A land treatment facility will be constructed for the progressive treatment and remediation of hydrocarbon contaminated soils as and when required. The land treatment facility will be located adjacent to the land fill area and will consist of two cells that are 10 m by 10 m each. If soil permeability in the facility is greater than 10^{-5} cm/s, a geomembrane liner will be installed and covered with fine grained gravel or soil to temporarily store and land farm contaminated soil. The area will be leveled and sloped such that run-off from the area can be contained and treated prior to release to the receiving environment. Snow will be removed prior to spring freshet to prevent excess runoff from the facility. Runoff from the facility will be collected in a sump and treated via an oil water separator in the sump prior to discharge to ground.

Hydrocarbon contaminated soils will be stored within the land treatment facility and remediated by regular tilling (aeration) and standard northern bioremediation practices. The construction of dual cells will allow the treatment of contaminants in cell 1 while soils are added to cell 2, with remediation treatment in summer months only. Contaminated soils will be tested for hydrocarbons prior to treatment and will be tested for F1/F2/F3/F4 (one test per 50 cubic meters). Application of fertilizer and water will be 1kg fertilizer per ton and 100 L of water per ton (water content may vary depending on moisture content of the contaminated soils). Aeration of hydrocarbon soils mix will introduce oxygen to facilitate reaction - aeration will occur every two weeks - testing of contaminated soils every 4 weeks. Once the material has been remediated to meet *Yukon Contaminated Sites Regulations Numerical Soil Standards for Industrial Land Use*), SGC will obtain approval from Environment Yukon to remove the material from the treatment facility for re-application as required around the Project site.

6.6 SPECIAL WASTE STORAGE AREA

Special wastes are defined as any waste requiring special handling, storage, or destruction and prescribed as special waste by *Yukon Special Waste Regulations*, regardless of whether the waste has any commercial value or is capable of useful purpose (e.g., waste oil burning for heat). For the purposes of this plan, special wastes and hazardous wastes are used interchangeably.

Hazardous materials will be recycled, re-used, recovered, or consumed to the extent economically and logically feasible. Hazardous wastes are defined as residual hazardous materials, whether in their original form or different material state/mixture. Hazardous wastes will be contained in purpose built containers prior to disposal.

Special wastes will be temporarily stored at separate dedicated facilities located at the Project site. During Stage 1 Construction, all special wastes will be temporarily stored at the truck shop and within the first aid room (biomedical wastes). During Stage 2 Construction and Operations, additional special waste storage areas will be constructed and operated as required. Special wastes generated during Stage 1 Construction will include:

- Waste Oil
- Used Filters
- Waste Diesel
- Waste Antifreeze
- Waste Solvents and Lubricants

- Used Lead Acid Batteries
- Aerosol Containers
- Biomedical Wastes

Special wastes, as defined by the *Yukon Special Waste Regulations* (batteries, antifreeze, solvents), will be collected and stored in specially marked and dedicated containers until shipment to an appropriate treatment or disposal facility.

The Solid Waste and Hazardous Materials Management Plan describes the management of hazardous wastes during all phases of the Project including Stage 1 Construction (Appendix H).

6.7 ACCESS ROAD

The Project is located northeast of Mayo, Yukon. Approximate driving distance to the Project site from Mayo is 85 km. Access to the Project site from the Silver Trail (Highway 11), will be via the existing South McQuesten Road (SMR) and the Haggart Creek Road (HCR). Together, the SMR and HCR comprise a 45 km road, which is divided by the South McQuesten River. The section of the road between the Silver Trail and the South McQuesten River is referred to as the SMR (km 0 to 22.9), whereas the section of the road between the river and the mine site is referred to as the HCR (km 23 to 45). Both roads are public roads, regulated under the Yukon *Highways Act*; however, the SMR is maintained during summer only by the Yukon Government Department of Highways and Public Works (HPW), whereas the HCR is considered a “public unmaintained” road.

The following upgrades are planned for the HCR during Stage 1 Construction:

- Upgrade from the existing one to two lane (depending on location) unimproved resource road to a two-way single-lane radio controlled resource access road
    - Construction of pullouts approximately 100 to 300 m along the grade to allow vehicles moving in opposite directions to pass each other and for vehicles to stop if necessary
    - Signage at the Silver Trail turnoff and South McQuesten River to describe road use protocol for drivers accessing the mine site as well as for the general public
    - Signage along the road, including kilometre markers visible from both directions and speed limit signs.
- Right of way clearing 15 m on each side of road centerline to increase site sight lines for the safety of the vehicles as well as to allow more light and air movement to reach the road surface to aid in the melting or drying of the road bed to obtain a longer season or reduced down time
- Drainage improvements
    - Installation of new and maintenance of the existing ditching along the roadway to ensure the road bed does not become saturated with ground water
    - Repair and replacement of damaged or undersized culverts as well as the installation of additional culverts in selected areas to improve the drainage of the road bed.

- Establishment of a uniform crown of 3%
- Where required, importing fill and raising the road grade through select areas
- Manufacture and installation of 100 mm surfacing gravel throughout the length of the HCR
- Minor realignments for safety improvements
- Construction of a gravel parking area at the South McQuesten River for recreational users as requested by the FNNND

Further detail regarding access and site road construction may be found in the Road Construction Plan (Appendix I).

6.8 SITE ROADS

A network of site roads will be constructed throughout the mine site. Site roads will include mine haul roads and secondary access roads. Further description of site road construction is provided in the Site Road Construction Plan (Appendix I). Figure 6.8-1 depicts the site roads to be constructed.

Haul roads will be approximately 31 m wide and gravel-surfaced. Clearing and grubbing for the site haul roads will begin pending receipt of the Quartz Mining Licence, followed by topsoil excavation and road base and surfacing construction. The duration of haul road construction is estimated to be 60 days for the excavation of 358,000 m^3 of material and placement of approximately 255,000 m^3 of material over a length of 2.5 km.

Secondary site roads will generally be 6 to 8 m wide gravel-surfaced roads. The road sub-base and base requirements will be governed by the quality of the subgrade; overall road thickness is expected to be approximately 1 m. The roads will be constructed with a maximum road grade of 10%.

The total length of secondary roads is approximately 7 km, involving the excavation of approximately 176,000 m^3 and placement of approximately 119,000 m^3 of material.

6.9 POWER SUPPLY AND DISTRIBUTION

The transmission line will be connected to the existing Mayo to Keno 69 kV transmission line at the Silver Trail Highway (Highway 11) and will follow the South McQuesten Road to the crossing of the South McQuesten River; and then along the Haggart Creek Road to the new substation at the mine site. The approximate total length of the proposed line route is 44 km.

The proposed 69 kV line will be of similar design to the 69 kV transmission lines connecting the Mayo Hydro power plant to Keno and Dawson City. The materials to be used shall be per Canadian Standards Association (CSA) standards and suitable for conditions in the Yukon Territory north of Mayo and in the vicinity of Eagle Gold Project area. The design is in accordance with CAN/CSA-C22.3 No. 1-06 standards, Alberta Electrical Utility Code, Yukon Energy's requirements, and the industry practices in North America.

Stage 1 Construction will include clearing of the Transmission Line RoW and the setting of the poles. Clearing and setting of some of the poles may be carried out during the winter season, depending on ground conditions, to allow the access of equipment. The foundations for the high voltage substation on the site will be poured during Stage 1; however, the substation will not be constructed until Stage 2. SGC and Yukon Energy are in

discussions to ensure that Yukon Energy will make the necessary upgrades to the Yukon energy grid in order to provide the required power to the site prior to production.

6.9.1 69 kV Utility Power Supply and 69 kV Site Substation

Power will be provided from a new tap point on the existing Yukon Energy 69 kV transmission line between Mayo and Keno. From the new tap point, approximately 44 km of a 69 kV wooden pole overhead line will be constructed parallel to the access road, to the on-site 69 kV substation.

The fenced site 69 kV substation will contain an incoming structure and isolation switches, a main circuit breaker, provision for utility metering, and bus work to deliver 69 kV power to two-step down transformers, each with a primary circuit breaker and isolating switches. The transformers will deliver power to a secondary substation, which will provide 25 kV power via overhead lines to the pit, crushing, processing plant and other local facilities. A filtered capacitor bank connected to the 25 kV bus will provide power factor correction. Three 1.5 MW emergency generators connected to the 25 kV bus will provide back-up power.

6.9.2 Site Power Distribution

Large-capacity power loads will be serviced by pad-mounted transformers and dedicated electrical buildings housing switchgear, motor control centres (MCCs) and control systems equipment. Small-capacity power loads will be serviced by pole-mounted transformers and electrical and control equipment installed in rooms within the administration, camp and other buildings, or in outdoor-rated enclosures.

6.9.2.1 25 kV

Power will be distributed through the site at 25 kV via two overhead power lines. One power line will run towards the camp and processing facilities, the other will run to the truck shop, pit and crushers. Step-down transformers will be provided near major loads to step the voltage down to the utilization level required.

6.9.2.2 4160 V

Large motors such as crushers, barren and pregnant solution pumps and large conveyors will be fed from 4,160 V. This voltage will also be used for distribution to local 600 V MCCs via transformers.

6.9.2.3 600 V

Low voltage motor control centres, switchboards and panels will be provided as appropriate. Process loads are powered via 600 V MCCs which are located close as reasonable to the associated equipment.

6.9.3 Back Up Power

Three 1,500 kW, 4,160 V, standby rated diesel generator sets will be provided at the 25 kV outdoor substation. Voltage is stepped up to 25 kV for distribution throughout the facilities by a step up transformer. Generators perform two functions, they:

- provide voltage support during large motor starting
- provide standby power to the following critical loads:

- heat tracing
- barren solution pumping
- pregnant solution pumping
- carbon regeneration kiln motor
- acid area sump pump
- fresh water distribution pumping
- buildings such as the administration complex and camp.

6.9.4 Annual Site-wide Power Demand

The power supply infrastructure is designed to operate at full capacity, year-round. However, a number of processing-related equipment units will not operate during the coldest period of winter (approximately December 1 to March 10). Accordingly, power consumption will vary seasonally.

Power consumption will also increase over the LOM, as the size of the HLF increases over its two expansion phases, requiring greater pumping and conveying capacity.

Table 6.9-1 outlines the estimated summer and winter energy demand through the various phases.

Table 6.9-1: Estimated Energy Consumption

Phase	Summer Consumption (kWh)	Winter Consumption (kWh)	Annual Consumption (kWh)
Construction	291,197	291,197	3,504,000
Years 1 to 4	11,273,634	4,932,342	114,751,166
Years 5 to 6	12,697,902	6,356,611	131,889,535
Years 7	12,832,581	6,491,290	133,510,135
Years 8+	13,383,403	7,042,111	140,138,227

6.9.5 Route Selection Criteria

The following assumptions and criteria have been adopted during the conceptual overhead transmission line route selection process:

- The 69 kV wood pole transmission line will generally be located along the existing and the new road alignment. The parts of the transmission line RoW may overlap with portions of the road's RoW.
- The transmission line route shall be designed so that the best combination of safety, environmental protection, site access, and economic cost are achieved.
- The transmission line poles shall be placed outside the Desirable Clear Zone (DCZ), as defined by *Roadside Design Guide* issued by Alberta Infrastructure and Transportation. For road design speeds below 90 km/h and Average Annual Daily traffic fewer than 750 vehicles, the minimum distances from

the edge of the driving lane to the pole will be in the range of 2.5 m to 5.5 m. The DCZ shall be increased at outside road curves.

- The minimum vertical clearances between road surface and bottom conductors of the 69 kV transmission line shall be 9 m. This clearance is based on the measurement of Mayo – Keno 69 kV line height above Silver Trail Highway. If the mine owner determines that the higher vehicles and loads will be present, the road crossing clearances shall be increased by the amount that the vehicles and loads' height exceeds 5.3 m.
- The minimum vertical clearances alongside roads and in areas unlikely to be travelled by road vehicles shall be 6.1 m.
- In accordance with Yukon Energy practice the width of RoW for the 69 kV transmission line will be 60 m.
- The clearing width within the 69 kV transmission line RoW will normally be 30 m (i.e., 15 m from centerline). Danger trees outside the clearing width will be removed as well.
- The transmission line RoW will not cross cultural or archaeological sites.
- Zones of permafrost, steep slopes and wetlands shall be avoided if possible.
- Terrains of limited stability (e.g. permafrost, steep slopes, or wetlands) will be given special attention. Where possible, longer spans and special foundations will be used.

Key measures to protect fish and fish habitat applicable to the conceptual design stage include:

- Locate the transmission line alignment to avoid or minimize the number of watercourse crossings required. Avoid running the alignment parallel to a watercourse.
- Locate the transmission line to minimize the complete removal of riparian vegetation within 30 m of top of bank or high water mark (HWM).
- A minimum distance of 15 m from the transmission line structures to the HWM or top of bank of any watercourse shall be maintained.
- Design and construct approaches so that they are perpendicular to the watercourse wherever possible to minimize loss or disturbance to riparian vegetation.
- Avoid building structures on meander bends, braided streams, alluvial fans, active floodplains, unstable slopes, or any other area that is inherently unstable and may result in erosion and scouring of the stream bed.
- Locate all temporary or permanent structures, such as poles, sufficiently above the HWM to prevent erosion.
- If necessary, special structures will be designed and placed so that any watercourse will be crossed with a single span.

6.9.6 Transmission Line Design Criteria

The design criteria adopted for the conceptual design of 69 kV Transmission Line and its components are as follows:

- The minimum design requirements that are most important to the: a) safety of persons; b) continuity of service; and c) protection of property shall be as specified in CSA C22.3 No. 1-06 Overhead Systems.
- Design life of the line for reliability considerations is 50 years.
- Design life of the line for calculation of power losses is 8 years.
- The line will be a single circuit, three-phase overhead transmission line.
- The approximate length of the transmission line is 44 km.
- Maximum power to be transmitted is 16.8 MW.
- The rated capacity of the conductors shall be calculated for conditions specified in Clause 3 of CSA C22.3 No. 1-06 Overhead Systems. The conductor elevation above sea level is assumed to be 700 m.
- Lightning performance— Several 69 kV lines in the area operate satisfactory without shield wire. No shield wire is required for the new line.
- Conductor galloping has not been observed on existing lines in the area and will not be considered in the design of the new line.
- Insulator leakage distance shall be determined based on IEC 60815—Guide for the Selection of Insulators in respect to polluted conditions. Pollution level light shall be selected for the complete line length. It will be determined during detailed design if the higher pollution level has to be adopted for Dublin Gulch area.
- Weather loads and assumed loads according to deterministic design methods shall be as specified in CSA C22.3 No. 1-06 Overhead Systems. The loading conditions for combined wind and ice shall be for a Heavy Loading Area, as specified in Table 30 of the standard. The loading case of extreme wind and the loading case of extreme ice shall be considered in accordance with Yukon Energy practice in the area. The minimum temperature for the line design is assumed to be -65° C.
- The load factors for the structures shall be as specified in CSA C22.3 No. 1 -06, Table 31 ‘Minimum load factors for non-linear analysis of structures’. The Construction Grade 2 shall be adopted for the complete transmission line length.
- The load factors for the line components other than structures shall be as specified in CSA C22.3 No. 1-06.
- The minimum clearances will not be less than those specified in CSA C22.3 No. 1-06 and in the Alberta Electrical Utility Code. The clearances shall be increased as required by Yukon Energy specifications.
- Normal soil conditions prevail along the proposed line route; there are smaller swampy zones, slopes, outcrop rocks and zones of localized permafrost. Geotechnical information will be available at a later stage.

- The applicable codes and standards to be used in the design of particular line components have been referenced in relative sections of this document.

Conductors

The transmission line overhead bare conductors will be concentric-lay-stranded aluminum conductor steel reinforced (ACSR). The applicable standards are:

- CSA C61089:03—Round wire concentric lay overhead electrical stranded conductors
- CSA C60888:03—Zinc-coated steel wire for stranded conductors
- CSA C60889:03—Hard-drawn aluminum wire for overhead line conductors.

For the transmission line from the Silver Trail Highway to Dublin Gulch a 266.8 kcmil ACSR conductor code name “Partridge” is proposed. The conductor on the existing Mayo to Keno 69 kV line is ACSR 1/0 code name “Raven” and has smaller current carrying capacity then ACSR “Partridge”.

Voltage drop in the transmission line has been estimated assuming that a maximum of 16.8 MW power is transmitted to Dublin Gulch and a total of 3 MW power is transmitted to Elsa and Keno. Taking into account the resistance of the conductor and estimated reactance of the transmission line, preliminary calculations show that under normal operating conditions voltage drop on the transmission line to Dublin Gulch will be around 10%. Detailed calculations including consideration of reactive power control will be done at a later stage of the project.

The corona discharge, radio, and audible noise during line operation will be well below allowable limits. The proposed conductor is of sufficient mechanical strength to withstand the assumed weather loadings. It is not likely that the conductor vibration dampners will be necessary. A proper consideration of wind induced conductor oscillations will be done during the detailed design stage.

Insulators and Fittings

The following types of insulators shall be used:

- Composite vertical line-post insulators or porcelain vertical line-post insulator or porcelain pin type insulators will be used on tangent pole type TP3 and light angle pole type TP15. These insulators will also be used as the conductor jumper supports at dead end poles.
- Composite suspension insulators will be used to dead-end the conductors on pole types FD45, VD90 and FD90. These insulators shall also be used as running angle insulators on pole type VS45. As an alternative to these insulators, the strings of five disks of porcelain or glass insulators can be used.
- Glass suspension insulators can be used to support outer phases. This will ease the line maintenance in areas where vehicle access is difficult.

The standard fittings for connecting conductors to insulators, insulators to structures, and conductors to conductor shall be selected so that electrical and mechanical requirements for the safe operation of the transmission line are satisfied.

The applicable standards are:

- CSA C411.1-M89 – AC Suspension Insulators

- CSA C411.4-98 – Composite Suspension Insulators for Transmission Applications.
- CSA C83-96 – Communication and Power line Hardware
- CSA-C57 – 98 (R2006) – Electric Power Connectors for Use in Overhead Line Conductors
- NEMA ANSI C29.6:1996 (R2002) – Wet-Process Porcelain Insulators-High-Voltage Pin Type
- NEMA ANSI C29.7:1996 (R2002) – Porcelain Insulators-High Voltage Line-Post Type
- NEMA ANSI C29.17:2002 – Insulators – Composite-Line Post Type.

Transmission Line Structures

The 69 kV structures will consist of single wood poles. Pole types and arrangements are shown in Appendix A – Project Figures and Drawings. Photo 6.9-1 shows a typical tangent pole and Photo 6.9-2 shows a typical running angle pole. If long crossing spans are required, double wood pole H frames can be used. All wood pole types except tangent pole type TP3 shall be guyed. Pole type TP3 shall also be guyed, if set in crib foundation on permafrost.

The material, manufacturing and class dimensional requirements of wood poles shall meet the requirements of CSA O15-05 Wood Utility Poles and Reinforcing Stubs. The preservative treatment of poles by pressure processes shall be in accordance with the CSA O80 series of standards.

Either or both laminated wood and steel cross-arms will be used. Steel “V” braces shall be used to stabilize horizontal position of cross-arms. The details of pole hardware will be determined during final design stage. Pole guy wires shall meet the requirements of CAN/CSA-G12-92 (R2007) Zinc-Coated Steel Wire Strand. Guy markers shall be installed as per requirements of CSA C22.3 No 1-06 Overhead Systems. All guys will be equipped with guy guards as per Yukon Energy’s EMS manual.

Average span between two poles will be about 95 meters. However, longer spans will be required at crossings of wetlands and rivers. The pole height above ground will typically vary between 9 m and 14 m for tangent pole type TP3. The poles with vertical configuration of conductors will be higher; for example, the height of pole type VS45 can vary between 13 m and 19 m.

Pole Foundations and Guy Anchors

The design of pole embedment methods and pole foundations will be selected in accordance with the soil conditions and the applied loads. Typical foundation outlines are given in the drawings 149-T-DD-SK1 Sheets 6 to 9 (Appendix A).

The standard embedment method for good bearing soils is to set the pole into an augured hole or a backhoe excavation with compacted backfill. The standard embedment depth is 10% of the pole length plus 2 ft.

Pole foundations in poor soil will include installation of corrugated steel pipe in the top soil layer and gravel backfill. For pole foundations in marshy soil, a drum filled with stones or concrete will be installed at the bottom of the hole and the top will be filled with crushed rock.

Special attention will be given to pole setting in permafrost zones. Any unnecessary disturbance of permafrost shall be avoided. Where practical a slurried pile foundation shall be installed. Three to four layers of polyethylene film will be wrapped around the pile in the active layer to break the adfreeze bond between the pile

and the permafrost. Where drilling is impractical or the active layer is too deep, pole crib foundations can be used. Such foundations normally require that the pole be anchored with at least two side guys. Regular adjustment of pole verticality is required as part of maintenance operations.

Generally, two types of guy anchors will be used. Wood log type anchors will be placed against the undisturbed side of an excavated hole and connected to an anchor rod. The hole shall be backfilled and compacted. Minimum depth of log placing shall not be less than 1.5 m and will be determined depending on the soil type and the loadings on anchor. Cross plate anchors will be installed in holes drilled by power diggers. The hole can be drilled by the same auger that is used to drill the pole holes. The hole is undercut so that the cross plate anchor can be placed at a right angle to the guy. An anchor rod slot is drilled with a small auger or cut with a trenching tool. After installation of the anchor and the anchor rod, the main hole and the anchor rod slot are backfilled and tamped. Typical guy anchor outlines are given in Drawing 149-T-DD-SK1 Sheet 10 (Appendix A).

Photo 6.9-1: Typical Tangent Pole

Photo 6.9-2: Typical Running Angle Pole

6.9.7 Transmission Line Route

Silver Trail to the South McQuesten River Crossing

The proposed line route starts near the junction of South McQuesten Road and Silver Trail. The line then crosses the two roads and runs north-west to join the South McQuesten Road near kilometer 1.02. From this point the line route closely follows the existing road. This line segment is located on relatively flat or slightly undulated ground with occasional wet and swampy zones. It has been estimated that there is about 20%

permafrost in this route segment. Where possible, the line RoW overlaps a part of the road RoW so that tree clearing is minimized.

South McQuesten River Crossing to Project

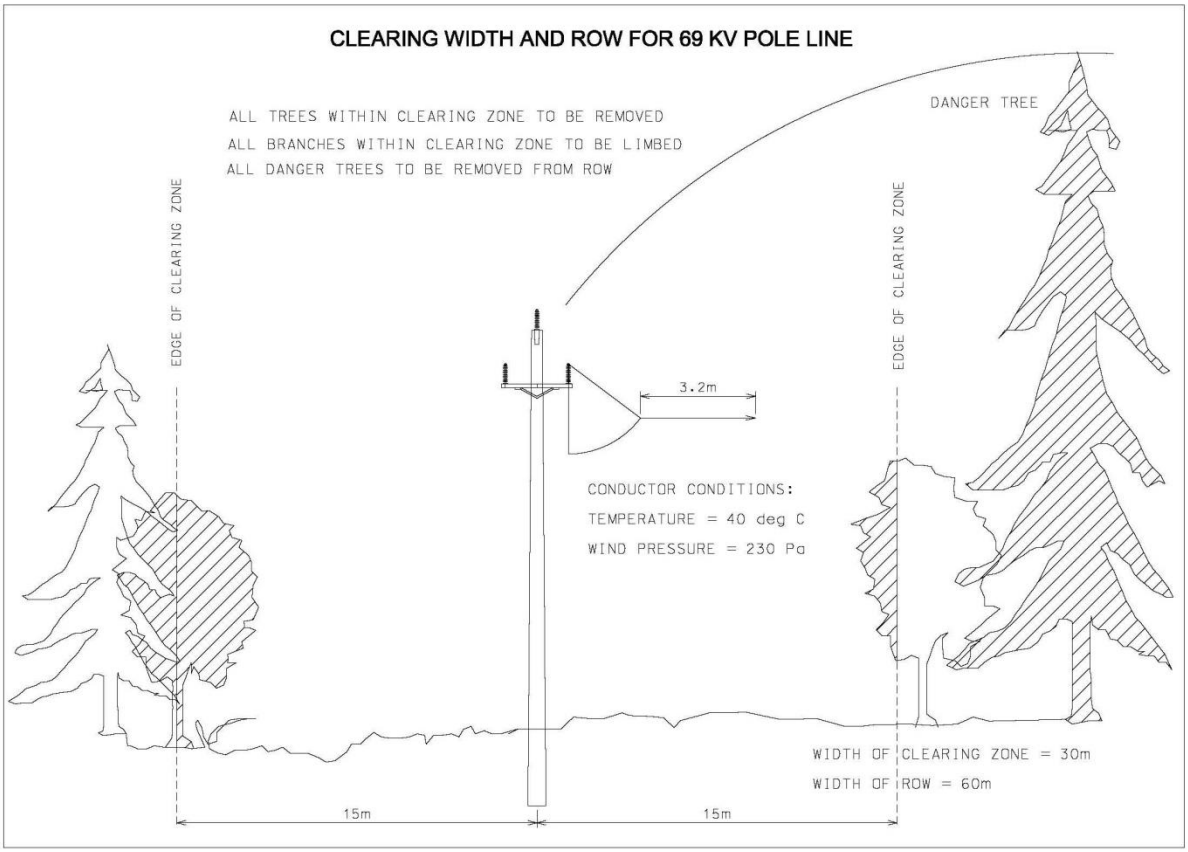
The section of the proposed route near the South McQuesten River Bridge is swampy. The river crossing will need a long span to keep the structures out of the flood plain. The rest of the line is located close to the road and generally away from Haggart Creek, which runs parallel to the line. The modifications and realignments of the road have been taken into account in the line route proposal. Bedrock near the ground surface has been observed in many spots close to watercourses. There are signs of permafrost in the section of the line route approaching the mine site.

6.9.8 Right of Way Requirements

The RoW width has been determined to ensure that there is a safe clearance between vegetation and man-made objects and the transmission line. The clearances between the live parts of the transmission line and other objects shall be maintained under still air conditions and when conductors are in position of swing under 230 Pa wind pressure. The typical clearing width and RoW cross section for the 69 kV transmission line is shown in the diagram below.

Before installation of the transmission line, a 30 m wide strip inside the RoW will be cleared of all shrubs and trees. Danger trees within the RoW shall also be cut. No tree shall hit or come within flashover distance of any part of the transmission line. The RoW shall be kept cleared during the service life of the transmission line.

The safe limits of approach distances from the transmission line shall be as specified in the Alberta Electrical Utility Code. In order to minimize tree cutting, where possible, the overhead transmission line is located within the RoW of the road. Therefore, the majority of the transmission line overlaps with the tree-clearing zone of the road.



Typical Clearing Width for Transmission Line ROW

6.9.9 Construction

Transportation of transmission line materials and equipment from Mayo to lay down areas will be by Silver Trail Highway, South McQuesten Road and the road along Haggart Creek. The RoW of the transmission line is very close to the road and it will be possible to reach many pole locations using existing trails and cleared RoW. Where access is not available, new access trails will be made to reach the RoW between difficult slopes or between stream crossings. It will be necessary that vehicles with rubber tires, crawler tractors, and truck mounted construction equipment will have access to most of the pole locations. An all-weather road and drainage will be built as a permanent access to the substation.

Tree clearing and brushing will typically be done by mechanized equipment. A mechanical feller buncher is mounted on crawler tractors to cut trees up to 20 cm in diameter. If the work is done during the frozen ground period, this method will cause minimal ground disturbance. Chainsaws and skidders will be used to remove salvageable timber in dense forest zones. Further clearing can be done by bulldozers and excavators. Hand clearing with chainsaws will be employed in rugged terrain and near the rivers and streams in riparian areas.

The survey crew will stake the pole locations and guy positions before the start of foundation excavation works. The contractor will transport poles, hardware, fittings, insulators, conductors and construction materials from the marshaling area to the identified pole locations on the line RoW. Trucks with a loading crane are normally used

for transport of line materials to site and tandem axle truck and trailers are used for hauling of poles. The pole structures are assembled on site.

Typical transportation tools and equipment used between the marshaling area and the pole locations include:

- Tandem axle trucks and trailers for transportation of wood poles
- Fork lifts
- Trucks 6 x 6 with loading crane
- Pickup trucks and crew cabs for crew and tools
- Crawler tractor
- Helicopter (if required).

Foundation holes will be excavated using small backhoe excavators or diggers with an auger. The pole structure will be lifted and set down in the hole using a crane or backhoe. Before backfilling the hole, the pole will be checked for proper verticality and alignment. The poles at angles, junctions, and terminal locations shall be set and raked against the strain so that the conductors are in line. Pole backfill is thoroughly compacted in full depth. Guy anchors and guys are then installed for the angle and dead-end poles.

Following the erection of the structures, specialized linemen crews will string the conductor. Large diameter pulleys (conductor sheaves) will be attached to the pole crossarms or suspension insulators along the entire stringing section. Conductor reels will be mounted on reel stands, loaded onto a trailer, and the conductor will be pulled from the reels and fed through the sheaves along the stringing section. The sagging operation can start after all the conductors are strung in one section.

Using a sagging winch, the individual conductors are pulled up to the proper design tension. The conductors will be sagged in accordance to a sag chart which considers the conductor type, the length of span, and the prevailing temperature. After the conductor is sagged correctly it is tied to the insulators or fixed into the insulator clamps as per construction drawings.

During the final inspection, the inspectors shall ensure that all debris has been removed and that the transmission line has been constructed in accordance with the approved drawings and specifications.

6.9.10 Substations

Substation design is in accordance with generally accepted and approved design standards such as established by the Canadian Standards Association, the Institute of Electrical and Electronics Engineers Standards Association (IEEE) and the Alberta Electrical Utility Code, which are consistent with current industry practice in North America.

A substation preliminary design is included as part of the electrical engineering work. The substation will include the following main equipment and related components:

- Dead-end structure designed to terminate the 69kV transmission line slack span
- 69kV main disconnect switch

- Station lightning arrester
- 69 kV Trans-Rupter for transformer protection
- Power transformer 12/15MVA, 69/13.8 kV
- Miscellaneous protection equipment, cables, connectors and associated hardware.

The substation details and interconnections to 13.8 kV switchgear and diesel generators are shown on electrical Drawing 10, SKE-001 (Appendix A).

A preliminary footprint of the proposed Eagle Gold Mine substation is estimated to be 25 m by 20 m and will be fenced, gated and locked. The substation will have a layer of crush stone. The proposed substation layouts are included in Appendix A.

Substations will be vendor-supplied units, supported on a conventional concrete foundation. Electrical rooms will be supported on concrete slab-on-grade with thickened portions to suit loading requirements. Transformers will be supported on concrete mat footings with containment areas and divider walls.

The fenced site 69 kV substation will contain an incoming structure and isolation switches, a main circuit breaker, provision for utility metering, and bus work to deliver 69 kV power to two-step down transformers, each with a primary circuit breaker and isolating switches. The transformers will deliver power to a secondary substation, which will provide 25 kV power via overhead lines to the pit, crushing, processing plant and other local facilities. Substations will be located at these locations where transformers will further step down the voltage to 4160 & 575 volts. A filtered capacitor bank connected to the 25 kV bus will provide power factor correction.

6.9.11 Site Power Distribution

Large-capacity power loads will be serviced by pad-mounted transformers and dedicated electrical buildings housing switchgear, MCCs and control systems equipment. Small-capacity power loads will be serviced by pole-mounted transformers and electrical and control equipment installed in rooms within the administration, camp and other buildings, or in outdoor-rated enclosures.

Site power distribution systems will not be constructed / installed during Stage 1 Construction. Details regarding site power distribution construction will be provided in the Stage 2 Construction plan as part of application for Quartz Mining Licence.

6.10 RECLAMATION MATERIAL STOCKPILES

Reclamation material stockpiles will be required for the storage of topsoil and organic material that is generated during construction for the purposes of progressive reclamation during operations, and final reclamation of the entire Project site at closure. The storage locations are sufficient in size to contain the soil volumes required for reclamation of Project facilities either progressively during operations or post closure.

The following areas will require the construction of an engineered cover to reduce net precipitation infiltration and mitigate potential effects to water quality via seepage from closed facilities:

- Heap Leach Facility

- Eagle Pup WRSA
- Platinum Gulch WRSA

The recommended reclamation cover design for these facilities calls for a cover that is 0.5 m thick consisting of two layers; a 0.3 m thick layer of 1/3 colluvium and 2/3 placer tailings and a 0.2 m thick layer of topsoil to enable re-vegetation.

The following sites will be covered with 0.2 m thick layer of topsoil at closure to assist with revegetation:

- Perimeter of the Open Pit (stripped)
- Temporary - 100 Day Ore Storage Pad
- Camp and Laydown Area
- Process Facility Area
- Truck Shop Area
- Substation and Guard House Area
- Explosives Facilities Area
- Crushing and Conveyance Facilities
- Lower Dublin North Pond
- Lower Dublin South Pond

The site access roads, diversion ditches and passive treatment systems are not included in the material estimate for the reclamation storage areas because these facilities are not expected to require additional material to be hauled for reclamation.

Selection of the stockpile locations has taken into account:

- Volume of soil to be stored
- Topography
- Avoidance of natural drainages
- Haulage distances
- Sufficient distance from mine Project activities to avoid dust contamination.

During site preparation activities trees will be cleared, chipped and wood chips will be transported to the reclamation material stockpiles for storage. Brush and organic material/vegetative mats will be cleared and mulched with top soil. Timber and brush will be processed using standard methods including whole tree drum chippers, tub grinders or horizontal wood grinders. Mixed wood and topsoil feedstock will provide a blend of organic material that will be transported to the reclamation storage areas for storage.

Soils will be stripped in a single lift, resulting in a mixture of organic surface litter materials and other vegetative materials, organic enriched mineral soil horizons, and underlying parent material.

During long term storage of soil (i.e., greater than two years) much of the nutrient content in the soil becomes depleted. Soil nutrient conditions will initially be poorer due to disturbance of the nutrient-rich litter layers. However, this situation will be ameliorated through fertilizer application and use of nitrogen fixing plant species in the re-vegetation prescriptions. SGC will implement a number of Best Management Practices (BMPs) to ensure that soils are handled and stored properly during all phases of the mine development including the following.

BMPs for Soil Stripping and Salvage:

- Excessive traffic will be avoided during the salvage process to minimize admixing, compaction and rutting
- Traffic will be confined to established routes to avoid unnecessary compaction of soil in undisturbed areas
- Erosion control measures will be implemented to prevent soil loss and siltation of watercourses

BMPs for Reclamation Material Stockpiles:

- Soil will be stockpiled in suitable locations where it will not be moved or subject to further disturbance to minimize admixing and physical deterioration
- Stockpile locations will be a sufficient distance away from operations to protect soils from contamination from risk of spills or metal and non-metal deposition
- Protective ditches will be constructed around stockpiles to prevent any spill reaching stockpiles and prevent any erosion from stockpiles from escaping offsite
- Erosion will be managed by limiting the height and slope of stockpiles. Where possible, slopes will be between 2:1 to 3:1 and heights will not exceed 10 m
- Stockpiles will be oriented to reduce wind erosion and stockpiles will not be stored at heights of land to reduce wind exposure
- Where appropriate, erosion control measures will be implemented
- Any vegetation slash that is not cleared from the site will be incorporated into soil stockpiles
- Soil stockpile locations will be identified by signage to prevent removal of material from the site or contamination with other materials
- Vegetation will promptly be established on stockpiles to reduce exposure of bare soil to wind and water erosion forces and control the establishment of invasive plants

Three reclamation material stockpiles will be located on site: a west stockpile, an east stockpile, and a middle stockpile. The three stockpiles are located between the Temporary (100 d) Ore storage facility and the HLF. The stockpiles will be accessed via the site access road that connects the truck shop/fuel storage facility to the crushing facilities.

Table 6.10-1 provides the approximate area footprints of each soil stockpile.

Table 6.10-1: Reclamation Material Stockpile Areas

Stockpile	Area (m^2)
East Stockpile	60,000
Middle Stockpile	90,000
West Stockpile	190,000
Total Area	**340,000**

6.11 OPEN PIT PRE-STRIPPING

During operations, the Project will include the recovery of gold by means of open pit mining at a proposed ore production rate of 29,500 t/d. The pit is situated between Platinum Gulch and Eagle Pup on the side of a hill, where a vein-hosted gold mineralization outcrops at the surface. Waste material will be primarily stored in Eagle Pup, and ore will be sent to the primary crusher. Over the 10-year Life of Mine (LOM), the pit will produce 92 Mt of ore, at an average gold grade of 0.78 g/t, along with 132 Mt of waste rock.

Stage 1 Construction will not include active open pit mining. During Stage 1 Construction a part of the open pit footprint will be cleared and grubbed progressively to quarry durable and non-durable rock to develop the haul roads and for other facility construction materials. Construction material borrow will be sourced from locations identified in Table 5.3-1

Part 2 of the Quartz Mining Licence application will include submission of an Open Pit Mine Development and Operations Plan. The plan will be consistent with requirements outlined by Yukon Government Energy Mines and Resources Plan Requirements for Quartz Mine Licensing (February 2012). Application for development and operation of the open pit mining will be made prior to active mining.

6.12 WASTE ROCK STORAGE AREAS

Stage 1 Construction will not include construction of the Waste Rock Storage Areas (WRSAs). Part 2 of the Quartz Mining Licence application will include submission of a Waste Rock and Overburden Management Plan. The plan will be consistent with requirements outlined by Yukon Government Energy Mines and Resources Plan Requirements for Quartz Mine Licensing (February 2012). Application for waste rock management will be made prior to commencing with open pit mining.

The information that follows is for information purposes only and does not constitute application for the development of the waste rock storage areas.

During operations after the commencement of open pit mining, waste rock is scheduled to go to one of two areas:

- Platinum Gulch WRSA
- Eagle Pup WRSA

WRSAs are located within a short haul distance from the open pit, and will provide adequate capacity for LOM waste rock. During operations, waste rock will be hauled from the pit via strategically positioned egress points. As part of the mine plan, the upper internal pit ramp will ultimately be mined out and external ramps will be constructed to access the upper lifts of the WRSAs.

6.12.1 Platinum Gulch Waste Rock Storage Area

The Platinum Gulch WRSA will be filled to capacity within the first three years of production and contain approximately 13.7 Mt. It will have a starting elevation of 1,253 masl and a footprint of 41 ha. Because this WRSA will be filled to capacity early in the mine life, there may be an opportunity for this WRSA to be reclaimed directly from material stripped at the Eagle Pup WRSA, which will help reduce the amount of re-handling of reclamation material.

During Stage 2, the development of the Platinum Gulch WRSA will follow clearing and grubbing of the upper portion of Platinum Gulch and the construction of the Platinum Gulch drainage ditch. The ditch will convey surface water from the Platinum Gulch WRSA to the open-pit surface water sump. The sequence for the Platinum Gulch WRSA development will involve installation of the Platinum Gulch rock drain and the construction of a small starter embankment.

6.12.2 Eagle Pup Waste Rock Storage Area

The Eagle Pup WRSA will contain approximately 116.8 Mt of waste rock over the LOM. It will have a starting elevation of 1,050 masl and a footprint of 103 ha. During Stage 2, the sequence for the Eagle Pup WRSA development will involve clearing and grubbing of the area, installation of a rock drain, construction of a buttress to mitigate instability from an ice lobate feature in the Eagle Pup valley and the construction of a starter embankment.

6.13 CRUSHING AND CONVEYING

Stage 1 Construction of the crushing and conveying facilities will be limited to bulk earthworks, foundation preparation, and concrete foundations.

Prior to operations, a Process Facilities Operations Plan will be submitted for review pursuant to requirements outlined by the Plan Requirements for Quartz Mine Licensing provided by Yukon Government Energy Mines and Resources (February 2012).

The crushing and screening plant will have a gyratory primary crusher with an ore dump pocket having a capacity of 300 metric tonnes, and the ability to truck dump from two sides. The mine will employ a mobile rock breaker. Primary crusher capacity will be to crush run-of-mine ore (at a maximum nominal size of 1,000 mm) at a rate of not less than 29,500 metric tonnes per day, feeding a fine ore crushing and screening plant. The ore processing plant will include secondary and tertiary cone crushers and associated conveyors, feeders, chutes, bins, screens, head sampler, dust collection system, overhead cranes and ancillary equipment, including but not limited to plant air, lube systems, heating, and lighting. For the gyratory crusher a storage area/stand for a fully dressed main-shaft is to be provided with appropriate crane coverage to facilitate crusher maintenance. Chutes and chute liners are designed to allow for easy liner replacement, with a pre-engineered replacement liner system.

The dust collection system is designed together with all chute transfers, crusher and screen covers and conveyor skirting to reduce dust generation and optimize dust collection.

Conveyors will be vendor-supplied systems, and will include all structural support frames, trusses, bents and take-up structures. Overland conveyors will be supported on concrete precast strip panels/sleepers spaced at

regular intervals. Elevated conveyor systems will be supported on vendor supplied steel trusses spanning between steel bents on concrete spread footings.

Clearing and grubbing, excavation and the placing of foundations for the crushing and screening plant and conveyor system will be carried out during Stage 1 Construction.

6.14 TEMPORARY ORE STORAGE PAD

The Temporary Ore Storage Pad will be located west of the primary crusher. The pad will have a footprint of approximately 157,000 m^2 and a storage capacity of approximately 3,000,000 t of ore, stacked up to approximately 13 m in height. Ore from the primary crusher will be diverted to this storage pad instead of the secondary and tertiary crushers during the annual ~100 d winter period. Fixed conveyors, a series of grasshopper conveyors, and a radial stacker, will transport the ore to this pad.

No construction activities are planned for the temporary ore storage pad during Stage 1 Construction. A description of construction activities for this facility will be included in Development and Operations Plans as outlined by the Plan Requirements for Quartz Mine Licensing provided by Yukon Government Energy Mines and Resources (February 2012).

6.15 HEAP LEACH FACILITY

The HLF will be located approximately 1.2 km north of the Eagle Zone ore body. The majority of the HLF will be located in the Ann Gulch catchment, a tributary to Dublin Gulch. The base of the HLF will be located in the valley floor of Dublin Gulch, at an elevation of 840 masl. At full height, the HLF will extend up Ann Gulch to an elevation of 1,080 masl.

The valley-fill HLF comprises a number of elements:

- An earth/rock-filled embankment, to provide stability to the base of the HLF
- A lined storage area for the ore to be leached
- Pregnant Leach Solution (PLS) collection system
- An in-heap storage pond to contain the PLS
- Pumping wells for the extraction of PLS
- Events ponds to contain excess solution in extreme events
- Diversion channel to re-route Dublin Gulch
- Leak detection recovery and monitoring systems to ensure the containment of PLS.

The HLF will be progressively developed in three phases—one phase during construction, and two phases during operations. Ore will be progressively stacked on the HLF pad throughout the LOM, where a diluted cyanide solution will be delivered to the ore via a system drip emitters. At the end of Phase 1 (end of Year 3 of Operations), the HLF footprint will be 40 ha. At the end of Phase 2 (end of Year 7 of Operations), the HLF footprint will be 91 ha. At the end of the LOM, the HLF footprint will be 105 ha.

HLF construction during Stage 1 Construction is limited to the following activities:

- HLF embankment footprint clearing and grubbing
- HLF embankment site preparation
- Phase 1 Pad vegetation clearing and grubbing
- Phase 1 Pad foundation preparation

All other construction activities required to commission Phase 1 of the HLF will be undertaken as part of Stage 2 Construction upon receipt of approval from Yukon Government and receipt of a Type A Water Use Licence. A Heap Leach Facility Development and Operations Plan will be submitted for approval as required and outlined by the Plan Requirements for Quartz Mine Licensing provided by Yukon Government Energy Mines and Resources (February 2012). This plan will provide information required for review of the development of remaining construction activities for the HLF.

The following sections describe the scope of construction activities proposed for the HLF during Stage 1 Construction.

6.15.1 Embankment

The HLF confining embankment will confine and stabilize the entire HLF, and create an in-heap pond leaching configuration that provides storage of PLS within the pore spaces of the ore. The embankment location, geometry, and height determine the ore storage capacity and solution storage capacity of the HLF. During operations, the embankment will provide heap stability and containment of process solutions in the in-heap pond. The embankment will include a 10 m crest width at elevation 891 masl for road and pipeline access, and 2.5H:1V upstream and downstream slopes. The in-heap pond will store volume created within the pore space of the ore, directly upstream of the confining embankment.

The HLF embankment has been designed in accordance with the following standards:

- The Yukon Water Board Licensing Guidelines (2012)
- Guidelines from the Canadian Dam Association (2007)

Stage 1 Construction of the HLF embankment will consist of clearing and grubbing, grading, and excavation or stabilization through compaction of the embankment foundation. Material will be excavated as required, screened and replaced and compacted as engineered fill. Once the required area has been stabilized, tested and signed off by the engineer on record then construction of the embankment with engineered fill will commence. The Dublin Gulch Diversion Channel (DGDC) will be excavated under and as per the conditions set forth in the placer mining license and Quartz Mining License. Excavated material will be treated as a borrow source for the embankment.

The confining embankment foundation preparation includes excavation, stripping and removal of the poorly consolidated placer tailings in the valley and excavation of soils on the abutment slopes. The loose placer tailings may be susceptible to liquefaction during intense earthquake events, and will be removed or stabilized to strengthen the dam foundation with compacted backfill. The valley placer fill stripping depth is anticipated to be about 10m deep at the upstream toe of the dam and up to 12 m deep at the centerline and downstream toe of the dam. The abutment surficial moraine soils, which may have been loosened by seasonal freeze-thaw action, will be removed or stabilized to provide a competent foundation in preparation for embankment fill placement.

These estimated depths are based on the seismic refraction surveys performed in the summer of 2011 by Frontier Geosciences Inc. and the study of liquefaction resistance of soils based on shear-wave velocity by Andrus et al 2000. The study reports that only materials with adjusted shear wave velocities below approximately 210 meters per second are susceptible to liquefaction. In the Dublin Gulch placer tailings, the depth to deepest liquefiable material was recorded at 2 meters. The Dublin Gulch valley bottom in the Event Pond areas will be stripped of loose material to a minimum depth of 3 m, or as field observations dictate. The surface will be graded to daylight downstream of the dam and pond limits for mitigating any potential liquefaction conditions in the foundation.

6.15.2 HLF Pad and Liner

Stage 1 Construction of the HLF Pad and Liner system will be limited to Phase 1 HLF pad foundation preparation. The scope of construction during Stage 1 will be limited to vegetation clearing, bulk earthworks and foundation preparation in anticipation of liner system installation during Stage 2 Construction upon approval of a Type A Water Use Licence and of a Heap Leach Facility Development and Operations Plan from Yukon Government. Construction and installation of underdrain and liner systems are not planned for Stage 1 Construction.

The preliminary design of the HLF has been submitted to YESAB as part of the environmental assessment. Detailed design of the HLF including the pad and liner is underway. Detailed design of this facility will be submitted as part of a detailed Heap Leach Facility Development and Operations Plan prior to Stage 2 Construction.

The Phase 1 pad will be completed with liner during Stage 2 Construction to accommodate approximately two years of ore production or approximately 20 Mt of ore. The construction of Phase 2 pad will start at the beginning of Year 2 of operations. The Phase 2 heap will consist of approximately 41 Mt of ore and will be stacked above the Phase 1 pad. The Phase 3 pad will be constructed in Year 6.

The heap ore quantities are based on an estimated average stacked ore heap dry density of 1.8 tonnes/m^3. A detailed stacking plan for each year of operation has been prepared by Tetra Tech and will be submitted as part of the Heap Leach Development and Operations Plan as required for Part 2 of the Quartz Mining Licence application.

Pad foundation preparation during Stage 1 Construction includes removing or relocating existing structures, removing vegetation and unsuitable materials, foundation stabilization, and site grading. The HLF underdrains will collect and route natural seepage flows beneath the liner system and confining embankment to discharge downstream of the event ponds. The HLF area will be cleared of all trees in a systematic way in order to be able to handle the areas of permafrost previously identified. Permafrost will be removed and transported to designated areas.

6.15.2.1 Foundation Improvement

Several conditions could affect the performance of the HLF foundation of the pad and embankment; however, when properly identified unsuitable conditions can be mitigated. For occurrences of permafrost, over excavation with rock fill replacement or in situ stabilization will be completed.

In the area of the HLF confining embankment and diversion embankment, the foundation will be stabilized via removal of unsuitable materials or stabilization via in-situ compaction. If removed, unsuitable materials will be excavated to remove any poorly consolidated placer tailings and alluvium that could shift or settle upon loading the foundation with the embankment and crushed ore.

Alternate methods such as deep dynamic compaction for stabilizing the embankment foundations will be considered. If deep dynamic compaction is used it will require the use of large cranes to drop heavy weights in the order of 30 tons on a close pattern over the designated area in order to compact to a required density. Dynamic compaction is a method that is used to increase the density of a wide variety of soil deposits and is commonly used to stabilize large areas. The process involves dropping a heavy weight repeatedly on the ground at regularly spaced intervals. Two to five passes are anticipated. Granular fill is added to the resulting depressions after each pass. Preliminary engineering has estimated that an approximate weight of 27 metric tonnes dropped from a height of approximately 26 m will achieve the required compaction. A depth of 12 m can be compacted using this method. The impact is controlled by hoisting the weight by means of a computer controlled crane. The final pattern, drop height, number of passes and quality control required will be designed taking into account the specific soil conditions of the site. A Becker hammer drill will be used in the geotechnical investigations for drilling, sampling and penetration testing the soils in order to evaluate density. The Becker hammer will provide requisite data prior to and post deep dynamic compaction to ensure the desired densification is achieved. A construction contractor Quality Control Plan will be prepared and will establish the quality control and tests that will be conducted. Close geotechnical control will be maintained during all phases of the operation and signed off by the Engineer of Record for the Heap Leach Facility including event ponds, embankment and heap leach pad footprint.

6.15.2.2 Foundation Drainage

Uncontrolled water courses below the HLF could locally destabilize the foundation materials and result in an unacceptable deformational strain on the liner system. Therefore, an under-drain will be constructed to remove any surface runoff and near surface groundwater.

The underdrains will be entrenched with vertical or 1H:1V side trench walls and constructed with geofabric wrapped around granular drain rock backfill materials to form a French drain. The backfilled and geofabric wrapped drain fill will be immediately covered by a minimum 0.3 m thick loose lift of soil backfill to limit geofabric exposure time to the wind and sunlight. The backfilled underdrain trench final surface will be rubber tire wheel-rolled without scarification to prevent construction equipment damage to the geofabric wrap in preparation for placement of the impoundment composite liner and overdrain system.

6.16 EVENTS PONDS

The HLF in-heap pond is designed to accommodate flood events. However, in the unlikely event that the capacity of the pond is exceeded, a spillway will be constructed on the southeastern side of the embankment during Stage 2 Construction. During operations and if necessary, excess water from the HLF in-heap pond will discharge to two events ponds. The events ponds are sized to provide containment storage for the 100-year, 24 h event after the in-heap pond has reached its maximum capacity.

During Stage 1 Construction, vegetation will be cleared and grubbed for the Events Ponds areas. No further construction including excavation or installation of leak detection and lining systems is planned until Stage 2 Construction.

6.17 DUBLIN GULCH DIVERSION CHANNEL

Once constructed, the HLF will encroach on the natural drainage of Dublin Gulch. A diversion channel has been designed to divert Dublin Gulch around the heap leach pad, confining embankment, and events ponds. The Dublin Gulch Diversion Channel (DGDC) will be constructed in two stages. During Stage 1 Construction the channel will be excavated in the dry and the scope of construction will be limited to vegetation clearing and bulk earthworks.

The DGDC will redirect flow in Dublin Gulch to the south of the proposed HLF and will connect to Eagle Creek prior to discharge to Haggart Creek.

The diversion channel will receive the majority of its flow at the inlet (flow from Dublin Gulch); in addition it will also intercept overland flow and run-on from Eagle Pup and Suttles Gulch. The diversion channel will direct flow around the south side of the event ponds, westward through a culvert under the access road, and to a transition structure before entering Eagle Creek upstream of the fish habitat compensation area.

The DGDC is designed to safely convey the peak flow from 100-year, 24-hour event with freeboard and the 500-year, 24-hour storm event without overtopping. Also the channel lining or armoring was designed to resist erosion for the peak flow from the 500-year, 24-hour storm event adjacent to the proposed HLF and the 100-year, 24-hour storm event downstream of the proposed HLF. The DGDC alignment and profile were determined based on the footprint of the HLF and the route that would minimize the amount of excavation into the adjacent Dublin Gulch valley walls. The proposed alignment follows natural topographic contours and mimics natural channel conditions as much as possible. The minimum horizontal curve radius for the DGDC was established at 30 meters to reduce the erosion potential of flowing water at critical bends; thus, minimizing the amount of lining or armoring material needed to protect the channel from erosion. The channel dimensions consist of a 1.25-meter deep trapezoidal channel section with 3H:1V side slopes, and a 0.25-meter deep triangular channel section at the bottom to create a low point along the channel centerline. The top width of the channel is 13.5 meters throughout the entire length of the DGDC.

Completion of the DGDC detailed design report is underway and will be submitted as part of an application for a Type A Water Use Licence and as required by Yukon Government as condition of Quartz Mining Licence. This report will include design optimization such as updated channel lining criteria and specifications as required by the Decision Document.

During Stage 1 Construction Dublin Gulch will be temporarily diverted to accommodate Placer Mining operations. This temporary diversion will allow for the clearing and excavation of the channel in the dry in support of the Quartz Mining Project. Construction of the DGDC during Stage 1 will include excavation only allowing for the placement of armouring and lining once a Type A Water Use Licence is issued. Excavated material will be used as a borrow source for other construction materials as required.

Preliminary civil drawings for the DGDC are attached in Appendix A.

6.18 ANCILLARY BUILDINGS

Ancillary buildings will be either pre-engineered or modular. The ancillary facilities have been designed using pre-engineered and modular construction where possible to minimize cost and site construction. Local climate and site conditions have been considered in the preliminary design of the buildings.

Pre-engineered buildings will be constructed with a structural steel frame, steel grates and purlins and intermediate structural members. Walls will be constructed of insulated metal wall panels and the roof will be a metal standing seam roof system. The envelope package comes complete with doors and all other envelope-related items. High bay lighting will also be included where applicable. Pre-engineered buildings will likely be used for the following facilities:

- process plant shop/warehouse building
- truck shop
- recovery plant

Modular buildings include heating, ventilation, and air conditioning (HVAC), electrical, piping, fire detection and suppression systems ready to be connected to the site utilities. The modules are to be constructed of wood framing with insulated metal clad walls and ethylene propylene diene monomer roofing on plywood substrate. Once the modules are in place and connected together the complex will be weather tight. Modular buildings will likely be used for the following facilities:

- administration facility (inside Process facility)
- assay lab modules gatehouse

6.19 PROCESS FACILITIES

During operations, gold will be recovered from the pregnant leach solution (PLS) by activated carbon adsorption and desorption, followed by electrowinning onto stainless steel cathodes, and the subsequent on-site smelting to gold doré. This process is referred to as the Adsorption Desorption Recovery (ADR) process. The gold-barren leach solution that remains after passing the PLS through the carbon columns will be replenished with reagents for cyanide and pH control and re-circulated back to the HLF as barren solution. The process plant will be located at the toe of the HLF. The process plant will include a cyanide detoxification circuit, which will treat solution by removing cyanide in the event that solution discharge from the operation is required.

The Process facility will include multiple buildings including the ADR plant, assay lab, process shop and warehouse (for reagent storage), and an administration building.

Stage 1 Construction of these process facilities is limited to vegetation clearing, bulk earthworks and concrete foundations. Civil drawings and general arrangement of the Process Facility is provided in Appendix A.

6.19.1 ADR Plant

The ADR Plant will be a pre-engineered steel building with insulated roof and walls. It will house carbon adsorption, carbon desorption, regeneration, refinery and reagent process areas. The building will be supported

on concrete spread footings with concrete grade walls along its perimeters. The building floor will be concrete slab-on-grade. The floor surface will be sloped toward sumps for cleanup operation.

Heavy equipment with dynamic loads will be supported on concrete foundations isolated from other building components. Interior steel platforms on multiple levels will be provided to support process equipment and to meet ongoing operation and maintenance needs. Elevated concrete floors will be provided to house mill dry area, change rooms, offices and control rooms.

6.19.2 Assay Lab Facility

The assay lab will be a prefabricated modular structure located inside the Process facility. This facility will house all necessary laboratory equipment for metallurgical grade testing and control. The lab will be equipped with all appropriate HVAC and chemical disposal equipment as needed. The facility floor will be reinforced as needed to accommodate specialized equipment.

6.19.3 Process Shop Warehouse Facility

The process shop warehouse will be a prefabricated modular structure located inside the Process facility. The building will house a mill shop, electrical and instrumentation shop, mechanical room, electrical room, an office and washrooms. The building is 65% open warehouse area. The mill shop will be serviced by a two tonne crane.

6.19.4 Administrative Building

The administration building will be a single-story modular unit, also located inside the Process facility. The building foundation will be composed of concrete slab-on-grade with localized thickened areas for higher imposed loads.

6.20 WATER DISTRIBUTION SYSTEM

During operations the Project will require multiple water distribution systems for potable water, process water, crushing, dust suppression, and fire protection. Water distribution during Stage 1 Construction will be limited to dust suppression for cleared areas and roads as needed and done via water truck. Stage 1 Construction will not include the construction of the water distribution systems. These works will be done during Stage 2 Construction after the receipt of a Type A Water Use Licence and approval of mine development and operating plans by Yukon Government.

During operations, the fresh water system will supply fresh water to the ADR facility area, the truck shop area, and crushing area. For fire protection, fresh water will be pumped from an aquifer via ground wells located in the Dublin Gulch valley, to a common fire water tank. Water will then be pumped to a fire water main at each facility throughout the site, providing required flow and pressure for the fire protection system.

Fresh water will be pumped from the well to a common fresh water/fire water holding tank located at the ADR facility area. Fresh water will be pumped from the upper portion of the tank to a potable water treatment system. Treated water stored in a tank supplies the heating solution boiler, elution solution boiler, and shower and eyewash stations in the facility plant. Distribution of potable water to other facilities will be via water truck. Fresh water not requiring treatment will be piped from the holding tank by gravity to the ADR facility for distribution.

Additional details regarding construction and operation of the water distribution system will be provided with various mine development and operations plans as required by the *Quartz Mining Act*.

6.21 MINE WATER TREATMENT PLANT

Active (mechanical and chemical) water treatment facilities to be provided as a part of the Project during operations include:

- potable water treatment plant
- septic system with leach field for sanitary sewage
- cyanide detoxification plant (CDP) to treat excess water discharged from the HLF
- mine water treatment plant (MWTP) to treat site drainage collected at the Lower Dublin South Pond and to further treat HLF discharge after it is processed through the cyanide detoxification plant.

During Stage 1 Construction the above facilities will be limited to site preparation works including vegetation clearing, bulk earthworks and concrete foundations for the Mine Water Treatment Plant (MWTP) that will house the CDP. A general arrangement for the facility is provided in Appendix A.

To meet throughput needs and to provide redundancy, the MWTP will be constructed as two essentially independent trains each capable of treating up to 300 m^3/h. It is scheduled to be constructed during Stage 2 Construction prior to operations so that it can be available to treat flows in Year 3, which is the first year in which excess water may be released under the median scenario of the water balance model. The MWTP is primarily a metals removal plant and is intended to treat the site drainage collected at Lower Dublin South Pond as well as to provide additional treatment for excess water from the HLF after it has been pre-treated by the CDP. Treated effluent from the MWTP will drain by gravity to an outfall at Haggart Creek.

The MWTP is intended to operate until heap rinsing, closure, and capping produces water quality at the HLF and Lower Dublin South Pond that will allow discharge either directly or through passive treatment while maintaining compliance with water quality guidelines. Treatment goals for the MWTP are based on achieving compliance with the metal mining effluent regulations (MMER) criteria for end of pipe concentrations as well as the water quality guidelines in Haggart Creek.

The treatment at the MWTP will consist of several processes: oxidation, high pH precipitation (lime softening using lime), low pH coagulation (using ferric), pH adjustment, and dechlorination. Filter presses will dewater the solids produced by the high pH precipitation step and the low pH coagulation step.

The MWTP equipment will be housed in a metal building to be constructed with space to add the CDP equipment during a later phase of construction. Building footprint will be approximately 35 x 117 m. Clarifiers and stripper towers will be located outside the building.

6.22 TRUCK SHOP

The mine will require a truck shop with armored bays to accommodate tracked equipment and a lube and wash bay with high pressure wash equipment and a wash water/oil and grease separation system. All bays will have access to lube reels (one set per two bays) compatible with Wiggins fast lube systems or similar. The bays should be large enough to accommodate 136 metric tonne (150 st) capacity trucks. The overhead crane will

serve five of the six bays (excluding the lube-wash bay) and have the capacity to safely lift a truck body fully lined (approx. weight 35 tonnes). Access to the bays will be via doors designed to operate in cold weather climate. A designated bay will have sufficient space to allow for tire changes. Designated areas will be provided for tool storage and a clean room for rebuilds of hydraulic components such as hydraulic cylinders and transmissions. Heating will be via waste oil heaters and/or diesel fired furnace.

The truck shop and mine dry will be a pre-engineered steel building with insulated roof and walls. The building will be supported on concrete spread footings with concrete grade walls along its perimeters. Sumps and trenches will be constructed to collect waste water during maintenance operation. Floor hardener will be applied to concrete surface on high trafficked areas.

The building will house a wash bay complete with pressure washer and an oil separator, repair bays, warehouse area, parts storage, mine dry, an emergency vehicle bay complete with a first aid room, electrical room, mechanical room, compressor room, lube storage room and light vehicle maintenance bay. A ready-line with heavy duty electrical outlets will be built for mine equipment. The mine, and maintenance offices will also be housed in this building above the warehouse.

During Stage 1, construction of the truck shop will be limited to site preparation works including vegetation clearing, bulk earthworks and concrete foundation. A general arrangement for the facility is provided in Appendix A.

6.23 FUEL STORAGE

Diesel fuel primarily for haul trucks, light vehicles and power generation (during construction) will be stored in two 750,000 L tanks within a concrete bermed containment area near the truck shop. Adjacent to the ADR plant, a 100,000 L diesel storage tank will be located in a concrete bermed area. The fuelling station will include a receiving pump, strainer and delivery pumps, and filters for the recovery area equipment solution heating boiler.

All bulk fuel storage tanks will be single walled tanks placed inside lined, bermed containment areas. The containment areas will be sized to hold the larger of 110% of the largest tank or 10% of the total maximum volume of all tanks in the facility, in accordance with the National Fire Code and in conformity with the *Environmental Code of Practice for Aboveground Storage Tank Systems Containing Petroleum Products.*

Waste oil will be stored in a 10,000 L steel tank located next to the truck shop. It is anticipated that this oil, collected from the mine equipment, will be burned along with diesel fuel in the solution heating boiler in the process plant. Oil filters and a blending system to facilitate in-line mixing of lube and diesel oil are included.

Three 5,000 gal propane tanks will be located adjacent to the permanent camp facilities. A general arrangement for fuel storage facilities (including on Camp General Arrangements [GA] and Truck Shop GA) is provided in Appendix A.

Stage 1 Construction of fuel storage facilities will consist of clearing, bulk earthworks, concrete foundations and installation of tanks and fuelling stations.

6.24 EXPLOSIVES STORAGE AND MANUFACTURE

Explosives will be used during construction of the infrastructure site pads, quarry development, and during life of mine in the open pit. Over life of mine, ANFO, and emulsion explosives products will be employed. Approximately 40 tonnes of fixed emulsion will be stored within the explosives storage facility. The facility will also have capacity to store 130 tonnes of ammonium nitrate (2 x 65 tonne silos). Explosive material will be stored in accordance with the applicable regulations and standards.

The preparation of the facility will involve removal of any salvageable soils required for reclamation, followed by any additional overburden material unsuitable for the site base. The designated areas will be graded and surrounded by a perimeter berm with a minimum height of 1.2 m.

The explosives storage and manufacture plant will be a pre-engineered building provided by the explosives supply contractor. The plant will be located 1 km southwest of the mine pit, and 600 m from the main access road to the plant. Access to the explosives storage and manufacture facility will be controlled by a locked gate to prevent unauthorized access.

6.25 MAGAZINE STORAGE

Two magazines will consist of pre-fabricated Sea-Can-type structures provided by an explosives supply contractor. The preparation of the facility will involve removal of any salvageable soils required for reclamation, followed by any additional overburden material unsuitable for the site base. The designated areas will be graded and surrounded by a perimeter berm with a minimum height of 1.2 m.

The magazines will be located 300 m south of the explosive manufacturing facility, and 600 m from the main access road to the plant. Like the explosives manufacture plant, access to the magazines will be controlled by a locked gate.

7 CLOSURE AND RECLAMATION

Yukon Government has a mandate to regulate major mining projects, including their closure and reclamation, on public lands in Yukon. Yukon Government has instituted the Yukon Mine Site Reclamation and Closure Policy and supporting guidelines to foster responsible and progressive mine reclamation and closure in Yukon. One of the principles of this policy is that security retained by Yukon Government equals site liability at all stages during the mine life.

A conceptual Closure and Reclamation Plan (CCRP) was provided as part of the Project Proposal submitted to YESAB in July 2011. The CCRP developed for the Project Proposal was based on the YESAB "Proponents Guide to Information Requirements for Executive Committee Project Proposal Submissions" and in consideration of the Yukon Government "Reclamation and Closure Policy". The CCRP outlines the closure and reclamation methods, criteria and objectives proposed for the Project. Consultation with the FNNND, Village of Mayo and other stakeholders occurred concurrently with the development of the Project Proposal and the CCRP. Closure and reclamation information was presented and discussed at Project open houses, and community meetings. A specially focused Conceptual Closure and Reclamation Plan workshop and open house was held with the FNNND and community members of Mayo on November 4, 2010. Feedback from these meetings and open houses was incorporated into the CCRP. Information on these meetings is further described in the summary of Consultations and Engagements included in the Project Proposal to YESAB.

The CCRP included estimated closure and reclamation costs for direct, indirect, and annual operations and maintenance costs. To estimate cost, three scenarios were evaluated: 1) premature closure, construction plus two years of operations; 2) premature closure, construction plus four years of operations, and; 3) full mine build-out, construction plus seven operating years. The estimates for the two premature closure scenarios included costs for full closure and reclamation of the mine at end of mine life. As presented in the CCRP, total estimated reclamation liability at the end of each scenario was:

- Scenario 1: $32.4 million
- Scenario 2: $41.2 million
- Scenario 3: $52.1 million

The CCRP was developed for the initial proposal submitted to YESAB in July 2011. In May 2012, SGC submitted a Supplementary Information Report (SIR) to YESAB outlining modifications to the Project based on a feasibility study completed for the Project. Modifications from the original Project Proposal included an increase of the amount of waste rock generated from 66 to 132 million tonnes and ore from 66 to 92 million tonnes. The size and surface area of the WRSAs, HLF, and open pit walls were also increased accordingly. Furthermore, the operational mine life increased by approximately two years. The CCRP and estimated closure and reclamation costs were not updated to account for modifications presented in the Supplementary Information Report submitted to YESAB. SGC committed to update the CCRP as required for Quartz Mine and Water Use Licence applications and in particular, to provide revised estimates for closure and reclamation at various stages of the Project using costs based on feasibility level engineering design.

As required by the *Quartz Mining Act*, SGC has updated the closure costs and methods in the form of an interim Decommissioning and Reclamation Plan (DRP) as part of the application for a Quartz Mining Licence. The preliminary DRP is attached as Appendix D and outlines the closure objectives and measures as well as the associated financial liability for the construction period.

Closure methods required for permanent closure at the end of mine life are presented in this DRP; however they remain conceptual at this time. As such, the reclamation and closure costs for end of mine life are not included in this DRP. Decommissioning and reclamation activities for end of mine life will be provided in the preliminary DRP to be submitted with the WUL and QML Part 2 applications. The preliminary DRP is scoped to meet the requirements of Yukon Government and the Yukon Water Board. The preliminary DRP will include a description of methods for closure at end of mine life and detailed cost estimates for reclamation of the current condition, year 2 (end of Stage 2 construction), and life of mine.

8 ENVIRONMENTAL MANAGEMENT, MONITORING AND PROTECTION PLANS

In addition to mitigation measures integrated into Project design and engineering, environmental management, monitoring and protection plans have been developed to prevent, mitigate and/or respond to potential effects of the Project, accidents, spills and/or malfunctions.

The following environmental management, monitoring and protection plans have been appended to this Stage 1 Construction Plan. Some will require update as the Project progresses into the Operations phase. Amended plans will be submitted to Yukon Government for review and approval concurrently with Development and Operations plans that will make up the Part 2 Quartz Mining Licence application.

- Dust Control Plan (Appendix J)
- Construction Phase Environmental Monitoring Plan (Appendix K)
- Spill Response Plan (Appendix L)
- Wildlife Protection Plan (Appendix M)
- Emergency Response Plan (Appendix N)
- Heritage Resource Protection Plan (Appendix O)

9 REFERENCES

BGC Engineering Inc. 2012a. 2011 Geotechnical Investigation for Mine Site Infrastructure - Foundation Report, dated January 31, 2012.

BGC Engineering Inc. 2012b. Estimate of Ice-rich Material - FINAL, dated November 16, 2012.

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APPENDIX A

Project Figures and Drawings

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Figure / Drawing No.	Page Reference	Drawing Title
1.1-1	1, 38	Overall Site General Arrangement Plan
1.1-2	1	Simplified Overall Flow Sheet
1.2-1	2,3,10	Property Location Map
4.2-1	18	Placer Mining Areas Dublin Gulch Valley
5.1-1	20	Stage 1 Construction – Site Clearing Extent
5.3-1	30	Borrow Materials
5.3-2	30	Borrow Materials – Placer Tailings
5.5-1	35	Stage 1 Construction – Concrete Foundations
6.8-1	43	Stage 1 Construction – Site Road Construction
000-CN-01	35	General Standards Concrete Sections and Details Sheet 1
000-CN-02	35	General Standards Concrete Sections and Details Sheet 2
10130-20-002 Rev A	38	Civil Overall Site Key Plan
10130-20-301 Rev A	59	Civil 100 Day Storage Plan and Typical Sections
10130-20-302 Rev A	68	Civil Explosives Facilities Plan and Typical Sections
10130-20-303 Rev A	67	Civil Truck Shop Plan and Typical Sections
10130-20-304 Rev A	38	Civil Camp and Laydown Plan and Typical Sections
10130-20-305 Rev A	64	Civil Process Plant Plan and Typical Sections
10130-20-306 Rev A	58	Civil Primary, Secondary, and Tertiary Crushers Plan and Typical Sections
2	59	Heap Leach Facility General Facilities Arrangement
17	64	Dublin Gulch Diversion Channel Plan and Profile Sheet 1 of 3
18	64	Dublin Gulch Diversion Channel Plan and Profile Sheet 2 of 3
19	64	Dublin Gulch Diversion Channel Plan and Profile Sheet 3 of 3
21	64	Dublin Gulch Diversion Channel Sections and Details
10100-10-003 Rev B	58	Crushing Plant General Arrangement
10100-10-004 Rev B	64	Process Plant General Arrangement
10100-10-005 Rev C	38	Ancillary Buildings General Arrangement
28100-10-500 Rev B	65	Recovery Plant General Arrangement
149-T-DD-SK1 Sht 5	49	Wood Pole Foundations, Standard Embedment Method
149-T-DD-SK1 Sht 6	49	Wood Pole Foundations, Embedment in Poor Soil

Figure / Drawing No.	Page Reference	Drawing Title
149-T-DD-SK1 Sht 7	49	Wood Pole Foundations in Marshy Ground
149-T-DD-SK1 Sht 8	49	Wood Pole Foundations in Permafrost with Shallow Active Layer
149-T-DD-SK1 Sht 9	49	Wood Pole Foundations on Permafrost
149-T-DD-SK1 Sht 10	49, 50	Wood Pole Foundations in Swampy Area
149-PP-SK001 Sht 1 to 32	49	Plan and Profile Drawing
10100-18-001	49	Power Site Distribution Single Line Diagram Baseline
10100-18-050	49	Power Site Distribution 69kV Substation Layout
10100-18-051	49	Power Site Distribution 69kV Substation Section
10100-18-060	49	Power Site Distribution 25kV Overhead Line
11000-18-050	49	Pit E-House & Transformer Yard Layout Mine
11080-18-001	49	69kV Overhead Line Pole Type FSS4 Flat 0^{o} ~ 4^{0} Semi Suspension Structure
11080-18-002	49	69kV Overhead Line Pole Type FSS8 Flat 4^{0} ~ 8^{0} Semi Suspension Structure
11080-18-003	49	69kV Overhead Line Pole Type FS15 Flat 8^{0} ~ 15^{0} Suspension Structure
11080-18-004	49	69kV Overhead Line Pole Type FS20 Flat 15^{0} ~ 20^{0} Suspension Structure
11080-18-005	49	69kV Overhead Line Pole Type FD45 Flat 0^{0}-45^{0} Dead End Structure
11080-18-006	49	69kV Overhead Line Pole Type VS60 Vertical 15^{0}-70^{0} Medium Angle Structure
11080-18-007	49	69kV Overhead Line Pole Type VD90 Vertical 45^{0}-90^{0} Dead End Structure
13120-18-050	49	Primary Crushing E-House & Transformer Yard Layout Mine
13220-18-050	49	Secondary Crushing E-House & Transformer Yard Layout Mine
13320-18-050	49	Tertiary Crushing E-House & Transformer Yard Layout Mine
22110-18-050	49	Heap Leach E-House & Transformer Yard Layout Mine

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APPENDIX B

StrataGold Corporation Claims affected by Construction

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APPENDIX C

Construction Sediment & Erosion Control Plan

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APPENDIX D

Preliminary Decommissioning and Reclamation Plan

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APPENDIX E

Design Criteria

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APPENDIX F

Report – Geochemical Characterization of Proposed Excavation Areas and Borrow Sources from the Eagle Gold Project

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APPENDIX G

Ice-Rich Materials Management Plan

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APPENDIX H

Solid Waste and Hazardous Materials Management Plan

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APPENDIX I

Road Construction Plan

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APPENDIX J

Dust Control Plan

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APPENDIX K

Construction Phase Environmental Monitoring Plan

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APPENDIX L

Spill Response Plan

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APPENDIX M

Wildlife Protection Plan

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APPENDIX N

Emergency Response Plan

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APPENDIX O

Heritage Resource Protection Plan

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