CASINO MINING CORPORATION
CASINO COPPER-GOLD PROJECT



WASTE STORAGE AREA AND STOCKPILES FEASIBILITY DESIGN

PREPARED FOR:

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December 19, 2012

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VA101-325/8-12

Rev	Description	Date	Approved
0	Issued in Final	December 19, 2012	KB

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EXECUTIVE SUMMARY

The Casino Copper-Gold Project Feasibility design includes for the safe and secure management of mine waste materials, ore stockpiles and topsoil stockpiles.

Storage piles have been designed to accommodate the following materials:

- Potentially reactive (PAG and ML) waste rock and overburden
- Stockpiled ore (Low Grade ore, Supergene Oxide ore and Gold leach ore), and
- Topsoil/overburden materials.

The quantities and classification of mine waste and ore materials is based on the mine production schedule provided by Casino Mining Corporation.

The primary waste management facility for the project is the Tailings Management Facility (TMF). The TMF has been sized to provide sufficient capacity to store approximately 956 million tonnes of tailings (including cyclone sand tailings used as embankment fill) and co-disposal of up to 658 million tonnes of potentially reactive waste rock and overburden, comprising Potentially Acid Generating (PAG) and Metal Leaching (ML) materials. The findings of geochemical waste characterization studies indicate that almost all of the waste material is PAG and/or ML. These PAG and ML waste materials will be placed and stored subaqueously in a Waste Storage Area (WSA) located within the TMF.

Approximately 157.5 million tonnes of additional mined ore will be processed at a Heap Leach Facility (HLF) located south of the open pit. This gold ore will be stored in a temporarily stockpile near the crusher on the valley slope east of the open pit and at the northern end of the TMF. This stockpiled ore will report to the heap leach facility over a period of about 18 years, starting in the pre-production years (3 years prior to mill start-up) and continuing up to Year 15 of mill operations.

During mine operations approximately 144 million tonnes of Low Grade ore and 32 million tonnes of Supergene Oxide (SOX) ore will be stored in temporary stockpiles. The SOX ore will be stockpiled at a location between the open pit and plant site during the pre-production years and in Year 1 of mill operations, and report to the mill during Years 4 to 12 together with direct feed mill ore. Mined Low Grade ore will be stockpiled up to Year 17 in locations generally east and south of the plant site, on valley slopes above the TMF. Low Grade ore mined after Year 12 can also be stockpiled at the same location used for the SOX ore south of the open pit. The stockpiled Low Grade ore will be milled during the last four years of mine operations (Years 19 to 22).

It is anticipated that approximately 2 to 3 million tonnes of Non-Acid Generating (NAG) waste rock (leach cap material) will be produced during pre-production mining. This material will be used in the construction of the TMF Starter (Stage 1) embankment. Any NAG waste rock that is either unsuitable for use as a construction material or in excess of construction material requirements will be placed in the WSA or an adjacent surface dump.

The temporary storage of topsoil recovered during the construction of mine site facilities is required to ensure sufficient reclamation medium is available for mine closure. Topsoil recovered during construction will be stockpiled at select locations close to the material source.

General site characteristics including physiographic setting, hydrometeorology and seismicity are presented. Review of historical earthquake records and regional tectonics indicates that the Casino

Project site is situated in a region of low seismicity and moderate seismic hazard. A summary of geotechnical conditions at the WSA, ore stockpiles and topsoil stockpiles is also provided.

Specific design and operating requirements for the WSA, ore stockpiles and topsoil stockpiles are provided. The general arrangement and configuration of the Waste Storage Area and ore stockpiles is presented, including their development over the life of mine.

The WSA and temporary stockpiles have been designed to remain stable under both static and seismic loading conditions. Surface water and diversion ditching has been designed to divert surface flow around the ore stockpiles to minimise contact with the water. General requirements and expectations for reclamation and closure of the WSA and stockpiles are presented.

Quantity estimates for materials and work activities required for initial construction and ongoing operations of the ore stockpiles and topsoil stockpiles are provided, including foundation clearing and preparation of ore stockpile foundations, surface water management and sediment control.

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1 – INTRODUCTION

1.1 PROJECT OVERVIEW

The Casino Copper-Gold Project is a venture by Casino Mining Corporation (CMC) to develop an open pit copper-gold-molybdenum mine in the Yukon Territory. The project is located in the Dawson Range Mountains of the Klondike Plateau approximately 300 km northwest of Whitehorse, Yukon, Canada, as shown on Figure 1.1. This area is somewhat unique in that the region was not glaciated during the Wisconsin Advance. The deposit is hosted by the Prospector Mountain Suite, a suite of igneous intrusive rocks with an intense hydrothermal alteration overprint. The deposit will be mined using open pit methods with a nominal mill throughput of approximately 125,000 tonnes/day (tpd) of ore over a 22 year operating life. During the 22 year operating period the deposit will be mined over a period of approximately 18 years using conventional open pit methods. The milling of ore stockpiled during the open pit operation will continue for the remainder of the mine life (approximately 4 years).

The proposed components of the project facilities include an open pit up to 600 meters deep containing a mineable reserve of approximately 965 million tonnes of mill ore. The primary waste management facility is the Tailings Management Facility (TMF). The TMF has been sized to provide sufficient capacity to store approximately 956 million tonnes of tailings (including cyclone sand tailings used as embankment fill) and co-disposal of up to 658 million tonnes of potentially reactive waste rock and overburden, comprising Potentially Acid Generating (PAG) and Metal Leaching (ML) materials. The findings of geochemical waste characterization studies indicate that almost all of the waste material is PAG and/or ML. These PAG and ML waste materials will be placed and stored subaqueously in a Waste Storage Area (WSA) located within the TMF. Details of the Feasibility design of the TMF are presented in the Knight Piésold Ltd. (KPL) report “Feasibility Design of the Tailings Management Facility” (Ref. No. VA101-325/8-10, December, 2012). A general arrangement of the project site is shown on Figure 1.2. Typical sections showing the development of the TMF and WSA during mine operations (Years 1, 4, 10 and 22) are provided on Figure 1.3.

Approximately 157.5 million tonnes of additional mined ore will be processed at a Heap Leach Facility (HLF) located south of the open pit. This gold ore will be stored in a temporarily stockpile near the crusher on the valley slope east of the open pit and at the northern end of the TMF. This stockpiled ore will report to the heap leach facility over a period of about 18 years, starting in the pre-production years (3 years prior to mill start-up) and continuing up to Year 15 of mill operations. Details of the Feasibility design of the HLF are presented in the KPL report “Feasibility Design of the Heap Leach Facility” (Ref. No. VA101-325/8-9, December, 2012). Heap leach facility operations will commence during pre-production stripping of the open pit.

During mine operations approximately 144 million tonnes of Low Grade ore and 32 million tonnes of Supergene Oxide (SOX) ore will be stored in temporary stockpiles. The SOX ore will be stockpiled at a location between the open pit and plant site during the pre-production years and in Year 1 of mill operations, and report to the mill during Years 4 to 12 together with direct feed mill ore. Mined Low Grade ore will be stockpiled up to Year 17 in locations generally east and south of the plant site, on valley slopes above the TMF. Low Grade ore mined after Year 12 can also be stockpiled at the same location used for the SOX ore south of the open pit. The stockpiled Low Grade ore will be milled during the last four years of mine operations (Years 19 to 22).

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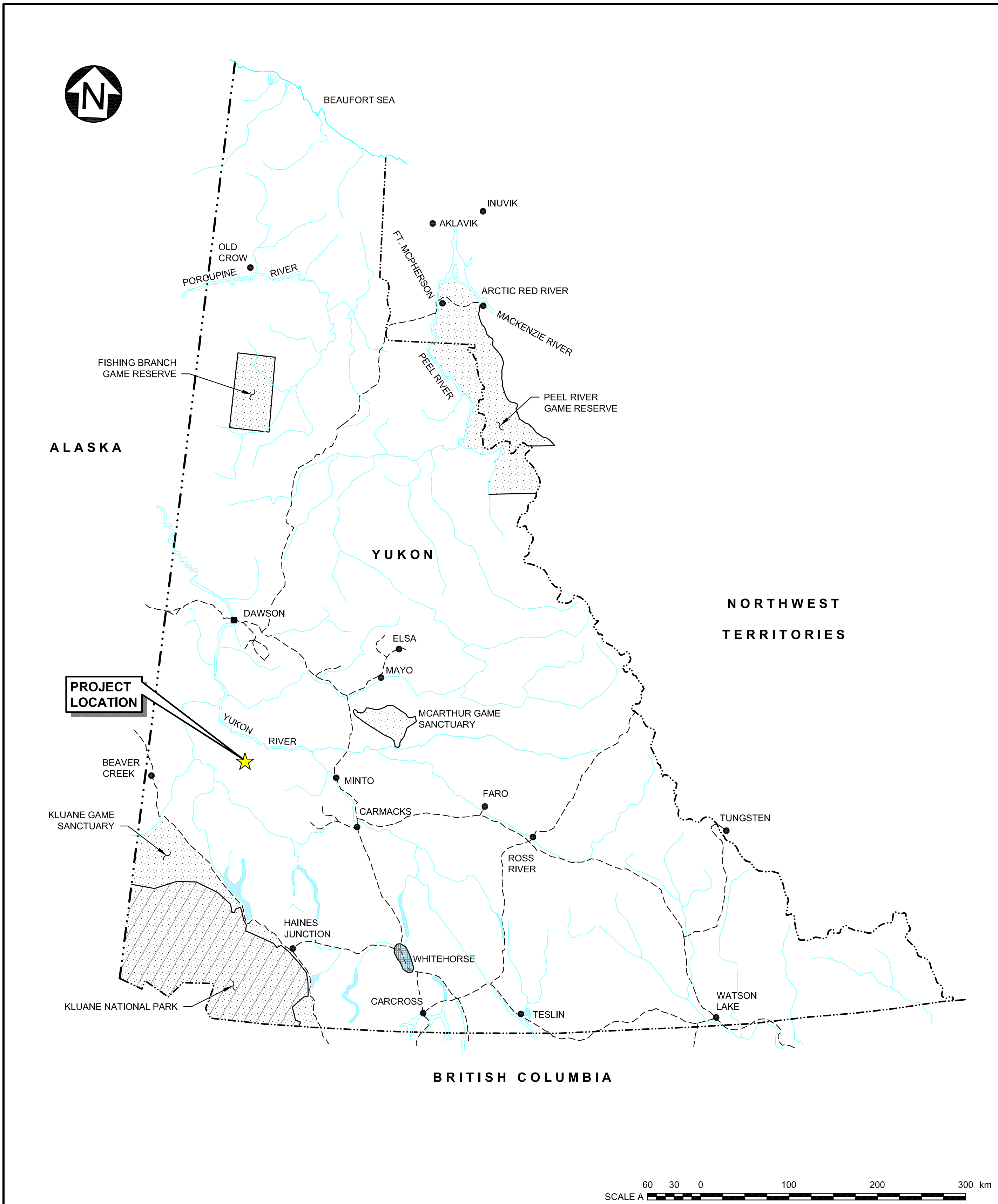
The temporary storage of topsoil recovered during the construction of mine site facilities is required to ensure sufficient reclamation medium is available for mine closure. Topsoil recovered during construction will be stockpiled at select locations close to the material source. The topsoil stockpiles are comparatively low and flat with gently sloped faces.

The general layouts of the ore and topsoil stockpiles are included on Figure 1.2.

1.2 SCOPE OF REPORT

This report summarizes the geotechnical design of the Waste Storage Area (WSA), stockpiled ore and topsoil stockpiles. Specific aspects addressed in this report include the following:

- Site characteristics including physiographic setting, hydrometeorology and seismicity
- Geotechnical conditions at the WSA and stockpile areas
- Layout and design of the WSA within the TMF
- Layout and design of ore stockpiles
- Layout and design of topsoil stockpiles
- Surface water management, including sediment control measures, and
- Reclamation and closure.



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PROJECT LOCATION MAP

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FIGURE 1.1 REV 0

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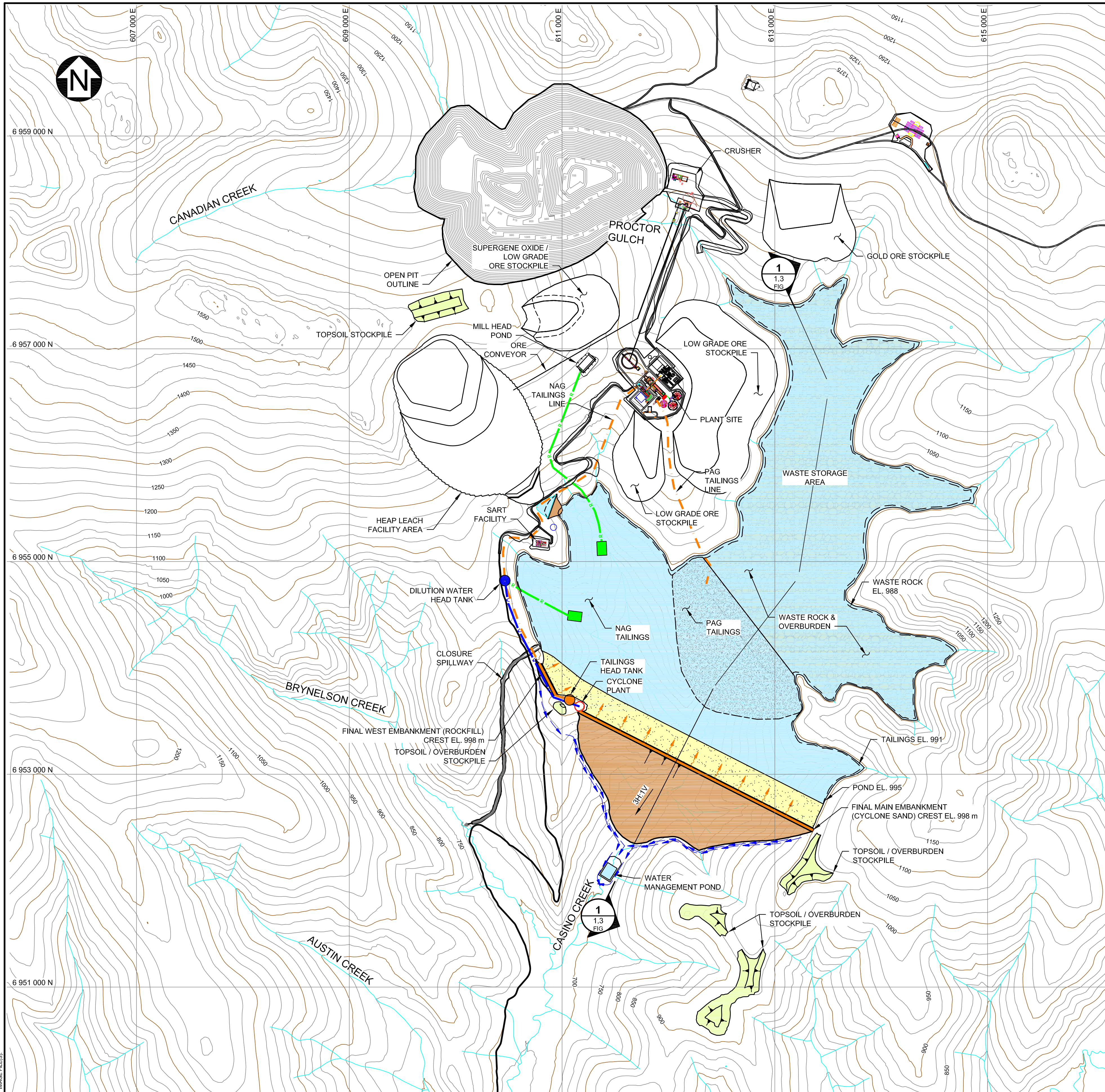
0	18DEC'12	ISSUED WITH REPORT	GM	WAL	GRG	KJB



NOTES:

1. COORDINATE GRID IS UTM (WGS84/NAD83) ZONE 7 (m).
2. CONTOUR INTERVAL IS 25 METRES.
3. DIMENSIONS ARE IN METRES UNLESS NOTED.
4. OPEN PIT AS PROVIDED BY CASINO MINING CORPORATION (NOVEMBER 2012).
5. PLANT SITE AND CRUSHER LAYOUT PROVIDED BY M3 ENGINEERING AND TECHNOLOGY CORPORATION (OCTOBER 4, 2012).
6. ORE AND TOPSOIL STOCKPILES ARE SHOWN AT THEIR MAXIMUM SIZE DURING OPERATIONS.

LEGEND:

- TOPSOIL / OVERBURDEN
- TAILINGS
- EMBANKMENT (CYCLONE SAND)
- EMBANKMENT (ROCKFILL)
- POND
- TAILINGS PIPELINES
- RECLAIM PIPELINES
- WATER PIPELINES
- TAILINGS HEAD TANK
- DILUTION WATER HEAD TANK
- CYCLONE PLANT
- DIVERSION DITCHES

SCALE A 400 200 0 400 800 1200 1600 2000 m

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MINE SITE GENERAL ARRANGEMENT

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FIGURE 1.2		REV 0

REV	DATE	DESCRIPTION	DESIGNED	DRAWN	CHK'D	APP'D
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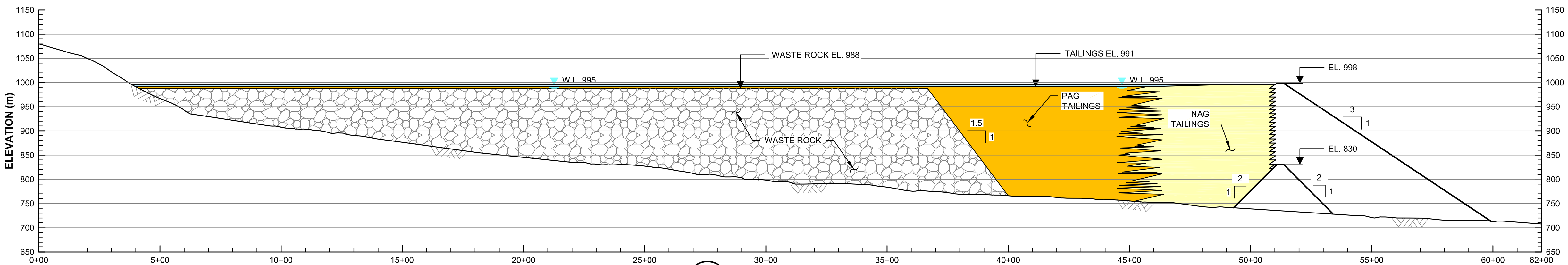
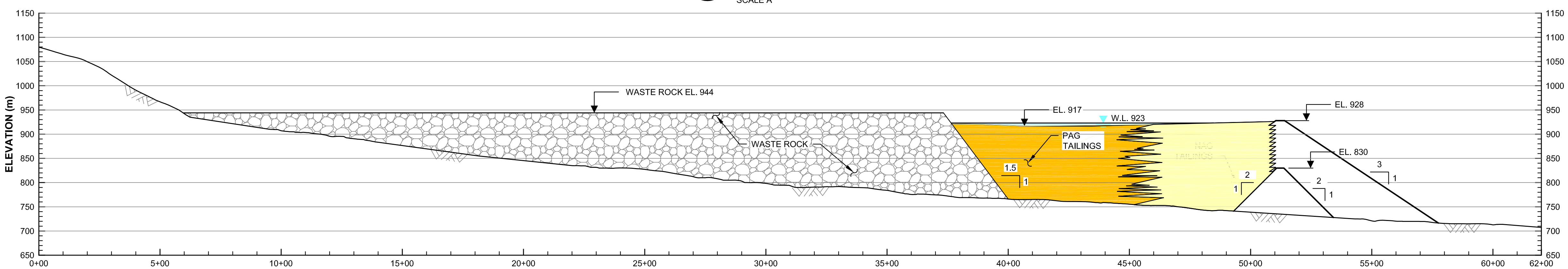
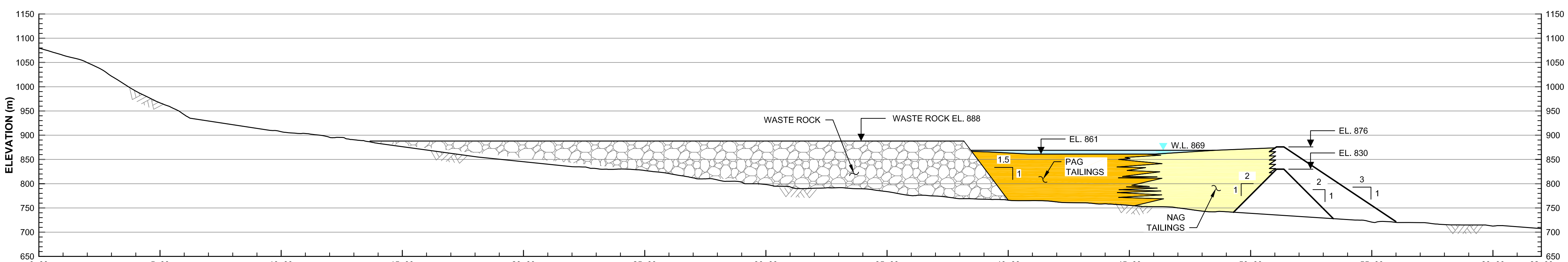


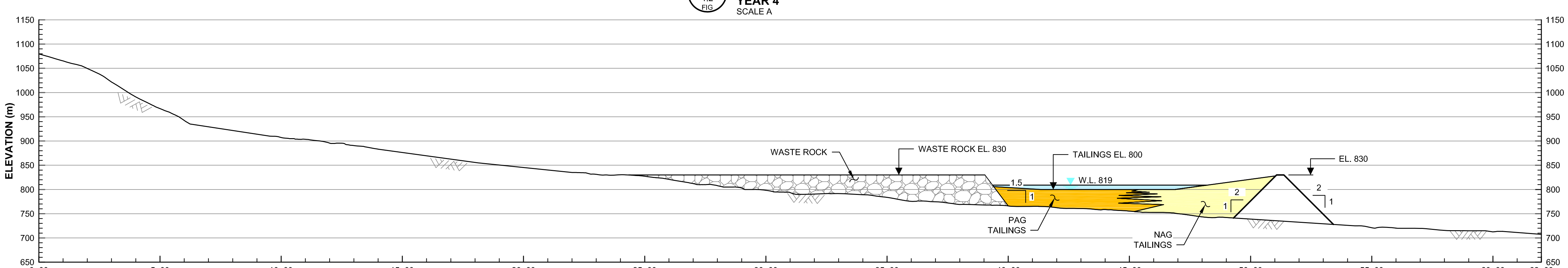
SECTION 1 (1.2 FIG)
YEAR 22
SCALE A



SECTION 1 (1.2 FIG)
YEAR 10
SCALE A



SECTION 1 (1.2 FIG)
YEAR 4
SCALE A



SECTION 1 (1.2 FIG)
YEAR 1
SCALE A

NOTES:

1. DIMENSIONS ARE IN METRES UNLESS NOTED.

VERT. SCALE 100 50 0 100 200 300 400 500 m

HORIZ. SCALE 200 100 0 200 400 600 800 1000 m

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TAILINGS MANAGEMENT FACILITY WASTE DEPOSITION STRATEGY TYPICAL SECTIONS (YEARS 1, 4, 10 and 22)

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FIGURE 1.3 REV 0

REV	DATE	DESCRIPTION	DESIGNED	DRAWN	CHK'D	APP'D
0	18DEC'12	ISSUED WITH REPORT	SB	PP	GRG	KJB

2 – SITE CHARACTERISTICS

2.1 PHYSIOGRAPHIC SETTING

The project is located in the Dawson Range Mountains of the Klondike Plateau. The area is somewhat unique in that the region was not glaciated during the Wisconsin Advance. The characteristic terrain features are smooth, rolling topography, with moderate to deeply incised valleys. Major drainage channels extend below 1,000 m elevation. Most of the terrain lies between 900 m and 1,500 m elevation, except in the valley bottom of Casino Creek which drops to about 700 m elevation.

The Tailings Management Facility (TMF), which incorporates the Waste Storage Area, is situated within the Casino Creek valley. The valley bottoms throughout the project area, with impeded drainage, have prominent permafrost features such as ice-rich peat plateaus, palsas, hummocky tussock fields and polygons. Ore stockpiles are generally situated on south to east facing slopes between the TMF and the open pit. These slopes are generally better drained and have frost susceptible soil. Topsoil/overburden stockpiles from stripping for the TMF Main Embankment are located on flatter slopes and hill top areas south of the TMF. Topsoil from stripping of the HLF area is stockpiled on a ridge located between the open pit and HLF at an elevation of about 1400 m.

2.2 HYDROMETEOROLOGY

The climate at the Casino Project area is characterized by long, cold, dry winters and short, warm, wet summers, with conditions varying according to altitude and aspect. Streamflow in the region is typically highest in May due to melting of the winter snowpack. Annual peak instantaneous flows commonly occur in this freshet period on larger rivers, but on smaller streams they may also occur in summer or early autumn due to intense rain or rain on snow events. Flows decrease throughout the winter and minimum flows typically occur in March or April.

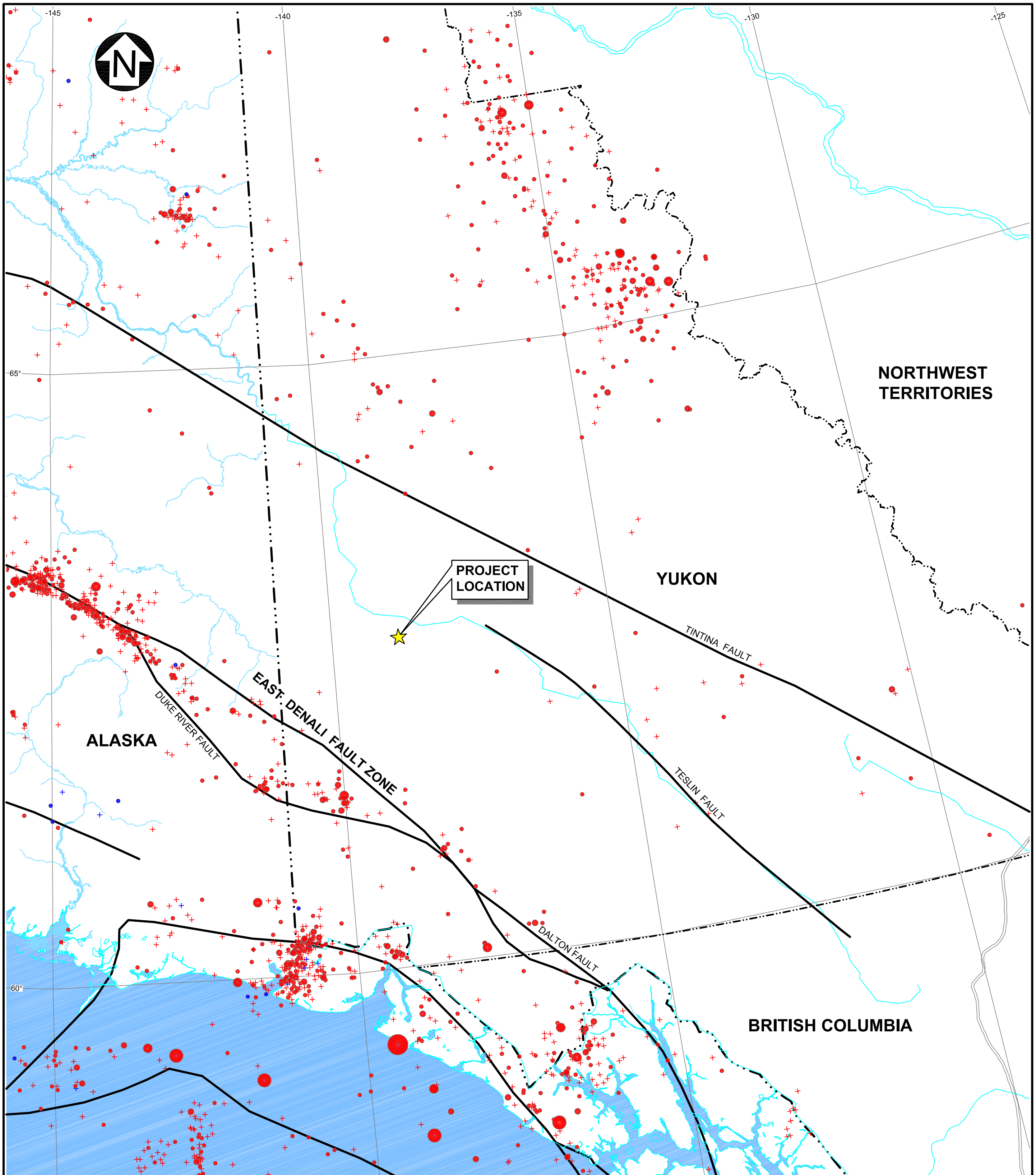
The climate and hydrology at the Casino Project site have been assessed based on both short-term site data and longer-term regional data. Climatic data were collected on-site at the Project climate station located in the upper Casino Creek sub-watershed at an elevation of 1200 m. The period of site record extends from 1993 to 1994 and from 2008 to 2011. Preliminary streamflow data were collected by Hallam Knight Piésold in 1993 and 1994. A new data streamflow collection program was initiated by AECOM in 2008, with the installation of ten streamflow gauging stations. As of 2012, nine streamflow gauging stations are considered to be in active operation and continue to be operated at present by Knight Piésold Ltd (KPL).

The mean annual unit runoff for undisturbed catchments in the project area was estimated to be approximately 183 mm, based on the long-term estimates of streamflow for the hydrology station W4 on Casino Creek. The mean annual precipitation is estimated to be 510 mm, with 65% falling as rain and 35% falling as snow. The annual potential evapotranspiration value is estimated to be 300 mm, based on measured temperatures at the Project site climate station, and long-term regional temperature records. Details of the hydrometeorological analyses are presented in the KPL report "Updated Hydrometeorology Report" (Ref. No. VA101-325/8-11, July 9, 2012).

2.3 SEISMICITY

The region of the southwest Yukon Territory and northwest British Columbia is one of the most seismically active areas in Canada. The seismic hazard in the region is also influenced by the seismically active region of southeast Alaska. The coastal region has experienced many large earthquakes, including events with magnitudes in the range of magnitude 7.0 to 8.0. In 1958 a magnitude 7.9 earthquake occurred along the Fairweather fault (the northern extension of the Queen Charlotte transform fault). The most significant inland zone of seismicity follows the Dalton and Duke River segments of the Denali fault zone through the southwest Yukon. Farther inland there is only minor seismicity between the Denali and Tintina fault systems, including the region of the Casino Project site.

A probabilistic seismic hazard assessment has been carried out for the Casino project site to provide seismic parameters for design of project facilities. Details and results of the seismic hazard analysis are provided in the KPL report “Feasibility Design of the Tailings Management Facility” (Ref. No. VA101-325/8-10, December, 2012). Figure 2.1 shows the regional tectonics and historical seismicity of the Yukon and surrounding regions. Review of historical earthquake records and regional tectonics indicates that the Casino Project site is situated in a region of low seismicity and moderate seismic hazard.



SYMBOL SIZE PROPORTIONAL TO MAGNITUDE

- 3.5 - 3.9
- 4.0 - 4.9
- 5.0 - 5.9
- 6.0 - 6.9
- 7.0 - 7.9
- 8.0 - 8.9
- 9.0 +

NOTES:

1. GLOBAL COORDINATE SYSTEM IS UTM WITH NAD83 DATUM, ZONE 10 m, CENTRAL MERIDIAN.
2. HISTORICAL EARTHQUAKE DATA FROM NRCAN, USGS, AND NGDC DATABASES.
3. INCLUDES RECORDED EARTHQUAKES FROM 1600 TO 1973 (MAGNITUDE > 6.0) AND FROM 1973 TO SEPTEMBER 2012 (MAGNITUDE > 3.5).

SCALE A: 50 25 0 50 100 150 200 250 km

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REGIONAL TECTONICS AND HISTORICAL SEISMICITY

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P/A NO.	REF NO.
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FIGURE 2.1 REV 0

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0	18DEC'12	ISSUED WITH REPORT	GRG	NSD	GRG	KJB

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3 – GEOTECHNICAL CONDITIONS

Geological information and geotechnical conditions for the WSA, ore stockpiles and topsoil stockpiles has been derived from interpretation of information and data provided by KPL site investigations at the project site in 1993, 1994, 2010, 2011 and 2012. These site investigations have included test pitting, geotechnical drilling, laboratory testing of recovered rock core and bulk soil samples, in situ permeability testing and geophysical surveys. The locations of site investigations in the area of the ore stockpiles are shown on Figure 3.1. The locations of site investigations in the area of the TMF, WSA and topsoil/overburden stockpiles located south of the TMF are shown on Figure 3.2.

Detailed results of previous geotechnical investigations at the Casino Project site are included in KPL reports:

- "Report on Preliminary Surficial Geotechnical Investigations" (Ref. No. 1831/1, March, 1994)
- "Data Compilation Report on 1994 Geotechnical/Hydrogeological Investigations" (Ref. No. 1832/2, February 22, 1995)
- "2010 Geotechnical Site Investigation Data Report" (Ref. No. VA101-325/3-4, November 2, 2010)
- "2011 Geotechnical Site Investigation Data Report – Waste Management Facilities" (Ref. No., VA101-325/8-5, December, 2012), and
- "2012 Geotechnical Site Investigation Data Report – Waste Management Facilities" (Ref. No., VA101-325/8-14, December, 2012).

A summary of the geotechnical conditions for the Waste Storage Area, ore stockpile areas and topsoil stockpile areas are provided in the following sections.

3.1 WASTE STORAGE AREA

The waste storage area is located in the upstream part of the TMF impoundment area, in Casino Creek valley. The WSA is underlain by the following geotechnical units:

- Overburden:
  - Topsoil
  - Silty SAND to GRAVEL with some cobbles, trace clay (residual soil and colluvial veneer) along valley ridges and upper slopes
  - SILT and SAND with some gravel and cobbles, trace clay (colluvial apron) and interbedded SAND and gravelly SAND with some cobbles (alluvium) along the lower slopes and valley bottom
- Weathered Bedrock, and
- Fresh Bedrock.

The ridges and upper slopes of Casino Creek valley are characterized by well drained colluvial and residual sandy soils, supporting stands of tall spruce and poplar. The colluvial veneer is locally overlying residual soils near the top of the slopes. The colluvium is relatively thin along the upper part of particularly south facing slopes, and generally absent on ridges where residual soils predominate.

The colluvial veneer along the slopes of the valley is comprised of a fine to medium grained sand with some silt, supporting coarse gravel and cobble sized broken rock fragments. The thickness and organic content generally increase down-slope. On north-facing slopes, the colluvial veneer is mostly frozen.

Along slopes and ridges in Casino Creek valley the depth to bedrock varies from about 0.5 to 7.5 metres, with an average overburden thickness of between 2 and 3 metres. The depth to bedrock is considerably larger near the valley bottom, where slopes are gentler. An overburden thickness of up to 23 metres has been observed in the valley bottom near the proposed Main Embankment, and conditions are expected to be similar in the waste storage area. This material is classified as colluvial apron, which has a higher fines and organic content than the colluvial veneer. The colluvial apron is mostly frozen, with excess ice and massive ice layers. The colluvial apron is underlain by alluvium close to Casino Creek. The alluvium is coarse grained and comprised of interbedded sands and gravelly sands with cobbles, and is mostly unfrozen due to the presence of Casino Creek.

Dawson Range Batholith (Mid-Cretaceous) is the main country rock in the WSA area and is dominantly granodiorite in composition. Quartz monzonite and diorite are less abundant.

Permafrost is discontinuous along Casino Creek valley and is restricted primarily to valley bottoms, north-facing slopes and local shaded areas.

3.2 ORE STOCKPILE AREAS

The proposed ore stockpiles are located on south to east-facing slopes near the plant site and open pit. Vegetation in these areas is comprised primarily of deciduous black spruce with thin moss and forest litter cover. Soil profiles throughout the areas typically comprise a thin veneer of organic rich topsoil and colluvium overlying in situ weathered residual soils or competent bedrock. The ore stockpile areas have the following generalized stratigraphy:

- Overburden:
    - Topsoil with many cobbles and boulders
    - Silty to gravelly SAND with some cobbles and boulders (Residual Soil and Colluvium)
- Weathered Bedrock, and
- Fresh Bedrock.

The topsoil thickness is typically less than 0.3 m, and comprises dry to moist organic-rich sandy silt with peat layers. Coarse talus blocks are found throughout the stockpile areas and are common at higher elevations such as the proposed gold ore and supergene oxide stockpiles. The underlying soil generally consists of loose silty sand to sandy silt with some gravel, cobbles and boulders (Residual Soil and Colluvium). It typically ranges in thickness from 0.3 to 3 m.

The overburden is often underlain by up to two meters of weathered bedrock. The bedrock is locally completely weathered and friable. Total depths to competent bedrock range from about 0.5 to 4 m with an average depth of approximately two meters. However, the depth to bedrock is greater in the Gold Ore stockpile area located east of the open pit. All test pits were refused on dense frozen soils at this location, and no bedrock was encountered. The overburden thickness typically exceeds five meters in the area of the Gold Ore stockpile.

The bedrock is predominantly comprised of medium strong, slightly weathered Dawson Range Batholith Granodiorite, with locally Quartz Monzonite.

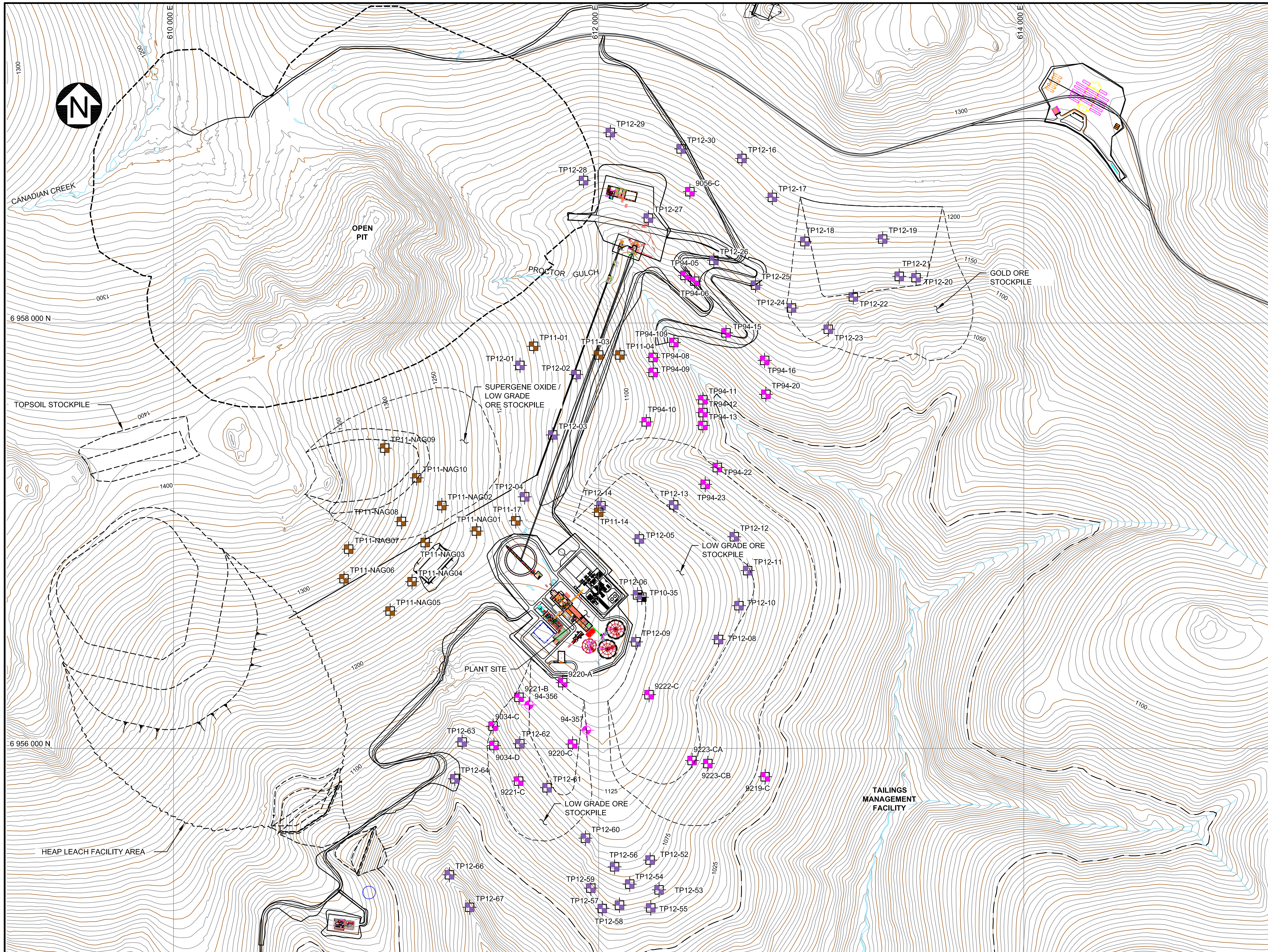
Discontinuous zones of permafrost were recorded throughout the stockpile areas. Thin ice lenses were found in the overburden and interstitial ice crystals were observed in completely weathered bedrock.

Other areas are characterized by well-drained colluvial and/or residual sandy soils supporting stands of tall spruce and poplar.

A perched water table was observed directly below ground surface in several test pits with frozen soils. The maximum depth at which the groundwater table was observed was approximately two to three metres below ground surface in all Ore stockpile areas. In the majority of the test pits no water level was observed.

3.3 TOPSOIL STOCKPILE AREAS

Limited site investigations have been performed to date at the proposed locations of the topsoil stockpiles, north of the HLF and south of the TMF. The topsoil stockpiles are located at hilltop areas, which are characterized by a thin layer of topsoil, underlain by residual soil and bedrock. The residual soil generally consists of loose silty sands and gravels, with some cobbles and boulders. A maximum overburden thickness of approximately 3 m is expected. Permafrost is generally limited or absent in hilltop areas.



NOTES:

1. COORDINATE GRID IS UTM (WGS84/NAD83) ZONE 7 (m).
2. CONTOUR INTERVAL IS 5 METRES.
3. DIMENSIONS ARE IN METRES UNLESS NOTED.
4. PLANT SITE AND CRUSHER LAYOUT PROVIDED BY M3 ENGINEERING AND TECHNOLOGY CORPORATION (OCTOBER 4, 2012).
5. OPEN PIT PROVIDED BY CASINO MINING CORPORATION (NOVEMBER 2012).
6. ONLY SELECT TEST PITS AND DRILLHOLES ARE SHOWN FROM PREVIOUS SITE INVESTIGATION PROGRAMS.
7. ORE AND TOPSOIL STOCKPILES ARE SHOWN AT THEIR MAXIMUM SIZE DURING OPERATIONS.

LEGEND:

- 1993 AND 1994 TEST PIT
- 2010 TEST PIT
- 2011 TEST PIT
- 2012 TEST PIT
- 2012 GEOTECHNICAL DRILLHOLE
- 1994 GEOTECHNICAL DRILLHOLE

200 100 0 200 400 600 800 1000 m
SCALE A

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ORE STOCKPILES AREA
SITE INVESTIGATIONS

Knight Piésold CONSULTING

P/A NO.	REF NO.
VA101-325/8	12

FIGURE 3.1 REV 0

REV	DATE	DESCRIPTION	DESIGNED	DRAWN	CHK'D	APP'D
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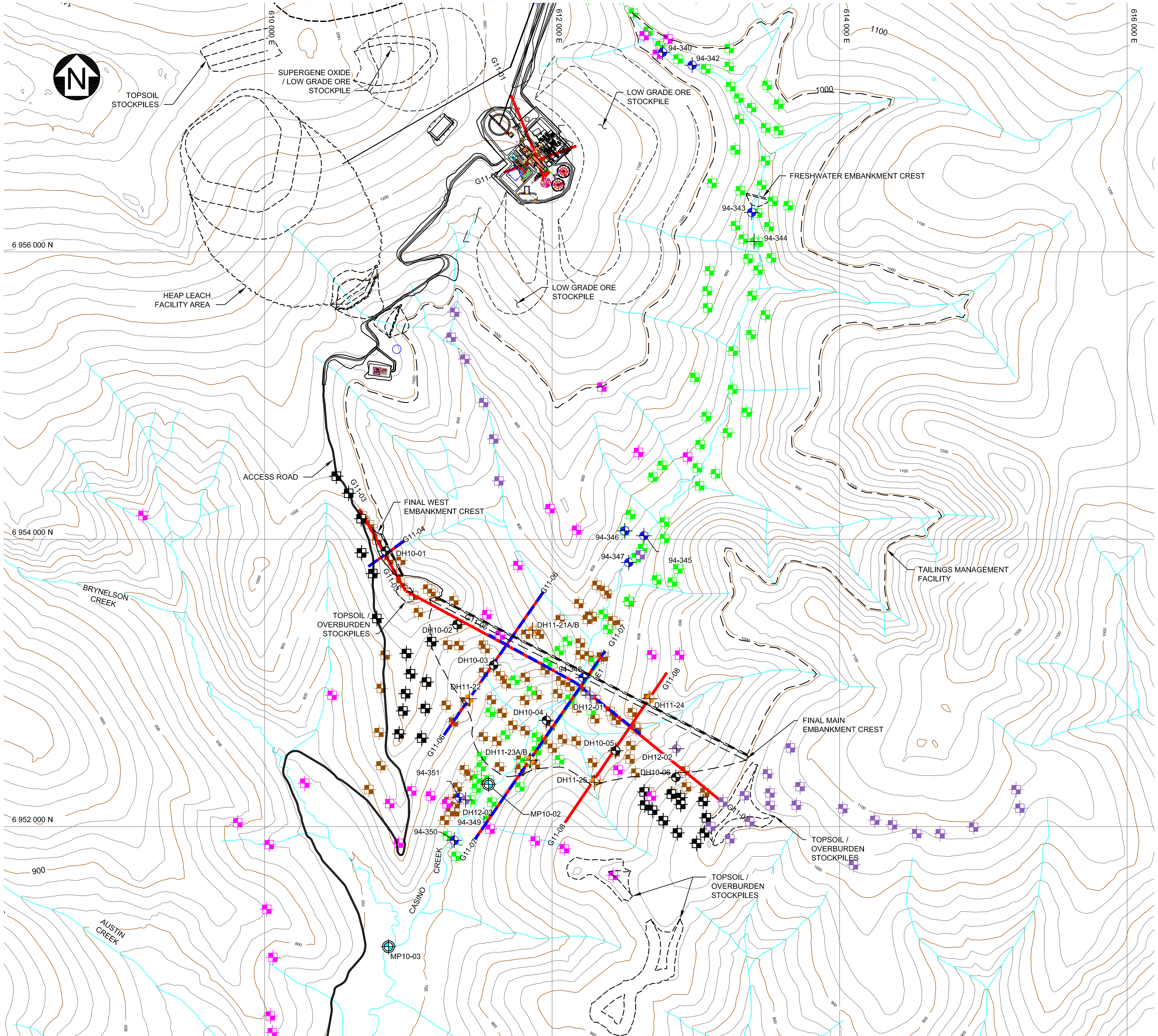

LEGEND:

- DH12-01 — 2012 GEOTECHNICAL DRILLHOLE
- DH11-30 — 2011 GEOTECHNICAL DRILLHOLE
- MW11-01A — 2011 MONITORING WELL
- MP10-01 — MINI PIEZOMETER
- HG10-01 — 2010 HYDROGEOLOGICAL DRILLHOLE
- DH10-01 — 2010 GEOTECHNICAL DRILLHOLE
- 94-305 — 1994 GEOTECHNICAL DRILLHOLE
- 94-344 — 1994 GEOTECHNICAL DRILLHOLE WITH THERMISTOR
- 94-350 — 1994 GEOTECHNICAL DRILLHOLE WITH 50 mm DIA. WELL
- 2012 TEST PIT LOCATION
- 2011 TEST PIT LOCATION
- 2010 TEST PIT LOCATION
- 1994 TEST PIT LOCATION
- 1993 TEST TRENCH LOCATION
- 2011 SEISMIC REFRACTION LINE
- 2011 GROUND PENETRATING RADAR (GPR) LINE
- 2011 EM31 LINE

NOTES:

1. COORDINATE GRID IS UTM (WGS84/NAD83) ZONE 7 (m).
2. CONTOUR INTERVAL IS 25 METRES.
3. DIMENSIONS ARE IN METRES UNLESS NOTED.
4. TEST PITS ID'S ARE NOT SHOWN ON FIGURE TO IMPROVE CLARITY.
5. PLANT SITE AND CRUSHER LAYOUT PROVIDED BY M3 ENGINEERING AND TECHNOLOGY CORPORATION (OCTOBER 4, 2012)
6. HEAP LEACH PAD IS SHOWN AT ITS MAXIMUM SIZE.
7. ORE AND TOPSOIL STOCKPILES ARE SHOWN AT THEIR MAXIMUM SIZE DURING OPERATIONS.

SCALE A: 300 150 0 500 1000 1500 m

REV	DATE	DESCRIPTION	DESIGNED	DRAWN	CHK'D	APP'D
0	18DEC'12	ISSUED WITH REPORT	SB/LM	WAL/PP	GRG	KJB

CASINO MINING CORPORATION

CASINO COPPER-GOLD PROJECT

TAILINGS MANAGEMENT FACILITY AREA SITE INVESTIGATIONS

Knight Piésold CONSULTING

P/A NO.	REF NO.
VA101-325/8	12

FIGURE 3.2 — REV 0

4 – WASTE STORAGE AREA AND STOCKPILES DESIGN

4.1 DESIGN BASIS

All mine waste rock and overburden material generated by open pit operations is to be stored in an environmentally sound, safe and secure manner in a permanent storage facility.

The current mine production schedule indicates that a total of approximately 658 million tonnes of waste rock and overburden will be produced over the life of the mine. A geochemical waste characterization program has been completed by Others to predict the potential reactivity of waste rock and overburden materials from the open pit. The findings of these studies indicate that almost all of this waste material comprises Potentially Acid Generating (PAG) and Metal Leaching (ML) materials. These PAG and ML waste materials will be placed and stored subaqueously in a Waste Storage Area (WSA) located within the Tailings Management Facility (TMF). The TMF has been sized to provide sufficient capacity to store approximately 956 million tonnes of tailings (including cyclone sand tailings used as embankment fill) and subaqueous disposal of 658 million tonnes of potentially reactive waste materials. Tailings and potentially reactive waste rock and overburden materials will be deposited in the TMF concurrently over the mine life.

In addition to the WSA, temporary ore stockpiles and a number of topsoil stockpiles will be located at engineered storage sites.

Approximately 157.5 million tonnes of gold ore will be processed at the Heap Leach Facility (HLF). This gold ore will be stored in a temporarily stockpile near to the crusher and will report to the heap leach facility over a period of about 18 years, starting in the pre-production years (3 years prior to mill start-up) and continuing up to Year 15 of mill operations. Heap leach facility operations will commence during pre-production stripping of the open pit.

During mine operations approximately 144 million tonnes of Low Grade ore and 32 million tonnes of Supergene Oxide (SOX) ore will be stored in temporary stockpiles. The SOX ore will be stockpiled during the pre-production years and in Year 1 of mill operations, and report to the mill during Years 4 to 12 together with direct feed mill ore. Low Grade ore will be stockpiled up to Year 17 and milled during the last four years of mine operations (Years 19 to 22).

It is anticipated that approximately 2 to 3 million tonnes of Non-Acid Generating (NAG) waste rock (leach cap material) will be produced during pre-production mining. This material will be used in the construction of the TMF Starter (Stage 1) embankment. Any NAG waste rock that is either unsuitable for use as a construction material or in excess of construction material requirements will be placed in the WSA or an adjacent surface dump.

The temporary storage of topsoil recovered during the construction of mine site facilities is required to ensure sufficient reclamation medium is available for mine closure. Topsoil recovered during construction will be stockpiled at select locations close to the material source.

A summary of the annual mine production schedule is presented in Table 4.1. Table 4.2 summarises the annual production and handling schedule of stockpiled ore.

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CONSULTING

TABLE 4.1

CASINO MINING CORPORATION
CASINO COPPER-GOLD PROJECT

FEASIBILITY DESIGN OF WASTE STORAGE AREA AND STOCKPILES
SUMMARY OF MINE PRODUCTION SCHEDULE

Print Dec/19/12 14:08:28

YEAR	ORE TO MILL				CONCENTRATE	TAILINGS		WASTE MATERIAL			
	Direct Feed	Ore Stockpiles		Total	Concentrate	NAG	PAG	Hypogene	Supergene	Unclassified Waste	Total Waste
		Low Grade	Supergene Oxide								
	Tonnes	Tonnes	Tonnes	Tonnes	Tonnes	Tonnes	Tonnes	Tonnes	Tonnes	Tonnes	Tonnes
PP	0	0	0	0	0	0	0	0	9,470,000	210,000	9,680,000
1	34,500,000	0	0	34,500,000	345,000	27,324,000	6,831,000	5,000	22,429,000	78,000	22,512,000
2	45,928,000	0	0	45,928,000	459,280	36,374,976	9,093,744	159,000	29,031,000	116,000	29,306,000
3	45,814,000	0	0	45,814,000	458,140	36,284,688	9,071,172	943,000	36,757,000	211,000	37,911,000
4	42,056,000	0	3,600,000	45,656,000	456,560	36,159,552	9,039,888	573,000	38,759,000	31,000	39,363,000
5	41,653,000	0	3,600,000	45,253,000	452,530	35,840,376	8,960,094	10,690,000	30,585,000	64,000	41,339,000
6	41,605,000	0	3,600,000	45,205,000	452,050	35,802,360	8,950,590	14,096,000	20,972,000	21,000	35,089,000
7	41,576,000	0	3,600,000	45,176,000	451,760	35,779,392	8,944,848	10,579,000	27,036,000	64,000	37,679,000
8	42,145,000	0	3,600,000	45,745,000	457,450	36,230,040	9,057,510	12,401,000	25,529,000	39,000	37,969,000
9	42,491,000	0	3,600,000	46,091,000	460,910	36,504,072	9,126,018	8,952,000	26,680,000	226,000	35,858,000
10	41,175,000	0	3,600,000	44,775,000	447,750	35,461,800	8,865,450	6,369,000	28,591,000	55,000	35,015,000
11	41,095,000	0	3,600,000	44,695,000	446,950	35,398,440	8,849,610	7,931,000	44,635,000	132,000	52,698,000
12	42,251,000	0	3,610,000	45,861,000	458,610	36,321,912	9,080,478	15,273,000	32,380,000	10,000	47,663,000
13	46,249,000	0	0	46,249,000	462,490	36,629,208	9,157,302	20,341,000	23,455,000	1,000	43,797,000
14	45,798,000	0	0	45,798,000	457,980	36,272,016	9,068,004	31,372,000	11,413,000	0	42,785,000
15	45,187,000	0	0	45,187,000	451,870	35,788,104	8,947,026	31,379,000	6,445,000	5,000	37,829,000
16	45,064,000	0	0	45,064,000	450,640	35,690,688	8,922,672	37,370,000	563,000	1,000	37,934,000
17	44,772,000	0	0	44,772,000	447,720	35,459,424	8,864,856	20,242,000	0	0	20,242,000
18	44,934,000	0	0	44,934,000	449,340	35,587,728	8,896,932	8,266,000	0	0	8,266,000
19	14,676,000	30,915,000	0	45,591,000	455,910	36,108,072	9,027,018	4,932,000	0	0	4,932,000
20	0	45,053,000	0	45,053,000	450,530	35,681,976	8,920,494	0	0	0	0
21	0	44,985,000	0	44,985,000	449,850	35,628,120	8,907,030	0	0	0	0
22	0	22,875,000	0	22,875,000	228,750	18,117,000	4,529,250	0	0	0	0
TOTALS	788,969,000	143,828,000	32,410,000	965,207,000	9,652,070	764,443,944	191,110,986	241,873,000	414,730,000	1,264,000	657,867,000

M:\1\01\00325\08\A\Report\12 - Waste Storage Areas & Stockpiles\Rev 0\Table\[Table 4.1 Rev 0 - Waste Production Schedule.xlsx]Table 4.1

NOTES:

1. MINE SCHEDULE PROVIDED BY CASINO MINING CORPORATION (NOVEMBER 01, 2012).
2. PP = PRE-PRODUCTION YEARS -3, -2 AND -1.
3. CONCENTRATE ASSUMED TO BE 1% OF MILL FEED.
4. POTENTIALLY ACID GENERATING (PAG) TAILINGS ASSUMED TO BE 20% OF TOTAL TAILINGS; NON-ACID GENERATING (NAG) TAILINGS ASSUMED TO BE 80% OF TOTAL TAILINGS.
5. APPROXIMATELY 2 MILLION Tonnes OF WASTE ROCK IS NON-REACTIVE AND BECOMES AVAILABLE DURING PRE-PRODUCTION.

0	07DEC'12	ISSUED WITH REPORT VA101-325/8-12	SB	GRG	KJB
REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D

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TABLE 4.2

CASINO MINING CORPORATION
CASINO COPPER-GOLD PROJECT

FEASIBILITY DESIGN OF WASTE STORAGE AREA AND STOCKPILES
ORE PRODUCTION AND STOCKPILE SCHEDULE

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YEAR		LOW GRADE ORE			SUPERGENE OXIDE			GOLD ORE (HEAP LEACH FACILITY)			Total Ore in Stockpiles
		To Stockpile	From Stockpile to Mill	Stockpile Size	To Stockpile	From Stockpile to Mill	Stockpile Size	Gold Ore to Stockpile	Gold Ore Stockpile to Crusher	Stockpile Size	
		Tonnes	Tonnes	Tonnes	Tonnes	Tonnes	Tonnes	Tonnes	Tonnes	Tonnes	Tonnes
PP	-3	0	0	0	20,000	0	20,000	0	0	0	20,000
	-2	0	0	0	2,806,000	0	2,826,000	5,072,000	0	5,072,000	7,898,000
	-1	184,000	0	184,000	9,950,000	0	12,776,000	12,529,000	0	17,601,000	30,561,000
1		839,000	0	1,023,000	19,634,000	0	32,410,000	9,542,000	0	27,143,000	60,576,000
2		7,187,000	0	8,210,000	0	0	32,410,000	8,454,000	0	35,597,000	76,217,000
3		3,396,000	0	11,606,000	0	0	32,410,000	3,754,000	0	39,351,000	83,367,000
4		10,772,000	0	22,378,000	0	3,600,000	28,810,000	0	1,316,000	38,035,000	89,223,000
5		16,513,000	0	38,891,000	0	3,600,000	25,210,000	0	8,630,000	29,405,000	93,506,000
6		22,234,000	0	61,125,000	0	3,600,000	21,610,000	0	8,053,000	21,352,000	104,087,000
7		11,972,000	0	73,097,000	0	3,600,000	18,010,000	0	352,000	21,000,000	112,107,000
8		6,775,000	0	79,872,000	0	3,600,000	14,410,000	3,986,000	0	24,986,000	119,268,000
9		8,299,000	0	88,171,000	0	3,600,000	10,810,000	4,227,000	0	29,213,000	128,194,000
10		5,575,000	0	93,746,000	0	3,600,000	7,210,000	9,110,000	0	38,323,000	139,279,000
11		4,944,000	0	98,690,000	0	3,600,000	3,610,000	0	7,862,000	30,461,000	132,761,000
12		9,461,000	0	108,151,000	0	3,610,000	0	0	8,500,000	21,961,000	130,112,000
13		9,029,000	0	117,180,000	0	0	0	0	8,200,000	13,761,000	130,941,000
14		6,670,000	0	123,850,000	0	0	0	0	8,887,000	4,874,000	128,724,000
15		8,620,000	0	132,470,000	0	0	0	0	4,874,000	0	132,470,000
16		7,142,000	0	139,612,000	0	0	0	0	0	0	139,612,000
17		4,216,000	0	143,828,000	0	0	0	0	0	0	143,828,000
18		0	0	143,828,000	0	0	0	0	0	0	143,828,000
19		0	30,915,000	112,913,000	0	0	0	0	0	0	112,913,000
20		0	45,053,000	67,860,000	0	0	0	0	0	0	67,860,000
21		0	44,985,000	22,875,000	0	0	0	0	0	0	22,875,000
22		0	22,875,000	0	0	0	0	0	0	0	0
TOTALS		143,828,000	143,828,000		32,410,000	32,410,000		56,674,000	56,674,000		

M:\1\01\00325\08\A\Report\12 - Waste Storage Areas & Stockpiles\Rev 0\Table\[Table 4.2 Rev 0 - Ore Production and Stockpile Schedule.xlsx]Table 4.2

NOTES:

1. MINE SCHEDULE PROVIDED BY CASINO MINING CORPORATION (VERSION "SCHED01NOV2012").
2. PP = PRE-PRODUCTION YEARS -3, -2 AND -1.

0	07DEC'12	ISSUED WITH REPORT VA101-325/8-12	SB	LM	KJB
REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D

The WSA and temporary stockpiles will be designed to remain stable under both static and seismic loading conditions. The minimum acceptable factor of safety for waste and ore stockpiles under static conditions is 1.3 for short-term operating conditions and 1.5 after closure and reclamation. All ore and topsoil stockpiles will be removed before or at closure of the mine. In the event of a premature mine closure it is anticipated that the stockpiled ore would need to be hauled to the TMF for disposal, or potentially re-handled for processing at the mill for delivery to the TMF as tailings. Details of the closure plan are being developed by Others.

The design earthquake defined for seismic stability assessment of the stockpile slopes is the 1 in 500 year earthquake, with a corresponding peak ground acceleration of 0.08g (mean hazard value on soft rock/very dense soil) and earthquake magnitude of 8.0. A factor of safety under seismic conditions of less than 1.0 is acceptable provided that any predicted deformations resulting from seismic loading are not significant, and would not impact mine site facilities, including the WSA and TMF.

The 1 in 100 year 24-hour storm event is defined as the design storm event for the sizing of surface runoff and diversion ditches for ore stockpiles. The 24-hour precipitation depth associated with this storm event was estimated according to the Rainfall Frequency Atlas of Canada (Hogg and Carr, 1965) as presented in the KPL report "Updated Hydrometeorology Report" (Ref. No. VA101-325/8-11, July 9, 2012).

A summary of the design basis for the WSA and stockpiles is presented in Table 4.3.

4.2 DESIGN AND OPERATION

Storage piles have been designed to accommodate the following materials:

- Potentially reactive (PAG and ML) waste rock and overburden
- Stockpiled ore (Low Grade ore, Supergene Oxide ore and Gold leach ore), and
- Topsoil/overburden materials.

The location and configuration of the Waste Storage Area and ore stockpiles is presented on the overall site general arrangement plan shown on Figure 1.2**.** A plan view of the WSA and stockpiles development over the life of mine is shown for Year -1 (Pre-production), Year 1, Year 4, Year 10 and Year 22 (Final) on Figures 4.1 to 4.5 respectively. Figure 4.6 shows typical slope configurations for the ore stockpiles and topsoil stockpiles.

The specific design and operating requirements for the WSA, ore stockpiles and topsoil stockpiles are described in the following sections.

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TABLE 4.3

CASINO MINING CORPORATION
CASINO COPPER-GOLD PROJECT

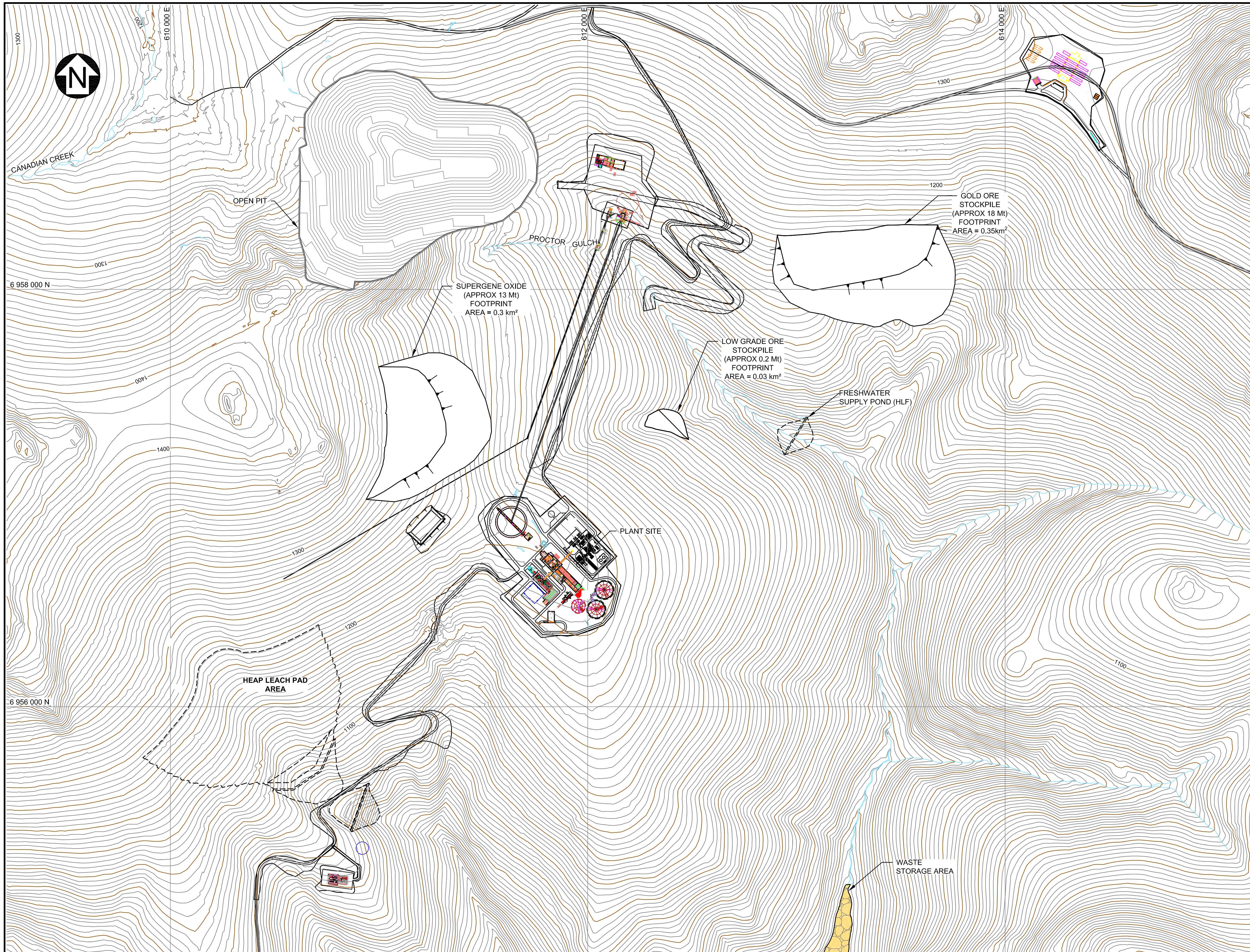
SUMMARY OF DESIGN BASIS FOR WASTE STORAGE AREA AND STOCKPILES

Print Dec/19/12 14:10:47

ITEM	DESIGN CRITERIA
Mine Production	• Total ore milled = 965.2 million tonnes (Mt) • Mine Operating Life = 22 years (+ 3 pre-production years) • Mill throughput= ~125,000 tpd • Heap Leach operations= ~157,5 million tonnes of gold ore
Stockpiled Ore	• Topsoil from embankment foundation preparation will be stockpiled for reclamation. • Low grade ore stockpiled during operations ◦ Maximum size = 143.8 Mt • Supergene Oxide ore stockpiled during operations ◦ Maximum size = 32.4 Mt • Gold Ore stockpiled during operations (reports to Heap Leach Facility) ◦ Maximum size = 39.4 Mt
Potentially Reactive Waste Rock and Overburden	• Produced from years 1 to 19 and stored in Waste Storage Area (WSA). • Total waste production is 658 million tonnes (overburden and waste rock) at variable rate.
Non Reactive Waste Rock (Leach Cap material)	• Approximately 2 to 3 million tonnes produced in pre-production years • Used for TMF Stage 1 (Starter) Embankment construction
Seismic Criteria	• Design Earthquake: 1/500 year event • Magnitude = 8.0 • Peak ground acceleration = 0.08g (Mean hazard value for soft rock / very dense soil conditions)
Stability Criteria	• The minimum acceptable factors of safety for each case considered are as follows: ◦ Short term (during mine operations) 1.3 ◦ Long term (closure) 1.5 (all stockpiles processed or removed to TMF prior to closure) ◦ For seismic loading condition, a factor of safety less than 1.0 is acceptable provided that any predicted deformations are minor, and would not impact mine site facilities, including the WSA and TMF.
Water Management	• Diversion ditches constructed upstream as required to minimize contact water with ore stockpiles. • Design storm event for ditch sizing is the 1 in 100 year event.
Closure Criteria	• Final crest of WSA to be levelled and contoured as required to provide long term stability. • Footprint of ore stockpiles to be covered with suitable topsoil and revegetated. • Stockpiled topsoil / overburden material used for reclamation of TMF and HLF.

M:\1\01\00325\08\A\Report\12 - Waste Storage Areas & Stockpiles\Rev 0\Table\[Table 4.3 Rev 0 - Summary of Design Basis.xls]Design Basis - Table 4.3

0	07DEC'12	ISSUED WITH REPORT VA101-325/8-12	LM	GRG	KJB
REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D



NOTES:

1. COORDINATE GRID IS UTM (WGS84/NAD83) ZONE 7 (m).
2. CONTOUR INTERVAL IS 5 METRES.
3. DIMENSIONS ARE IN METRES UNLESS NOTED.
4. PLANT SITE AND CRUSHER LAYOUT PROVIDED BY M3 ENGINEERING AND TECHNOLOGY CORPORATION (OCTOBER 4, 2012).
5. OPEN PIT AS PROVIDED BY CASINO MINING CORPORATION (NOVEMBER 2012).

SCALE A 200 100 0 200 400 600 800 1000 m

CASINO MINING CORPORATION

CASINO COPPER-GOLD PROJECT

GENERAL ARRANGEMENT OF ORE STOCKPILES - YEAR -1 (PRE-PRODUCTION)

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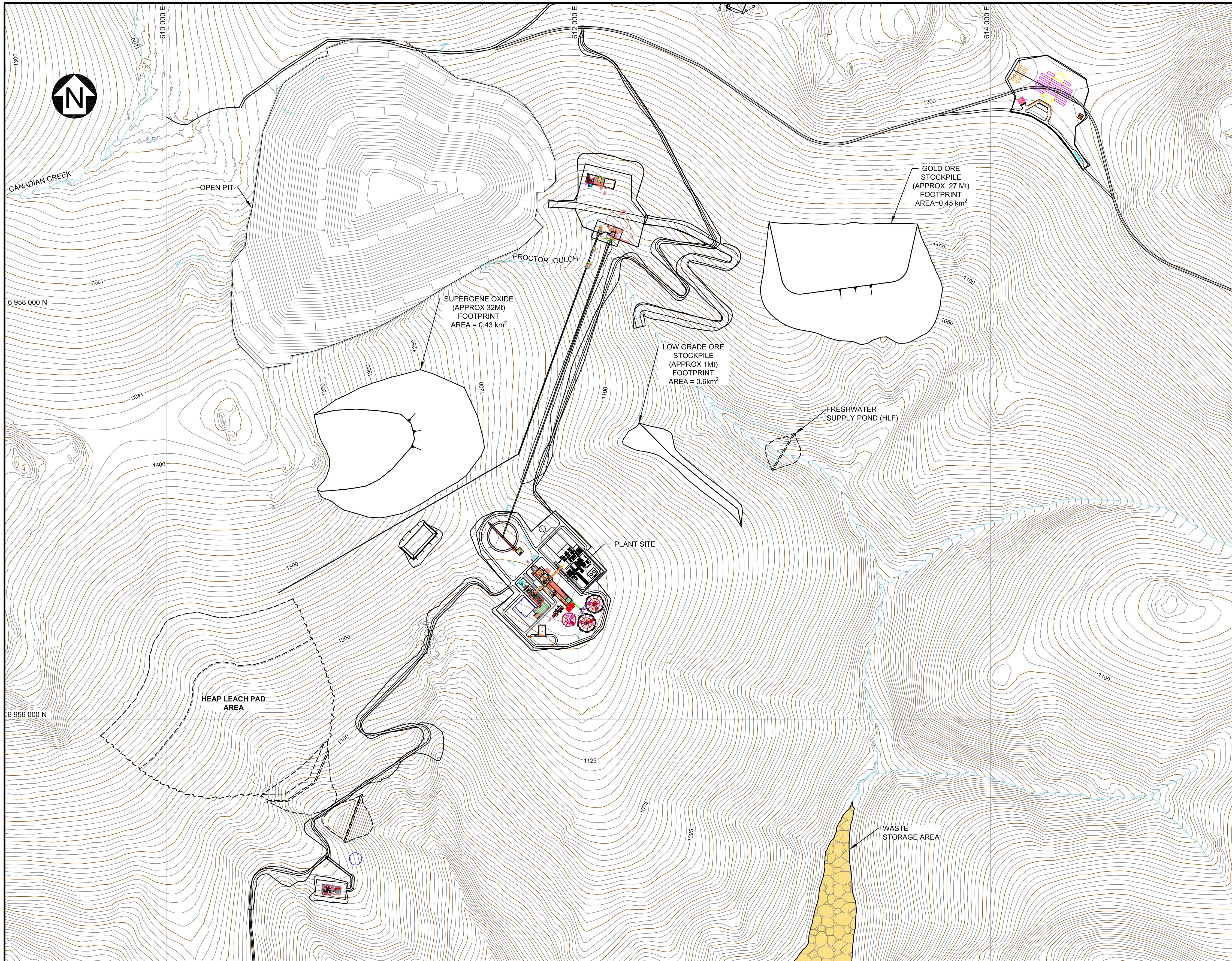
P/A NO.	REF NO.	
VA101-325/8	12	
FIGURE 4.1		REV 0

REV	DATE	DESCRIPTION	DESIGNED	DRAWN	CHK'D	APP'D
0	18DEC'12	ISSUED WITH REPORT	BH/LM	NSD/PP	GRG	KJB



NOTES:

1. COORDINATE GRID IS UTM (WGS84/NAD83) ZONE 7 (m).
2. CONTOUR INTERVAL IS 5 METRES.
3. DIMENSIONS ARE IN METRES UNLESS NOTED.
4. PLANT SITE AND CRUSHER LAYOUT PROVIDED BY M3 ENGINEERING AND TECHNOLOGY CORPORATION (OCTOBER 4, 2012).
5. OPEN PIT AS PROVIDED BY CASINO MINING CORPORATION (NOVEMBER 2012).

SCALE A 200 100 0 200 400 600 800 1000 m

CASINO MINING CORPORATION

CASINO COPPER-GOLD PROJECT

GENERAL ARRANGEMENT OF ORE STOCKPILES - YEAR 1

Knight Piésold CONSULTING

P/A NO.	REF NO.
VA101-325/8	12

FIGURE 4.2 REV 0

REV	DATE	DESCRIPTION	DESIGNED	DRAWN	CHK'D	APP'D
0	18DEC'12	ISSUED WITH REPORT	BH/LM	NSD/PP	GRG	KJB

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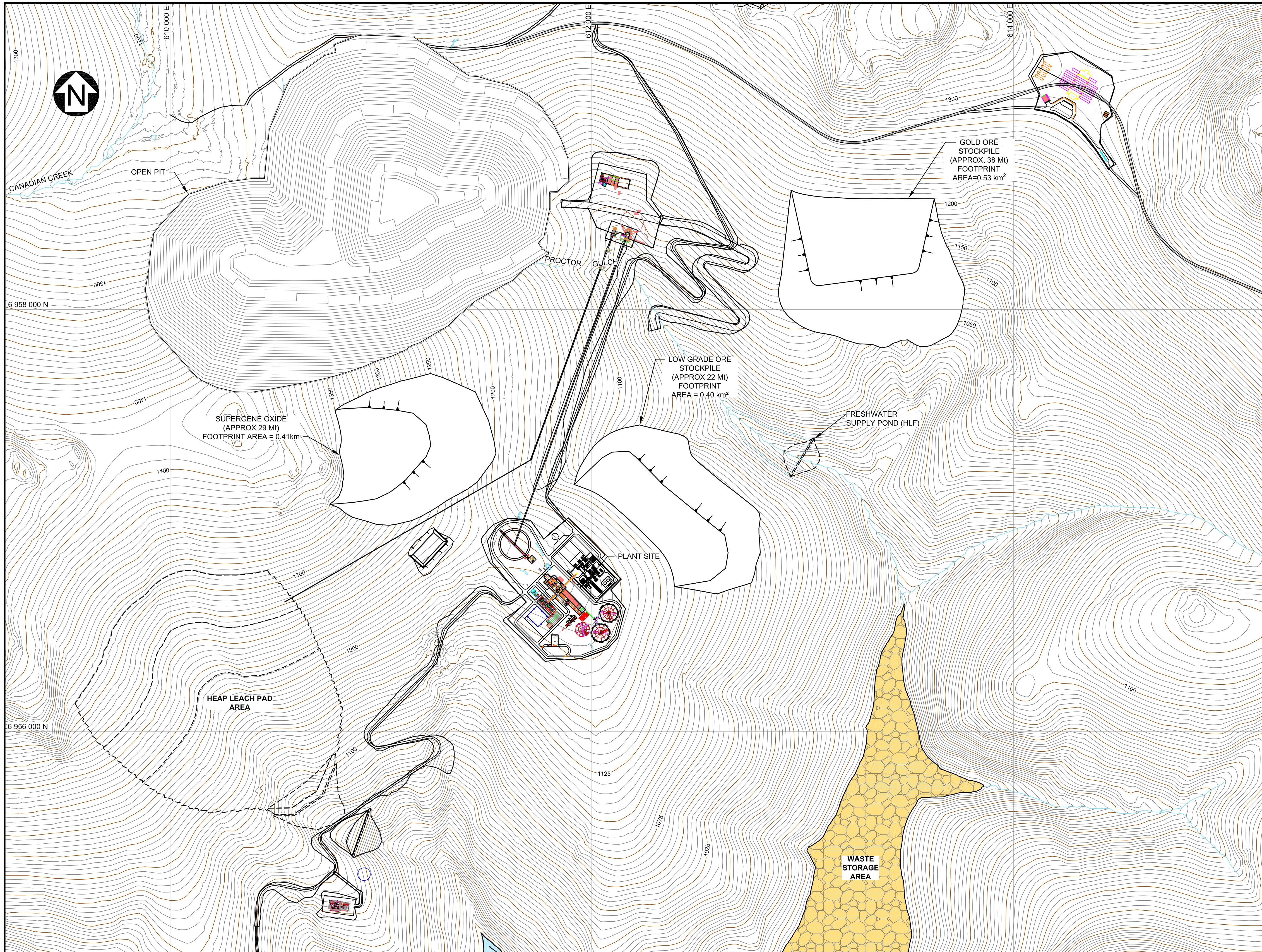


NOTES:

1. COORDINATE GRID IS UTM (WGS84/NAD83) ZONE 7 (m).
2. CONTOUR INTERVAL IS 5 METRES.
3. DIMENSIONS ARE IN METRES UNLESS NOTED.
4. PLANT SITE AND CRUSHER LAYOUT PROVIDED BY M3 ENGINEERING AND TECHNOLOGY CORPORATION (OCTOBER 4, 2012).
5. OPEN PIT AS PROVIDED BY CASINO MINING CORPORATION (NOVEMBER 2012).

SCALE A: 200 100 0 200 400 600 800 1000 m

CASINO MINING CORPORATION

CASINO COPPER-GOLD PROJECT

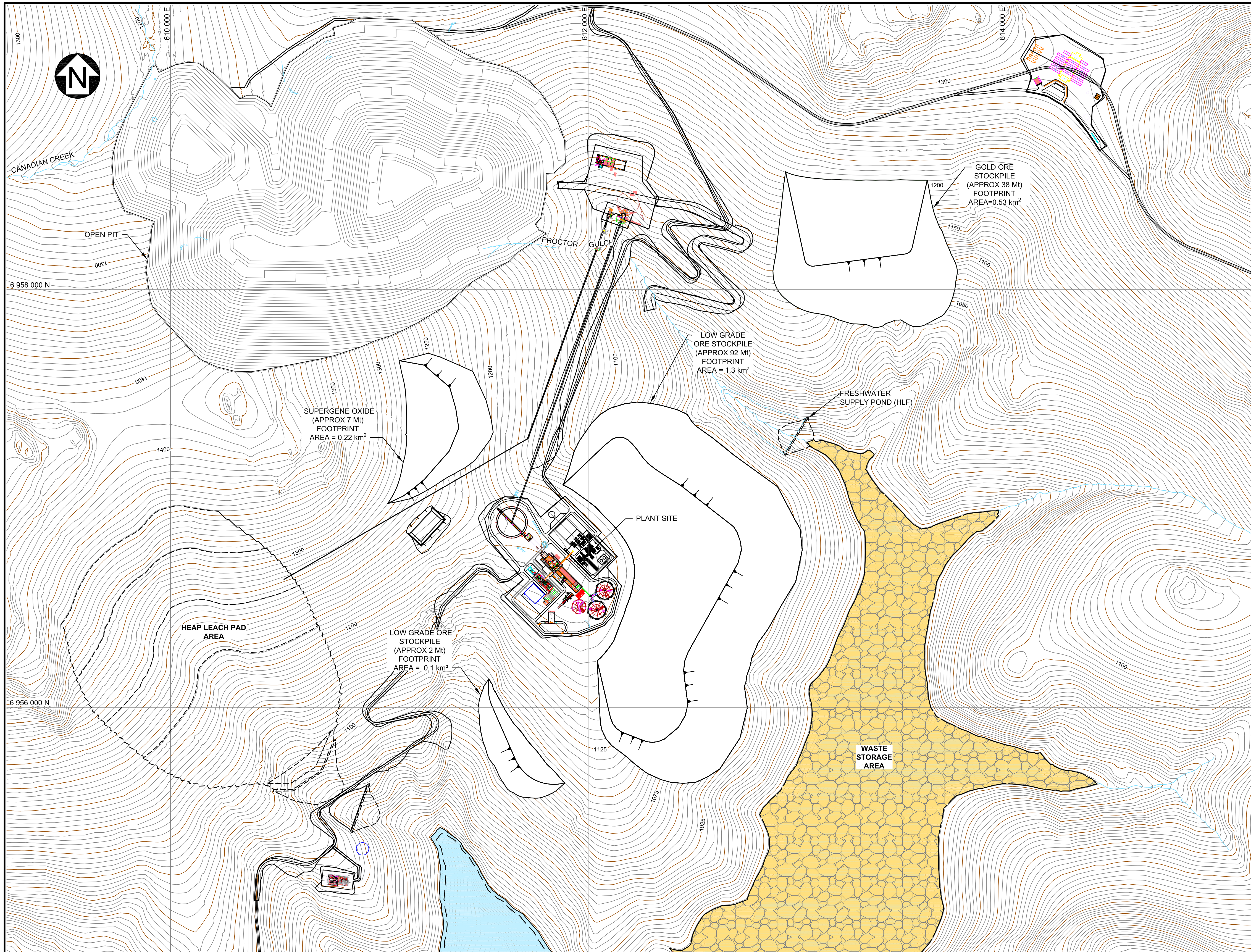
GENERAL ARRANGEMENT OF ORE STOCKPILES - YEAR 4

Knight Piésold CONSULTING

P/A NO.	REF NO.
VA101-325/8	12

FIGURE 4.3	REV 0

REV	DATE	DESCRIPTION	DESIGNED	DRAWN	CHK'D	APP'D
0	18DEC'12	ISSUED WITH REPORT	BH/LM	NSD/PP	GRG	KJB



NOTES:

1. COORDINATE GRID IS UTM (WGS84/NAD83) ZONE 7 (m).
2. CONTOUR INTERVAL IS 5 METRES.
3. DIMENSIONS ARE IN METRES UNLESS NOTED.
4. PLANT SITE AND CRUSHER LAYOUT PROVIDED BY M3 ENGINEERING AND TECHNOLOGY CORPORATION (OCTOBER 4, 2012).
5. OPEN PIT AS PROVIDED BY CASINO MINING CORPORATION (NOVEMBER 2012).

200 100 0 200 400 600 800 1000 m
SCALE A

CASINO MINING CORPORATION

CASINO COPPER-GOLD PROJECT

GENERAL ARRANGEMENT OF ORE STOCKPILES - YEAR 10

Knight Piésold CONSULTING

P/A NO.	REF NO.	REV
VA101-325/8	12	0

FIGURE 4.4

REV	DATE	DESCRIPTION	DESIGNED	DRAWN	CHK'D	APP'D
0	12DEC'12	ISSUED WITH REPORT	BH/LM	NSD/PP	GRG	KJB

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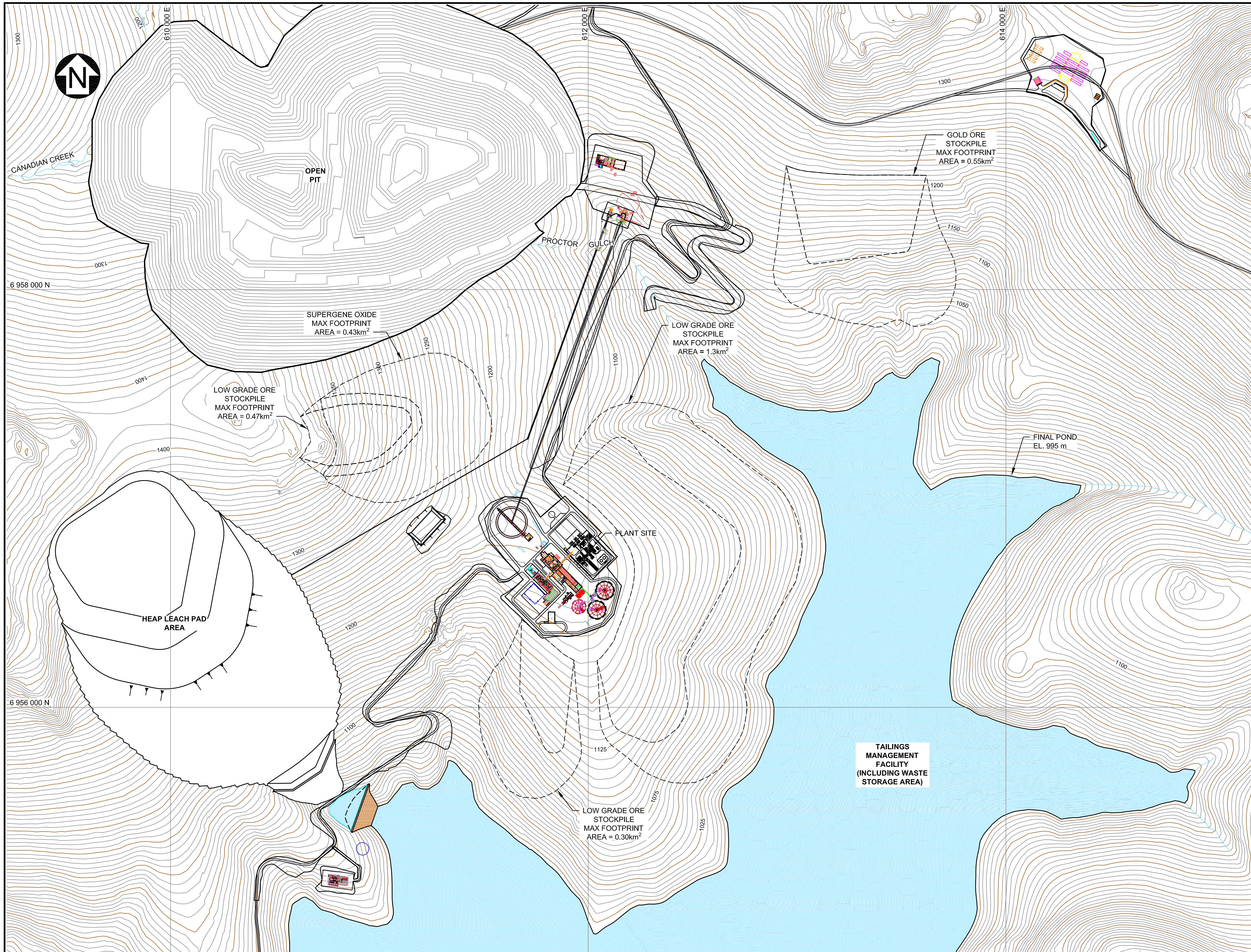

NOTES:

1. COORDINATE GRID IS UTM (WGS84/NAD83) ZONE 7 (m).
2. CONTOUR INTERVAL IS 5 METRES.
3. DIMENSIONS ARE IN METRES UNLESS NOTED.
4. PLANT SITE AND CRUSHER LAYOUT PROVIDED BY M3 ENGINEERING AND TECHNOLOGY CORPORATION (OCTOBER 4, 2012).
5. OPEN PIT IS SHOWN AT ITS FINAL OUTLINE AS PROVIDED BY CASINO MINING CORPORATION (NOVEMBER 2012).
6. ORE STOCKPILES ARE SHOWN AT THEIR MAXIMUM SIZE DURING OPERATIONS. ALL STOCKPILES REMOVED DURING OPERATIONS OR AT CLOSURE.

SCALE A 200 100 0 200 400 600 800 1000 m

CASINO MINING CORPORATION

CASINO COPPER-GOLD PROJECT

GENERAL ARRANGEMENT OF ORE STOCKPILES - YEAR 22

Knight Piésold CONSULTING

P/A NO.	REF NO.	
VA101-325/8	12	
FIGURE 4.5		REV 0

REV	DATE	DESCRIPTION	DESIGNED	DRAWN	CHK'D	APP'D
0	18DEC'12	ISSUED WITH REPORT	BH/LM	NSD/PP	GRG	KJB

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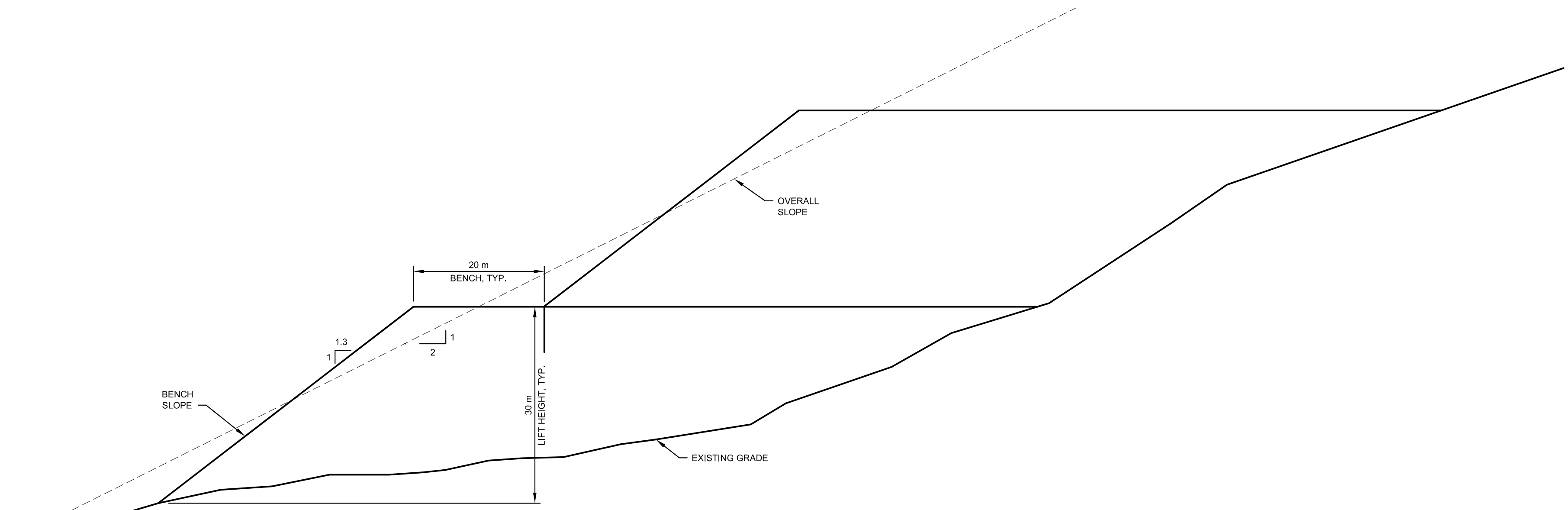
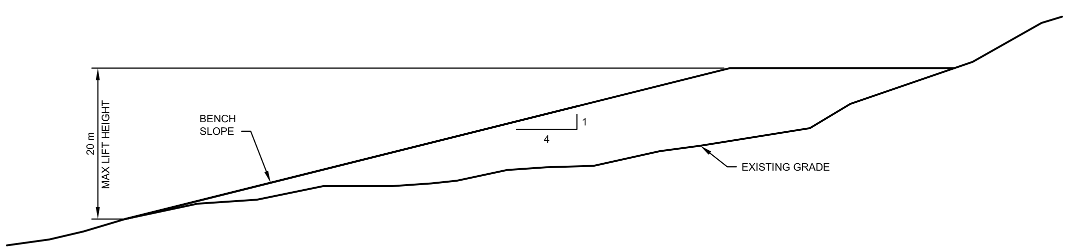


ORE STOCKPILE
SCALE A



TOPSOIL
SCALE A

SCALE A 10 5 0 10 20 30 40 50 m

CASINO MINING CORPORATION

CASINO COPPER-GOLD PROJECT

ORE AND TOPSOIL STOCKPILES SLOPE CONFIGURATIONS

Knight Piésold CONSULTING

P/A NO.	REF NO.
VA101-325/08	12

FIGURE 4.6 REV 0

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REV	DATE	DESCRIPTION	DESIGNED	DRAWN	CHK'D	APP'D

4.2.1 Waste Storage Area

Approximately 658 million tonnes of potentially reactive (PAG and ML) waste rock and overburden material from the open pit will be placed into the WSA. The WSA will be operated to maintain a minimum separation between the WSA and the TMF embankments of approximately one km. This separation will allow development of a NAG tailings beach between the TMF embankments and the WSA. The tailings deposit will provide a low permeability transition zone between the coarse, permeable waste rock and the TMF embankments. This low permeability zone will function as a seepage limitation and control measure.

Development of the WSA is based on the mine production schedule presented in Table 4.1. It will be developed with a similar rate of rise as the tailings. The on-going maximum elevation of the WSA will be maintained at an elevation above the potential flood level of the TMF supernatant pond. The crest will be maintained several metres higher than the tailings and supernatant pond to provide a dry, stable surface for access and placement of material. The crest of the WSA will be covered with tailings and submerged by the supernatant pond in the later years of the mine life when stockpiled low grade ore is being milled after open pit mining is complete. Based on the current mine production schedule, approximately four years of tailings deposition will occur after final placement of waste rock in the WSA.

Waste rock deposition shall satisfy short and long term stability requirements. An overall slope of 1.5H:1V has been assumed for design purposes, but steeper slopes may be achieved in practice.

The following are recommended methods of construction and operation to ensure on going stability and performance of the WSA:

- Waste rock and overburden will be transported from the open pit using haul trucks. The material may be end dumped over the face or spread by dozers over the crest of the waste dump.
- Trial sections may be constructed in the field during the initial stages of development to monitor waste pile stability and foundation performance.
- Waste rock shall be end dumped over the crest to allow for maximum segregation of the coarser material at the base of each bench. For overburden materials, end dumping short of the crest and dozing over may be required.

These methods may be updated and revised, as necessary, based on field observations and performance monitoring during the initial stages of WSA development.

Details of the design and operation of the TMF, including the co-disposal of waste rock and overburden materials within the WSA, are provided in the KPL report “Feasibility Design of the Tailings Management Facility” (Ref. No. VA101-325/8-10, December, 2012).

4.2.2 Ore Stockpiles

Stockpiled ore will be placed on the south to east facing slopes between the TMF and the open pit, and will expand progressively over the mine life. The stockpiled ore will vary over the mine life, as shown in Table 4.2, with a peak of approximately 144 million tonnes of Low Grade ore stockpiled in Year 17. The stockpiled ore will be milled over the later years of the mine life. Low Grade ore mined after Year 12 can be stockpiled at the same location used for the SOX ore stockpile, located south of the open pit. SOX ore stockpiled in pre-production and Year 1 of mill operations will report to the mill in Years 4 to 12.

The following are recommended methods of construction and operation to ensure stockpile stability and to allow easy recovery of the ore. These methods may be updated and revised, as necessary, based on field observations and performance monitoring during the initial stages of waste pile construction.

Pre-Production

- Clear vegetated areas and strip the foundations prior to loading to remove the organic layer and to initiate the melting of any permafrost or frozen soils
- Strip topsoil to windrow for use during reclamation
- Remove any ice rich, frost susceptible and unsuitable soft or thawed and saturated materials in the foundation prior to ore placement, and
- Construct diversion and runoff collection ditches where required.

Operations

- Ore material will be transported from the pit using haul trucks. The material will be end dumped and spread by dozers over the crest of the pile.
- Load the ore stockpile in lifts starting at the toe and working progressively upslope. Each lift may be developed at the angle of repose for the material (approximately 1.3H:1V). However, benches should be left along the toe of each successive lift to establish a maximum overall slope angle of 2H:1V.
- The lifts should be loaded and developed in a direction parallel to the slope wherever possible to avoid stress concentrations associated with “nose” configurations where the axis of the pile extends outward and perpendicular to the slope.
- Trial sections should be constructed in the field during the initial stages of development to monitor pile stability and foundation performance.

The prepared base of the stockpiles will function as a working platform during the re-handling of the ore for milling.

Unsuitable soils excavated from the footprint of the ore stockpiles can be placed within the TMF. It is recommended to excavate down to competent bedrock in areas where permafrost or frozen soils are encountered during construction. Bedrock is generally encountered at shallow depths throughout the stockpile areas with an assumed average depth of approximately two meters, and will provide a solid foundation that is not susceptible to frost effects. However, the depth to bedrock is deeper (over 5 metres) in the area of the gold leach ore stockpile. For this area, and any other areas where the depth to competent bedrock is deep, it may be preferable to develop the stockpile configuration to provide suitable stability by buttressing at the toe of the pile.

Diversion ditches will be required upstream of the ore stockpiles to minimize the contact of runoff water with the ore. Details of the surface water management strategy are described in Section 4.4.

4.2.3 Topsoil Stockpiles

Topsoil materials will be stripped during development of the plant site, the open pit, ore stockpiles, HLF and the TMF embankments. The topsoil will be placed in stockpiles for use in reclamation activities. The stockpiles will generally be located within two kilometres of the material source. Topsoil salvaged from the base of ore stockpiles will be windrowed around the toe of the piles. The location of the various topsoil stockpiles is shown on the general arrangement plan on Figure 1.2.

Initial construction and ongoing development of mine site facilities will require that topsoil and organic material be salvaged from select areas of ground disturbance. Soil salvaging and stockpiling operations will require a variety of management practices to ensure that soils are handled and stored properly during all phases of the mine development. Soil management practices to be carried out for soil stripping, salvage and stockpiling are summarized below:

- Wet conditions will be avoided when possible during soil salvage operations.
- 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.
- Soil will be stockpiled in locations to minimize the possibility of further disturbance.
- Stockpile locations will, where possible, be located a sufficient distance away from operations to protect soils from contamination from risk of spills or metal deposition.
- Protective ditches will be constructed where practical around stockpiles to prevent any spill reaching stockpiles.
- Erosion will be managed by limiting the height and slope of stockpiles. Erosion control measures will be implemented including prompt vegetation establishment on topsoil stockpiles to reduce exposure of bare soil.
- Where possible soil stockpiles will be oriented to reduce wind erosion and located to reduce wind exposure.

These methods may be updated and revised, as necessary, based on field observations and performance monitoring during stockpile development. Toe berms to ensure stockpile stability may be required, based on foundation conditions and the strength characteristics and condition of the stockpiled material.

The topsoil stockpiles will be limited to a maximum height of about 20 m (crest to downstream toe), with consideration of site-specific ground conditions, and constructed as wrap around dumps in an ascending sequence. This construction method is used to improve overall stability as each constructed lift will act as a buttress for the toe of the next lift. In addition, the topsoil stockpiles will be constructed such that the overall slope angle will average 14 degrees (4H:1V). These flat overall topsoil stockpile slopes will minimize the risk of slope instability, reduce erosion potential and improve the amenability for vegetation growth. The use of topsoil for concurrent reclamation activities will reduce the quantity of material required to be stockpiled. Figure 4.7 shows the slope configuration for the topsoil stockpiles.

It is anticipated that some overburden material will also be required for reclamation and erosion control of the downstream slopes of TMF embankments. Overburden and topsoil materials will be stockpiled separately.

4.3 STABILITY OF WASTE STORAGE AREA AND STOCKPILES

A stability assessment has been carried out for the WSA, topsoil stockpiles and ore stockpiles.

The stability of the WSA is not a concern, as the slope of the waste material adjacent to the tailings deposit is buttressed by the tailings, with only a few metres height of the waste pile above the surface of the tailings. Acceptable slopes and benching of the waste rock will depend on the elevation difference between the waste rock, tailings and supernatant pond during operations, as well as the condition of the tailings. An overall slope of 1.5H:1V has been assumed for design purposes, as shown on Figure 1.3, but steeper slopes may be achieved in practice. Any sloughing and ravelling of waste material into the tailings and supernatant pond will not impact the integrity of the TMF. The tailings embankments are typically over one kilometre from the WSA and it is anticipated that there will be a significant tailings beach width (over 200 metres) that slopes upward between the pond and embankments.

To provide stability the slopes of the topsoil stockpiles are comparatively low and flat, with gently sloped faces with an overall slope angle of about 14 degrees (4H:1V). Toe berms to ensure stockpile stability may be required, based on the foundation conditions encountered and the strength characteristics and condition of the stockpiled material.

Numerical stability analyses have been carried out for the ore stockpiles. Two sections have been considered:

- Low Grade ore stockpile, with an overall slope of 2H:1V and overburden thickness of 3 metres, representing the stockpile located south of the open pit, and
- Gold Leach ore stockpile, with an overall slope of 2H:1V and overburden thickness of 10 metres (located in an area where the thickness of the overburden is typically greater than 5 metres).

The conditions and stability of the other Low Grade ore stockpiles are similar to or better than those identified for the Low Grade ore stockpile south of the open pit, based on consideration of overburden thickness and ground slope.

Figures 4.7 and 4.8 show the stockpile sections and material parameters used in the stability analyses for the Low Grade ore stockpile and Gold Leach ore stockpile respectively. Both sections are based on the maximum stockpile height achieved during operations.

The stability analyses for the ore stockpiles were carried out using the limit equilibrium computer program SLOPE/W. In this program a systematic search was performed to obtain the minimum factor of safety from a number of potential slip surfaces. Factors of safety were calculated using the rigorous Morgenstern-Price method of analysis. In accordance with standard industry practice, the minimum acceptable factor of safety for waste and ore stockpiles under static conditions is 1.3 for short-term operating conditions and 1.5 after reclamation and abandonment. Seismic loading was modelled by performing a pseudo-static analysis. A factor of safety under seismic conditions of less than 1.0 is acceptable provided that any predicted deformations resulting from seismic loading are not significant, and would not impact mine site facilities, including the WSA and TMF.

The design earthquake has been taken as the 1 in 500 year return period event, consistent with the Operating Basis Earthquake (OBE) defined for the TMF. The corresponding mean peak ground acceleration is 0.08g. A design earthquake magnitude of 8.0 has been selected based on a review of regional tectonics, potential seismic source zones in the region and historical seismicity.

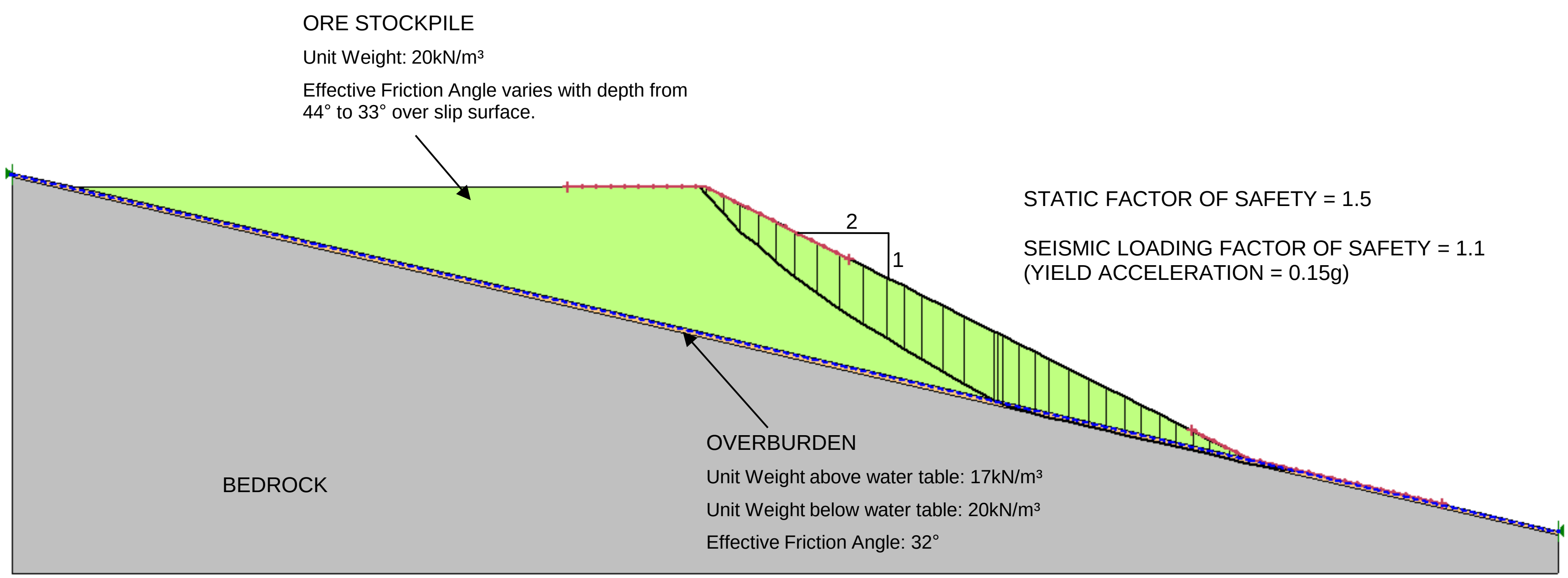
The following parameters and assumptions were incorporated into the stability analyses:

- The unit weights used for the stockpiled ore and foundation soils were based on typical values for similar materials. An average bulk unit weight of 20 kN/m^3 was used for the stockpiled ore materials. Unit weights of 17 kN/m^3 and 20 kN/m^3 were used for the foundation overburden soils above and below the water table respectively.

- The effective friction angle of the overburden materials at the base of stockpile is assumed to be 32 degrees for cleared foundations (all unsuitable and ice rich soils are assumed to be removed).
- The shear strength for stockpiled ore material has been defined using a conservative strength function that defines the variation of shear strength with normal stress. The strength function is based on published information on the shear strength properties of granular rock fill materials (Leps, 1970).
- The phreatic surface was assumed to be one metre below the base of the ore stockpile. This is based on information provided by test pitting during the site investigation programs.
- There are no excess pore water pressures generated by thawing of foundation materials. It is assumed that appropriate foundation preparation and/or excavation have been conducted in any areas with ice rich and frozen soils.

The minimum calculated static factor of safety is 1.5 for the Low Grade ore stockpile and 1.4 for the Gold Leach ore stockpile (about 1.35 for small shallow slip surfaces). These results indicate that the proposed configuration of the stockpile slopes is adequate to maintain short term (operational) static stability (factors of safety greater than 1.3). The potential slip surface and minimum static factor of safety calculated from the analyses are included on Figures 4.7 and Figure 4.8. In the event of a premature mine closure it is anticipated that the stockpiled ore would need to be hauled to the TMF for disposal, or potentially re-handled for processing at the mill for delivery to the TMF as tailings. Details of the closure plan are being developed by Others.

The seismic stability assessment of the ore stockpiles has included an estimation of potential seismically induced deformations from the design earthquake. To account for the possible amplification of ground accelerations as seismic waves propagate through stockpile, an amplification factor of 1.5 was assumed, resulting in an estimated average maximum acceleration of 0.12g within the waste rock pile. Potential deformations under earthquake loading have been estimated using the simplified methods of Newmark (1965) and Makdisi-Seed (1977). Predicted deformations calculated for the design earthquake are negligible. The consequences of a stockpile slope failure due to earthquake shaking is minimal and restricted to minor displacement of the surface of the stockpile slopes (ravelling). There would be a negligible impact on the integrity of the stockpile and little, if any, impact on other mine site facilities.



NOTES:

1. PHREATIC SURFACE ASSUMED TO BE AT A DEPTH OF 1 METRE BELOW BASE OF STOCKPILE.
2. AVERAGE OVERBURDEN THICKNESS OF 3 METRES ASSUMED.
3. STOCKPILE SECTION REPRESENTS MAXIMUM HEIGHT OF LOW GRADE ORE STOCKPILES (190 METRES FOR STOCKPILE LOCATED SOUTH OF OPEN PIT).

CASINO MINING CORPORATION

CASINO COPPER-GOLD PROJECT

ORE STOCKPILE STABILITY ANALYSIS
LOW GRADE ORE STOCKPILE

Knight Piésold CONSULTING

P/A NO. VA101-325/8

REF. NO. 12

FIGURE 4.7

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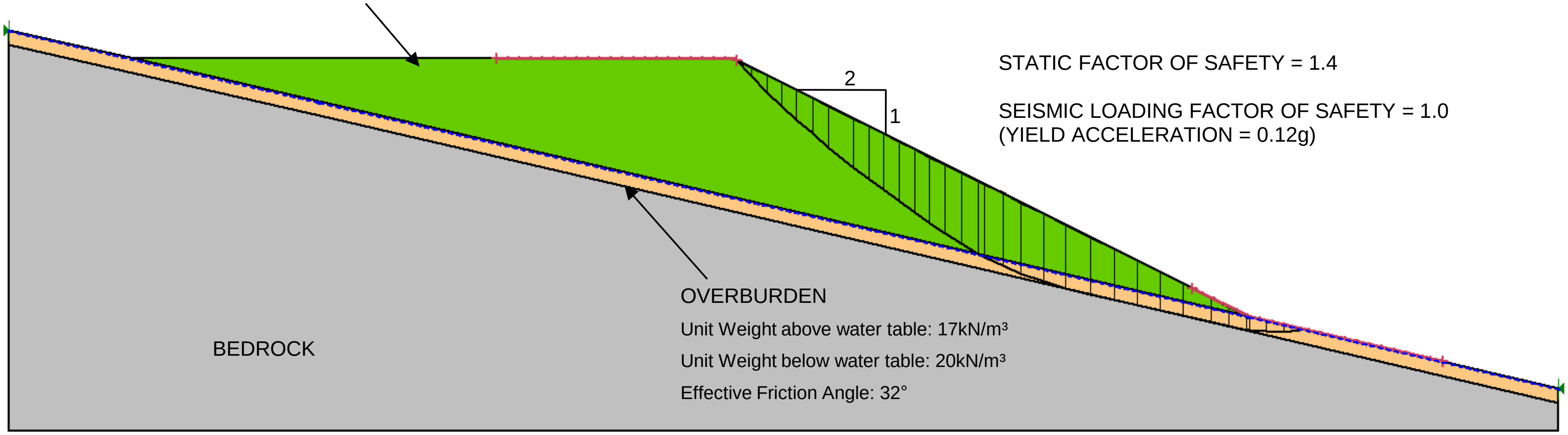

NOTES:

1. PHREATIC SURFACE ASSUMED TO BE AT A DEPTH OF 1 METRE BELOW BASE OF STOCKPILE.
2. AVERAGE OVERBURDEN THICKNESS OF 10 METRES ASSUMED.
3. STOCKPILE SECTION REPRESENTS MAXIMUM HEIGHT OF ORE STOCKPILE (180 METRES).

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	07DEC'12	ISSUED WITH REPORT	LM	GRG	KJB

CASINO MINING CORPORATION

CASINO COPPER-GOLD PROJECT

ORE STOCKPILE STABILITY ANALYSIS
GOLD LEACH ORE STOCKPILE

Knight Piésold CONSULTING

P/A NO.	REF. NO.
VA101-325/8	12

FIGURE 4.8 REV 0

4.4 SURFACE WATER MANAGEMENT AND SEDIMENT CONTROL

The surface and diversion ditching system which discharges to the TMF basin, is designed to divert surface flow around the ore stockpiles to minimise contact with the water. The collection of seepage from the toe of the ore will not be required. The diversion ditching system consists of a series of ditches constructed along the upslope side of the stockpiles and are designed to meet the following design criteria:

- Design storm conveyance: 1 in 100 year 24-hour duration storm event
- Minimum freeboard = 0.3 m
- Maximum design storm flow depth = 0.5 m
- Minimum ditch grade = 0.01 m/m
- Minimum channel side slope = 2H:1V

Evaluation of the estimated surface runoff for the 1 in 100 year 24-hour storm event was undertaken using the Hydrologic Engineering Centre Hydrologic Modeling System (HEC-HMS). HEC-HMS simulates the precipitation-runoff processes of dendritic drainage basins and uses site specific data to accurately capture the specific climate and catchment conditions, including storm precipitation intensity distribution, snowmelt, catchment slope, drainage and precipitation losses.

Two different ditch systems are required for the diversion runoff: ‘earth lined’ and ‘erosion protected’. The earth lined ditch sections are those portions of ditch with shallow grades and low flow velocities. The erosion protection ditch sections will require either riprap or synthetic lining to prevent ditch scouring and erosion when conveying runoff water at steeper grades and higher velocity flows. Based on the topography at Site, the total ditch widths range between three to four metres for protected ditch sections and four to five metres for the shallow-grade earth lined sections.

Sediment control fencing will be placed around the down-gradient perimeter sections of the stockpiles to prevent sediment discharge from the stockpiles.

4.5 RECLAMATION AND CLOSURE

Reclamation of ore stockpile footprints will be required for mine closure. As much as practical the reclamation will be carried out concurrent with mine operations.

It is anticipated that reclamation of the footprint of ore stockpiles will take place in the later years of mine operations and post mill closure as stockpiled ore is milled and the stockpile footprints are exposed. Reclamation will be conducted in conjunction with on-going environmental monitoring to ensure that sediment control and water quality objectives and criteria are met. A general arrangement of the project site at the end of operations (Year 22) is shown on Figure 4.5 including the location and configuration of the final WSA within the TMF.

The WSA will be fully contained within the final TMF at closure. No closure activities will be required on the WSA to ensure long-term geotechnical stability and integrity. The final configuration of the TMF and WSA provides a tailings layer approximately 3 metres thick over the surface of the WSA (assuming a horizontal tailings surface) with a 4 metre deep supernatant pond over the tailings layer at the end of operations (Year 22). A minimum cover of 2 metres of water is recommended to ensure geochemical containment of the WSA materials.

Topsoil and overburden materials stockpiled south of the TMF will be used for reclamation of the TMF beach and the downstream slope of the TMF Main Embankment. For the West Saddle Embankment a small quantity of topsoil and overburden will be stockpiled nearby and used for reclamation of the downstream slope. The topsoil stockpile located south of the open pit will be used for reclamation of the Heap Leach Facility. The windrow topsoil located at the toe of the ore stockpiles will be used to reclaim the stripped area of the stockpile foundations.

A closure and reclamation plan for the project is being developed by Others.

5 – SCHEDULE OF QUANTITIES

Quantity estimates for the materials and work items required for initial construction and for ongoing operations of the ore stockpiles and topsoil stockpiles are presented in Table 5.1. Quantities have been estimated for the following components of stockpile development and operation:

- Foundation clearing and preparation of ore stockpiles foundations
- Surface water management ditching, and
- Erosion and sediment control.

The estimated maximum footprint area for each of the ore stockpiles is included on Figure 4.5.

An average depth of 0.3 metres was assumed for stripping and grubbing of ore stockpiles footprints. Excavation of unsuitable overburden materials was assumed to a depth of 3 metres for the Low Grade ore and SOX ore stockpiles. Excavation of unsuitable overburden materials to a depth of 5 metres was assumed for the Gold Leach ore stockpile, where the depth of overburden is greater.

The Feasibility level quantities were measured on the basis of the designs and dimensions shown on the relevant Figures of this report. These quantities have been developed to enable costing to be conducted to a level of accuracy of ± 15 percent. It is understood that the all capital costs and operating costs will be prepared by Others.

The cost estimate will also need to include the following items:

- Site haul roads to ore/topsoil stockpiles and the WSA
- Haulage of ore and topsoil materials to/from stockpiles
- Haulage of potentially reactive mine waste rock and overburden materials to the WSA, and
- Excavation of unsuitable (ice-rich and frost susceptible) soils from the ore stockpiles, and haulage and placement of these materials into the TMF.

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TABLE 5.1

CASINO MINING CORPORATION
CASINO COPPER-GOLD PROJECT

FEASIBILITY DESIGN STUDIES
SCHEDULE OF QUANTITIES FOR STOCKPILES

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Item Number		Description	Unit	PP Quantity	Year 1 Quantity	Year 2 Quantity	Year 3 Quantity	Year 4 Quantity	Year 5 Quantity	Year 6 Quantity	Year 7 Quantity	Year 8 Quantity	Year 9 Quantity	Year 10 Quantity	Year 11 Quantity
1		**ORE STOCKPILES**													
	a	**North-East Gold Ore Stockpile**													
		Clearing	m^2	347,000	94,000	71,000	35,000	0	0	0	0	0	0	0	0
		Stripping and Grubbing (0.3m thick)	m^3	104,200	28,300	21,200	10,400	0	0	0	0	0	0	0	0
		Excavation unsuitable material (5m thick)	m^3	1,736,100	471,800	352,500	172,500	0	0	0	0	0	0	0	0
		Diversion Ditching Earth lined, 4 to 5 metres wide	m	670	0	0	0	0	0	0	0	0	0	0	0
		Diversion Ditching Erosion protected, 3 to 4 metres wide	m	950	0	0	0	0	0	0	0	0	0	0	0
	b	**North-West Supergene Oxide and later Low Grade Ore Stockpiles**													
		Clearing	m^2	288,000	144,000	0	0	0	0	0	0	0	0	0	0
		Stripping and Grubbing (0.3m thick)	m^3	86,300	43,300	0	0	0	0	0	0	0	0	0	0
		Excavation unsuitable material (3m thick)	m^3	863,300	433,000	0	0	0	0	0	0	0	0	0	0
		Diversion Ditching Earth lined, 4 to 5 metres wide	m	400	0	0	0	0	0	0	0	0	0	0	0
		Diversion Ditching Erosion protected, 3 to 4 metres wide	m	1,530	0	0	0	0	0	0	0	0	0	0	0
	c	**South-East Low Grade Ore Stockpile**													
		Clearing	m^2	3,000	15,000	128,000	61,000	193,000	150,000	314,000	169,000	96,000	117,000	54,000	0
		Stripping and Grubbing (0.3m thick)	m^3	1,000	4,500	38,500	18,200	57,800	44,900	94,300	50,800	28,700	35,200	16,200	0
		Excavation unsuitable material (3m thick)	m^3	9,900	44,900	385,000	181,900	578,300	448,600	942,500	507,500	287,200	351,800	162,300	0
		Diversion Ditching Earth lined, 4 to 5 metres wide	m	510	0	0	0	0	510	0	0	0	0	0	0
		Diversion Ditching Erosion protected, 3 to 4 metres wide	m	970	0	0	0	0	0	0	0	0	0	0	0
	d	**South-West Low Grade Ore Stockpiles**													
		Clearing	m^2	0	0	0	0	0	0	0	0	0	0	103,000	109,000
		Stripping and Grubbing (0.3m thick)	m^3	0	0	0	0	0	0	0	0	0	0	30,900	32,700
		Excavation unsuitable material (3m thick)	m^3	0	0	0	0	0	0	0	0	0	0	309,000	327,000
		Diversion Ditching Earth lined, 4 to 5 metres wide	m	0	0	0	0	0	0	0	0	0	0	320	0
		Diversion Ditching Erosion protected, 3 to 4 metres wide	m	0	0	0	0	0	0	0	0	0	0	970	0
2		**SEDIMENT AND EROSION CONTROL BMP'S ALLOWANCE(3)**	PS												

Item Number		Description	Unit	Year 12 Quantity	Year 13 Quantity	Year 14 Quantity	Year 15 Quantity	Year 16 Quantity	Year 17 Quantity	Year 18 Quantity	Year 19 Quantity	Year 20 Quantity	Year 21 Quantity	Year 22 Quantity
1		**ORE STOCKPILES**												
	a	**North-East Gold Ore Stockpile**												
		Clearing	m^2	0	0	0	0	0	0	0	0	0	0	0
		Stripping and Grubbing (0.3m thick)	m^3	0	0	0	0	0	0	0	0	0	0	0
		Excavation unsuitable material (5m thick)	m^3	0	0	0	0	0	0	0	0	0	0	0
		Diversion Ditching Earth lined, 4 to 5 metres wide	m	0	0	0	0	0	0	0	0	0	0	0
		Diversion Ditching Erosion protected, 3 to 4 metres wide	m	0	0	0	0	0	0	0	0	0	0	0
	b	**North-West Supergene Oxide and later Low Grade Ore Stockpiles**												
		Clearing	m^2	0	0	0	0	6,000	31,000	0	0	0	0	0
		Stripping and Grubbing (0.3m thick)	m^3	0	0	0	0	1,700	9,300	0	0	0	0	0
		Excavation unsuitable material (3m thick)	m^3	0	0	0	0	16,800	92,600	0	0	0	0	0
		Diversion Ditching Earth lined, 4 to 5 metres wide	m	0	0	0	0	250	0	0	0	0	0	0
		Diversion Ditching Erosion protected, 3 to 4 metres wide	m	0	0	0	0	130	0	0	0	0	0	0
	c	**South-East Low Grade Ore Stockpile**												
		Clearing	m^2	0	0	0	0	0	0	0	0	0	0	0
		Stripping and Grubbing (0.3m thick)	m^3	0	0	0	0	0	0	0	0	0	0	0
		Excavation unsuitable material (3m thick)	m^3	0	0	0	0	0	0	0	0	0	0	0
		Diversion Ditching Earth lined, 4 to 5 metres wide	m	0	0	0	0	0	0	0	0	0	0	0
		Diversion Ditching Erosion protected, 3 to 4 metres wide	m	0	0	0	0	0	0	0	0	0	0	0
	d	**South-West Low Grade Ore Stockpiles**												
		Clearing	m^2	89,000	0	0	0	0	0	0	0	0	0	0
		Stripping and Grubbing (0.3m thick)	m^3	26,600	0	0	0	0	0	0	0	0	0	0
		Excavation unsuitable material (3m thick)	m^3	266,300	0	0	0	0	0	0	0	0	0	0
		Diversion Ditching Earth lined, 4 to 5 metres wide	m	0	0	0	0	0	0	0	0	0	0	0
		Diversion Ditching Erosion protected, 3 to 4 metres wide	m	0	0	0	0	0	0	0	0	0	0	0
2		**SEDIMENT AND EROSION CONTROL BMP'S ALLOWANCE(3)**	PS											

M:\1\01\00325\08\A\Report\12 - Waste Storage Areas & Stockpiles\Rev 0\Table\[Table 5.1 Rev 0 - Schedule of Quantities for Stockpiles.xlsx]Table 5.1

NOTES:

1. PS = PROVISIONAL SUM.
2. NO CONTINGENCY ADDED TO QUANTITIES
3. SEDIMENT AND EROSION CONTROL INCLUDES SEDIMENT FENCING AROUND THE PERIMETER OF THE ORE STOCKPILES, AND EROSION PROTECTION/STABILIZATION OF TOPSOIL STOCKPILES.

0	07DEC'12	ISSUED WITH REPORT VA101-325/8-12	LM	SB	KJB
REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D

6 – REFERENCES

Leps, T.M., (1970), “Review of Shearing Strength of Rockfill”. J.Soil Mech. Foundation Div. ASCE. Vol. 96, No. SM4, July.

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7 – CERTIFICATION

This report was prepared, reviewed and approved by the undersigned.

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