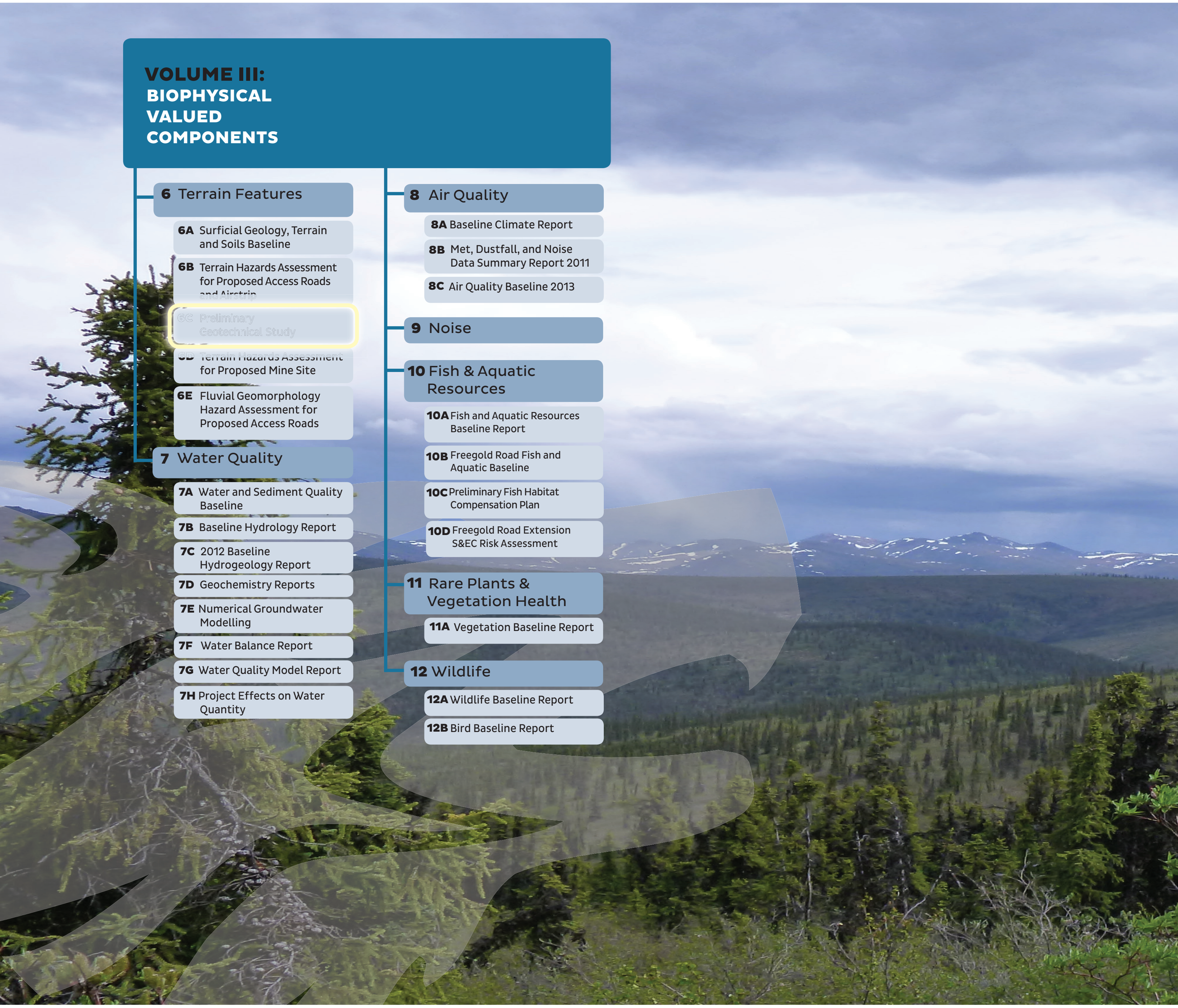
APPENDIX 6C: PRELIMINARY GEOTECHNICAL STUDY



December 17, 2013

File No.:VA101-325/14-A.01
Cont. No.:VA13-00470

ISO 9001 - FS 64925
ISO 14001 - EMS 550121
OHSAS 18001 - OHS 550122

Mr. Paul West-Sells
Casino Mining Corporation
2050 - 1111 West Georgia St.
Vancouver, BC, V6E 4M3

Dear Paul,

Re: The Casino Project – Preliminary Geotechnical Study for the proposed Freegold Road Upgrade

1. Introduction

Casino Mining Corporation (CMC) proposes to develop a copper-gold mine at their Casino Property, situated approximately 280 km northwest of Whitehorse, Yukon (Figure 1). The proposed mine comprises an open pit operation with an operating life of 22 years. The site is currently accessed by fixed-wing aircraft or helicopter. An all-season road is needed to facilitate the development and operation of the mine. It is proposed to provide road access to the mine site by upgrading the existing Freegold Road and by constructing a new road, referred to as the 'Freegold Road Extension'.

Knight Piésold Ltd. (KP) was commissioned by CMC to prepare a Project Proposal for the Casino Project for submission to the Yukon Environmental and Socioeconomic Assessment Board (YESAB) Executive Committee and to provide input to the Feasibility Study design of the project. This report presents the findings of a preliminary geotechnical study for the proposed 'Freegold Road Upgrade' section. The report is intended to provide background information pertinent to the planning and preliminary design of the road upgrade, in addition to providing input to the Project Proposal. The study incorporates a geotechnical desk top study and an air photo interpretation, undertaken to identify terrain hazards and potentially hazardous permafrost-related features. The report has been prepared exclusively for CMC in relation to the Casino Project.

2. Background

The Freegold Road is an active, unpaved resource road in Central Yukon that extends northwest from the village of Carmacks to placer mines in the Seymour Creek Valley and Big Creek Valley (Figure 2). The road is maintained by Yukon Highways and Public Works. The road extends for a distance of approximately 83 km to a former crossing point of Big Creek where a bailey bridge has been washed out.

In the mid-1990s, the Yukon Government completed a design for the upgrade of an approximately 32 km-long section of the Freegold Road starting at the Mount Nansen Road intersection. The Yukon Government also selected a preliminary route for truck traffic to by-pass the village of Carmacks. This bypass, hereafter referred to as the 'Carmacks By-pass Route' connects directly to the Klondike Highway near Km 354 at the Garvice Industrial Subdivision. The 'Carmacks By-pass Route' crosses the Nordenskiold River approximately 4 km upstream from the existing Freegold Road Crossing.

In 2012, Associated Engineering (AE) prepared a Scoping Study for the upgrade of the Freegold Road (AE, 2012). AE adopted the Yukon Government's functional design for the east part of the route and established a functional design for the west part of the route. This is the alignment assessed in this report. However, since the completion of this assessment the Freegold Road Upgrade alignment has been updated and, portions of the new alignment deviate significantly from the alignment presented in this report. The information presented here-in is no longer applicable for these portions. The portions of the Freegold Road Upgrade alignment presented in this report that differ from the alignment presented in the YESAB Proposal are:

- Km 0.4 to Km 1.1
- Km 3.8 to Km 4.4

- Km 46.7 to Km 47
- Km 48 to Km 49.3
- Km 50.7 to Km 59.8
- Km 60.5 to Km 60.8
- Km 61.7 to Km 62.7
- Km 63.7 to Km 63.9
- Km 64.9 to Km 65.1
- Km 65.9 to Km 66.4
- Km 67.6 to Km 70.3, and
- Km 83.1 to Km 83.8.

3. Scope of Work

The study comprised:

- A review of the published geology maps of the area
- Air photo interpretation (API), and
- Terrain mapping for those portions of the route that, based upon the findings of the slope angle analyses and the nature of the surficial geology, are expected to include broad areas of 'potentially unstable' terrain.

The Study Section extends from Carmacks to the Bow Creek crossing at approximately Ch. 70.5 km. The remainder of the Freegold Road Upgrade alignment, extending to the Big Creek Crossing at Ch. 83 km, was included in an earlier study (KP, 2012).

4. Site and Project Description

4.1 Physiography and Drainage

The site is located on the east and north slopes of the Dawson Mountain Range within the Klondike Plateau Physiographic Area. The alignment follows the west side of the Yukon River Valley as far as Ch. 24 km. The road then heads west along the toe of the slopes on the north side of the Crossing Creek Valley. There is a major catchment divide at approximately Ch. 53 km. The remainder of the route follows the toe of the slopes on the north side of the Seymour Creek Valley. The ground elevation ranges from approximately 600 m above sea level (ASL) at Carmacks to approximately 1000 m ASL at the watershed between Crossing Creek and Seymour Creek.

Bedrock outcrops are limited in occurrence, comprising occasional cliffs and residual knobs (tors). The first 53 km of the alignment lies within an area affected by the middle Pleistocene Glaciation. The alignment traverses hummocky kame and kettle topography comprising glaciofluvial sands and gravels as far as Ch. 24 km with 'rolling' glacial till morphology predominating from Ch. 24 km to Ch. 53 km. There are some areas of moderately steep (50% to 70%) terrain. The area to the west of Ch. 53 km was not affected by the middle Pleistocene Glaciation. The valley profiles are typically asymmetric in this area with shallower north-facing slopes being the result of enhanced sheetwash and solifluction processes on these 'sheltered' slopes. The alignment traverses areas of moderately steep terrain at the toe of the north side of the Seymour Creek Valley between Ch. 62 km and Ch. 70.5 km.

4.2 Climate

The climate of the region is described as cold and semi-arid. The mean annual temperature is between approximately -4°C and -8°C and the mean annual precipitation is 300 mm (Smith et al., 2004). The mountainous terrain of central Yukon is prone to thermal inversion (EBA, 2004). This means that the mean annual air temperature is commonly lower in the valley bottoms. This microclimate effect often results in the presence of thicker permafrost on the valley bottoms.

5. Desk Study

5.1 Site History

A range of all-season roads, winter roads and access trails have been developed over several decades to support regional mining operations. Historical air photos indicate that access had been established from Carmacks to the Big Creek Valley, to the west of the Study Site, by 1961 and that placer mining operations initiated in the region sometime between 1961 and 1989 (KP, 2012).

Provincial watershed fish habitat suitability maps, prepared by the Yukon Placer Mining Secretariat, were examined as part of the Desk Study. The mapping indicates historical mining on the north side of the Seymour Creek Valley, approximately 6 km east of the confluence with Bow Creek.

5.2 Published Geology

5.2.1 *Surficial Geology Maps*

An extract from the Geological Survey of Canada`s 1:100,000-scale published surficial geology maps covering the site area (Jackson, L.E. 1997 and Jackson, L.E,. 1997a) is presented on Figures 3 and 4. The mapping shows a clear divide in the vicinity of Ch. 53 km, with extensive glacial deposits occurring to the east of that location, but only occurring locally in the area to the west. This divide coincides with the approximate western limit of the middle Pleistocene Glaciation (Duk-Rodkin, 2010). The portion of the alignment to the west of Ch. 53 km was only affected by the older Pliocene to early Pleistocene Glaciation.

The surficial geology along the initial north-south trending portion of the Freegold Road alignment predominantly comprises glaciofluvial sands and gravels according to the published surficial geology map (Jackson, 1997). The glaciofluvial sands and gravels are indicated to have a discontinuous surface cover of eolian sands and silts. Glacial till is mapped in the vicinity of Ch. 24 km to Ch. 52 km of the alignment. Loess deposits are mapped locally in the vicinity of Ch. 26 km and Ch. 30 km. Alluvium is mapped in the vicinity of the proposed Nordenskiold River Crossing along the Carmacks Bypass Route and in the vicinity of Ch. 12.5 km of the main alignment.

Colluvium blankets the mountain slopes in the area to the west of Ch. 52 km. Alluvial complex sediments ($A^{PM}X$) are mapped along the valley floor between approximately Ch. 45 km and Ch. 67 km. These soils comprise alluvial sands and gravels interstratified with colluvium, re-worked loess and organic soils according to the published surficial geology map. They are indicated to have a blanket bog cover that is generally less than 1 m-thick. Organic soils are mapped on the valley floor in the vicinity of Ch. 55 km. A terrace of glaciofluvial sands and gravels is mapped in the area to the south of the alignment in the vicinity of Ch. 70.5 km.

Intermittent bedrock outcrops are mapped in the vicinity of the alignment, in particular in the areas upslope from Ch. 15 km to Ch. 21 km and Ch. 45 km to Ch. 46 km. Tors are mapped on the upper slopes on the north side of the Seymour Creek Valley in the vicinity of Ch. 58 km to Ch. 61 km of the alignment and on the upper slopes on the south side of the Seymour Creek valley in the vicinity of Ch. 67 km to Ch. 69 km of the alignment.

The published mapping indicates the presence of thermokarst features on the lower slopes on the south side of the Crossing Creek Valley in the vicinity of Ch. 50 km to Ch. 52 km of the alignment (Figure 3). Landslides are mapped in the natural terrain, upslope from Ch. 8 km to Ch. 19 km of the alignment.

5.2.2 *Bedrock Geology*

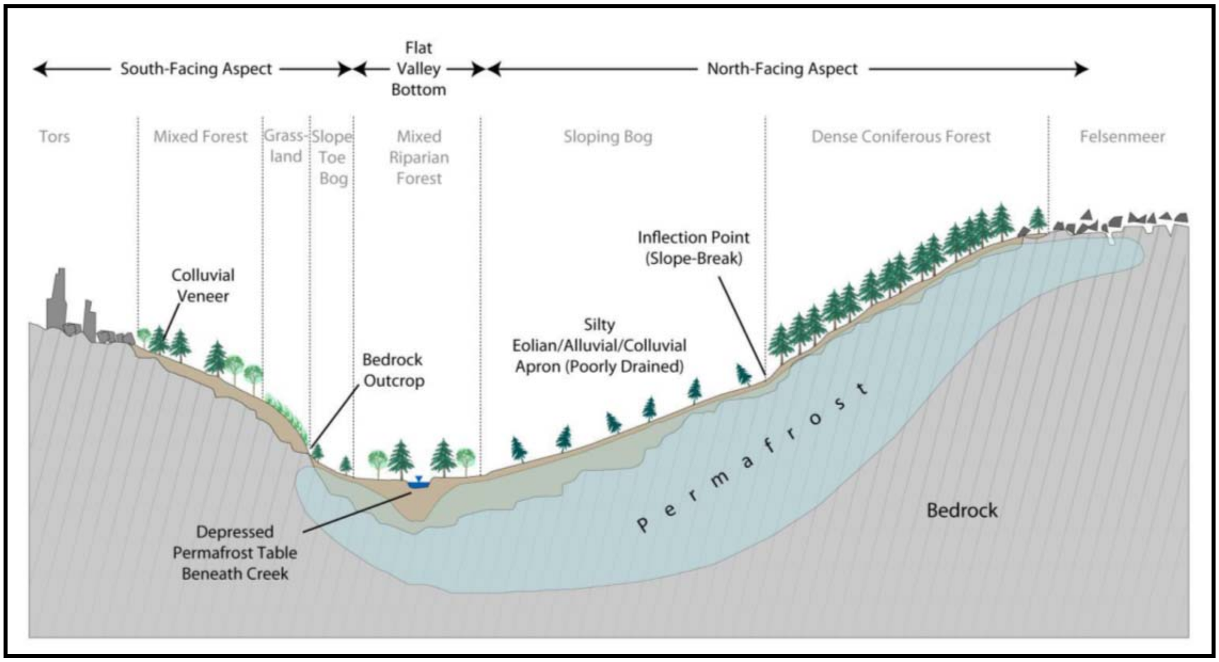
The Canadian Geological Survey's provincial scale published bedrock geology map for the Yukon Territory (Gordey and Makepeace, 2001) indicates the bedrock geology along the initial portion of the alignment, (approximately as far as Ch. 26 km) comprises basalts and breccias with some crystal tuff and some sedimentary rocks belonging to the Upper Cretaceous Carmacks Formation. The floor of the Crossing Creek Valley follows the alignment of an east-northeast trending geological fault. Bedrock belonging to the Carmacks Formation is mapped on the south side of the fault and granodiorite on the north side. A geological fault is also mapped along the floor of the Seymour Creek Valley. The bedrock geology in this valley comprises granitic rocks and bedrock belonging to the Carmacks Formation.

5.3 Permafrost Conditions

Permafrost is widespread but discontinuous in the northern Dawson Range (Bond and Lipovsky, 2011). The surficial geology mapping indicates the alluvial complex sediments contain segregated ice lenses and ice wedges.

5.4 Geological and Geomorphological Model

The following geological/geomorphological model was developed for the east-west trending valleys in the site area by AECOM in their early work on the project:



This model is considered to apply to the portion of the route to the west of Ch. 52 km, which was not affected by the middle Pleistocene Glaciation.

The key features of the model are:

- The 'sheltered' north-facing slopes have a shallow permafrost table. Sheetwash and solifluction occur during seasonal melting within the active layer and result in colluvial soils intermixing with organic soils and loess deposits to form poorly-drained colluvial aprons at the toes of the slopes.
- The south-facing slopes have a deeper permafrost table or are free of permafrost. Permafrost-related processes are far less prevalent on these slopes and the surficial soils tend to be better drained.
- There is a depressed permafrost table associated with the main watercourse on the valley floor.
- The valley profile is distinctly asymmetric with shallower slope angles occurring on the north-facing slopes as a result of sheetwash and solifluction.
- Tors develop in granite bedrock outcrops on the hill tops as a result of mechanical weathering.

5.5 Fish Habitat and Previous Placer Mining

Provincial watershed fish habitat suitability maps prepared by the Yukon Placer Mining Secretariat were examined as part of the Desk Study. The maps indicate that the first 6 km reach of Seymour Creek heading east from its confluence with Bow Creek generally has 'moderate habitat suitability' and that the upper reaches of the catchment generally have ‘moderate to low habitat suitability’. Current placer mining operations are mapped on both sides of the valley approximately 4 km upstream of the confluence. An area of previous placer mining is mapped on the north side of the Seymour Creek Valley, approximately 6 km upstream from the confluence with Bow Creek. The reach of Crossing Creek that the alignment follows is indicated to have ‘moderate to low habitat suitability’. The Freegold Road crosses the lower reach of Murray Creek at Ch. 12.5 km. The lower reach of this creek is indicated to have ‘moderate to high habitat suitability’. The Nordenskiold River is indicated to have been affected by previous placer mining.

6. Air Photo Interpretation

Air photos were obtained from the National Air Photo Library and inspected with a stereoscope. Black and white contact prints taken in 1990 at a scale of 1:25,000 were inspected. The air photos inspected (Ref. A 27668 No.’s 39 to 96) cover the full length of the alignment. In addition, 1:20,000 scale air photos taken in 1994 were inspected for the Carmacks area (Ref. A28155, No.’s 12 and 13 and Ref. A26590 No.’s 02 and 03) and colour 1:20,000 scale air photos taken in 2009 were inspected for the portion of the alignment between Ch. 62 km and Ch. 70 km.

7. Findings of the Geotechnical Study

The findings of the study are detailed below and illustrated on Figures 5 to 18.

7.1 Geological Model

The API confirmed the general geological model for the Study Area developed in the desk study. The surficial geology along the Carmacks Bypass Route predominantly comprises glaciofluvial sands and gravels. The glaciofluvial sands and gravels extend as far as approximately Ch. 26.5 km of the alignment, where it is interpreted that a break of slope marks the contact with glacial till. The glaciofluvial sands and gravels are expected to be capped, locally, by loess deposits comprising silts and fine sands. The alignment crosses a fluvial plain in the vicinity Ch. 11 km to Ch. 12.5 km and fluvial fans in the vicinity of Ch. 9.5 km, Ch. 12.5 km and Ch. 22 km. The surficial geology is interpreted to predominantly comprise glacial till between Ch. 26.5 km and Ch. 52 km. Loess deposits may also occur, locally, along this portion of the alignment. The alignment traverses the toe of a colluvial fan in the vicinity of Ch. 34.5 km. A possible solifluction lobe was identified in the west part of the fan. The alignment traverses a fluvial plain and a fluvial fan between Ch. 37.5 km and Ch. 38.5 km. Areas of organic soils were identified in the vicinity of Ch. 27 km, Ch. 30 km and Ch. 32 km. The Freegold Road Upgrade alignment follows a straighter course than the existing alignment meaning that it extends, locally, onto colluvial aprons, fluvial plains and fluvial fans. These areas have a relatively sparse tree cover, are poorly-drained and are interpreted to have a surface cover of organic soils and/or fine mineral soils. The interpreted extents of the possible organic soils in these areas are indicated on Figures 8 to 13. The organic soils identified on the valley floors are possibly ice-rich with permafrost occurring at shallow depth.

In the area to the west of Ch. 52 km, the weathered bedrock is generally overlain by colluvium. This portion of the proposed alignment also follows a straighter course than the existing alignment and it too extends into inferred areas of organic soils, e.g. Ch. 60.5 km to Ch. 62.5 km and Ch. 66 km.

7.2 Permafrost

Permafrost degradation features in the form of thaw lakes and thermokarst depressions were identified in the vicinity of Ch. 11.5 km, Ch. 14 km and Ch. 30 km to Ch. 37.5 km of the alignment. There is generally no clear association between the permafrost degradation features identified and anthropogenic processes. However, a thaw lake and a thermokarst depression were identified close to the existing road in the vicinity of Ch. 11.5 km of the alignment. There is no clear evidence of recent forest fires in the 1990 air photos that could have resulted in permafrost degradation.

7.3 Terrain Hazards

7.3.1 *Landslides*

In this report, landslides are described as either 'recent' or 'relict'. 'Recent' landslides are devoid of vegetation, partly re-vegetated or re-vegetated with pioneer species, only, in the 1990 air photos. 'Relict' landslides are completely re-vegetated.

A possible relict slump and a recent slide were identified upslope from the alignment in the vicinity of Ch. 8 km (Figure 17). A recent debris slide was identified at a meander bend on the west bank of Seymour Creek near Ch. 69 km of the alignment (Figure 5). Recent debris slides were observed in cut slopes along the Freegold Road in the vicinity of Ch. 34 km of the alignment (Figure 12).

Two possible thaw slump/flows were identified in the north-facing slopes of the Seymour Creek Valley in the vicinity of Ch. 61 km of the alignment (Figure 6). A possible skin flow was identified in the vicinity of Ch. 70.5 km. The north-facing slopes along the west portion of the Seymour Creek Valley are interpreted to have a shallow active layer, locally, with the active layer becoming saturated with melt water during the summer months resulting in soil creep and solifluction.

7.3.2 *Snow Avalanches*

Snow avalanches generally occur on terrain with slope angles of approximately 27 to 40 degrees. The route passes through some areas of moderately steep terrain that could be susceptible to snow avalanches.

7.3.3 *Fluvial Geomorphology Hazards*

In the 1990 air photos, the Nordenskiold River follows a markedly different course in the vicinity of the proposed crossing point than its current alignment as shown on the google earth imagery (Figure 18). It is therefore interpreted that the river has undergone meander migration since 1990 in the vicinity of the proposed bridge site. An abandoned channel was also identified in the area to the north of the bridge site (Figure 18).

The Freegold Road Upgrade alignment is adjacent to pronounced meander bends of creeks in the vicinity of Ch. 29 km and Ch. 32.5 km. The proposed alignment crosses an abandoned meander in the vicinity of Ch. 70 km.

Placer mining operations have likely added significant quantities of sand and gravel into the streams, locally, in particular into Seymour Creek in the vicinity of the final 6 km of the alignment. Due to the added sediment, the placer mine streams and the major streams that receive the sediment can be less stable and more prone to channel erosion, re-location and flooding.

8. Terrain Mapping

8.1 Study Areas

Terrain mapping was undertaken in areas deemed to be relatively susceptible to terrain hazards based upon the findings of the API. Terrain Mapping was undertaken along the steeper western portion of the alignment (Ch. 58 km and Ch. 70.5 km). Mapping was also undertaken for the proposed Carmacks Bypass Route, where the API indicated the river channel to be susceptible to meander migration.

8.2 Terrain Mapping

Terrain mapping was undertaken using the available air photos, as detailed in Section 6 of the report. The mapping follows the system described in Howes and Kenk (1997).

8.3 Findings of Mapping

The terrain maps are presented on Figures 19 to 22. The terrain mapping undertaken in the vicinity of Ch. 58 km to Ch. 70.5 km confirmed the valley slopes generally have a surface cover of colluvium. Bedrock is interpreted to be at or very close to ground surface at the hill tops and along the hillside spurs. Colluvial fans were mapped at the confluences of some of the tributary valleys with the main one; in particular, in the vicinity of Ch. 58 km, Ch. 63 km, Ch. 67 km and Ch. 68 km. Solifluction slopes were identified on the south side of the valley. The alignment crosses fluvial plains in the vicinity of Ch. 64.5 km to Ch. 66 km and Ch. 68.5 km to Ch. 69 km. The alignment crosses areas of organic soils along the valley floor in the vicinity of Ch. 60.5 km to Ch. 64.5 km. Anthropogenic soils associated with previous placer mining were mapped along the valley floor and along tributary valleys in the area west of Ch. 61 km.

The terrain mapping undertaken for the proposed Carmacks Bypass Route confirmed that the surficial geology predominantly comprises glaciofluvial sands and gravels. There is an approximately 100 m-wide fluvial plain on the west bank of the Nordenskiold River.

8.4 Reliability of Mapping

The terrain mapping was undertaken to Terrain Survey Intensity Level 'E' (MoF, 1999). Factors detracting from the accuracy of the mapping are the absence of field-truthing, the limited availability of survey-based contour maps and ortho-imagery and difficulties of mapping through vegetation cover. In addition, interpretation of historical air photos was outside the scope of work.

9. Engineering Considerations

9.1 Permafrost

The Study Site lies within an area of widespread discontinuous permafrost. It is interpreted that permafrost is present locally in the north-facing slopes of the Seymour Creek Valley and Crossing Creek Valley as well as in organic soils on the valley floors. Ice-rich soils may be encountered, locally, in these areas. Permafrost is interpreted to be generally absent in the glacial deposits to the east of Ch. 52 km. However, permafrost may be present, locally, in the fluvial plain and fluvial plain deposits along this portion of the alignment, particularly in the vicinity of Ch. 11 km to Ch. 13 km of the alignment. Permafrost is interpreted to be absent or present at depth in close proximity to the major watercourses and in the south-facing colluvial slopes.

Permafrost is susceptible to thermal disruption and may thaw. Thaw lakes and thermokarst depressions provide evidence of permafrost degradation at the Study Site. Permafrost degradation can occur both during and after construction, resulting in the possibility of differential settlement of embankments and bridge foundations, slope instability and enhanced erosion and sediment delivery to watercourses. It will be important in areas of ice-rich soils to adopt construction methods that prevent disturbance of the permafrost. The key objective in such an environment is to maintain a stable permafrost regime. Some non-anthropogenic permafrost degradation should, however, be anticipated, and the extent to which this key objective can be achieved will partly depend upon the relative influences of non-anthropogenic and anthropogenic permafrost degradation. Processes that can lead to permafrost degradation are identified below:

Non-Anthropogenic Processes

Some non-anthropogenic processes that could lead to permafrost degradation in the Study Area are considered to be:

- Forest fires initiated by lightning strikes
- Natural terrain landslides
- Natural stream avulsions
- Windthrow, and
- Climate change.

Anthropogenic processes

Some anthropogenic processes that could lead to permafrost degradation are considered to be:

- Removal of vegetation – the thick layer of sphagnum moss provides effective insulation
- Alteration to surface water drainage

- Creating standing bodies of water that are in direct thermal contact with the surficial soils
- Implementing inadequate road drainage
- Stockpiling
- Stream avulsions resulting from placer mining
- Man-made fires, and
- Climate change.

9.2 Earthworks

The alignment is expected to traverse local areas of permafrost terrain that may include ice-rich soils. In areas of known or suspected ice-rich soil, it will be important to develop design solutions and construction methodologies that mitigate possible permafrost degradation; for example, constructing the road on an embankment of non-frost susceptible fill without disturbing the surface cover of moss. The surface water management strategies implemented should prevent water 'ponding', which can lead to permafrost degradation. Ditching at the toe of embankments should be avoided in areas of known ice-rich soils.

9.3 Landslides and Terrain stability

Landslides were only identified in the roadside slopes of the Freegold Road in the vicinity of Ch. 34 km of the alignment. The relatively low occurrence of landslides in the roadside slopes is attributed to the fact that the alignment follows the north sides of the Crossing Creek Valley and Seymour Creek Valley, which are expected to have little or no permafrost. The study indicated solifluction to be active on north-facing colluvial slopes in the west part of the Seymour Creek Valley. The Freegold Road Upgrade alignment follows the north side of the valley in this area and therefore avoids the hazard areas. The alignment crosses the toe of a possible solifluction lobe in the vicinity of Ch. 35 km. The terrain is gently sloping in this area and the stability is unlikely to be unduly affected by the road construction.

9.4 Erosion Potential

The API highlighted local occurrences of silty and organic soils along the alignment. These soils are expected to have a relatively high susceptibility to erosion.

9.5 Other Hazards

Placer mining operations have likely added significant quantities of sand and gravel into the streams in the west part of the Study Site. Due to the added sediment, the placer mine streams and the major streams that receive the sediment can be less stable and more prone to channel erosion, re-location and flooding. It is possible that any bridges or culverts located close to placer mining operations will need to be designed to take account of higher throughput of debris and possible higher flows and flood elevations.

10. Conclusions

A preliminary geotechnical study has been undertaken for the proposed Freegold Road Upgrade alignment. The study included a desk top study and API. Terrain mapping was undertaken in areas deemed to be relatively susceptible to terrain hazards based upon the findings of the API.

There is interpreted to be a clear divide in the nature of the surficial geology in vicinity of Ch. 52 km of the alignment with extensive glacial deposits occurring in the area to the east of that location, but only occurring locally in the area to the west. Areas of organic soils were identified, locally, along the west part of the alignment. The Freegold Road Upgrade alignment follows a straighter course than the existing alignment, meaning that it extends, locally, onto colluvial aprons, fluvial plains and fluvial fans. These terrain units are interpreted to have a surface cover of organic soils and/or fine mineral soils. The organic soils identified on the valley floors along the west part of the alignment are possibly ice-rich with permafrost occurring at shallow depth. There is uncertainty regarding the nature and thickness of the organic soils as well as the ice content in these areas. The study identified local indicators of permafrost degradation including thaw lakes and thermokarst depressions. In areas of known or suspected ice-rich soil, it will be important to develop design solutions and construction methodologies that mitigate possible permafrost degradation, for example constructing the road on an embankment of non-frost susceptible fill without disturbing the surface cover of moss.

The terrain mapping undertaken in the vicinity of Ch. 58 km to Ch. 70.5 km confirmed the valley slopes generally have a surface cover of colluvium. The terrain mapping indicated solifluction to be active on north-facing colluvial slopes in the west portion of the Seymour Creek Valley. The Freegold Road Upgrade alignment follows the north side of the valley in this area and therefore generally avoids the hazard areas. Anthropogenic soils associated with previous placer mining were mapped along the valley floor and along tributary valleys in the area west of Ch. 61 km. The terrain mapping undertaken for the Carmacks Bypass Route indicated there is an approximately 100 m-wide fluvial plain on the west bank of the Nordenskiold River.

The study highlighted possible occurrences of silty and organic soils at the site. These soils include loess deposits along the east part of the alignment and colluvial apron, fluvial plain and fluvial fan deposits along the west part. Silt and organic soils are especially prone to erosion.

11. References

Associated Engineering (AE), 2012. Freegold Upgrade Scoping Study. Western Copper Corporation, March 2012.

Bond, J.D. and Lipovsky, P.S., 2011 Surficial Geology, Soils and Permafrost of the Northern Dawson Range

Duk-Rodkin, 2001. Glacial Limits of Carmacks, Yukon Territory (115-I); Geological Survey of Canada. Open File 3805, scale 1:250,000.

EBA, 2004. Permafrost Considerations for Effective Mine Site Development in the Yukon Territory. MERG Report 2004-1.

Gordey, S.P. and Makepeace, A.J., 2001. Bedrock Geology, Yukon Territory, Geological Survey of Canada, Open File 3754, scale 1:1,000,000.

Howes, D.E. and Kenk, E., 1997. Terrain Classification System for British Columbia (Version 2). Surveys and resource mapping Branch, Ministry of Crown Land, Victoria BC, 90pp, version 2.

Knight Piesold Ltd (2012). Casino Copper-Gold Project. Terrain Hazards Assessment for Proposed Access Roads and Air Strip

MOF (Ministry of Forests), 1999 Forest Practices Code of British Columbia, 1999. Mapping and assessing Terrain Stability Guidebook, second edition, B.C., Ministry of Forests and B.C. Environment. 36pp.

RIC (Resources Inventory Committee), 1996. Terrain Stability Mapping in British Columbia. A Review and Suggested Methods for Landslide Hazard and Risk Mapping. Slope Stability Task Group, Earth Sciences Task Force. Resources Inventory Committee, August 1996.

Smith, C.A.S., Meikle, J.C. and Roots, C.F. (edititors), 2004. Ecoregions of the Yukon Territory: Biophysical properties of Yukon landscapes. *Agriculture and Agri-Food Canada, PARC Technical Bulletin No. 04-01*, Summerland, BC, 313 p.

Jackson, L.E. 1997 Surficial Geology, Tantalus Butte, Yukon Territory; Geological Survey of Canada, Map 1879A, Scale 1:100,000

Jackson, L.E. 1997a Surficial Geology, Victoria Creek, Yukon Territory; Geological Survey of Canada, Map 1876A, Scale 1:100,000

Ryan, J.J., Colpron, M. and Hayward, N., 2010 Geology, southwestern McQuesten and parts of northern Carmacks, Yukon; Geological Survey of Canada, Canadian Geoscience Map 7 (preliminary version), scale 1:125,000

Please do not hesitate to contact the undersigned should you have any questions regarding the findings of this preliminary geotechnical study.

Yours truly,

KNIGHT PIESOLD LTD

Signed:
James Haley, P.Eng
Senior Geotechnical Engineer

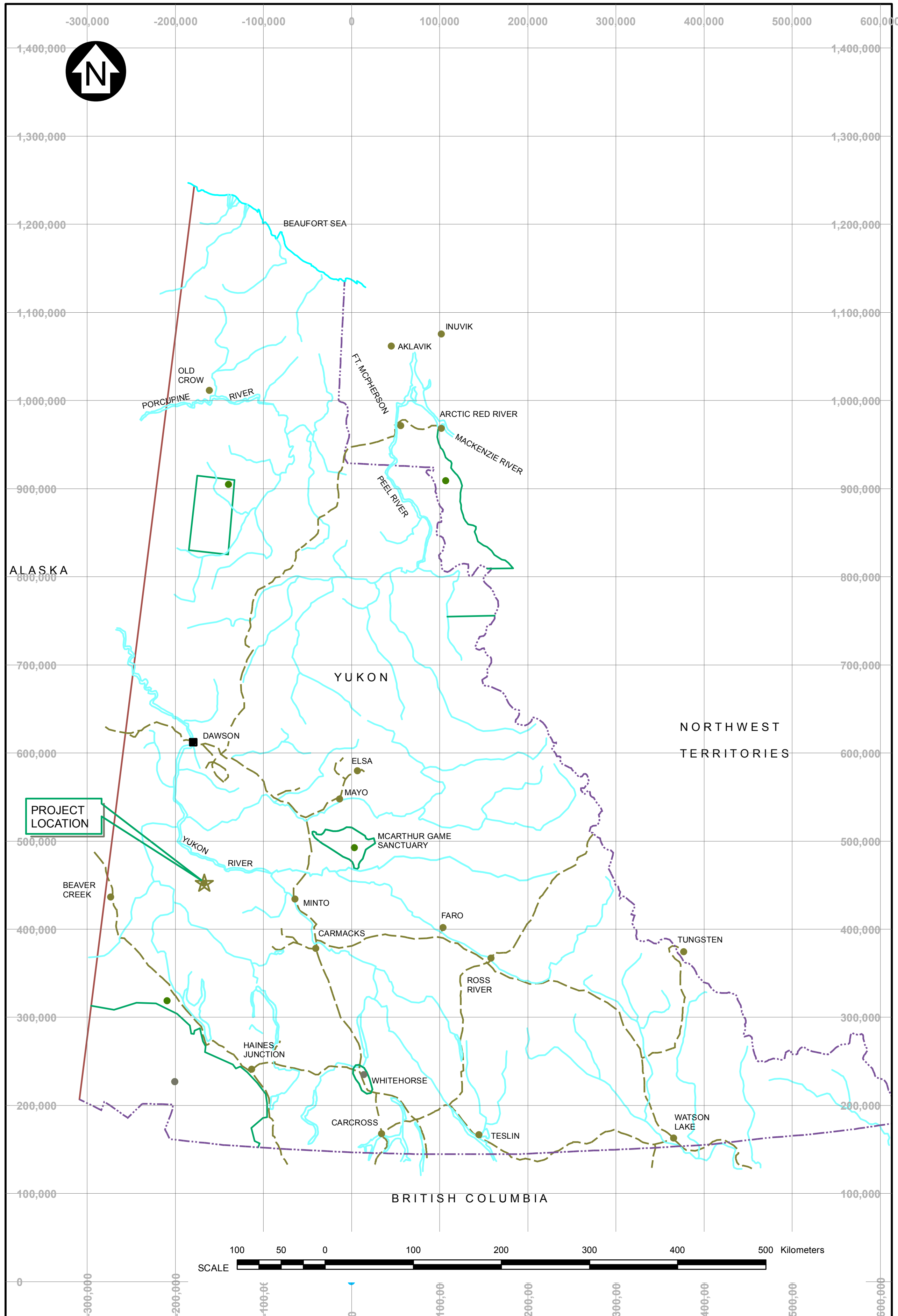
Reviewed:
Greg Smyth, BSc.
Senior Project Manager

Approved,
Ken Brouwer, P.Eng.
President

Attachments:

Figure 1 Rev 0	Site Location Map and Terrain Unit Legend
Figure 2 Rev 0	Freegold Road Upgrade Alignment
Figure 3 Rev 0	Published Surficial Geology – Freegold Road Upgrade (East)
Figure 3a Rev 0	Published Surficial Geology – Freegold Road Upgrade (East) - Legend
Figure 4 Rev 0	Published Surficial Geology – Freegold Road Upgrade (West)
Figure 4a Rev 0	Published Surficial Geology – Freegold Road Upgrade (West) - Legend
Figures 5 to 18, Rev 0	Findings of Preliminary Geotechnical Study of Freegold Road Upgrade (Sheets 1 to 14)
Figures 19 to 22, Rev 0	Freegold Road Upgrade – Terrain Maps (Sheets 1 to 4)

/jh



SAVED: \\van11\prj_file\1\01\00325\14\A\GIS\Figs\VA13-470-Freegold Road Upgrade Preliminary Geotech Study\TerrainMapLegend.mxd; Dec 16, 2013 2:16 PM; kkrauszova

REV	DATE	DESCRIPTION	DESIGNED	DRAWN	CHK'D	APP'D
0	16DEC'13	ISSUED WITH REPORT	JEH	KK	GLS	KJB

TERRAIN UNIT MAP LEGEND

Example

7aCk - R:m

- proportional coverage of component (7=70%)
- texture
- surficial material
- drainage class
- geomorphological process
- terrain symbol
- surface expression

TEXTURE

- a blocks (>256 mm; angular)
- b boulders (>256 mm; round)
- c clay (<0.002 mm)
- d angular and rounded particles; >2 mm
- e fibric organics
- g gravel (rounded particles, >2mm)
- h humic organics
- k cobbles (64-256 mm, rounded)
- m mud (silt and /or clay)
- p pebbles (2-64 mm, rounded)
- r rubble (2-256 mm, angular)
- s sand (0.63-2 mm)
- u mesic organics
- x 2 to 256 mm, angular
- z silt (0.002-0.63 mm)

SURFICIAL MATERIALS

- A anthropogenic material
- C colluvium
- D weathered bedrock
- E aolian sediments
- F fluvial sediments
- FG glaciofluvial sediments
- I ice
- L lacustrine sediments
- LG glacial lake sediments
- M till
- MI ablation till
- O organic materials
- R bedrock
- U undifferentiated materials
- V volcanic sediments

Superscripts: ^A = active, ^I = inactive

SURFACE EXPRESSION

- a apron
- d moderate slope(s) (27-49%)
- b blanket
- c cone
- cl cliff
- d depression
- e plateau (no upslope catchment)
- f fan
- fp fill platform
- g gully
- h hummocky topography
- j gentle slope(s) (6-26%)
- k moderately steep slope(s) (50-70%)
- l lobe
- m rolling topography
- p plain (0-5%)
- r ridge topography
- s steep slope(s) (>70%)
- t terraced
- u undulating topography
- v veneer
- w mantle of variable thickness
- x thin veneer
- y1 topographically confined hill slope
- y2 topographically confined plain
- z1 hill top (rounded)
- z2 hill top (sharp)

GEOMORPHOLOGICAL PROCESSES

- A snow avalanches
- B braided channel
- C cryoturbation
- E glacial meltwater channels
- F slow mass movement
- G glacial processes
- H kettled
- I irregularly sinuous channel
- J anstomosing channel
- L abundant seepage
- M meandering channel
- N nivation
- O Decomposition of plant remains
- R rapid mass movement
- S solifluction
- U sheet erosion
- V gully erosion
- W weathering
- X permafrost processes
- Z general periglacial processes

GEOMORPHOLOGICAL PROCESSES: SUBCLASSES AND SUBTYPES

- F" slow mass movement, initiation zone
- Fc soil creep
- Fe slow earthflow(s)
- Fg rock creep
- Fk tension cracks
- Fr slow rockslide(s)
- Fs slow debris slide(s)
- R" rapid mass movement, initiation zone
- Ra rock avalanche
- Rb rockfall(s)
- Rd debris flow(s)
- Rr rapid rockslide(s)
- Rs rapid debris slide(s)
- Rt debris torrent(s)

PERMAFROST PROCESS SUBCLASSES

- p palsas, peat plateaus
- t thermokarst: subsidence
- e thermokarst: thermal erosion by water
- f thaw flow slides
- w ice wedge polygons
- r patterned ground
- s sheetwash
- i segregated ice

DRAINAGE CLASSES

- x very well drained
- r rapidly drained
- w well drained
- m moderately well drained
- i imperfectly drained
- p poorly drained
- v very poorly drained

TERRAIN SYMBOLS

- · components on either side of the symbol are of approximately equal proportion
- / the component in front of the symbol is more extensive than the one that follows
- // the component in front of the symbol is considerably more extensive than the one that follows
- _ the component in front of the symbol overlays the one that follows

NOTES:

1. COORDINATE GRID IS IN METRES. COORDINATE SYSTEM: WGS 1984 WEB MERCATOR AUXILIARY SPHERE.

2. THIS FIGURE IS PRODUCED AT A NOMINAL SCALE OF 1:6,000,000 FOR 11x17 (TABLOID) PAPER. ACTUAL SCALE MAY DIFFER ACCORDING TO CHANGES IN PRINTER SETTINGS OR PRINTED PAPER SIZE.

CASINO MINING CORPORATION

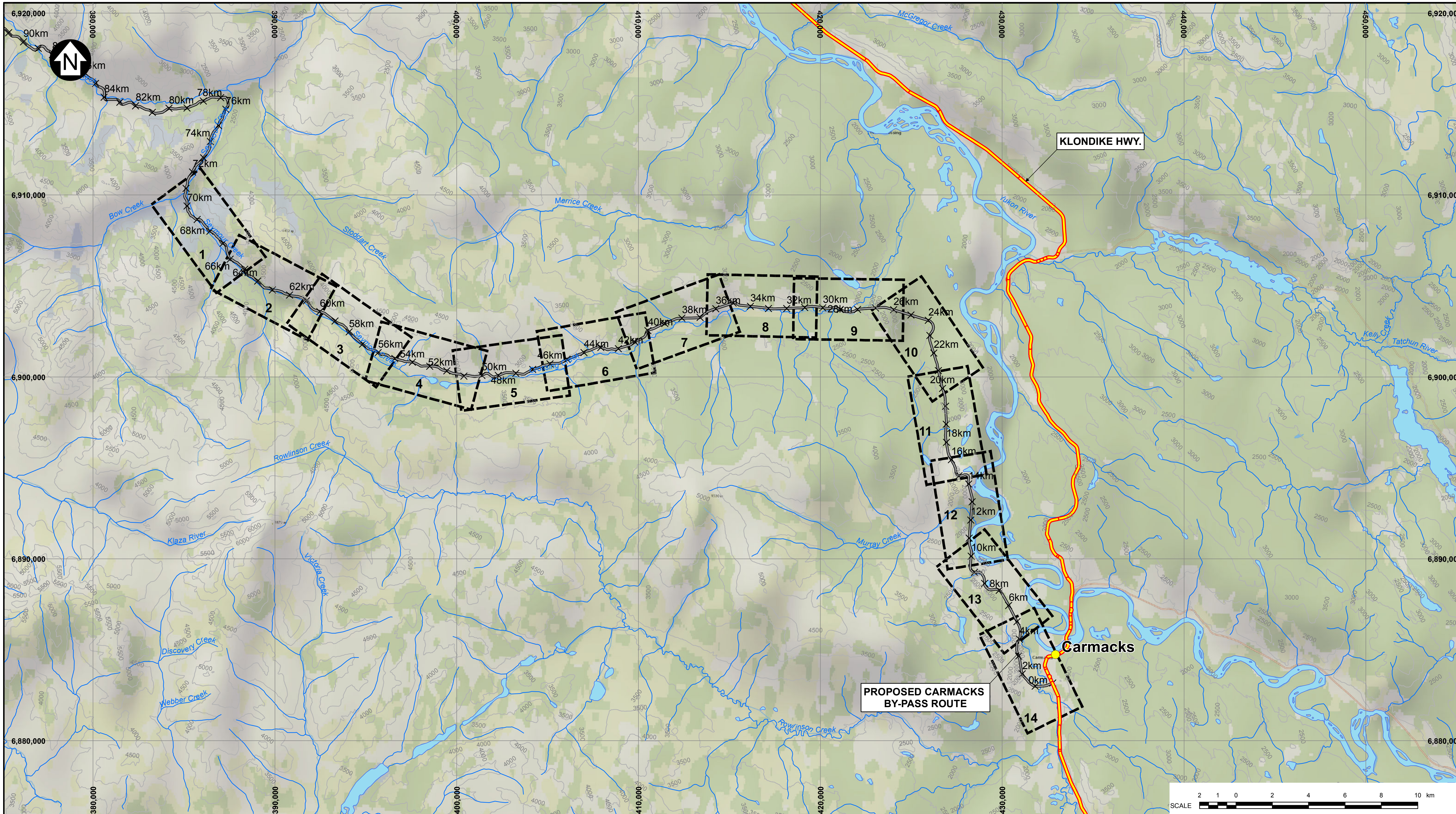
CASINO PROJECT

SITE LOCATION MAP AND TERRAIN UNIT LEGEND

Knight Piésold CONSULTING

P/A NO. VA101-325/14 | REF NO. VA13-00470

FIGURE 1 | REV 0



LEGEND:

- COMMUNITY
- CREEK/RIVER
- CONTOUR (500 ft)
- FREEGOLD ROAD UPGRADE
- FREEGOLD ROAD EXTENSION
- EXISTING ROAD
- KLONDIKE HIGHWAY
- INDEX SHEET

NOTES:

1. BASE MAP: YUKON NTS MAPS, CANVEC, AND ESRI ONLINE MAPS.
2. COORDINATE GRID IS IN METRES. COORDINATE SYSTEM: NAD 1983 UTM ZONE 8N.
3. THIS FIGURE IS PRODUCED AT A NOMINAL SCALE OF 1:200,000 FOR 11X17 (TABLOID) PAPER. ACTUAL SCALE MAY DIFFER ACCORDING TO CHANGES IN PRINTER SETTINGS OR PRINTED PAPER SIZE.
4. FREEGOLD ROAD UPGRADE ALIGNMENT IS FROM ASSOCIATED ENGINEERING, MAY 2013.

REV	DATE	DESCRIPTION	DESIGNED	DRAWN	CHK'D	APP'D
0	16DEC'13	ISSUED WITH REPORT	JEH	KK	GLS	KJB

CASINO MINING CORPORATION

CASINO PROJECT

FREEGOLD ROAD UPGRADE ALIGNMENT

Knight Piésold CONSULTING

P/A NO.	REF NO.
VA101-325/14	VA13-00470

FIGURE 2 REV 0

SAVED: M:\1\01\00325\14\A\GIS\Figs\VA13-470-Freegold Road Upgrade Preliminary Geotech Study\FreegoldRoadAlignment.mxd; Dec 17 2013 3:35 PM kkrauszova

LEGEND:

GENERAL

COMMUNITY

KLONDIKE HIGHWAY

PROPOSED FEATURES

FREEGOLD ROAD UPGRADE

SCALE 2 1 0 2 4 6 8 10 km

NOTES:

1. BASE TOPOGRAPHY: NRCAN SURFICIAL GEOLOGY.
2. COORDINATE GRID IS IN METRES. COORDINATE SYSTEM: NAD 1983 UTM ZONE 7N.
3. EXTRACTED FROM 1:100,000 SCALE SURFICIAL GEOLOGY MAP 1879A OF THE YUKON TERRITORY, PUBLISHED BY GEOLOGICAL SURVEY OF CANADA (JACKSON, L.E., 1997).
4. THIS FIGURE IS PRODUCED AT A NOMINAL SCALE OF 1:170,000 FOR 11x17 (TABLOID) PAPER. ACTUAL SCALE MAY DIFFER ACCORDING TO CHANGES IN PRINTER SETTINGS OR PRINTED PAPER SIZE.
5. ROAD ALIGNMENT BASED ON MAY 2013 FILE FROM ASSOCIATED ENGINEERING.
6. REFER TO FIGURE 3a FOR THE LEGEND.

CASINO MINING CORPORATION

CASINO PROJECT

PUBLISHED SURFICIAL GEOLOGY - FREEGOLD ROAD UPGRADE (EAST)

Knight Piésold CONSULTING

P/A NO.	REF NO.
VA101-325/14	VA13-00470

FIGURE 3 REV 0

0	16DEC'13	ISSUED WITH REPORT	JEH	CC	JEH	KJB
REV	DATE	DESCRIPTION	DESIGNED	DRAWN	CHK'D	APP'D

SAVED: M:\1\01\00325\14\A\GIS\Figs\VA13-470-Freegold Road Upgrade Preliminary Geotech Study\FreegoldRoadSurficialGeologyEast.mxd; Dec 17, 2013 2:58 PM; kkrauszova

LEGEND

Coloured legend blocks indicate map units that appear on this map
This legend is common to maps 1876A-1879A

CENOZOIC

QUATERNARY

HOLOCENE – POST-McCONNELL GLACIATION

ORGANIC DEPOSITS: *peat and muck formed predominently by the accumulation of vegetative material in bogs, fens, and swamps situated on valley bottoms and blanket bog on hillsides (see SYMBOLS below). Permafrost is commonly encountered within 1 m of the surface. Open system pingos are common in blanket bog and thermokarst collapse and palsa growth are common in bogs, fens, and swamps*

O — ***Bog, fen, and swamp deposits:*** *undivided; thickness < 1 m to 10 m*

ALLUVIAL DEPOSITS: *gravel to silt size sediments deposited by streams*

Ap — ***Floodplain sediments:*** *gravel, cobble to pebble; massive to thick bedded capped by sand and silt; flat lying; includes lacustrine and organic deposits in abandoned channels and backswamp areas subject to periodic inundation and reworking by floods; thickness 1 to 5 m*

At — ***Alluvial terrace sediments:*** *gravel, cobble to pebble with a sandy matrix; massive to thick bedded; capped by sands and silts; sediments are of flood plain origin now isolated from flooding by stream incisions; thickness 1 m to 10 m or more*

Af — ***Alluvial fan sediments****: gravel, sand, silt, and diamicton, poorly sorted; thick bedded to massive; sediments form fan-shaped landforms at the confluence of tributary streams with lower gradient trunk streams; subject to flooding accompanied by sudden stream migration and inundation by debris flows on fans with gradients in excess of 4%; thickness up to 10 m or more*

Au — ***Alluvial sediments, undivided:*** *sediments forming floodplains, fans, and terraces as above that cannot be subdivided at this map scale*

PLEISTOCENE AND HOLOCENE (UNDIVIDED)

EOLIAN DEPOSITS: *well sorted medium sand to coarse silt transported and deposited by wind action during the early postglacial and McConnell Glaciation. Thin deposits of very fine sand and coarse silt < 1 m thick are distributed discontinuously throughout low lying areas (see SYMBOLS below)*

Eb — ***Eolian sands:*** *sand, well sorted; massive; forms crescent-shape and linear dunes and featureless or gently undulating inter-dune eolian plains; thickness 1 to 5 m*

COLLUVIAL DEPOSITS: *stony diamicton resulting from the physical and chemical breakdown of bedrock and reworking and transportation by creep, solifluction, debris flow, snow avalanching, and rockfall. It also includes diamicton created by landsliding. Colluvial deposits may contain reworked glacial sediments within the limits of ice cover during the Reid and McConnell glaciations. Colluvial deposits beyond the limits of the McConnell Glaciation ice cover are likely the product of continuous formation and reworking over a significant part of the Pleistocene*

Cb — ***Colluvial blanket sediments:*** *diamicton, stony with a sandy matrix; massive; surface conforms to underlying bedrock or buried glacial deposits; thickness > 1 m to 50 m or more in large landslides*

Cv — ***Colluvial veneer sediments:*** *diamicton, stony with a sandy matrix; massive; thickness < 1 m to discontinuous over bedrock*

Ca — ***Colluvial apron sediments:*** *diamicton, bouldery diamicton and bouldery sandy gravel, poorly sorted; massive; sediments form a wedge-like slope-toe complex of small steep debris flow and avalanche-dominated fans and solifluction deposits; thickness is < 1 m at up and down slope limit to up to 5 m or more in the thickest part of the apron*

bCa — ***Rockfall sediments:*** *boulders, angular; massive; deposits form as rockfall accumulations along the bases of steep bedrock slopes; thickness ranges from < 1 m at margins to up to 10 m*

LATE PLEISTOCENE (WISCONSINAN) – McCONNELL GLACIATION

GLACIOLACUSTRINE DEPOSITS: *well stratified sand, silt, clay, deposited in lakes ponded by glacial ice. Glaciolacustrine sediments may have regular surfaces or have ridged, hummocky, or pitted surfaces caused by meltout of former supporting glacial ice . Glaciolacustrine silt and clay commonly contain extensive segregated ground ice. Consequently, they are widely affected by thermokarst collapse and retrogressive thaw landsliding along rivers*

Lp — ***Glaciolacustrine plain:*** *sand, silt, and clay with minor dropstones; thinly bedded to laminated; thickness > 5 m*

Lb — ***Glaciolacustrine blanket:*** *silt and clay with minor sand; thinly bedded to laminated; deposit conforms to underlying topography; thickness 1 m to 5 m*

Lv — ***Glaciolacustrine veneer:*** *silt and clay with minor sand; thinly bedded to laminated; deposit conforms to underlying topography; thickness < 1 m to discontinuous*

Lx — ***Ice-contact glaciolacustrine complex:*** *sand, silt, and clay; laminated to medium bedded with up to 10 percent lenticular beds of gravel and diamicton and dropstones; surface is hummocky, pitted, and ridged; thickness > 5 m*

GLACIOFLUVIAL DEPOSITS: *sands, gravels and minor silts > 1 m thick deposited by streams flowing away from, or in contact with glacial ice including deltas graded to former glacial lakes. Sorting ranges from good to poor and stratification from thin bedded to massive. Sediments commonly display evidence of syndepositional collapse due to meltout of buried or supporting ice*

Gp — ***Glaciofluvial plain sediments:*** *pebble to cobble gravel; massive to thick bedded, capped by sand and silt; planar surface; thickness 1 to > 10 m*

Gt — ***Glaciofluvial terrace sediments:*** *pebble to cobble gravel; massive to thick bedded; incised into flights of terraces by glacial streams; thickness 1 to > 10 m*

Gd — ***Glaciofluvial delta sediments****: sand, gravel, and minor silt and clay, moderately to well sorted, texture becomes finer downward; massive to thick bedded; deposit has a planar surface and delta-form in plan view; thickness > 5 m*

Gx — ***Glaciofluvial ice stagnation complex sediments:*** *gravel, sand, diamicton, poorly to moderately sorted, and minor silt and clay; bedding thick to massive and commonly folded and faulted from syndepositional ice meltout; surface consists of hummocks, kettles, esker and crevasse-fill ridges with minor elements of units* **Gp, Gd,** *and* **Gt**

Gu — ***Discontinuous glaciofluvial sediments:*** *gravel and sand including elements of units* **Gp** *and* **Gx**, *discontinuously distributed in areas of units* **Mb** *and* **Mv**

MORAINAL DEPOSITS (TILL): *glacial diamicton, mainly till, generally consisting of a matrix ranging from sand to clay that supports clasts ranging from boulders to pebbles in size; deposited either directly from glacial ice or by gravity flow from glacial ice*

Mb — ***Till blanket:*** *diamicton, stony with a silty, sandy matrix; massive to crudely stratified; surface conforms to the underlying topography; thickness 1 to 5 m*

Mv — ***Till veneer:*** *diamicton, stony with a silty, sandy matrix; massive to crudely stratified; may contain extensive areas of thin (< 1 m) to patchy colluvium over bedrock*

MIDDLE PLEISTOCENE – PRE-McCONNELL GLACIATION (UNDIVIDED)

ALLUVIAL DEPOSITS: *gravel and sand deposited by streams that were not fed by glacial meltwaters. Sediments may represent several cycles of alluviation and erosion. Sediments are not presently correlative to past glaciations but presumably predate McConnell Glaciation due to the presence of McConnell age loess overlying them. Basal gravels within these sediments commonly contain placer gold in basins draining Cretaceous granodiorite and andesite*

$A^{PM}f$ — ***Alluvial fans:*** *single fans or aprons of coalesced fans formed of gravel and sand, poorly to moderately sorted, thick bedded. Sediments disturbed by cryoturbation and clasts commonly wind sculpted. Thickness up to 10 m or more*

$A^{PM}x$ — ***Alluvial complex sediments:*** *gravel and sand, poorly to moderately sorted; thin to thick bedded, interstratified with colluvial diamicton, reworked loess, peat, and woody detritus; sediments underlie the floors and margins of narrow upland valleys and grade laterally (upslope) into colluvial blankets. They contain segregated ice lenses and ice wedges and are normally capped by blanket bog; sediments may represent several depositional cycles; thicknesses may exceed 10 m in mid-valley locations*

MIDDLE PLEISTOCENE – REID GLACIATION

ALLUVIAL DEPOSITS: *complexes of nonglacial and fan sands and gravels deposited by streams that flowed from ice-free areas toward Reid Glaciation ice margins. These sands and gravels locally overlie older interglacial gravels that contain placer gold*

$A^{R}t$ — ***Alluvial terrace sediments:*** *gravelly micaceous sand and gravel, moderately sorted, clasts angular to subangular; bedding is thin to massive and lenticular; gravel clasts are commonly frost shattered and wind sculpted; sediments have been incised into flights of terraces. Sediments are commonly cut by ice wedge waters pseudomorphs over their upper 2 m (includes terrace gravels along Klaza River possibly deposited by outlet waters from a lake dammed by a glacial margin during Reid Glaciation). Thickness 1 to 15 m*

$A^{R}f$ — ***Alluvial fans:*** *single fans or aprons of coalesced fans formed of gravel and sand, poorly to moderately sorted, thick bedded. Sediments disturbed by cryoturbation and clasts commonly wind sculpted. Thickness up to 10 m or more*

$A^{R}x$ — ***Alluvial complex sediments:*** *gravel and sand, poorly to moderately sorted; thin to thick bedded, interstratified with colluvial diamicton, reworked loess, peat, and woody detritus; sediments underlie the floors and margins of narrow upland valleys and grade laterally (upslope) into colluvial blankets. They contain segregated ice lenses and ice wedges and are normally capped by blanket bog; sediments may represent several depositional cycles; thicknesses may exceed 10 m in mid-valley locations*

GLACIOLACUSTRINE DEPOSITS: *well stratified sand, silt, clay, and minor gravel and diamicton deposited in lakes ponded by glacial ice. Glaciolacustrine silts and clays commonly contain segregated ground ice and are affected by contemporary thermokarst collapse*

$L^{R}p$ — ***Glaciolacustrine plain:*** *sand, silt, and clay, with minor dropstones; thinly bedded to laminated; thickness 1 to > 5 m*

GLACIOFLUVIAL DEPOSITS*: gravel and sand deposited by streams flowing away from, or in contact with glacial ice*

$G^{R}p$ — ***Glaciofluvial plain sediments:*** *gravel and sand, moderately to well sorted; thick bedded to massive; planar surface; thickness 1 to 10 m or more*

$G^{R}t$ — ***Glaciofluvial terrace sediments:*** *pebble to cobble gravel; massive to thick bedded; incised into flights of terraces by glacial streams; thickness 1 to > 10 m*

$G^{R}d$ — ***Glaciofluvial delta sediments:*** *sand, gravel and minor silt and clay, moderately to well sorted and becomes finer downward; massive to thick bedded; planar surface, deposit is delta form in plan view; thickness > 5 m*

$G^{R}x$ — ***Glaciofluvial ice stagnation complex sediments:*** *gravel, sand, diamicton, poorly to moderately sorted, and minor silt and clay; bedding thick to massive and commonly folded and faulted from syndepositional ice meltout; surface consists of hummocks, kettles, esker and crevasse-fill ridges with minor elements of units* $G^{R}p$, $G^{R}d$, *and* $G^{R}t$

MORAINAL DEPOSITS (TILL)*: glacial diamicton, mainly till, generally consisting of a matrix ranging from sand to clay that supports clasts ranging from boulders to pebbles in size; deposited either directly from glacial ice or by gravity flow from glacial ice*

$M^{R}b$ — ***Till blanket:*** *diamicton, stony, silty sandy matrix; massive; conforms to underlying topography; thickness 1 to 5 m*

$M^{R}v$ — ***Till veneer:*** *diamicton, stony, silty sandy matrix; massive; discontinuous and may contain extensive areas of thin (< 1 m) and patchy colluvium over bedrock*

EARLY PLEISTOCENE – YOUNGER PRE-REID GLACIATION

GLACIOFLUVIAL DEPOSITS*: gravel and sand deposited by streams flowing away from glacial ice in meltwater channels and outwash planes. Thick bedded to massive; clasts, except for quartz, quartzite, and chert are disaggregated or weathered to clay over the upper 2 m of the sediments where they underlie the surface; clasts near the surface of the unit are intensely wind sculpted and this interval is cut by ice wedge pseudomorphs and sand wedges; thickness 1 m to > 5 m*

$G^{PR}p$ — ***Glaciofluvial plain sediments****: gravel and sand, deeply weathered; forms an unincised plain*

$G^{PR}t$ — ***Glaciofluvial terrace sediments:*** *gravel and sand, deeply weathered; incised into flights of terraces*

MORAINAL DEPOSITS (TILL)*: glacial diamicton, mainly till, generally consisting of a matrix ranging from sand to clay that supports clasts ranging from boulders to pebbles in size; deposited either directly from glacial ice or by gravity flow from glacial ice*

$M^{PR}v$ — ***Till veneer:*** *patchy, deeply weathered diamicton. Matrix sandy silty clay. Formerly feldspar-rich stones are weathered to clay*

EARLY PLEISTOCENE

VOLCANIC ROCK and INTERSTRATIFIED SEDIMENTS

V — ***Pleistocene volcanics (undivided):*** *basalt, breccia, volcanic ejecta and hyaloclastite of the Selkirk volcanics erupted during the early and late Pleistocene or early Holocene epochs in the Fort Selkirk area. Cumulative basalt flow thicknesses exceed 100 m where they have filled valleys. Deposits of the two known pre-Reid glaciations and at least one nonglacial period are locally interstratified with the volcanics and are exposed only in sections*

PALEOZOIC AND MESOZOIC

R — ***PRE-QUATERNARY BEDROCK:*** *basalt, andesite, greenstone, schist, gneiss, greywacke, granodiorite and monzonite: includes areas of thin colluvial cover, blockfields, sorted stone polygons in alpine areas*

R-A — ***AVALANCHE MODIFIED PRE-QUATERNARY BEDROCK:*** *bedrock areas subject to rapid mass wasting processes (rockfall and snow avalanches)*

SYMBOLS

Note: **pR** *- pre-Reid glaciations,* **r** *- Reid Glaciation,* **pM** *- pre-McConnell Glaciation, (no designator, assume McConnell Glaciation)*

- *Geological boundary*
- *Blanket bog covering generally less than 1 m thick*
- *Discontinuous eolian sands or silts, thickness locally up to 2 m*
- *Open system pingo, collapsed open system pingo*
- *Thermokarst collapse activity* — Tk
- *Landslide, arrow(s) indicate direction of movement*
- *Cirque: degraded cirque active prior to McConnell Glaciation*
- *Arête: degraded arête active prior to McConnell Glaciation*
- *Streamlined glacial bedforms: ice flow direction known, unknown*
- *Meltwater channel; large, small ice-walled channel, arrow indicates flow direction*
- *Esker: flow direction defined, unknown*
- *End moraine*
- *Recessional moraine*
- *Ice-contact face in stratified drift (teeth on ice side)*
- *Ice limit*
- *Cryoplanation terrace*
- *Tor* — +
- *Vertebrate fossil locality* — Ⓕ
- *Stratigraphic section* — 2+

CASINO MINING CORPORATION

CASINO PROJECT

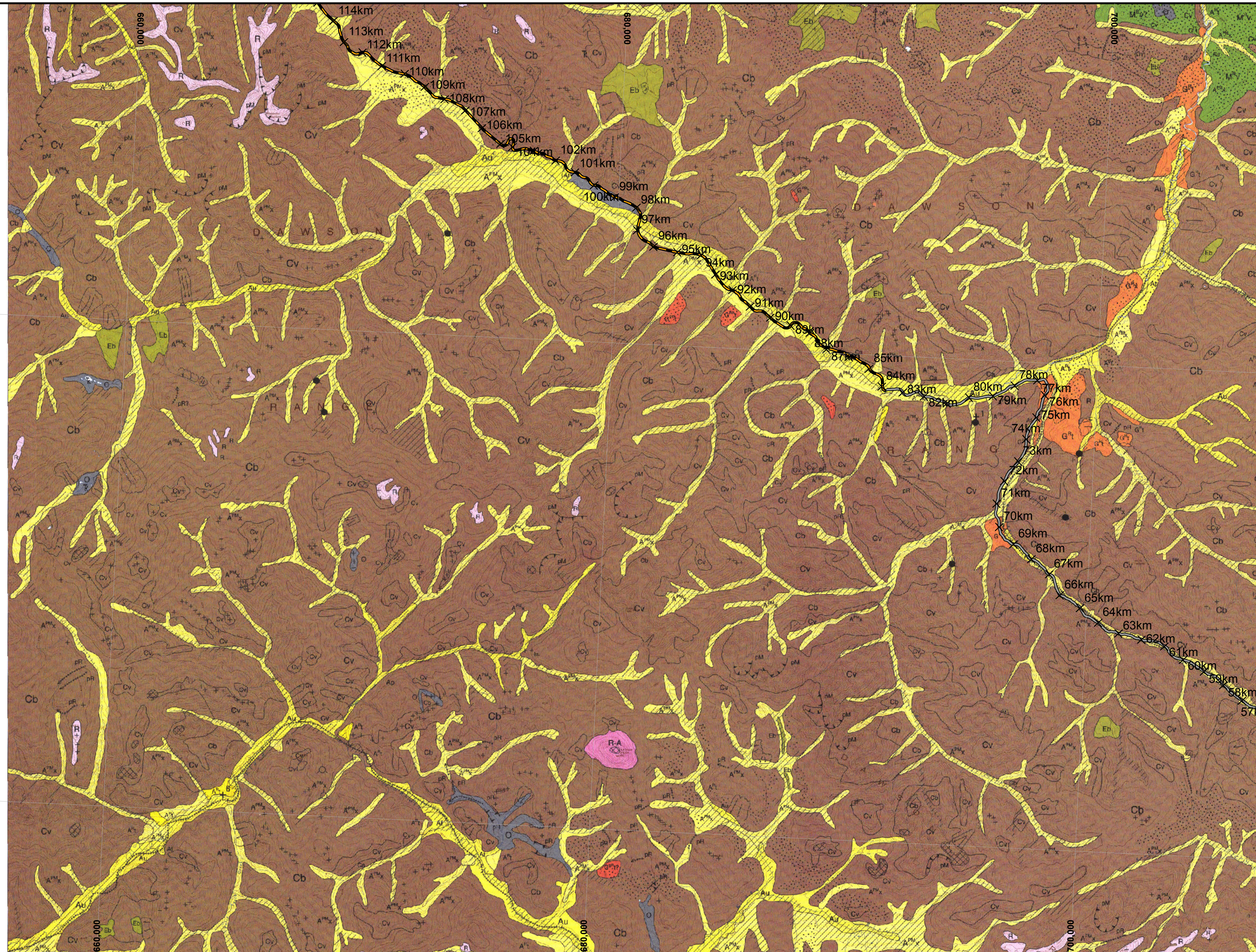
PUBLISHED SURFICIAL GEOLOGY - FREEGOLD ROAD UPGRADE (EAST) LEGEND

Knight Piésold CONSULTING

P/A NO.	REF NO.
VA101-325/14	VA13-00470

FIGURE 3a — REV 0

REV	DATE	DESCRIPTION	DESIGNED	DRAWN	CHK'D	APP'D
0	16DEC'13	ISSUED WITH REPORT	JEH	AMD	JEH	KJB



LEGEND:

PROPOSED FEATURES

FREEGOLD ROAD UPGRADE

FREEGOLD ROAD EXTENSION

SCALE 2 1 0 2 4 6 8 10 km

NOTES:

1. BASE TOPOGRAPHY: NRCAN SURFICIAL GEOLOGY.
2. COORDINATE GRID IS IN METRES. COORDINATE SYSTEM: NAD 1983 UTM ZONE 7N.
3. EXTRACTED FROM 1:100,000 SCALE SURFICIAL GEOLOGY MAP 1879A OF THE YUKON TERRITORY, PUBLISHED BY GEOLOGICAL SURVEY OF CANADA (JACKSON, L.E., 1997).
4. THIS FIGURE IS PRODUCED AT A NOMINAL SCALE OF 1:175,000 FOR 11x17 (TABLOID) PAPER. ACTUAL SCALE MAY DIFFER ACCORDING TO CHANGES IN PRINTER SETTINGS OR PRINTED PAPER SIZE.
5. ROAD ALIGNMENT BASED ON MAY 2013 FILE FROM ASSOCIATED ENGINEERING.
6. REFER TO FIGURE 4a FOR THE LEGEND.

REV	DATE	DESCRIPTION	DESIGNED	DRAWN	CHK'D	APP'D
0	16DEC'13	ISSUED WITH REPORT	JEH	CC	JEH	KJB

CASINO MINING CORPORATION

CASINO PROJECT

PUBLISHED SURFICIAL GEOLOGY - FREEGOLD ROAD UPGRADE (WEST)

Knight Piésold CONSULTING

P/A NO.	REF NO.
VA101-325/14	VA13-00470

FIGURE 4 REV 0

LEGEND

Coloured legend blocks indicate map units that appear on this map
This legend is common to maps 1876A-1879A

CENOZOIC

QUATERNARY

HOLOCENE – POST-McCONNELL GLACIATION

ORGANIC DEPOSITS: *peat and muck formed predominently by the accumulation of vegetative material in bogs, fens, and swamps situated on valley bottoms and blanket bog on hillsides (see SYMBOLS below). Permafrost is commonly encountered within 1 m of the surface. Open system pingos are common in blanket bog and thermokarst collapse and palsa growth are common in bogs, fens, and swamps*

O — ***Bog, fen, and swamp deposits:*** *undivided; thickness < 1 m to 10 m*

ALLUVIAL DEPOSITS: *gravel to silt size sediments deposited by streams*

Ap — ***Floodplain sediments:*** *gravel, cobble to pebble; massive to thick bedded capped by sand and silt; flat lying; includes lacustrine and organic deposits in abandoned channels and backswamp areas subject to periodic inundation and reworking by floods; thickness 1 to 5 m*

At — ***Alluvial terrace sediments:*** *gravel, cobble to pebble with a sandy matrix; massive to thick bedded; capped by sands and silts; sediments are of flood plain origin now isolated from flooding by stream incisions; thickness 1 m to 10 m or more*

Af — ***Alluvial fan sediments:*** *gravel, sand, silt, and diamicton, poorly sorted; thick bedded to massive; sediments form fan-shaped landforms at the confluence of tributary streams with lower gradient trunk streams; subject to flooding accompanied by sudden stream migration and inundation by debris flows on fans with gradients in excess of 4%; thickness up to 10 m or more*

Au — ***Alluvial sediments, undivided:*** *sediments forming floodplains, fans, and terraces as above that cannot be subdivided at this map scale*

PLEISTOCENE AND HOLOCENE (UNDIVIDED)

EOLIAN DEPOSITS: *well sorted medium sand to coarse silt transported and deposited by wind action during the early postglacial and McConnell Glaciation. Thin deposits of very fine sand and coarse silt < 1 m thick are distributed discontinuously throughout low lying areas (see SYMBOLS below)*

Eb — ***Eolian sands:*** *sand, well sorted; massive; forms crescent-shape and linear dunes and featureless or gently undulating inter-dune eolian plains; thickness 1 to 5 m*

COLLUVIAL DEPOSITS: *stony diamicton resulting from the physical and chemical breakdown of bedrock and reworking and transportation by creep, solifluction, debris flow, snow avalanching, and rockfall. It also includes diamicton created by landsliding. Colluvial deposits may contain reworked glacial sediments within the limits of ice cover during the Reid and McConnell glaciations. Colluvial deposits beyond the limits of the McConnell Glaciation ice cover are likely the product of continuous formation and reworking over a significant part of the Pleistocene*

Cb — ***Colluvial blanket sediments:*** *diamicton, stony with a sandy matrix; massive; surface conforms to underlying bedrock or buried glacial deposits, thickness > 1 m to 50 m or more in large landslides*

Cv — ***Colluvial veneer sediments:*** *diamicton, stony with a sandy matrix; massive; thickness < 1 m to discontinuous over bedrock*

Ca — ***Colluvial apron sediments:*** *diamicton, bouldery diamicton and bouldery sandy gravel, poorly sorted; massive; sediments form a wedge-like slope-toe complex of small steep debris flow and avalanche-dominated fans and solifluction deposits; thickness is < 1 m at up and down slope limit to up to 5 m or more in the thickest part of the apron*

bCa — ***Rockfall sediments:*** *boulders, angular; massive; deposits form as rockfall accumulations along the bases of steep bedrock slopes; thickness ranges from < 1 m at margins to up to 10 m*

LATE PLEISTOCENE (WISCONSINAN) – McCONNELL GLACIATION

GLACIOLACUSTRINE DEPOSITS: *well stratified sand, silt, clay, deposited in lakes ponded by glacial ice. Glaciolacustrine sediments may have regular surfaces or have ridged, hummocky, or pitted surfaces caused by meltout of former supporting glacial ice . Glaciolacustrine silt and clay commonly contain extensive segregated ground ice. Consequently, they are widely affected by thermokarst collapse and retrogressive thaw landsliding along rivers*

Lp — ***Glaciolacustrine plain:*** *sand, silt, and clay with minor dropstones; thinly bedded to laminated; thickness > 5 m*

Lb — ***Glaciolacustrine blanket:*** *silt and clay with minor sand; thinly bedded to laminated; deposit conforms to underlying topography; thickness 1 m to 5 m*

Lv — ***Glaciolacustrine veneer:*** *silt and clay with minor sand; thinly bedded to laminated; deposit conforms to underlying topography; thickness < 1 m to discontinuous*

Lx — ***Ice-contact glaciolacustrine complex:*** *sand, silt, and clay; laminated to medium bedded with up to 10 percent lenticular beds of gravel and diamicton and dropstones; surface is hummocky, pitted, and ridged; thickness > 5 m*

GLACIOFLUVIAL DEPOSITS: *sands, gravels and minor silts > 1 m thick deposited by streams flowing away from, or in contact with glacial ice including deltas graded to former glacial lakes. Sorting ranges from good to poor and stratification from thin bedded to massive. Sediments commonly display evidence of syndepositional collapse due to meltout of buried or supporting ice*

Gp — ***Glaciofluvial plain sediments:*** *pebble to cobble gravel; massive to thick bedded, capped by sand and silt; planar surface; thickness 1 to > 10 m*

Gt — ***Glaciofluvial terrace sediments:*** *pebble to cobble gravel; massive to thick bedded; incised into flights of terraces by glacial streams; thickness 1 to > 10 m*

Gd — ***Glaciofluvial delta sediments:*** *sand, gravel, and minor silt and clay, moderately to well sorted, texture becomes finer downward; massive to thick bedded; deposit has a planar surface and delta-form in plan view; thickness > 5 m*

Gx — ***Glaciofluvial ice stagnation complex sediments:*** *gravel, sand, diamicton, poorly to moderately sorted, and minor silt and clay; bedding thick to massive and commonly folded and faulted from syndepositional ice meltout; surface consists of hummocks, kettles, esker and crevasse-fill ridges with minor elements of units* **Gp, Gd,** *and* **Gt**

Gu — ***Discontinuous glaciofluvial sediments:*** *gravel and sand including elements of units* **Gp** *and* **Gx,** *discontinuously distributed in areas of units* **Mb** *and* **Mv**

MORAINAL DEPOSITS (TILL): *glacial diamicton, mainly till, generally consisting of a matrix ranging from sand to clay that supports clasts ranging from boulders to pebbles in size; deposited either directly from glacial ice or by gravity flow from glacial ice*

Mb — ***Till blanket:*** *diamicton, stony with a silty, sandy matrix; massive to crudely stratified; surface conforms to the underlying topography; thickness 1 to 5 m*

Mv — ***Till veneer:*** *diamicton, stony with a silty, sandy matrix; massive to crudely stratified; may contain extensive areas of thin (< 1 m) to patchy colluvium over bedrock*

MIDDLE PLEISTOCENE – PRE-McCONNELL GLACIATION (UNDIVIDED)

ALLUVIAL DEPOSITS: *gravel and sand deposited by streams that were not fed by glacial meltwaters. Sediments may represent several cycles of alluviation and erosion. Sediments are not presently correlative to past glaciations but presumably predate McConnell Glaciation due to the presence of McConnell age loess overlying them. Basal gravels within these sediments commonly contain placer gold in basins draining Cretaceous granodiorite and andesite*

$A^{PM}f$ — ***Alluvial fans:*** *single fans or aprons of coalesced fans formed of gravel and sand, poorly to moderately sorted, thick bedded. Sediments disturbed by cryoturbation and clasts commonly wind sculpted. Thickness up to 10 m or more*

$A^{PM}x$ — ***Alluvial complex sediments:*** *gravel and sand, poorly to moderately sorted; thin to thick bedded, interstratified with colluvial diamicton, reworked loess, peat, and woody detritus; sediments underlie the floors and margins of narrow upland valleys and grade laterally (upslope) into colluvial blankets. They contain segregated ice lenses and ice wedges and are normally capped by blanket bog; sediments may represent several depositional cycles; thicknesses may exceed 10 m in mid-valley locations*

MIDDLE PLEISTOCENE – REID GLACIATION

ALLUVIAL DEPOSITS: *complexes of nonglacial and fan sands and gravels deposited by streams that flowed from ice-free areas toward Reid Glaciation ice margins. These sands and gravels locally overlie older interglacial gravels that contain placer gold*

$A^{R}t$ — ***Alluvial terrace sediments:*** *gravelly micaceous sand and gravel, moderately sorted, clasts angular to subangular; bedding is thin to massive and lenticular; gravel clasts are commonly frost shattered and wind sculpted; sediments have been incised into flights of terraces. Sediments are commonly cut by ice wedge waters pseudomorphs over their upper 2 m (includes terrace gravels along Klaza River possibly deposited by outlet waters from a lake dammed by a glacial margin during Reid Glaciation). Thickness 1 to 15 m*

$A^{R}f$ — ***Alluvial fans:*** *single fans or aprons of coalesced fans formed of gravel and sand, poorly to moderately sorted, thick bedded. Sediments disturbed by cryoturbation and clasts commonly wind sculpted. Thickness up to 10 m or more*

$A^{R}x$ — ***Alluvial complex sediments:*** *gravel and sand, poorly to moderately sorted; thin to thick bedded, interstratified with colluvial diamicton, reworked loess, peat, and woody detritus; sediments underlie the floors and margins of narrow upland valleys and grade laterally (upslope) into colluvial blankets. They contain segregated ice lenses and ice wedges and are normally capped by blanket bog; sediments may represent several depositional cycles; thicknesses may exceed 10 m in mid-valley locations*

GLACIOLACUSTRINE DEPOSITS: *well stratified sand, silt, clay, and minor gravel and diamicton deposited in lakes ponded by glacial ice. Glaciolacustrine silts and clays commonly contain segregated ground ice and are affected by contemporary thermokarst collapse*

$L^{R}p$ — ***Glaciolacustrine plain:*** *sand, silt, and clay, with minor dropstones; thinly bedded to laminated; thickness 1 to > 5 m*

GLACIOFLUVIAL DEPOSITS: *gravel and sand deposited by streams flowing away from, or in contact with glacial ice*

$G^{R}p$ — ***Glaciofluvial plain sediments:*** *gravel and sand, moderately to well sorted, thick bedded to massive; planar surface; thickness 1 to 10 m or more*

$G^{R}t$ — ***Glaciofluvial terrace sediments:*** *pebble to cobble gravel; massive to thick bedded; incised into flights of terraces by glacial streams; thickness 1 to > 10 m*

$G^{R}d$ — ***Glaciofluvial delta sediments:*** *sand, gravel and minor silt and clay, moderately to well sorted and becomes finer downward; massive to thick bedded; planar surface, deposit is delta form in plan view; thickness > 5 m*

$G^{R}x$ — ***Glaciofluvial ice stagnation complex sediments:*** *gravel, sand, diamicton, poorly to moderately sorted, and minor silt and clay; bedding thick to massive and commonly folded and faulted from syndepositional ice meltout; surface consists of hummocks, kettles, esker and crevasse-fill ridges with minor elements of units* $G^{R}p$, $G^{R}d$, *and* $G^{R}t$

MORAINAL DEPOSITS (TILL): *glacial diamicton, mainly till, generally consisting of a matrix ranging from sand to clay that supports clasts ranging from boulders to pebbles in size; deposited either directly from glacial ice or by gravity flow from glacial ice*

$M^{R}b$ — ***Till blanket:*** *diamicton, stony, silty sandy matrix; massive; conforms to underlying topography; thickness 1 to 5 m*

$M^{R}v$ — ***Till veneer:*** *diamicton, stony, silty sandy matrix; massive; discontinuous and may contain extensive areas of thin (< 1 m) and patchy colluvium over bedrock*

EARLY PLEISTOCENE – YOUNGER PRE-REID GLACIATION

GLACIOFLUVIAL DEPOSITS: *gravel and sand deposited by streams flowing away from glacial ice in meltwater channels and outwash planes. Thick bedded to massive; clasts, except for quartz, quartzite, and chert are disaggregated or weathered to clay over the upper 2 m of the sediments where they underlie the surface; clasts near the surface of the unit are intensely wind sculpted and this interval is cut by ice wedge pseudomorphs and sand wedges; thickness 1 m to > 5 m*

$G^{PR}p$ — ***Glaciofluvial plain sediments:*** *gravel and sand, deeply weathered; forms an unincised plain*

$G^{PR}t$ — ***Glaciofluvial terrace sediments:*** *gravel and sand, deeply weathered; incised into flights of terraces*

MORAINAL DEPOSITS (TILL): *glacial diamicton, mainly till, generally consisting of a matrix ranging from sand to clay that supports clasts ranging from boulders to pebbles in size; deposited either directly from glacial ice or by gravity flow from glacial ice*

$M^{PR}v$ — ***Till veneer:*** *patchy, deeply weathered diamicton. Matrix sandy silty clay. Formerly feldspar-rich stones are weathered to clay*

EARLY PLEISTOCENE

VOLCANIC ROCK and INTERSTRATIFIED SEDIMENTS

V — ***Pleistocene volcanics (undivided):*** *basalt, breccia, volcanic ejecta and hyaloclastite of the Selkirk volcanics erupted during the early and late Pleistocene or early Holocene epochs in the Fort Selkirk area. Cumulative basalt flow thicknesses exceed 100 m where they have filled valleys. Deposits of the two known pre-Reid glaciations and at least one nonglacial period are locally interstratified with the volcanics and are exposed only in sections*

PALEOZOIC AND MESOZOIC

R — ***PRE-QUATERNARY BEDROCK:*** *basalt, andesite, greenstone, schist, gneiss, greywacke, granodiorite and monzonite: includes areas of thin colluvial cover, blockfields, sorted stone polygons in alpine areas*

R-A — ***AVALANCHE MODIFIED PRE-QUATERNARY BEDROCK:*** *bedrock areas subject to rapid mass wasting processes (rockfall and snow avalanches)*

SYMBOLS

Note: **pR** *- pre-Reid glaciations,* **r** *- Reid Glaciation,* **pM** *- pre-McConnell Glaciation, (no designator, assume McConnell Glaciation)*

Geological boundary

Blanket bog covering generally less than 1 m thick

Discontinuous eolian sands or silts, thickness locally up to 2 m

Open system pingo, collapsed open system pingo

Thermokarst collapse activity

Landslide, arrow(s) indicate direction of movement

Cirque: degraded cirque active prior to McConnell Glaciation

Arête: degraded arête active prior to McConnell Glaciation

Streamlined glacial bedforms: ice flow direction known, unknown

Meltwater channel; large, small ice-walled channel, arrow indicates flow direction

Esker, flow direction defined, unknown

End moraine

Recessional moraine

Ice-contact face in stratified drift (teeth on ice side)

Ice limit

Cryoplanation terrace

Tor

Vertebrate fossil locality

Stratigraphic section

CASINO MINING CORPORATION

CASINO PROJECT

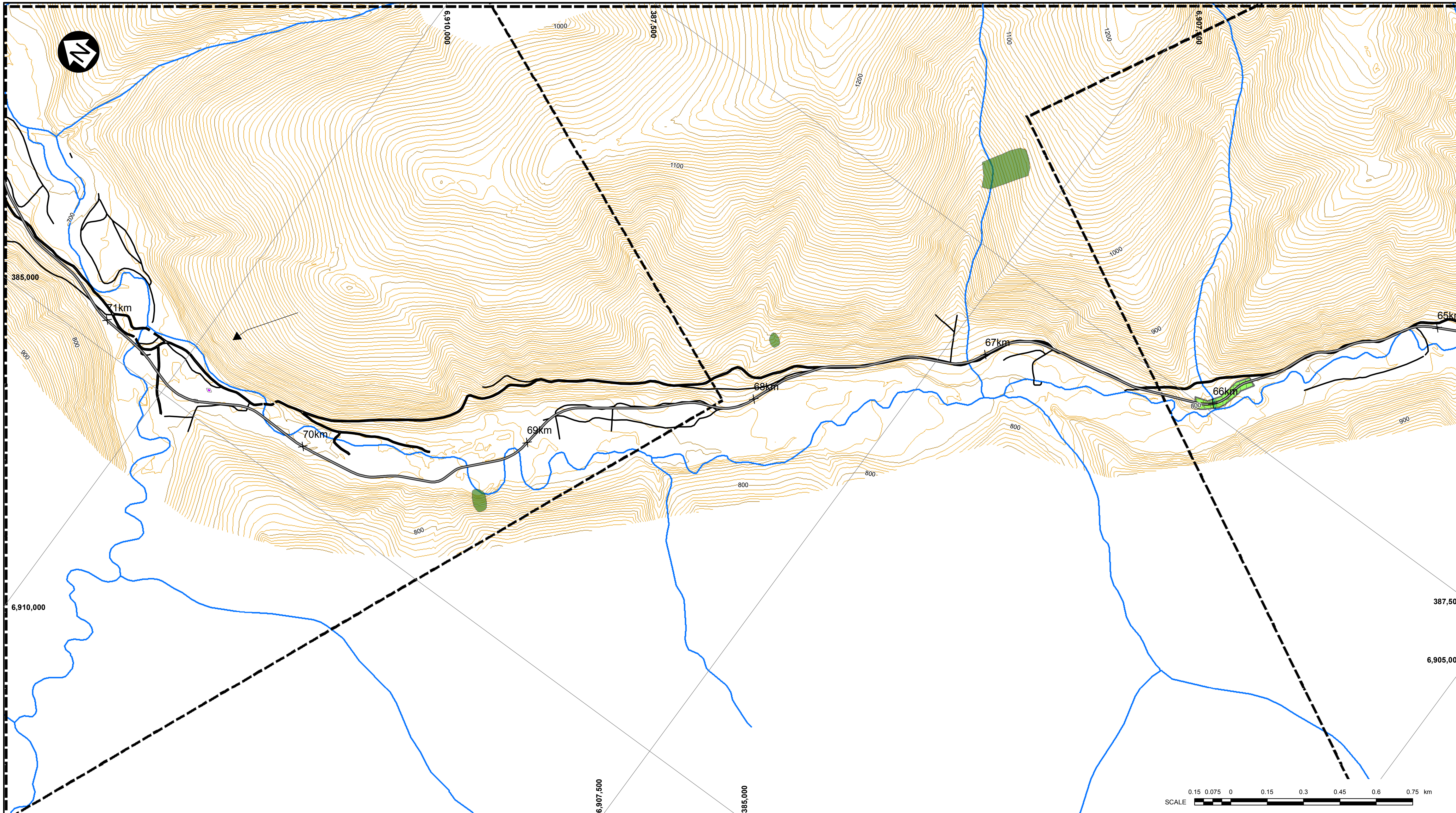
PUBLISHED SURFICIAL GEOLOGY - FREEGOLD ROAD UPGRADE (WEST) LEGEND

Knight Piésold CONSULTING

P/A NO.	REF NO.
VA101-325/14	VA13-00470

FIGURE 4a — REV 0

REV	DATE	DESCRIPTION	DESIGNED	DRAWN	CHK'D	APP'D
0	16DEC'13	ISSUED WITH REPORT	JEH	AMD	JEH	KJB



LEGEND:

GENERAL
- CREEK/RIVER
- KLONDIKE HIGHWAY
- EXISTING FREEGOLD ROAD
- CONTOUR (5 m)
- CONTOUR (25 m)
- INDEX SHEET

PROPOSED FACILITIES
- FREEGOLD ROAD UPGRADE
- FREEGOLD ROAD EXTENSION

TERRAIN FEATURES/ HAZARDS
- RECENT SLIDE
- RECENT DEBRIS SLIDES & GULLY EROSION
- RELICT SLIDE
- RELICT SLUMP/FLOW
- ORGANIC SOIL
- POSSIBLE ORGANIC SOIL
- COLLUVIAL FAN
- FLUVIAL FAN
- FLUVIAL PLAIN
- ABANDONED CHANNEL
- PRESENT DAY WATERCOURSE

PERMAFROST RELATED FEATURES
- THAW LAKE
- THERMOKARST
- RECENT THAW SLUMP/FLOW
- RELICT THAW SLUP/FLOW
- SOLIFLUCTION LOBE
- SKIN FLOW

NOTES:

1. BASE MAP: 5m CONTOURS.
2. COORDINATE GRID IS IN METRES. COORDINATE SYSTEM: NAD 1983 UTM ZONE 8N.
3. THIS FIGURE IS PRODUCED AT A NOMINAL SCALE OF 1:15,000 FOR 11x17 (TABLOID) PAPER. ACTUAL SCALE MAY DIFFER ACCORDING TO CHANGES IN PRINTER SETTINGS OR PRINTED PAPER SIZE.
4. FREEGOLD ROAD UPGRADE ALIGNMENT BASED ON MAY 2013 FILE FROM ASSOCIATED ENGINEERING.

REV	DATE	DESCRIPTION	DESIGNED	DRAWN	CHK'D	APP'D
0	16DEC'13	ISSUED WITH REPORT	JEH	KK	JEH	KJB

CASINO MINING CORPORATION

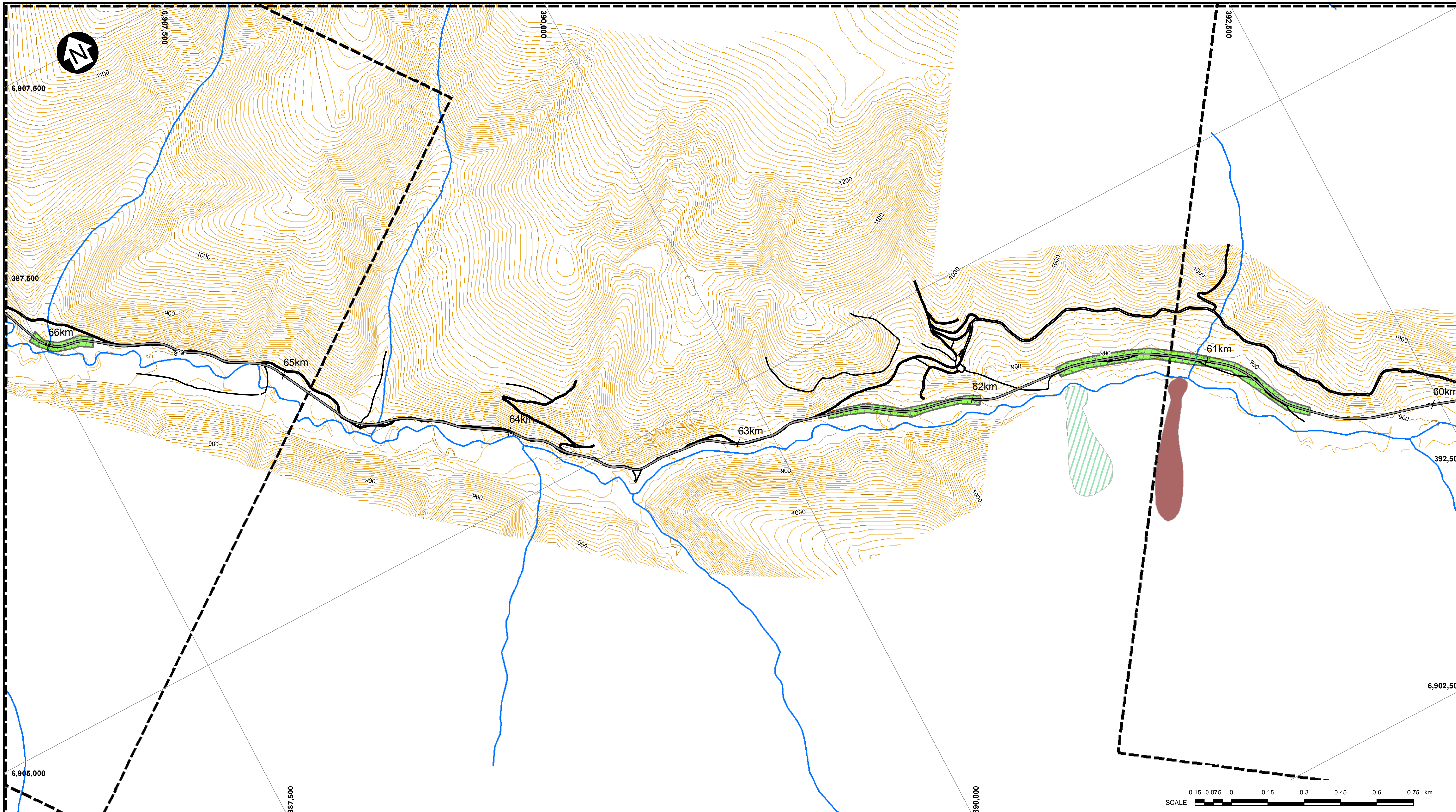
CASINO PROJECT

FINDINGS OF PRELIMINARY GEOTECHNICAL STUDY OF FREEGOLD ROAD UPGRADE
SHEET 1 OF 14

Knight Piésold CONSULTING

P/A NO.	REF NO.
VA101-325/14	VA13-00470

FIGURE 5 REV 0



LEGEND:

GENERAL
- CREEK/RIVER
- KLONDIKE HIGHWAY
- EXISTING FREEGOLD ROAD
- CONTOUR (5 m)
- CONTOUR (25 m)
- INDEX SHEET

PROPOSED FACILITIES
- FREEGOLD ROAD UPGRADE
- FREEGOLD ROAD EXTENSION

TERRAIN FEATURES/ HAZARDS
- RECENT SLIDE
- RECENT DEBRIS SLIDES & GULLY EROSION
- RELICT SLIDE
- RELICT SLUMP/FLOW
- ORGANIC SOIL
- POSSIBLE ORGANIC SOIL
- COLLUVIAL FAN
- FLUVIAL FAN
- FLUVIAL PLAIN
- ABANDONED CHANNEL
- PRESENT DAY WATERCOURSE

PERMAFROST RELATED FEATURES
- THAW LAKE
- THERMOKARST
- RECENT THAW SLUMP/FLOW
- RELICT THAW SLUP/FLOW
- SOLIFLUCTION LOBE
- SKIN FLOW

NOTES:

1. BASE MAP: 5m CONTOURS.
2. COORDINATE GRID IS IN METRES. COORDINATE SYSTEM: NAD 1983 UTM ZONE 8N.
3. THIS FIGURE IS PRODUCED AT A NOMINAL SCALE OF 1:15,000 FOR 11x17 (TABLOID) PAPER. ACTUAL SCALE MAY DIFFER ACCORDING TO CHANGES IN PRINTER SETTINGS OR PRINTED PAPER SIZE.
4. FREEGOLD ROAD UPGRADE ALIGNMENT BASED ON MAY 2013 FILE FROM ASSOCIATED ENGINEERING.

REV	DATE	DESCRIPTION	DESIGNED	DRAWN	CHK'D	APP'D
0	16DEC'13	ISSUED WITH REPORT	JEH	KK	JEH	KJB

CASINO MINING CORPORATION

CASINO PROJECT

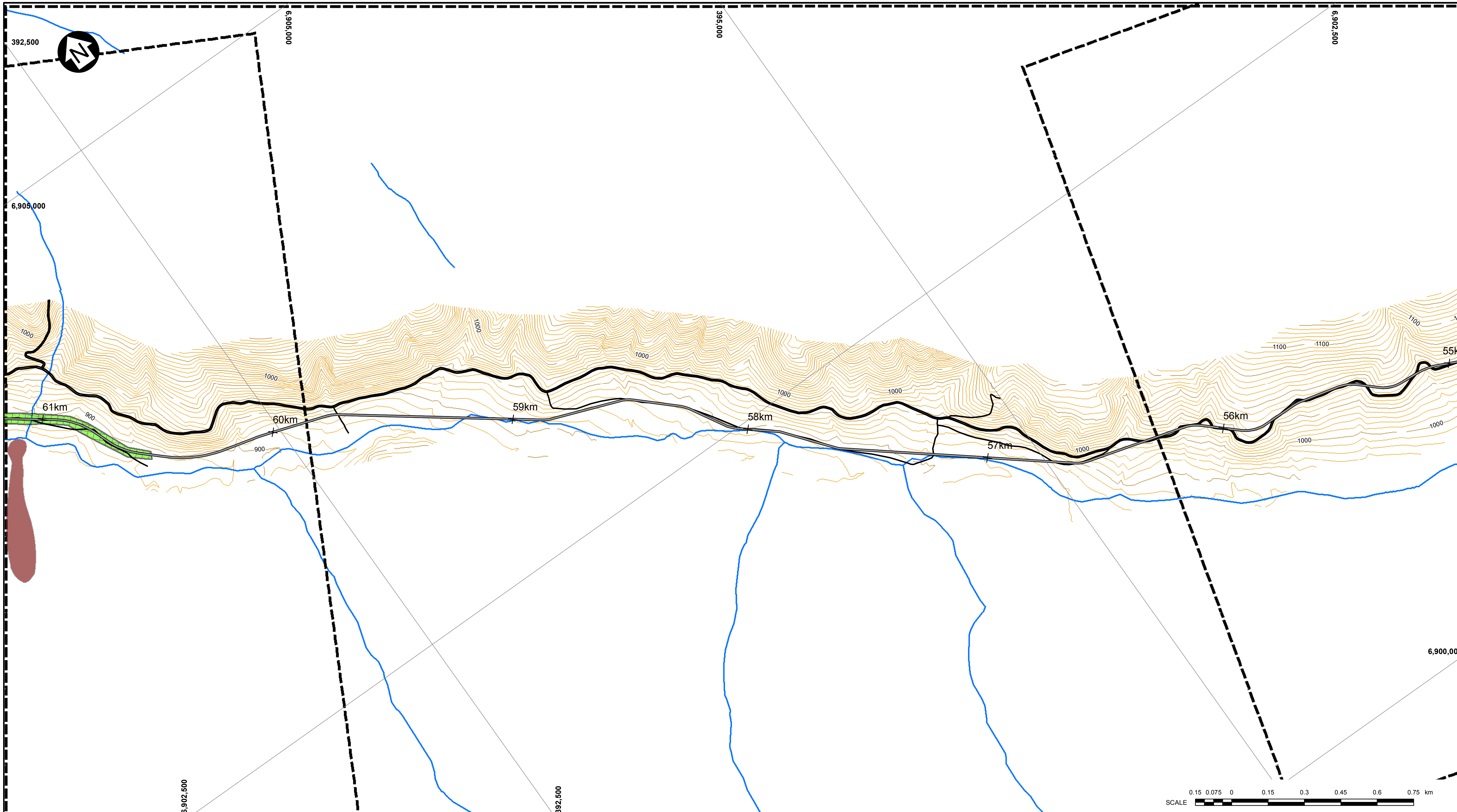
FINDINGS OF PRELIMINARY GEOTECHNICAL STUDY OF FREEGOLD ROAD UPGRADE
SHEET 2 OF 14

Knight Piésold CONSULTING

P/A NO. VA101-325/14 | REF NO. VA13-00470

FIGURE 6 REV 0

SAVED: M:\1\01\00325\14\A\GIS\Figs\VA13-470-Freegold Road Upgrade Preliminary Geotech Study\FreegoldRoadUpgradePreliminaryGeotechAssessment.mxd; Dec 17,2013 3:04 PM kkrauszova



LEGEND:

GENERAL
- CREEK/RIVER
- KLONDIKE HIGHWAY
- EXISTING FREEGOLD ROAD
- CONTOUR (5 m)
- CONTOUR (25 m)
- INDEX SHEET

PROPOSED FACILITIES
- FREEGOLD ROAD UPGRADE
- FREEGOLD ROAD EXTENSION

TERRAIN FEATURES/ HAZARDS
- RECENT SLIDE
- RECENT DEBRIS SLIDES & GULLY EROSION
- RELICT SLIDE
- RELICT SLUMP/FLOW
- ORGANIC SOIL
- POSSIBLE ORGANIC SOIL
- COLLUVIAL FAN
- FLUVIAL FAN
- FLUVIAL PLAIN
- ABANDONED CHANNEL
- PRESENT DAY WATERCOURSE

PERMAFROST RELATED FEATURES
- THAW LAKE
- THERMOKARST
- RECENT THAW SLUMP/FLOW
- RELICT THAW SLUP/FLOW
- SOLIFLUCTION LOBE
- SKIN FLOW

NOTES:

1. BASE MAP: 5m CONTOURS.
2. COORDINATE GRID IS IN METRES.
COORDINATE SYSTEM: NAD 1983 UTM ZONE 8N.
3. THIS FIGURE IS PRODUCED AT A NOMINAL SCALE OF 1:15,000 FOR 11x17 (TABLOID) PAPER. ACTUAL SCALE MAY DIFFER ACCORDING TO CHANGES IN PRINTER SETTINGS OR PRINTED PAPER SIZE.
4. FREEGOLD ROAD UPGRADE ALIGNMENT BASED ON MAY 2013 FILE FROM ASSOCIATED ENGINEERING.

REV	DATE	DESCRIPTION	DESIGNED	DRAWN	CHK'D	APP'D
0	16DEC'13	ISSUED WITH REPORT	JEH	KK	JEH	KJB

CASINO MINING CORPORATION

CASINO PROJECT

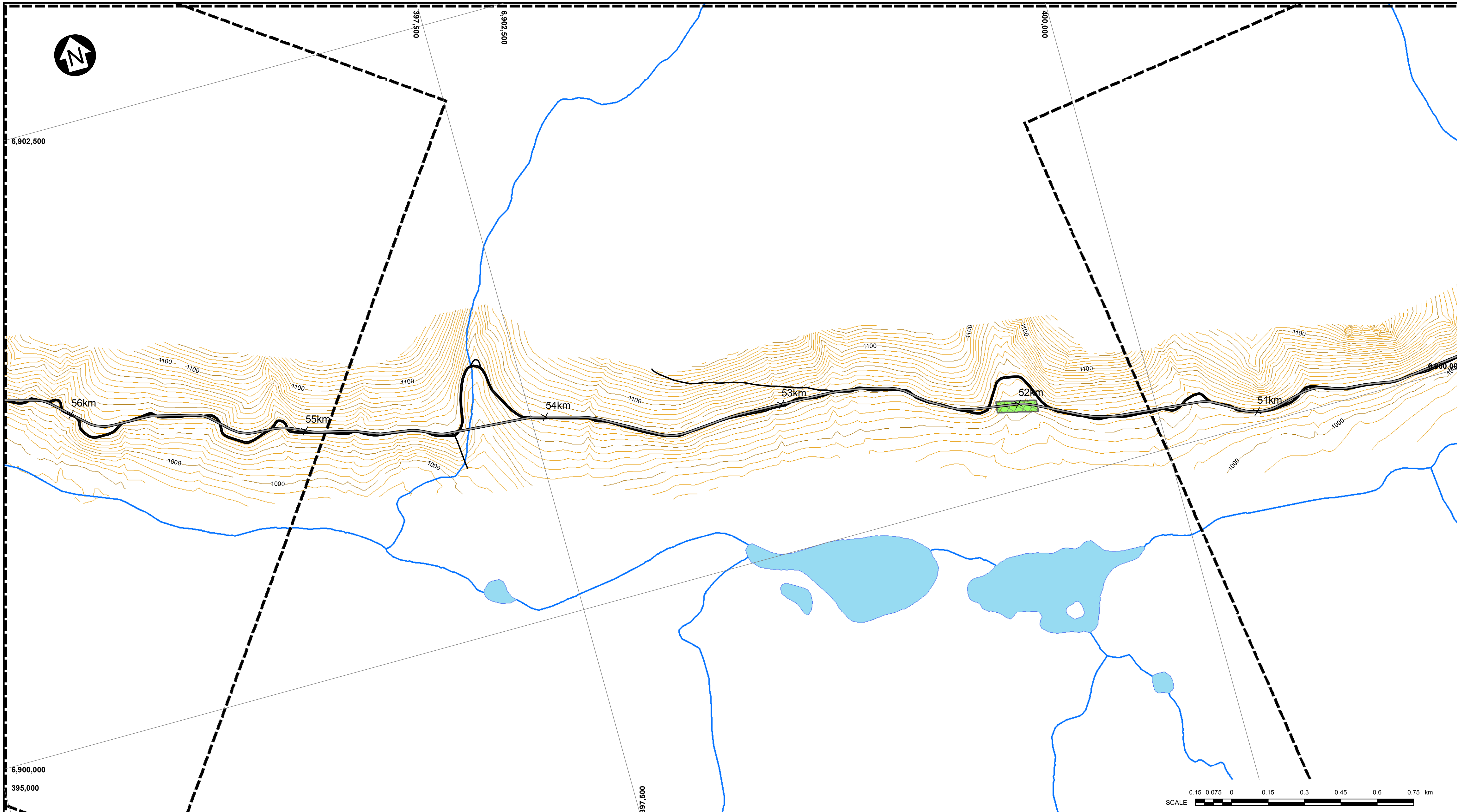
FINDINGS OF PRELIMINARY GEOTECHNICAL STUDY OF FREEGOLD ROAD UPGRADE
SHEET 3 OF 14

Knight Piésold CONSULTING

P/A NO.	REF NO.
VA101-325/14	VA13-00470

FIGURE 7 REV 0

SAVED: M:\1\01\00325\14\A\GIS\Figs\VA13-470-Freegold Road Upgrade Preliminary Geotech Study\FreegoldRoadUpgradePreliminaryGeotechAssessment.mxd; Dec 17,2013 3:04 PM kkrauszova



LEGEND:

GENERAL
- CREEK/RIVER
- KLONDIKE HIGHWAY
- EXISTING FREEGOLD ROAD
- CONTOUR (5 m)
- CONTOUR (25 m)
- INDEX SHEET

PROPOSED FACILITIES
- FREEGOLD ROAD UPGRADE
- FREEGOLD ROAD EXTENSION

TERRAIN FEATURES/ HAZARDS
- RECENT SLIDE
- RECENT DEBRIS SLIDES & GULLY EROSION
- RELICT SLIDE
- RELICT SLUMP/FLOW
- ORGANIC SOIL
- POSSIBLE ORGANIC SOIL
- COLLUVIAL FAN
- FLUVIAL FAN
- FLUVIAL PLAIN
- ABANDONED CHANNEL
- PRESENT DAY WATERCOURSE

PERMAFROST RELATED FEATURES
- THAW LAKE
- THERMOKARST
- RECENT THAW SLUMP/FLOW
- RELICT THAW SLUP/FLOW
- SOLIFLUCTION LOBE
- SKIN FLOW

NOTES:

1. BASE MAP: 5m CONTOURS.
2. COORDINATE GRID IS IN METRES.
COORDINATE SYSTEM: NAD 1983 UTM ZONE 8N.
3. THIS FIGURE IS PRODUCED AT A NOMINAL SCALE OF 1:15,000 FOR 11x17 (TABLOID) PAPER. ACTUAL SCALE MAY DIFFER ACCORDING TO CHANGES IN PRINTER SETTINGS OR PRINTED PAPER SIZE.
4. FREEGOLD ROAD UPGRADE ALIGNMENT BASED ON MAY 2013 FILE FROM ASSOCIATED ENGINEERING.

REV	DATE	DESCRIPTION	DESIGNED	DRAWN	CHK'D	APP'D
0	16DEC'13	ISSUED WITH REPORT	JEH	KK	JEH	KJB

CASINO MINING CORPORATION

CASINO PROJECT

FINDINGS OF PRELIMINARY GEOTECHNICAL STUDY OF FREEGOLD ROAD UPGRADE
SHEET 4 OF 14

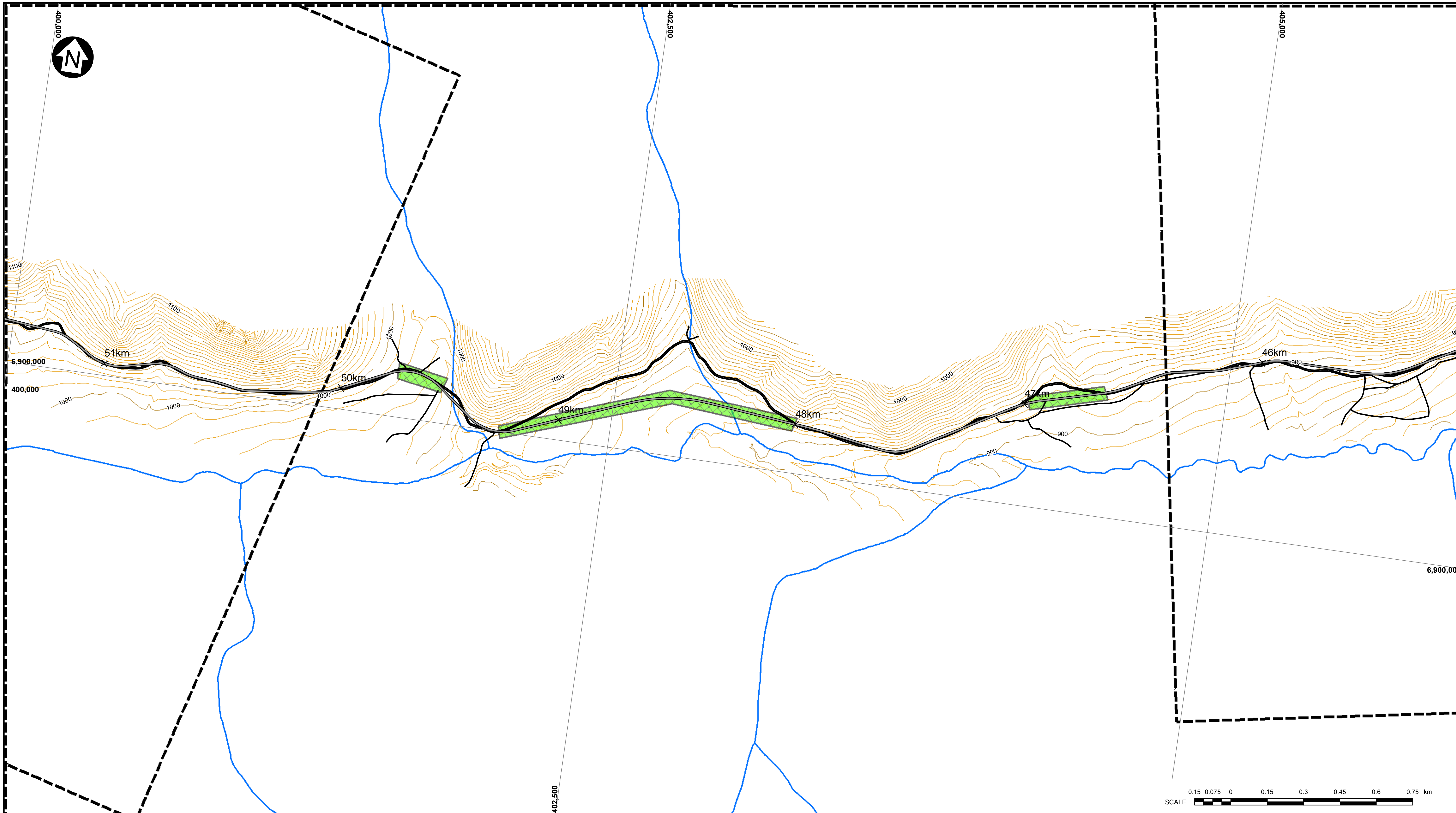
Knight Piésold CONSULTING

P/A NO. VA101-325/14

REF NO. VA13-00470

FIGURE 8

REV 0



LEGEND:

GENERAL
- CREEK/RIVER
- KLONDIKE HIGHWAY
- EXISTING FREEGOLD ROAD
- CONTOUR (5 m)
- CONTOUR (25 m)
- INDEX SHEET

PROPOSED FACILITIES
- FREEGOLD ROAD UPGRADE
- FREEGOLD ROAD EXTENSION

TERRAIN FEATURES/ HAZARDS
- RECENT SLIDE
- RECENT DEBRIS SLIDES & GULLY EROSION
- RELICT SLIDE
- RELICT SLUMP/FLOW
- ORGANIC SOIL
- POSSIBLE ORGANIC SOIL
- COLLUVIAL FAN
- FLUVIAL FAN
- FLUVIAL PLAIN
- ABANDONED CHANNEL
- PRESENT DAY WATERCOURSE

PERMAFROST RELATED FEATURES
- THAW LAKE
- THERMOKARST
- RECENT THAW SLUMP/FLOW
- RELICT THAW SLUP/FLOW
- SOLIFLUCTION LOBE
- SKIN FLOW

NOTES:

1. BASE MAP: 5m CONTOURS.
2. COORDINATE GRID IS IN METRES. COORDINATE SYSTEM: NAD 1983 UTM ZONE 8N.
3. THIS FIGURE IS PRODUCED AT A NOMINAL SCALE OF 1:15,000 FOR 11x17 (TABLOID) PAPER. ACTUAL SCALE MAY DIFFER ACCORDING TO CHANGES IN PRINTER SETTINGS OR PRINTED PAPER SIZE.
4. FREEGOLD ROAD UPGRADE ALIGNMENT BASED ON MAY 2013 FILE FROM ASSOCIATED ENGINEERING.

REV	DATE	DESCRIPTION	DESIGNED	DRAWN	CHK'D	APP'D
0	16DEC'13	ISSUED WITH REPORT	JEH	KK	JEH	KJB

CASINO MINING CORPORATION

CASINO PROJECT

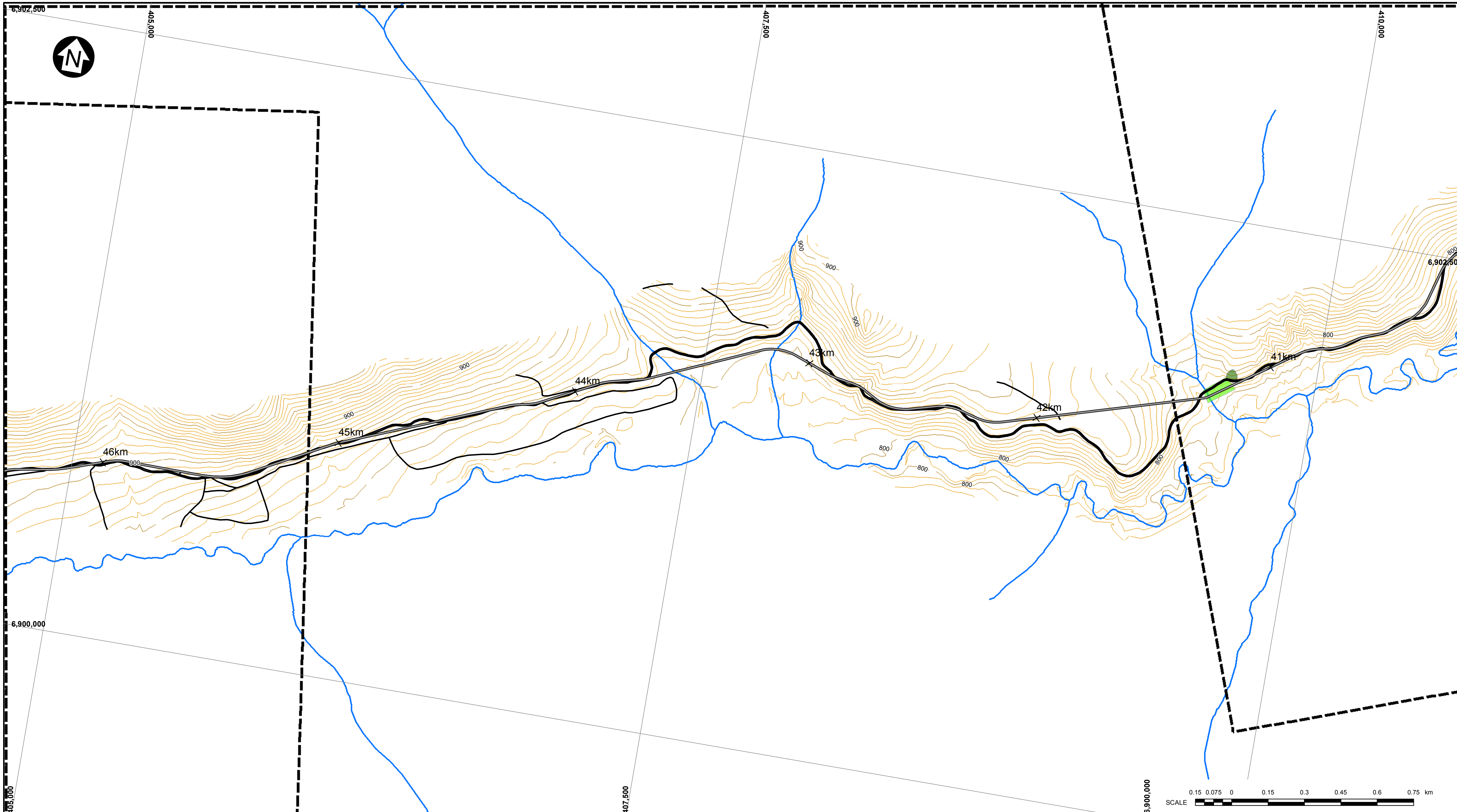
FINDINGS OF PRELIMINARY GEOTECHNICAL STUDY OF FREEGOLD ROAD UPGRADE
SHEET 5 OF 14

Knight Piésold CONSULTING

P/A NO. VA101-325/14 | REF NO. VA13-00470

FIGURE 9 | REV 0

SAVED: M:\1\01\00325\14\A\GIS\Figs\VA13-470-Freegold Road Upgrade Preliminary Geotech Study\FreegoldRoadUpgradePreliminaryGeotechAssessment.mxd; Dec 17,2013 3:05 PM kkrauszova



LEGEND:

GENERAL
- CREEK/RIVER
- KLONDIKE HIGHWAY
- EXISTING FREEGOLD ROAD
- CONTOUR (5 m)
- CONTOUR (25 m)
- INDEX SHEET

PROPOSED FACILITIES
- FREEGOLD ROAD UPGRADE
- FREEGOLD ROAD EXTENSION

TERRAIN FEATURES/ HAZARDS
- RECENT SLIDE
- RECENT DEBRIS SLIDES & GULLY EROSION
- RELICT SLIDE
- RELICT SLUMP/FLOW
- ORGANIC SOIL
- POSSIBLE ORGANIC SOIL
- COLLUVIAL FAN
- FLUVIAL FAN
- FLUVIAL PLAIN
- ABANDONED CHANNEL
- PRESENT DAY WATERCOURSE

PERMAFROST RELATED FEATURES
- THAW LAKE
- THERMOKARST
- RECENT THAW SLUMP/FLOW
- RELICT THAW SLUP/FLOW
- SOLIFLUCTION LOBE
- SKIN FLOW

NOTES:

1. BASE MAP: 5m CONTOURS.
2. COORDINATE GRID IS IN METRES. COORDINATE SYSTEM: NAD 1983 UTM ZONE 8N.
3. THIS FIGURE IS PRODUCED AT A NOMINAL SCALE OF 1:15,000 FOR 11x17 (TABLOID) PAPER. ACTUAL SCALE MAY DIFFER ACCORDING TO CHANGES IN PRINTER SETTINGS OR PRINTED PAPER SIZE.
4. FREEGOLD ROAD UPGRADE ALIGNMENT BASED ON MAY 2013 FILE FROM ASSOCIATED ENGINEERING.

REV	DATE	DESCRIPTION	DESIGNED	DRAWN	CHK'D	APP'D
0	16DEC'13	ISSUED WITH REPORT	JEH	KK	JEH	KJB

CASINO MINING CORPORATION

CASINO PROJECT

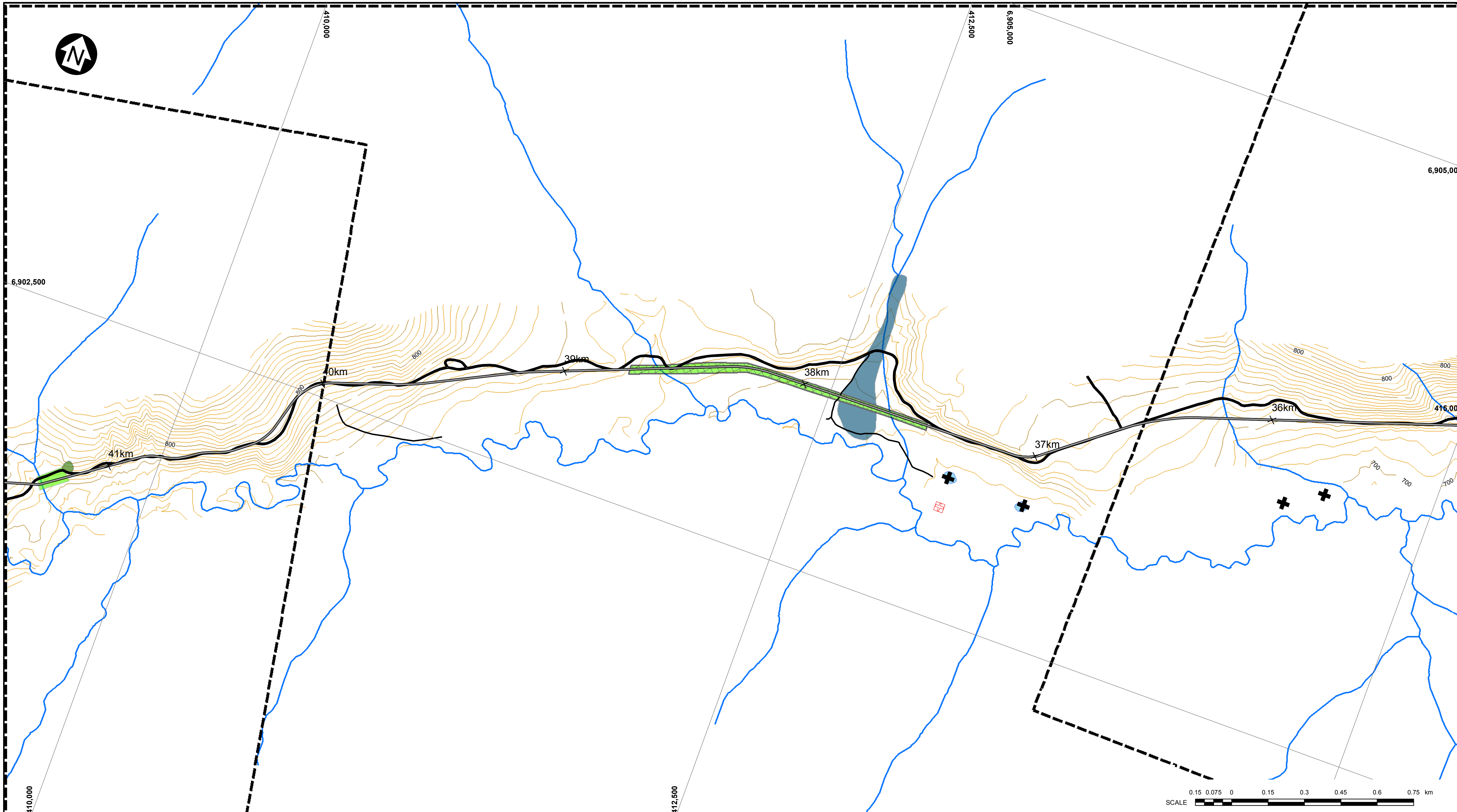
FINDINGS OF PRELIMINARY GEOTECHNICAL STUDY OF FREEGOLD ROAD UPGRADE
SHEET 6 OF 14

Knight Piésold CONSULTING

P/A NO.	REF NO.
VA101-325/14	VA13-00470

FIGURE 10 REV 0

SAVED: M:\1\01\00325\14\A\GIS\Figs\VA13-470-Freegold Road Upgrade Preliminary Geotech Study\FreegoldRoadUpgradePreliminaryGeotechAssessment.mxd; Dec 17,2013 3:05 PM kkrauszova



LEGEND:

GENERAL
- CREEK/RIVER
- KLONDIKE HIGHWAY
- EXISTING FREEGOLD ROAD
- CONTOUR (5 m)
- CONTOUR (25 m)
- INDEX SHEET

PROPOSED FACILITIES
- FREEGOLD ROAD UPGRADE
- FREEGOLD ROAD EXTENSION

TERRAIN FEATURES/ HAZARDS
- RECENT SLIDE
- RECENT DEBRIS SLIDES & GULLY EROSION
- RELICT SLIDE
- RELICT SLUMP/FLOW
- ORGANIC SOIL
- POSSIBLE ORGANIC SOIL
- COLLUVIAL FAN
- FLUVIAL FAN
- FLUVIAL PLAIN
- ABANDONED CHANNEL
- PRESENT DAY WATERCOURSE

PERMAFROST RELATED FEATURES
- THAW LAKE
- THERMOKARST
- RECENT THAW SLUMP/FLOW
- RELICT THAW SLUP/FLOW
- SOLIFLUCTION LOBE
- SKIN FLOW

NOTES:

1. BASE MAP: 5m CONTOURS.
2. COORDINATE GRID IS IN METRES.
COORDINATE SYSTEM: NAD 1983 UTM ZONE 8N.
3. THIS FIGURE IS PRODUCED AT A NOMINAL SCALE OF 1:15,000 FOR 11x17 (TABLOID) PAPER. ACTUAL SCALE MAY DIFFER ACCORDING TO CHANGES IN PRINTER SETTINGS OR PRINTED PAPER SIZE.
4. FREEGOLD ROAD UPGRADE ALIGNMENT BASED ON MAY 2013 FILE FROM ASSOCIATED ENGINEERING.

0	16DEC'13	ISSUED WITH REPORT	JEH	KK	JEH	KJB
REV	DATE	DESCRIPTION	DESIGNED	DRAWN	CHK'D	APP'D

CASINO MINING CORPORATION

CASINO PROJECT

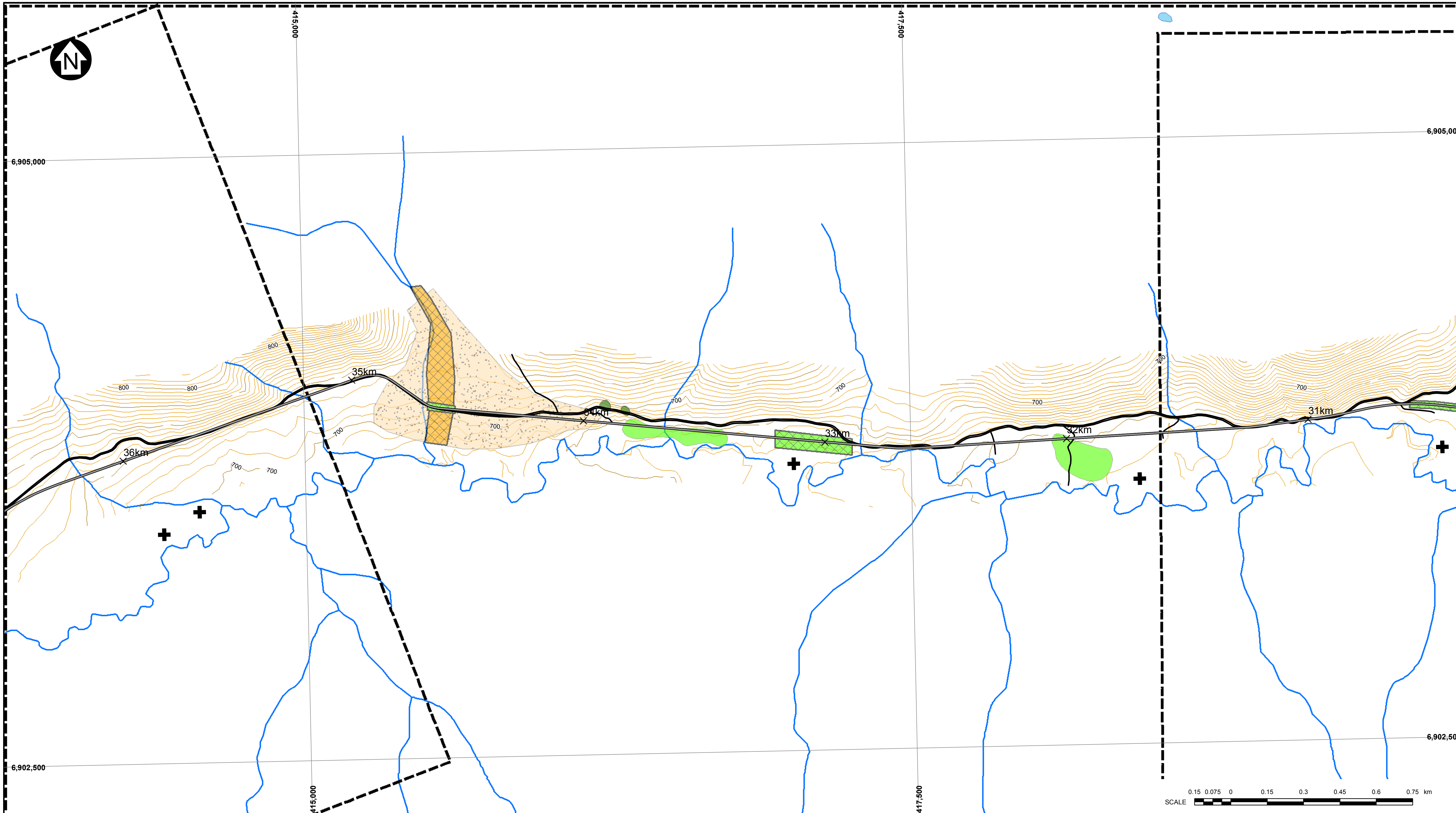
FINDINGS OF PRELIMINARY GEOTECHNICAL STUDY OF FREEGOLD ROAD UPGRADE
SHEET 7 OF 14

Knight Piésold CONSULTING

P/A NO. VA101-325/14 | REF NO. VA13-00470

FIGURE 11 REV 0

SAVED: M:\1\01\00325\14\A\GIS\Figs\VA13-470-Freegold Road Upgrade Preliminary Geotech Study\FreegoldRoadUpgradePreliminaryGeotechAssessment.mxd; Dec 17,2013 3:05 PM kkrauszova



LEGEND:

GENERAL
- CREEK/RIVER
- KLONDIKE HIGHWAY
- EXISTING FREEGOLD ROAD
- CONTOUR (5 m)
- CONTOUR (25 m)
- INDEX SHEET

PROPOSED FACILITIES
- FREEGOLD ROAD UPGRADE
- FREEGOLD ROAD EXTENSION

TERRAIN FEATURES/ HAZARDS
- RECENT SLIDE
- RECENT DEBRIS SLIDES & GULLY EROSION
- RELICT SLIDE
- RELICT SLUMP/FLOW
- ORGANIC SOIL
- POSSIBLE ORGANIC SOIL
- COLLUVIAL FAN
- FLUVIAL FAN
- FLUVIAL PLAIN
- ABANDONED CHANNEL
- PRESENT DAY WATERCOURSE

PERMAFROST RELATED FEATURES
- THAW LAKE
- THERMOKARST
- RECENT THAW SLUMP/FLOW
- RELICT THAW SLUP/FLOW
- SOLIFLUCTION LOBE
- SKIN FLOW

NOTES:

1. BASE MAP: 5m CONTOURS.
2. COORDINATE GRID IS IN METRES.
COORDINATE SYSTEM: NAD 1983 UTM ZONE 8N.
3. THIS FIGURE IS PRODUCED AT A NOMINAL SCALE OF 1:15,000 FOR 11x17 (TABLOID) PAPER. ACTUAL SCALE MAY DIFFER ACCORDING TO CHANGES IN PRINTER SETTINGS OR PRINTED PAPER SIZE.
4. FREEGOLD ROAD UPGRADE ALIGNMENT
BASED ON MAY 2013 FILE FROM ASSOCIATED ENGINEERING.

REV	DATE	DESCRIPTION	DESIGNED	DRAWN	CHK'D	APP'D
0	16DEC'13	ISSUED WITH REPORT	JEH	KK	JEH	KJB

CASINO MINING CORPORATION

CASINO PROJECT

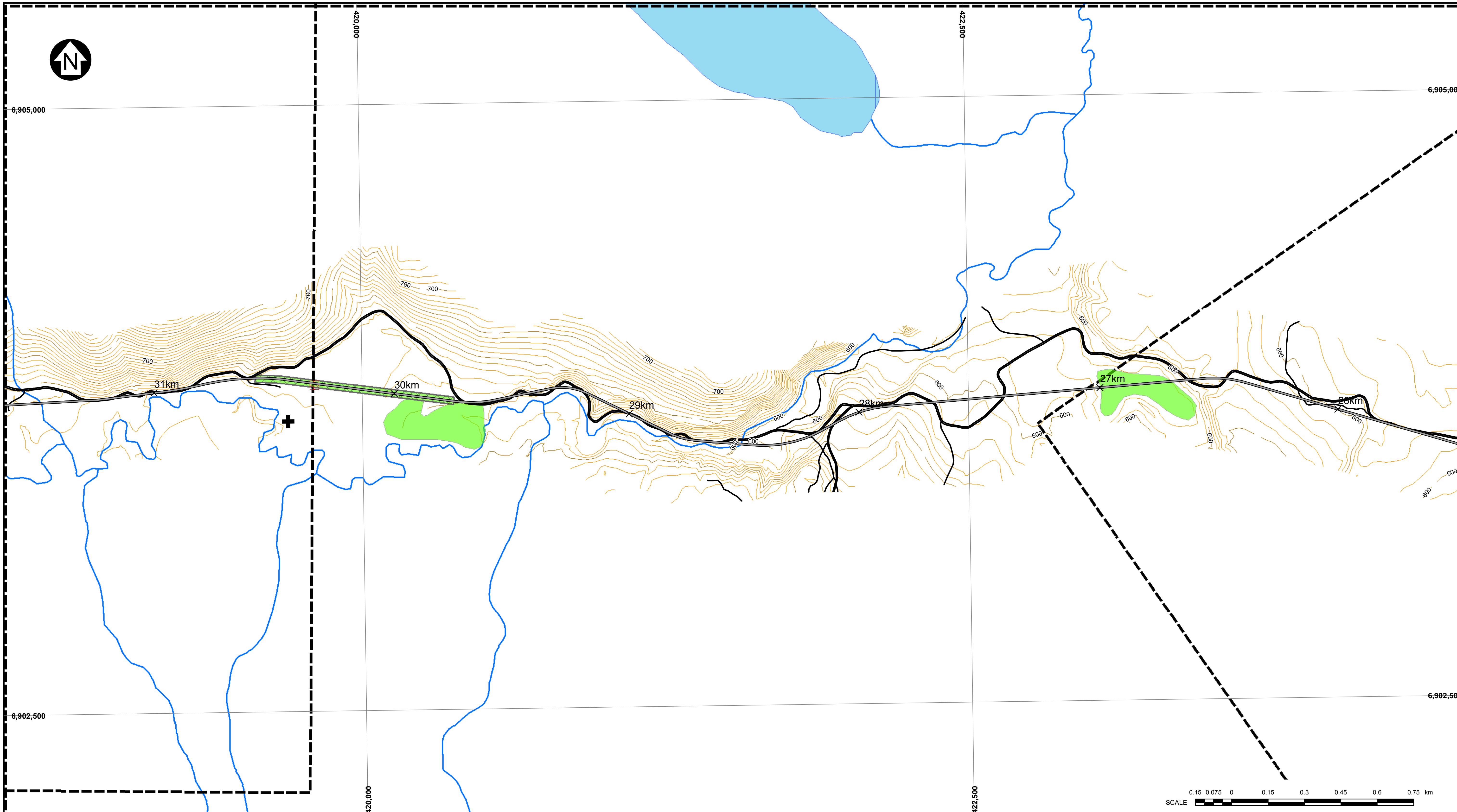
FINDINGS OF PRELIMINARY GEOTECHNICAL STUDY OF FREEGOLD ROAD UPGRADE
SHEET 8 OF 14

Knight Piésold CONSULTING

P/A NO.	REF NO.
VA101-325/14	VA13-00470

FIGURE 12 REV 0

SAVED: M:\1\01\00325\14\AGIS\Figs\VA13-470-Freegold Road Upgrade Preliminary Geotech Study\FreegoldRoadUpgradePreliminaryGeotechAssessment.mxd; Dec 17,2013 3:05 PM kkrauszova



SAVED: M:\1\01\00325\14\A\GIS\Figs\VA13-470-Freegold Road Upgrade Preliminary Geotech Study\FreegoldRoadUpgradePreliminaryGeotechAssessment.mxd; Dec 17,2013 3:06 PM kkrauszova

LEGEND:

GENERAL
- CREEK/RIVER
- KLONDIKE HIGHWAY
- EXISTING FREEGOLD ROAD
- CONTOUR (5 m)
- CONTOUR (25 m)
- INDEX SHEET

PROPOSED FACILITIES
- FREEGOLD ROAD UPGRADE
- FREEGOLD ROAD EXTENSION

TERRAIN FEATURES/ HAZARDS
- RECENT SLIDE
- RECENT DEBRIS SLIDES & GULLY EROSION
- RELICT SLIDE
- RELICT SLUMP/FLOW
- ORGANIC SOIL
- POSSIBLE ORGANIC SOIL
- COLLUVIAL FAN
- FLUVIAL FAN
- FLUVIAL PLAIN
- ABANDONED CHANNEL
- PRESENT DAY WATERCOURSE

PERMAFROST RELATED FEATURES
- THAW LAKE
- THERMOKARST
- RECENT THAW SLUMP/FLOW
- RELICT THAW SLUP/FLOW
- SOLIFLUCTION LOBE
- SKIN FLOW

REV	DATE	DESCRIPTION	DESIGNED	DRAWN	CHK'D	APP'D
0	16DEC'13	ISSUED WITH REPORT	JEH	KK	JEH	KJB

NOTES:

1. BASE MAP: 5m CONTOURS.
2. COORDINATE GRID IS IN METRES.
COORDINATE SYSTEM: NAD 1983 UTM ZONE 8N.
3. THIS FIGURE IS PRODUCED AT A NOMINAL SCALE OF 1:15,000 FOR 11x17 (TABLOID) PAPER. ACTUAL SCALE MAY DIFFER ACCORDING TO CHANGES IN PRINTER SETTINGS OR PRINTED PAPER SIZE.
4. FREEGOLD ROAD UPGRADE ALIGNMENT BASED ON MAY 2013 FILE FROM ASSOCIATED ENGINEERING.

CASINO MINING CORPORATION

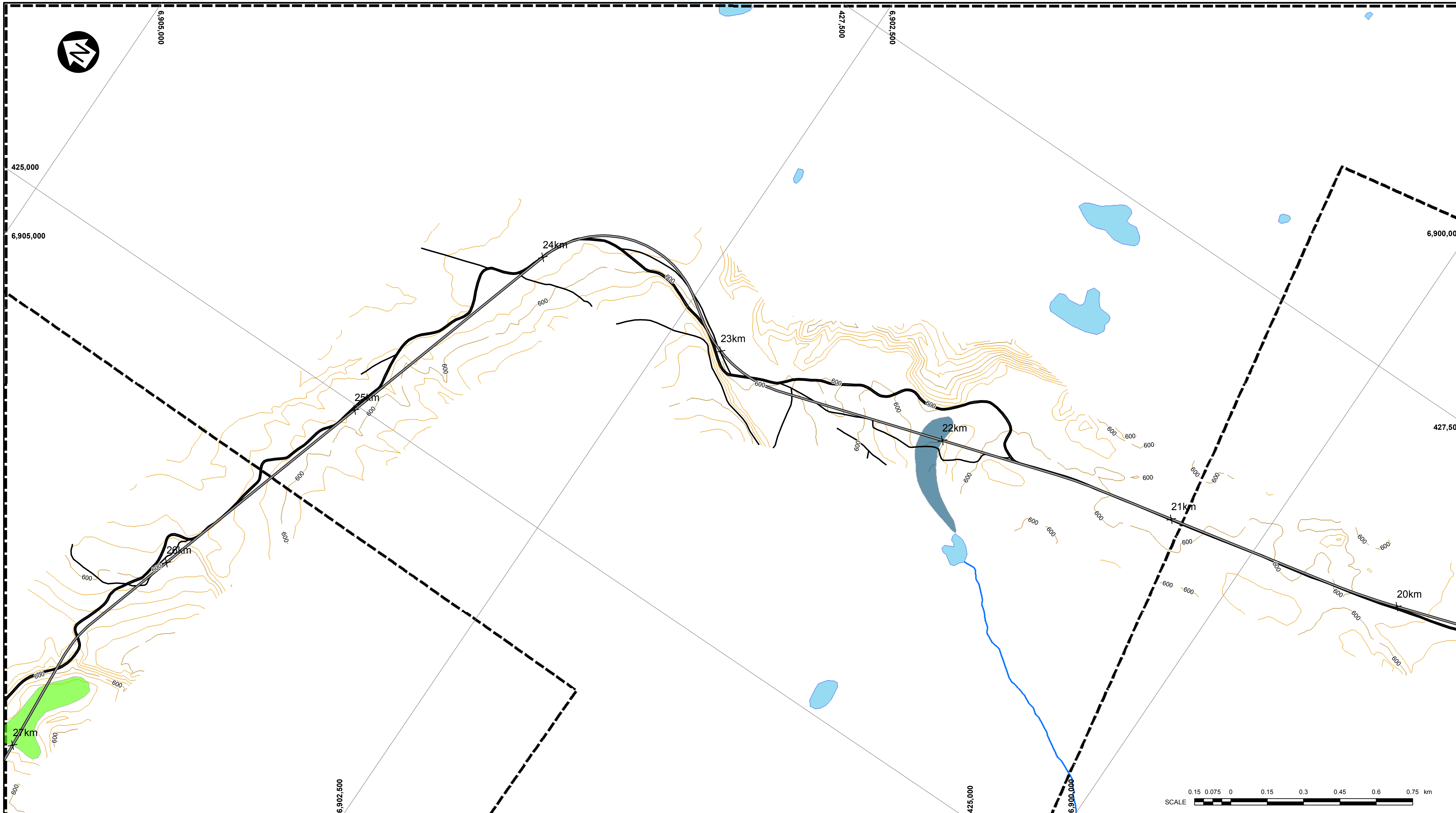
CASINO PROJECT

FINDINGS OF PRELIMINARY GEOTECHNICAL STUDY OF FREEGOLD ROAD UPGRADE SHEET 9 OF 14

Knight Piésold CONSULTING

P/A NO.	REF NO.
VA101-325/14	VA13-00470

FIGURE 13 REV 0



LEGEND:

GENERAL
- CREEK/RIVER
- KLONDIKE HIGHWAY
- EXISTING FREEGOLD ROAD
- CONTOUR (5 m)
- CONTOUR (25 m)
- INDEX SHEET

PROPOSED FACILITIES
- FREEGOLD ROAD UPGRADE
- FREEGOLD ROAD EXTENSION

TERRAIN FEATURES/ HAZARDS
- RECENT SLIDE
- RECENT DEBRIS SLIDES & GULLY EROSION
- RELICT SLIDE
- RELICT SLUMP/FLOW
- ORGANIC SOIL
- POSSIBLE ORGANIC SOIL
- COLLUVIAL FAN
- FLUVIAL FAN
- FLUVIAL PLAIN
- ABANDONED CHANNEL
- PRESENT DAY WATERCOURSE

PERMAFROST RELATED FEATURES
- THAW LAKE
- THERMOKARST
- RECENT THAW SLUMP/FLOW
- RELICT THAW SLUP/FLOW
- SOLIFLUCTION LOBE
- SKIN FLOW

REV	DATE	DESCRIPTION	DESIGNED	DRAWN	CHK'D	APP'D
0	16DEC'13	ISSUED WITH REPORT	JEH	KK	JEH	KJB

NOTES:

1. BASE MAP: 5m CONTOURS.
2. COORDINATE GRID IS IN METRES.
COORDINATE SYSTEM: NAD 1983 UTM ZONE 8N.
3. THIS FIGURE IS PRODUCED AT A NOMINAL SCALE OF 1:15,000 FOR 11x17 (TABLOID) PAPER. ACTUAL SCALE MAY DIFFER ACCORDING TO CHANGES IN PRINTER SETTINGS OR PRINTED PAPER SIZE.
4. FREEGOLD ROAD UPGRADE ALIGNMENT BASED ON MAY 2013 FILE FROM ASSOCIATED ENGINEERING.

CASINO MINING CORPORATION

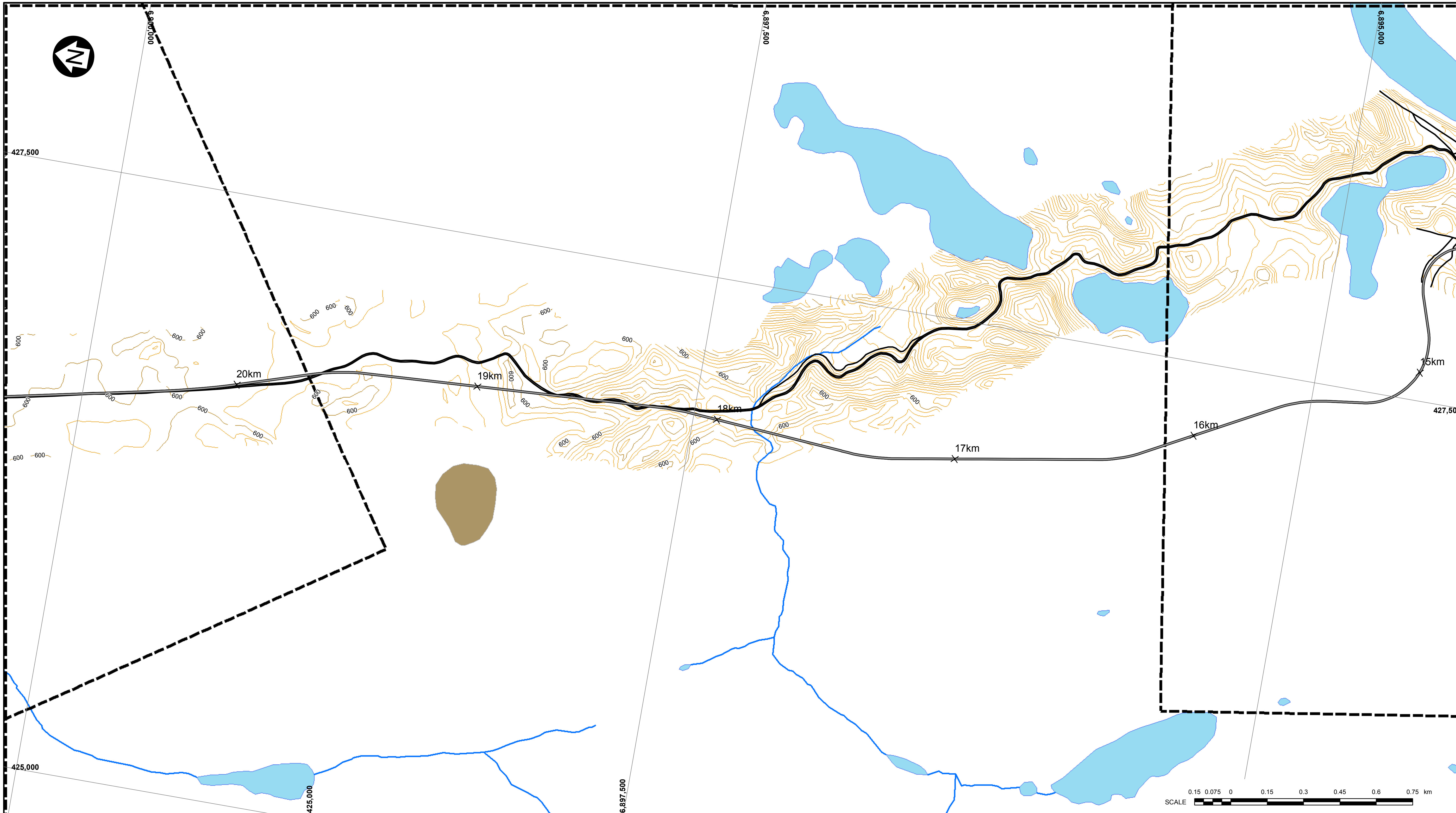
CASINO PROJECT

FINDINGS OF PRELIMINARY GEOTECHNICAL STUDY OF FREEGOLD ROAD UPGRADE
SHEET 10 OF 14

Knight Piésold CONSULTING

P/A NO.	REF NO.
VA101-325/14	VA13-00470

FIGURE 14 REV 0



LEGEND:

GENERAL
- CREEK/RIVER
- KLONDIKE HIGHWAY
- EXISTING FREEGOLD ROAD
- CONTOUR (5 m)
- CONTOUR (25 m)
- INDEX SHEET

PROPOSED FACILITIES
- FREEGOLD ROAD UPGRADE
- FREEGOLD ROAD EXTENSION

TERRAIN FEATURES/ HAZARDS
- RECENT SLIDE
- RECENT DEBRIS SLIDES & GULLY EROSION
- RELICT SLIDE
- RELICT SLUMP/FLOW
- ORGANIC SOIL
- POSSIBLE ORGANIC SOIL
- COLLUVIAL FAN
- FLUVIAL FAN
- FLUVIAL PLAIN
- ABANDONED CHANNEL
- PRESENT DAY WATERCOURSE

PERMAFROST RELATED FEATURES
- THAW LAKE
- THERMOKARST
- RECENT THAW SLUMP/FLOW
- RELICT THAW SLUP/FLOW
- SOLIFLUCTION LOBE
- SKIN FLOW

REV	DATE	DESCRIPTION	DESIGNED	DRAWN	CHK'D	APP'D
0	16DEC'13	ISSUED WITH REPORT	JEH	KK	JEH	KJB

NOTES:

1. BASE MAP: 5m CONTOURS.
2. COORDINATE GRID IS IN METRES.
COORDINATE SYSTEM: NAD 1983 UTM ZONE 8N.
3. THIS FIGURE IS PRODUCED AT A NOMINAL SCALE OF 1:15,000 FOR 11x17 (TABLOID) PAPER. ACTUAL SCALE MAY DIFFER ACCORDING TO CHANGES IN PRINTER SETTINGS OR PRINTED PAPER SIZE.
4. FREEGOLD ROAD UPGRADE ALIGNMENT BASED ON MAY 2013 FILE FROM ASSOCIATED ENGINEERING.

CASINO MINING CORPORATION

CASINO PROJECT

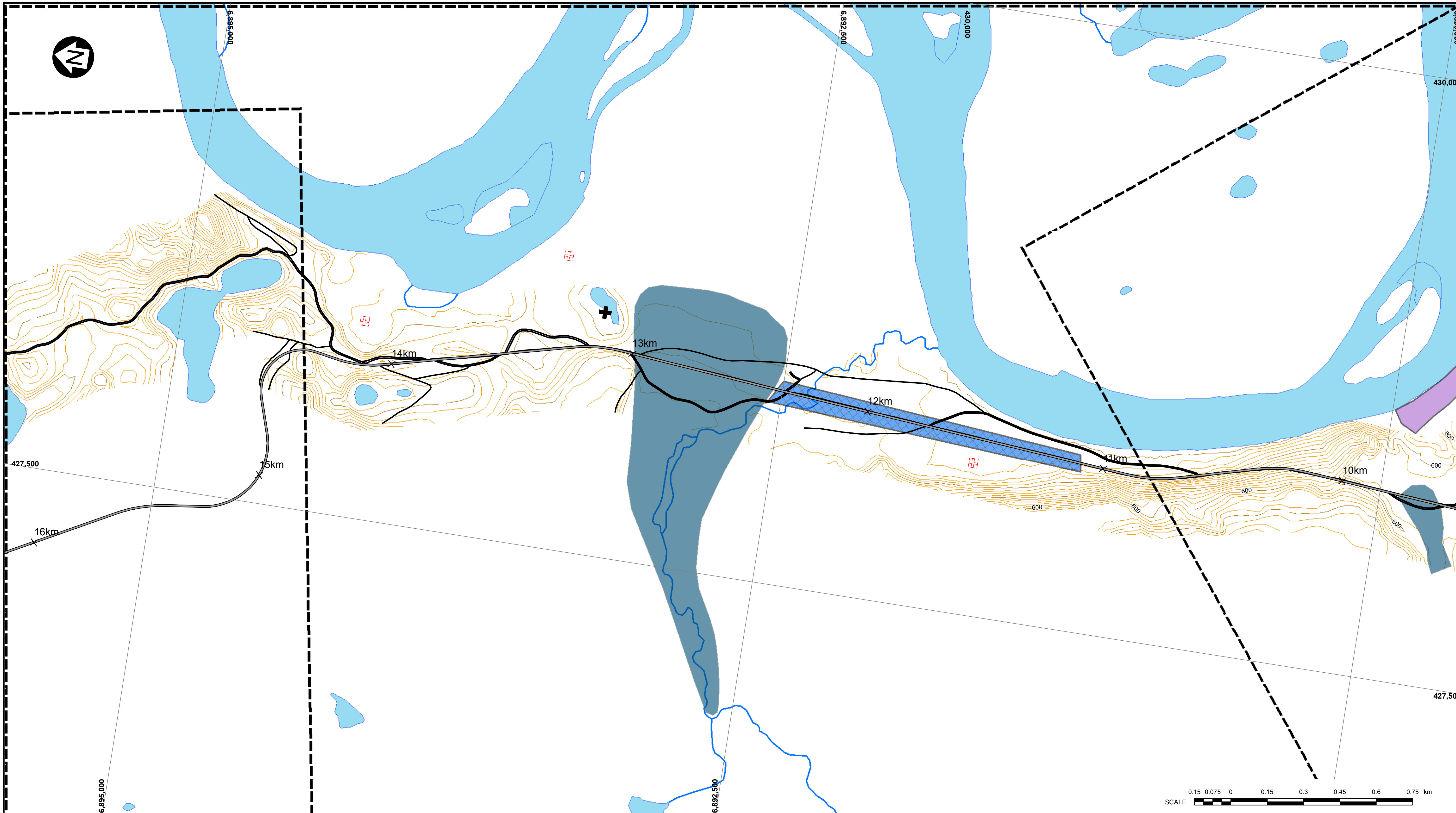
FINDINGS OF PRELIMINARY GEOTECHNICAL STUDY OF FREEGOLD ROAD UPGRADE
SHEET 11 OF 14

Knight Piésold CONSULTING

P/A NO.	REF NO.
VA101-325/14	VA13-00470

FIGURE 15 REV 0

SAVED: M:\1\01\00325\14\A\GIS\Figs\VA13-470-Freegold Road Upgrade Preliminary Geotech Study\FreegoldRoadUpgradePreliminaryGeotechAssessment.mxd; Dec 17,2013 3:06 PM kkrauszova



LEGEND:

GENERAL

- CREEK/RIVER
- KLONDIKE HIGHWAY
- EXISTING FREEGOLD ROAD
- CONTOUR (5 m)
- CONTOUR (25 m)
- INDEX SHEET

PROPOSED FACILITIES

- FREEGOLD ROAD UPGRADE
- FREEGOLD ROAD EXTENSION

TERRAIN FEATURES/ HAZARDS

- RECENT SLIDE
- RECENT DEBRIS SLIDES & GULLY EROSION
- RELICT SLIDE
- RELICT SLUMP/FLOW
- ORGANIC SOIL
- POSSIBLE ORGANIC SOIL
- COLLUVIAL FAN
- FLUVIAL FAN
- FLUVIAL PLAIN
- ABANDONED CHANNEL
- PRESENT DAY WATERCOURSE

PERMAFROST RELATED FEATURES

- THAW LAKE
- THERMOKARST
- RECENT THAW SLUMP/FLOW
- RELICT THAW SLUP/FLOW
- SOLIFLUCTION LOBE
- SKIN FLOW

NOTES:

1. BASE MAP: 5m CONTOURS.
2. COORDINATE GRID IS IN METRES.
COORDINATE SYSTEM: NAD 1983 UTM ZONE 8N.
3. THIS FIGURE IS PRODUCED AT A NOMINAL SCALE OF 1:15,000 FOR 11x17 (TABLOID) PAPER. ACTUAL SCALE MAY DIFFER ACCORDING TO CHANGES IN PRINTER SETTINGS OR PRINTED PAPER SIZE.
4. FREEGOLD ROAD UPGRADE ALIGNMENT BASED ON MAY 2013 FILE FROM ASSOCIATED ENGINEERING.

REV	DATE	DESCRIPTION	DESIGNED	DRAWN	CHK'D	APP'D
0	16DEC'13	ISSUED WITH REPORT	JEH	KK	JEH	KJB

CASINO MINING CORPORATION

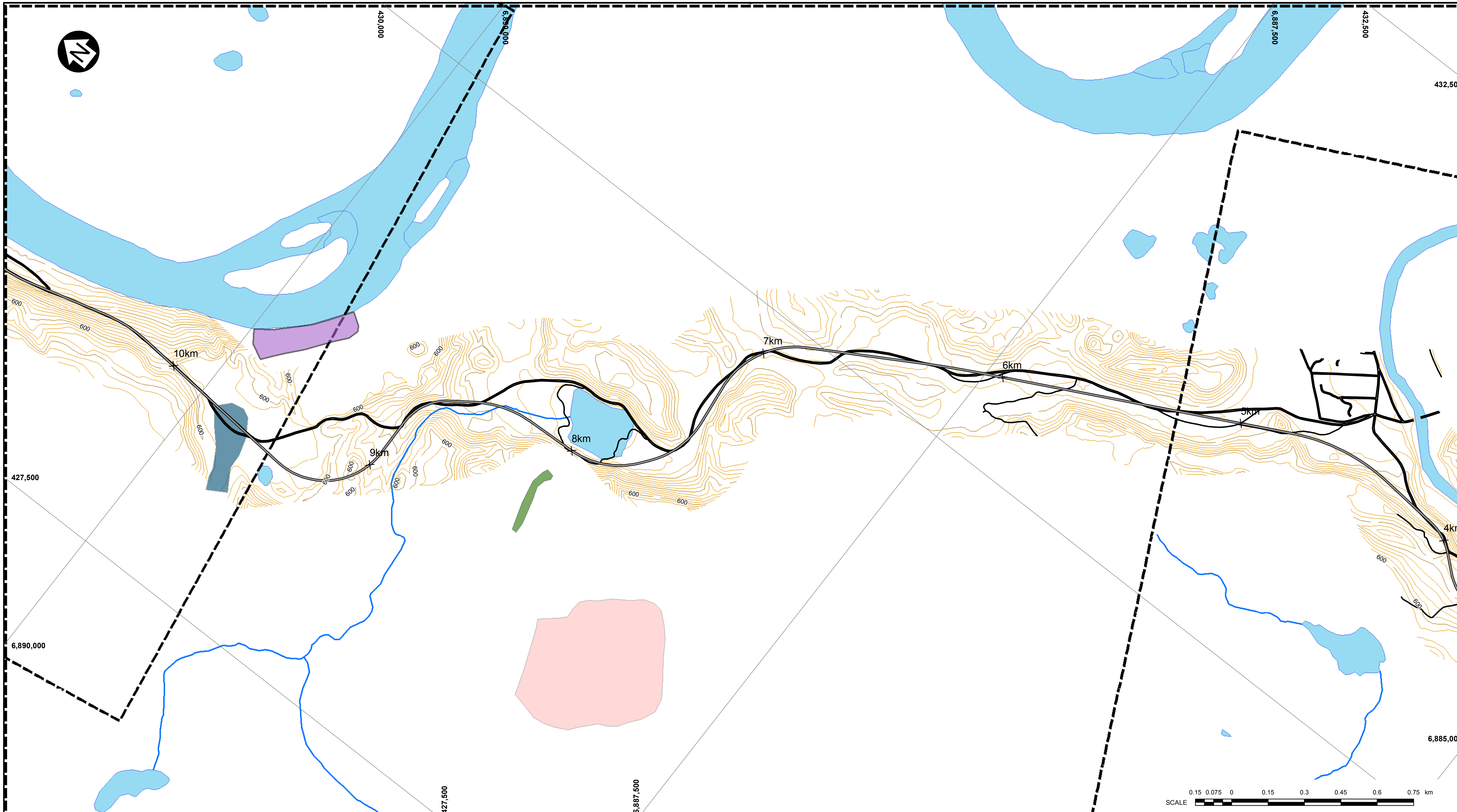
CASINO PROJECT

FINDINGS OF PRELIMINARY GEOTECHNICAL STUDY OF FREEGOLD ROAD UPGRADE
SHEET 12 OF 14

Knight Piésold CONSULTING

P/A NO.	REF NO.
VA101-325/14	VA13-00470

FIGURE 16 REV 0



LEGEND:

GENERAL
- CREEK/RIVER
- KLONDIKE HIGHWAY
- EXISTING FREEGOLD ROAD
- CONTOUR (5 m)
- CONTOUR (25 m)
- INDEX SHEET

PROPOSED FACILITIES
- FREEGOLD ROAD UPGRADE
- FREEGOLD ROAD EXTENSION

TERRAIN FEATURES/ HAZARDS
- RECENT SLIDE
- RECENT DEBRIS SLIDES & GULLY EROSION
- RELICT SLIDE
- RELICT SLUMP/FLOW
- ORGANIC SOIL
- POSSIBLE ORGANIC SOIL
- COLLUVIAL FAN
- FLUVIAL FAN
- FLUVIAL PLAIN
- ABANDONED CHANNEL
- PRESENT DAY WATERCOURSE

PERMAFROST RELATED FEATURES
- THAW LAKE
- THERMOKARST
- RECENT THAW SLUMP/FLOW
- RELICT THAW SLUP/FLOW
- SOLIFLUCTION LOBE
- SKIN FLOW

NOTES:

1. BASE MAP: 5m CONTOURS.
2. COORDINATE GRID IS IN METRES.
COORDINATE SYSTEM: NAD 1983 UTM ZONE 8N.
3. THIS FIGURE IS PRODUCED AT A NOMINAL SCALE OF 1:15,000 FOR 11x17 (TABLOID) PAPER. ACTUAL SCALE MAY DIFFER ACCORDING TO CHANGES IN PRINTER SETTINGS OR PRINTED PAPER SIZE.
4. FREEGOLD ROAD UPGRADE ALIGNMENT BASED ON MAY 2013 FILE FROM ASSOCIATED ENGINEERING.

REV	DATE	DESCRIPTION	DESIGNED	DRAWN	CHK'D	APP'D
0	16DEC'13	ISSUED WITH REPORT	JEH	KK	JEH	KJB

CASINO MINING CORPORATION

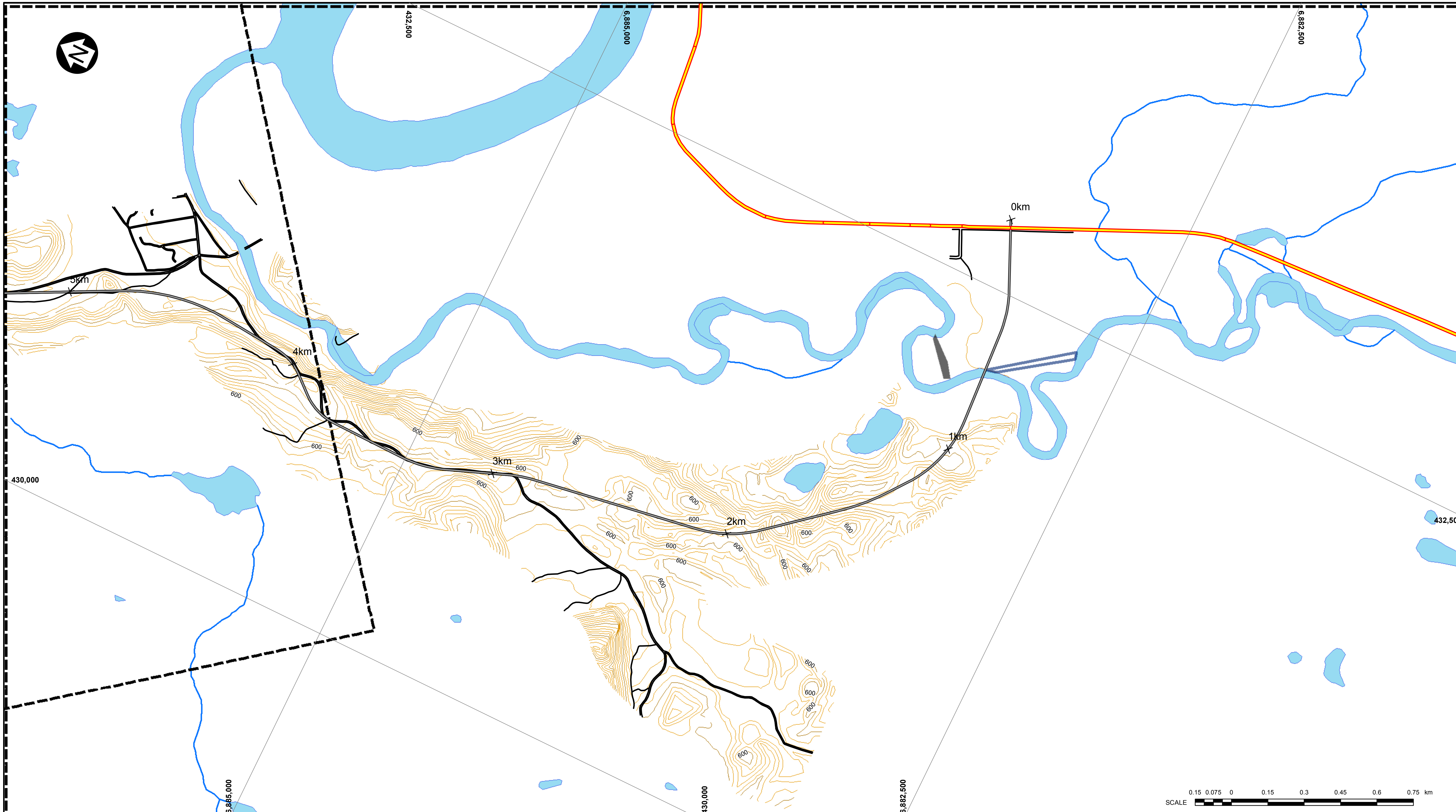
CASINO PROJECT

FINDINGS OF PRELIMINARY GEOTECHNICAL STUDY OF FREEGOLD ROAD UPGRADE SHEET 13 OF 14

Knight Piésold CONSULTING

P/A NO. VA101-325/14 | REF NO. VA13-00470

FIGURE 17 REV 0



LEGEND:

GENERAL
- CREEK/RIVER
- KLONDIKE HIGHWAY
- EXISTING FREEGOLD ROAD
- CONTOUR (5 m)
- CONTOUR (25 m)
- INDEX SHEET

PROPOSED FACILITIES
- FREEGOLD ROAD UPGRADE
- FREEGOLD ROAD EXTENSION

TERRAIN FEATURES/ HAZARDS
- RECENT SLIDE
- RECENT DEBRIS SLIDES & GULLY EROSION
- RELICT SLIDE
- RELICT SLUMP/FLOW
- ORGANIC SOIL
- POSSIBLE ORGANIC SOIL
- COLLUVIAL FAN
- FLUVIAL FAN
- FLUVIAL PLAIN
- ABANDONED CHANNEL
- PRESENT DAY WATERCOURSE

PERMAFROST RELATED FEATURES
- THAW LAKE
- THERMOKARST
- RECENT THAW SLUMP/FLOW
- RELICT THAW SLUP/FLOW
- SOLIFLUCTION LOBE
- SKIN FLOW

NOTES:

1. BASE MAP: 5m CONTOURS.
2. COORDINATE GRID IS IN METRES. COORDINATE SYSTEM: NAD 1983 UTM ZONE 8N.
3. THIS FIGURE IS PRODUCED AT A NOMINAL SCALE OF 1:15,000 FOR 11x17 (TABLOID) PAPER. ACTUAL SCALE MAY DIFFER ACCORDING TO CHANGES IN PRINTER SETTINGS OR PRINTED PAPER SIZE.
4. FREEGOLD ROAD UPGRADE ALIGNMENT BASED ON MAY 2013 FILE FROM ASSOCIATED ENGINEERING.

REV	DATE	DESCRIPTION	DESIGNED	DRAWN	CHK'D	APP'D
0	16DEC'13	ISSUED WITH REPORT	JEH	KK	JEH	KJB

CASINO MINING CORPORATION

CASINO PROJECT

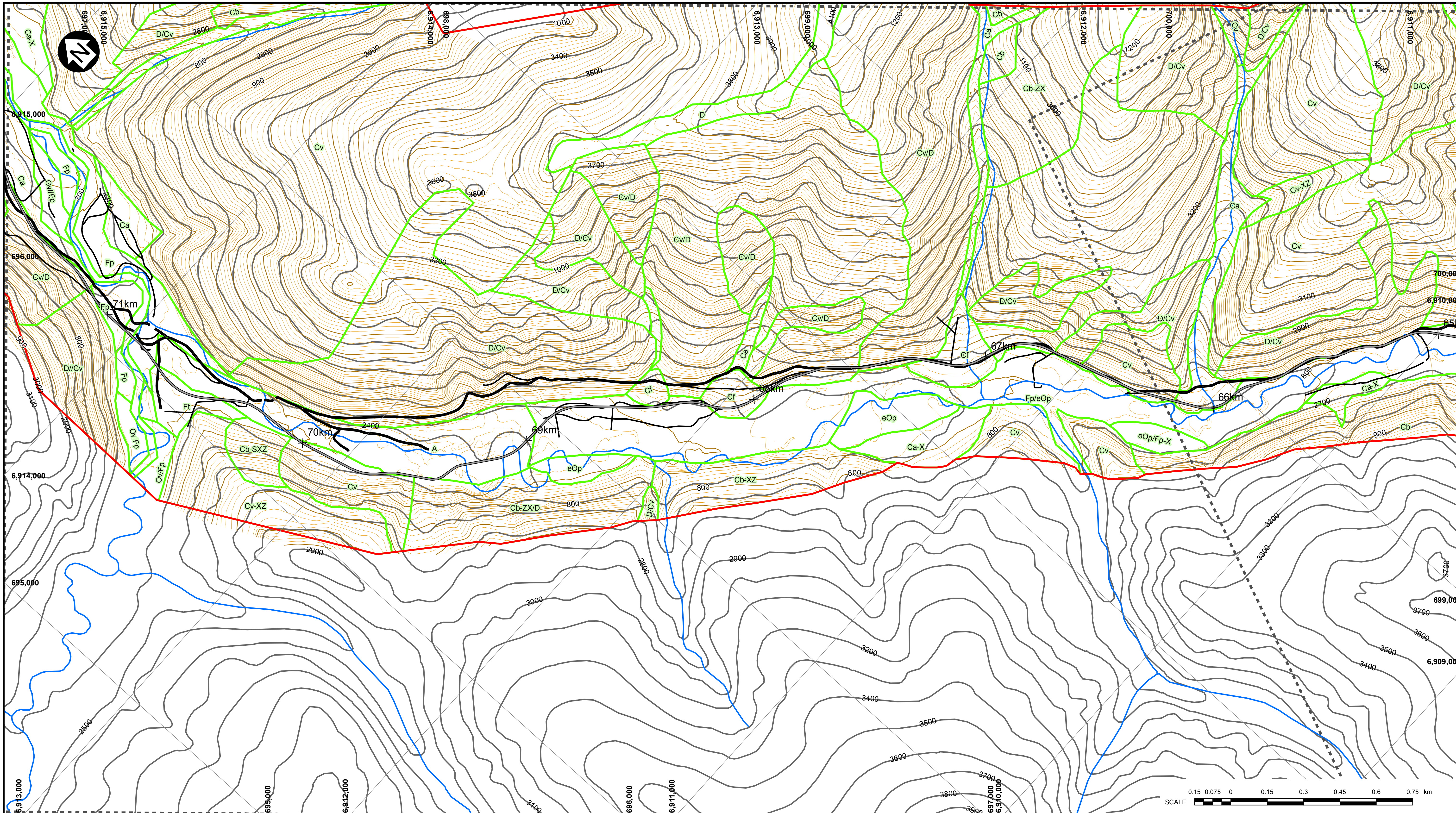
FINDINGS OF PRELIMINARY GEOTECHNICAL STUDY OF FREEGOLD ROAD UPGRADE
SHEET 14 OF 14

Knight Piésold CONSULTING

P/A NO.	REF NO.
VA101-325/14	VA13-00470

FIGURE 18 REV 0

SAVED: M:\1\01\00325\14\A\GIS\Figs\VA13-470-Freegold Road Upgrade Preliminary Geotech Study\FreegoldRoadUpgradePreliminaryGeotechAssessment.mxd; Dec 17,2013 3:07 PM kkrauszova



LEGEND:

GENERAL

- EXISTING FREEGOLD ROAD
- CREEK/RIVER
- CONTOUR (5 m)
- CONTOUR (25 m)
- CONTOUR (100 ft)
- TERRAIN UNIT
- STUDY AREA
- INDEX SHEET

PROPOSED FACILITIES

- FREEGOLD ROAD UPGRADE

0	16DEC'13	ISSUED WITH REPORT	JEH	JN	JEH	KJB
REV	DATE	DESCRIPTION	DESIGNED	DRAWN	CHK'D	APP'D

NOTES:

1. BASE MAP: 5M CONTOURS EAGLE MAPPING.
2. . COORDINATE GRID IS IN METRES. COORDINATE SYSTEM: NAD 1983 UTM ZONE 7N.
3. THIS FIGURE IS PRODUCED AT A NOMINAL SCALE OF 1:15,000 FOR 11X17 (TABLOID) PAPER. ACTUAL SCALE MAY DIFFER ACCORDING TO CHANGES IN PRINTER SETTINGS OR PRINTED PAPER SIZE.
4. FREEGOLD ROAD UPGRADE ALIGNMENT IS FROM ASSOCIATED ENGINEERING, MAY 2013.
5. TERRAIN MAPPING UNDERTAKEN TO TERRAIN SURVEY INTENSITY LEVEL E.
6. REFER TO FIGURE 1 FOR TERRAIN UNIT LEGEND.

CASINO MINING CORPORATION

CASINO PROJECT

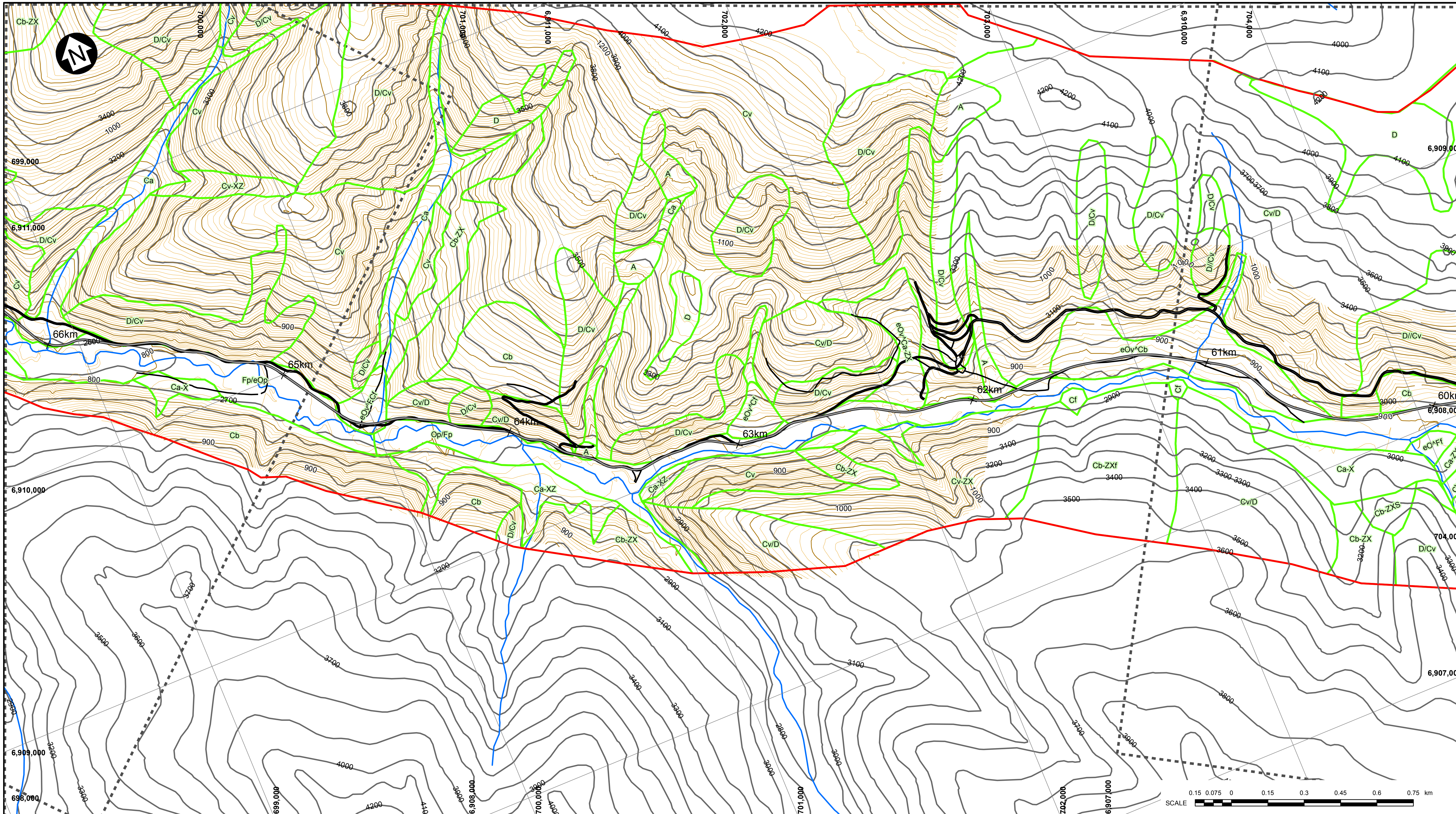
FREEGOLD ROAD UPGRADE
TERRAIN MAP
SHEET 1 OF 4

Knight Piésold CONSULTING

P/A NO.	REF NO.
VA101-325/14	VA13-00470

FIGURE 19 REV 0

SAVED: M:\1\01\00325\14\A\GIS\Figs\VA13-470-Freegold Road Upgrade Preliminary Geotech Study\FreegoldRoadTerrainMap.mxd; Dec 17,2013 3:18 PM kkrauszova



LEGEND:

GENERAL

- EXISTING FREEGOLD ROAD
- CREEK/RIVER
- CONTOUR (5 m)
- CONTOUR (25 m)
- CONTOUR (100 ft)
- TERRAIN UNIT
- STUDY AREA
- INDEX SHEET

PROPOSED FACILITIES

- FREEGOLD ROAD UPGRADE

REV	DATE	DESCRIPTION	DESIGNED	DRAWN	CHK'D	APP'D
0	16DEC'13	ISSUED WITH REPORT	JEH	JN	JEH	KJB

NOTES:

1. BASE MAP: 5M CONTOURS EAGLE MAPPING.
2. . COORDINATE GRID IS IN METRES.
COORDINATE SYSTEM: NAD 1983 UTM ZONE 7N.
3. THIS FIGURE IS PRODUCED AT A NOMINAL SCALE OF 1:15,000 FOR 11X17 (TABLOID) PAPER. ACTUAL SCALE MAY DIFFER ACCORDING TO CHANGES IN PRINTER SETTINGS OR PRINTED PAPER SIZE.
4. FREEGOLD ROAD UPGRADE ALIGNMENT IS FROM ASSOCIATED ENGINEERING, MAY 2013.
5. TERRAIN MAPPING UNDERTAKEN TO TERRAIN SURVEY INTENSITY LEVEL E.
6. REFER TO FIGURE 1 FOR TERRAIN UNIT LEGEND.

CASINO MINING CORPORATION

CASINO PROJECT

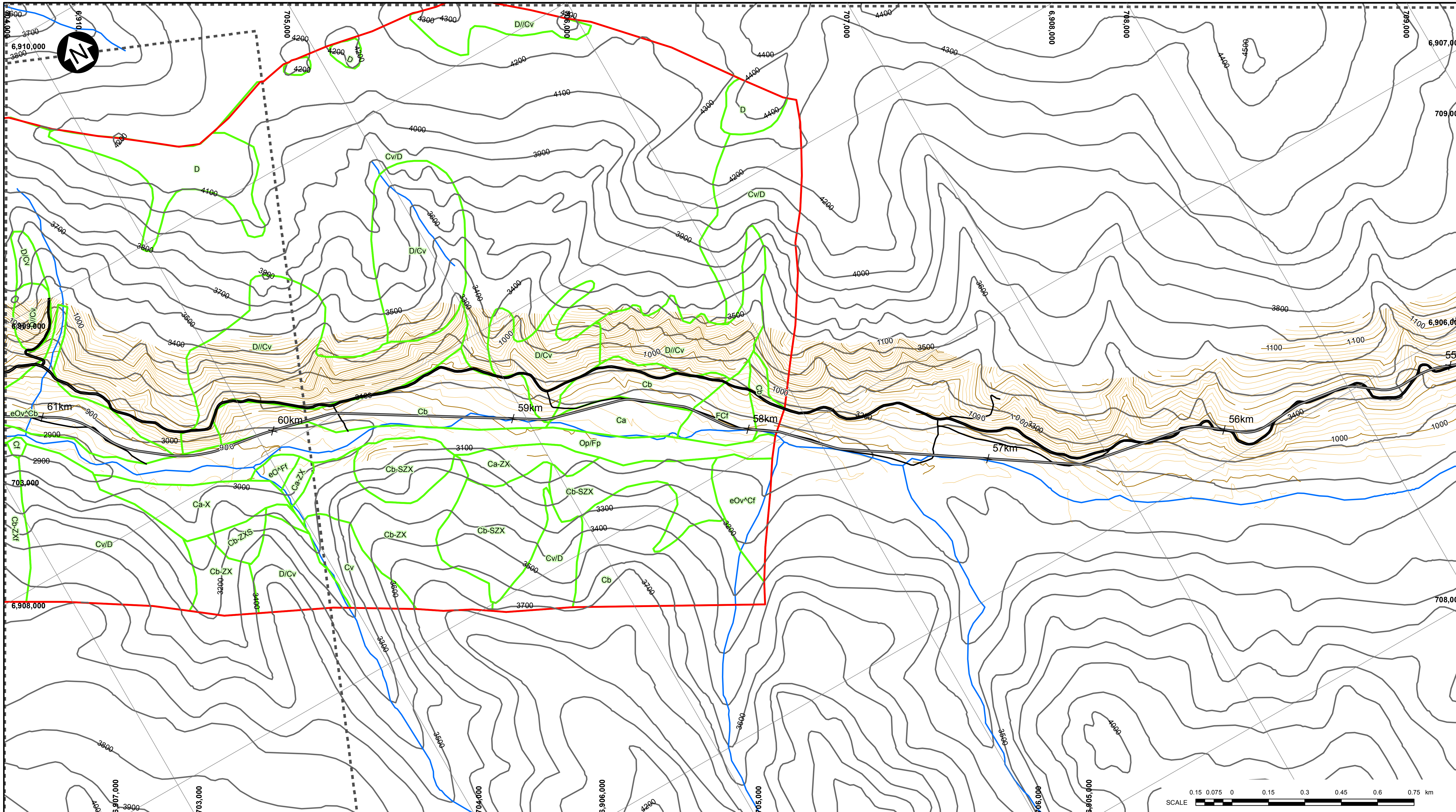
FREEGOLD ROAD UPGRADE
TERRAIN MAP
SHEET 2 OF 4

Knight Piésold CONSULTING

P/A NO.	REF NO.
VA101-325/14	VA13-00470

FIGURE 20 REV 0

SAVED: M:\1\01\00325\14\A\GIS\Figs\VA13-470-Freegold Road Upgrade Preliminary Geotech Study\FreegoldRoadTerrainMap.mxd; Dec 17,2013 3:18 PM kkrausova



LEGEND:

GENERAL

- EXISTING FREEGOLD ROAD
- CREEK/RIVER
- CONTOUR (5 m)
- CONTOUR (25 m)
- CONTOUR (100 ft)
- TERRAIN UNIT
- STUDY AREA
- INDEX SHEET

PROPOSED FACILITIES

- FREEGOLD ROAD UPGRADE

REV	DATE	DESCRIPTION	DESIGNED	DRAWN	CHK'D	APP'D
0	16DEC'13	ISSUED WITH REPORT	JEH	JN	JEH	KJB

NOTES:

1. BASE MAP: 5M CONTOURS EAGLE MAPPING.
2. . COORDINATE GRID IS IN METRES.
COORDINATE SYSTEM: NAD 1983 UTM ZONE 7N.
3. THIS FIGURE IS PRODUCED AT A NOMINAL SCALE OF 1:15,000 FOR 11X17 (TABLOID) PAPER. ACTUAL SCALE MAY DIFFER ACCORDING TO CHANGES IN PRINTER SETTINGS OR PRINTED PAPER SIZE.
4. FREEGOLD ROAD UPGRADE ALIGNMENT IS FROM ASSOCIATED ENGINEERING, MAY 2013.
5. TERRAIN MAPPING UNDERTAKEN TO TERRAIN SURVEY INTENSITY LEVEL E.
6. REFER TO FIGURE 1 FOR TERRAIN UNIT LEGEND.

CASINO MINING CORPORATION

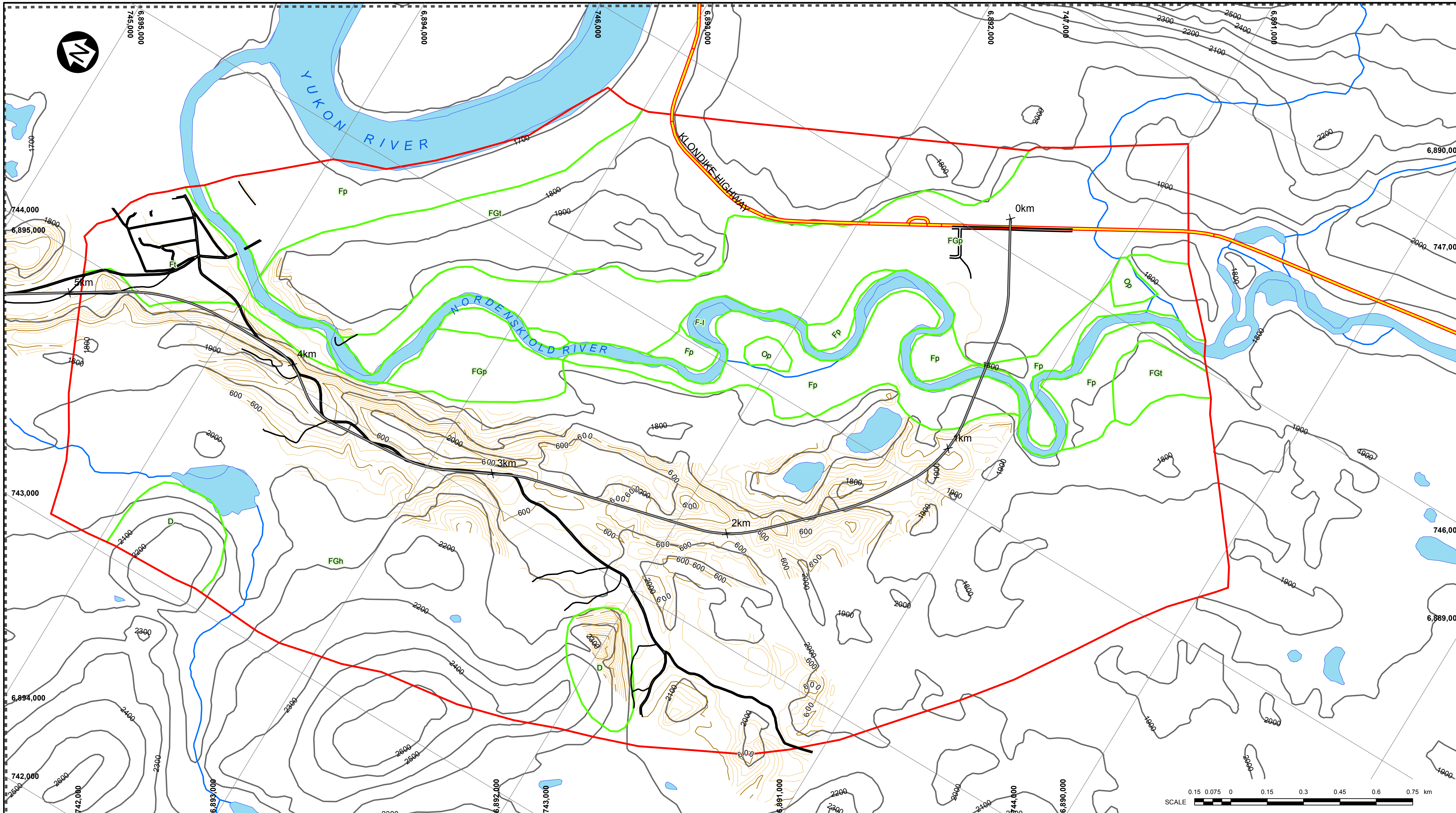
CASINO PROJECT

FREEGOLD ROAD UPGRADE
TERRAIN MAP
SHEET 3 OF 4

Knight Piésold CONSULTING

P/A NO.	REF NO.	REV
VA101-325/14	VA13-00470	0

FIGURE 21



LEGEND:

GENERAL

- EXISTING FREEGOLD ROAD
- CREEK/RIVER
- CONTOUR (5 m)
- CONTOUR (25 m)
- CONTOUR (100 ft)
- TERRAIN UNIT
- STUDY AREA
- INDEX SHEET

PROPOSED FACILITIES

- FREEGOLD ROAD UPGRADE

REV	DATE	DESCRIPTION	DESIGNED	DRAWN	CHK'D	APP'D
0	16DEC'13	ISSUED WITH REPORT	JEH	JN	JEH	KJB

NOTES:

1. BASE MAP: 5M CONTOURS EAGLE MAPPING.
2. . COORDINATE GRID IS IN METRES. COORDINATE SYSTEM: NAD 1983 UTM ZONE 7N.
3. THIS FIGURE IS PRODUCED AT A NOMINAL SCALE OF 1:15,000 FOR 11X17 (TABLOID) PAPER. ACTUAL SCALE MAY DIFFER ACCORDING TO CHANGES IN PRINTER SETTINGS OR PRINTED PAPER SIZE.
4. FREEGOLD ROAD UPGRADE ALIGNMENT IS FROM ASSOCIATED ENGINEERING, MAY 2013.
5. TERRAIN MAPPING UNDERTAKEN TO TERRAIN SURVEY INTENSITY LEVEL E.
6. REFER TO FIGURE 1 FOR TERRAIN UNIT LEGEND.

CASINO MINING CORPORATION

CASINO PROJECT

FREEGOLD ROAD UPGRADE TERRAIN MAP SHEET 4 OF 4

Knight Piésold CONSULTING

P/A NO.	REF NO.
VA101-325/14	VA13-00470

FIGURE 22 REV 0