March 19, 2010 EBA File: W23101051.103

Yukon Water Board
Auite 106
419 Range Road
Whitehorse, YT Y1A 3V1

Attention: Ms. Carola Scheu

Subject: Type B Water Licence Application – Tailings Pond Maintenance
Ketza River Mine, Yukon

The attached documentation is provided in support of a Type B Water Licence application on behalf of Ketza River Holdings Ltd. for the care and maintenance of an existing tailings pond at the Ketza River Mine near Ross River, Yukon.

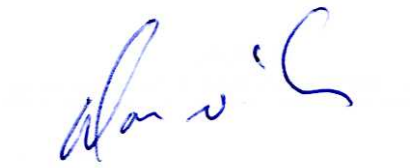
The Type B application is being submitted following consultation with members of the Yukon Water Board and Water Resources staff. The previous licence for this facility was a Type A (QZ04-063) licence which expired on December 31, 2009. This Type B application is being made to obtain a licence in an expedient manner while a Type A application is being prepared for anticipated production at the mine.

The supporting information pertaining to the licence application is contained in the attached reports *Project Proposal Application for District Office Level Assessment Type B Water Licence for the Ketza River Mine, YT* (EBA Engineering Consultants Ltd., March, 2010) and *Type B Water Licence Application – Supplemental Information* (EBA March 2010). The proponent is proposing that the licence conditions in the previous licence (QZ04-063) be continued in any new licence issued. In the interim, Ketza River Holdings Ltd. is continuing to monitor, report, and adhere to the conditions of the previous water licence until such time as a new licence is issued.

EBA Engineering Consultants Ltd.
p. 867.668.3068 • f. 867.668.4349
Calcite Business Centre • Unit 6, 151 Industrial Road • Whitehorse, Yukon Y1A 2V3 • CANADA

We trust this information is sufficient for the purpose of the licence application. Should you have any questions or comments, please contact the undersigned at your convenience.

Respectfully submitted,
EBA Engineering Consultants Ltd.



Don Wilson, B.Sc.
Team Leader, Contaminants
Whitehorse Environment Group
Direct line: 867.668.2071 x 223
E-mail: dwilson@eba.ca

Attachments:
Schedule 4 Application
Type B Water Licence Application
Type B Water Licence Application – Supplemental Information
Project Proposal Application for District Office Level Assessment Type B Water Licence for the Ketza River Mine, YT

Waters Act **Schedule 4 Application**

If Amendment or Renewal: Licence # _____

1. NAME: Ketza River Holdings Ltd.

2. PERMANENT MAILING ADDRESS: 105 C Platinum Road
Whitehorse, YT Y1A 5M3

TELEPHONE: 867 456-4853 FAX: 456-4853 EMAIL:

3. SEASONAL MAILING ADDRESS (if different from permanent) From _____ to _____
(Date) (Date)

TELEPHONE: FAX:

4. LOCATION OF UNDERTAKING: Ketza River Mine

WATER SOURCE: Cache Creek Tributary of Ketza River

WASTE DEPOSIT: Station KR9A Figure 2 (Describe location, attach map, indicate location of waste deposit)
YR SAB Application

5. QUANTITY OF WATER TO BE USED: 0 m^3/day 6. PROPOSED EXPIRY DATE: December 31/2015

7. TYPE OF UNDERTAKING

Industrial	☐
Placer Mining	☐
Quartz Mining	☑
Municipal	☐
Power	☐
Agriculture	☐
Conservation	☐
Recreational	☐
Miscellaneous (attach description)	☐

8. WATER USE:

To obtain water	☐
To divert water	☐
To store/alter flow of water	☑
To modify the bed or bank of a watercourse	☐
To cross a watercourse	☐
To deposit waste	☐
Other (attach description)	☐

9. OTHER PERSONS OR PROPERTIES AFFECTED BY THIS UNDERTAKING (attach list)
10. NAME, ADDRESS, TELEPHONE AND FAX NUMBER OF AGENT OR ALTERNATE CONTACT

Signature Jenny Pitz Date 9 March 2010

FOR OFFICE USE ONLY

Application Fee Amount _____ Receipt No: _____

Water Use Deposit Amount _____ Receipt No: _____

MLUR Amount _____ Receipt No: _____

Yukon Water Board
106-419 Range Rd. Whitehorse YT Y1A 3V1
Phone (867) 456-3980 Fax (867) 456-3890
email: ywb@yukonwaterboard.ea
www.yukonwaterboard.ea

Information Sheet for Quartz Mining Undertakings

The *Yukon Environmental and Socio Economic Assessment Act* ("YESAA") came into full effect on November 28, 2005. Your project will require an assessment under that *Act.*

The Yukon Water Board cannot issue a water licence if the issuance of the licence is contrary to a Decision Document issued under YESAA, and any water use licence that is issued cannot conflict with a Decision Document.

In addition to the information requirements identified in this package, the Yukon Water Board also requires a copy of the project confirmation form to be completed after you have received your Decision Document. For information about YESAA, you can refer to the map that is included with this package to determine the location of your YESAB designated office. Alternatively, you may want to contact the YESAB main office at:

Box 31642
Whitehorse, Yukon Y1A 6L2
Telephone (867) 668-6420 / Fax (867) 668-6425 / Email yesab@yesab.ca

You may also submit your project to YESAB through their website, http://www.yesab.ca .

After you have provided the project confirmation form, our office will review your water use application for adequacy and provide public notice, as required by the *Waters Act.* You will receive a copy of any interventions that we receive in response to public notice, and you may respond to those interventions. Then, the Board will consider the entire register, including your application, the interventions, your responses to interventions and the YESAA Decision Document.

If the Board approves a Water Use Licence, the conditions included in that licence may differ significantly from your application. Therefore, all Licensees are urged to review any licence, and relevant reasons for decision that may be issued as a result of this application.

If you require a copy of the *Waters Act* or *Waters Regulation* please contact our office at (867) 456-3980 or you can get these documents and other information from our web site at www.yukonwaterboard.ca.

Please complete the application in ink. Do not put any information on the back of any page. Use additional pages if required.

Complete the sections that are applicable to your operation and put N/A where a section is not applicable.

Notes to Applicant:

This information sheet must be accompanied by a completed Schedule 4 and the applicable fees.

This information sheet is intended to apply only to new or renewal applications. If you are applying to amend an existing licence, you are required to provide a letter indicating precisely the nature of the amendment, the licence sections for which amendment is requested, the proposed amendment wording and the rationale for the amendment.

In addition to the information requested in this form, please refer to Section 5 of the *Waters Regulation* and the Board's *Licensing Guidelines for Type A Quartz Mining Undertakings* to ensure that your application contains all of the required information.

The information provided in this form should reference relevant page numbers of any supporting reports submitted with your application. If insufficient space is provided in this form, or where no space is provided, please attach the required information using the same section titles and numbers as listed in this form.

If more than one licenceable activity or facility is proposed (e.g. multiple water sources, waste deposits, dams, water crossings, etc.), the required information should be presented for each activity or facility.

All design drawings submitted as part of the application must be sealed by a Professional Engineer licenced to practice in the Yukon. Drawings shall be to at least a preliminary design level as described in *the Licensing Guidelines for Type A Quartz Mining Undertakings* but may be labelled "Not for Construction".

A. GENERAL INFORMATION

1. Name of Applicant: Ketza River Holdings Ltd.

2. Are you applying for a Type A Licence or a Type B Licence? Type A ( ) Type B (✓)

3. If you are applying for a Type B Licence, confirm that every aspect of your proposed undertaking does not exceed the licensing criteria specified in Column III of Schedule VII of the *Waters Regulation*.

4. Name of Waterbody(ies): Cache Creek

5. Tributary of: Ketza River

6. a) National Topographical System (NTS) 1:50,000 scale Map Sheet Number(s):

   105 P/9

   b) Indicate your project location on a 1:50,000 topographical map, or part thereof. Please ensure that the map sheet number is clearly indicated, selected UTM grid lines are labelled and the UTM zone is indicated. Figure 1 YESAB Application

   c) Attach a copy of the claim map for the project area and outline your claims.

7. Provide map co-ordinates for the project. If the project covers an area, provide the co-ordinates for a box that includes the entire project as well as the co-ordinates of the centre of the project area.

Minimum Latitude	61° 31'	Maximum Latitude	61° 34'
Minimum Longitude	132° 10'	Maximum Longitude	132° 17'
Centre Latitude	61° 32' 126"	Centre Longitude	132° 15' 364"

8. Nearest Community: Ross River

9. Name of Highway and Kilometre Location: Campbell Highway km 340

10. In which First Nation Traditional Territory (or Territories) is your project located?

    Ross River Dena

11. Is your project located on or near First Nation Settlement Land? Yes ( ) No (✓)

    Will water flowing from your project flow on or adjacent to First Nation Settlement Land? Yes ( ) No (✓)

    If so, provide details and attach a map showing the Settlement Lands in relation to your project.

12. Have you contacted the First Nation(s) regarding your project? Yes (✓) No ( )

    If so, provide details.

13. Are there any existing licences or pre-existing applicants whose use of water may be affected by your project? Yes ( ) No (✓)

    If so, provide information about who they are and any contacts that you have made with them.

14. Are there any other surface water or groundwater users that might be affected by your project?

    Yes ( ) No (✓)

    If YES, identify the other users and describe how they will or may be affected.

15. Does the undertaking require any other permits (e.g. land use permit, quarry permit, timber permit, etc.)?

    Yes ( ) No (✓) If YES, specify the type of permit and it's status.

B. PROJECT DESCRIPTION

16. Provide a general description of the project.

17. Is this a new undertaking or a reactivation of a previous operation?

reactivation - previous licence QZ04-063

18. Indicate the status of the mine and/or mill (or other relevant processing facility) on the date of the application:

	Mine	Mill
In Design		
Under Construction		
In Operation		
Temporarily Closed	✓	✓
Permanently Closed		

19. If a change in the status of the mine or the mill is expected, please indicate the proposed date of such change(s). Mine feasibility study currently underway.

20. Indicate the proposed operating schedule:

	Mine	Mill
Hours per day	NA	
Days per week		
Weeks per year		
Number and length of shifts		
Number of workers on site		

21. Attach an overall project layout plan at a scale not less detailed than 1:5000 showing the locations of all of the main components of the project, including but not limited to the mining claims, mine, mill, rock dump(s), ore stockpile(s), dam(s), tailings area(s), access road(s), camp(s), water supply source(s), waste discharge(s) and any other facilities proposed to be licenced through this application. Indicate any Settlement Land and the location of other users identified in Part A if they are within the area of the map.

22. Describe the type(s) of mining operation(s) proposed (i.e. conventional underground, conventional open pit, combined conventional underground and open pit, strip mining, etc.). Include in the description the mining methods to be used, the magnitude of each operation in terms of tonnes of ore and waste to be removed per day on average. Indicate any seasonal operation. NA

23. Does your site include any existing underground workings? Yes (✓) No ( )

If so, describe them and provide drawings showing the location and extent. Do the workings free-drain? If so, describe the quantity and quality of the existing flow.

Underground workings are not part of the tailings pond maintenance program

24. Specify the proposed milling rate in tonnes of ore per day: N/A

25. Describe the proposed milling and processing operation, including methods, equipment, reagents, etc. Provide a flow chart of the operation.

26. Generally characterize the project by providing at least the following information:

a) Topographic maps: copies of the most recent and largest scale (up to 1:2000) topographic maps available, showing where the mine, mill, tailings and other related facilities will be located.

b) Soil maps: copies of the most recent and largest scale (up to 1:2000) soil maps available of the project area complete with legends and explanations.

c) Geologic maps: copies of the most recent and largest scale (up to 1:2000) geologic maps available of the project area complete with legends and explanations.

d) Climate: climatological information, including precipitation and evaporation data for the project area.

e) Hydrology: hydrologic information for the project area, including peak flows, average flows, seasonal flows, flood flows and their return periods, flow patterns, seasonal water quality and quantity, and stream sediment data.

f) Information pertaining to groundwater in the project area, including location, flow direction(s) and quality.

g) Information pertaining to the distribution and nature of permafrost in the project area, including any areas where your assessments indicate the potential existence of ice-rich, thaw unstable permafrost.

C. GEOLOGY AND GEOCHEMISTRY

27. Describe the physical nature of the ore body(ies), including location, known dimensions and approximate shape. Include separate descriptions of any recognized ore types and waste rocks within the ore bodies.

28. Describe the country rock in the vicinity of the ore body, paying particular attention to any rocks that will be excavated during mining or will remain in pit walls or workings.

29. For each country rock unit, waste rock unit or ore type, describe the mineralogy of the unit, listing the constituent minerals and their average percentage weights. If available, provide summary chemical analysis of the rock types, including trace elements.

30. Are pyrite and/or pyrrohotite present in the ore body, waste rocks or country rocks?

Yes ( ) No ( ) Mining applications are being prepared separately from the Type B licence.

Is arsenopyrite present in the ore body, waste rocks or country rocks? Yes ( ) No ( )

If YES, be sure that the response to Question 29 indicates the amount of each mineral. Describe the grainsize and habit of the mineral (i.e. disseminated, veinlet, etc.). If any parameter is variable, then provide the range and average of the parameter. If the response to Question 30 is YES, then provide for each rock type and ore, any results for Acid Base Accounting, paste pH or other static/kinetic testing available.

31. Is there a potential for acid rock drainage to occur? Yes ( ) No ( ) NA

If YES, describe the location, extent and degree of any anticipated acid rock drainage, including from waste rock, and the methods proposed to be used to minimize or mitigate any significant adverse environmental impacts. If NO, provide a technically based analysis, supported by site-specific data, that justifies the conclusion.

D. USES

32. Does the project include Direct Water Use? Yes ( ) No (✓)

If YES, attach the following information for each source:

a) a description of the water use and source.

b) the acquisition rate in cubic metres per day and cubic metres per year.

c) a description of the location the water source(s). If the source is groundwater, attach well logs.

d) the water intake method.

e) details of any screening to exclude fish.

f) the location and design of any water storage facility, if applicable, and the water storage volume in cubic metres.

g) streamflow data in cubic metres per second for the water supply source, including:

i) Mean Annual Flow
ii) Mean Seasonal Flow
iii) Minimum Summer Flow
iv) Minimum Annual Flow

v) Mean Annual Flood
vi) Maximum Summer Flood
vii) Mean Summer Flood

33. Does the project include Construction of a Watercourse Crossing? Yes ( ) No (✓)

If YES, attach the following information for each crossing:

a) a description of the type of crossing (i.e. bridge, culvert, rock drain, ford, etc.).

b) an explanation of why the crossing is required and the rationale for selection of the type of crossing.

c) the following information for the crossing location:

i) the width of the watercourse at the Ordinary High Water Mark (OHWM).
ii) the gradient of the watercourse.
iii) the Design Flood Flow in cubic metres per second and its Return Period.
iv) the Mean Seasonal Flow in cubic metres per second
v) an explanation of the rationale for the selected Design Flood Flow and its Return Period.
vi) a description of the streambed material, streambank material and streambank vegetation.
vii) a description of proposed sediment control measures.
viii) design drawings in plan and profile.
ix) a description of the construction methods, schedule, quality assurance/quality control measures, and inspection and maintenance procedures and schedule proposed to be used.

34. Does the project include Watercourse Training? Yes ( ) No (✓)
(includes channel and/or bank alterations, watercourse infilling, spurs, docks, culverts, erosion control, rip-rap, etc.)

If YES, attach the following information for each proposed training work:

a) a description of the type of watercourse training proposed.

b) an explanation of why the training is required.

c) the following information for the watercourse training location:

i) the Design Flood Flow in cubic metres per second and its Return Period.
ii) the Mean Seasonal Flow in cubic metres per second.

iii) an explanation of the rationale for the selected Design Flood Flow and its Return Period.
iv) a description of the streambed material, streambank material, and streambank vegetation.
v) a description of the source, size, and composition of any material to be used for the training and the quantity of material to be either placed into or removed from the watercourse.
vi) a description of proposed sediment control measures.
vii) design drawings in plan and profile.
viii) a description of the construction methods, schedule, quality assurance/quality control measures, and inspection and maintenance procedures and schedule proposed to be used.

35. Does the project include Diversions? Yes (✓) No ( ) Existing structures
(includes dikes and other structures relating to the diversion)

If YES, attach the following information for each diversion and related structure:

a) the width of the pre-diversion watercourse at the Ordinary High Water Mark (OHWM).

b) a description of the proposed diversion or structure.

c) an explanation of the reason for the diversion or structure.

d) information on the length and gradient of the existing channel and of the proposed diversion.

e) the following information for the diversion:

i) the Design Flood Flow in cubic metres per second and its Return Period.
ii) the Mean Seasonal Flow in cubic metres per second.
iii) an explanation of the rationale for the selected Design Flood Flow and its Return Period.
iv) design drawings in plan and profile.
v) a description of the construction methods, schedule, quality assurance/quality control measures, and inspection and maintenance procedures and schedule proposed to be used.

36. Does the project include Waste Rock Dumps or Ore/Concentrate Storage? Yes ( ) No (✓)

If YES, attach the following information for each contiguous dump:

a) a description of the proposed dump site, including location and extent, topography, soil and rock conditions (provide test pit/drill hole logs and laboratory test results), permafrost conditions, geologic and hydrologic characteristics, rock types and amounts to be placed in the dump, physical and chemical quality of rock to be placed in the dump, and the quantity and quality of surface runoff and seepage through the dump to surface water and groundwater.

b) a description of the methods proposed to be used to ensure stability of the dump and avoid, minimize or mitigate significant adverse environmental impacts, including, but not limited to, site preparation, methods of rock placement, operating and final slopes, caps and crowns, seepage collection or interception ditches, sediment control measures, revegetation/reclamation measures, and monitoring of stability and seepage.

c) design drawings in plan and profile.

d) a description of the site preparation, construction methods, schedule, proposed quality assurance/quality control measures, inspection and maintenance procedures, and schedule.

37. Does the project include Dams, Spillways, Cofferdams or Dikes? Yes (✓) No ( ) Existing Structures

If YES, attach the following information for each structure:

a) a description of the structure and its purpose.

b) a description of the site conditions, including the location, topography, geologic and hydrologic characteristics, permafrost conditions, and soil and rock conditions (provide test pit/drill hole logs and laboratory test results).

c) a description of the type and composition of the material to be used in the construction of the structure.

d) design drawings in plan and profile.

e) a description of the construction methods, schedule, quality assurance/quality control measures, and inspection and maintenance procedures and schedule proposed to be used.

f) in the case of a dam, details of the seismic design parameters and confirmation that the structure is designed to withstand the Maximum Credible Earthquake.

g) in the case of a spillway, details of the hydraulic design parameters and confirmation that the structure is designed to pass the Probable Maximum Flood.

h) If the structure creates a reservoir in a natural watercourse, attach drawings of the reservoir in plan and profile and show representative cross sections. Identify the size of the drainage basin upstream of the reservoir and provide a topographic plan showing the drainage area boundary. Indicate the number of hectares to be flooded, the surface area of the reservoir at full supply level, the total storage capacity of the reservoir, and details of any shoreline protection proposed.

38. Does the project include the Deposit of Solid or Liquid Waste? Yes (✓) No ( )

(Note: This includes all wastes as defined in Section 1 of the *Waters Act* that have the potential to alter or degrade surface or groundwater. Wastes include but are not limited to tailings, milling residues, runoff from mine workings and tailings, discharges from workings, explosives residues, debris, domestic sewage, sediment, etc, whether treated or not.)

If YES, attach the following information for each liquid waste: See 2009 Annual Report for Water License Q204-063

a) the type and quantity of waste proposed to be deposited and the reason for the deposit.

b) in the case of a liquid waste, the chemical characterization and concentration of the waste proposed to be deposited.

c) in the case of a solid waste, the geochemical characteristics of the waste.

d) the location, rate, timing, frequency and duration of the deposit.

e) the baseline surface and groundwater quality at the location of the proposed discharge.

f) the potential qualitative and quantitative effects that the deposit may have on any watercourse and/or surface water and/or groundwater.

g) the proposed methods for collecting, storing, treating and discharging the waste, and the volumes of any waste storage systems.

h) a description of the construction methods, schedule, quality assurance/quality control measures, and inspection and maintenance procedures and schedule proposed to be used for any waste treatment/storage/discharge facilities.

i) a description and justification of the standards proposed to be applied to any discharges of waste to the receiving environment.

E. HAZARDOUS MATERIALS AND SPILL CONTINGENCY

39. Does the project include the Handling or Storage of Petroleum Products or Hazardous Materials? Yes ( ) No (✓)

If YES, provide the following information:

a) a plan for the safe handling, storage, and disposal of petroleum products or hazardous materials.

b) a description of equipment to be kept available for spill response or other emergency and it's location, and a description of proposed training programs for workers.

c) a contingency plan for the containment and clean-up in the event of a spill.

F. EMERGENCY RESPONSE

40. Provide an emergency response plan that includes mechanisms and processes for addressing potential or actual failures of structures, equipment and material stockpiles, and programs for appropriate training to workers.

G. WATER BALANCE MODEL

41. Provide the analysis and results of a detailed water balance model for the project, including all assumptions, calculations and findings, including wet and dry events modelled.

H. WATER QUALITY MODEL

42. Provide the analysis and results of a predictive water quality model for the project.

I. PROJECT EFFECTS

43. Provide a description of any potential impacts to fish and fish habitat.

44. Provide a description of plans to mitigate any effects on fish resources.

45. Provide a description of plans for compensation of any fish habitat lost due to the project.

46. Provide a description of wildlife uses in the project area including sport hunting, subsistence hunting, trapping, and non-consumptive uses.

47. Provide a description of plans to mitigate any effects on wildlife resources due to the project.

48. Provide a description of plans to mitigate any damage to plant cover and topsoil.

49. Provide a detailed description of any potential impacts to water quality, quantity and/or seasonal rate of flow, and any mitigative measures included in the project design.

50. Are there anticipated to be any potential impacts to traditional uses and water rights of a First Nation as described in Section 14.8.0, or of a Yukon Indian Person as described in Section 14.9.0 of the *Umbrella Final Agreement*? Yes ( ) No (✓)

    If YES, provide an explanation of how they have been considered and what mitigative measures have been included in the project design.

51. Provide an explanation of how any existing water use licensees or pre-existing applicants, whose use of water may be affected by your project, have been considered and what mitigative measures have been included in the project design.

52. Are there any trapline concession holders in the area of your project? Yes ( ) No (✓)

If YES, provide information about who they are, what contacts that you have made with them, how they have been considered in the project development, and what mitigative measures have been included in the project design.

53. Are there any outfitters in the area of your project? Yes ( ) No (✓)

If YES, provide information about who they are, what contacts that you have made with them, how they have been considered in the project development, and what mitigative measures have been included in the project design.

54. Are there any other owners or occupiers of land in the area of your project? Yes ( ) No (✓)

If YES, provide information about who they are, what contacts that you have made with them, how they have been considered in the project development, and what mitigaive measures have been included in the project design.

J. DECOMMISSIONING PLANS

55. What is the expected life of the project?
licence application is for five years during which decisions regarding production will be made.

56. Provide a detailed description of decommissioning measures to be taken when the project is either temporarily or permanently abandoned and describe how project facilities will be removed and the site reclaimed. Decommissioning Plans submitted as part of water licence #2804-063

57. Provide a description of proposed monitoring and inspection procedures to be followed during either temporary or permanent decommissioning.

K. MONITORING PLANS

58. Provide a detailed description of the methods, procedures, standards, systems, networks and schedules proposed to be used to monitor the performance of the project facilities/systems and their impact on the environment.
Monitoring Plan provided in YESAB application.

OFFICERS OF THE COMPANY/CORPORATION

This page must only be completed if the applicant is a corporation, limited company, or other business entity. Non profit organizations should provide proof that they are a registered society or organization in the Yukon.

Before issuing a water licence in the name of a corporation, limited company or other business entity, the Yukon Water Board will require that the following declaration be completed:

I, Terry Risenman certify that (name of business entity) Ketza River Holdings Ltd. is incorporated or registered pursuant to the *Business Corporations Act* Of The Yukon Territory or is registered in the province of Yukon.

The officers of the company are:

Name (Please Print):	Title
Graham Dickson	President
Shaun Hinrick	Secretary / Treasurer

Signature

Director

Title

March 9/10

Date

Please Note: If the above information is not completed, the Board will consider the application to be in the name of the individual who signed the Schedule IV.

In addition to this declaration, we require proof that the business entity is allowed to do business in the Yukon. Please attach an annual return, Form 1-04, or certificate of Registration.

Yukon
Justice

BUSINESS CORPORATIONS ACT
FORM 1

CERTIFICATE OF INCORPORATION

KETZA RIVER HOLDINGS LTD.	23816
Name of Corporation	Corporate Access Number

I HEREBY CERTIFY THAT THE ABOVE-MENTIONED CORPORATION, THE ARTICLES OF INCORPORATION OF WHICH ARE ATTACHED, WAS INCORPORATED UNDER THE BUSINESS CORPORATIONS ACT OF THE YUKON.

Registrar of Corporations
M. Richard Roberts

December 9, 1993
Date of Incorporation

March 15, 2010 EBA File: W23101051.103

Yukon Water Board
Suite 106
419 Range Road
Whitehorse, YT Y1A 3V1

Attention: Ms. Carola Scheu

Subject: Type B Water Licence Application – Supplemental Information
Ketza River Mine Tailings Pond, Yukon

The attached documentation is provided in support of a Type B Water Licence application submitted on behalf of Ketza River Holdings Ltd. (KRH) for the care and maintenance of an existing tailings pond at the Ketza River Mine near Ross River, Yukon. The numbering system matches that of the licence application. References to figures match those from the 2009 Annual Water Licence Report, Ketza River Mine, Yukon. Those figures are attached for ease of reference.

12. KRH had contacted Ross River Dena Council and the Liard First Nation in 2005 and 2006 during the original licence application (QZ04-063) to inform then of plans for care and maintenance of the tailings pond. As part of the preparation for production permitting, community meetings were held in Ross River with the Ross River Dena Council 2007 and ongoing correspondence was provided to the Liard First Nation through 2007. KRH continues to meet with Ross River Dena Council to keep them informed of current plans and schedules for the mine including maintenance of the tailings pond.

16. This project relates to the tailings pond, surface drainage ditches in the area of the tailings pond, and associated structures for the monitoring and control of seepage from the tailings pond. The objective of obtaining a water licence for these structures is to allow for the continuing storage of water in, and discharge from the existing tailings pond by Ketza River Holdings Ltd. as was previously covered by Water Licence QZ04-063.

The ongoing care and maintenance of the tailings pond and associated structures will generally include the following:

EBA Engineering Consultants Ltd.
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Calcite Business Centre • Unit 6, 151 Industrial Road • Whitehorse, Yukon Y1A 2V3 • CANADA

- Maintenance of existing surface diversions for Lower Subsidiary Creek (northern side of tailings pond) and Cache Creek South Diversion to divert surface water around the tailings pond (see Figure 2).
- Monitoring of water quality within the tailings pond, the seepage drainage courses, and in Cache Creek. Monitoring will also include seepage rates below the dams and groundwater levels and water quality in functioning piezometers as established by the previous water licence.
- Assuming water quality in the tailings pond continues to remain below water licence standards imposed for discharge (including LC_{50} toxicity tests) then tailings water would be discharged to maintain or lower the level of liquid in the tailings pond to improve dam stability and reduce contact with old tailings.
- The maintenance of a water treatment plant to provide emergency treatment of tailings pond water if required.

Once the mine feasibility study has been completed, a decision would be made respecting the future of the mine and the future use of the tailings pond. Should the mine not proceed to production (considered unlikely) the decommissioning plan developed as required by Water Licence QZ04-063 could be implemented.

21. See Figures 1 to 4 attached.

26. Section 6 of the attached *Project Proposal Application for District Office Level Assessment Type B Water Licence for the Ketza River Mine, YT* (EBA, March 2010) provides a discussion of existing site conditions.

26.d) From 1986 until 1995, a meteorological station was in operation at the Ketza River Mine site located at 61.52° N, 132.27° W (WGS-84) at an elevation 1380 m. This meteorological station was re-activated in 2006 with data collection beginning on February 26.

Rainfall measurements at the Ketza River Mine site meteorological station were taken between 1986 and 1995, and then again from 2006 to present.

The total annual average rainfall for this station for the period of record was 272.5 mm. A seasonal cycle is observed with high rainfall occurring in the region predominantly in the month of August. The winter season is marked with little to no rainfall (due to snow occurrences instead of rain). In 2006 and 2007, the recorded rainfall was considerably lower and was attributed to the use of a different method for collecting the data (cumulative rainfall collection as compared with tipping bucket method for the previous data collected).

Snow measurements recorded by the Ketza River Mine site meteorological station indicate snow occurring typically during the months of September through to May. The reported monthly average snow depth (September to May) for the Ketza River Mine site is 44.8 cm and a total average annual snowfall of 405.15 cm. Snow measurements collected in 2007 and 2008 were collected using a different method and are not reported as an actual snow depth. A rain gauge was used to collect

snow, which was then melted and reported as precipitation in mm. These data were converted to snow depth in cm using an assumed snow density of 0.1 g/cm^3.

The total annual precipitation recorded at the Ketza River Mine Site was calculated using the sum of the monthly averages over the period of record. The total annual precipitation was 646.6 mm with the wettest month is September (85.4 mm of precipitation) while the wet season typically extends between August to November. The driest month is typically April (18.1 mm of precipitation). The average monthly precipitation is 53.9 mm.

26.e) The mean monthly flow for Cache Creek before the mining operation began reached a maximum of 240 L/s (0.240 m^3/s) in June and fell to a minimum of approximately 10 L/s (0.010 m^3/s) from January to April (Table 4.9-1 (Ker, Priestman & Associates, 1987).

The post-mine closure streamflow measurements are limited to a few locations at the site and are not continuous. Flow measurements have been collected sporadically by KRH since 2005. The data show relatively low flows in winter and higher flows in the fall. However, comparison of the post-mining streamflow and pre-mining streamflow is difficult due to the lack of continuous measurement for an extended period of time. It is impractical to compare discrete measurements made before and after the development of the mine even if they were made on the same date due to the short time scale of weather systems.

26.f) Regional groundwater flow occurs as a deep flow system within bedrock. Groundwater is recharged at higher elevations in the upland areas and flows toward discharge areas within the valleys at lower elevations. In some cases, groundwater flow occurs as perched systems above the bedrock, low permeability soils, or potentially permafrost. Groundwater discharge zones include water courses and diversion ditches.

Groundwater data from the area of the tailings pond consists of data collected from groundwater monitoring wells used to collect seepage water within the tailings pond dam and groundwater below the tailings pond dam. Analytical results are available for metals and routine water parameters as required by the former water licence (QZ04-063). The water licence did not set standards for water quality for samples from the monitoring wells. However KRH has monitored water quality by comparing results to CCME guidelines multiplied by 10 as per industry standards.

As in previous years (2005 to 2008), 2009 seepage water quality parameters (aluminum, arsenic, chromium, copper and iron) within the dam were often not consistent with tailings pond water quality. Instead, they related more to natural surface water quality off the north slope (KR15). P07A, P08, P09 and P12C in particular (see Figure 2), appear to be affected by north slope concentrations. The data indicates that these peizometers may be influenced by groundwater rather than seepage water originating from the tailings pond (*2009 Annual Water Licence Report, Ketza River Mine, Yukon* EBA, 2010).

26.g) The tailings pond was constructed in late 1987 for use during mining activities at the Site. During construction of the existing tailings pond, patches of discontinuous permafrost were recorded and mapped by Golder Associates. Although there is no documentation that permafrost is affecting the hydrogeological regime at this site, it is possible that groundwater confinement and/or

perched conditions may be found at some locations on the site in connection with reduced permeability resulting from discontinuous permafrost.

One area along the south side of the Cache Creek South Diversion channel has had a history of instability which was an area that was believed to be prone to permafrost. Repairs were made to this area in 2005 by KRH by placing additional rip-rap along the southern bank of the creek. The area is monitored on a regular basis and no further issues of instability have been reported.

27 to 29 Geology and geochemistry data are being collected as part of the preparation for a Type A Water Licence for production. This information has not been presented as it has little bearing on the care and maintenance of the tailings pond or diversion ditches.

37. The tailings pond is an existing structure. It has been inspected on an annual basis in 2007 and 2008 by EBA Engineering Consultants Ltd. These reports have been provided to the Water Board in the annual reports for Water Licence QZ04-063. In 2008 a toe berm was constructed along the north tailings dam as per a recommendation in the 2007 annual inspection report.

A copy of the most recent (2008) inspection by EBA is attached.

40. The tailings pond has been lowered to improve dam safety and reduce the potential that tailings pond water would be released through the emergency spillway. The current plans are to maintain the tailings pond at or below 1309 m a.s.l., which is approximately 2.5 m below the spillway invert elevation.

There is also a water treatment plant at the site that could be used to treat arsenic concentrations in water pumped from the tailings pond if that were required.

42. Water sampling and monthly reporting of analytical data is continuing following the conditions set out in Water Licence QZ04-063.

That Water License set discharge standards for seepage at KR04N3 and KR05S2, and pumped discharge from KR09A (see Figure 2). The 2009 analytical results for total arsenic, copper, cyanide, lead, nickel, zinc, total suspended solids and ammonia are summarized in Tables 3, 7, 8, 10, 12 and 17 which are copied from the 2009 annual report and provided here for ease of reference. They indicate that the water discharged from KR04N3, KR05S2 and KR09A did not exceed maximum concentrations in a grab sample allowed by the Water Licence.

The only exception to this was for total suspended solids. This parameter exceeded twice, once at KR04N3 (65 mg/L) and once at KR05S2 (17 mg/L). These results were inconsistent with preceding and subsequent results. The highest 2009 concentration otherwise at KR04N3 was 5 mg/L, and at KR05S2 was 2 mg/L. The frequency and concentration differences indicate that the two results above the Water Licence standard may be anomalies; possibly due to sampling error. Furthermore, the total suspended solid concentrations upstream of those exceedances (at locations KR04N2 and KR05S1) on the same sampling dates were both 2 mg/L.

96-hour LC50 bioassay testing using Rainbow Trout have been performed on tailings pond water. No bioassay tests were conducted in 2009. However, in July of 2007 and June 2008 water samples

were collected from the tailings pond and submitted for a 96 hr Rainbow Trout LC50 test. Results from both tests indicated 100% survival after >96 hrs. Given that metals concentrations in the bioassay samples are consistent with concentrations observed in 2009 samples, EBA has no reason to believe bioassay results would have changed in 2009.

43. Previous reports (Northern Natural Resources Ltd, 1977; BC Research, 1986; Godin and Mackenzie-Grieve, 1984; Norecol, 1986; Osborne, 1991 & Fisheries and Oceans, 1991) indicated that fish species that may be or have been found within the study area include:

- Humpback whitefish (*Coregonus pidschian*)
- Broad whitefish (*Coregonun nasus*)
- Northern Pike (*Esox lucius*)
- Inconnu (*Stenodus leucichthys*)
- Least cisco (*Coregonus sardinella*)
- Long nosed sucker (*Catostomus catostomus*)
- Arctic grayling (*Thymallus arcticus*)
- Slimy sculpin (*Cottus cognatus*)
- Chinook salmon (*Oncorhynchus tshawytscha*)

According to these reports, fish use on the Ketza River system near the Cache Creek confluence was limited and had low productivity. Cache Creek was assumed to be even less likely to support fish because of steeper gradients and limited fish cover. Little spawning, rearing, over wintering and holding/feeding habitat was found in Cache Creek. The majority of fish found in the Cache Creek system were slimy sculpin and arctic grayling.

A 2007 study of the Cache Creek Watershed by Environmental Dynamics generally supported these results and the concept that this watershed has generally low fisheries productivity. Results of fisheries sampling in this study suggested that lower Cache Creek provides some year-round habitat for slimy sculpin, and that spring/summer seasonal rearing habitat for Arctic grayling is most suitable in Cache Creek upstream of Peel or Oxo Creeks. The lower reaches were found to be generally unsuitable, and limited over-wintering habitat was observed. The authors speculated that most Arctic grayling in the system likely return annually to the main stem of the Ketza River to over winter. No evidence of juvenile Chinook salmon was observed during these 2007 studies.

In 2008, EBA undertook aquatics studies comprised of periphyton presence, abundance, and characteristics; and collection of benthic macroinvertebrate data at eight sampling stations that included Cache Creek and a tributary thereof, Oxo Creek, Peel Creek, and the Ketza River.

EBA's periphyton analysis revealed moderate periphyton density and productivity in the central and upper reaches of Cache Creek. Oxo Creek (also in the upper Cache drainage) was determined to have low productivity despite having an abundant benthic community. Lower Cache Creek had the

lowest periphyton density and productivity of all site sampled during the 2007 program. Both Ketza River sites were determined to have moderate relative productivities.

EBA's benthic invertebrate analysis in August 2007 revealed local benthic communities to be generally representative of unproductive alpine aquatic ecosystems, with isolated effects from local development or geology. Results indicated that Cache Creek near the site and Oxo Creek had abundances and diversity most indicative of uninfluenced environments. Peel Creek and sites influenced by lower Cache Creek showed signs of negative influences from water quality, sediments, or other effects. The overall trends suggested that local influences may have played a role in the state of the Cache Creek and Ketza River systems at that time. Local productivity and the aquatic ecosystem health appeared to be below the potential for such alpine/subalpine systems.

44. There are no anticipated negative effects on fish from the project. It is expected that maintaining the tailings pond at the proposed elevation of 1309 m a.s.l. and continuing to operate under conditions of the previous water licence will actually improve water quality, over time, by limiting contact with existing tailings.

45. There are no new construction activities planned and no changes to any water courses; no loss of fish habitat is expected due to the project.

46. The site is within the active mine area of the Ketza River Mine. Access to the area is restricted and hunting is not allowed. A wildlife study is underway as part of the baseline work for production permitting. Initial observations indicate that larger wildlife species are generally avoiding the area although occasional sightings of moose have been reported near the tailings pond.

47. There are no anticipated impacts on wildlife resources due to the planned project activities.

48. There are no new construction activities planned for the project that are expected to affect plant cover or topsoil.

49. The potential effects on water quality would be increased concentrations of arsenic in Cache Creek downstream of the tailings pond. As discussed in the 2009 annual report to the Water Board it appears that concentrations of arsenic have decreased with lowering of the tailings pond water due to reduced contact with the tailings. Maintenance of the tailings pond at or below the proposed elevation of 1309 m a.s.l. should continue to assist in reducing arsenic mobilization from the tailings.

Changes in water quantity are not anticipated as no water is being withdrawn from existing water courses as part of this project. Some deposit of tailings pond water is anticipated into Cache Creek as part of the project in order to maintain the desired tailings pond elevation. The pumping volume is typically in the range of 10 L/sec which generally accounts for less than one percent of flow in Cache Creek at the discharge point.

58. The proposed water quality monitoring program is a continuation of the program established by Water Licence QZ04-063. The frequency of sampling is provided in the following Table 1. Sampling locations are indicated in Figures 2 to 4, attached.

TABLE 1: WATER QUALITY MONITORING PROGRAM DURING CARE AND MAINTENANCE		
Location Identifier	Sample Logic	Sampling Schedule
Surface Water		
KR-1	Water quality in Cache Creek upstream of tailings pond	Monthly
KR-4N2	Seepage water quality below tailings dam	Bi-weekly
KR-4N3	Surface discharge to Cache Creek	Bi-weekly
KR-5(S1)	Seepage water quality below tailings dam	Bi-weekly
KR-5(S2)	Surface discharge to Cache Creek	Bi-weekly
KR-8	Water quality in Cache Creek downstream of tailings pond	Monthly
KR-9	Tailings water quality	Bi-weekly
KR-9A	End of pipe discharge from tailings pond	Weekly during discharge
KR-10	Water quality in Cache Creek upstream of confluence with Ketza River	Monthly
KR-11	Water quality in Ketza River upstream of Cache Creek confluence	Monthly
KR-12	Water quality in Ketza River downstream of Cache Creek confluence	Monthly
KR13	Water quality in Cache Creek upstream of tailings pond discharge pipe	Monthly
KR14	Water quality in Oxo Creek upstream of confluence with Cache Creek	Monthly
KR15	Water quality in Peel Creek upstream of confluence with Cache Creek	Monthly
KR16	Water quality in Cache Creek upstream of camp and mill facilities	Monthly
KR50	Water quality in Ketza River at Campbell Highway	Monthly
Groundwater		
P90-7A	Completed in dam	Monthly
P90-7B	Completed in bedrock	Monthly
P90-7C	Completed in native outwash gravels	Monthly
P90-8	Completed in native outwash gravels	Monthly
P90-9	Completed in native outwash gravels	Monthly
P96-11A	Completed in bedrock	Monthly
P96-11B	Completed in native outwash gravels	Monthly
P96-11C	Completed in dam	Monthly
P96-12A	Completed in bedrock	Monthly
P96-12B	Completed in native outwash gravels	Monthly
P96-12C	Completed in dam	Monthly

KRH is proposing to adhere to the standards imposed by the previous water licence (QZ04-063). These parameters and standards are presented in Table 2.

TABLE 2: PROPOSED WATER QUALITY STANDARDS FOR KR04 N3, KR05 S2, AND KR09A

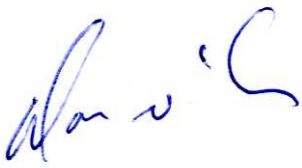
Parameter	Concentration for any Grab Sample
Total Suspended Solids	Not greater than 15 mg/L
pH	Not less than 6.5 pH units
Fish toxicity (KR09A only)	Non-toxic as determined by LC_{50} Bioassay
Total Arsenic	0.5 mg/L
Total Copper	0.3 mg/L
Total Cyanide	1.0 mg/L
Total Lead	0.2 mg/L
Total Nickel	0.5 mg/L
Total Zinc	0.5 mg/L
Total Ammonia (as N)	1.0 mg/L

We trust this information is sufficient for the purpose of the licence application. Should you have any questions or comments, please contact the undersigned at your convenience.

Respectfully submitted,
EBA Engineering Consultants Ltd.

Respectfully submitted,
EBA Engineering Consultants Ltd.

Prepared by:



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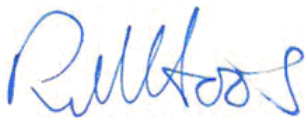

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Attachments:
Tables 3, 7, 8, 10, 12, 17, and Figures 1, 2, 3, and 4 from 2009 Annual Report for Water Licence QZ04-063
2008 Geotechnical Site Inspection, Ketza River Gold Mine, Yukon

Table 3: Total Arsenic (mg/L) at Water License locations

Site Type	Background (upstream of Tailings Pond)					Tailings Pond	Discharge	Seepage (downstream of Tailings Pond)											Potentially affected (downstream of Tailings Pond)				
Water body	Cache Creek			Oxo Creek	Peel Creek			* Groundwater							Surface Water				Cache Creek		Ketza River		
Date	KR16	KR01	KR13	KR14	KR15	KR09	KR09A	P07A	P07B	P08	P09	P12A	P12B	P12C	KR04N2	KR04N3	KR05S1	KR05S2	KR08	KR10	KR11	KR12	KR50
04/01/2009	0.017	0.0159	0.0121	0.0004	0.105	0.598			0.0171	0.553	0.0795	0.0253	2.67		0.118	0.029	0.443	0.0268	0.0091	0.0066	0.0003	0.0022	0.0002
19/01/2009						0.582									0.122	0.0278	0.547	0.0292					
02/02/2009	0.0152	0.0158	0.0104	0.0004	0.09	0.492			0.0066	0.0393	0.0207				0.127	0.0223	0.446	0.0203	0.0074	0.0044	0.0003	0.0018	0.0003
17/02/2009						0.646									0.0798	0.0235	0.671	0.0261					
02/03/2009	0.016	0.0162	0.0129	0.0005	0.117	0.67			0.0272	0.539	0.243				0.153	0.0263	0.725	0.0259	0.0083	0.0056	0.0002	0.0022	0.0002
19/03/2009						0.655									0.0708	0.0291	0.836	0.0205					
29/03/2009		0.0171	0.0126		0.131	0.732					0.0966				0.0693	0.0297	0.918	0.0294	0.0088	0.0049	0.0002	0.002	0.0002
27/04/2009	0.0166	0.0171			0.147	0.631					0.118				0.121	0.0337	0.698	0.0288	0.0089	0.0052	0.0003	0.0033	0.0004
25/05/2009		0.0158	0.0208	0.0004	0.0607										0.0309	0.201	0.285	0.228	0.0133	0.0102	0.0009	0.0044	0.0044
07/06/2009						0.277									0.0741	0.0263	0.485	0.245					
22/06/2009	0.0073	0.0126	0.192	0.0006	0.0346	0.393									0.0736	0.0267	0.408	0.117	0.0086	0.0081	0.0002	0.0037	0.0013
20/07/2009	0.0112	0.012	0.0119	0.0005	0.0579	0.454	0.446		0.0883						0.0741	0.0295	0.419	0.104	0.0134	0.0098	0.0002	0.0042	0.0005
18/08/2009	0.014	0.0096	0.0116	0.0011	0.069	0.436	0.422		0.022	0.0251	0.109	0.0185	2.41		0.0601	0.0309	0.375	0.104	0.0207	0.0123	0.001	0.0063	0.001
01/09/2009						0.487	0.486								0.0857	0.0315	0.414	0.112					
14/09/2009		0.0121	0.0122	0.0006	0.0566	0.529		0.0216	0.048	0.0379	0.0972	0.0144	2.13	0.0155	0.0848	0.0314	0.451	0.204	0.0111	0.0105	0.0004	0.0048	0.0009
28/09/2009						0.516									0.084	0.0289	0.434	0.127					
13/10/2009	0.0131	0.0145	0.0116	0.0006	0.077			0.419	0.0515	0.348	0.156	0.0244	1.74	0.0165	0.0882	0.0317	0.0346	0.121	0.0108	0.0049	0.0004	0.0022	0.0005
28/10/2009						0.638									0.0854	0.0317	0.125	0.0383					
09/11/2009	0.0148	0.0151	0.0186	0.0006	0.0907	0.525			0.0141	0.105	0.0676	0.008	1.5	0.148	0.0914	0.0331	0.205	0.0315	0.0115	0.0091	0.0003	0.0038	0.0003
22/11/2009						0.534									0.0877	0.0332	0.131	0.0344					
Water Licence Standard	NC	NC	NC	NC	NC	NC	0.5	NC	NC	NC	NC	NC	NC	NC	NC	0.5	NC	0.5	NC	NC	NC	NC	NC
CCME AL	0.005	0.005	0.005	0.005	0.005	NC	NC	0.05	0.05	0.05	0.05	0.05	0.05	0.05	NC	NC	NC	NC	0.005	0.005	0.005	0.005	0.005

Blank Cell indicates no data

Highlighted cell indicates exceedance of CCME Aquatic Life criteria (CCME AL)

* CCME standards were multiplied by 10 to interpret groundwater results as is industry practice.

Units are in mg/L

NC indicates no applicable standard or criteria

Note that CCME guidelines are included for comparison reasons only.

Table 7: Total Copper (mg/L) at Water License locations

Site Type	Background (upstream of Tailings Pond)					Tailings Pond	Discharge	Seepage (downstream of Tailings Pond)											Potentially affected (downstream of Tailings Pond)				
Water body	Cache Creek			Oxo Creek	Peel Creek			* Groundwater							Surface Water				Cache Creek		Ketza River		
Date	KR16	KR01	KR13	KR14	KR15	KR09	KR09A	P07A	P07B	P08	P09	P12A	P12B	P12C	KR04N2	KR04N3	KR05S1	KR05S2	KR08	KR10	KR11	KR12	KR50
04/01/2009	0.001	0.001	0.001	0.001	0.015	0.001			0.005	0.071	0.021	0.018	0.002		0.004	0.002	0.008	0.001	0.001	0.002	0.001	0.007	0.001
19/01/2009						0.001									0.004	0.001	0.008	0.001					
02/02/2009	0.001	0.001	0.001	0.001	0.012	0.001			0.001	0.004	0.004				0.004	0.001	0.004	0.001	0.001	0.001	0.001	0.001	0.001
17/02/2009						0.001									0.003	0.001	0.005	0.001					
02/03/2009	0.001	0.001	0.001	0.001	0.015	0.001			0.004	0.073	0.059				0.005	0.001	0.003	0.001	0.001	0.001	0.001	0.001	0.001
19/03/2009						0.001									0.002	0.001	0.002	0.001					
29/03/2009		0.001	0.001		0.016	0.001					0.027				0.002	0.003	0.002	0.001	0.001	0.001	0.001	0.001	0.001
27/04/2009	0.001	0.001			0.02	0.001					0.021				0.005	0.001	0.004	0.001	0.001	0.001	0.001	0.001	0.001
25/05/2009		0.001	0.001	0.001	0.005										0.002	0.007	0.001	0.001	0.001	0.002	0.001	0.002	0.004
07/06/2009						0.001									0.003	0.001	0.001	0.001					
22/06/2009	0.001	0.001	0.001	0.001	0.003	0.001									0.004	0.001	0.001	0.001	0.001	0.004	0.001	0.002	0.001
20/07/2009	0.001	0.001	0.001	0.001	0.005	0.001	0.001		0.007						0.003	0.001	0.001	0.001	0.001	0.004	0.001	0.002	0.001
18/08/2009	0.001	0.001	0.001	0.001	0.007	0.001	0.001		0.002	0.002	0.006	0.002	0.002		0.002	0.002	0.001	0.001	0.001	0.004	0.001	0.002	0.001
01/09/2009						0.001	0.001								0.004	0.001	0.001	0.001					
14/09/2009		0.001	0.001	0.001	0.005	0.001		0.001	0.003	0.003	0.004	0.001	0.002	0.016	0.003	0.001	0.001	0.001	0.001	0.005	0.001	0.002	0.001
28/09/2009						0.001									0.003	0.001	0.001	0.001					
13/10/2009	0.001	0.001	0.001	0.001	0.007			0.054	0.006	0.04	0.019	0.003	0.001	0.024	0.004	0.001	0.003	0.002	0.001	0.001	0.001	0.001	0.001
28/10/2009						0.001									0.003	0.001	0.002	0.001					
09/11/2009	0.001	0.001	0.001	0.001	0.011	0.001			0.001	0.015	0.007	0.001	0.003	0.075	0.004	0.001	0.002	0.001	0.001	0.003	0.001	0.001	0.001
22/11/2009						0.001									0.003	0.001	0.002	0.001					
Water Licence Standard	NC	NC	NC	NC	NC	NC	0.3	NC	NC	NC	NC	NC	NC	NC	NC	0.3	NC	0.3	NC	NC	NC	NC	NC
CCME AL	0.003	0.003	0.003	0.003	0.003	NC	NC	0.03	0.03	0.03	0.03	0.03	0.03	0.03	NC	NC	NC	NC	0.003	0.003	0.003	0.003	0.003

Blank Cell indicates no data

Highlighted cell indicates exceedance of CCME Aquatic Life criteria (CCME AL) (site specific criteria using the lowest hardness concentration found on site (137 mg/L at KR05S1 on May 11, 2009).

* CCME standards were multiplied by 10 to interpret groundwater results as is industry practice.

Units are in mg/L

NC indicates no applicable standard or criteria

Note that CCME guidelines are included for comparison reasons only.

Table 8: Total Cyanide (mg/L) at Water License locations

Site Type	Background (upstream of Tailings Pond)					Tailings Pond	Discharge	Seepage (downstream of Tailings Pond)											Potentially affected (downstream of Tailings Pond)				
Water body	Cache Creek			Oxo Creek	Peel Creek			* Groundwater							Surface Water				Cache Creek		Ketza River		
Date	KR16	KR01	KR13	KR14	KR15	KR09	KR09A	P07A	P07B	P08	P09	P12A	P12B	P12C	KR04N2	KR04N3	KR05S1	KR05S2	KR08	KR10	KR11	KR12	KR50
04/01/2009	0.001	0.001	0.001	0.001	0.001	0.001			0.008	0.011	0.02	0.004	0.039		0.005	0.004	0.003	0.005	0.001	0.001	0.001	0.001	0.001
19/01/2009						0.001									0.004	0.003	0.002	0.002					
02/02/2009	0.001	0.001	0.001	0.001	0.001	0.001			0.007	0.01	0.012				0.004	0.003	0.003	0.004	0.001	0.001	0.001	0.001	0.001
17/02/2009						0.001									0.003	0.003	0.003	0.007					
02/03/2009	0.001	0.001	0.001	0.001	0.001	0.001			0.007	0.4	0.004				0.004	0.003	0.004	0.005	0.001	0.001	0.001	0.001	0.001
19/03/2009						0.001									0.004	0.006	0.005	0.004					
29/03/2009		0.001	0.001		0.001	0.003					0.014				0.004	0.003	0.005	0.005	0.001	0.001	0.001	0.001	0.001
27/04/2009	0.001	0.001			0.001	0.005					0.014				0.004	0.003	0.006	0.006	0.001	0.001	0.001	0.001	0.001
25/05/2009		0.001	0.001	0.001	0.001										0.002	0.002	0.007	0.004	0.001	0.001	0.001	0.001	0.001
07/06/2009						0.001									0.005	0.003	0.004	0.002					
22/06/2009	0.001	0.001	0.001	0.003	0.001	0.001									0.005	0.003	0.005	0.001	0.001	0.001	0.001	0.001	0.001
20/07/2009	0.002	0.002	0.002	0.002	0.002	0.001	0.001		0.006						0.006	0.003	0.006	0.002	0.001	0.002	0.001	0.001	0.001
18/08/2009	0.001	0.001	0.001	0.001	0.001	0.001	0.001		0.006	0.015	0.063	0.003	0.038		0.005	0.004	0.008	0.003	0.001	0.001	0.001	0.001	0.003
01/09/2009						0.001	0.001								0.007	0.003	0.005	0.002					
14/09/2009		0.001	0.001	0.001	0.001	0.001		0.001	0.005	0.013	0.052	0.002	0.02		0.006	0.003	0.006	0.002	0.001	0.001	0.001	0.001	0.001
28/09/2009						0.001									0.006	0.004	0.005	0.002					
13/10/2009	0.001	0.001	0.001	0.001	0.001			0.002	0.005	0.013	0.06	0.003	0.014	0.001	0.017	0.005	0.006	0.001	0.001	0.001	0.001	0.001	0.001
28/10/2009						0.001									0.006	0.005	0.007	0.004					
09/11/2009	0.001	0.001	0.001	0.001	0.001	0.001			0.004	0.011	0.048	0.002	0.011		0.006	0.005	0.004	0.003	0.002	0.001	0.001	0.001	0.001
22/11/2009						0.001									0.006	0.005	0.006	0.004					
Water Licence Standard	NC	NC	NC	NC	NC	NC	1	NC	NC	NC	NC	NC	NC	NC	NC	1	NC	1	NC	NC	NC	NC	NC
CCME AL	0.005	0.005	0.005	0.005	0.005	NC	NC	0.05	0.05	0.05	0.05	0.05	0.05	0.05	NC	NC	NC	NC	0.005	0.005	0.005	0.005	0.005

Blank Cell indicates no data

Highlighted cell indicates exceedance of CCME Aquatic Life criteria (CCME AL) for free cyanide. Data in table is for total cyanide.

* CCME standards were multiplied by 10 to interpret groundwater results as is industry practice.

Units are in mg/L

NC indicates no applicable standard or criteria

Note that CCME guidelines are included for comparison reasons only.

Table 10: Total Lead (mg/L) at Water License locations

Site Type	Background (upstream of Tailings Pond)					Tailings Pond	Discharge	Seepage (downstream of Tailings Pond)											Potentially affected (downstream of Tailings Pond)				
Water body	Cache Creek			Oxo Creek	Peel Creek			* Groundwater							Surface Water				Cache Creek		Ketza River		
Date	KR16	KR01	KR13	KR14	KR15	KR09	KR09A	P07A	P07B	P08	P09	P12A	P12B	P12C	KR04N2	KR04N3	KR05S1	KR05S2	KR08	KR10	KR11	KR12	KR50
04/01/2009	0.0002	0.0002	0.0001	0.0002	0.0001	0.0002			0.0006	0.0314	0.0045	0.0019	0.0003		0.0002	0.0002	0.0001	0.0001	0.0001	0.0004	0.0001	0.0002	0.0002
19/01/2009						0.0001									0.0003	0.0001	0.0002	0.0001					
02/02/2009	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001			0.0001	0.0022	0.0011				0.0027	0.0001	0.0001	0.0001	0.0001	0.0002	0.0001	0.0002	0.0001
17/02/2009						0.0001									0.0004	0.0001	0.0005	0.0001					
02/03/2009	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001			0.0011	0.042	0.014				0.0006	0.0001	0.0001	0.0001	0.0001	0.0002	0.0001	0.0001	0.0001
19/03/2009						0.0004									0.0002	0.0001	0.0001	0.0001					
29/03/2009		0.0003	0.0001		0.0001	0.0001					0.0062				0.0002	0.0001	0.0001	0.0001	0.0001	0.0002	0.0001	0.0001	0.0001
27/04/2009	0.0001	0.0001			0.0001	0.0001					0.0056				0.0009	0.0001	0.0003	0.0001	0.0001	0.0003	0.0002	0.0004	0.0002
25/05/2009		0.0001	0.0002	0.0002	0.0002										0.0003	0.0029	0.0001	0.0001	0.0007	0.0015	0.0017	0.0018	0.0035
07/06/2009						0.0001									0.0001	0.0001	0.0001	0.0001					
22/06/2009	0.0001	0.0001	0.0001	0.0009	0.0001	0.0001									0.0001	0.0001	0.0001	0.0001	0.0001	0.0028	0.0002	0.0002	0.0006
20/07/2009	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001		0.0018						0.0001	0.0001	0.0001	0.0001	0.0001	0.0002	0.0001	0.0002	0.0001
18/08/2009	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001		0.0006	0.001	0.0018	0.0008	0.0005		0.0001	0.0001	0.0001	0.0001	0.0001	0.0002	0.0001	0.0002	0.0001
01/09/2009						0.0001	0.0001								0.0001	0.0001	0.0001	0.0001					
14/09/2009		0.0001	0.0001	0.0001	0.0001	0.0001		0.0005	0.0012	0.0022	0.001	0.0004	0.0006	0.0015	0.0001	0.0001	0.0006	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001
28/09/2009						0.0001									0.0005	0.0001	0.0001	0.0001					
13/10/2009	0.0001	0.0001	0.0001	0.0001	0.0001			0.046	0.0016	0.029	0.0056	0.0012	0.0002	0.0035	0.0003	0.0001	0.0005	0.0007	0.0002	0.0005	0.0002	0.0004	0.0002
28/10/2009						0.0001									0.0001	0.0001	0.0001	0.0001					
09/11/2009	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001			0.0004	0.0081	0.0014	0.0001	0.0001	0.034	0.0001	0.0001	0.0001	0.0001	0.0001	0.0003	0.0001	0.0002	0.0001
22/11/2009						0.0001									0.0001	0.0001	0.0001	0.0001					
Water Licence Standard	NC	NC	NC	NC	NC	NC	0.2	NC	NC	NC	NC	NC	NC	NC	NC	0.2	NC	0.2	NC	NC	NC	NC	NC
CCME AL	0.004	0.004	0.004	0.004	0.004	NC	NC	0.04	0.04	0.04	0.04	0.04	0.04	0.04	NC	NC	NC	NC	0.004	0.004	0.004	0.004	0.004

Blank Cell indicates no data

Highlighted cell indicates exceedance of CCME Aquatic Life criteria (CCME AL) (site specific criteria calculated using the lowest hardness concentration found on site (137 mg/L at KR05S1 on May 11, 2009).

* CCME standards were multiplied by 10 to interpret groundwater results as is industry practice.

Units are in mg/L

NC indicates no applicable standard or criteria

Note that CCME guidelines are included for comparison reasons only.

Table 12: Total Nickel (mg/L) at Water Licence locations

Site Type	Background (upstream of Tailings Pond)					Tailings Pond	Discharge	Seepage (downstream of Tailings Pond)											Potentially affected (downstream of Tailings Pond)				
Water body	Cache Creek			Oxo Creek	Peel Creek			* Groundwater							Surface Water				Cache Creek		Ketza River		
Date	KR16	KR01	KR13	KR14	KR15	KR09	KR09A	P07A	P07B	P08	P09	P12A	P12B	P12C	KR04N2	KR04N3	KR05S1	KR05S2	KR08	KR10	KR11	KR12	KR50
04/01/2009	0.0005	0.0005	0.0005	0.001	0.0188	0.0006			0.0014	0.0493	0.0039	0.0098	0.0005		0.0015	0.0012	0.0008	0.0005	0.0005	0.0044	0.0005	0.0005	0.0015
19/01/2009						0.0006									0.0017	0.0012	0.004	0.0006					
02/02/2009	0.001	0.001	0.001	0.001	0.021	0.001			0.001	0.003	0.002				0.002	0.001	0.003	0.001	0.001	0.005	0.001	0.002	0.002
17/02/2009						0.001									0.002	0.001	0.003	0.001					
02/03/2009	0.001	0.001	0.001	0.001	0.026	0.001			0.002	0.05	0.01				0.002	0.001	0.002	0.001	0.001	0.004	0.001	0.002	0.002
19/03/2009						0.001									0.001	0.001	0.002	0.001					
29/03/2009		0.001	0.001		0.03	0.001					0.007				0.001	0.001	0.002	0.001	0.001	0.004	0.001	0.001	0.002
27/04/2009	0.001	0.001			0.031	0.001					0.006				0.002	0.001	0.002	0.001	0.001	0.004	0.001	0.002	0.002
25/05/2009		0.001	0.001	0.003	0.007		0.002								0.002	0.004	0.002	0.001		0.004	0.002	0.005	0.008
07/06/2009						0.001									0.002	0.001	0.001	0.001					
22/06/2009	0.001	0.001	0.001	0.002	0.008	0.001									0.002	0.002	0.001	0.001	0.001	0.01	0.001	0.005	0.004
20/07/2009	0.001	0.001	0.001	0.002	0.01	0.001	0.001		0.002						0.002	0.002	0.001	0.001	0.001	0.011	0.001	0.004	0.003
18/08/2009	0.001	0.001	0.001	0.001	0.013	0.001	0.001		0.002	0.002	0.003	0.01	0.003		0.002	0.002	0.001	0.001	0.001	0.008	0.001	0.005	0.003
01/09/2009						0.002	0.002								0.003	0.003	0.002	0.001					
14/09/2009		0.002	0.002	0.003	0.011	0.002		0.01	0.003	0.004	0.003	0.01	0.004	0.005	0.003	0.003	0.002	0.002	0.002	0.013	0.001	0.007	0.004
28/09/2009						0.002									0.003	0.003	0.002	0.002					
13/10/2009	0.001	0.002	0.002	0.002	0.012			0.03	0.004	0.03	0.006	0.011	0.004	0.009	0.003	0.003	0.005	0.002	0.002	0.005	0.001	0.003	0.003
28/10/2009						0.001									0.002	0.003	0.002	0.001					
09/11/2009	0.002	0.002	0.003	0.004	0.02	0.003			0.004	0.013	0.005	0.013	0.005	0.04	0.005	0.005	0.004	0.003	0.003	0.012	0.002	0.006	0.004
22/11/2009						0.002									0.003	0.003	0.003	0.001					
Water Licence Standard	NC	NC	NC	NC	NC	NC	0.5	NC	NC	NC	NC	NC	NC	NC	NC	0.5	NC	0.5	NC	NC	NC	NC	NC
CCME AL	0.11	0.11	0.11	0.11	0.11	NC	NC	1.1	1.1	1.1	1.1	1.1	1.1	1.1	NC	NC	NC	NC	0.11	0.11	0.11	0.11	0.11

Blank Cell indicates no data

Highlighted cell indicates exceedance of CCME Aquatic Life criteria (CCME AL) (site specific criteria using the lowest hardness concentration found on site (137 mg/L at KR05S1 on May 11, 2009).

* CCME standards were multiplied by 10 to interpret groundwater results as is industry practice.

Units are in mg/L

NC indicates no applicable standard or criteria

Note that CCME guidelines are included for comparison reasons only.

Table 17: Total Zinc (mg/L) at Water Licence locations

Site Type	Background (upstream of Tailings Pond)					Tailings Pond	Discharge	Seepage (downstream of Tailings Pond)											Potentially affected (downstream of Tailings Pond)				
Water body	Cache Creek			Oxo Creek	Peel Creek			* Groundwater							Surface Water				Cache Creek		Ketza River		
Date	KR16	KR01	KR13	KR14	KR15	KR09	KR09A	P07A	P07B	P08	P09	P12A	P12B	P12C	KR04N2	KR04N3	KR05S1	KR05S2	KR08	KR10	KR11	KR12	KR50
04/01/2009	0.008	0.007	0.007	0.008	0.093	0.008			0.014	0.152	0.028	0.02	0.009		0.007	0.011	0.021	0.008	0.006	0.031	0.009	0.014	0.013
19/01/2009						0.009									0.004	0.005	0.012	0.004					
02/02/2009	0.005	0.008	0.006	0.004	0.09	0.017			0.006	0.011	0.005				0.007	0.005	0.005	0.004	0.005	0.018	0.008	0.008	0.009
17/02/2009						0.004									0.006	0.011	0.013	0.01					
02/03/2009	0.007	0.007	0.006	0.011	0.11	0.006			0.015	0.13	0.04				0.005	0.006	0.012	0.012	0.009	0.023	0.009	0.009	0.015
19/03/2009						0.01									0.005	0.004	0.007	0.007					
29/03/2009		0.002	0.004		0.127	0.003					0.018				0.005	0.003	0.004	0.004	0.002	0.018	0.002	0.006	0.01
27/04/2009	0.013	0.008			0.141	0.015					0.019				0.006	0.008	0.015	0.006	0.01	0.023	0.008	0.012	0.013
25/05/2009		0.017	0.007	0.013	0.03										0.009	0.013	0.007	0.006	0.008	0.022	0.011	0.017	0.054
07/06/2009						0.005									0.004	0.005	0.007	0.007					
22/06/2009	0.002	0.002	0.001	0.004	0.022	0.002									0.001	0.002	0.003	0.002	0.001	0.022	0.005	0.001	0.019
20/07/2009	0.001	0.008	0.001	0.004	0.034	0.001	0.001		0.016						0.005	0.004	0.004	0.001	0.004	0.025	0.004	0.01	0.011
18/08/2009	0.002	0.008	0.003	0.009	0.048	0.002	0.004		0.009	0.015	0.009	0.007	0.009		0.003	0.007	0.004	0.005	0.014	0.027	0.004	0.016	0.016
01/09/2009						0.004	0.006								0.003	0.005	0.005	0.004					
14/09/2009		0.008	0.003	0.006	0.032	0.002		0.005	0.007	0.006	0.004	0.002	0.004	0.036	0.004	0.004	0.008	0.007	0.004	0.031	0.003	0.019	0.014
28/09/2009						0.003									0.004	0.006	0.003	0.005					
13/10/2009	0.003	0.003	0.004	0.004	0.048			0.11	0.014	0.14	0.024	0.01	0.003	0.047	0.003	0.003	0.006	0.005	0.006	0.012	0.006	0.016	0.007
28/10/2009						0.002									0.002	0.003	0.004	0.002					
09/11/2009	0.003	0.005	0.005	0.003	0.062	0.004			0.007	0.021	0.007	0.004	0.002	0.14	0.008	0.009	0.01	0.012	0.009	0.03	0.007	0.013	0.012
22/11/2009						0.005									0.006	0.008	0.013	0.007					
Water Licence Standard	NC	NC	NC	NC	NC	NC	0.5	NC	NC	NC	NC	NC	NC	NC	NC	0.5	NC	0.5	NC	NC	NC	NC	NC
CCME AL	0.03	0.03	0.03	0.03	0.03	NC	NC	0.3	0.3	0.3	0.3	0.3	0.3	0.3	NC	NC	NC	NC	0.03	0.03	0.03	0.03	0.03

Blank Cell indicates no data

Highlighted cell indicates exceedance of CCME Aquatic Life criteria (CCME AL) for long term exposure

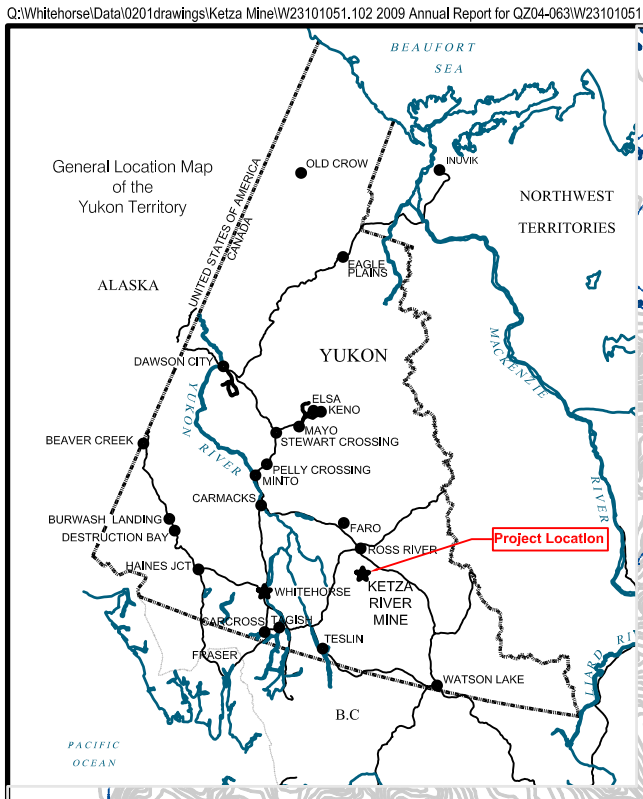
* CCME standards were multiplied by 10 to interpret groundwater results as is industry practice.

Units are in mg/L

NC indicates no applicable standard or criteria

Note that CCME guidelines are included for comparison reasons only.

Q:\Whitehorse\Data\0201drawings\Ketza Mine\W23101051.102 2009 Annual Report for QZ04-063\W23101051.102 Figures 1,4.dwg [FIGURE 1] February 23, 2010 - 1:43:53 pm (BY: KEN TOMCZYK)



Robert Campbell Highway

Bruce Lake

Ketza River

Mount Green

Clouter Creek

Ketza River

S T C Y R

R A N G E

(PELLY MOUNTAINS)

Ketza River

Airfield

Cache Creek

TAILINGS POND

KETZA CAMP

TARN LAKE

Oro Creek

ISSUED FOR USE

0 50 000

Scale: 1: 100 000 (metres)

CLIENT

Ketza River Holdings

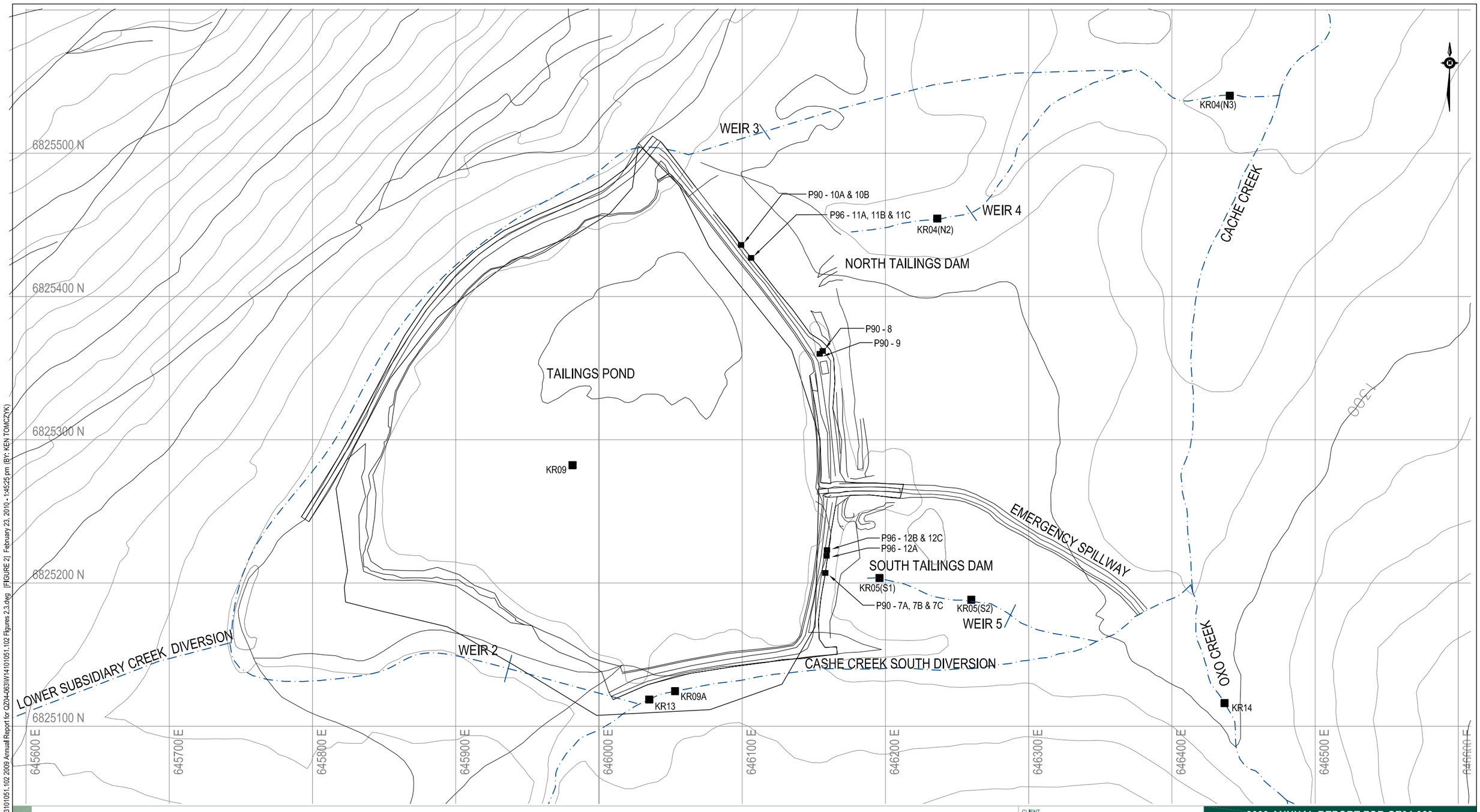
2009 ANNUAL REPORT FOR QZ04-063
KETZA RIVER MINE, YUKON

SITE PLAN

EBA Engineering Consultants Ltd.

PROJECT NO.	DWN	CKD	REV
W23101051.102	KJT	DJW	0
OFFICE: EBA-WHSE	DATE: February 23, 2010		

Figure 1



Q:\Whitehorse\Data\0201drawings\Ketza Mine\W23101051.102 2009 Annual Report for QZ04-063\W14101051.102 Figures 2,3.dwg [FIGURE 2] February 23, 2010 - 1:45:25 pm (BY: KEN TOMCZYK)

LEGEND

- ROADWAY
- WATERCOURSE
- WATER QUALITY SAMPLING STATION

0 100

Scale: 1: 2 500 (metres)

ISSUED FOR USE

CLIENT

Ketza River Holdings

2009 ANNUAL REPORT FOR QZ04-063
KETZA RIVER MINE, YUKON

PIEZOMETERS AND WATER SAMPLING STATIONS NEAR TAILINGS POND

EBA Engineering Consultants Ltd.

PROJECT NO.	DWN	CKD	REV
W23101051.102	KJT	DJW	0
OFFICE: WHSE	DATE: February 23, 2010		

Figure 2

PEEL CREEK

N 6 826 000

KR15

KR08

CACHE CREEK

4300

CACHE CREEK SOUTH DIVERSION

TAILINGS POND

KR13

KR14

KR16

LOWER SUBSIDIARY CREEK

N 6 825 000

5000

OXO CREEK

MILL & CAMP

CACHE CREEK

KR01

5000

E 644 000

E 645 000

E 646 000

E 647 000

LEGEND:

- CREEKS
- ROADS
- EXISTING WATER QUALITY STATIONS

0 1 000

Scale: 1: 30 000 (metres)

ISSUED FOR USE

CLIENT

Ketza River Holdings

2009 ANNUAL REPORT FOR QZ04-063 KETZA RIVER MINE, YUKON

CACHE CREEK WATER SAMPLING STATIONS

EBA Engineering Consultants Ltd.

PROJECT NO.	DWN	CKD	REV
W23101051.102	KJT	DJW	0

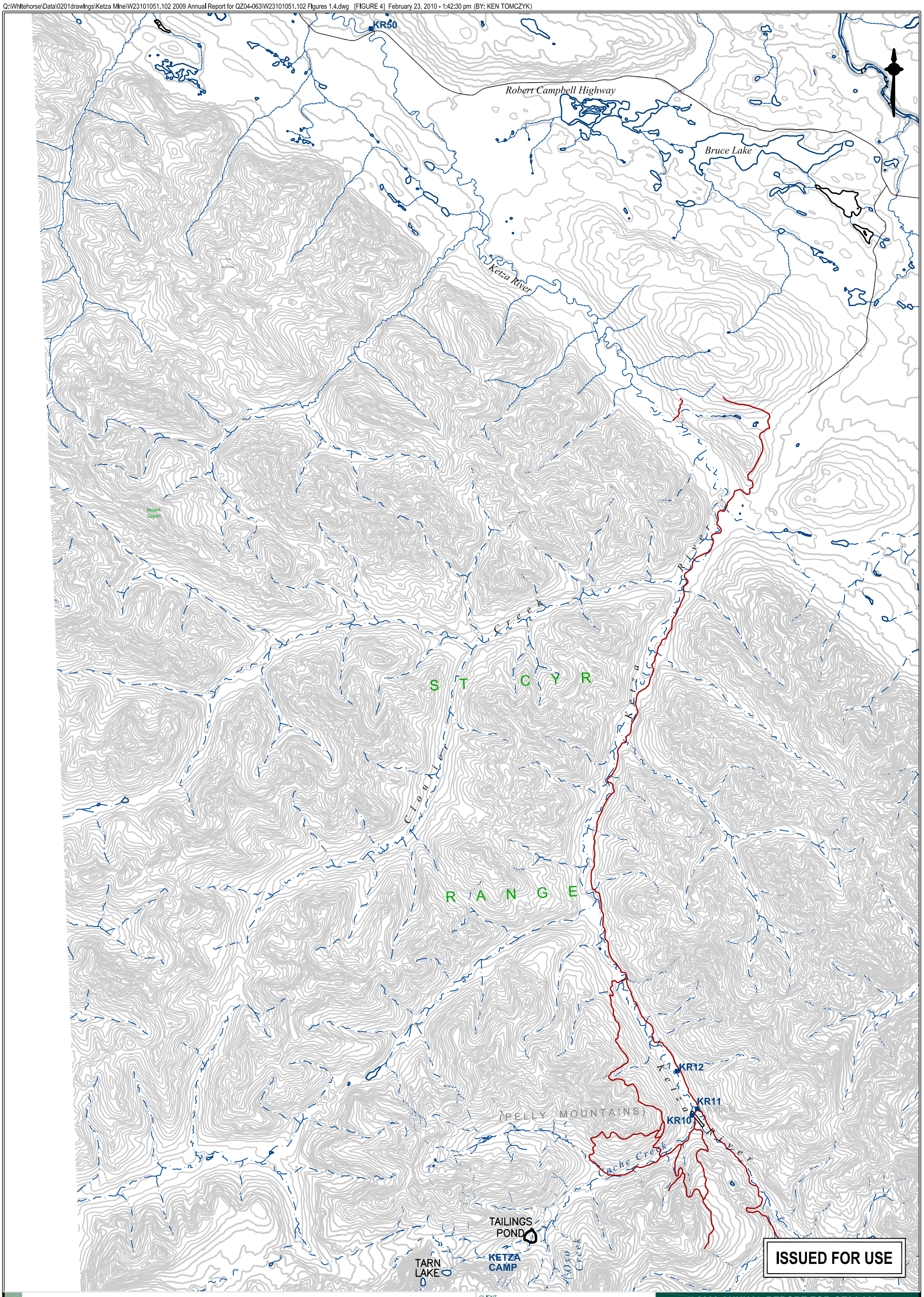
OFFICE: WHSE

DATE: February 23, 2010

Figure 3

Q:\Whitehorse\Data\0201drawings\Ketza Mine\W23101051.102.2009 Annual Report for QZ04-063\W14101051.102 Figures 2,3.dwg [FIGURE 3] February 23, 2010 - 1:46:17 pm (BY: KEN TOMCZYK)

Q:\Whitehorse\Data\0201drawings\Ketza Mine\W23101051.102 2009 Annual Report for QZ04-063\W23101051.102 Figures 1,4.dwg [FIGURE 4] February 23, 2010 - 1:42:30 pm (BY: KEN TOMCZYK)



0 50 000

Scale: 1: 100 000 (metres)

CLIENT

Ketza River Holdings

2009 ANNUAL REPORT FOR QZ04-063
KETZA RIVER MINE, YUKON

KETZA RIVER WATER SAMPLING STATIONS

EBA Engineering Consultants Ltd.

PROJECT NO.	DWN	CKD	REV
W23101051.102	KJT	DJW	0
OFFICE: EBA-WHSE	DATE: February 23, 2010		

Figure 4

Yukon-Nevada Gold Corp.

ISSUED FOR USE

2008 GEOTECHNICAL SITE INSPECTION
KETZA RIVER GOLD MINE, YUKON

W14101051

February 2010

EBA Engineering Consultants Ltd.
p. 867.668.3068 • f. 867.668.4349
Calcite Business Centre • Unit 6, 151 Industrial Road • Whitehorse, Yukon Y1A 2V3 • CANADA

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APPENDICES

1.0 INTRODUCTION

Yukon-Nevada Gold Corporation (YNG) retained EBA Engineering Consultants Ltd. (EBA) to conduct a geotechnical site inspection of the following structures at the Ketza River Gold Mine:

- South Tailings Dam
- North Tailings Dam
- Cache Creek Diversion
- Lower Subsidiary Creek Diversion
- Northwest Runoff Interceptor Ditch
- Break Zone Open Pit
- Ridge Zone Open Pit
- 1430 Portal
- 1510 Portal
- 1550 Portal

The location of the Ketza River Gold Mine is shown in Figures 1 and 2. The locations of the specific structures at the mine site are shown in Figure 3.

This report summarizes the observations and recommendations for each structure. Mr. Richard Trimble, P. Eng, and Mr. Christopher Dixon, P. Eng. of EBA conducted the last documented inspection on June 26, 2007 (EBA 2007).

2.0 METHOD OF INSPECTION

Mr. Christopher Dixon, P. Eng. and Mr. Christopher Gräpel, P. Eng. of EBA conducted the inspections on August 6, 2008. The structures and immediate surrounding areas at each site were visually examined for signs of settlement, seepage, cracking, and other indicators of distress. Noteworthy observations were photographed and recorded.

EBA also read the water levels in the accessible standpipe piezometers on the dams. The piezometer data is included in Appendix A.

3.0 SOUTH TAILINGS DAM

3.1 CONSTRUCTION ACTIVITIES

Weir 5 was reconstructed since the last inspection. It does not appear that any other construction activities have occurred at this site since the last documented site inspection. An overview of the dam is shown in Photo 1.

3.2 WATER LEVELS

The elevation of the tailings pond at the time of the inspection was approximately 3.5 m below the invert of the emergency spillway. Observations of the high water mark in the

facility indicate that the water level has dropped approximately 1.0 m recently. A plan of the dam is shown in Figure 4.

3.3 PIEZOMETERS

EBA was able to locate and take readings in the following ten standpipe piezometers/ monitoring wells:

- P89-4
- P89-5
- P89-6A
- P89-6B
- P90-7A
- P90-7B
- P90-7C
- P96-12A
- P96-12B
- P96-12C

EBA was not able to locate the standpipe piezometer/monitoring well P89-3, however data was provided by the YNG staff.

The collected water level data, up to and including the date of the inspection is included in Appendix A. The data from the last documented inspection is consistent with available historic data. Piezometer/monitoring well locations are shown in Figure 4.

3.4 STABILITY

The entire crest, downstream face, and emergency spillway were visually inspected. In general, the slopes and crest of the dam are in good condition. The emergency spillway is shown in Photo 2.

As mentioned in the 2007 the approximate D_{50} of the rip-rap amouring the emergency spillway is 75 mm. The rip-rap armour is sufficient for a flow rate up to 0.3 m^3/s, or a pond elevation of less than 0.25 m below the invert of the spillway. There is no record or visual indicators of the tailings pond elevation historically being above the spillway invert elevation.

Erosion of the spillway is not likely to cause instability to the structure as a whole; and the dam is considered stable in its present condition.

3.5 SEEPAGE

Seepage was observed along the downstream toe of the dam. The seepage has created a pond immediately downstream of the dam and upstream of a sharp-crested triangular notch weir (Weir 5) that was previously installed to monitor the seepage rate, as shown in Photo 3. The flow rate from a sharp-crested triangular notch weir can be determined using the following equation:

$$Q = C_{de}\frac{8}{15}\sqrt{2g}\tan\left(\frac{\phi}{2}\right)H_e^{5/2} \qquad (1)$$

Where: Q is the flow rate (m^3/s)

C_{de} is discharge coefficient = 0.578 for this weir

H_e is effective head = measured head + head correction of 1.5 mm (m)

ϕ is the notch angle (degrees) = 51 for this weir

At the time of inspection the measured head 90 mm which correlates to a flow rate of approximately 1.6 L/s.

3.6 RECOMMENDATIONS

Flow rates from Weir 5 should be collected and reviewed at least bi-weekly and piezometer/monitoring well water elevations should be collected and reviewed at least monthly, as is the current site practice. The rip-rap design should be reviewed to determine what return interval event would cause an erosion failure in the spillway. This event should be checked against the design flood event recommended by Canadian Dam Safety Guidelines for the consequence classification assigned to this structure.

4.0 NORTH TAILINGS DAM

4.1 CONSTRUCTION ACTIVITIES

Weir 4 was reconstructed since the last inspection. It does not appear that any other construction activities have occurred at this site since the last documented site inspection. An overview of the dam is shown in Photo 1.

4.2 WATER LEVELS

The elevation of the tailings pond at the time of the inspection was approximately 3.5 m below the invert of the emergency spillway. Observations of the high water mark in the facility indicate that the water level has dropped approximately 1.0 m recently. A plan of the dam is shown in Figure 4.

4.3 PIEZOMETERS

EBA was able to locate and take readings in the following seven standpipe piezometers/ monitoring wells:

- P90-8
- P90-9
- P90-10B
- P90-10C
- P96-11A
- P96-11B
- P96-11C

EBA was able to locate the standpipe piezometer P89-1, however the standpipe was blocked at 1.9 m below top of pipe and a reading was not obtained.

Piezometers P90-10A, P90-10B and P90-8 are all in need of repair. Also, there is approximately 80 mm of settlement beneath piezometers P90-8 and P90-9.

The collected water level data, up to and including the date of the inspection is included in Appendix A. The data from the last documented inspection is consistent with available historic data. Piezometer/monitoring well locations are shown in Figure 4.

4.4 STABILITY

The entire crest, downstream face and downstream toe were visually inspected. In general, the slopes and crest of the dam are in fair condition.

The tension crack observed in 2007 on or near the upstream crest of the dam did not appear to have changed over the year.

The soft area at the toe of the dam observed in 2007 was observed again during this inspection; and was approximately the same size as previously noted. In these seepage areas sand was present in areas of surfacing seepage water which could indicate some internal erosion (i.e. piping) of the fill or foundation soil. This area is shown in Photo 4 and in detail in Photo 5.

A minor bulge (less than 10 mm of deflection) in the upper third of the slope was noted during the inspection. It appears that this bulge has been present for quite some time; however, it has not been noted in previous inspections.

Erosion rills are present on the downstream slope of the dam.

4.5 SEEPAGE

Seepage was observed along the downstream toe of the dam. The seepage has created a pond immediately downstream of the dam and upstream of a sharp-crested triangular notch weir (Weir 4) that was previously installed to monitor the seepage rate, as shown in Photo 6. The flow rate from a sharp-crested triangular notch weir can be determined using equation (1). Weir 4 had a measured notch angle of 63 degrees, which correlates to a discharge coefficient of 0.575 and a head correction of 1.1 mm. At the time of inspection the measured head 105 mm, thus the flow rate was approximately 3.1 L/s.

4.6 RECOMMENDATIONS

Flow rates from Weir 4 should be collected and reviewed at least bi-weekly and piezometer/monitoring well water elevations should be collected and reviewed at least monthly, as in the current site practice.

Piezometers P90-10A, P90-10B and P90-8 should be repaired. The settlement or possible heave of instruments P90-8 and P90-9 should be monitored regularly. The collar of each

instrument should be surveyed with a rod and level four times a year (March, July, October and December) to identify when and if the instrument is moving.

A toe berm, as previously recommended and designed by EBA, should be constructed along the downstream toe of the dam to mitigate the potential for piping.

Settlement monuments should be installed on the crest, downstream slope and downstream toe of the dam. These monuments should be surveyed twice a year (March and September) to ensure that the bulge in the downstream slope of the dam isn't growing.

5.0 CACHE CREEK DIVERSION

5.1 CONSTRUCTION ACTIVITIES

It does not appear that any construction activities have occurred at this site since the last documented site inspection.

5.2 FLOWS AND CHANNEL DIMENSIONS

The channel is approximately 5 m wide and has 2H:1V side slopes. The flow in the channel is monitored at a weir constructed across the channel. The weir was not inspected during the site visit.

5.3 BANK AND CHANNEL STABILITY

The majority of the channel and banks are in good condition with sufficiently sized rip-rap for flows observed during the inspection. EBA noted two sections of instability, the locations of which are shown in Figure 4, Photo 7 and Photo 8. Both these areas were noted in the 2007 inspection.

The first section of instability, shown in Photo 7, is near the South Tailings Dam on the south side of the channel. The area was outlined as requiring remediation during the 2007 inspection and has a history of creep and instability. It is possible that the soil conditions consist of ice-rich permafrost that is degrading, resulting in creep and slope instability.

The second section of instability, shown in Photo 8, is near the confluence of the emergency spillway channel and is also where the South Tailings Dam seepage enters the creek diversion. The area of instability is on the south side of the channel near a bedrock outcrop. The instability seems to be caused by ongoing high water flow erosion.

5.4 RECOMMENDATIONS

The two areas of instability require remediation. This remediation should consist of placing a layer of nonwoven geotextile at least 5 m in all directions beyond the area of instability, and covering the nonwoven geotextile with adequately sized rip-rap to match the rest of the channel. The mitigation works for the second area of instability due to high water flow will require some grading work to flatten the slope prior to armouring.

6.0 LOWER SUBSIDIARY CREEK DIVERSION

6.1 CONSTRUCTION ACTIVITIES

It does not appear that any construction activities have occurred at this site since the last documented site inspection.

6.2 FLOW AND CHANNEL DIMENSIONS

The channel is approximately 2 m wide and has 2H:1V side slopes. The flow in channel is monitored at a weir constructed across the channel. The weir was not inspected during the site visit. There are twin 600 mm corrugated steel pipe (CSP) culverts where the creek diversion intersects with the Northwest Runoff Interceptor Ditch. There is also a 300 mm CSP culvert where the creek diversions flow into the Cache Creek Diversion.

6.3 BANK AND CHANNEL STABILITY

The channel and banks are in good condition with sufficiently sized rip-rap for the flows observed during the inspection.

6.4 RECOMMENDATIONS

The culverts along the channel should be checked each month to make sure they have not become blocked by debris or silt. Inspections should also be conducted daily in the spring during freshet to minimize the potential for overflow into the tailings pond. If seasonal freezing of these culverts continues to be an issue, the installation of heat tracing or steam pipes should be considered.

7.0 NORTHWEST INTERCEPTOR DITCH

7.1 CONSTRUCTION ACTIVITIES

It does not appear that any construction activities have occurred at this site since the last documented site inspection.

7.2 FLOW AND CHANNEL DIMENSIONS

The channel is approximately 1 m wide and has 1.5H:1V side slopes. There is a 600 mm CSP culvert where the creek diversion flows beneath the mine access road.

7.3 BANK AND CHANNEL STABILITY

The channel and banks are in good condition and should be able to convey flows observed during the inspection to Cache Creek, as designed.

7.4 RECOMMENDATIONS

The culvert along the channel should be checked each month to make sure they have not become blocked by debris or silt. Inspections should also be conducted daily in the spring

during freshet. It may be necessary to clear snow from the culvert inlet prior to or during spring freshet.

8.0 OPEN PITS AND PORTALS

8.1 BREAK ZONE OPEN PIT

The Break Zone Open Pit was inspected for water seepage and stability concerns. No seepage was observed and the area did not have any visual signs of instability.

8.2 RIDGE ZONE OPEN PIT

The Ridge Zone Open Pit was inspected for water seepage and stability concerns. No seepage was observed and the area did not have any visual signs of instability.

8.3 1430 PORTAL

The 1430 Portal was inspected for water seepage and stability concerns. There were no visual signs of instability. A small amount (estimated at less than 1 L/s) of seepage was observed exiting the portal at the time of inspection. The adit was plugged by massive ice and the seepage could be some of this ice melting and draining away.

8.4 1510 PORTAL

The 1510 Portal was inspected for water seepage and stability concerns. There were no visual signs of instability. A small amount (estimated at less than 1 L/s) of seepage water was observed behind the bulkhead at the portal entrance. The adit was plugged by massive ice and the seepage is likely some of this ice melting and draining away.

8.5 1550 PORTAL

The 1550 Portal was inspected for water seepage and stability concerns. No seepage was observed and there area did not have any visual signs of instability.

8.6 RECOMMENDATIONS

Monthly inspections of the Open Pits and Portals should be conducted by mine staff to monitor any visual signs of instability or water seepage. If the water seepage from the 1430 Portal continues, water quality samples should be collected and tested.

9.0 LIMITATIONS

This report and its contents are intended for the sole use of Yukon-Nevada Gold Corp. and their agents. EBA does not accept any responsibility for the accuracy of any of the data, the analysis or the recommendations contained or referenced in the report when the report is used or relied upon by any Party other than Yukon-Nevada Gold Corp., or for any Project other than the proposed development at the subject site. Any such unauthorized use of this report is at the sole risk of the user. Use of this report is subject to the terms and

conditions stated in EBA's Services Agreement. EBA's General Conditions are provided in Appendix B of this report.

10.0 CLOSURE

We trust this report meets your present requirements. Should you have any questions or comments, please contact the undersigned at your convenience.

Sincerely,
EBA Engineering Consultants Ltd.

PROFESSIONAL ENGINEER
YUKON TERRITORY
CHRISTOPHER J. DIXON
Feb 12/2010

PERMIT TO PRACTICE
EBA ENGINEERING CONSULTANTS LTD.
SIGNATURE
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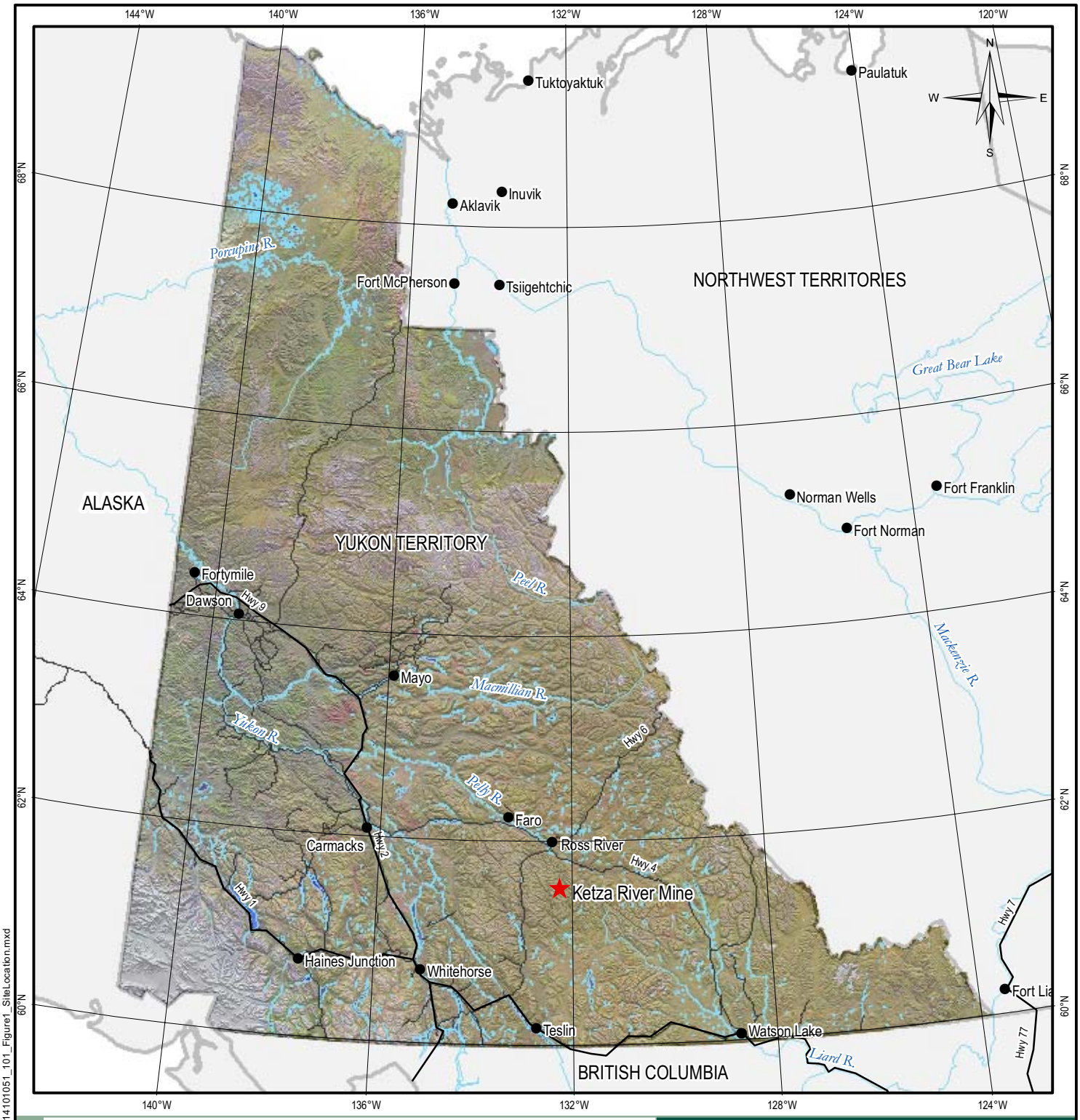
FIGURES



LEGEND

- Site Location
- City
- Waterbody
- Road
- Political Boundary

NOTES

Base data source: ESRI, Government of Yukon

2008 GEOTECHNICAL SITE INSPECTION
KETZA RIVER GOLD MINE, YUKON

Site Location

PROJECTION: Yukon Albers			DATUM: NAD83
Scale: 1:6,000,000			
100 50 0 100 Kilometres			
FILE NO.: W14101051_101_SiteLocation.mxd			
PROJECT NO.: W14101051	DWN: MEZ	CKD: CD	REV: 0
OFFICE: EBA-VANC	DATE: February 2, 2010		

Yukon-Nevada Gold Corp.

EBA Engineering Consultants Ltd.

Figure 1

Q:\Vancouver\GIS\ENGINEERING\W141\W14101051_KetzaMaps\101\W14101051_101_Figure1_SiteLocation.mxd

LEGEND

- Site Location
- Road
- Waterbody

NOTES

Base data source: ESRI, Government of Yukon

2008 GEOTECHNICAL SITE INSPECTION
KETZA RIVER GOLD MINE, YUKON

Regional Map

PROJECTION	DATUM
Yukon Albers	NAD83

Scale: 1:1,000,000

10 5 0 10

Kilometers

FILE NO.: W14101051_101_Figure2.mxd

PROJECT NO.	DWN	CKD	REV
W14101051	MEZ	CD	0

OFFICE	DATE
EBA-VANC	February 2, 2010

Yukon-Nevada Gold Corp.

EBA Engineering Consultants Ltd.

Figure 2

Q:\Vancouver\GIS\ENGINEERING\W141\W14101051_KetzaMaps\W14101051_Figure2.mxd

BREAK ZONE PIT

1430L PORTAL

RIDGE OPEN PIT

1550L PORTAL

1510L PORTAL

REFUSE DISPOSAL

1430 EAST PIT

1430L PORTAL

NORTHWEST RUNOFF INTERCEPTOR DITCH

WEIR 3

NORTH TAILINGS DAM

WEIR 4

TAILINGS POND

SOUTH TAILINGS DAM

WEIR 5

CACHE CREEK

CACHE CREEK DIVERSION

OXO CREEK

WEIR 2

LOWER SUBSIDIARY CREEK DIVERSION

EXPLORATION CAMP MOSTLY REMOVED

MILL & CAMP

MINERAL LICK

LOW GRADE ORE STOCKPILE

WEIR 1

CACHE CREEK

6826000 N

6825500 N

6825000 N

6824500 N

644000 E

644500 E

645000 E

645500 E

646000 E

646500 E

647000 E

LEGEND

PORTAL

ROADWAY

WATERCOURSE

0 250

Scale: 1: 7 500 (metres)

CLIENT

Yukon-Nevada Gold Corp.

2008 GEOTECHNICAL SITE INSPECTION
KETZA RIVER MINE, YUKON

GENERAL SITE ARRANGEMENT PLAN

EBA Engineering Consultants Ltd.

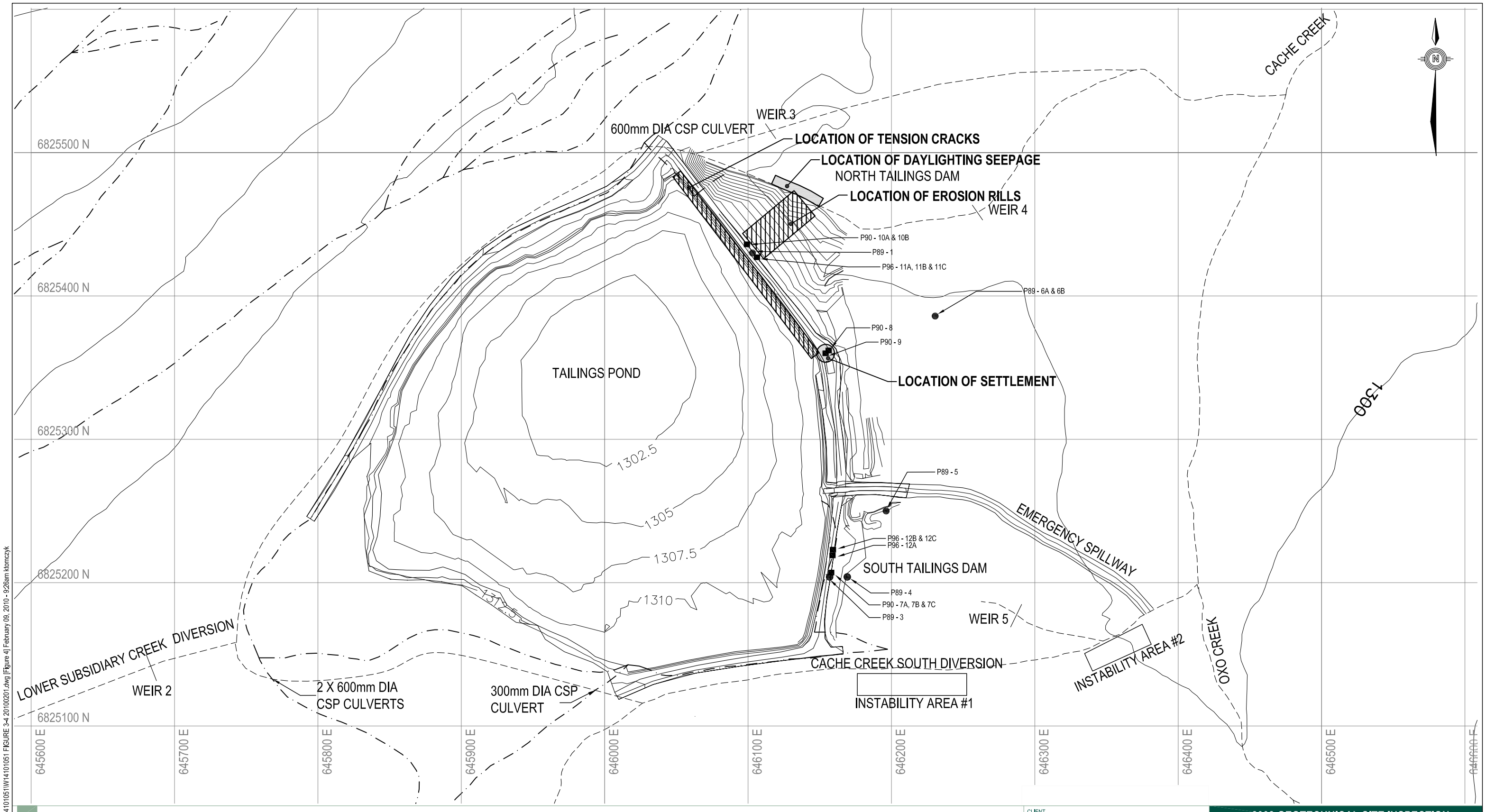
PROJECT NO.	DWN	CKD	REV
W14101051	KJT	CJD	0

OFFICE: EBA-WHSE

DATE: February 1, 2010

Figure 3

C:\Whitehorse\Data\2201\drawings\Ketza Mine\W14101051\W14101051 FIGURE 3-4 20100201.dwg [Figure 3] February 09, 2010 - 9:27am ktomczyk



LEGEND

- ● P89 - 3 PIEZOMETER (INSTALLED 1989)
- ■ P96 - 12A MONITORING WELL (INSTALLED 1996)
- – · – ROADWAY
- — — WATERCOURSE

0 100

Scale: 1: 2 500 (metres)

CLIENT

Yukon-Nevada Gold Corp.

2008 GEOTECHNICAL SITE INSPECTION
KETZA RIVER MINE, YUKON

TAILINGS IMPOUNDMENT - SITE PLAN

EBA Engineering Consultants Ltd.

PROJECT NO.	DWN	CKD	REV
W14101051	KJT	CJD	0
OFFICE: EBA-WHSE	DATE: February 1, 2010		

Figure 4

C:\Whitehorse\Data\0201\drawings\Ketza Mine\W14101051\W14101051 FIGURE 3-4 20100201.dwg [Figure 4] February 09, 2010 - 9:26am ktomczyk

PHOTOGRAPHS

Photo 1
Overview of tailings pond. Aspect: SE. Photo taken Aug. 6, 2008

Photo 2
Emergency Spillway on South Dam. Aspect: E. Photo taken Aug. 6, 2008

Photo 3
Weir 5 at South Dam. Photo taken Aug. 6, 2008

Photo 4
Soft/seepage area at toe of North Dam. Aspect: NW. Photo taken Aug. 6, 2008

Photo 5
Sand present in seepage location at toe of North Dam. Photo taken Aug. 6, 2008

Photo 6
Weir 4 at North Dam. Photo taken Aug. 6, 2008

Photo 7
Instability Area #1 near South Dam along Cache Creek Diversion Channel. Aspect: S. Photo taken Aug. 6, 2008

Photo 8
Instability Area #2 at Emergency Spillway confluence along Cache Creek Diversion Channel. Aspect: NE. Photo taken Aug. 6, 2008

APPENDIX A

APPENDIX A PIEZOMETER DATA

TABLE A1: PIEZOMETER DATA

Piezometer	P89-1		P89-3		P89-4		P89-5		P89-6A		P89-6B		P90-7A		P90-7B		P90-7C		P90-8	
Alternative Well ID	P1		P3		P4		P5		P6A		P6B		P7A		P7B		P7C		P8	
Collar Elev. (m)	1314.00		1314.10		1310.00		1309.70		1302.50		1302.50		1313.88		1313.88		1313.88		1313.99	
Casing Stickup Above Ground (m)	0.00		0.00		0.52		1.34		2.46		2.62		0.00		0.00		0.00		0.00	
Constructed Depth of Casing Below Collar (m)	15.10		7.80		5.20		6.00		23.80		6.60		8.61		19.20		11.90		9.90	
Date	Depth to water (m)	Water Elev. (m)	Depth to water (m)	Water Elev. (m)	Depth to water (m)	Water Elev. (m)	Depth to water (m)	Water Elev. (m)	Depth to water (m)	Water Elev. (m)	Depth to water (m)	Water Elev. (m)	Depth to water (m)	Water Elev. (m)	Depth to water (m)	Water Elev. (m)	Depth to water (m)	Water Elev. (m)	Depth to water (m)	Water Elev. (m)
14-May-97	14.05	1299.95	Dry	Dry	5.03	1304.45	6.55	1302.01	10.76	1289.28	Dry	Dry	Plugged	Plugged	Plugged	Plugged	8.16	1305.72	8.15	1305.84
24-Jul-97	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
22-Jul-98	14.00	1300.00	Dry	Dry	Dry	Dry	6.66	1301.70	11.41	1288.63	Dry	Dry	Dry	Dry	8.77	1305.11	6.20	1307.68	6.50	1307.49
3-Aug-05	-	-	-	-	4.98	1304.50	6.07	1302.29	12.86	1287.18	-	-	6.33	1307.55	Plugged	Plugged	8.39	1305.49	7.00	1306.99
3-May-06	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	7.83	1306.16
6-Jul-06	-	-	-	-	-	-	-	-	-	-	-	-	0.00	-	-	-	11.32	1302.56	0.00	-
7-Sep-06	-	-	-	-	-	-	-	-	-	-	-	-	6.61	1307.27	-	-	8.77	1305.11	7.58	1306.41
7-Nov-06	-	-	-	-	5.38	1304.10	-	-	-	-	-	-	7.59	1306.29	5.67	1308.22	8.86	1305.02	7.64	1306.35
3-Jan-07	-	-	-	-	-	-	-	-	-	-	-	-	-	-	6.33	1307.55	-	-	-	-
4-Jan-07	-	-	-	-	-	-	-	-	-	-	-	-	0.00	-	-	-	8.95	1304.93	7.77	1306.22
28-Feb-07	-	-	-	-	-	-	-	-	-	-	-	-	-	-	5.90	1307.98	8.99	1304.89	7.84	1306.15
8-May-07	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
26-Jun-07	-	-	Frozen	@ 1.9 m	5.05	1304.43	6.18	1302.18	12.23	1287.81	8.56	1291.32	Plugged	-	5.07	1308.81	8.51	1305.37	Frozen	-
15-Aug-07	-	-	6.49	1307.61	-	-	6.20	1302.16	-	-	-	-	-	-	-	-	8.62	1305.26	7.20	1306.79
8-Oct-07	-	-	6.30	1307.80	5.11	1304.37	6.30	1302.06	-	-	-	-	6.20	1307.68	5.17	1308.71	8.77	1305.11	7.31	1306.68
6-Nov-07	12.52	1301.48	7.58	1306.52	5.29	1304.19	6.59	1301.77	-	-	-	-	7.71	1306.17	5.30	1308.58	8.81	1305.07	7.42	1306.57
4-Dec-07	13.23	1300.77	Dry	Dry	5.40	1304.08	6.42	1301.94	-	-	-	-	Dry	Dry	5.66	1308.22	8.91	1304.97	7.63	1306.36
2-Jan-08	-	-	Dry	Dry	Dry	Dry	6.42	1301.94	-	-	-	-	Dry	Dry	5.69	1308.19	8.94	1304.94	7.68	1306.31
31-Jan-08	13.21	1300.79	Dry	Dry	Dry	Dry	-	-	-	-	-	-	Dry	Dry	5.78	1308.10	8.97	1304.91	7.75	1306.24
24-Mar-08	13.47	1300.53	Dry	Dry	5.49	1303.99	6.50	1301.86	-	-	-	-	Dry	Dry	5.93	1307.95	9.05	1304.83	7.86	1306.13
21-May-08	-	-	Frozen	-	4.88	1304.60	6.23	1302.13	-	-	-	-	Dry	Dry	5.56	1308.32	Blocked	-	Frozen	-
16-Jun-08	13.33	1300.67	Dry	Dry	5.05	1304.43	6.15	1302.21	-	-	-	-	8.18	1305.70	4.93	1308.95	8.49	1305.39	Blocked	-
13-Jul-08	-	-	5.73	1308.37	4.50	1304.98	6.25	1302.11	-	-	-	-	8.18	1305.70	5.22	1308.66	8.64	1305.24	Blocked	-
7-Aug-08	-	-	7.64	1306.46	5.37	1304.11	6.40	1301.96	12.47	1287.57	8.54	1291.34	7.31	1306.57	5.69	1308.19	8.88	1305.00	6.29	1307.70

TABLE A1: PIEZOMETER DATA (continued)

Piezometer	P90-9		P90-10A		P90-10B		P96-11A		P96-11B		P96-11C		P96-12A		P96-12B		P96-12C		Tailings Pond	
Alternative Well ID	P9		P10A		P10B		P11A		P11B		P11C		P12A		P12B		P12C		-	
Collar Elev. (m)	1313.96		1314.08		1314.08		1314.24		1314.25		1314.25		1313.93		1313.95		1313.95		1307.98	
Casing Stickup Above Ground (m)	-0.12		0.00		0.00		1.15		1.16		1.05		0.99		1.03		1.11		-	
Constructed Depth of Casing Below Collar (m)	7.60		32.20		15.20		25.84		20.33		17.00		14.75		11.83		8.30		-	
Date	Depth to water (m)	Water Elev. (m)	Depth to water (m)	Water Elev. (m)	Depth to water (m)	Water Elev. (m)	Depth to water (m)	Water Elev. (m)	Depth to water (m)	Water Elev. (m)	Depth to water (m)	Water Elev. (m)	Depth to water (m)	Water Elev. (m)	Depth to water (m)	Water Elev. (m)	Depth to water (m)	Water Elev. (m)	Water Elev. (m)	
14-May-97	6.85	1307.23	12.98	1301.10	14.83	1299.25	-	-	-	-	-	-	-	-	-	-	-	-	Iced Over	
24-Jul-97	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1310.98	
22-Jul-98	7.94	1306.14	13.58	1300.50	15.03	1299.05	-	-	18.76	1294.33	Dry	Dry	8.86	1304.08	8.64	1304.28	Dry	Dry	-	
3-Aug-05	6.06	1308.02	-	-	15.00	1299.08	18.98	1294.11	Dry	Dry	Dry	Dry	7.65	1305.29	7.49	1305.43	Dry	Dry	1311.60	
3-May-06	6.03	1308.05	15.52	1298.56	0.00	-	19.43	1293.66	0.00	-	0.00	-	8.54	1304.40	8.42	1304.50	8.79	1304.05	-	
6-Jul-06	7.06	1307.02	0.00	-	0.00	-	27.00	1286.09	0.00	-	0.00	-	9.47	1303.47	10.70	1302.22	10.57	1302.27	-	
7-Sep-06	6.07	1308.01	-	-	-	-	19.24	1293.85	-	-	-	-	8.39	1304.55	8.25	1304.67	8.74	1304.10	-	
7-Nov-06	6.14	1307.94	15.62	1298.46	14.83	1299.26	19.45	1293.64	6.61	1306.48	17.85	1295.35	8.52	1304.42	8.38	1304.54	7.82	1305.02	-	
3-Jan-07	-	-	15.64	1298.44	14.92	1299.16	-	-	-	-	17.91	1295.29	-	-	-	-	-	-	-	
4-Jan-07	6.16	1307.92	-	-	-	-	19.68	1293.41	-	-	-	-	8.59	1304.35	8.47	1304.45	8.85	1303.99	-	
28-Feb-07	7.76	1306.32	15.44	1298.64	-	-	19.83	1293.26	-	-	17.92	1295.28	8.67	1304.27	8.50	1304.42	8.75	1304.09	-	
8-May-07	6.20	1307.88	15.34	1298.74	-	-	-	-	-	-	17.94	1295.26	8.61	1304.33	8.50	1304.42	-	-	-	
26-Jun-07	6.08	1308.00	15.93	1298.15	Dry	Dry	Frozen	@bailer	Frozen	@bailer	Frozen	@bailer	8.03	1304.91	Frozen	@bailer	Frozen	@bailer	1312.05	
15-Aug-07	6.02	1308.06	-	-	-	-	19.32	1293.77	-	-	17.87	1295.33	7.98	1304.96	4.78	1308.14	8.35	1304.49	1311.41	
8-Oct-07	6.03	1308.05	15.64	1298.44	14.75	1299.33	19.34	1293.75	4.79	1308.30	17.88	1295.32	8.20	1304.74	8.00	1304.92	7.78	1305.06	-	
6-Nov-07	6.07	1308.01	15.52	1298.56	14.86	1299.22	19.34	1293.75	7.21	1305.88	17.89	1295.31	8.27	1304.67	8.15	1304.77	7.96	1304.88		
4-Dec-07	6.18	1307.90	15.53	1298.55	Dry	Dry	19.43	1293.66	Dry	Dry	Dry	Dry	8.46	1304.48	8.25	1304.67	8.27	1304.57		
2-Jan-08	6.12	1307.96	Blocked	-	Dry	Dry	19.39	1293.70	Blocked	-	Dry	Dry	8.47	1304.47	8.29	1304.63	8.63	1304.21		
31-Jan-08	6.10	1307.98	15.46	1298.62	Dry	Dry	19.42	1293.67	Dry	Dry	Dry	Dry	8.50	1304.44	8.33	1304.59	8.95	1303.89		
24-Mar-08	6.10	1307.98	15.64	1298.44	Dry	Dry	Blocked	-	Dry	Dry	Dry	Dry	8.62	1304.32	8.46	1304.46	9.09	1303.75	1307.08	
21-May-08	6.08	1308.00	Blocked	-	Dry	Dry	Blocked	-	Dry	Dry	Dry	Dry	8.37	1304.57	8.19	1304.73	9.15	1303.69	1307.41	
16-Jun-08	6.04	1308.04	15.37	1298.71	Dry	Dry	Blocked	-	Dry	Dry	Dry	Dry	8.00	1304.94	7.81	1305.11	9.04	1303.80		
16-Jun-08	6.10	1307.98	Blocked	-	9.87	1304.21	Blocked	-	Dry	Dry	Dry	Dry	8.24	1304.70	8.08	1304.84	8.85	1303.99	1307.31	
7-Aug-08	6.29	1307.79	Blocked	-	14.81	1299.27	19.47	1293.62	4.88	1308.21	17.87	1295.33	8.57	1304.37	8.42	1304.50	8.47	1304.37	1306.72	

APPENDIX B

APPENDIX B EBA'S GENERAL TERMS AND CONDITIONS

GEOTECHNICAL REPORT – GENERAL CONDITIONS

This report incorporates and is subject to these "General Conditions".

1.0 USE OF REPORT AND OWNERSHIP

This geotechnical report pertains to a specific site, a specific development and a specific scope of work. It is not applicable to any other sites nor should it be relied upon for types of development other than that to which it refers. Any variation from the site or development would necessitate a supplementary geotechnical assessment.

This report and the recommendations contained in it are intended for the sole use of EBA's Client. EBA does not accept any responsibility for the accuracy of any of the data, the analyses or the recommendations contained or referenced in the report when the report is used or relied upon by any party other than EBA's Client unless otherwise authorized in writing by EBA. Any unauthorized use of the report is at the sole risk of the user.

This report is subject to copyright and shall not be reproduced either wholly or in part without the prior, written permission of EBA. Additional copies of the report, if required, may be obtained upon request.

2.0 ALTERNATE REPORT FORMAT

Where EBA submits both electronic file and hard copy versions of reports, drawings and other project-related documents and deliverables (collectively termed EBA's instruments of professional service), only the signed and/or sealed versions shall be considered final and legally binding. The original signed and/or sealed version archived by EBA shall be deemed to be the original for the Project.

Both electronic file and hard copy versions of EBA's instruments of professional service shall not, under any circumstances, no matter who owns or uses them, be altered by any party except EBA. EBA's instruments of professional service will be used only and exactly as submitted by EBA.

Electronic files submitted by EBA have been prepared and submitted using specific software and hardware systems. EBA makes no representation about the compatibility of these files with the Client's current or future software and hardware systems.

3.0 ENVIRONMENTAL AND REGULATORY ISSUES

Unless stipulated in the report, EBA has not been retained to investigate, address or consider and has not investigated, addressed or considered any environmental or regulatory issues associated with development on the subject site.

4.0 NATURE AND EXACTNESS OF SOIL AND ROCK DESCRIPTIONS

Classification and identification of soils and rocks are based upon commonly accepted systems and methods employed in professional geotechnical practice. This report contains descriptions of the systems and methods used. Where deviations from the system or method prevail, they are specifically mentioned.

Classification and identification of geological units are judgmental in nature as to both type and condition. EBA does not warrant conditions represented herein as exact, but infers accuracy only to the extent that is common in practice.

Where subsurface conditions encountered during development are different from those described in this report, qualified geotechnical personnel should revisit the site and review recommendations in light of the actual conditions encountered.

5.0 LOGS OF TESTHOLES

The testhole logs are a compilation of conditions and classification of soils and rocks as obtained from field observations and laboratory testing of selected samples. Soil and rock zones have been interpreted. Change from one geological zone to the other, indicated on the logs as a distinct line, can be, in fact, transitional. The extent of transition is interpretive. Any circumstance which requires precise definition of soil or rock zone transition elevations may require further investigation and review.

6.0 STRATIGRAPHIC AND GEOLOGICAL INFORMATION

The stratigraphic and geological information indicated on drawings contained in this report are inferred from logs of test holes and/or soil/rock exposures. Stratigraphy is known only at the locations of the test hole or exposure. Actual geology and stratigraphy between test holes and/or exposures may vary from that shown on these drawings. Natural variations in geological conditions are inherent and are a function of the historic environment. EBA does not represent the conditions illustrated as exact but recognizes that variations will exist. Where knowledge of more precise locations of geological units is necessary, additional investigation and review may be necessary.

7.0 SURFACE WATER AND GROUNDWATER CONDITIONS

Surface and groundwater conditions mentioned in this report are those observed at the times recorded in the report. These conditions vary with geological detail between observation sites; annual, seasonal and special meteorologic conditions; and with development activity. Interpretation of water conditions from observations and records is judgemental and constitutes an evaluation of circumstances as influenced by geology, meteorology and development activity. Deviations from these observations may occur during the course of development activities.

8.0 PROTECTION OF EXPOSED GROUND

Excavation and construction operations expose geological materials to climatic elements (freeze/thaw, wet/dry) and/or mechanical disturbance which can cause severe deterioration. Unless otherwise specifically indicated in this report, the walls and floors of excavations must be protected from the elements, particularly moisture, desiccation, frost action and construction traffic.

9.0 SUPPORT OF ADJACENT GROUND AND STRUCTURES

Unless otherwise specifically advised, support of ground and structures adjacent to the anticipated construction and preservation of adjacent ground and structures from the adverse impact of construction activity is required.

10.0 INFLUENCE OF CONSTRUCTION ACTIVITY

There is a direct correlation between construction activity and structural performance of adjacent buildings and other installations. The influence of all anticipated construction activities should be considered by the contractor, owner, architect and prime engineer in consultation with a geotechnical engineer when the final design and construction techniques are known.

11.0 OBSERVATIONS DURING CONSTRUCTION

Because of the nature of geological deposits, the judgmental nature of geotechnical engineering, as well as the potential of adverse circumstances arising from construction activity, observations during site preparation, excavation and construction should be carried out by a geotechnical engineer. These observations may then serve as the basis for confirmation and/or alteration of geotechnical recommendations or design guidelines presented herein.

12.0 DRAINAGE SYSTEMS

Where temporary or permanent drainage systems are installed within or around a structure, the systems which will be installed must protect the structure from loss of ground due to internal erosion and must be designed so as to assure continued performance of the drains. Specific design detail of such systems should be developed or reviewed by the geotechnical engineer. Unless otherwise specified, it is a condition of this report that effective temporary and permanent drainage systems are required and that they must be considered in relation to project purpose and function.

13.0 BEARING CAPACITY

Design bearing capacities, loads and allowable stresses quoted in this report relate to a specific soil or rock type and condition. Construction activity and environmental circumstances can materially change the condition of soil or rock. The elevation at which a soil or rock type occurs is variable. It is a requirement of this report that structural elements be founded in and/or upon geological materials of the type and in the condition assumed. Sufficient observations should be made by qualified geotechnical personnel during construction to assure that the soil and/or rock conditions assumed in this report in fact exist at the site.

14.0 SAMPLES

EBA will retain all soil and rock samples for 30 days after this report is issued. Further storage or transfer of samples can be made at the Client's expense upon written request, otherwise samples will be discarded.

Ketza River Holding Ltd.

ISSUED FOR USE

PROJECT PROPOSAL
APPLICATION FOR
DISTRICT OFFICE LEVEL ASSESSMENT TYPE B WATER LICENCE
FOR THE KETZA RIVER MINE, YT

W23101051.103

March 2010

EBA Engineering Consultants Ltd.
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Calcite Business Centre • Unit 6, 151 Industrial Road • Whitehorse, Yukon Y1A 2V3 • CANADA

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ACRONYMS

DFO	Fisheries and Oceans Canada
EBA	EBA Engineering Consultants Ltd.
HADD	Harmful Alteration, Disruption or Destruction of fish habitat
SCP	Spill Contingency Plan
YESAA	Yukon Environmental and Socio-Economic Assessment Act
YESAB	Yukon Environmental and Socio-Economic Assessment Board
YG	Yukon Government

FIGURES

1.0 PROPONENT CONTACT INFORMATION

1.1 CONTACT PERSON

For the purposes of this assessment please use the following contacts:

Main Contact: Scott Davidson, M.Sc., P.Geo. (BC) Project Manager Whitehorse Environment Group EBA Engineering Consultants Ltd. Direct Line: 867.668.2071 x 248	Alternate Contact: Don Wilson, B.Sc. Alternate Project Manager Whitehorse Environment Group EBA Engineering Consultants Ltd. Direct Line: 867.668.2071 x 223

Ketza River Holdings Ltd. is the proponent for the project.

2.0 REQUIREMENT FOR AN EVALUATION UNDER YESAA

The project is assessable under the *Yukon Environmental and Socio-Economic Assessment Act* (YESAA) Section 47 (2) as it:

- Is located in the Yukon;
- Involves a project and accessory activities listed in the *Assessable Activities, Exceptions and Executive Committee Project Regulations,* including Part 9, Item 11, and
- Requires the following permits:
  - Type B Water Licence

3.0 PROJECT LOCATION

The Ketza River Mine is located in the Pelly Mountains, which are part of the Boreal Cordillera, of the south-central Yukon Territory. The mine is located approximately 85 km south by road from Ross River, the closest community. The Ketza River Mine access road is located approximately 49 km from the Robert Campbell Highway and travels along the Ketza River valley (Barichello *et al.* 1989).

This application specifically refers to the tailings pond, monitoring wells and monitoring stations on Cache Creek, Oxo Creek, Peel Creek, and the Ketza River that were subject to Water Licence QZ04-063.

Figure 1 shows the project location including the tailings pond. Figure 2 shows the existing monitoring stations and monitoring wells in close proximity to the tailings pond. Figures 3 and 4 show the monitoring stations in Cache Creek, Oxo Creek, Peel Creek, and Ketza River. The geographic coordinates for the tailings pond site are listed as follows:

Minimum Latitude: 61° 25', Maximum Latitude 61° 26'

Minimum Longitude: 132° 14', Maximum Longitude 132° 19'

The geographic coordinates for the various monitoring stations are listed in Table 3.0.1.

The site is located at the head of the Cache Creek drainage basin, which is part of the Ketza River Drainage Basin.

The site is located in Quad 105F09 on land that is administered by the Yukon Government. Ketza River Holdings Ltd. holds a surface lease, which encompasses the tailings pond and the majority of monitoring stations included in the former Water Licence.

The land is leased under Surface Lease No. 105F09-001 to Ketza River Holdings Ltd. for a commercial mine, mill, campsite, tailing pond and other mine-like facilities until June 30, 2017 (Yukon Government, Department of Energy, Mines and Resources, 2003). Quartz Mining Licence Class 4 Approval No. LQ00156 has also been issued to Ketza River Holdings Ltd.

TABLE 3.0.1: GEOGRAPHIC COORDINATES OF THE EXISTING WATER QUALITY MONITORING STATIONS				
Station	Latitude		Longitude	
	Degrees	Minutes	Degrees	Minutes
KRO1	61	31.7912	132	16.1384
KRO4 N2	61	32.2104	132	14.6078
KRO4 N3	61	32.21	132	15.2
KRO5 S1	61	32.0582	132	14.9534
KRO5 S2	61	32.052	132	15.157
KRO8	61	32.5808	132	14.0366
KRO9	61	32.1064	132	15.1308
KRO9A	61	32.0204	132	15.1976
KR1O	61	33.8995	132	9.7545
KR11	61	33.9895	132	9.6051
KR12	61	34.5685	132	10.1996
KR13	61	32.0174	132	15.2018
KR14	61	32.0102	132	14.7302
KR15	61	32.552	132	14.7062
KR16	61	32.0192	132	17.0486
KR50	61	50.89	132	18.79

3.1 TRADITIONAL TERRITORY

The Ketza River Mine and the access road to the mine are located in the traditional territory of the Ross River Dena and the Liard First Nation. Both of these governments are members of the Kaska Nation. No Final Land Claims Agreement has been signed with any of the Kaska First Nations. Therefore, the mine is not located on settlement land. (Ketza River Holdings, 2006).

In 2007, an archaeological assessment of the original mine production area (Salix Heritage Consulting, 2007) was conducted as part of the preparation for a YESAA assessment for the mine's production phase. No significant heritage values were found.

The assessment focused on heritage and archaeological survey and sub-surface testing in the entire area of the mine's proposed impact zone (2007) which included the tailings pond and access road along Cache Creek. The fieldwork was completed between August 14th and 16th, 2007. This survey identified one moderate potential location for heritage values within the valley where the main access road is located. This location was surveyed and sub-surface tested and no heritage or archaeological resources were found.

The report stated that no further heritage assessments were required in advance of the development of the mine and that no further recommendations or results were forthcoming.

4.0 PROJECT PURPOSE

4.1 PROJECT HISTORY

The original water licence (Y-IN87-06L) for the Ketza River Mine site was granted to Canamax Resources Inc. on May 1, 1987. In August 1989 the licence was amended to include the requirement for an abandonment plan. In 1990 Canamax applied for an amendment to the existing water licence to allow for the mining of sulphide ore. In November 1990 the mine operation was suspended and the application for amendment of the water licence was later withdrawn. Eventually the mine was sold to Wheaton River Minerals Ltd. in November 1992 and in 1994 the mine was transferred to Ketza River Holdings Ltd., a wholly owned subsidiary of YGC Resources Ltd.

Water quality at the site was monitored by Ketza River Holdings Ltd. until 1996. During that time various attempts were made to complete an abandonment plan for the mine. In September 2004, Water Resources instructed Ketza River Holdings Ltd. to obtain a water licence for the mine. Type A Water Licence QZ04-063 was issued on July 27, 2007.

4.2 PROJECT PURPOSE

This application relates to the tailings pond, surface drainage ditches in the area of the tailings pond, and associated structures for the monitoring and control of seepage from the tailings pond. The objective of obtaining a water licence for these structures is to allow for the continuing storage of water in, and discharge from the existing tailings pond by Ketza River Holdings Ltd. as was previously covered by Water Licence QZ04-063.

The ongoing care and maintenance of the tailings pond and associated structures will generally include the following.

- Maintenance of existing surface diversions for Lower Subsidiary Creek (northern side of tailings pond) and Cache Creek South Diversion to divert surface water around the tailings pond (see Figure 2).
- Monitoring of water quality within the tailings pond, the seepage drainage courses and in Cache Creek. Monitoring will also include seepage rates below the dams and groundwater levels and water quality in functioning piezometers as established by the water licence.
- Assuming water quality in the tailings pond continues to remain below water licence standards imposed for discharge (including LC_{50} toxicity tests) then tailings water would be discharged to maintain or lower the level of liquid in the tailings pond to improve dam stability.

- The maintenance of a water treatment plant to provide emergency treatment of tailings pond water if required.

Once the mine feasibility study has been completed, a decision would be made respecting the future of the mine and the future use of the tailings pond. Should the mine not proceed to production (considered unlikely) the decommissioning plan developed as required by Water Licence QZ04-063 could be implemented.

As previously noted, the Ketza River Mine was in operation as recently as 1990. Major infrastructure components are still in place, such as the access and ancillary roads, camp and ancillary buildings, sewage treatment plant, waste management disposal equipment and practices, mill building, tailings pond, and others.

Ketza River Holdings Ltd is also conducting a clean-up program at the site. This planned program included:

- Development of an inventory and subsequent disposal program for chemical wastes left at the site.
- Clean-up and disposal of solid wastes and building debris left at the site.
- Progressive reclamation of existing and new access roads, drilling pads and sumps from the recent exploration program.

The first two items have been completed and the progressive reclamation program is underway as roads and drilling programs are completed. These activities contributed to the mine winning the 2007 Robert E. Leckie Award for Outstanding Mining Reclamation.

4.3 PROJECT ALTERNATIVES

The only feasible alternative to continued care and maintenance of the tailings pond would be to pump down the tailings pond and decommission the site. Current production plans include using the tailings pond, for future tailings disposal, if the decision is made to proceed to production. Therefore, the alternative of decommissioning the tailings pond is considered to be premature until a production decision is made.

5.0 PROJECT DESCRIPTION

5.1 PROJECT SCOPE

This project involves continued care and maintenance of the tailings pond, diversion ditches and monitoring program as identified in Water Licence QZ04-063. The spatial scope of the project includes the site components as listed in Water Licence QZ04-063. Specifically this includes the tailings pond, diversion ditches around the pond, and the existing surface water quality monitoring stations on Cache Creek, Oxo Creek, Peel Creek, and the Ketza River.

The temporal scope of this application is for a five year water licence. Presumably, if a five year licence was issued in the fall of 2010 the expiry date would be December 31, 2015.

5.1.1 Principle Project Activities

The principle activity of the proposed project is the operation and maintenance of the existing tailings pond that will include:

- Maintenance of the tailings pond dam and emergency spillway,
- Maintaining tailings pond water (supernate) elevation;
- Maintenance of existing diversion ditches;
- Maintenance of existing access to the tailings pond and monitoring points; and
- Maintenance of a standby arsenic treatment plant;

5.1.2 Accessory Project Activities

Accessory activities associated with the proposed project that are not included in the project scope are as follows:

- Operation of a camp;
- Mobilization of equipment;
- Use of heavy equipment;
- Ongoing exploration activities; and
- Domestic water supply and treatment.

5.2 CARE AND MAINTENACE OF TAILINGS POND - PROJECT DESCRIPTION

The following activities will be undertaken during care and maintenance:

- Ongoing sediment clean out from the Northwest Interceptor Ditch along the northwest side of the tailings pond;
- Ongoing maintenance of culverts in the Northwest Interceptor Ditch, and the Lower Subsidiary Creek diversion;
- Inspection of all other culverts and clean out debris where necessary;
- Maintenance of the pond elevation in the tailings pond at or below 1309 m.a.s.l;
- Continue the earthworks monitoring program for the North and South Dams, and emergency spillway; and
- Continue with the existing water quality monitoring program.

The objective of these maintenance activities is to address concerns regarding the tailings pond by reducing the potential for inflow to the tailings pond and to monitoring stability of the dams and the improvements made to the North Dam.

The ongoing water quality monitoring program will address both water quality and hydrology as required in Water Licence QZ04-063.

5.3 DECOMMISIONING

A decommissioning plan was submitted in December 2009 under Water Licence QZ04-063 (EBA, 2009). In general the plan proposes that the tailings pond water level will be lowered during the late summer and fall to expose as much of the tailings solids as possible. The water level in the pond will be drawn down to as close to the 1,302 m elevation as is possible and maintained near that level. The lowering of the pond will be accomplished through pumping, with water treatment conducted as required to maintain the release of arsenic concentrations below licence standards. Some relocation of tailings will be completed and then the exposed tailings will be capped.

A drainage channel will be established through the footprint of the existing tailings pond in order to re-establish more natural drainage patterns. The north dam will eventually be breached and a coarse armoured channel constructed through the footprint of that structure.

5.4 SCHEDULE OF ACTIVITIES

The water quality monitoring program is continuing as per the schedule established by Water Licence QZ04-063 (Table 5.4.1).

TABLE 5.4.1: WATER QUALITY MONITORING PROGRAM DURING CARE AND MAINTENANCE		
Location Identifier	Sample Logic	Sampling Schedule
Surface Water		
KR-1	Water quality in Cache Creek upstream of tailings pond	Monthly
KR-4N2	Seepage water quality below tailings dam	Bi-weekly
KR-4N3	Surface discharge to Cache Creek	Bi-weekly
KR-5(S1)	Seepage water quality below tailings dam	Bi-weekly
KR-5(S2)	Surface discharge to Cache Creek	Bi-weekly
KR-8	Water quality in Cache Creek downstream of tailings pond	Monthly
KR-9	Tailings water quality	Bi-weekly
KR-9A	End of pipe discharge from tailings pond	Weekly during discharge
KR-10	Water quality in Cache Creek upstream of confluence with Ketza River	Monthly
KR-11	Water quality in Ketza River upstream of Cache Creek confluence	Monthly
KR-12	Water quality in Ketza River downstream of Cache Creek confluence	Monthly
KR13	Water quality in Cache Creek upstream of tailings pond discharge pipe	Monthly
KR14	Water quality in Oxo Creek upstream of confluence with Cache Creek	Monthly
KR15	Water quality in Peel Creek upstream of confluence with Cache Creek	Monthly
KR16	Water quality in Cache Creek upstream of camp and mill facilities	Monthly
KR50	Water quality in Ketza River at Campbell Highway	Monthly
Groundwater		
P90-7A	Completed in dam	Monthly
P90-7B	Completed in bedrock	Monthly
P90-7C	Completed in native outwash gravels	Monthly
P90-8	Completed in native outwash gravels	Monthly
P90-9	Completed in native outwash gravels	Monthly
P96-11A	Completed in bedrock	Monthly
P96-11B	Completed in native outwash gravels	Monthly
P96-11C	Completed in dam	Monthly
P96-12A	Completed in bedrock	Monthly
P96-12B	Completed in native outwash gravels	Monthly
P96-12C	Completed in dam	Monthly

Monitoring of stream flows is conducted periodically throughout the year and inspection of earthworks is completed on an annual basis.

Pumped discharges from the tailings pond generally occur during summer and early fall when water quality in the tailings pond is below current licence discharge standards and there is ample flow in Cache Creek.

6.0 DESCRIPTION OF EXISTING ENVIRONMENTAL AND SOCIO-ECONOMIC CONDITIONS

This section, describes the existing conditions for the components listed below. This information is based on the existing information available at the time of the assessment.

Environmental Components

- Biophysical Conditions
- Climate
- Permafrost
- Surface Water Quantity
- Surface Water Quality
- Groundwater
- Aquatic Resources
- Wildlife
- Air Quality
- Noise

Socio-economic Components

- Community characteristics
- Economy and employment
- Health and safety
- Heritage resources

6.1 BIOPHYSICAL CONDITIONS

The Ketza River Mine is located at the head of the Cache Creek drainage basin (Geo-Engineering 1998), within the discontinuous permafrost sub-zone of the Pelly Mountains Ecoregion.

Cache Creek flows eastward and drains into the Ketza River. The creek valley dips moderately eastward at slopes ranging from 7% to 16%. The adjacent valley walls are steeper, with slopes ranging from 30% to 80%.

The valley bottom is at an elevation of almost 1,400 m, while surrounding peaks are about 600 m higher (Geo-Engineering 1998). The valley bottom consists primarily of limestone bedrock overlain by shallow deposits of compacted glacial till, which in turn is covered by a thin layer of relatively permeable outwash materials. The lower valley walls are commonly tills deposited as lateral moraines mixed with talus and colluvium.

The base of Cache Creek valley is characterized by a mix of rubbly colluvium from the valley walls and glacial till or morainal deposits. Glacial outwash sands and gravels or terminal moraine form a portion of the tailings impoundment and are found in the Cache Creek valley downstream of the mine site (Gartner Lee *et al.*, 2001).

The site is located within the Cache Creek drainage basin, which flows into the Ketza River and eventually the Pelly River. A section of Cache Creek was originally diverted to bypass the site's tailings pond, which was constructed during previous mining activity on the site by Canamax Resources Inc. For the purpose of the water licence, Cache Creek is the major surface water source of interest. As required by water licence QZ04-063, KRH has been and continues to monitor water quality in Cache Creek, Oxo Creek, Pelly Creek, and the Ketza River.

6.2 CLIMATE

6.2.1 Local Climatic Conditions

The Ketza property is located in the area known as the Southern Mountains hydrologic zone of the Yukon River basin or the Pelly-Cassiar climatic zone (Wahl, 1983 in Ker, Priestman & Associates, 1986).

These zones include the Pelly and Cassiar mountains, which act as secondary orographic barriers for Pacific air masses. Therefore, this area experiences greater precipitation than the surrounding plateau (Ker, Priestman & Associates, 1986). The mine site is located on the northeast side of the Pelly Mountains, in the St. Cyr Range.

6.2.1.1 Ketza Mine Meteorological Station

From 1986 until 1995, a meteorological station was in operation at the Ketza River Mine site located at 61.52° N, 132.27° W (WGS-84) at an elevation 1380 m. This meteorological station was re-activated in 2006 with data collection beginning on February 26.

Rainfall measurements at the Ketza River Mine site meteorological station were taken between 1986 and 1995, and then again from 2006 to present. Snowfall was measured separately and is discussed in the next section. The total annual average rainfall for this station for the period of record was 272.5 mm. A seasonal cycle is observed with high rainfall occurring in the region predominantly in the month of August. The winter season is marked with little to no rainfall (due to snow occurrences instead of rain). In 2006 and 2007, the recorded rainfall was considerably lower and was attributed to the use of a different method for collecting the data (cumulative rainfall collection as compared with tipping bucket method for the previous data collected).

6.2.2 Snow

Snow measurements recorded by the Ketza River Mine site meteorological station indicate snow occurring typically during the months of September through to May. The reported monthly average snow depth (September to May) for the Ketza River Mine site is 44.8 cm and a total average annual snowfall of 405.15 cm. Snow measurements collected in 2007 and 2008 were collected using a different method and are not reported as an actual snow depth. A rain gauge was used to collect snow, which was then melted and reported as precipitation in mm. These data were converted to snow depth in cm using an assumed snow density of 0.1 g/cm^3.

6.2.3 Precipitation

The total annual precipitation recorded at the Ketza River Mine Site was calculated using the sum of the monthly averages over the period of record. The total annual precipitation was 646.6 mm with the wettest month is September (85.4 mm of precipitation) while the wet season typically extends between August to November. The driest month is typically April (18.1 mm of precipitation). The average monthly precipitation is 53.9 mm.

6.3 PERMAFROST

The tailings pond was constructed in late 1987 for use during mining activities at the Site. During construction of the existing tailings pond, patches of discontinuous permafrost were recorded and mapped by Golder Associates in 1986 (Golder, 1986). Although there is no documentation that permafrost is affecting the hydrogeological regime at this site, it is possible that groundwater confinement and/or perched conditions may be found at some locations on the site in connection with reduced permeability resulting from discontinuous permafrost.

One area along the south side of the Cache Creek South Diversion channel had a history of instability which was an area that was believed to be prone to permafrost. Repairs were made to this area in 2005 by KRH. The area is monitored on a regular basis and no further issues of instability have been reported.

6.4 SURFACE WATER QUALITY

KRH has been analyzing water quality in the Ketza River and three of its tributaries. Testing occurs from the highest elevation to the lowest elevation at the following locations: Cache Creek south diversion upstream of the tailings pond (KR-13), the tailings pond (KR-09), the tailings pond overflow outlet to the south diversion (KR-09A), tailings pond seepage below the north and south dams (KR-04-N2, KR-04-N3, KR-05-S1, and KR-05-S2), Oxo Creek (KR-14), Cache Creek below Oxo Creek (KR-08), Peel Creek (KR-15), Cache Creek near the Ketza River (KR-10), and Ketza River upstream and downstream of Cache Creek (KR-11 and KR-12). The locations of the sampling stations are presented in Figures 2 to 4.

6.4.1 Baseline Water Quality

Historically, water quality data were collected monthly during several periods between 1988 and 1995. Water quality monitoring recommenced in July 2005. At that time, some additional sampling stations were initiated and others were decommissioned, the surface water sampling frequency was increased to twice monthly.

Since 2005 the water samples were analyzed for total metals and routine chemistry (sulphate, ion balance calculation, pH, conductivity, and total alkalinity). Temperature, pH, conductivity, and dissolved oxygen were sampled in situ.

Water from the tailings pond and under the direct influence of the tailings pond was compared to the federal Metal Mining Effluent Regulations (MMER) standards prior to the issuance of Water Licence QZ04-063. The stations monitored since 2005 included KR09, KR04-N2, KR04-N3, KR05-S1, KR05-S2, and KR08.

While there were some MMER total arsenic exceedences at seepage stations KR05-S1, KR05–S2 and in the tailings pond (KR09), arsenic concentrations at these sites have met the MMER standard since September 2006 (EBA unpublished data). Care and maintenance activities associated with the tailings pond have been directed toward lowering water elevations, thereby decreasing the arsenic concentration in the tailings pond seepage water down gradient from the tailings pond.

6.4.2 Current Water Quality

Based on available data since the mine ceased milling operations, the concentrations of metals and ammonia have dropped. Arsenic is now typically the only metal with concentrations near the standards of the water licence at two of the surface water monitoring stations. In 2007, 2008, and 2009 all monthly copper, cyanide, lead, nickel, and zinc concentrations met the water licence standards (EBA, 2009 and EBA, 2010).

Total arsenic concentrations in the tailings pond (KR09) fluctuate slightly on a seasonal basis. The lowest concentrations typically coincide with the spring thaw, and then rise through the summer until the tailings pond freezes in the fall. Arsenic concentrations remain relatively stable over the winter months and drop again in the spring. At the pumped discharge monitoring location (KR-09A) one sample exceeded the arsenic standard in August 2008. Upon receiving the results, pumping was stopped temporarily; the subsequent sample collected and analyzed indicated that the arsenic concentration had dropped below the standard. Nevertheless, as arsenic concentrations in the tailings pond were close to the discharge standard no further discharge was undertaken in 2008. The total arsenic concentrations at the tailings pond seepage monitoring stations met the total arsenic criteria in 2007 and 2008 (EBA, 2009).

Surface water from the tailings pond (KR-09) was sampled in July 2005, July 2007, and June 2008 for toxicity testing. 96hr acute toxicity bioassay tests (LC50) were conducted at Enviro-Test Laboratory in Winnipeg, Manitoba. Results from these tests indicated

100% survival after >96 hours and showed no observable toxicity and no sub-lethal biological effects.

The 2009 analytical results show that all arsenic, copper, cyanide, lead, nickel and zinc concentrations at the discharge (KR09A) and seepage (KR04N3, KR05S2) compliance locations were below the Water Licence standards.

This is consistent with conclusion made in the 2008 annual report (EBA, 2009) where EBA stated that "based on available data and since the mine ceased milling operations, the concentrations of metals and ammonia have dropped".

Consistent with historical results, the 2009 surface water quality results showed that several parameters (aluminum, arsenic, boron, cadmium, chromium, copper, iron, selenium, silver and zinc) exceeded the relevant CCME guidelines for the protection of fresh water aquatic life.

In 2009, several parameters (aluminum, cadmium, copper, iron and zinc) exceeded CCME Guidelines at background locations where water originated from the north slope of the site (KR15 and KR10). These data indicated that some metals were leaching naturally off the site's north slope. Other parameters (arsenic, boron, chromium, selenium and silver) were recorded across the site at both background and downstream locations. This indicated that naturally elevated background conditions existed for these parameters.

EBA found that KR04N3 and KR05S2 reflected parameter concentrations found in the piezometers and in the water off the north slope. This resulted in aluminum, boron, chromium, iron, and silver concentrations that occasionally exceeded the CCME guidelines (EBA, 2010).

6.5 GROUNDWATER

Regional groundwater flow occurs as a deep flow system within bedrock. Groundwater is recharged at higher elevations in the upland areas and flows toward discharge areas within the valleys at lower elevations. In some cases, groundwater flow occurs as perched systems above the bedrock, low permeability soils, or potentially permafrost. Groundwater discharge zones include water courses and diversion ditches.

Groundwater recharge zones in the upper slopes and mountain ridges consist predominantly of scree and rock outcrops. The lower valley walls are commonly tills deposited as lateral moraines mixed with talus and colluvium. Three main lithologic units influence the drainage pattern in the area of the valley bottom: limestone bedrock; consolidated glacial drift; and unconsolidated or weathered soils. Sedimentary and metamorphic bedrock (limestone, argillite and shale), which have a low matrix permeability underlie the area. These types of bedrock are usually highly fractured near the surface, permitting considerable groundwater flows through fractures and other rock mass discontinuities. Some discontinuous permafrost has also been observed at the site which may affect the hydrogeological regime in some areas.

6.5.1 Subsurface Conditions at Site

Construction of the tailings pond was completed in September 1987. The glacial and post glacial geology of the area of the tailings dams and pond, as well as the underlying limestone, govern the pertinent seepage aspects of the pond structure. The areas adjacent to the subsidiary creek and Cache Creek are underlain by coarse alluvial deposits, and the western portion of the pond area is underlain by a layered deltaic deposit. These materials are subsequently underlain by glacial drift or till and limestone bedrock. The higher areas of the site are underlain by glacial drift which is partially mantled by cleaner glacial outwash deposits and, at the northern edge of the pond, by colluvium (Golder, 1986).

Prior to construction of the tailings pond, eight boreholes were drilled to depths of between 8.8 m and 19.5 m. Limestone bedrock was encountered within 6 m of ground surface on the higher ground at the southern edge of the pond prior to pond development. Piezometers were installed in each of the completed boreholes to permit measurement of the ground water levels, and testing to determine the permeability of the strata encountered (Golder, 1986).

The depth to bedrock in the north dam area is roughly 20 m to 25 m, and about 10 m to 15 m in the south dam area. The glacial till which overlies the limestone is a very dense, gravelly, silty sand with silt contents varying between 17% and 35%. Pockets of silty sand have also been documented. Unconsolidated soils overlie the drift or till and are more permeable than the other two layers (Golder, 1986)

6.5.2 Groundwater Quality

Seepage water within the tailings pond dam and groundwater below the tailings pond dam has been tested through monitoring wells and analysed for metals and routine water parameters as required by the water licence. The water licence did not set standards for water quality for samples from the monitoring wells. Therefore, these data were compared to CCME guidelines multiplied by 10 as per industry standards.

As in the past, 2009 seepage water quality parameters (aluminum, arsenic, chromium, copper and iron) within the dam were often not consistent with tailings pond water quality. Instead, they related more to natural surface water quality off the north slope (KR15). P07A, P08, P09 and P12C in particular, appear to be affected by north slope concentrations. The data indicates that these piezometers may be influenced by groundwater rather than seepage water originating from the tailings pond (EBA, 2010).

6.6 AQUATIC RESOURCES

KRH retained EBA to conduct a number of baseline environmental studies at the site in order to update and expand the existing baseline information that exists for the mine area. EBA commenced an aquatic resources baseline environmental study in 2007 and the results were presented to KRH (EBA 2008).

6.6.1 Fish

Previous reports (Northern Natural Resources Ltd, 1977; BC Research, 1986; Godin and Mackenzie-Grieve, 1984; Norecol, 1986; Osborne, 1991 & Fisheries and Oceans, 1991) indicated that fish species that may be or have been found within the study area include:

- Humpback whitefish (*Coregonus pidschian*)
- Broad whitefish (*Coregonun nasus*)
- Northern Pike (*Esox lucius*)
- inconnu (*Stenodus leucichthys*)
- least cisco (*Coregonus sardinella*)
- long nosed sucker (*Catostomus catostomus*)
- Arctic grayling (*Thymallus arcticus*)
- slimy sculpin (*Cottus cognatus*)
- Chinook salmon (*Oncorhynchus tshawytscha*)

According to these reports, fish use on the Ketza River system near the Cache Creek confluence was limited and had low productivity. Cache Creek was assumed to be even less likely to support fish because of steeper gradients and limited fish cover. Little spawning, rearing, over wintering and holding/feeding habitat was found in Cache Creek. The majority of fish found in the Cache Creek system were slimy sculpin and arctic grayling.

A 2007 study of the Cache Creek Watershed by Environmental Dynamics generally supported these results and the concept that this watershed has generally low fisheries productivity. Results of fisheries sampling in this study suggested that lower Cache Creek provides some year-round habitat for slimy sculpin, and that spring/summer seasonal rearing habitat for Arctic grayling is most suitable in Cache Creek upstream of Peel or Oxo Creeks. The lower reaches were found to be generally unsuitable, and limited over-wintering habitat was observed. The authors speculated that most Arctic grayling in the system likely return annually to the main stem of the Ketza River to over winter. No evidence of juvenile Chinook salmon was observed during these 2007 studies.

6.6.2 Fish Habitat

In 2008, EBA undertook aquatics studies comprised of periphyton presence, abundance, and characteristics; and collection of benthic macroinvertebrate data at eight sampling stations that included Cache Creek and a tributary thereof, Oxo Creek, Peel Creek, and the Ketza River.

EBA's periphyton analysis revealed moderate periphyton density and productivity in the central and upper reaches of Cache Creek. Oxo Creek (also in the upper Cache drainage) was determined to have low productivity despite having an abundant benthic community. Lower Cache Creek had the lowest periphyton density and productivity of all site sampled

during the 2007 program. Both Ketza River sites were determined to have moderate relative productivities.

EBA's benthic invertebrate analysis in August 2007 revealed local benthic communities to be generally representative of unproductive alpine aquatic ecosystems, with isolated effects from local development or geology. Results indicated that Cache Creek near the site and Oxo Creek had abundances and diversity most indicative of uninfluenced environments. Peel Creek and sites influenced by lower Cache Creek showed signs of negative influences from water quality, sediments, or other effects. The overall trends suggested that local influences may have played a role in the state of the Cache Creek and Ketza River systems at that time. Local productivity and the aquatic ecosystem health appeared to be below the potential for such alpine/subalpine systems.

6.7 WILDLIFE

6.7.1 Ungulate Species

Four ungulate species are known to occur within the study area, including: boreal caribou (mountain ecotype), moose, stone sheep and mule deer.

The only caribou occurring within the Ketza Mine region are boreal caribou. The Ketza Mine is located in a mountainous area that is not known to be used very much by caribou. The nearest herds to the Ketza Mine project site include the Wolf Lake and Finlayson herds, located approximately 8 km to the southwest of the mine site. The project area lies between their respective core ranges and, accordingly, the study area is not considered to be used extensively by either herd (Adam Czewski pers. comm.).

Known winter moose habitat exists along the Pelly River valley and wetland complexes east of Ross River, approximately 35 km from the mine site. No key moose areas have been documented within the study area; however, moose are assumed to commonly occur in the boreal high (large river valleys) and subalpine bioclimate zones throughout the year.

Stone sheep commonly occur within the area (Barichello *et al.*. 1989). Based on surveys completed, a large stone sheep winter range has been documented in the northwest corner of the Ketza River Claim Block, and smaller winter ranges were identified throughout the Ketza River Claim Block (Government of Yukon, 2005). Surveys conducted between 1986 and 1989 indicated that stone sheep were reported to utilize much of the Ketza River area throughout the year, including immediately around the Ketza River Mine site (Barichello *et al.,* 1989). Barichello *et al.* (1989) concluded that sheep were not suffering apparent negative effects from the operation of the mine and road.

Mule deer are considered to be at their northern-most range in the Yukon. Although mule deer hypothetically occur within the study area, their presence has not been confirmed within the study area.

6.7.2 Large Carnivore Species

A total of eight large carnivore species occur within the study area or hypothetically occur based on the presence of preferred habitats, occurrence of prey species, and published field guides. These species include: coyote, wolf, red fox, cougar, lynx, wolverine, black bear and grizzly bear. Of these eight large carnivore species, the populations of grizzly bear and wolverine are listed as Special Concern by the Committee on the Status of Endangered Wildlife in Canada (COSEWIC).

To date, no key grizzly bear areas have been identified within the study area (Government of Yukon, 2005). Based on known information, wolverines are assumed to occur in habitats occupied by the Ketza Mine access road.

6.7.3 Small Mammal Species

A total of 33 small mammal species occur, or hypothetically occur, within the study area including: river otter, American marten, ermine, least weasel, American mink, little brown myotis (bat), shrew (5 species), snowshoe hare, collared pika, beaver, muskrat, meadow jumping mouse, deer mouse, porcupine, Lemming (2 species), Voles (6 species), Squirrels (3 species), hoary marmot, woodchuck, least chipmunk, and bushy-tailed woodrat.

6.7.4 Bird Species

Bird and bird species have been sorted into species groupings that include: passerines, shorebirds, waterfowl and raptors.

Based on Yukon Environment (2003) Birder's Checklist of the Faro and Ross River Region, a total of 147 bird species occur, or hypothetically occur, within the study area during some time of the year. The majority of bird species migrate to the Yukon during the spring to breed, and only a few species are residents throughout the year.

Passerines

Passerines occur throughout all terrestrial habitat types in the study area from forested valleys to rocky slopes of the mountains. A total of 57 passerine species (including the common raven) occur, or hypothetically occur, within the study area. The majority of these passerine species are migrants and reside in the study area during breeding.

Shorebirds

A total of 26 shorebird species (including gulls and terns), are expected to occur, or hypothetically occur, within the study area during spring, summer and fall. Shorebirds are found in or near mudflats, streams/rivers, flood zones, wetlands, ponds and lake margins. These habitats occur most commonly in the valley bottoms of the boreal high bioclimate zone.

Waterfowl

A total of 31 waterfowl species, including swans, geese, ducks, grebes and loons occur, or hypothetically occur, within the study area. The occurrence and abundance of waterfowl varies throughout the spring, summer and fall periods. Waterfowl occur most often in wetlands, ponds/lakes and rivers/streams in the valley bottoms located in the boreal high bioclimate zone. Waterfowl may also occur at higher elevation lakes and ponds; however, lake productivity at such elevations is typically lower than in the valley bottoms.

Raptors

A total of 16 raptor species (osprey, eagles, hawks, falcons and owls) occur, or hypothetically occur, within the study area. Of these 16 species, the Peregrine Falcon, Gyrfalcon and the Short-eared Owl have special conservation status.

Two known Golden Eagle key summer and nesting areas have been identified within the study area; one in the northwest corner of the Ketza River Holdings Claim Block (approximately 5 km northwest of the Ketza Mine site), and the second approximately 7 km northeast of the Ketza Mine Site (outside the Ketza River Claim Block) (Government of Yukon 2005).

No surveys or monitoring programs of peregrine falcons have occurred within the study area. Key peregrine falcon areas have been identified along the Pelly River, approximately 10 km northeast of the study area.

Short-eared Owl

Short-eared owl is designated as a species of Special Concern and is listed under SARA Schedule III. Short-eared Owls are associated with open habitats such as tundra, alpine tundra, open wetland and meadow habitats (Alexander *et al.* 2003; Wiggins *et al.* 2006). This species has not been identified at the study area

6.7.5 Amphibian Species

A single amphibian species, the wood frog occurs within the study area (Government of Yukon 2005b). Wood frogs are assumed to commonly occur throughout the high boreal bioclimate zone within the study area, wherever appropriate habitat exists.

6.8 AIR QUALITY

The proposed mining area of the Ketza River Mine is located within a wilderness area that has no other sources that would affect the air quality. It is assumed that the air quality in the area would be in the same range as background levels for the Canadian north.

There is currently no air quality monitoring equipment at the mine site or any other adjacent sites. The only ongoing air quality monitoring in the Yukon is conducted at Whitehorse. The Whitehorse station is part of the National Air Quality Surveillance (NAPS) Network. The air pollutants monitored in Whitehorse include carbon monoxide, nitrogen dioxide, nitric oxide, ground level ozone, and fine particulate matter (PM_{25}). The monitored ambient air pollutants in Whitehorse are compared with the National Air Quality Objectives (NAQOs). Summary reports for 1998, 2000, 2001 and 2004 were reviewed for this station. Overall, the reports conclude that the ambient air pollutant levels monitored at the Whitehorse NAPS station are good and rarely exceed the levels specified in the NAQOs.

A direct comparison cannot be made between Whitehorse ambient air pollutant levels and those at the Ketza River Mine location. However, it is assumed that due to the location of the mine site, the comparatively lower levels of traffic and comparatively lower levels of wood burning than in Whitehorse, the ambient air quality is considered to be higher quality than in Whitehorse.

6.9 NOISE

The mine site is situated in a remote area where the background noise consists of natural sounds. Some noise is created during the current mining exploration, care and maintenance activities, and vehicular movements. Noise levels at the mine site are currently not monitored but are commensurate with regular exploration activities. Ambient noise is expected to be mainly of a temporary nature and will only impact the immediate vicinity of the above-mentioned activities. The daily and long-term averages for ambient noise in the area are anticipated to be low.

6.10 COMMUNITY CHARACTERISTICS

The site is located in the Pelly Mountains, which are part of the Boreal Cordillera of the south-central Yukon Territory. The area is currently uninhabited. The site's latitudes and longitudes in the Water Licence are listed as:

- minimum latitude: 61° 25' N, and maximum latitude: 61° 26' N; and
- minimum longitude: 132° 14', and maximum longitude 132° 19' W.

6.10.1 Nearest Community

The site is located approximately 85 km south by road from Ross River, YT, the closest community. The Ketza River Mine access road is approximately 49 km south from the Robert Campbell Highway and travels along the Ketza River valley.

6.10.2 Population

During the current operation of the mine approximately 18 people are residing on site at the camp. The mine site is currently not operating and the camp has been staffed since April 2005.

There are no permanent residents living along the Ketza River Mine access road; however the Ross River Dena and Liard First Nation have historical hunting and trapping camps in the area that could be occupied during the hunting and trapping season.

Ross River, the nearest community to the site had an estimated population of 335 residents in 2003. Approximately 80% of the total population of the community are members of the Ross River Dena Council. (www.yukoncommunities.yk.ca)

6.10.3 Ross River Dena

The Ketza River Mine and the access road to the mine are in the traditional territory of the Ross River Dena. The Ross River Dena are members of the Kaska Nation. Calculations generated by Indian and Northern Affairs Canada in 2004 estimated the registered population of the Ross River Dena Council at 436. (www.yukoncommunities.yk.ca) Approximately 100 members live outside the community.

Community consultations with the Ross River Dena were conducted in March 2007 to seek the opinions and experiences of participants of previous mining projects that had affected the communities and to gather information, comments and questions from participants relating to the Ketza River Mine proposal, primarily concerning the social, economic and environmental impacts of the mine. The main themes that developed from the comments and questions received at the March, 2007 meetings held in Ross River can be summarized as:

- Job and business opportunities;
- Training opportunities;
- Protection of the natural environment (Land, water and wildlife); and
- Drug and alcohol abuse brought on by higher incomes.

No Final Land Claims Agreement has been signed with any of the Kaska First Nations. Therefore, the mine is not located on settlement land. (Ketza River Holdings, 2006)

6.10.4 Liard First Nation

The Ketza River Mine is located approximately 360 km from Watson Lake, which is the centre for the Liard First Nation. The mine site is located within the traditional territory of the Liard First Nation. Representatives of this First Nation have advised Company representatives that it would be sufficient to keep Liard First Nation informed about progress of the project via e-mail updates, and that full consultation meetings were not required.

6.11 ECONOMY AND EMPLOYMENT

The mine and camp currently employ about 18 people. The monitoring of the tailings pond and water quality employs two staff for monitoring and an additional staff member is trained as an alternate. Two additional staff are involved indirectly through the maintenance of access roads and operation of the pumping station and treatment plant when these are required. The majority of staff are from the community of Ross River.

According to Statistics Canada, 2006 Census, the community of Ross River had the second highest unemployment rate (21.2%) in the Yukon.

6.12 HEALTH AND SAFETY

KRH provides training for staff who are currently involved in the monitoring program. This includes attendance at training courses for the Environmental Monitor position and safety training on-site. EBA has also completed staff training for the safe handling of chemicals and safe work practices for the collection of samples and the use of sampling equipment.

The mine also has a drug and alcohol program in camp.

6.13 HERITAGE RESOURCES

In 2007, an archaeological assessment (Salix Heritage Consulting, 2007) was conducted as part of the preparation for a YESAA assessment for the mine's production phase. The assessment covered the original mine production area which included the tailings pond and access roads to the pond and various monitoring stations. No significant heritage values were found.

7.0 IDENTIFICATION OF POTENTIAL ENVIRONMENTAL AND SOCIO-ECONOMIC EFFECTS AND PROPOSED MITIGATIONS

This section, including the determination of valued components, the effects assessment and significance determination, is based on the information available at the time of the assessment.

Valued components for the proposed project have been identified as:

Environmental Valued Components

- Permafrost
- Surface water quality and quantity
- Groundwater quality
- Aquatic Resources
- Wildlife
- Air Quality

- Noise

Socio-economic Valued Components

- Economy and employment
- Health and safety
- Heritage resources

7.1 PERMAFROST

7.1.1 Effects Characterization

One area along the south side of the Cache Creek South Diversion channel had a history of instability which was an area that was believed to be prone to permafrost. Sloughing of soil in this area could expose permafrost leading to continued thawing in this area.

7.1.2 Proposed Mitigations

Maintain of riprap along the banks of Cache Creek South Diversion, particularly in the area of suspected permafrost.

7.1.3 Significance Determination

It was determined through a review of the potential effects and associated project activities that the proposed project, with the recommended mitigation, will not result in a significant, adverse effect to permafrost.

7.2 SURFACE WATER QUALITY AND QUANTITY

Surface water quality and water quantity (flow), were identified as valued components (VC) tied to maintenance of aquatic habitat downstream of the site. Changes to water quality or flow could affect downstream water use and aquatic habitat. Potential project effects have been considered in Cache Creek and downstream to the Ketza River.

Since there will not be any significant volumes of water withdrawn from any surface water bodies in association with this project, no effects have been identified regarding surface water quantity or flow, including either Cache Creek or Ketza River.

7.2.1 Water Quality

7.2.1.1 Effects Characterization

Seepage from the tailings pond has concentrations of some metals that are in excess of CCME aquatic life water use guidelines. Discharge of water from the tailings pond at times of the year when other creeks are high in metals could adversely affect water quality.

7.2.1.2 Proposed Mitigation

KRH will adhere to the standards imposed by the Yukon Water Board. KRH proposes the standards in Table 7.2.1.2.1 be implemented during the course of the project to minimize effects on surface water:

TABLE 7.2.1.2.1: PROPOSED DISCHARGE WATER QUALITY STANDARDS

Parameter	Concentration for any Grab Sample	Sampling Locations
Total Suspended Solids	Not greater than 15 mg/L	KR-04 N3 KR-05 S2 KR-09A
pH	Not less than 6.5 pH units	KR-04 N3 KR-05 S2 KR-09A
Fish toxicity	Non-toxic as determined by LC_{50} Bioassay	KR-09A
Total Arsenic	0.5 mg/L	KR-04 N3 KR-05 S2 KR-09A
Total Cyanide	1.0 mg/L	KR-04 N3 KR-05 S2 KR-09A
Total Copper	0.3 mg/L	KR-04 N3 KR-05 S2 KR-09A
Total Lead	0.2 mg/L	KR-04 N3 KR-05 S2 KR-09A
Total Nickel	0.5 mg/L	KR-04 N3 KR-05 S2 KR-09A
Total Zinc	0.5 mg/L	KR-04 N3 KR-05 S2 KR-09A
Total Ammonia (as N)	1.0 mg/L	KR-04 N3 KR-05 S2 KR-09A

7.2.1.3 Significance Determination

It was determined through a review of the potential effects and associated project activities that the proposed project, with the recommended mitigation, will not result in a significant, adverse effect to surface water quality. It will, however, result in a significant positive effect to surface water quality.

7.2.2 Water Quantity

7.2.2.1 Effects Characterization

No water is withdrawn from Cache Creek for the project. Discharge from the tailings pond into Cache Creek would add about 10 L/sec which will not significantly alter stream flow.

7.2.2.2 Proposed Mitigation

Discharge of tailings pond water into Cache Creek should be monitored to ensure no significant changes in water quantity are created.

7.2.2.3 Significance Determination

It was determined through a review of the potential effects and associated project activities that the proposed project, with the recommended mitigation, would not result in a significant, adverse effect to surface water quantity.

7.3 GROUNDWATER QUALITY

7.3.1 Effects Characterization

Seepage from the tailings pond could affect groundwater quality in the vicinity of the tailings pond. This groundwater daylights immediately downstream of the tailings dam and therefore could affect surface water quality downstream.

7.3.2 Proposed Mitigation

Groundwater in the tailings pond dam and seepage water immediately downstream should be monitored to ensure no significant changes in water quality are occurring.

7.3.3 Significance Determination

It was determined through a review of the identified potential effects and associated mitigation measures that the proposed project would not likely result in a significant, adverse effect to groundwater quality.

7.4 AQUATIC RESOURCES

7.4.1 Effects Characterization

Water in the tailings pond has concentrations of metals that are in excess of CCME aquatic life water use guidelines. Discharge of water from the tailings pond at times of the year when other creeks are high in metals could adversely affect aquatic resource downstream in Cache Creek.

7.4.2 Proposed Mitigation

Pumping of water from tailings pond water into Cache Creek should be monitored to ensure no significant changes in water quantity are created that could affect aquatic resources.

7.4.3 Significance Determination

It was determined through a review of the potential effects and associated project activities that the proposed project, with the recommended mitigation, will not result in a significant, adverse effect to aquatic resources.

7.5 WILDLIFE

7.5.1 Effects Characterization

Direct impact on local wildlife is expected to be minimal. Most wildlife with the ability to move from the site will likely avoid the site when any maintenance or monitoring activities are occurring. Wildlife using this area are likely to already be habituated to the types of disturbance that have been occurring at the site. Wildlife local to the area may include, but is not limited to, small mammals (mice, voles), Arctic ground squirrels, red squirrels, and avian species.

7.5.2 Proposed Mitigation

No required mitigation measures have been identified.

7.5.3 Significance Determination

It was determined through a review of the potential effects and associated project activities that the proposed project will not result in any significant adverse effects on wildlife.

7.6 AIR QUALITY

7.6.1 Effects Characterization

No significant environmental effects identified.

7.6.2 Proposed Mitigation

No required mitigation measures have been identified.

7.6.3 Significance Determination

It was determined through a review of the potential effects and associated project activities that the proposed project will not result in any significant adverse effects on air quality.

7.7 NOISE

7.7.1 Effects Characterization

No significant environmental effects identified.

7.7.2 Proposed Mitigation

No required mitigation measures have been identified.

7.7.3 Significance Determination

It was determined through a review of the potential effects and associated project activities that the proposed project will not result in any significant adverse effects relating to noise.

7.8 ECONOMY AND EMPLOYMENT

7.8.1 Effects Characterization

Operation of the site will continue to provide employment to staff and contractors as required for its operation.

7.8.2 Proposed Mitigation

No required mitigation measures have been identified.

7.8.3 Significance Determination

It was determined through a review of the potential effects and associated project activities that the proposed project will result in a positive effect to the economy of the area.

7.9 HEALTH AND SAFETY

7.9.1 Effects Characteristics

Work on this project involves working near fast flowing water, working on ice, the use of chemical preservatives for water samples and accessing sites with avalanche hazards. Improper training and work procedures could result in work injury.

7.9.2 Proposed Mitigation

Work on all aspects of the project will be conducted in accordance with Yukon's WCB requirements and the Occupational Health and Safety Act (Yukon).

7.9.3 Significance Determination

It was determined through a review of the potential effects and associated project activities that the proposed project, with the recommended mitigation, will not result in a significant, adverse effect to worker health and safety.

7.10 HERITAGE RESOURCES

7.10.1 Effects Characteristics

No significant effects identified

7.10.2 Proposed Mitigation

No heritage resources have been identified in the area of the tailings pond or monitoring stations. Should monitoring station locations change or new stations be required the locations would be compared to maps of known areas of potential heritage resources to ensure locations and access would not impact the identified areas.

7.10.3 Significance Determination

It was determined through a review of the potential effects and associated project activities that the proposed project, with the recommended mitigation, will not result in a significant, adverse effect to any know heritage resources.

7.11 SUMMARY OF MITIGATIONS FOR ALL IDENTIFIED EFFECTS

The following is a list of the mitigation measures proposed for the identified potential project effects:

- Maintenance of riprap along the banks of Cache Creek South Diversion, particularly in the area of suspected permafrost, to prevent sloughing of the bank and possibly exposing permafrost soils.
- Continue adherence to the inspections, monitoring and discharge standards established by the previous Water Licence QZ04-063.
- During discharge of tailings pond water, Cache Creek should be monitored to ensure no significant changes in water quantity are created.
- Work on all aspects of the project will be conducted in accordance with Yukon's WCB requirements and the Occupational Health and Safety Act (Yukon).
- Should monitoring station locations change or new stations be required the locations would be compared to maps of known areas of potential heritage resources to ensure locations and access would not impact areas of potential heritage resources.

7.12 SIGNFICANCE DETERMINATION

It was determined through a review of the potential effects and associated project activities that the proposed project, with the recommended mitigations, will not result in a significant, adverse effect to any of the valued components identified in this project proposal.

8.0 ADDITIONAL INFORMATION / RESOURCES

8.1 SOURCES OF INFORMATION

See reference list.

9.0 ACKNOWLEDGEMENT AND CERTIFICATION

Please refer to Section 9.0 of the Form 1.

10.0 CLOSURE AND LIMITATIONS

This project proposal has been prepared for Ketza River Holdings Ltd for the purpose of supporting the proposed project Form 1 submission.

With respect to regulatory compliance issues, please note that regulatory statutes and the interpretation of regulatory statutes are subject to change over time. Moreover, this report is not meant to represent a legal opinion regarding compliance with applicable laws.

Respectfully submitted,
EBA Engineering Consultants Ltd.

Prepared by:

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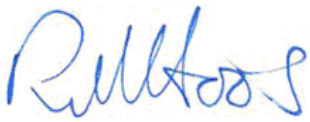

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FIGURES

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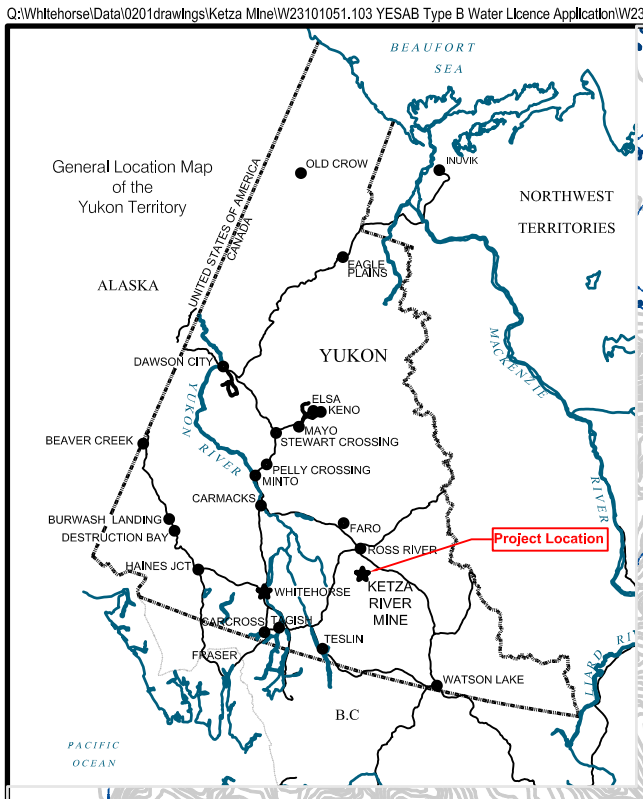


Robert Campbell Highway

Bruce Lake

Ketza River

Mount Green

Clouter Creek

Ketza River

S T C Y R

R A N G E

(PELLY MOUNTAINS)

Ketza River

Airfield

Cache Creek

TAILINGS POND

KETZA CAMP

TARN LAKE

Oro Creek

ISSUED FOR USE

0 50 000

Scale: 1: 100 000 (metres)

CLIENT

Ketza River Holdings

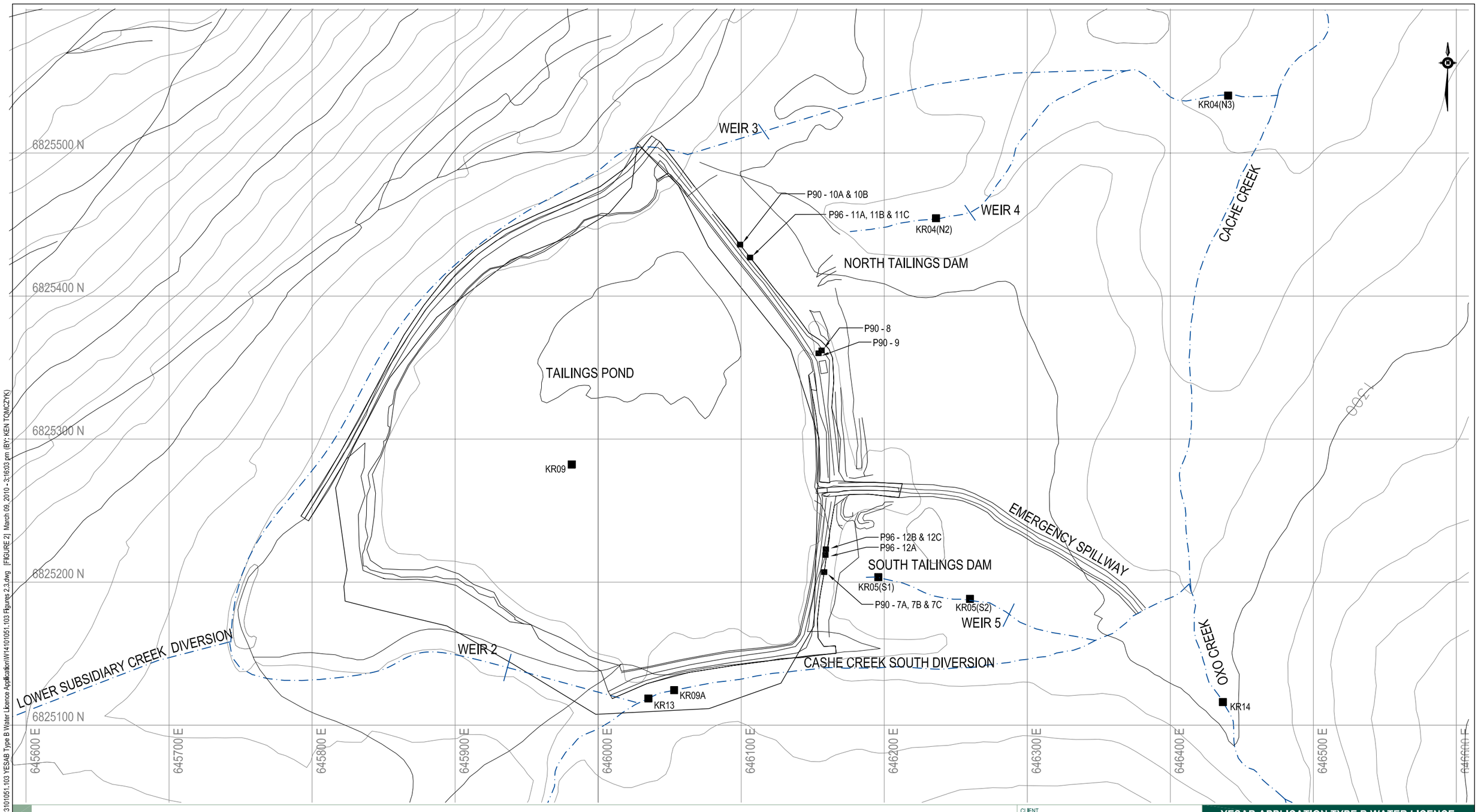
YESAB APPLICATION TYPE B WATER LICENCE
KETZA RIVER MINE, YUKON

SITE PLAN

EBA Engineering Consultants Ltd.

PROJECT NO.	DWN	CKD	REV
W23101051.103	KJT	DJW	0
OFFICE: EBA-WHSE	DATE: March 9, 2010		

Figure 1



LEGEND

- ROADWAY
- WATERCOURSE
- WATER QUALITY SAMPLING STATION

0 100

Scale: 1: 2 500 (metres)

ISSUED FOR USE

CLIENT

Ketza River Holdings

YESAB APPLICATION TYPE B WATER LICENCE KETZA RIVER MINE, YUKON

PIEZOMETERS AND WATER SAMPLING STATIONS NEAR TAILINGS POND

EBA Engineering Consultants Ltd.

PROJECT NO.	DWN	CKD	REV
W23101051.103	KJT	DJW	0
OFFICE: WHSE	DATE: March 9, 2010		

Figure 2

PEEL CREEK

N 6 826 000

KR15

KR08

CACHE CREEK

4300

CACHE CREEK SOUTH DIVERSION

TAILINGS POND

KR14

KR13

KR16

LOWER SUBSIDIARY CREEK

N 6 825 000

5000

CACHE CREEK

MILL & CAMP

KR01

OXO CREEK

5000

E 644 000

E 645 000

E 646 000

E 647 000

LEGEND:

- CREEKS
- ROADS
- EXISTING WATER QUALITY STATIONS

0 1 000

Scale: 1: 30 000 (metres)

ISSUED FOR USE

CLIENT

Ketza River Holdings

YESAB APPLICATION TYPE B WATER LICENCE KETZA RIVER MINE, YUKON

CACHE CREEK WATER SAMPLING STATIONS

EBA Engineering Consultants Ltd.

PROJECT NO.	DWN	CKD	REV
W23101051.103	KJT	DJW	0

OFFICE: WHSE

DATE: March 9, 2010

Figure 3

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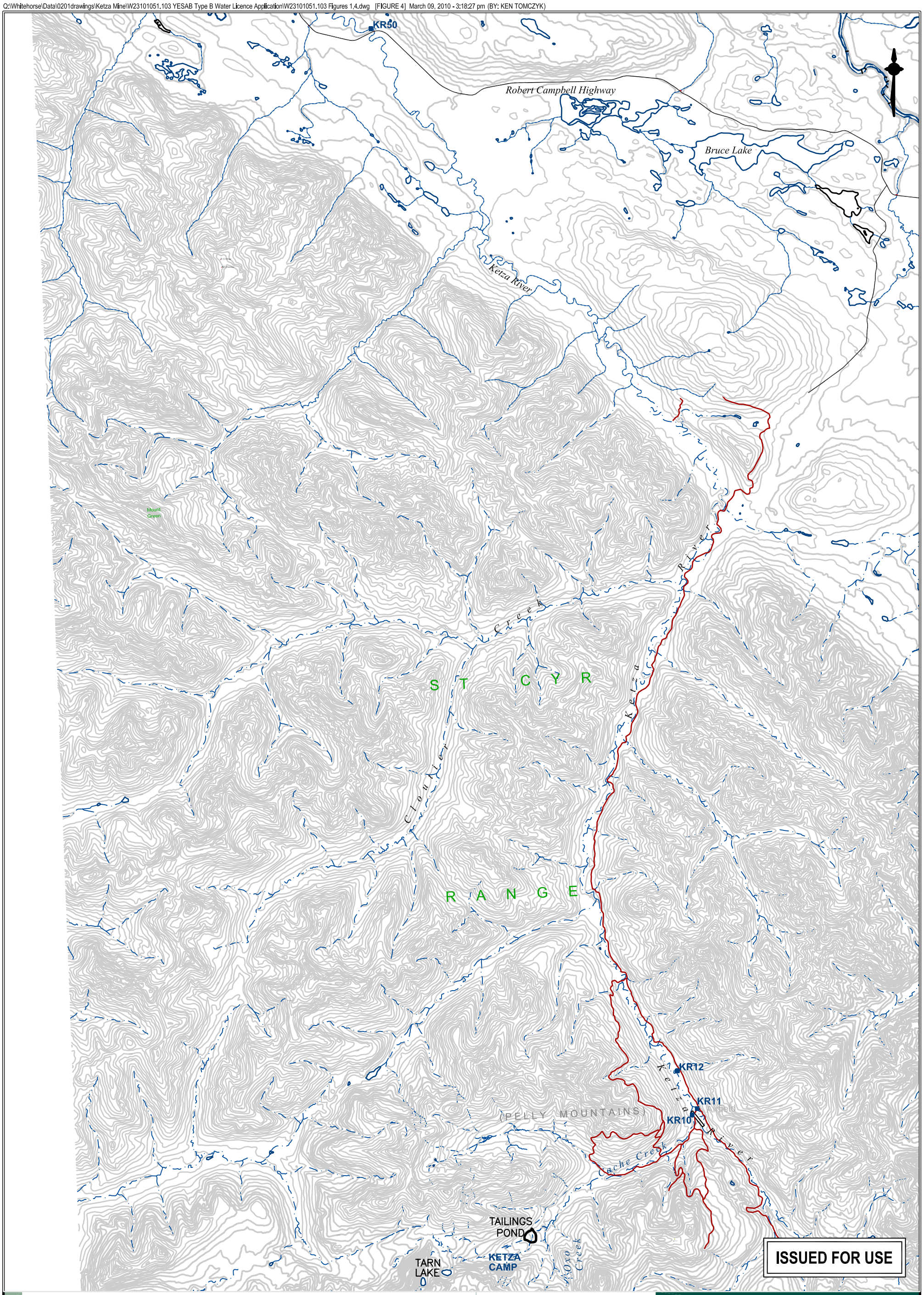

0 50 000

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CLIENT

Ketza River Holdings

YESAB APPLICATION TYPE B WATER LICENCE
KETZA RIVER MINE, YUKON

KETZA RIVER WATER SAMPLING STATIONS

EBA Engineering Consultants Ltd.

PROJECT NO.	DWN	CKD	REV
W23101051.103	KJT	DJW	0
OFFICE: EBA-WHSE	DATE: March 9, 2010		

Figure 4