Lorimer and Associates

WHITEHORSE COPPER SUBDIVISION HYDROGEOLOGICAL ASSESSMENT FOR WATER SUPPLY WHITEHORSE, YUKON

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EXECUTIVE SUMMARY

EBA Engineering Consultants Ltd. (EBA) was retained by Lorimer and Associates on behalf of YTG Community Services Department to co-ordinate and supervise a test well drilling program for the new Whitehorse Copper Subdivision. The Whitehorse Copper Subdivision is comprised of 110 country residential and 25 service industrial lots and is located to the west of the McRae industrial area and to the south east of the Mt. Sima Road. The lots will not be serviced by municipal water or sewer, and it will be the responsibility of the individual property owners to provide such services.

The purpose of this project was to provide potential lot purchasers with a qualitative assessment of the water supply potential of the subdivision area and to address the potential impact to downgradient water users resulting from the establishment of water supply wells and inground sewage disposal fields in the area.

Five test wells were drilled and tested throughout the subdivision footprint. Based on the results of well drilling and testing and laboratory analysis, two distinct units are interpreted to exist within the subdivision footprint- the Miles Canyon Basalt and the Whitehorse Batholith Granodiorite. The extent of these units has been estimated based on bedrock geology mapping for the area, and the results of the test well drilling program. Bedrock contacts are not considered to be exact.

Areas underlain by the Miles Canyon Basalt have a high potential for the establishment of successful domestic water supply wells as water quantity and quality is consistent regionally. Three test wells; TW06-01, TW06-03 and TW06-04 encountered the Miles Canyon Basalt. TW06-01 and TW06-04 were completed in the basalt and have safe sustainable yields of 3.4 and 19.4 USgpm respectively. The water from both wells meets Canadian Drinking Water Quality Guidelines (CDWQG) for health based parameters, iron and manganese may exceed the aesthetic objectives at some locations.

Areas underlain by the Whitehorse Batholith Granodiorite have a lower potential for the establishment of successful water supply wells, as both water quantity and quality are variable throughout the region. Two of the test wells TW06-02 and TW06-05 are completed within this unit. Each well was drilled to a depth of 61.0 meters below ground (mbgl). The safe sustainable yield of TW06-02 is 0.7 USgpm, and the safe sustainable yield of TW06-05 is 8.2 USgpm. The large difference in the well yield is attributed to the productive fracture zone which was encountered in TW06-05 near the bottom of the hole (a productive fracture zone was not encountered in TW06-02). Water quality results for these two wells display total uranium above the CDWQG Maximum Acceptable Concentration (MAC) of 0.02 mg/L. Water from these wells should not be consumed or used for cooking without prior treatment for uranium removal. A point of use Reverse Osmosis (RO) system could be installed for approximately $ 1,000 at the kitchen sink. This would allow home owners to use the treated water for drinking and cooking, and the untreated well water for other household activities such as bathing and irrigation.

Productive overburden deposits are expected to exist intermittently throughout the subdivision area. Where present in sufficient thickness, overburden aquifers are expected to supply adequate water quantity and quality for the establishment of domestic water supply wells.

Potential impacts to downgradient groundwater quantity have been assessed based on the expected groundwater recharge and demand over the subdivision area. Based on the conservative assumptions that every homeowner establishes a water supply well, and that no well water is returned to the ground through septic fields, recharge over the total recharge area (72 000 m^3/year), exceeds the total groundwater demand (44 845 m^3/year).

Downgradient impacts to water quality are expected to be negligible as long as in-ground sewage disposal fields are designed and operated properly. The feasibility of establishing in-ground sewage disposal should be evaluated on a lot by lot basis, and wells must have properly constructed with surface seals to ensure protection of the underlying aquifers in the area. Continued monitoring for both water levels and water quality of the Wolf Creek long term monitoring well is recommended to ensure water level and quality objectives are maintained in the area.

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1.0 INTRODUCTION

1.1 BACKGROUND AND PURPOSE

The proposed Whitehorse Copper Subdivision is comprised of 110 country residential and 25 service industrial lots encompassing an area of approximately 526 hectares located to the north and northwest of the existing Wolf Creek and Wolf Creek North Country residential Subdivisions (Figure 1). Lots at the Whitehorse Copper subdivision will not be serviced by municipal water or sewer. Homeowners will be required to either drill individual water supply wells, or to rely on bulk water delivery for water supply.

EBA Engineering Consultants Ltd. (EBA) was retained by Lorimer and Associates on behalf of the Government of Yukon (YTG), Community Services Branch to provide hydrogeological consulting services in relation engineering design services for the Whitehorse Copper Subdivision.

The purpose of this hydrogeological assessment is to provide a qualitative assessment of the water supply potential of the subdivision for the establishment of water supply wells to serve individual residences for domestic purposes. Required yields for domestic water supply wells have been estimated based on the following formulas provided in Gartner Lee's preliminary hydrogeological assessment for the Subdivision:

Personal Usage (L/day) = # people per household x 275 L per person/ per day (GLL 2002)

Lawn and Garden Usage (m^3/year) = (225 m^2) x (0.025 m/week) x (12 weeks) (GLL 2002)

Based on an average occupancy of 3 people per household (GLL 2002), the average day demand per household is 1010 L/day (0.3 USgpm).

Additional information collected through test well drilling has also been used to further assess potential impacts to downgradient groundwater users in the Wolf Creek and Pineridge subdivisions.

1.2 SCOPE OF WORK

EBA's scope of work for the project involved the following tasks:

- Review of background information;
- Site reconnaissance to select optimal drilling locations;
- Arranging for qualified drilling and pumping test contractors;
- Supervising and directing the drilling and testing program;
- Analyzing and interpreting data; and

- Preparing this letter report summarizing the work completed and conclusions of the study.

The work was competed in general accordance with EBA's proposal of September 25, 2005.

2.0 REGIONAL GEOLOGY AND HYDROGEOLOGY

The Whitehorse Copper Subdivision development is located on the upland benches landscape setting of Whitehorse (GLL 2002). This landscape is characterized by rolling topography that is frequently intersected by glacial melt water channels and small stream channels. (GLL 2003). A summary of well depths, lithology encountered and yields are summarized on Table 1. Corresponding well locations are indicated on Figure 2. Regional groundwater flow throughout the subdivision footprint is from topographic highs (Mt Sima area) to topographic lows (Yukon River).

The Whitehorse Copper Subdivision is underlain by two distinct bedrock units; the Miles Canyon Basalt, and the Whitehorse Batholith (Granodiorite). A third unit, the Hancock Formation Limestone is also known to exist to the west of the subdivision area (towards Mt. Sima). Bedrock is overlain by varying thickness of overburden. The interpreted extent of the three bedrock units is shown on Figure 8, and a detailed description of the units is provided in the following sections.

2.1 SURFICIAL DEPOSITS

Surficial geology mapping for the area (Bond et al. 2005) shows that the main overburden unit is a veneer of glacial till overlying bedrock, some small pockets of fluvial and organic deposits are shown to occur in the study area. Depth to bedrock is variable and generally no deeper than 30 m. Extractable groundwater in the surficial deposits generally occurs within interbedded sands and gravels, which may exist intermittently throughout the subdivision footprint. The water supply potential of these surficial deposits is variable, and dependant on the occurrence of sufficient thicknesses of permeable sands and gravels.

2.2 MILES CANYON BASALT

The Miles Canyon Basalt consists of several sequences of flows located between Mary Lake, MacRae, Miles Canyon and Whitehorse Rapids (Figure 8). The basalts are dominated by columnar-jointed, variably vesicular and amyglodial flows and scoria (Pearson et al. 2001). The columnar joints give rise to good vertical and secondary permeability and the connectivity of the joints provides considerable horizontal permeability (Pearson et al. 2001). These characteristics provide good domestic water supply potential, and relatively consistent aquifer performance parameters. Aquifers in the basalt are not highly productive, but with sufficient thickness are commonly adequate for single residence usage (Pearson et al. 2001).

2.3 WHITEHORSE BATHOLITH (GRANODIORITE)

The Whitehorse Batholith is a Cretaceous intrusive body encompassing over 6000 km^2 which ranges from diorite to granite, and is dominated by granodioroite. As the unit lacks significant fracturing or jointing, wells developed in granodiorite have much more variable aquifer performance. If a fracture zone is intersected in the granitic rock, adequate water supplies can be developed. If a fracture zone is not intersected in the drill hole, the well may yield inadequate water supplies, or may require excessive drilling depths. (Pearson et al. 2001).

2.4 HANCOCK MEMBER (LIMESTONE)

The Hancock member of the Aksala Formation is described as a limestone and silty limestone which is fossiliferous and grades upward to a siltstone, greywacke, sandstone and tuff (Mandana member). In the Whitehorse Copper Belt area, pendants and embayments of the Hancock member into the Whitehorse batholith localize the gold-silver skarn deposits (GLL 2002). The water supply potential of the Hancock Member is variable, and dependant on the intersection of productive fracture zones.

3.0 WELL DRILLING AND CONSTRUCTION

The contract for well drilling, construction and testing was awarded to MacDougall's Water Resources of Whitehorse, Yukon on August 28, 2006 under YTG contract CC-651-3015-00048. The test well drilling and construction commenced on September 12, 2006 and was completed on October 3, 2006.

The test wells were completed using the air rotary drilling method which advances steel casing into the ground using a downhole hammer and returns soil cuttings and/or bedrock chips to the surface by air. Soil samples or bedrock chips were collected from the end of the discharge pipe or from the cyclone every 1.52 m (5 ft) when drilling. All wells were constructed in accordance with Canadian Groundwater Association Guidelines for Water Well Construction including the installation of sanitary surface seals and stainless steel well screens (where applicable).

Test well locations are shown on Figure 2. Well locations were chosen to ensure sufficient spatial representation of the subdivision footprint, and to target areas of unconfirmed bedrock geology. Each test well location was selected such that it can be used as a domestic water supply well for an individual residence. TW06-03 was drilled on the school site (Moraine Drive) with the intention that it could be used as an observation well until a school is established on the lot.

Well logs detailing subsurface lithology, static water levels and well construction details are included as Figures 3 – 7 and briefly described in the following sections.

3.1 TW06-01

TW06-01 is located on Drumlin Crescent (Lot 6) as shown on Figure 2; a well log is included as Figure 3. The stratigraphy encountered at TW06-01 consisted of 17.6 m of overburden material (carrying degrees of silt, sand and gravel) overlying bedrock. Incompetent, weathered bedrock (Miles Canyon Basalt) was encountered at 17.6 meters below ground level (mbgl), and hardened downwards into competent bedrock at 34.1 mbgl.

Casing was installed though the incompetent bedrock zone, and the well was drilled open hole in basalt bedrock from 34.1 mbgl to 54.9 mbgl, and terminated in an unstable fracture zone encountered from 50.5 to 54.9 mbgl. Saturated conditions were encountered below 15.4 mbgl. Upon completion the well was developed for approximately 2 hours by air lifting until water clarity ceased to improve.

3.2 TW06-02

TW06-02 is located on Levich Drive (Lot 19) a shown on Figure 2; a well log is included as Figure 4. The stratigraphy encountered at TW06-02 consisted of 9.8 m of overburden (sand and gravel) overlying competent bedrock (Hancock Member Limestone). Saturated conditions were encountered from 6.2 mbgl to the total depth of 61.0 m. Casing was installed to 12.2 m and the well was drilled open hole in limestone bedrock to 61.0 m. Upon completion, the well was developed for approximately 2 hours by air lifting until water clarity ceased to improve.

3.3 TW06-03

TW06-03 is located at the potential school site on Moraine Drive (Figure 2); a well log is included as Figure 5. The stratigraphy encountered at TW06-03 consisted of 27.1 m of overburden overlying bedrock (Miles Canyon Basalt). Overburden deposits consisted of interbedded gravel, sand and silt, with saturated conditions below 6.1 m. The material encountered from 6.1 to 27.1 mbgl is considered to be one aquifer. Based on the productivity of the overburden deposits, a well screen was designed using grain size analysis results of the material from 25.9m (85 ft).

Grain size analysis was completed at EBA's materials testing laboratory in Whitehorse, YT; results are included in Appendix B. Based on the grain size results, a 2.54 mm (0.100 in), or 100 slot v-wire stainless steel screen was installed. The well screen assembly consisted of a 1.5 m (5 ft) screen interval with a 0.3 m (1 ft) riser and K-Packer. The entire screen was exposed from 25.6 to 27.1 mbgl, and the well was developed by jetting with air and water for approximately 8 hours until water clarity ceased to improve.

3.4 TW06-04

TW06-04 is located on Crevasse Place (Lot 54) as shown on Figure 2; a well log is included as Figure 6. The stratigraphy encountered at TW06-04 consisted of 3.7 m of overburden overlying incompetent bedrock (Miles Canyon Basalt). Overburden deposits consisted of

unsaturated sand and gravel. A 152 mm diameter steel casing was installed through the incompetent bedrock to a depth of 12.2 m, and the well was drilled open hole from 12.2 m to a total depth of 48.7 m. Based on the unstable conditions of the basalt bedrock encountered, a standard slotted PVC well liner was installed in the well. The well was developed for approximately 2 hours by air lifting until water clarity ceased to improve.

3.5 TW06-05

TW06-05 is located on Pingo Place (Lot 81) as shown on Figure 2, a well log is included a Figure 7. The stratigraphy encountered at TW06-05 consisted of 27.4 of overburden overlying bedrock. Overburden deposits consisted of 10.1 m of sand and gravel overlying 17.3 m of silt and clay (till). Saturated conditions were encountered from 9.3 to 61.0 mbgl. Incompetent, weathered granitic bedrock (Whitehorse Bathololith) was encountered from 27.4 to 41.1 mbgl, and competent granodorite was encountered below. Casing was installed to a depth of 42.6 m and the well was drilled open hole below to a depth of 61.0 m. Upon completion the well was developed by air lifting for approximately 2 hours until water clarity ceased to improve.

4.0 HYDRAULIC TESTING AND GROUNDWATER SAMPLE COLLECTION

Hydraulic testing of the wells was completed by Aqua Tech Sales and Services (Aqua Tech) working under sub-contract to Macdougall's Water Resources. Hydraulic testing commenced on October 18th and was completed on October 30th, 2006. Hydraulic testing at each well site involved a step drawdown, constant rate pumping test and recovery interval. The step drawdown test was completed at several different rates to determine the optimal rate for the constant rate pumping test, during each step the well as pumped at a constant rate for one hour. The constant rate pumping test was conducted for a target duration of 8 hours.

Water levels in the pumping well were measured manually during the pumping tests at specified intervals using a graduated water level tape. The flow rate was monitored at specified intervals using an instantaneous digital flow meter located at the wellhead and double checked using a graduated bucket and stopwatch. Water pumped from each well was conveyed to a location at least 60 m away and downgradient from the pumping well.

Water samples were collected near the end of the constant rate pumping interval at each well. Samples were collected in laboratory sample containers in accordance with laboratory recommended sampling procedures. Samples from each well were shipped on ice to ALS Environmental in Vancouver, BC for drinking water quality analysis including total metals, anions, nutrients and physical parameters.

Recovery was monitored in the well after the step drawdown and constant rate pumping intervals. Data collected during the step rate and constant rate pumping tests are included

in Appendix C, as Appendix C1 – C10. The data is presented graphically in Appendix D through Appendix H.

Details of pumping rates and observations during testing with each well are summarized in the following sections.

4.1 TW06-01

The step rate test completed on TW06-01 was initiated on October 18, 2006 at 11:15 AM. Three steps were conducted at rates of 0.06, 0.13 and 0.25 L/s (1, 2 and 4 USgpm), the third step was terminated after 44 min, as the water level was drawn down to the pump intake. The maximum drawdown observed during the step rate test was 33.02 m. Recovery was monitored for 100 min until the water level had recovered to within 90% of the total observed drawdown.

Based on results of the step rate test, the constant rate pumping test was initiated on October 18th, 2006 at 3:38 PM at a rate of 0.09 L/s (1.5 USgpm). The maximum drawdown observed during the constant rate test was 10.17 m. A total volume of 2,725 L (720 USG) was pumped over 8 hours during the constant rate test. Recovery was monitored for 3 hours upon termination of the constant rate test until the water level had recovered to within 98% of the total observed drawdown. Data collected during the step rate and constant rate pumping test with TW06-01 is included as Appendix C1 and C2 respectively, and graphical presentations are included as Appendix D1 and D2.

4.2 TW06-02

The step rate test completed on TW06-02 was initiated on October 27, 2006 at 1:22 PM, three steps were conducted at rates of 0.06, 0.13 and 0.25 L/s (1, 2 and 4 USgpm). The third step was terminated after 38 min, as the water level was drawn down to the pump intake. The maximum drawdown observed during the step rate test was 48.79 m. After 90 min of recovery monitoring, the water level had only recovered to within 53% of the static water level. After 67 hours of recovery monitoring, the water level had recovered to within 98% of the static water level.

Based on results of the step rate test, the constant rate pumping test was initiated on October 30th, 2006 at 8:45 AM at a rate of 0.13 L/s (2 USgpm). The maximum drawdown observed during the constant rate test was 48.79 m. The constant rate test was prematurely terminated after 270 min, as the water level was drawn down to the pump intake. A total volume of 2,044 L (540 USG) was pumped over 4.5 hours during the constant rate test. After 4 hours of recovery monitoring the water level had recovered to within 83% of the static water level. After 24.25 hours of recovery monitoring the water level had recovered to within 97% of the static water level. Data collected during the step rate and constant rate pumping test completed on TW06-02 is included as Appendix C3 and C4 respectively, graphical presentations are included as Appendix E1 and E2.

4.3 TW06-03

The step rate test completed on TW06-03 was initiated on October 19, 2006 at 1:34 PM. Three steps were conducted at rates of 0.6, 0.4 and 0.5 L/s (10, 5.5 and 7.5 USgpm). The maximum drawdown observed during the step rate test was 13.04 m. Recovery was monitored for 60 min at which time the water level had recovered to within 97% of the total observed drawdown.

Based on results of the step rate test, the constant rate pumping test was initiated on October 20th, 2006 at 9:20 AM at a rate of 0.5 L/s (7.5 USgpm). The maximum drawdown observed during the constant rate test was 8.85 m. A total volume of 13,600 L (3,600 USG) was pumped over 8 hours during the constant rate test. Recovery was monitored for 2 hours upon termination of the constant rate test until the water level had recovered to within 95% of the total observed drawdown. Data collected during the step rate and constant rate pumping test with TW06-03 is included as Appendix C5 and C6 respectively graphical presentations are included as Appendix F1 and F2.

4.4 TW06-04

The step rate test completed on TW06-04 was initiated on October 25, 2006 at 12:00 PM. Two steps were conducted at rates of 0.3, 0.6 L/s (5 and 10 USgpm), the second step was terminated after 30 min, as the water level was drawn down to the pump intake. The maximum drawdown observed during the step rate test was 31.4 m. Recovery was monitored for 70 min until the water level had recovered to within 91% of the total observed drawdown.

Based on results of the step rate test, the constant rate pumping test was initiated on October 26th, 2006 at 8:45 AM at a rate of 0.3 L/s (5 USgpm). The maximum drawdown observed during the constant rate test was 6.48 m. A total volume of 9,100 L (2,400 USG) was pumped over 8 hours during the constant rate test. Recovery was monitored for 6 hours upon termination of the constant rate test until the water level had recovered to within 90% of the total observed drawdown. Data collected during the step rate and constant rate pumping test with TW06-04 is included as Appendix C7 and C8 respectively, graphical presentations are included as Appendix G1 and G2.

4.5 TW06-05

The step rate test completed on TW06-05 was initiated on October 23, 2006 at 13:40 PM. Two steps were conducted at rates of 0.6, and 0.9 L/s (10 and 15 USgpm), the second step was terminated after 55 min, as the water level was drawn down to the pump intake. The maximum drawdown observed during the step rate test was 45.60 m. Recovery was monitored for 90 min until the water level had recovered to within 95% of the total observed drawdown.

Based on results of the step rate test, the constant rate pumping test was initiated on October 24th, 2006 at 9:06 AM at a rate of 0.6 L/s (10 USgpm). A total volume of 18,200 L

(4,800 USG) was pumped over 8 hours during the constant rate test. The maximum drawdown observed during the constant rate test was 45.50 m. Recovery was monitored for 4 hours upon termination of the constant rate test until the water level had recovered to within 90% of the total observed drawdown. Data collected during the step rate and constant rate pumping test with TW06-05 is included as Appendix C9 and C10 respectively, graphical presentations are included as Appendix H1 and H2.

5.0 HYDRAULIC TESTING RESULTS

5.1 HYDRAULIC TEST DATA ANALYSIS

Observed and residual drawdown during the constant rate pumping tests with each well has been analyzed using the Cooper-Jacob straight-line method which assumes the following:

- The aquifer is infinite in areal extent and uniform in thickness;
- The aquifer is homogeneous and isotropic;
- The pumping well fully penetrates the aquifer thickness, and pumps at a constant rate;
- The piezometric surface was horizontal prior to pumping;
- Water is released instantaneously from storage with a decline in head;
- The well diameter is small such that well storage is negligible; and,
- Flow is laminar.

The Cooper Jacob analysis has been applied separately for pumping and recovery intervals, and for boundary conditions observed during each test. Results are included on Figures D2, E2, F2, G2 and H2, and summarized in Table 2 on the following page. Also included (where applicable) is the aquifer hydraulic conductivity based on grain size analysis of aquifer material.

Table 2: Summary of Aquifer Hydraulic Conductivities and Transmissivities

Well Name	Aquifer Description	Data Set Used for Analysis	Transmissivity (m^2/day)	Hydraulic Conductivity K (m/sec)	Representative [1] Parameters	
					T (m^2/day)	K (m/sec)
TW06-01	Miles Canyon Basalt	Early Pumping (T_1,K_1)	4	2.8×10^{-6}	**2**	**1.3×10^{-6}**
		Mid Pumping (T_2,K_2)	1	4.5×10^{-7}		
		Late Pumping (T_3,K_3)	**2**	**1.0×10^{-6}**		
		Early Recovery (T_4,K_4)	**2**	**1.5×10^{-6}**		
		Mid-Late Recovery (T_5,K_5)	0.4	2.6×10^{-7}		
TW06-02	Whitehorse Batholith (Granodiorite)	Early Pumping (T_1,K_1)	2	3.5×10^{-7}	**1**	**3.1×10^{-7}**
		Late Pumping (T_2,K_2)	0.1	2.3×10^{-8}		
		Early Recovery (T_3,K_3)	2	3.1×10^{-7}		
		Mid-Late Recovery (T_4,K_4)	**1**	**3.1×10^{-7}**		
TW06-03	Overburden (Gravel and Sand)	Early Pumping (T_1,K_1)	4	2.0×10^{-6}	**20**	**1.1×10^{-5}**
		Late Pumping (T_2,K_2)	**14**	**8.0×10^{-6}**		
		Early Recovery (T_3,K_3)	3	1.6×10^{-6}		
		Late Recovery (T_4,K_4)	**25**	**1.4×10^{-5}**		
		Grain Size Analysis[2]	N/A	3.0×10^{-3}		
TW6-04	Miles Canyon Basalt	Mid- Late Pumping (T_1,K_1)	**9**	**2.8×10^{-6}**	**9**	**2.2×10^{-6}**
		Early Recovery (T_2,K_2)	5	1.4×10^{-6}		
		Late Recovery (T_3,K_3)	**9**	**1.6×10^{-6}**		
TW06-05	Whitehorse Batholith (Granodiorite)	Early- Late Pumping	**2**	**4.7×10^{-7}**	**2**	**4.9×10^{-7}**
		Early Recovery (T_2,K_2)	**2**	**5.0×10^{-7}**		
		Late Recovery (T_3,K_3)	**2**	**5.0×10^{-7}**		

Data collected during the early to mid pumping intervals in usually not representative of aquifer characteristics due to the effects of well losses and pump interference. Thus, the

[1] Representative Parameters have been calculated by averaging **bold** data, interpreted to be most representative of long term aquifer performance.

[2] Hazen Approximation where $K = (D_{10})^2 \times 10^{-2}$ m/sec with D_{10} in mm.

mid to late time data shown in bold above has been used to interpret representative aquifer characteristics.

The hydraulic conductivity values interpreted from pumping tests with wells completed in the Miles Canyon Basalt were consistent (1.3×10^{-6} and 2.2×10^{-6} m/sec), and in agreement with regional values reported from other wells completed in the basalt (9.3×10^{-7} – 5.1×10^{-6} m/sec) (Pearson et. al.).

The hydraulic conductivity value (1.1×10^{-5} m/sec) reported for TW06-03 which is completed in Sand and Gravel overburden is significantly lower than the conductivity calculated based on grain size analysis of the aquifer material (3.0×10^{-3} m/sec). The overburden aquifer is underlain by the Miles Canyon Basalt which was encountered at a depth of 27.1 mbgl. A possible explanation for the low aquifer conductivity is that the aquifer is bounded both horizontally and vertically by the basalt, resulting in aquifer recharge coming from the basalt rather than overburden. The resulting effect is aquifer performance parameters more representative of basalt bedrock than of sand and gravel deposits.

The hydraulic conductivity values interpreted from pumping tests with wells completed in the Whitehorse Batholith Grandiorite were consistent (3.1×10^{-7} and 4.7×10^{-7} m/sec) and in agreement with regional values reported from other wells completed in the unfractured unit (2.3×10^{-8} – 1.7×10^{-7} m/sec) (Pearson et. al. 2001).

5.2 SAFE SUSTAINABLE WELL YIELDS

The safe yield of each well has been calculated by projecting the constant rate drawdown to 100 days as shown on Figures D2 (TW06-01), E2 (TW06-02), F2 (TW06-03), G2 (TW06-04) and H2 (TW06-05). This conservatively assumes that each well would be continuously pumped at the same rate for 100-days with no recharge to the aquifer. The safe sustainable yield is determined by applying a safety factor of 70% of the physical available drawdown after an allowance has been made for seasonal fluctuations in static water level. Safe yield calculations for each well are detailed in Table 3 and briefly discussed in the following sections.

5.2.1 TW06-01

The safe sustainable yield of TW06-01 is 0.2 L/sec (3.3 USgpm), which is considered sufficient for domestic use. As shown in Figure D2, a recharge boundary was encountered at approximately 80 min into the constant rate pumping test. A discrete fracture zone was not encountered in TW06-01, instead, the permeability occurs throughout the open hole, which is consistent with basalt bedrock. To maximize the available drawdown, the pump intake should be positioned below the 70% available drawdown depth (38.5 mbgl).

5.2.2 TW06-02

TW06-02 has the lowest capacity of the five test wells, with a safe sustainable well yield of 0.04 L/sec (0.6 USgpm). As shown in Figure D3, drawdown steepened during the constant rate pumping test resulting in premature termination of the test. To maximize the available drawdown, the pump intake should be positioned below the 70% available drawdown depth or (54.7 m).

Commissioning of TW06-02 for domestic water supply will likely require the installation of a larger pressure or storage tank than typically used for a domestic water supply system. Depending on the size of pressure or storage tank installed, the well should be used with caution for high demand activities such as gardening or irrigation.

5.2.3 TW06-03

The safe sustainable yield of TW06-03 is 0.8 L/sec (12 USgpm), which is considered sufficient for domestic use. As shown in Figure G2, a recharge boundary was encountered at approximately 15 min into the constant rate pumping test. TW06-03 is screened within a gravel and sand overburden aquifer, to maximize the available drawdown, the pump intake should be positioned just above the top of the screen interval at 25.6 mbgl. The capacity of this well is considered sufficient for single, and potentially multiple domestic water supplies.

The water demand of a potential school is unknown, thus the potential demand and well yield should be re-evaluated prior to commissioning for a school water supply system.

5.2.4 TW06-04

The safe sustainable yield of TW06-04 is 1.2 L/sec (18.9 USgpm), which is considered sufficient for domestic use. As shown in Figure E2, a recharge boundary was encountered at approximately 100 min into the constant rate pumping test. TW06-03 is completed in a bedrock aquifer with no discrete fracture zones; to maximize the available drawdown, the pump intake should be positioned below the 70% available drawdown depth (26.4 mbgl). The capacity of this well is considered sufficient for single, and potentially multiple domestic water supplies.

5.2.5 TW06-05

The safe sustainable yield of TW06-05 is 2.7 L/sec (43.4 USgpm), which is considered sufficient for domestic use. As shown in Figure F2, a negative or no-flow boundary was encountered at approximately 120 min into the constant rate pumping test. TW06-05 is completed in a bedrock aquifer with a discrete fracture zone at 53 mbgl, to maximize the available drawdown, the pump intake should be positioned below the 70% available drawdown depth (37.3 mbgl). The capacity of this well is considered sufficient for single, and potentially multiple domestic water supplies.

6.0 RESULTS OF LABORATORY ANALYSIS

Samples from each well were analyzed for the main parameters included in the Canadian Drinking Water Quality Guidelines (CDWQG). Laboratory results for all wells have been summarized in Table 2, and are compared to the CDWQG maximum acceptable concentrations (MACs) for health based and aesthetic objectives (AOs). A brief description of the water quality for each well is included below, along with notable exceedences and/or observations.

6.1 TW06-01

Water from TW06-01 is a very hard magnesium-bicarbonate type water with a slight tendency to scale (as indicated by a slightly positive saturation index of 0.392). Water from TW06-01 meets all CDWQG for health based parameters. Total iron at 0.603 mg/L is 2 times the aesthetic objective (AO) of 0.3 mg/L. Iron at this concentration is not expected to cause any adverse effects such as staining of household appliances or fixtures.

6.2 TW06-02

Water from TW06-02 is a very hard calcium-bicarbonate type water with a slight tendency to scale (as indicated by a positive saturation index of 0.439). The total uranium concentration of 0.0527 mg/L is 2.6 times the CDWQG health based maximum acceptable concentration (MAC) of 0.02 mg/L. Total manganese at 0.367 mg/L is 7.3 times the CDWQG aesthetic objective (AO) of 0.05 mg/L. Total iron at 0.720 mg/L is 2.5 times the CDWQG AO of 0.3 mg/L.

Although not a health concern, manganese and iron at these concentrations may be noticed as a slightly metallic taste and/or odour by the consumers of the untreated water. Manganese and iron at these concentrations may also cause slight staining of household appliances and fixtures.

The source of uranium in groundwater at TW06-02 is unknown, and inferred to be naturally occurring. Water from TW06-02 should not be consumed or used for cooking without prior treatment for uranium removal. Untreated well water can still be used for other household needs such as bathing and cooking[3].

6.3 TW06-03

Water from TW06-03 is a moderately hard calcium-bicarbonate type water with a slight tendency to scale (as indicated by a slightly positive saturation index of 0.282). Water from TW06-03 meets all CDWQG for health based parameters. Turbidity at 5.55 NTU is slightly above the AO of 5 NTU, manganese at 0.202 mg/L is 4 times above the AO of 0.05 mg/L. The elevated manganese concentration at TW06-03 may be related to the elevated turbidity, if this is the case, the concentration of both parameters is expected to decrease over time as

[3] Per. communication between Katherine Johnston (EBA) and Pat Brooks, Environmental Health Officer

the well is pumped. Although not a health concern, manganese at this concentration may be noticed as a slightly metallic taste and/or odour by the consumers of the untreated water. Manganese at this concentration may also cause slight staining of household appliances and fixtures.

6.4 TW06-04

Water from TW06-04 is a very hard calcium-bicarbonate type water with a tendency to scale (as indicated by a positive saturation index of 0.545). Water from TW06-04 meets all CDWQG for health based parameters. Manganese at 0.114 mg/L is 2.3 times above the aesthetic objective of 0.05 mg/L. Manganese at this concentration is not expected to cause any adverse effects such as staining of household appliances or fixtures. It may be noticed as a slightly metallic taste or odour.

6.5 TW06-05

Water from TW06-05 is a hard calcium-bicarbonate type water with a slight tendency to scale (as indicated by a slightly positive saturation index of 0.324). The total uranium concentration of 0.0501 mg/L is 2.5 times the CDWQG health based maximum acceptable concentration (MAC) of 0.02 mg/L. Total manganese at 0.682 mg/L is 13 times above the CDWQG aesthetic objective (AO) of 0.05 mg/L.

Although not a health concern, manganese at this concentration may be noticed as a slightly metallic taste and/or odour by the consumers of the untreated water. Manganese at this concentration may also cause slight staining of household appliances and fixtures.

The source of uranium in groundwater at TW06-05 is unknown, and inferred to be naturally occurring. Water from TW06-05 should not be consumed or used for cooking without prior treatment for uranium removal. Untreated well water can still be used for other household needs such as bathing and cooking.

7.0 GROUNDWATER SUPPLY EVALUATION

As evident from the hydraulic testing and water quality results, wells completed in the Miles Canyon Basalt have a higher potential for encountering both sufficient water quantity and acceptable water quality (TW06-01, TW06-03 and TW06-04). As evident at TW06-03, there is also the potential for the completion of successful overburden wells where adequate sediments exists. Bedrock contacts shown on Figure 8 are based on the following data sources and are considered approximate:

- Results of the test well drilling program;
- Bedrock geology mapping for the area; and
- Available well logs for the Whitehorse Copper area.

As previously mentioned, drilling a test well in the Miles Canyon Basalt carries less risk than drilling in the Whitehorse Batholith Granodiorite because the basalt has displayed consistent aquifer performance, and acceptable water quality regionally.

Wells completed in the Whitehorse Batholith Granodiorite (TW06-02 and TW06-05) have a lower potential for encountering sufficient water quantity and quality. Although the well yields are lower than the yields of wells completed in the basalt, the yields are still considered sufficient for domestic water supply to single family residences. Without proper treatment, water quality for these wells is unacceptable for human consumption due to elevated uranium (above CDWQG of 0.02 mg/L). A point of use Reverse Osmosis (RO) system can be installed at the main consumption point for approximately $1,000. This would enable homeowners to consume treated water, and use untreated water for other household needs.

Several successful wells (Table 1) in Wolf Creek North are completed in this unit with both acceptable water quantity and quality. There are also records of unsuccessful test wells drilled in the Whitehorse batholith; one homeowner in Wolf Creek North reportedly was unsuccessful in obtaining sufficient water supply at depths up to 50 m (Pearson et al. 2001). The elevated uranium observed in TW06-02 and TW06-05 may be related to these wells being completed near the contact zone between the Hancock Formation Limstone and the Whitehorse Batholith Granodiorite.

8.0 POTENTIAL IMPACTS ON DOWNGRADIENT GROUNDWATER USERS

8.1 POTENTIAL IMPACTS ON DOWNGRADIENT WATER QUANTITY

The subdivision plan has undergone modifications since the preliminary groundwater assessment completed in 2002 (GLL 2002). Groundwater recharge, and the potential groundwater demand of the subdivision have been re-assessed based on the most recent subdivision plan shown on Figure 2.

A water budget prepared by Environment Canada for the nearby Wolf Creek Pilot Study area (GLL 2001) indicates that the water surplus for the area is approximately 25 mm/year (or 9 % of mean annual precipitation). The amount of this surplus that recharges to groundwater depends on several factors such as slope, soil type and forest cover (and time of year). In a recharge assessment completed by Gartner Lee in 2002 it was estimate that approximately 62 % of this water surplus (15 mm/year) recharges to groundwater. Applying this recharge rate to the new subdivision plan which encompasses 526 hectares (rather than 590 hectares due to the elimination of some of the proposed lots) results in a groundwater recharge rate of 78,900 m^3/year.

Similarly, the groundwater demand for the subdivision can be calculated using the following usage assumptions presented in the preliminary hydrogeological assessment (GLL 2002).

Table 6: SUMMARY OF GROUNDWATER DEMAND AND RECHARGE ASSESSMENT			
Lot Type	Number (A)	Demand/Lot[4] (B)	Demand (A x B)
Service Industrial Lots	25	120 m^3/year	3,000 m^3/year
Residential Lots	110	370 m^3/year	40,070 m^3/year
School	1	775 m^3/year	774 m^3/year
TOTAL DEMAND			44,844 m^3/year
TOTAL RECHARGE (from above)			78,900 m^3/year

As outlined in Table 6 above, the total anticipated groundwater recharge is higher than the total anticipated subdivision demand. These calculations are reliant on several conservative assumptions which are outlined below:

- There is no regional recharge from upgradient areas. Although not taken into account regional recharge likely accounts for a significant amount of recharge to the aquifer. (Golder 1977);
- Water supply wells are established on every lot within the subdivision. Many property buyers may choose to rely on bulk water delivery which will reduce the overall subdivision demand; and
- No water removed from the aquifer will returned to the aquifer. The establishment of in-ground sewage disposal fields on most lots will provide an additional source of recharge to groundwater in the area that has not been incorporated into this assessment.

As a conservatively high estimate of the total demand of the subdivision is less than a conservatively low estimate of the total recharge from precipitation there should be no net impact on downgradient water users water quantity (no aquifer dewatering).

8.2 POTENTIAL IMPACTS ON DOWNGRADIENT WATER QUALITY

As municipal sewage service will not be provided to the Whitehorse Copper Subdivision, homeowners will have to rely on either in-ground sewage disposal fields or septic effluent tanks. The feasibility of establishing in-ground sewage disposal fields will depend on the characteristics of each lot (presence of accepting soil, grade and setback distances). If designed, constructed and operated in accordance with applicable guidelines (Yukon Health and Social Services 2006), there should be little to no impact to aquifer water quality from in-ground sewage disposal. However, the feasibility of septic field construction should be

[4] Gartner Lee 2002

evaluated on a lot by lot basis, and alternate sewage disposal systems may be required on lots where the grade is not suitable or where bedrock is at or near surface.

It is understood by EBA that Government of Yukon's Water Resources Section currently monitors a single observation well completed in the Miles Canyon Basalt within the Wolf Creek Subdivision. Continued monitoring of water levels and water quality in this well will provide observations of trends in aquifer water quality and water levels in the Wolf Creek area.

9.0 CONCLUSIONS AND RECOMMENDATIONS

The following conclusions are based upon information reviewed and collected as part of this study:

- The Whitehorse Copper Subdivision is underlain by two distinct bedrock aquifers- the Miles Canyon Basalt Aquifer and the Whitehorse Batholith Granodiorite; the approximate extent of these units is shown on Figure 8;
- The water supply potential of the Miles Canyon Basalt is considered to be good, as test wells completed within the basalt display adequate water quantity and acceptable water quality for domestic water supply;
- The water supply potential of the Whitehorse Batholith Granodiorite is considered to be marginal, as test wells completed within the granodiorite display variable yields and in some areas elevated uranium concentrations, requiring water treatment prior to human consumption;
- Point of entry removal of uranium is expected to cost approximately $ 1,000;
- The cost for a domestic well is expected to range from $ 15,000 – $ 20,000 based on typical rates charged by local contractors in 2006;
- The expected groundwater demand of the Whitehorse Copper subdivision is less than the expected groundwater recharge to the area by precipitation which suggests that the establishment of domestic water supply wells is sustainable; and,
- No significant water quantity or quality impacts are expected in the downgradient subdivision of Wolf Creek, continued monitoring of the observation well within the Wolf Creek Subdivision will confirm this assessment.

The following recommendations are made to ensure the viability and safety of groundwater resources in the area:

- Care should be taken to ensure that water supply wells within the Whitehorse Copper Subdivision are completed with adequate surface seals, and well casings sealed into bedrock (where applicable);

- The establishment of in-ground sewage disposal fields should be evaluated on a lot by lot basis and special considerations will be necessary where bedrock is at or near ground surface;
- A regional aquifer mapping and wellhead protection plan should be established to ensure the long-term protection and viability of the water supply.

10.0 CLOSURE AND LIMITATIONS

Conclusions and recommendations included in this report are based upon the Hydrogeological Investigations as described in the previous sections. The geologic information obtained from this investigation was limited to five test wells throughout a relatively large area. Extrapolation of these results to area surrounding each well should be made carefully, as the nature of the earth's structure and characteristics throughout the site is highly variable.

This report has been prepared for the use of Lorimer and Associates. It has been prepared in accordance with generally accepted hydrogeological practices. For further limitations regarding the use of this report, reference should be made to the EBA Environmental Report – General Conditions, which form a part of this report.

EBA trusts that this report satisfies your present requirements. Should you have any questions or comments please do not hesitate to contact the undersigned.

Yours truly,
EBA Engineering Consultants Ltd.

Prepared by:

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ENVIRONMENTAL REPORT – GENERAL CONDITIONS

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

1.0 USE OF REPORT

This 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 those to which it refers. Any variation from the site or proposed development would necessitate a supplementary investigation and assessment.

This report and the assessments and 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 analysis 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 LIMITATIONS OF REPORT

This report is based solely on the conditions which existed on site at the time of EBA's investigation. The client, and any other parties using this report with the express written consent of the client and EBA, acknowledge that conditions affecting the environmental assessment of the site can vary with time and that the conclusions and recommendations set out in this report are time sensitive.

The client, and any other party using this report with the express written consent of the client and EBA, also acknowledge that the conclusions and recommendations set out in this report are based on limited observations and testing on the subject site and that conditions may vary across the site which, in turn, could affect the conclusions and recommendations made.

The client acknowledges that EBA is neither qualified to, nor is it making, any recommendations with respect to the purchase, sale, investment or development of the property, the decisions on which are the sole responsibility of the client.

2.1 INFORMATION PROVIDED TO EBA BY OTHERS

During the performance of the work and the preparation of this report, EBA may have relied on information provided by persons other than the client. While EBA endeavours to verify the accuracy of such information when instructed to do so by the client, EBA accepts no responsibility for the accuracy or the reliability of such information which may affect the report.

3.0 LIMITATION OF LIABILITY

The client recognizes that property containing contaminants and hazardous wastes creates a high risk of claims brought by third parties arising out of the presence of those materials. In consideration of these risks, and in consideration of EBA providing the services requested, the client agrees that EBA's liability to the client, with respect to any issues relating to contaminants or other hazardous wastes located on the subject site shall be limited as follows:

1. With respect to any claims brought against EBA by the client arising out of the provision or failure to provide services hereunder shall be limited to the amount of fees paid by the client to EBA under this Agreement, whether the action is based on breach of contract or tort;
2. With respect to claims brought by third parties arising out of the presence of contaminants or hazardous wastes on the subject site, the client agrees to indemnify, defend and hold harmless EBA from and against any and all claim or claims, action or actions, demands, damages, penalties, fines, losses, costs and expenses of every nature and kind whatsoever, including solicitor-client costs, arising or alleged to arise either in whole or part out of services provided by EBA, whether the claim be brought against EBA for breach of contract or tort.

4.0 JOB SITE SAFETY

EBA is only responsible for the activities of its employees on the job site and is not responsible for the supervision of any other persons whatsoever. The presence of EBA personnel on site shall not be construed in any way to relieve the client or any other persons on site from their responsibility for job site safety.

5.0 DISCLOSURE OF INFORMATION BY CLIENT

The client agrees to fully cooperate with EBA with respect to the provision of all available information on the past, present, and proposed conditions on the site, including historical information respecting the use of the site. The client acknowledges that in order for EBA to properly provide the service, EBA is relying upon the full disclosure and accuracy of any such information.

6.0 STANDARD OF CARE

Services performed by EBA for this report have been conducted in a manner consistent with the level of skill ordinarily exercised by members of the profession currently practicing under similar conditions in the jurisdiction in which the services are provided. Engineering judgement has been applied in developing the conclusions and/or recommendations provided in this report. No warranty or guarantee, express or implied, is made concerning the test results, comments, recommendations, or any other portion of this report.

7.0 EMERGENCY PROCEDURES

The client undertakes to inform EBA of all hazardous conditions, or possible hazardous conditions which are known to it. The client recognizes that the activities of EBA may uncover previously unknown hazardous materials or conditions and that such discovery may result in the necessity to undertake emergency procedures to protect EBA employees, other persons and the environment. These procedures may involve additional costs outside of any budgets previously agreed upon. The client agrees to pay EBA for any expenses incurred as a result of such discoveries and to compensate EBA through payment of additional fees and expenses for time spent by EBA to deal with the consequences of such discoveries.

8.0 NOTIFICATION OF AUTHORITIES

The client acknowledges that in certain instances the discovery of hazardous substances or conditions and materials may require that regulatory agencies and other persons be informed and the client agrees that notification to such bodies or persons as required may be done by EBA in its reasonably exercised discretion.

9.0 OWNERSHIP OF INSTRUMENTS OF SERVICE

The client acknowledges that all reports, plans, and data generated by EBA during the performance of the work and other documents prepared by EBA are considered its professional work product and shall remain the copyright property of EBA.

10.0 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), the Client agrees that only the signed and sealed hard copy versions shall be considered final and legally binding. The hard copy versions submitted by EBA shall be the original documents for record and working purposes, and, in the event of a dispute or discrepancies, the hard copy versions shall govern over the electronic versions. Furthermore, the Client agrees and waives all future right of dispute that the original hard copy signed version archived by EBA shall be deemed to be the overall original for the Project.

The Client agrees that 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. The Client warrants that EBA's instruments of professional service will be used only and exactly as submitted by EBA.

The Client recognizes and agrees that 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.

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TABLES

TABLE 1: SUMMARY OF EXISTING WELL DETAILS IN THE WHITEHORSE COPPER AREA

WELL DESCRIPTION	FIGURE	ID	DATE DRILLED	DIAMETER (")	GR. Elev. (Approx) m-asl	DEPTH (m)	LITHOLOGY (m-bgl)		SCREENED INTERVAL		Static Water Level (m-bgl)	Static Water Level Elev. (m-asl)	YIELD		WATER QUALITY
							FROM - TO	DESCRIPTION	FROM - TO	SLOT			L/s	USgpm	
MCRAE PETROCAN	1,8	1	11-Oct-94	6"	728.5	56.1	0.0 - 4.9 4.9 - 8.8 8.8 - 13.1 13.1 - 16.3 16.3 - 56.1	GRAVEL, SILT, SAND SILT, GRAVEL GRAVEL, SAND SILT, GRAVEL, SAND, COBBLES BEDROCK (BASALT)	BEDROCK WELL		35.7	692.8	1.7	10	UNK
MAIN STREET MINING	1,8	2	11-Jul-89	6"	730	50.3	0.0 - 4.6 4.6 - 5.8 5.8 - 15.5 15.5 - 50.3	SILT CLAY GRAVEL, SAND, COBBLES BEDROCK (BASALT)	BEDROCK WELL		UNK	UNK	0.9	5	UNK
McINROY DISPOSAL	1,8	3	13-Mar-84	6"	727	61.0	0.0 - 20.7 20.7 - 26.8 26.8 - 61.0	SILTY SAND AND GRAVEL SILT, SOME GRAVEL BEDROCK (BASALT)	BEDROCK WELL		UNK	UNK	2.6	15	UNK
MEADOW LAKES GOLF COURSE	1,8	4	02-May-98	6"	718	61.0	0.0 - 26.2 26.2 - 45.1 45.1 - 49.7 49.7 - 61.0	SANDY SILT CLAY SAND, COBBLES BEDROCK (BASALT)	BEDROCK WELL		30.2	687.8	1.7	10	Meets CDWQG Health Based and Aesthetic Objectives (EBA 2006)
KOSMENKO	1,8	5		6"	738	33.5	0.0 - 1.2 1.2 - 33.5	OVERBURDEN BEDROCK (BATHOLITH)	BEDROCK WELL		UNK	UNK	0.1	0.6	UNK
35 HARBOTTLE ROAD (LOT 92)	1,8	6	08-Jul-79	6"	740	123.1	0.0 - 0.9 0.9 - 1.2 1.2 - 2.1 2.1 - 2.7 2.7 - 5.5 5.5 - 7.9 7.9 - 9.4 9.4 - 123.1	GRAVEL, SAND SILTY SAND GRAVEL SAND, GRAVEL SAND GRAVEL, COBBLES, SAND GRAVEL, COBBLES, SILT BEDROCK (GRANITE)	BEDROCK WELL		18.9	721.1	0.1	0.5	Meets CDWQG Health Based and Aesthetic Objectives (GLL 2003)
39 HARBOTTLE ROAD (LOT 90)	1,8	7	07-Jul-79	6"	738	25.6	0.0 - 5.2 5.2 - 6.7 6.7 - 8.8 8.8 - 11.3 11.3 - 14.0 14.0 - 14.6 14.6 - 25.6	GRAVEL, COBBLES fine SAND and GRAVEL gravelly TILL GRAVEL, SILT, COBBLES soft TILL TILL, COBBLES BEDROCK (inferred GRANITE)	9.5 - 10.7	0.020"	8.8	729.2	0.7	4	UNK
38 HARBOTTLE ROAD (LOT 88) BH77-1	1,8	8	1-Apr-77	6"	745	44.5	0.0 - 5.2 5.2 - 10.1 10.1 - 14.2 14.2 - 17.0 17.0 - 44.5	SAND AND GRAVEL SAND sandy TILL weatherd BEDROCK (GRANITE) competent BEDROCK (GRANITE)	BEDROCK WELL		12.3	732.4	0.2	7	UNK
Lot 388	1,8	9	UNK	6"	711	20.1	0.0 - 1.0 1.0 - 6.0	SAND AND GRAVEL SILT AND CLAY	UNK		19.2	691.3	UNK	UNK	UNK
Lot 133 TH1-00	1,8	10	Sep-00	6"	727	54.3	0.0 - 13.7 13.7 - 35.1 35.1 - 37.2 37.2 - 39.0 39.0 - 50.3 50.3 - 54.3	coarse SAND AND GRAVEL fine SAND silty TILL BEDROCK (BASALT) BEDROCK (GRANITE) BEDROCK (BASALT)	BEDROCK WELL		31.5	695.2	0.32	1.9	UNK
McFADDEN WAY	1,8	11	UNK	UNK	755	UNK	0.0 - 12.0 12.0 - 34.0	OVERBURDEN BEDROCK	BEDROCK WELL		19	736	UNK	UNK	UNK
McFADDEN WAY	1,8	12	UNK	UNK	760	UNK	0.0 - 12.0 12.0 - 47.0	OVERDURDEN BEDROCK	BEDROCK WELL		25	735	UNK	UNK	UNK
SCHMIDT	1,8	13	UNK	UNK	750	14.6	0.0 - 14.6	HARDPAN (TILL)	DRY HOLE		> 14.6		DRY	DRY	DRY

TABLE 1: SUMMARY OF EXISTING WELL DETAILS IN THE WHITEHORSE COPPER AREA

WELL DESCRIPTION	FIGURE	ID	DATE DRILLED	DIAMETER (")	GR. Elev. (Approx) m-asl	DEPTH (m)	LITHOLOGY (m-bgl)		SCREENED INTERVAL		Static Water Level (m-bgl)	Static Water Level Elev. (m-asl)	YIELD		WATER QUALITY
							FROM - TO	DESCRIPTION	FROM - TO	SLOT			L/s	USgpm	
TW06-01	1,8	14	Sep-06	6"	755	54.9	0.0 - 5.4 5.4 - 7.6 76.0 - 10.6 10.6 - 17.6 17.6 - 34.1 34.1 - 50.5 50.5 - 51.8 51.8 - 52.4 52.4 - 54.9	SILT and SAND SAND GRAVEL, some sand SAND and GRAVEL BEDROCK (BASALT), incompetent BEDROCK (BASALT), competent BEDROCK (BASALT), incompetent BEDROCK (BASALT), competent BEDROCK (BASALT), incompetent	BEDROCK WELL		15.48	739.52	0.21	3.4	Meets CDWQG Health Based Objectives, Iron > Aesthetic Objective
TW06-02	1,8	15	Sep-06	6"	755	61	0.0 - 1.5 1.5 - 9.8 9.8 - 61.0	SAND and GRAVEL SAND and GRAVEL BEDROCK (GRANODIORITE)	BEDROCK WELL		6.21	748.79	0.04	0.7	Uranium > CDWG MAC, Iron, Manganese > Aesthetic Objective
TW06-03	1,8	16	Sep-06	6"	765	27.5	0.0 - 1.5 1.5 - 3.0 3.0 - 6.7 6.7 - 9.1 9.1 - 13.7 13.7 - 16.8 16.8 - 18.3 18.3 - 27.1 27.1 - 27.4	SILTY GRAVEL SAND and GRAVEL GRAVEL SAND GRAVEL and SILT SANDY GRAVEL SAND GRAVEL BEDROCK (BASALT)	25.6 - 27.5	0.100"	6.055	758.945	0.77	12.2	Turbidity, Manganese > CDWQG Aesthetic Objectives
TW06-04	1,8	17	Sep-06	6"	755	48.7	0.0 - 3.7 3.7 - 12.2 12.2 - 48.7	SAND and GRAVEL BEDROCK (BASALT), incompetent BEDROCK (BASALT), competent	BEDROCK WELL		11.84	743.16	1.22	19.4	Manganese CDWQG Aesthetic Objective
TW06-05	1,8	18	Oct-06	6"	768	61	0.0 - 2.4 2.4 - 4.6 4.6 - 10.1 10.1 - 22.9 22.9 - 27.4 27.4 - 33.5 33.5 - 41.1 41.1 - 61.0	SILT and GRAVEL GRAVEL SAND and GRAVEL SIlT/ CLAY SIlT/ CLAY BEDROCK (GRANITE), weathered BEDROCK (GRANITE), competent BEDROCK (GRANODIORITE)	BEDROCK WELL		9.275	758.725	0.52	8.2	Uranium > CDWG MAC, Turbidity, Manganese > Aesthetic Objective

Notes:
1) Elevations estimatated from 1: 50 000 topographical mapping or measured with GPS.
2) AO " Aesthetic Objective" from the Canadian Drinking Water Quality Guidelines (CDWQG) April 2004.
3) MAC "Maximum Acceptable Concentration" from the Canadian Drinking Water Quality Guidelines (CDWQG) April 2004.
4) PMAC "Proposed Maximum Acceptable Concentration" from the Canadian Drinking Water Quality Guidelines (CDWQG) April 2004.

TABLE 2: SUMMARY OF LABORATORY CHEMISTRY RESULTS

	Well	TW06-01	TW06-02	TW06-03	TW06-04	TW06-05	Canadian Drinking Water Quality Guidelines	
	ALS Report	L448107	L450018	L448107	L450018	L448107		
	Date	18-Oct-06	26-Oct-06	18-Oct-06	30-Oct-06	18-Oct-06	Upper Limit	
	Sampled by:	Aqua Tech	Aqua Tech	Aqua Tech	Aqua Tech	Aqua Tech	MAC	AO
Physical Tests	**Units**							
Colour	CU	<5.0	<5.0	<5.0	<5.0	<5.0		15
Conductivity (Lab)	uS/cm	207	61	614	462	362		
Total Dissolved Solids (Lab)	mg/L	130	359	376	295	220		500
Hardness (CaCO3)	mg/L	322	241	100	206	162		
pH (lab)	pH units	8.13	7.99	8.18	8.22	8.19		6.5-8.5
Turbidity	NTU	0.6	3.75	**5.55**	0.63	**1.64**	1	5
Anions and Nutrients								
Alkalinity-Total CaCO3	mg/L	112	255	278	220	175		
Chloride	mg/L	<0.50	6.18	1.07	0.78	<0.50		250
Fluoride	mg/L	0.116	0.122	0.098	0.141	<0.50	1.5	
Sulphate	mg/L	3.51	65.2	78.1	52.3	27.6		500
Nitrate Nitrogen N	mg/L	<0.0050	<0.0050	0.0136	<0.0050	<0.0050	10	
Nitrite Nitrogen N	mg/L	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	3.2	
Total Metals								
Aluminum	mg/L	<0.010	0.025	<0.010	0.011	0.050		
Antimony	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	0.006	
Arsenic	mg/L	0.00025	0.00042	0.00105	0.00019	0.00025	0.01	
Barium	mg/L	0.022	<0.020	<0.020	0.029	0.048	1	
Boron	mg/L	<0.10	<0.10	<0.10	<0.10	<0.10	5	
Cadmium	mg/L	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	0.005	
Calcium	mg/L	42.6	51.8	29.5	44.2	46.4		
Chromium	mg/L	0.0066	0.0024	<0.0020	<0.0020	<0.0020	0.05	
Copper	mg/L	0.0024	0.0031	0.0196	0.0070	0.0017		1
Iron	mg/L	**0.601**	**0.720**	0.114	0.178	0.236		0.3
Lead	mg/L	0.0016	0.0029	0.0020	<0.0010	0.0013	0.01	
Magnesium	mg/L	52.3	27.2	6.49	23.3	11.3		
Manganese	mg/L	0.0206	**0.367**	**0.202**	**0.114**	**0.682**		0.05
Mercury	mg/L	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	0.001	
Potassium	mg/L	3.21	2.06	1.27	2.380	0.81		
Selenium	mg/L	0.0034	<0.0010	<0.0010	<0.0010	<0.0010	0.01	
Sodium	mg/L	14.5	35.6	3.7	27.0	19.8		200
Uranium	mg/L	0.00916	**0.0527**	0.00163	0.00998	**0.0501**	0.02	
Zinc	mg/L	0.13	0.413	<0.050	<0.050	<0.050		5

Notes:

1) CDWQG criteria are taken from the " Canadian Drinking Water Quality Guidelines, April 2004."

2) MAC refers to the Maximum Acceptable Concentration according to the CDWQG criteria.

3) AO refers to the Aesthetic Objective according to the CDWQG criteria.

4) "-" indicates not analyzed.

6) **Bold** indicates parameter above CDWQG AO.

5) **Bold shading** ndicates parameter above CDQQG MAC.

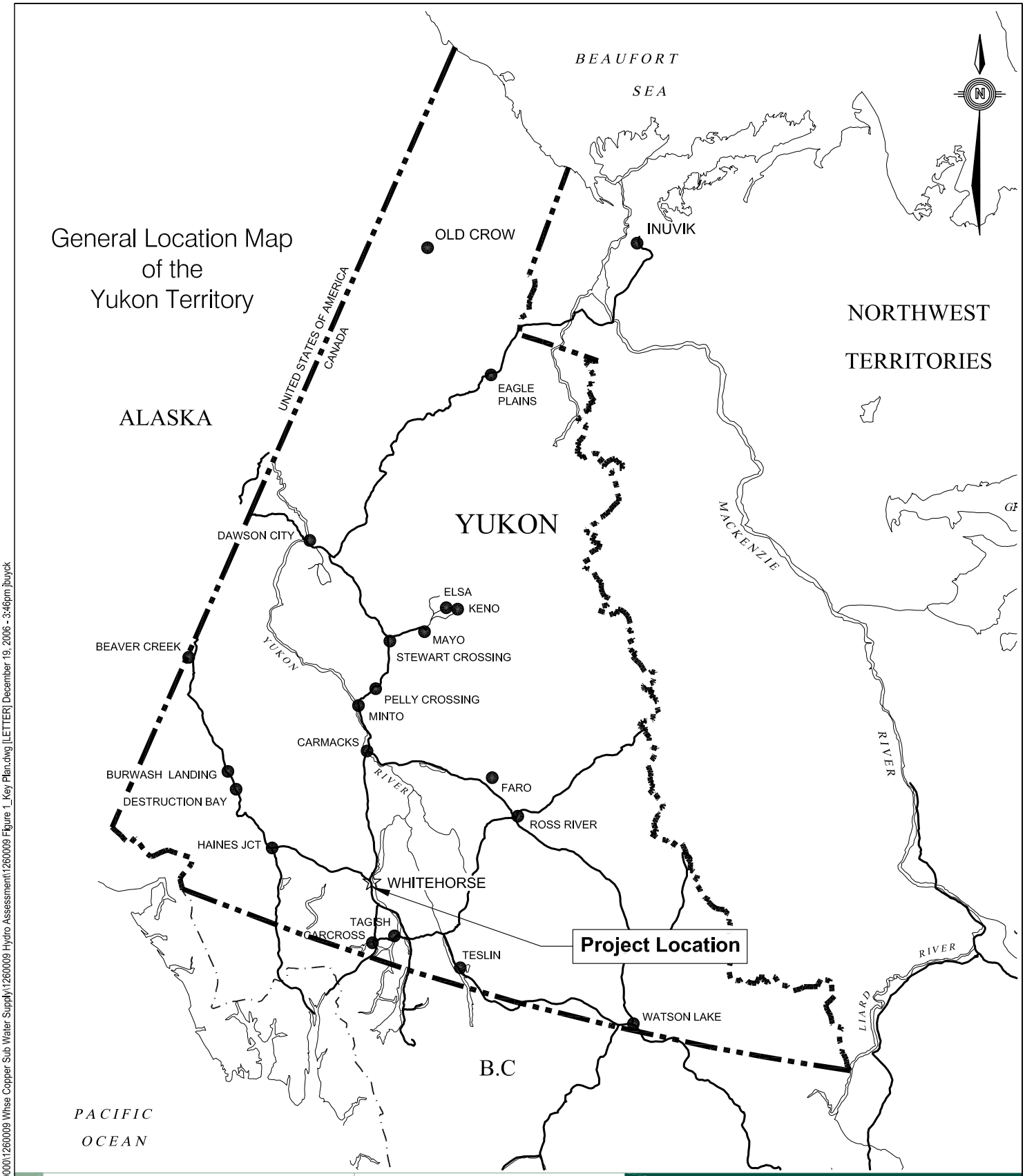
TABLE 3: SAFE YIELD CALCULATIONS, WHITEhORSE COPPER SUBDIVISION

WELL PARAMETER	TW06-01	TW06-02	TW06-03	TW06-04	TW06-05	KEY
Constant Rate Pumping Test Discharge Rate (L/s)	0.10	0.13	0.48	0.32	3.40	a
Projected 100-Day Drawdown (m)	18.25	166.00	11.75	9.70	65.00	b
100-Day Specific Capacity (L/s/m)	0.01	0.001	0.04	0.03	0.05	c
Lowest expected Seasonal Static Water Level (mbgl)[1]	17.4	7.3	5.8	12.0	8.7	d
Depth to top of Screen Interval or Bottom of Open Hole (mbgl)	54.9	61.0	25.6	48.7	61.0	e
Available Drawdown (m)	37.50	53.70	19.80	36.70	52.30	f = e - d
Safety Factor (%)	70	70	70	70	70	g
Safe Available Drawdown	26.25	37.59	13.86	25.69	36.61	h = f x g
Safe Estimated Sustainable Yield (L/sec)	**0.21**	**0.04**	**0.81**	**1.19**	**2.74**	i = c x h
Safe Estimated Sustainable Yield (Igpm)	**2.7**	**0.5**	**10.7**	**15.7**	**36.1**	
Safe Estimated Sustainable Yield (USgpm)	**3.3**	**0.6**	**12.8**	**18.9**	**43.4**	
Well Bore Storage[2] (L)	479	686	253	469	668	
Well Bore Storage[2] (USG)	126	181	67	124	176	

Notes:

1) meters below ground level (mbgl), 1 m allowance made for seasonal flutuation.
2) based on 70% available drawdown.

FIGURES



CLIENT

LORIMER & Associates
Consulting Engineers

EBA Engineering Consultants Ltd.

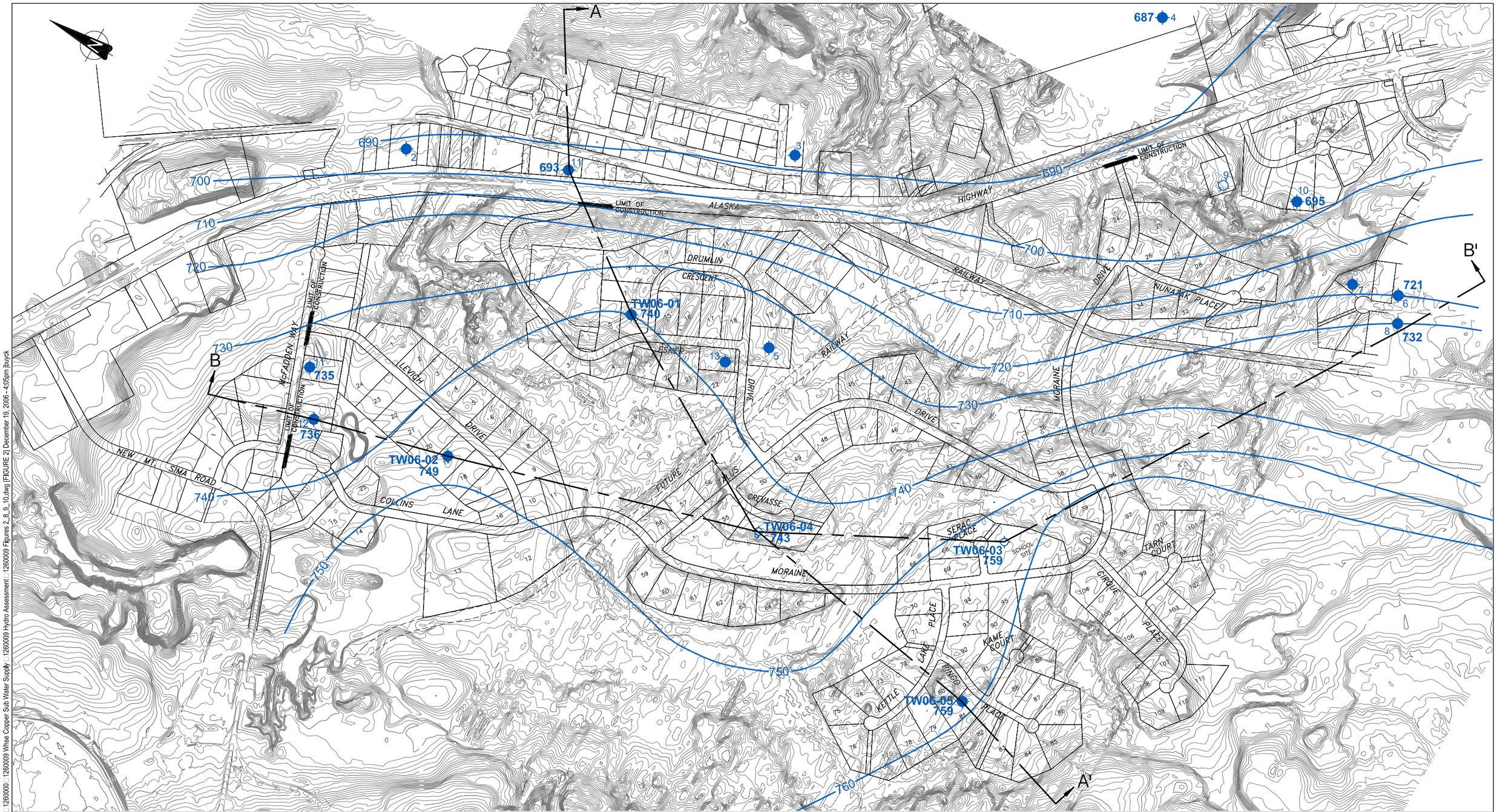
WHITEHORSE COPPER SUBDIVISION
HYDROGEOLOGIC ASSESSMENT FOR WATER SUPPLY

SITE LOCATION MAP

PROJECT NO.	DWN	CKD	REV
1260009	JSB	KSJ	0
OFFICE	DATE		
EBA-WHSE	December 8, 2006		

Figure 1

Q:\Whitehorse\Data\0201drawings\Whitehorse\1260000\1260009 Whse Copper Sub Water Supply\1260009 Hydro Assessment\1260009 Figure 1_Key Plan.dwg [LETTER] December 19, 2006 - 3:46pm jbuyck



LEGEND:

- 7 / 759 — BEDROCK WELL AND INDENTIFIER (SEE TABLE 1 FOR DETAILS)
- 7 — BEDROCK WELL AND INDENTIFIER (SEE TABLE 1 FOR DETAILS)
- 7 — OVERBURDEN WELL AND INDENTIFIER (SEE TABLE 1 FOR DETAILS)
- GROUNDWATER EQUIPOTENTIAL (GROUNDWATER ELEVATIONS COMPILED FROM GLL 2002 AND DATA COLLECTED IN OCTOBER 2006)

NOTES:

1. ALL LOCATIONS ARE APPROXIMATE.
2. DRAWING ADAPTED FROM BASE PLAN PROVIDED BY QUEST ENGINEERING GROUP.
3. BEDROCK GEOLOGY ADAPTED FROM GARTNER LEE 2002.
4. DRAWING HAS BEEN PRODUCED IN COLOR, ANY REPRODUCTIONS MAY NOT BE REPRESENTATIVE OF ORIGINAL.

0 200 500 1000 m

SCALE 1 : 12,500

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WHITEHORSE COPPER SUBDIVISION
HYDROGEOLOGICAL ASSESSMENT FOR WATER SUPPLY

SITE PLAN WITH WELL LOCATIONS AND GROUNDWATER EQUIPOTENTIALS

EBA Engineering Consultants Ltd.

PROJECT NO.	DWN	CKD	REV
1260009	JSB	KSJ	0
OFFICE: EBA-WHSE	DATE: December 20, 2006		

Figure 2

C:\Whitehorse\Data\0201drawings\Whitehorse\1260000\1260009 Whse Copper Sub Water Supply\1260009 Hydro Assessment\1260009 Figures 2_8_9_10.dwg [FIGURE 2] December 19, 2006 - 4:05pm buyck

HYDROGEOLOGIC LOG

BOREHOLE NO. TW06-01

PURPOSE OF HOLE:	Water Supply Well	GROUND ELEV.:	755 m-geod (approx.)
DRILLING METHOD:	Air Rotary	CASING STICK UP:	1.0 m
DRILLING DATE:	September 12-15, 2006	DEPTH TO STATIC:	15.480 m-bgl.
CONTRACTOR:	MacDougall's Water Resources	LOCATION:	Drumlin Crescent

Lithology

Depth (m)

0m

SILT & SAND - some gravel, fine to med. sand, moist, grey.

5m — 5.4 m

SAND - some silt, fine to med. grained sand, moist, grey — 7.62 m

10m — SAND & GRAVEL - silty, fine to med. grained sand, moist, grey — 10.6 m

GRAVEL - some silt, med. to coarse grained, rounded, moist, brown

15m

17.6 m

BEDROCK (BASALT) - soft, incompetent

20m

25m

30m

34.1 m

35m — BEDROCK (BASALT) - competent

40m

45m

50m — 50.5 m

BEDROCK (BASALT) - soft, incompetent — 51.8 m

BEDROCK (BASALT) - soft, competent — 52.4 m

55m — BEDROCK (BASALT) - soft, incompetent — 54.9 m

END OF HOLE

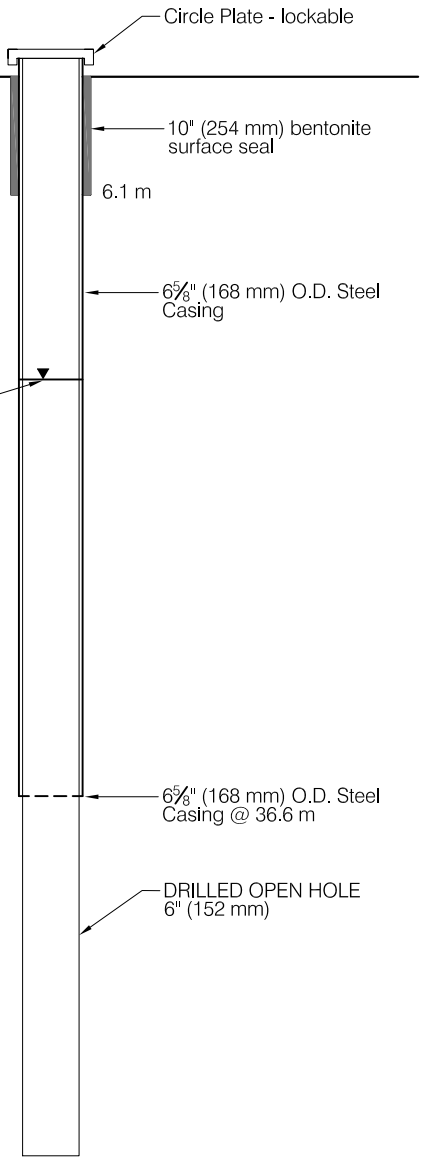
60m

Comments

Static Water Level = 15.4 mbgl (October 18, 2006)

UNSTABLE FRACTURE ZONE 50.5 m - 54.9 m-bgl.

Well Installation Summary



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WHITEHORSE COPPER SUBDIVISION HYDROGEOLOGICAL ASSESSMENT FOR WATER SUPPLY-WHITEHORSE, YT.

WELL LOG TW06-01

PROJECT NO.	DWN	CKD	REV
1260009	JSB	KSJ/RMM	0

OFFICE	DATE
EBA-WHSE	December 20, 2006

Figure 3

Q:\Whitehorse\Data\0201drawings\Whitehorse\1260000\1260009 Whse Copper Sub Water Supply\1260009 Figure 3_7REV 1.dwg [FIG 3] December 19, 2006 - 3:11pm jbuyck

HYDROGEOLOGIC LOG

PURPOSE OF HOLE:	Water Supply Well	BOREHOLE NO.	TW06-02
DRILLING METHOD:	Air Rotary	GROUND ELEV.:	755 m-geod (approx.)
DRILLING DATE:	September 16-19, 2006	CASING STICK UP:	1.0 m
CONTRACTOR:	MacDougall's Water Resources	DEPTH TO STATIC:	6.210 m-bgl.
		LOCATION:	Levich Drive

Lithology

Depth (m)

0m

SAND & GRAVEL - some silt, fine to med. sand & gravel, moist, brown. — 1.5 m

5m

10m — 9.8 m

BEDROCK (GRANODIORITE) - competent

15m

20m

25m

30m

35m

40m

- Possible fracture @ 42.7 m-bg.

45m

50m

55m

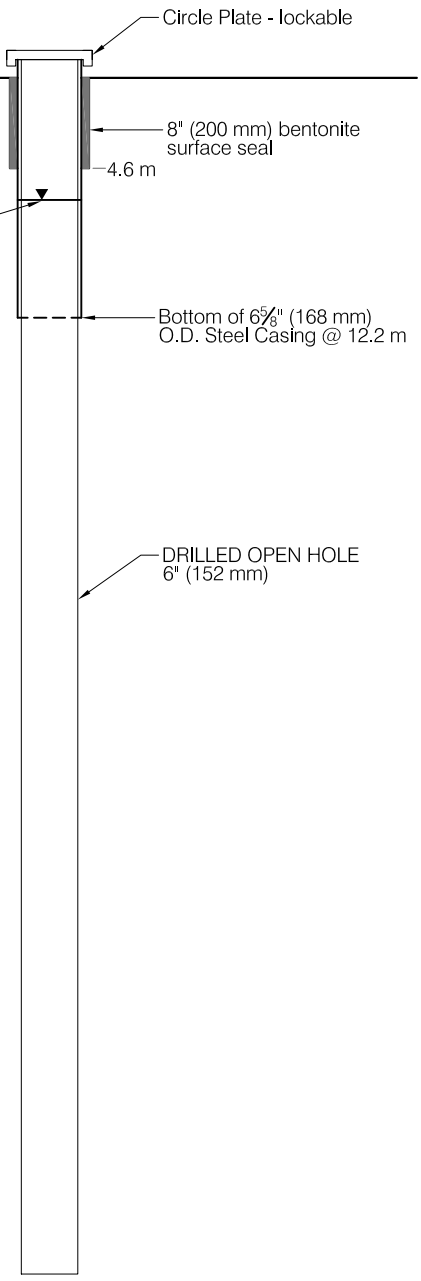
60m — 61.0 m

END OF HOLE

Comments

Static Water Level = 6.21 mbgl (October 20, 2006)

Well Installation Summary



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WHITEHORSE COPPER SUBDIVISION HYDROGEOLOGICAL ASSESSMENT FOR WATER SUPPLY-WHITEHORSE, YT.

WELL LOG TW06-02

EBA Engineering Consultants Ltd.

PROJECT NO.	DWN	CKD	REV
1260009	JSB	KSJ/RMM	0

OFFICE	DATE
EBA-WHSE	December 20, 2006

Figure 4

Q:\Whitehorse\Data\0201drawings\Whitehorse\1260000\1260009 Whse Copper Sub Water Supply\1260009 Figure 3_7REV 1.dwg [FIG 4] December 19, 2006 - 3:15pm jbuyck

HYDROGEOLOGIC LOG

BOREHOLE NO. TW06-03

PURPOSE OF HOLE:	Water Supply Well	GROUND ELEV.:	765 m-geod (approx.)
DRILLING METHOD:	Air Rotary	CASING STICK UP:	0.78 m
DRILLING DATE:	September 20-24, 2006	DEPTH TO STATIC:	6.055 m-bgl.
CONTRACTOR:	MacDougall's Water Resources	LOCATION:	Moraine Drive (Potential School Site)

Lithology

Depth (m)

0m

GRAVEL - silty, some sand, some organics, sub-angular to sub-rounded gravel gravel, grey — 1.5 m

SAND & GRAVEL - trace of silt, med. to coarse grained, grey — 3.0 m

GRAVEL - some sand, trace of silt, coarse grained, sub-angular to sub-rounded, dry, grey

5m

- becomes finer with depth

6.7 m

SAND - some silt, medium to coarse sand, wet, grey.

- becomes finer with depth

9.1 m

10m

GRAVEL & SILT - fine grained, sub-angular to sub-rounded, wet, grey

13.7 m

15m

GRAVEL - sandy, some silt, well, sub-rounded gravel, well graded sand, grey, wet

16.8 m

SAND - some silt, trace of gravel, fine to coarse grained sand, grey, wet — 18.3 m

20m

GRAVEL & SAND - fine to coarse grained gravel, med.- to coarse sand, sub-angular to sub-rounded, wet, grey

25m

27.1 m

BEDROCK (BASALT) — 27.4 m

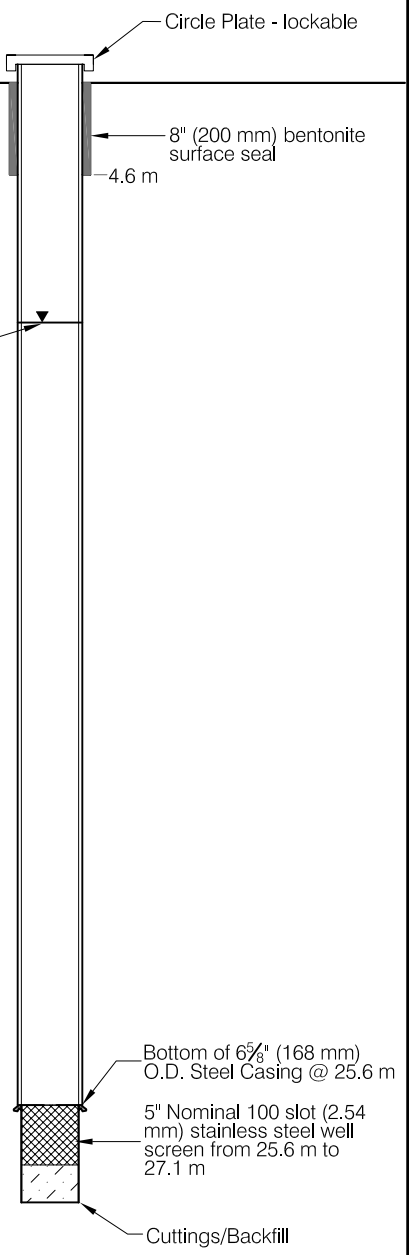
END OF HOLE

30m

Comments

Static Water Level = 6.055 m-bgl (October 19, 2006)

Well Installation Summary



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WHITEHORSE COPPER SUBDIVISION HYDROGEOLOGICAL ASSESSMENT FOR WATER SUPPLY-WHITEHORSE, YT.

WELL LOG TW06-03

PROJECT NO.	DWN	CKD	REV
1260009	JSB	KSJ/RMM	0

OFFICE: EBA-WHSE

DATE: December 20, 2006

Figure 5

Q:\Whitehorse\Data\0201drawings\Whitehorse\1260000\1260009 Whse Copper Sub Water Supply\1260009 Figure 3_7REV 1.dwg [FIG 5] December 19, 2006 - 3:22pm jbuyck

HYDROGEOLOGIC LOG

BOREHOLE NO. TW06-04

PURPOSE OF HOLE:	Water Supply Well	GROUND ELEV.:	755 m-geod (approx.)
DRILLING METHOD:	Air Rotary	CASING STICK UP:	1.00 m
DRILLING DATE:	September 27-28, 2006	DEPTH TO STATIC:	11.84 m-bgl.
CONTRACTOR:	MacDougall's Water Resources	LOCATION:	Crevasse Place

Lithology

Depth (m)

0m

SAND & GRAVEL - silty, fine to coarse grained, wet, grey

3.7 m

5m BEDROCK (BASALT) - incompetent, soft, hardening, downwards

10m

12.2 m

BEDROCK (BASALT) - competent

15m

20m

25m

30m

35m

40m

- Possible fracture @ 43.3 m-bg.

45m

48.7 m

50m END OF HOLE

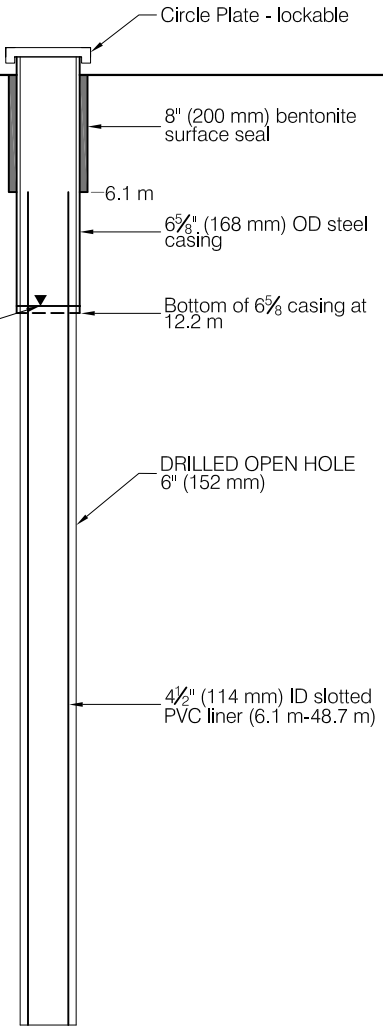
55m

60m

Comments

Static Water Level = 11.84 m-bgl (October 26, 2006)

Well Installation Summary



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WHITEHORSE COPPER SUBDIVISION HYDROGEOLOGICAL ASSESSMENT FOR WATER SUPPLY-WHITEHORSE, YT.

WELL LOG TW06-04

PROJECT NO.	DWN	CKD	REV
1260009	JSB	KSJ/RMM	0

OFFICE	DATE
EBA-WHSE	December 20, 2006

Figure 6

Q:\Whitehorse\Data\0201drawings\Whitehorse\1260000\1260009 Whse Copper Sub Water Supply\1260009 Figure 3_7REV 1.dwg [FIG 6] December 19, 2006 - 3:29pm jbuyck

HYDROGEOLOGIC LOG

BOREHOLE NO. TW06-05

PURPOSE OF HOLE:	Water Supply Well	GROUND ELEV.:	768 m-geod (approx.)
DRILLING METHOD:	Air Rotary	CASING STICK UP:	0.68 m
DRILLING DATE:	September 29 - October 3, 2006	DEPTH TO STATIC:	9.275 m-bgl.
CONTRACTOR:	MacDougall's Water Resources	LOCATION:	Pingo Place

Lithology

Depth (m)

0m

SILT & GRAVEL - some sand, med. grained sand, sub-angular, dry, light brown — 2.4 m

GRAVEL - some sand, trace of organics, fine to coarse sand, dry, light brown — 4.6 m

5m

SAND & GRAVEL - trace of silt, well graded sand, med. to coarse grained angular to sub-angular gravel, moist, grey

10m

10.1 m

SILT/CLAY - trace of sand, trace of gravel, coarse grained sand, alternating soft & compact, moist, grey

15m

20m

22.9 m

25m SILT/CLAY & GRAVEL - trace of coarse sand, becomes coarser with depth, moist, grey

27.4 m

30m BEDROCK(GRANODIORITE) - weathered, soft

33.5 m

35m BEDROCK(GRANODIORITE) - competent

40m

41.1 m

BEDROCK(GRANODIORITE)

45m

50m

55m

60m

61.0 m

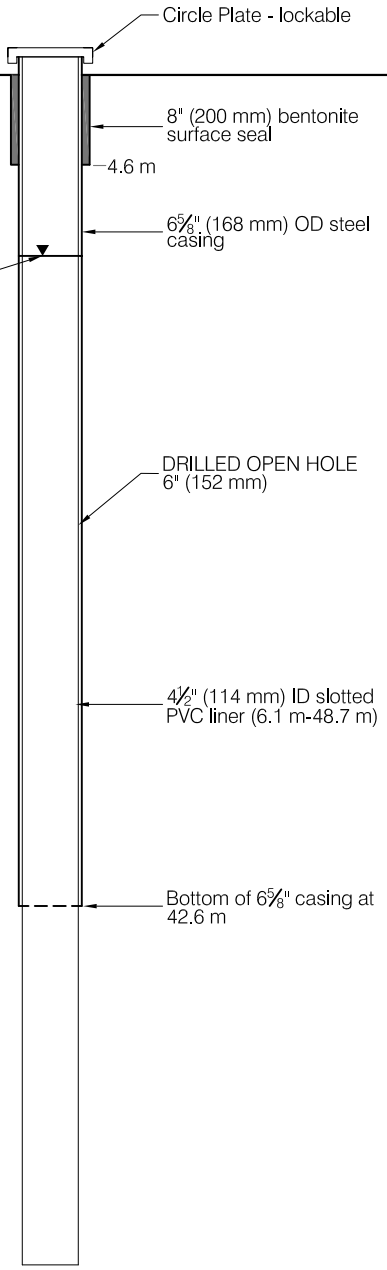
END OF HOLE

Comments

Static Water Level = 9.275 m-bgl (October 24, 2006)

PRODUCTIVE FRACTURE ZONE 54.8 m - 61.0 m-bgl.

Well Installation Summary



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WELL LOG TW06-05

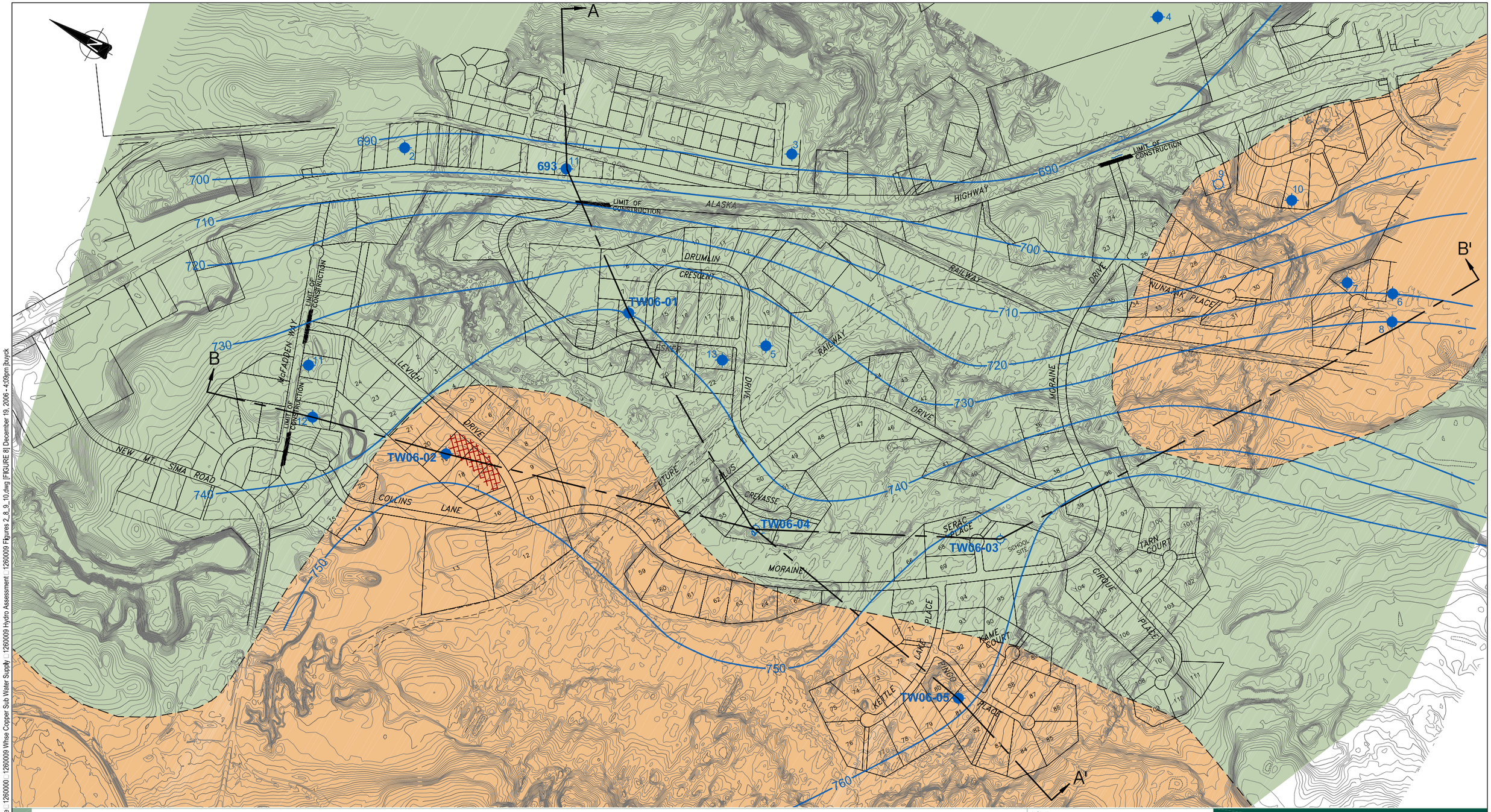
EBA Engineering Consultants Ltd.

PROJECT NO.	DWN	CKD	REV
1260009	JSB	KSJ/RMM	0

OFFICE	DATE
EBA-WHSE	December 20, 2006

Figure 7

Q:\ Whitehorse\ Data\ 0201drawings\ Whitehorse\ 1260000\ 1260009 Whse Copper Sub Water Supply\ 1260009 Figure 3_7REV 1.dwg [FIG 7] December 19, 2006 - 3:38pm jbuyck



LEGEND:

- BEDROCK WELL AND INDENTIFIER (SEE TABLE 1 FOR DETAILS)
- BEDROCK WELL AND INDENTIFIER (SEE TABLE 1 FOR DETAILS)
- OVERBURDEN WELL AND INDENTIFIER (SEE TABLE 1 FOR DETAILS)
- BEDROCK CONTACT (INFERRED)
- PRIMARY BEDROCK UNIT IS MILES CANYON BASALT
- PRIMARY BEDROCK UNIT IS WHITEHORSE BATHOLITH (GRANODIORITE)
- BEDROCK OUTCROP

0 200 500 1000 m

SCALE 1 : 12,500

NOTES:

1. ALL LOCATIONS ARE APPROXIMATE.
2. DRAWING ADAPTED FROM BASE PLAN PROVIDED BY QUEST ENGINEERING GROUP.
3. BEDROCK GEOLOGY ADAPTED FROM GARTNER LEE 2002.
4. DRAWING HAS BEEN PRODUCED IN COLOR, ANY REPRODUCTIONS MAY NOT BE REPRESENTATIVE OF ORIGINAL.

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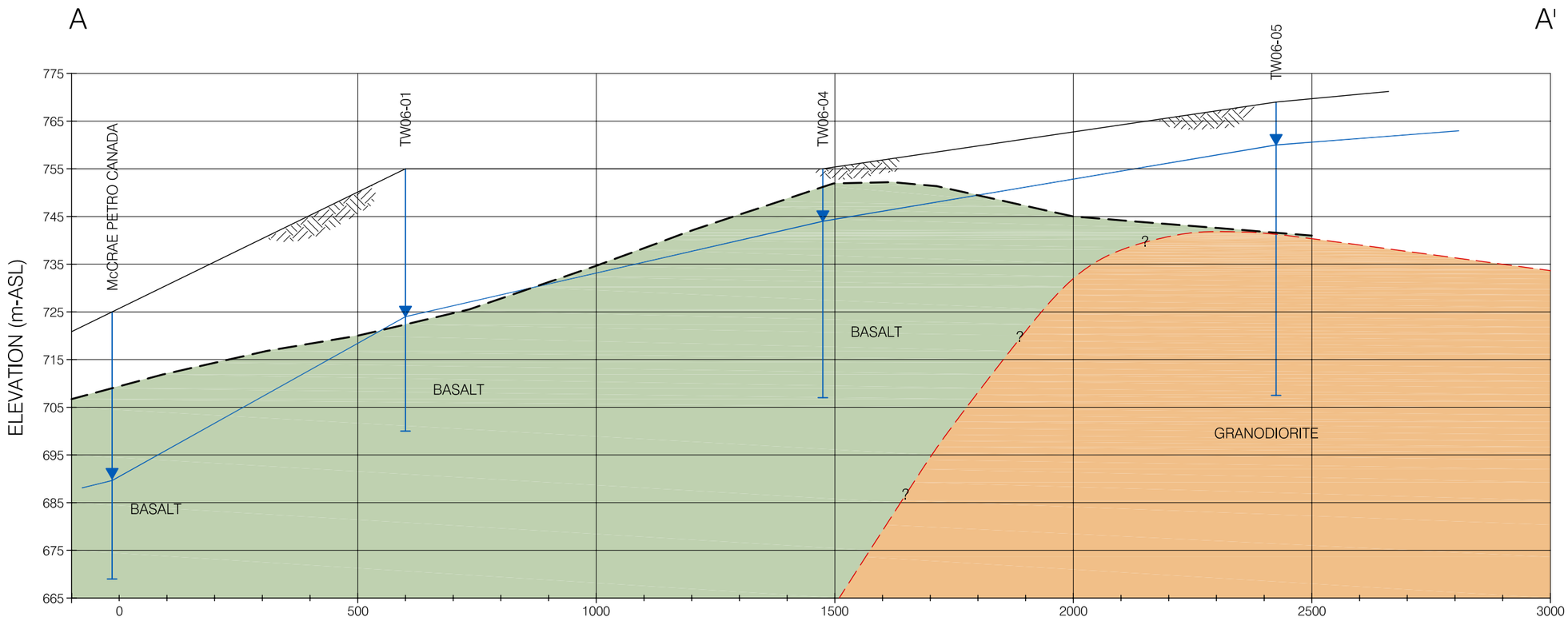
WHITEHORSE COPPER SUBDIVISION
HYDROGEOLOGICAL ASSESSMENT FOR WATER SUPPLY

SITE PLAN WITH WELL LOCATIONS AND BEDROCK GEOLOGY

PROJECT NO.	DWN	CKD	REV
1260009	JSB	KSJ	0
OFFICE: EBA-WHSE	DATE: December 5, 2006		

Figure 8

C:\Whitehorse\Data\020\drawings\Whitehorse\1260000\1260009 Whse Copper Sub Water Supply\1260009 Hydro Assessment\1260009 Figures 2_8_9_10.dwg [FIGURE 8] December 19, 2006 - 4:09pm jbuyck



SECTION A - A'

SCALE
HOR. 1:10,000
VERT. 1:1,000

LEGEND:

- GROUND SURFACE
- BEDROCK CONTACT (INFERRED)
- BEDROCK SURFACE
- MILES CANYON BASALT
- WHITEHORSE BATHOLITH GRANODIORITE
- GROUND SURFACE (APPROXIMATE)
- TW06-04 — WELL IDENTIFIER
- STATIC WATER LEVEL
- WELL SCREEN (IF APPLICABLE)

NOTES:
1. ALL LOCATIONS ARE APPROXIMATE.
2. BEDROCK GEOLOGY ADAPTED FROM GARTNER LEE 2002.
3. DRAWING HAS BEPRODUCED IN COLOR, ANY REPRODUCTIONS MAY NOT BE REPRESENTATIVE OF ORIGINAL.

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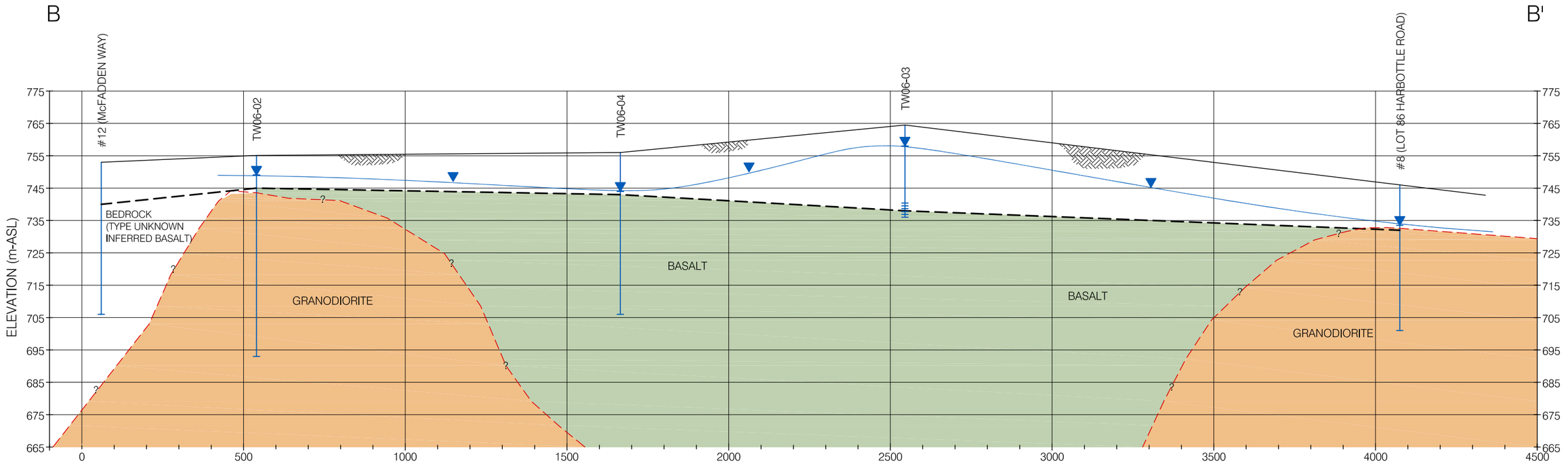
WHITEHORSE COPPER SUBDIVISION
HYDROGEOLOGICAL ASSESSMENT FOR WATER SUPPLY

SECTION A - A'

PROJECT NO.	DWN	CKD	REV
1260009	JSB	KSJ	0
OFFICE	DATE		
EBA-WHSE	December 20, 2006		

Figure 9



SECTION B - B'

SCALE
HOR. 1:12,500
VERT. 1:1250

LEGEND:

- GROUND SURFACE
- BEDROCK CONTACT (INFERRED)
- BEDROCK SURFACE
- MILES CANYON BASALT
- WHITEHORSE BATHOLITH GRANODIORITE
- GROUND SURFACE (APPROXIMATE)
- TW06-04 — WELL IDENTIFIER
- STATIC WATER LEVEL
- WELL SCREEN (IF APPLICABLE)

NOTES:
1. ALL LOCATIONS ARE APPROXIMATE.
2. BEDROCK GEOLOGY ADAPTED FROM GARTNER LEE 2002.
3. DRAWING HAS BEEN PRODUCED IN COLOR, ANY REPRODUCTIONS MAY NOT BE REPRESENTATIVE OF ORIGINAL.

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WHITEHORSE COPPER SUBDIVISION
HYDROGEOLOGICAL ASSESSMENT FOR WATER SUPPLY

SECTION B - B'

EBA Engineering Consultants Ltd.

PROJECT NO.	DWN	CKD	REV
1260009	JSB	KSJ	0

OFFICE: EBA-WHSE
DATE: December 20, 2006

Figure 10

APPENDIX A

APPENDIX A DRILLERS WELL LOGS

Yukon Government
Department of Environment
Water Resources Section V-310
Yukon Water Well Registry
Box 2703 Whitehorse, Yukon Y1A 2C6

Well ID: YW06-01
To be assigned by Dept. Of Environment

WATER WELL DRILLERS FORM

INSTRUCTIONS FOR COMPLETING THE FORM

1. Additional information is provided at the bottom of this form on page 2.
2. Question can be directed to Water Resources at 867 667-3171.
3. All well construction measurements shall be reported to 0.1 m or 0.3 ft.
4. Please print clearly in blue or black ink.
5. Completion and submission of this form is the responsibility of the drilling contractor.
6. Please specify metric or imperial units for all measurements.

WELL LOCATION AND OWNER'S INFORMATION

A1 Well Name: [ ] Optional (i.e. City Well No. 2)

A2 Drilled For: First Name [ ] Last Name [ ] Company / Department / Organization [ ]

A3 Street Address of Well Location: [ ]

A4 Town / Village / Area / Lot #: [ ]

A5 UTM Coordinates (using handheld GPS): NAD [8|3] Zone [ ]

Easting [ ] Northing [ ]

A6 Elevation of Top of Casing: [ ] m / ft ASL

A7 Accuracy of GPS: [ ] +/- m / ft

Sketch of Well Location

In sketch, indicate distances from property line, septic field, fuel tank(s) and building. Please include North arrow.

Well #1 Lot 6 Brundin Cr

A8 Purpose of Wells

- ☐ Domestic
- ☐ Commercial
- ☐ Industrial
- ☐ Test Well
- ☐ Municipal
- ☐ Agricultural
- ☐ Irrigation
- ☐ Observation - Water Level
- ☐ Public/Recreational
- ☐ Environmental (Quality)
- ☐ Other *(please identify use)* [ ]

LOG OF OVERBURDEN AND BEDROCK MATERIALS *(All depths are below ground surface, circle appropriate units, use descriptors provided)*

EXAMPLE ONLY →	(brown, grey, green, black, redish, beige, olive, yellowish)	CLAY, SILT, SAND, GRAVEL, COBBLES, BOULDERS, BEDROCK	"trace" <10% (i.e. SILT trace gravel) "some" 10-20% (i.e. SAND some gravel) "silty / sandy / gravelly" 20-30% (i.e. silty SAND) "and sand" or "and gravel" 35-50%	MOISTURE: dry / moist / saturated (wet) HARDNESS: soft / hard / very hard
	brown	SAND	trace gravel some silt	soft and saturated

Depth (m / ft) B2 From	B3 To	B4 General Colour	B5 Most Common Material	B6 Secondary Materials	B7 General Description
0	18	grey	silt boulders	gravel	dry
18	25	brown	sand		
25	42		gravel sand	some silt	course
53	70	red pink	bad rock	some silt	soft punky
70	112	dark brown	bedrock		fractured
112	168	Grey brown red	bedrock		Lots of layers
168	180	orange			very soft

B8 Permafrost Encountered: ☑ NO ☐ YES If yes, indicated depth (m / ft): from: [ ] to: [ ]

WELL CONSTRUCTION *(Continues on Page 2)*

Date Well Completed: [2010|09|15] (Y Y Y Y M M D D) *Example: 2005 01 31*

C1 Drilling Method: ☑ Air Rotary (Conventional) ☐ Reverse Air Rotary ☐ Mud Rotary ☐ Dug ☐ Cable Tool ☐ Auger (Hollow / Solid Stem) ☐ Other *(please specify)* [ ]

C2 Well Type: In what geological material is the water producing zone located? ☐ OVERBURDEN ☑ BEDROCK

Casing *(depth below ground surface, please circle appropriate units)*

C3 Outside Diameter: [6 5/8] (cm / in)

C4 Casing Material: ☑ Steel ☐ Plastic ☐ Other [ ]

C5 Casing Wall Thickness: [.250] (cm / in)

C6 Casing Depth to: [120] (m / ft)

C7 Other Comments Regarding Casing: [ ]

TW06-01

WELL CONSTRUCTION *(Continued from Page 1)*

Surface / Environmental Seal (depth below ground surface, please circle appropriate units)

C8 Seal Material Type: Bentonite (i.e. Bentonite) | C9 Diameter of Seal: 10 (cm / in) | C10 Seal Depth from: 0 (m / ft) | C11 Seal Depth to: 20 (m / ft) | C12 Volume Placed: (m³ / ft³)

Gravel Pack *(depth below ground surface, please circle appropriate units)*

C13 Gravel Pack: ☒ NO ☐ YES — If yes, indicated depth (m / ft): from: to: Indicate diameter of material: (mm / inches) Material type: (i.e. silica)

Well Screen Information *(depth below ground surface, please circle appropriate units)*

C14 Outside Diameter (cm / in)

C15 Screen Material: ☐ Stainless Steel ☐ Steel ☐ Plastic ☐ N/A ☐ Other

C16 Screen Type: ☐ Continuous Wire Wrap ☐ Louver Screen ☐ Perforated ☐ Slotted ☐ Open Hole

	C17 Depth from:	C18 Depth to:	Slot Size / Perforation Dia:
Screen 1.	(m / ft)	(m / ft)	Thou. / mm / Inches
Screen 2.	(m / ft)	(m / ft)	Thou. / mm / Inches
Screen 3.	(m / ft)	(m / ft)	Thou. / mm / Inches

C19 Screen Comments:

WELL DEVELOPMENT AND STATUS

D1 Well Developed by: ☐ Surge Block ☒ Water Jetting ☒ Air Jetting / Air Lifting ☐ Bailing ☐ Pumping ☐ Other:

D2 Well Head Completion: ☐ Well House ☐ Pitless Adaptor *Depth of adaptor:* (m / ft) ☐ Well Pit (NOT PERMITTED) ☐ None (well not completed)

D3 Well Head Stick-up *(above ground surface)*: 1 (m / ft) *(Use negative if below grade)*

D4 Static Water Level *(below top of casing)*: 54? (m / ft) *(Use negative if below grade)*

D5 Well Yield Estimate: 2 (Lps / gpm)

D6 Final Well Status: ☐ Water Supply (in use) ☐ Stand by (Back-up) ☐ Observation ☐ Not in use ☐ Deepened ☐ Other: ☐ Abandoned *If well was abandoned, please give reason:* ☐ Dry ☐ Poor Quality ☐ Insufficient Yield ☐ Artesian conditions

D7 Well Abandonment Status: Was the well properly decommissioned with bentonite grout? ☐ YES ☐ NO

If YES, Indicate Date: Y Y Y Y M M D D

D8 Method Used to Estimate Well Yield: ☒ Air Lifting ☐ Bailing ☐ Pumping Test *(If test conducted, complete Pumping Test Record)*

PUMPING TEST RECORD AND GROUNDWATER QUALITY

(All depths below ground, circle appropriate units)

E1 Pumping Test Information

Pumping Test Start Date: Y Y Y Y M M D D

Static Water Level (SWL): (m / ft)

Pump Intake Set at: (m / ft)

Duration of pumping: hrs min

Final Water Level (FWL) at end of Pumping Test: (m / ft)

RECOMMENDATIONS

Recomm. Pump Depth: (m / ft)

Recomm. Pumping Rate: (Lps / gpm)

If flowing, provide rate: (Lps / gpm)

F1 Well Water Level Drawdown/Recovery DATA

Drawdown Time (min)	Drawdown Water Level (m / ft)	Recovery Time (min)	Recovery Water Level (m / ft)
0 (SWL)		0 (FWL)	
1		1	
2		2	
3		3	
4		4	
5		5	
10		10	
15		15	
20		20	
25		25	
30		30	
40		40	
50		50	
60		60	

G1 GROUNDWATER QUALITY

Field Data

Date Measurements Taken: Y Y Y Y M M D D

Electrical Conductivity: uS

pH:

Temperature: °C

Groundwater Type

☐ Salty ☐ Sulphur / Egg Odour ☐ Organic Taste / Odour ☐ Metallic Taste ☐ Other:

Turbidity/Sand Content

☐ Clear ☐ Slightly turbid/cloudy ☐ Moderately turbid/cloudy ☐ Turbid/cloudy ☐ Trace sand present ☐ No sand present

Well Disinfection

Was the well disinfected upon completion of the pump installation? ☐ YES ☐ NO

Briefly describe method of well disinfection.

Bacteria Testing

Was a sample taken? ☐ YES ☐ NO *If yes, indicate the name of the laboratory.*

Date Sample Taken: Y Y Y Y M M D D

Chemical Analysis of Water

Was a sample taken? ☐ YES ☐ NO *If yes, indicate the name of the laboratory.*

Date Sample Taken: Y Y Y Y M M D D

WELL CONTRACTOR

H1 Name of Contractor / Drilling Company: MacDougall Water Resources

H2 Name of Driller(s): Brian MacDougall

H3 Address of Driller: Box 10259 Whitehorse YT Y1A 7A1

Signature of Primary Driller

Date Submitted to Dept. Of Environment: Y Y Y Y M M D D

CONSULTANT *(If applicable)*

I 1 Company Name:

I 2 Company Address:

I 3 Report Reference:

I 4 Report Date: Y Y Y Y M M D D

ADDITIONAL INSTRUCTIONS

Upon completing this form, please mail or fax it to:

Water Resources Section (V-310), Department of Environment, Government of Yukon Box 2703, Whitehorse, Yukon, Canada Y1A 2C6

Please feel free to contact us at:
Phone: (867) 667-3171, Toll free (in Yukon): (1-800) 661-0408, local 3171)
Fax: (867) 667-3195 E-mail: Water.Resources@gov.yk.ca

Personal information contained on this form is collected under the authority of the *Access to Information and Protection of Privacy (ATIPP) Act*, Section 29 (c) and will be used to compile a public database of well and ground water information. For further information contact the Manager of Hydrology, Water Resources at (867) 667-3223, toll free within Yukon 1-800-661-0408 Ext 3223.

I have read the above clause and understand the purpose for collection of personal information.

Signature of Well Owner

Yukon Government

Department of Environment
Water Resources Section V-310
Yukon Water Well Registry
Box 2703 Whitehorse, Yukon Y1A 2C6

Well ID: TW0602
To be assigned by Dept. Of Environment

WATER WELL DRILLERS FORM

INSTRUCTIONS FOR COMPLETING THE FORM

1. Additional information is provided at the bottom of this form on page 2.
2. Question can be directed to Water Resources at 867 667-3171.
3. All well construction measurements shall be reported to 0.1 m or 0.3 ft.
4. Please print clearly in blue or black ink.
5. Completion and submission of this form is the responsibility of the drilling contractor.
6. Please specify metric or imperial units for all measurements.

WELL LOCATION AND OWNER'S INFORMATION

A1 Well Name: _____ Optional (i.e. City Well No. 2)

A2 Drilled For: First Name _____ Last Name _____ Company / Department / Organization _____

A3 Street Address of Well Location: _____

A4 Town / Village / Area / Lot #: _____

A5 UTM Coordinates (using handheld GPS): NAD 8 3 Zone 1

Easting _____ Northing _____

A6 Elevation of Top of Casing: _____ m / ft ASL

A7 Accuracy of GPS: _____ +/- m / ft

Sketch of Well Location

In sketch, indicate distances from property line, septic field, fuel tank(s) and building. Please include North arrow.

T.W#2 Lot 19 Leuch Drive

A8 Purpose of Wells

- ☐ Domestic
- ☐ Commercial
- ☐ Industrial
- ☐ Test Well
- ☐ Municipal
- ☐ Agricultural
- ☐ Irrigation
- ☐ Observation - Water Level
- ☐ Public/Recreational
- ☐ Environmental (Quality)
- ☐ Other *(please identify use)* _____

LOG OF OVERBURDEN AND BEDROCK MATERIALS *(All depths are below ground surface, circle appropriate units, use descriptors provided)*

EXAMPLE ONLY →	*(brown, grey, green, black, redish, beige, olive, yellowish)*	*CLAY, SILT, SAND, GRAVEL, COBBLES, BOULDERS, BEDROCK*	*"trace" <10% (i.e. SILT trace gravel) "some" 10-20% (i.e. SAND some gravel) "silty / sandy / gravely" 20-30% (i.e. silty SAND) "and sand" or "and gravel" 35-50%*	*MOISTURE: dry / moist / saturated (wet) HARDNESS: soft / hard / very hard*
	brown	SAND	trace gravel some silt	soft and saturated

Depth (m / ft) B2 From	B3 To	B4 General Colour	B5 Most Common Material	B6 Secondary Materials	B7 General Description
0	20	Grey Brown	Rock Cobbles	Sand seams	course
20	32	brown	Rock Gravel		course
32	200	grey green	bedrock		soft

B8 Permafrost Encountered: ☒ NO ☐ YES If yes, indicated depth (m / ft): from: _____ to: _____

WELL CONSTRUCTION *(Continues on Page 2)*

Date Well Completed: 2 0 1 0 1 6 | 0 1 9 | 1 9 (Y Y Y Y M M D D) *Example: 2005 01 31*

C1 Drilling Method: ☑ Air Rotary (Conventional) ☐ Reverse Air Rotary ☐ Mud Rotary ☐ Dug ☐ Cable Tool ☐ Auger (Hollow / Solid Stem) ☐ Other *(please specify)* _____

C2 Well Type: In what geological material is the water producing zone located? ☐ OVERBURDEN ☑ BEDROCK

Casing *(depth below ground surface, please circle appropriate units)*

C3 Outside Diameter: 6 5/8 (cm / in)

C4 Casing Material: ☒ Steel ☐ Plastic ☐ Other _____

C5 Casing Wall Thickness: .250 (cm / in)

C6 Casing Depth to: 40 (m / ft)

C7 Other Comments Regarding Casing: _____

TW0602

WELL CONSTRUCTION *(Continued from Page 1)*

Surface / Environmental Seal (depth below ground surface, please circle appropriate units)

C8 Seal Material Type: (i.e. Bentonite)	C9 Diameter of Seal:	C10 Seal Depth from:	C11 Seal Depth to:	C12 Volume Placed:
bentonite	9 (cm / in)	0 (m / ft)	15 (m / ft)	(m³ / ft³)

Gravel Pack *(depth below ground surface, please circle appropriate units)*

C13 Gravel Pack: ☑ NO ☐ YES — If yes, indicated depth (m / ft): from: ____ to: ____ Indicate diameter of material: ____ (mm / inches) Material type: (i.e. silica) ____

Well Screen Information *(depth below ground surface, please circle appropriate units)*

C14 Outside Diameter ____ (cm / in)

C15 Screen Material: ☐ Stainless Steel ☐ Steel ☐ Plastic ☐ N/A ☐ Other ____

C16 Screen Type: ☐ Continuous Wire Wrap ☐ Louver Screen ☐ Perforated ☐ Slotted ☐ Open Hole

	C17 Depth from:	C18 Depth to:	Slot Size / Perforation Dia:
Screen 1.	____ (m / ft)	____ (m / ft)	____ Thou. / mm / inches
Screen 2.	____ (m / ft)	____ (m / ft)	____ Thou. / mm / inches
Screen 3.	____ (m / ft)	____ (m / ft)	____ Thou. / mm / inches

C19 Screen Comments: ____

WELL DEVELOPMENT AND STATUS

D1 Well Developed by: ☐ Surge Block ☑ Water Jetting ☑ Air Jetting / Air Lifting ☐ Bailing ☐ Pumping ☐ Other: ____

D2 Well Head Completion: ☐ Well House ☐ Pitless Adaptor *Depth of adaptor:* ____ (m / ft) ☐ Well Pit (NOT PERMITTED) ☐ None (well not completed)

D3 Well Head Stick-up *(above ground surface)*: 2 (m / ft) *(Use negative if below grade)*

D4 Static Water Level *(below top of casing)*: 25? (m / ft) *(Use negative if below grade)*

D5 Well Yield Estimate: 18-2 (Lps / gpm)

D6 Final Well Status: ☐ Water Supply (in use) ☐ Stand by (Back-up) ☐ Observation ☐ Not in use ☐ Deepened ☐ Other: ____ ☐ Abandoned *If well was abandoned, please give reason:* ☐ Dry ☐ Poor Quality ☐ Insufficient Yield ☐ Artesian conditions

D7 Well Abandonment Status: Was the well properly decommissioned with bentonite grout? ☐ YES ☐ NO

If YES, Indicate Date: ____ (Y Y Y Y M M D D)

D8 Method Used to Estimate Well Yield: ☑ Air Lifting ☐ Bailing ☐ Pumping Test *(If test conducted, complete Pumping Test Record)*

PUMPING TEST RECORD AND GROUNDWATER QUALITY

(All depths below ground, circle appropriate units)

E1 Pumping Test Information

Pumping Test Start Date: ____ (Y Y Y Y M M D D)

Static Water Level (SWL): ____ (m / ft)

Pump Intake Set at: ____ (m / ft)

Duration of pumping: ____ hrs ____ min

Final Water Level (FWL) at end of Pumping Test: ____ (m / ft)

RECOMMENDATIONS

Recomm. Pump Depth: ____ (m / ft)

Recomm. Pumping Rate: ____ (Lps / gpm)

If flowing, provide rate: ____ (Lps / gpm)

F1 Well Water Level Drawdown/Recovery DATA

Drawdown Time (min)	Drawdown Water Level (m / ft)	Recovery Time (min)	Recovery Water Level (m / ft)
0 (SWL)		0 (FWL)	
1		1	
2		2	
3		3	
4		4	
5		5	
10		10	
15		15	
20		20	
25		25	
30		30	
40		40	
50		50	
60		60	

G1 GROUNDWATER QUALITY

Field Data

Date Measurements Taken: ____ (Y Y Y Y M M D D)

Electrical Conductivity: ____ uS

pH: ____

Temperature: ____ °C

Groundwater Type: ☐ Salty ☐ Sulphur / Egg Odour ☐ Organic Taste / Odour ☐ Metallic Taste ☐ Other: ____

Turbidity/Sand Content: ☐ Clear ☐ Slightly turbid/cloudy ☐ Moderately turbid/cloudy ☐ Turbid/cloudy ☐ Trace sand present ☐ No sand present

Well Disinfection

Was the well disinfected upon completion of the pump installation? ☐ YES ☐ NO

Briefly describe method of well disinfection. ____

Bacteria Testing

Was a sample taken? ☐ YES ☐ NO *If yes, indicate the name of the laboratory.*

Date Sample Taken: ____ (Y Y Y Y M M D D) ____

Chemical Analysis of Water

Was a sample taken? ☐ YES ☐ NO *If yes, indicate the name of the laboratory.*

Date Sample Taken: ____ (Y Y Y Y M M D D) ____

WELL CONTRACTOR

H1 Name of Contractor / Drilling Company: MacDougall's Water Resources

H2 Name of Driller(s): Brian MacDougall

H3 Address of Driller: Box 10254 Whse Y1A7A1

Signature of Primary Driller ____

Date Submitted to Dept. Of Environment ____ (Y Y Y Y M M D D)

CONSULTANT *(If applicable)*

I 1 Company Name: ____

I 2 Company Address: ____

I 3 Report Reference: ____

I 4 Report Date: ____ (Y Y Y Y M M D D)

ADDITIONAL INSTRUCTIONS

Upon completing this form, please mail or fax it to:

Water Resources Section (V-310), Department of Environment, Government of Yukon Box 2703, Whitehorse, Yukon, Canada Y1A 2C6

Please feel free to contact us at:
Phone: (867) 667-3171, Toll free (in Yukon): (1-800) 661-0408, local 3171)
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I have read the above clause and understand the purpose for collection of personal information. ____ Signature of Well Owner

Yukon Government

Department of Environment
Water Resources Section V-310
Yukon Water Well Registry
Box 2703 Whitehorse, Yukon Y1A 2C6

Well ID: W06-03
To be assigned by Dept. Of Environment

WATER WELL DRILLERS FORM

INSTRUCTIONS FOR COMPLETING THE FORM

1. Additional information is provided at the bottom of this form on page 2.
2. Question can be directed to Water Resources at 867 667-3171.
3. All well construction measurements shall be reported to 0.1 m or 0.3 ft.
4. Please print clearly in blue or black ink.
5. Completion and submission of this form is the responsibility of the drilling contractor.
6. Please specify metric or imperial units for all measurements.

WELL LOCATION AND OWNER'S INFORMATION

A1 Well Name: Optional (i.e. City Well No. 2)

A2 Drilled For: First Name | Last Name | Company / Department / Organization

A3 Street Address of Well Location:

A4 Town / Village / Area / Lot #:

A5 UTM Coordinates (using handheld GPS): NAD 8 3 Zone

Easting | Northing

A6 Elevation of Top of Casing: m / ft ASL

A7 Accuracy of GPS: +/- m / ft

Sketch of Well Location
In sketch, indicate distances from property line, septic field, fuel tank(s) and building. Please include North arrow.

TW#3 School Site Service Place

A8 Purpose of Wells

- ☐ Domestic
- ☐ Commercial
- ☐ Industrial
- ☐ Test Well
- ☐ Municipal
- ☐ Agricultural
- ☐ Irrigation
- ☐ Observation - Water Level
- ☐ Public/Recreational
- ☐ Environmental (Quality)
- ☐ Other *(please identify use)*

LOG OF OVERBURDEN AND BEDROCK MATERIALS *(All depths are below ground surface, circle appropriate units, use descriptors provided)*

EXAMPLE ONLY →	*(brown, grey, green, black, redish, beige, olive, yellowish)*	*CLAY, SILT, SAND, GRAVEL, COBBLES, BOULDERS, BEDROCK*	*"trace" <10% (i.e. SILT trace gravel) "some" 10-20% (i.e. SAND some gravel) "silty / sandy / gravely" 20-30% (i.e. silty SAND) "and sand" or "and gravel" 35-50%*	*MOISTURE: dry / moist / saturated (wet) HARDNESS: soft / hard / very hard*
	brown	SAND	trace gravel some silt	soft and saturated

Depth (m / ft) B2 From	B3 To	B4 General Colour	B5 Most Common Material	B6 Secondary Materials	B7 General Description
0	20	Grey brown	Sand & Silt	boulders	rough
20	27	brown	Sand		damp
27	55		Silt	gravel boulders	
55	70	grey	Silt	gravel	wet
70	89	brown	gravel		course
89	90		bedrock		soft

B8 Permafrost Encountered: ☑ NO ☐ YES If yes, indicated depth (m / ft): from: to:

WELL CONSTRUCTION *(Continues on Page 2)*

Date Well Completed 2 0 0 6 0 9 2 4 (Y Y Y Y M M D D) *Example: 2005 01 31*

C1 Drilling Method

- ☑ Air Rotary (Conventional)
- ☐ Reverse Air Rotary
- ☐ Mud Rotary
- ☐ Dug
- ☐ Cable Tool
- ☐ Auger (Hollow / Solid Stem)
- ☐ Other *(please specify)*

C2 Well Type: In what geological material is the water producing zone located?

☑ OVERBURDEN ☐ BEDROCK

Casing *(depth below ground surface, please circle appropriate units)*

C3 Outside Diameter 6 5/8 (cm / in)

C4 Casing Material

- ☑ Steel
- ☐ Plastic
- ☐ Other

C5 Casing Wall Thickness .250 (cm / in)

C6 Casing Depth to: 92 (m / ft)

C7 Other Comments Regarding Casing:

TW06-03

WELL CONSTRUCTION *(Continued from Page 1)*

Surface / Environmental Seal (depth below ground surface, please circle appropriate units)

C8 Seal Material Type: Bentonite (i.e. Bentonite) | C9 Diameter of Seal: 8 (cm / in) | C10 Seal Depth from: 0 (m / ft) | C11 Seal Depth to: 15 (m / ft) | C12 Volume Placed: (m^3 / ft^3)

Gravel Pack *(depth below ground surface, please circle appropriate units)*

C13 Gravel Pack: ☐ NO ☐ YES — If yes, indicated depth (m / ft): from: ☐ to: ☐ Indicate diameter of material: ☐ (mm / Inches) Material type: (i.e. silica)

Well Screen Information *(depth below ground surface, please circle appropriate units)*

C14 Outside Diameter: 5 (cm / in)

C15 Screen Material: ☑ Stainless Steel ☐ Steel ☐ Plastic ☐ N/A ☐ Other

C16 Screen Type: ☐ Continuous Wire Wrap ☐ Louver Screen ☐ Perforated ☐ Slotted ☐ Open Hole

	C17 Depth from:	C18 Depth to:	Slot Size / Perforation Dia:
Screen 1.	84 (m / ft)	89 (m / ft)	☐ Thou. / mm / Inches
Screen 2.	☐ (m / ft)	☐ (m / ft)	☐ Thou. / mm / Inches
Screen 3.	☐ (m / ft)	☐ (m / ft)	☐ Thou. / mm / Inches

C19 Screen Comments: ☐

WELL DEVELOPMENT AND STATUS

D1 Well Developed by: ☐ Surge Block ☑ Water Jetting ☑ Air Jetting / Air Lifting ☐ Bailing ☐ Pumping ☐ Other: ☐

D2 Well Head Completion: ☐ Well House ☐ Pitless Adaptor *Depth of adaptor:* ☐ (m / ft) ☐ Well Pit (NOT PERMITTED) ☐ None (well not completed)

D3 Well Head Stick-up *(above ground surface)*: 1 (m / ft) *(Use negative if below grade)*

D4 Static Water Level *(below top of casing)*: ? (m / ft) *(Use negative if below grade)*

D5 Well Yield Estimate: 13 (Lps / gpm)

D6 Final Well Status: ☐ Water Supply (in use) ☐ Stand by (Back-up) ☐ Observation ☐ Not in use ☐ Deepened ☐ Other: ☐ ☐ Abandoned *If well was abandoned, please give reason:* ☐ Dry ☐ Poor Quality ☐ Insufficient Yield ☐ Artesian conditions

D7 Well Abandonment Status: Was the well properly decommissioned with bentonite grout? ☐ YES ☐ NO — If YES, Indicate Date: ☐ (Y Y Y Y M M D D)

D8 Method Used to Estimate Well Yield: ☐ Air Lifting ☐ Bailing ☐ Pumping Test *(If test conducted, complete Pumping Test Record)*

PUMPING TEST RECORD AND GROUNDWATER QUALITY

(All depths below ground, circle appropriate units)

E1 Pumping Test Information

Pumping Test Start Date: ☐ (Y Y Y Y M M D D)

Static Water Level (SWL): ☐ (m / ft)

Pump Intake Set at: ☐ (m / ft)

Duration of pumping: ☐ hrs ☐ min

Final Water Level (FWL) at end of Pumping Test: ☐ (m / ft)

RECOMMENDATIONS

Recomm. Pump Depth: ☐ (m / ft)

Recomm. Pumping Rate: ☐ (Lps / gpm)

If flowing, provide rate: ☐ (Lps / gpm)

F1 Well Water Level Drawdown/Recovery DATA

Drawdown Time (min)	Drawdown Water Level (m / ft)	Recovery Time (min)	Recovery Water Level (m / ft)
0 (SWL)		0 (FWL)	
1		1	
2		2	
3		3	
4		4	
5		5	
10		10	
15		15	
20		20	
25		25	
30		30	
40		40	
50		50	
60		60	

G1 GROUNDWATER QUALITY

Field Data

Date Measurements Taken: ☐ (Y Y Y Y M M D D)

Electrical Conductivity: ☐ uS

pH: ☐

Temperature: ☐ °C

Groundwater Type: ☐ Salty ☐ Sulphur / Egg Odour ☐ Organic Taste / Odour ☐ Metallic Taste ☐ Other: ☐

Turbidity/Sand Content: ☐ Clear ☐ Slightly turbid/cloudy ☐ Moderately turbid/cloudy ☐ Turbid/cloudy ☐ Trace sand present ☐ No sand present

Well Disinfection

Was the well disinfected upon completion of the pump installation? ☐ YES ☐ NO

Briefly describe method of well disinfection. ☐

Bacteria Testing

Was a sample taken? ☐ YES ☐ NO *If yes, indicate the name of the laboratory.*

Date Sample Taken: ☐ (Y Y Y Y M M D D) ☐

Chemical Analysis of Water

Was a sample taken? ☐ YES ☐ NO *If yes, indicate the name of the laboratory.*

Date Sample Taken: ☐ (Y Y Y Y M M D D) ☐

WELL CONTRACTOR

H1 Name of Contractor / Drilling Company: MacDougall's Water Resources

H2 Name of Driller(s): Dave MacDougall

H3 Address of Driller: Box 10054 Whse Y1A2A1

Signature of Primary Driller ☐

Date Submitted to Dept. Of Environment ☐ (Y Y Y Y M M D D)

CONSULTANT *(If applicable)*

I 1 Company Name: ☐

I 2 Company Address: ☐

I 3 Report Reference: ☐

I 4 Report Date: ☐ (Y Y Y Y M M D D)

ADDITIONAL INSTRUCTIONS

Upon completing this form, please mail or fax it to:

Water Resources Section (V-310), Department of Environment, Government of Yukon Box 2703, Whitehorse, Yukon, Canada Y1A 2C6

Please feel free to contact us at:
Phone: (867) 667-3171, Toll free (in Yukon): (1-800) 661-0408, local 3171)
Fax: (867) 667-3195 E-mail: Water.Resources@gov.yk.ca

Personal information contained on this form is collected under the authority of the *Access to Information and Protection of Privacy (ATIPP) Act*, Section 29 (c) and will be used to compile a public database of well and ground water information. For further information contact the Manager of Hydrology, Water Resources at (867) 667-3223, toll free within Yukon 1-800-661-0408 Ext 3223.

I have read the above clause and understand the purpose for collection of personal information. ☐

Signature of Well Owner

TW06-04

Yukon Government
Department of Environment
Water Resources Section V-310
Yukon Water Well Registry
Box 2703 Whitehorse, Yukon Y1A 2C6

Well ID: _____
To be assigned by Dept. Of Environment

WATER WELL DRILLERS FORM

INSTRUCTIONS FOR COMPLETING THE FORM
1. Additional information is provided at the bottom of this form on page 2.
2. Question can be directed to Water Resources at 867 667-3171.
3. All well construction measurements shall be reported to 0.1 m or 0.3 ft.
4. Please print clearly in blue or black ink.
5. Completion and submission of this form is the responsibility of the drilling contractor.
6. Please specify metric or imperial units for all measurements.

WELL LOCATION AND OWNER'S INFORMATION

A1 Well Name: - Optional (i.e. City Well No. 2)

A2 Drilled For: First Name | Last Name | Company / Department / Organization

A3 Street Address of Well Location:

A4 Town / Village / Area / Lot #:

A5 UTM Coordinates (using handheld GPS): NAD 8 3 Zone
Easting | Northing

A6 Elevation of Top of Casing: m / ft ASL

A7 Accuracy of GPS: +/- m / ft

Sketch of Well Location
In sketch, indicate distances from property line, septic field, fuel tank(s) and building. Please include North arrow.
TW#4 Crevasse Place Lot 54

A8 Purpose of Wells
☐ Domestic ☐ Test Well ☐ Irrigation ☐ Environmental (Quality)
☐ Commercial ☐ Municipal ☐ Observation - Water Level ☐ Other *(please identify use)*
☐ Industrial ☐ Agricultural ☐ Public/Recreational

LOG OF OVERBURDEN AND BEDROCK MATERIALS *(All depths are below ground surface, circle appropriate units, use descriptors provided)*

EXAMPLE ONLY →	*(brown, grey, green, black, redish, beige, olive, yellowish)*	*CLAY, SILT, SAND, GRAVEL, COBBLES, BOULDERS, BEDROCK*	*"traces" <10% (i.e. SILT trace gravel) "some" 10-20% (i.e. SAND some gravel) "silty / sandy / gravely" 20-30% (i.e. silty SAND) "and sand" or "and gravel" 35-50%*	*MOISTURE: dry / moist / saturated (wet) HARDNESS: soft / hard / very hard*
	brown	SAND	trace gravel some silt	soft and saturated

Depth (m / ft) B2 From	B3 To	B4 General Colour	B5 Most Common Material	B6 Secondary Materials	B7 General Description
0	12	brown	gravel		course
12	38	pink	bedrock		punky
38	54	black	bedrock		hard
54	70	red orange	bedrock		very soft
70	145	black-with red specks	"		hard
145	160	black	"		fractured

B8 Permafrost Encountered: ☒ NO ☐ YES If yes, indicated depth (m / ft): from: to:

WELL CONSTRUCTION *(Continues on Page 2)*

Date Well Completed 2 0 0 6 0 9 2 8 (Y Y Y Y M M D D) *Example: 2005 01 31*

C1 Drilling Method ☒ Air Rotary (Conventional) ☐ Dug ☐ Other *(please specify)*
☐ Reverse Air Rotary ☐ Cable Tool
☐ Mud Rotary ☐ Auger (Hollow / Solid Stem)

C2 Well Type: In what geological material is the water producing zone located?
☐ OVERBURDEN ☒ BEDROCK

Casing *(depth below ground surface, please circle appropriate units)*

C3 Outside Diameter 6 ~~5~~ (cm / in)

C4 Casing Material ☒ Steel ☒ Plastic ☐ Other

C5 Casing Wall Thickness .250 (cm / in)

C6 Casing Depth to: 40 (m / ft) Steel
* 20-160' PVC
-4.5 I.D.

C7 Other Comments Regarding Casing:

TW06-04

WELL CONSTRUCTION *(Continued from Page 1)*

Surface / Environmental Seal (depth below ground surface, please circle appropriate units)

C8 Seal Material Type: Bentonite (i.e. Bentonite) | C9 Diameter of Seal: 8 (cm / in) | C10 Seal Depth from: 0 (m / ft) | C11 Seal Depth to: 20 (m / ft) | C12 Volume Placed: (m^3 / ft^3)

Gravel Pack *(depth below ground surface, please circle appropriate units)*

C13 Gravel Pack: ☑ NO ☐ YES | If yes, indicated depth (m / ft): from: ☐ to: ☐ | Indicate diameter of material: ☐ (mm / inches) | Material type: (i.e. silica) ☐

Well Screen Information *(depth below ground surface, please circle appropriate units)*

C14 Outside Diameter (cm / in) ☐

C15 Screen Material: ☐ Stainless Steel ☐ Steel ☐ Plastic ☐ N/A ☐ Other ☐

C16 Screen Type: ☐ Continuous Wire Wrap ☐ Louver Screen ☐ Perforated ☐ Slotted ☐ Open Hole

	C17 Depth from:	C18 Depth to:	Slot Size / Perforation Dia:
Screen 1.	☐ (m / ft)	☐ (m / ft)	☐ Thou. / mm / inches
Screen 2.	☐ (m / ft)	☐ (m / ft)	☐ Thou. / mm / inches
Screen 3.	☐ (m / ft)	☐ (m / ft)	☐ Thou. / mm / inches

C19 Screen Comments: ☐

WELL DEVELOPMENT AND STATUS

D1 Well Developed by: ☐ Surge Block ☑ Water Jetting ☑ Air Jetting / Air Lifting ☐ Bailing ☐ Pumping ☐ Other: ☐

D2 Well Head Completion: ☐ Well House ☐ Pitless Adaptor *Depth of adaptor:* ☐ (m / ft) ☐ Well Pit (NOT PERMITTED) ☐ None (well not completed)

D3 Well Head Stick-up *(above ground surface)*: 2 (m / ft) *(Use negative if below grade)*

D4 Static Water Level *(below top of casing)*: 35? (m / ft) *(Use negative if below grade)*

D5 Well Yield Estimate: 5 (Lps / gpm)

D6 Final Well Status: ☐ Water Supply (in use) ☐ Stand by (Back-up) ☐ Observation ☐ Not in use ☐ Deepened ☐ Other: ☐ ☐ Abandoned *If well was abandoned, please give reason:* ☐ Dry ☐ Poor Quality ☐ Insufficient Yield ☐ Artesian conditions

D7 Well Abandonment Status: Was the well properly decommissioned with bentonite grout? ☐ YES ☐ NO

If YES, indicate Date: ☐ (Y Y Y Y M M D D)

D8 Method Used to Estimate Well Yield: ☑ Air Lifting ☐ Bailing ☐ Pumping Test *(If test conducted, complete Pumping Test Record)*

PUMPING TEST RECORD AND GROUNDWATER QUALITY

(All depths below ground, circle appropriate units)

E1 Pumping Test Information

Pumping Test Start Date: ☐ (Y Y Y Y M M D D)

Static Water Level (SWL): ☐ (m / ft)

Pump Intake Set at: ☐ (m / ft)

Duration of pumping: ☐ hrs ☐ min

Final Water Level (FWL) at end of Pumping Test: ☐ (m / ft)

RECOMMENDATIONS

Recomm. Pump Depth: ☐ (m / ft)

Recomm. Pumping Rate: ☐ (Lps / gpm)

If flowing, provide rate: ☐ (Lps / gpm)

F1 Well Water Level Drawdown/Recovery DATA

Drawdown Time (min)	Drawdown Water Level (m / ft)	Recovery Time (min)	Recovery Water Level (m / ft)
0 (SWL)		0 (FWL)	
1		1	
2		2	
3		3	
4		4	
5		5	
10		10	
15		15	
20		20	
25		25	
30		30	
40		40	
50		50	
60		60	

G1 GROUNDWATER QUALITY

Field Data

Date Measurements Taken: ☐ (Y Y Y Y M M D D)

Electrical Conductivity: ☐ uS

pH: ☐

Temperature: ☐ °C

Turbidity/Sand Content

☐ Clear
☐ Slightly turbid/cloudy
☐ Moderately turbid/cloudy
☐ Turbid/cloudy
☐ Trace sand present
☐ No sand present

Groundwater Type

☐ Salty
☐ Sulphur / Egg Odour
☐ Organic Taste / Odour
☐ Metallic Taste
☐ Other: ☐

Well Disinfection

Was the well disinfected upon completion of the pump installation? ☐ YES ☐ NO

Briefly describe method of well disinfection. ☐

Bacteria Testing

Was a sample taken? ☐ YES ☐ NO *If yes, indicate the name of the laboratory.*

Date Sample Taken: ☐ ☐ (Y Y Y Y M M D D)

Chemical Analysis of Water

Was a sample taken? ☐ YES ☐ NO *If yes, indicate the name of the laboratory.*

Date Sample Taken: ☐ ☐ (Y Y Y Y M M D D)

WELL CONTRACTOR

H1 Name of Contractor / Drilling Company: MacDonald's Water Resources

H2 Name of Driller(s): Brian MacDonald

H3 Address of Driller: PO Box 10254 Whse Y.T

Signature of Primary Driller ☐

Date Submitted to Dept. Of Environment ☐ (Y Y Y Y M M D D)

CONSULTANT *(If applicable)*

I 1 Company Name: ☐

I 2 Company Address: ☐

I 3 Report Reference: ☐

I 4 Report Date: ☐ (Y Y Y Y M M D D)

ADDITIONAL INSTRUCTIONS

Upon completing this form, please mail or fax it to:

Water Resources Section (V-310), Department of Environment, Government of Yukon Box 2703, Whitehorse, Yukon, Canada Y1A 2C6

Please feel free to contact us at:
Phone: (867) 667-3171, Toll free (in Yukon): (1-800) 661-0408, local 3171)
Fax: (867) 667-3195 E-mail: Water.Resources@gov.yk.ca

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I have read the above clause and understand the purpose for collection of personal information. ☐ Signature of Well Owner

TW06-05

Yukon Government
Department of Environment
Water Resources Section V-310
Yukon Water Well Registry
Box 2703 Whitehorse, Yukon Y1A 2C6

Well ID: _____ To be assigned by Dept. Of Environment

WATER WELL DRILLERS FORM

INSTRUCTIONS FOR COMPLETING THE FORM

1. Additional information is provided at the bottom of this form on page 2.
2. Question can be directed to Water Resources at 867 667-3171.
3. All well construction measurements shall be reported to 0.1 m or 0.3 ft.
4. Please print clearly in blue or black ink.
5. Completion and submission of this form is the responsibility of the drilling contractor.
6. Please specify metric or imperial units for all measurements.

WELL LOCATION AND OWNER'S INFORMATION

A1 Well Name: _____ Optional (i.e. City Well No. 2)

A2 Drilled For: First Name _____ Last Name _____ Company / Department / Organization _____

A3 Street Address of Well Location: _____

A4 Town / Village / Area / Lot #: _____

A5 UTM Coordinates (using handheld GPS): NAD 8 3 Zone 1

Easting _____ Northing _____

A6 Elevation of Top of Casing: _____ m / ft ASL

A7 Accuracy of GPS: _____ +/- m / ft

Sketch of Well Location

In sketch, indicate distances from property line, septic field, fuel tank(s) and building. Please include North arrow.

RW#5 Lot81 Pringle Pl

A8 Purpose of Wells

- ☐ Domestic
- ☐ Commercial
- ☐ Industrial
- ☐ Test Well
- ☐ Municipal
- ☐ Agricultural
- ☐ Irrigation
- ☐ Observation - Water Level
- ☐ Public/Recreational
- ☐ Environmental (Quality)
- ☐ Other *(please identify use)* _____

LOG OF OVERBURDEN AND BEDROCK MATERIALS *(All depths are below ground surface, circle appropriate units, use descriptors provided)*

EXAMPLE ONLY →

B4 General Colour *(brown, grey, green, black, redish, beige, olive, yellowish)*	B5 Most Common Material *CLAY, SILT, SAND, GRAVEL, COBBLES, BOULDERS, BEDROCK*	B6 Secondary Materials *"trace" <10% (i.e. SILT trace gravel) "some" 10-20% (i.e. SAND some gravel) "silty / sandy / gravely" 20-30% (i.e. silty SAND) "and sand" or "and gravel" 35-50%*	B7 General Description *MOISTURE: dry / moist / saturated (wet) HARDNESS: soft / hard / very hard*
brown	SAND	trace gravel some silt	soft and saturated

Depth (m / ft) B2 From	B3 To	B4 General Colour	B5 Most Common Material	B6 Secondary Materials	B7 General Description
0	8	Grey	boulders	Clay	rough
8	33	Grey	gravel		course
33	90	yellow Brown	silt	gravel	soft wet
90	110	brown	rock	silt	soft wet
110	200	green white	bedrock		soft

B8 Permafrost Encountered: ☒ NO ☐ YES If yes, indicated depth (m / ft): from: _____ to: _____

WELL CONSTRUCTION *(Continues on Page 2)*

Date Well Completed 2 0 0 6 1 0 0 3 (Y Y Y Y M M D D) *Example: 2005 01 31*

C1 Drilling Method

- ☒ Air Rotary (Conventional)
- ☐ Reverse Air Rotary
- ☐ Mud Rotary
- ☐ Dug
- ☐ Cable Tool
- ☐ Auger (Hollow / Solid Stem)
- ☐ Other *(please specify)* _____

C2 Well Type: In what geological material is the water producing zone located?

☐ OVERBURDEN ☒ BEDROCK

Casing *(depth below ground surface, please circle appropriate units)*

C3 Outside Diameter 6 5/8 (cm / in)

C4 Casing Material

- ☒ Steel
- ☐ Plastic
- ☐ Other _____

C5 Casing Wall Thickness .150 (cm / in)

C6 Casing Depth to: 140 (m / ft)

C7 Other Comments Regarding Casing:

TW06-05

WELL CONSTRUCTION *(Continued from Page 1)*

Surface / Environmental Seal (depth below ground surface, please circle appropriate units)

C8 Seal Material Type: Bentonite (i.e. Bentonite) | C9 Diameter of Seal: 8 (cm / in) | C10 Seal Depth from: 0 (m / ft) | C11 Seal Depth to: 15 (m / ft) | C12 Volume Placed: (m^3 / ft^3)

Gravel Pack *(depth below ground surface, please circle appropriate units)*

C13 Gravel Pack: ☒ NO ☐ YES If yes, indicated depth (m / ft): from: ☐ to: ☐ Indicate diameter of material: ☐ (mm / Inches) Material type: (i.e. silica) ☐

Well Screen Information *(depth below ground surface, please circle appropriate units)*

C14 Outside Diameter (cm / in) ☐

C15 Screen Material: ☐ Stainless Steel ☐ Steel ☐ Plastic ☐ N/A ☐ Other ☐

C16 Screen Type: ☐ Continuous Wire Wrap ☐ Louver Screen ☐ Perforated ☐ Slotted ☐ Open Hole

	C17 Depth from:	C18 Depth to:	Slot Size / Perforation Dia:
Screen 1.	☐ (m / ft)	☐ (m / ft)	☐ Thou. / mm / inches
Screen 2.	☐ (m / ft)	☐ (m / ft)	☐ Thou. / mm / inches
Screen 3.	☐ (m / ft)	☐ (m / ft)	☐ Thou. / mm / inches

C19 Screen Comments: ☐

WELL DEVELOPMENT AND STATUS

D1 Well Developed by: ☐ Surge Block ☒ Water Jetting ☐ Air Jetting / Air Lifting ☐ Bailing ☐ Pumping ☐ Other: ☐

D2 Well Head Completion: ☐ Well House ☐ Pitless Adaptor *Depth of adaptor:* ☐ (m / ft) ☐ Well Pit (NOT PERMITTED) ☐ None (well not completed)

D3 Well Head Stick-up *(above ground surface)*: 2 (m / ft) *(Use negative if below grade)*

D4 Static Water Level *(below top of casing)*: 3.6? (m / ft) *(Use negative if below grade)*

D5 Well Yield Estimate: 15 (Lps / gpm)

D6 Final Well Status: ☐ Water Supply (In use) ☐ Stand by (Back-up) ☐ Observation ☐ Not in use ☐ Deepened ☐ Other: ☐ ☐ Abandoned *If well was abandoned, please give reason:* ☐ Dry ☐ Poor Quality ☐ Insufficient Yield ☐ Artesian conditions

D7 Well Abandonment Status: Was the well properly decommissioned with bentonite grout? ☐ YES ☐ NO

If YES, Indicate Date: ☐ (Y Y Y Y M M D D)

D8 Method Used to Estimate Well Yield: ☒ Air Lifting ☐ Bailing ☐ Pumping Test *(If test conducted, complete Pumping Test Record)*

PUMPING TEST RECORD AND GROUNDWATER QUALITY

(All depths below ground, circle appropriate units)

E1 Pumping Test Information

Pumping Test Start Date: ☐ (Y Y Y Y M M D D)

Static Water Level (SWL): ☐ (m / ft)

Pump Intake Set at: ☐ (m / ft)

Duration of pumping: ☐ hrs ☐ min

Final Water Level (FWL) at end of Pumping Test: ☐ (m / ft)

RECOMMENDATIONS

Recomm. Pump Depth: ☐ (m / ft)

Recomm. Pumping Rate: ☐ (Lps / gpm)

If flowing, provide rate: ☐ (Lps / gpm)

F1 Well Water Level Drawdown/Recovery DATA

Drawdown Time (min)	Drawdown Water Level (m / ft)	Recovery Time (min)	Recovery Water Level (m / ft)
0 (SWL)		0 (FWL)	
1		1	
2		2	
3		3	
4		4	
5		5	
10		10	
15		15	
20		20	
25		25	
30		30	
40		40	
50		50	
60		60	

G1 GROUNDWATER QUALITY

Field Data

Date Measurements Taken: ☐ (Y Y Y Y M M D D)

Electrical Conductivity: ☐ uS

pH: ☐

Temperature: ☐ °C

Turbidity/Sand Content: ☐ Clear ☐ Slightly turbid/cloudy ☐ Moderately turbid/cloudy ☐ Turbid/cloudy ☐ Trace sand present ☐ No sand present

Groundwater Type: ☐ Salty ☐ Sulphur / Egg Odour ☐ Organic Taste / Odour ☐ Metallic Taste ☐ Other: ☐

Well Disinfection

Was the well disinfected upon completion of the pump installation? ☐ YES ☐ NO

Briefly describe method of well disinfection. ☐

Bacteria Testing

Was a sample taken? ☐ YES ☐ NO *If yes, indicate the name of the laboratory.*

Date Sample Taken: ☐ (Y Y Y Y M M D D) ☐

Chemical Analysis of Water

Was a sample taken? ☐ YES ☐ NO *If yes, indicate the name of the laboratory.*

Date Sample Taken: ☐ (Y Y Y Y M M D D) ☐

WELL CONTRACTOR

H1 Name of Contractor / Drilling Company: Mac Dunn Ill's Water Resources

H2 Name of Driller(s): Brian MacDonald

H3 Address of Driller: Box 10254 Whse Yk Y1A 7A1

Signature of Primary Driller ☐

Date Submitted to Dept. Of Environment ☐ (Y Y Y Y M M D D)

CONSULTANT *(If applicable)*

I 1 Company Name: ☐

I 2 Company Address: ☐

I 3 Report Reference: ☐

I 4 Report Date: ☐ (Y Y Y Y M M D D)

ADDITIONAL INSTRUCTIONS

Upon completing this form, please mail or fax it to:

Water Resources Section (V-310), Department of Environment, Government of Yukon Box 2703, Whitehorse, Yukon, Canada Y1A 2C6

Please feel free to contact us at:
Phone: (867) 667-3171, Toll free (in Yukon): (1-800) 661-0408, local 3171)
Fax: (867) 667-3195 E-mail: Water.Resources@gov.yk.ca

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I have read the above clause and understand the purpose for collection of personal information. ☐

Signature of Well Owner

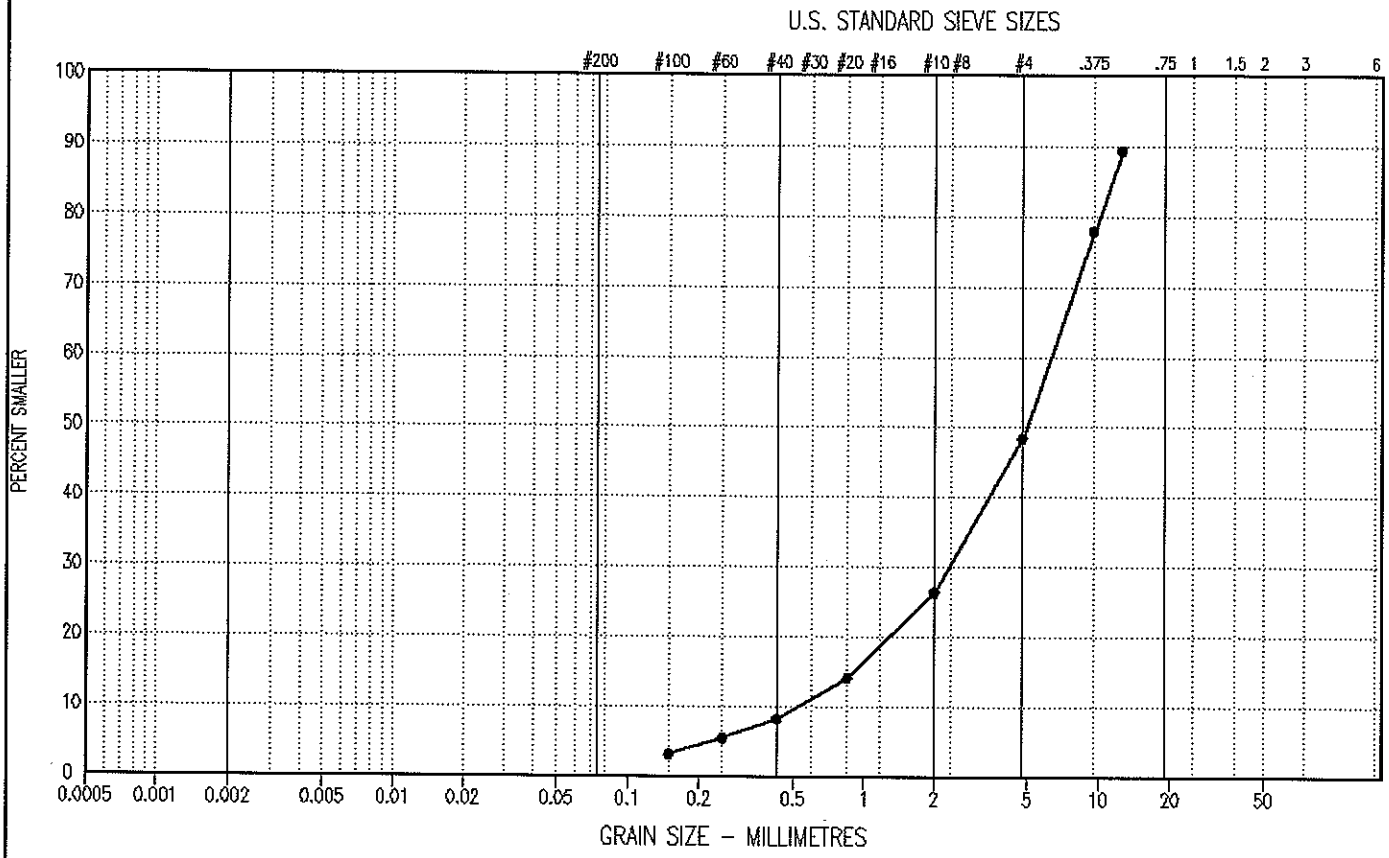
APPENDIX B

APPENDIX B TW06-03 GRAIN SIZE ANALYSIS

EBA Engineering

PARTICLE SIZE – ANALYSIS OF SOILS

CLAY	SILT	SAND			GRAVEL	
		FINE	MEDIUM	COARSE	FINE	COARSE



SYMBOL	BOREHOLE NUMBER	DEPTH (m)	DESCRIPTION				Cu	Cc	U.S.C
			CLAY %	SILT %	SAND %	GRAVEL %			
●	TW06-03	25.90	---	3 ---	45	52	11.9	1.6	GW

Project: 0201-1260009 Date Tested: 06/09/22 BY: KSJ

Tested in accordance with ASTM D422 unless otherwise noted.

APPENDIX C

APPENDIX C1: TW06-01 STEP DRAWDOWN PUMPING TEST DATA

EBA PROJECT NUMBER: 1260009
PROJECT LOCATION: Whitehorse Copper Subdivision
WELL NAME: TW06-01
PUMP INTAKE DEPTH: 49.38 (162 ft)
STATIC WATER LEVEL (m): 16.390
SCREEN INTERVAL: Bedrock Well- No Screen
DATUM DESCRIPTION: Top of Sounding Tube
SCREEN SLOT SIZE: Bedrock Well - No Screen
DATUM STICK-UP(m): 0.70 m
AVAILABLE DRAWDOWN: 32.99 m
TOTAL WELL DEPTH: 55.66 m
OBSERVER: Mark Robertson

DATE	TIME	ELAPSED TIME (min)	DEPTH TO WATER (m)	DRAWDOWN (m)	TOTALIZER READING [3]	FLOW RATE (USGPM)	FLOW RATE (IGPM)	FLOW RATE (L/s)	SPECIFIC CAPACITY (L/s/m)	COMMENTS
18-Oct-06	11:15:00	0	16.480	0.000	-	-	-	-	-	Start Step 1
18-Oct-06	11:15:30	0.5	19.200	2.720	-	-	-	-	-	1 USgpm
18-Oct-06	11:16:00	1	19.770	3.290	-	-	-	-	-	
18-Oct-06	11:16:30	1.5	19.900	3.420	-	1	0.8314	0.063	0.02	
18-Oct-06	11:17:00	2	19.990	3.510	-	1	0.8314	0.063	0.02	
18-Oct-06	11:17:30	2.5	20.050	3.570	-	1	0.8314	0.063	0.02	
18-Oct-06	11:18:00	3	20.090	3.610	-	1	0.8314	0.063	0.02	
18-Oct-06	11:18:30	3.5	20.180	3.700	-	1	0.8314	0.063	0.02	
18-Oct-06	11:19:00	4	20.260	3.780	-	1	0.8314	0.063	0.02	
18-Oct-06	11:19:30	4.5	20.320	3.840	-	1	0.8314	0.063	0.02	
18-Oct-06	11:20:00	5	20.360	3.880	-	1	0.8314	0.063	0.02	
18-Oct-06	11:21:00	6	20.470	3.990	-	1	0.8314	0.063	0.02	
18-Oct-06	11:22:00	7	20.570	4.090	-	1	0.8314	0.063	0.02	
18-Oct-06	11:23:00	8	20.690	4.210	-	1	0.8314	0.063	0.01	
18-Oct-06	11:24:00	9	20.780	4.300	-	1	0.8314	0.063	0.01	
18-Oct-06	11:25:00	10	20.880	4.400	-	1	0.8314	0.063	0.01	
18-Oct-06	11:27:00	12	21.090	4.610	-	1	0.8314	0.063	0.01	
18-Oct-06	11:29:00	14	21.230	4.750	-	1	0.8314	0.063	0.01	
18-Oct-06	11:31:00	16	21.390	4.910	-	1	0.8314	0.063	0.01	
18-Oct-06	11:33:00	18	21.530	5.050	-	1	0.8314	0.063	0.01	
18-Oct-06	11:35:00	20	21.690	5.210	-	1	0.8314	0.063	0.01	
18-Oct-06	11:40:00	25	21.965	5.485	-	1	0.8314	0.063	0.01	
18-Oct-06	11:45:00	30	22.230	5.750	-	1	0.8314	0.063	0.01	
18-Oct-06	11:50:00	35	22.390	5.910	-	1	0.8314	0.063	0.01	
18-Oct-06	11:55:00	40	22.570	6.090	-	1	0.8314	0.063	0.01	
18-Oct-06	12:00:00	45	22.720	6.240	-	1	0.8314	0.063	0.01	
18-Oct-06	12:05:00	50	22.870	6.390	-	1	0.8314	0.063	0.01	
18-Oct-06	12:10:00	55	23.005	6.525	-	1	0.8314	0.063	0.01	
18-Oct-06	12:15:00	60	23.110	6.630	-	1	0.8314	0.063	0.01	
18-Oct-06	12:15:30	60.5	23.220	6.740	-	2	1.6628	0.126	0.02	Start Step 2
18-Oct-06	12:16:00	61	23.405	6.925	-	3	2.4942	0.189	0.03	2 USgpm
18-Oct-06	12:16:30	61.5	23.540	7.060	-	2	1.6628	0.126	0.02	
18-Oct-06	12:17:00	62	23.565	7.085	-	1	0.8314	0.063	0.01	
18-Oct-06	12:17:30	62.5	23.630	7.150	-	2	1.6628	0.126	0.02	
18-Oct-06	12:18:00	63	23.705	7.225	-	2	1.6628	0.126	0.02	
18-Oct-06	12:18:30	63.5	23.780	7.300	-	2	1.6628	0.126	0.02	

APPENDIX C1: TW06-01 STEP DRAWDOWN PUMPING TEST DATA

EBA PROJECT NUMBER: 1260009 PROJECT LOCATION: Whitehorse Copper Subdivision

18-Oct-06	12:19:00	64	23.770	7.290	-	2	1.6628	0.126	0.02	
18-Oct-06	12:19:30	64.5	23.960	7.480	-	2	1.6628	0.126	0.02	
18-Oct-06	12:20:00	65	24.010	7.530	-	2	1.6628	0.126	0.02	
18-Oct-06	12:21:00	66	24.140	7.660	-	2	1.6628	0.126	0.02	
18-Oct-06	12:22:00	67	24.275	7.795	-	2	1.6628	0.126	0.02	
18-Oct-06	12:23:00	68	24.290	7.810	-	2	1.6628	0.126	0.02	
18-Oct-06	12:24:00	69	24.520	8.040	-	2	1.6628	0.126	0.02	
18-Oct-06	12:25:00	70	24.640	8.160	112	2	1.6628	0.126	0.02	
18-Oct-06	12:27:00	72	24.880	8.400	-	2	1.6628	0.126	0.02	
18-Oct-06	12:31:00	76	25.290	8.810	-	2	1.6628	0.126	0.01	
18-Oct-06	12:33:00	78	25.440	8.960	-	2	1.6628	0.126	0.01	
18-Oct-06	12:35:00	80	25.610	9.130	133	2	1.6628	0.126	0.01	
18-Oct-06	12:40:00	85	25.975	9.495	-	2	1.6628	0.126	0.01	
18-Oct-06	12:45:00	90	26.300	9.820	153	2	1.6628	0.126	0.01	
18-Oct-06	12:50:00	95	26.580	10.100	-	2	1.6628	0.126	0.01	
18-Oct-06	12:55:00	100	26.855	10.375	-	2	1.6628	0.126	0.01	
18-Oct-06	13:00:00	105	27.080	10.600	183	2	1.6628	0.126	0.01	
18-Oct-06	13:05:00	110	27.260	10.780	-	2	1.6628	0.126	0.01	
18-Oct-06	13:10:00	115	27.440	10.960	203	2	1.6628	0.126	0.01	
18-Oct-06	13:15:00	120	27.900	11.420	213	2	1.6628	0.126	0.01	
18-Oct-06	13:15:30	120.5	28.630	12.150	-	-	-	-	-	Start Step 3
18-Oct-06	13:17:30	122.5	28.755	12.275	-	5	4.157	0.316	0.03	4 USgpm
18-Oct-06	13:18:00	123	28.900	12.420	-	4	3.3256	0.252	0.02	
18-Oct-06	13:18:30	123.5	29.100	12.620	-	4	3.3256	0.252	0.02	
18-Oct-06	13:19:00	124	29.550	13.070	-	4	3.3256	0.252	0.02	
18-Oct-06	13:19:30	124.5	29.300	12.820	-	4	3.3256	0.252	0.02	
18-Oct-06	13:20:00	125	29.580	13.100	230	4	3.3256	0.252	0.02	
18-Oct-06	13:21:00	126	29.850	13.370	-	4	3.3256	0.252	0.02	
18-Oct-06	13:23:00	128	30.390	13.910	-	4	3.3256	0.252	0.02	
18-Oct-06	13:24:00	129	30.530	14.050	-	4	3.3256	0.252	0.02	
18-Oct-06	13:25:00	130	30.655	14.175	250	4	3.3256	0.252	0.02	
18-Oct-06	13:27:00	132	31.260	14.780	-	4	3.3256	0.252	0.02	
18-Oct-06	13:29:00	134	32.780	16.300	-	4	3.3256	0.252	0.02	
18-Oct-06	13:31:00	136	33.910	17.430	-	4	3.3256	0.252	0.01	
18-Oct-06	13:33:00	138	35.660	19.180	-	4	3.3256	0.252	0.01	
18-Oct-06	13:35:00	140	36.650	20.170	293	4	3.3256	0.252	0.01	
18-Oct-06	13:40:00	145	39.900	23.420	-	4	3.3256	0.252	0.01	
18-Oct-06	13:45:00	150	42.840	26.360	334	4	3.3256	0.252	0.01	
18-Oct-06	13:50:00	155	45.580	29.100	-	4	3.3256	0.252	0.01	
18-Oct-06	13:55:00	160	48.130	31.650	372	4	3.3256	0.252	0.01	
18-Oct-06	13:59:00	164	49.500	33.020	384	4	3.3256	0.252	0.01	
18-Oct-06	13:59:30	164.5	49.050	32.570	-	0	0	0	-	Start Recovery
18-Oct-06	14:00:00	165	48.620	32.140	-	0	0	0	-	
18-Oct-06	14:00:30	165.5	48.080	31.600	-	0	0	0	-	
18-Oct-06	14:01:00	166	47.820	31.340	-	0	0	0	-	

APPENDIX C1: TW06-01 STEP DRAWDOWN PUMPING TEST DATA

EBA PROJECT NUMBER: 1260009 PROJECT LOCATION: Whitehorse Copper Subdivision

18-Oct-06	14:01:30	166.5	47.400	30.920	-	0	0	0	-	
18-Oct-06	14:02:00	167	47.090	30.610	-	0	0	0	-	
18-Oct-06	14:02:30	167.5	46.680	30.200	-	0	0	0	-	
18-Oct-06	14:03:00	168	46.300	29.820	-	0	0	0	-	
18-Oct-06	14:03:30	168.5	45.920	29.440	-	0	0	0	-	
18-Oct-06	14:04:00	169	45.490	29.010	-	0	0	0	-	
18-Oct-06	14:05:00	170	44.700	28.220	-	0	0	0	-	
18-Oct-06	14:06:00	171	44.000	27.520	-	0	0	0	-	
18-Oct-06	14:07:00	172	43.300	26.820	-	0	0	0	-	
18-Oct-06	14:08:00	173	42.510	26.030	-	0	0	0	-	
18-Oct-06	14:09:00	174	40.210	23.730	-	0	0	0	-	
18-Oct-06	14:11:00	176	38.850	22.370	-	0	0	0	-	
18-Oct-06	14:13:00	178	37.380	20.900	-	0	0	0	-	
18-Oct-06	14:15:00	180	35.900	19.420	-	0	0	0	-	
18-Oct-06	14:17:00	182	34.640	18.160	-	0	0	0	-	
18-Oct-06	14:21:00	186	33.300	16.820	-	0	0	0	-	
18-Oct-06	14:26:00	191	30.470	13.990	-	0	0	0	-	
18-Oct-06	14:33:00	198	27.810	11.330	-	0	0	0	-	
18-Oct-06	14:36:00	201	26.980	10.500	-	0	0	0	-	
18-Oct-06	14:41:00	206	25.020	8.540	-	0	0	0	-	
18-Oct-06	14:46:00	211	24.470	7.990	-	0	0	0	-	
18-Oct-06	14:51:00	216	23.470	6.990	-	0	0	0	-	
18-Oct-06	14:56:00	221	22.500	6.020	-	0	0	0	-	
18-Oct-06	15:01:00	226	21.725	5.245	-	0	0	0	-	
18-Oct-06	15:07:00	232	21.060	4.580	-	0	0	0	-	
18-Oct-06	15:17:00	242	19.980	3.500	-	0	0	0	-	
18-Oct-06	15:22:00	247	19.690	3.210	-	0	0	0	-	
18-Oct-06	15:40:00	265	19.370	2.890	-	0	0	0	-	

Notes:

1) Depth to Water below top of sounding tube (Stick-up = 0.70 m)

2) "-" indicates no data or not applicable

3) Totalizer located at wellhead.

APPENDIX C2: TW06-01 CONSTANT RATE PUMPING TEST DATA

EBA PROJECT NUMBER: 1260009
PROJECT LOCATION: Whitehorse Copper Subdivision
WELL NAME: TW06-01
PUMP INTAKE DEPTH (m): 49.38 (162 ft)
STATIC WATER LEVEL (m): 16.390
SCREEN INTERVAL: Bedrock Well- No Screen
DATUM DESCRIPTION: Top of Sounding Tube
SLOT SIZE ("): Bedrock Well - No Screen
DATUM STICK-UP(m): 0.70 m
AVAILABLE DRAWDOWN(m): 32.99 m
TOTAL WELL DEPTH: 55.66 m
OBSERVER'S NAME: Mark Robertson

DATE	TIME	ELAPSED TIME (min)	DEPTH TO WATER (m)	DRAWDOWN (m)	TOTALIZER READING [3]	FLOW RATE (USGPM)	FLOW RATE (IGPM)	FLOW RATE (L/s)	SPECIFIC CAPACITY (L/s/m)	COMMENTS
18-Oct-06	15:38:00	0	19.200	0.000	-	-	-	-	-	
18-Oct-06	15:38:30	0.5	21.200	2.000	-	-	-	-	-	
18-Oct-06	15:39:00	1	21.300	2.100	-	-	-	-	-	Clear water.
18-Oct-06	15:39:30	1.5	21.420	2.220	-	1.6	1.3	0.10	0.05	
18-Oct-06	15:40:00	2	21.600	2.400	-	1.6	1.3	0.10	0.04	
18-Oct-06	15:40:30	2.5	21.700	2.500	-	1.6	1.3	0.10	0.04	
18-Oct-06	15:41:00	3	21.800	2.600	-	1.6	1.3	0.10	0.04	
18-Oct-06	15:41:30	3.5	21.900	2.700	-	1.6	1.3	0.10	0.04	
18-Oct-06	15:42:00	4	22.010	2.810	-	1.6	1.3	0.10	0.04	
18-Oct-06	15:42:30	4.5	22.130	2.930	-	1.6	1.3	0.10	0.03	
18-Oct-06	15:43:00	5	22.230	3.030	-	1.6	1.3	0.10	0.03	
18-Oct-06	15:44:00	6	22.430	3.230	-	1.6	1.3	0.10	0.03	
18-Oct-06	15:45:00	7	22.630	3.430	-	1.6	1.3	0.10	0.03	
18-Oct-06	15:46:00	8	22.830	3.630	-	1.6	1.3	0.10	0.03	
18-Oct-06	15:47:00	9	23.010	3.810	-	1.6	1.3	0.10	0.03	
18-Oct-06	15:48:00	10	23.200	4.000	-	1.6	1.3	0.10	0.03	
18-Oct-06	15:53:00	15	23.920	4.720	-	1.6	1.3	0.10	0.02	
18-Oct-06	15:58:00	20	24.545	5.345	41	1.6	1.3	0.10	0.02	
18-Oct-06	16:03:00	25	25.060	5.860	-	1.6	1.3	0.10	0.02	
18-Oct-06	16:08:00	30	25.500	6.300	-	1.6	1.3	0.10	0.02	
18-Oct-06	16:18:00	40	26.180	6.980	72	1.6	1.3	0.10	0.01	
18-Oct-06	16:28:00	50	26.665	7.465	87	1.6	1.3	0.10	0.01	
18-Oct-06	16:38:00	60	27.000	7.800	99	1.5	1.2	0.09	0.01	
18-Oct-06	16:58:00	80	27.505	8.305	133	1.5	1.2	0.09	0.01	
18-Oct-06	17:18:00	100	27.845	8.645	163	1.5	1.2	0.09	0.01	
18-Oct-06	17:38:00	120	28.080	8.880	193	1.5	1.2	0.09	0.01	
18-Oct-06	18:08:00	150	28.390	9.190	255	1.5	1.2	0.09	0.01	
18-Oct-06	18:38:00	180	28.480	9.280	283	1.5	1.2	0.09	0.01	
18-Oct-06	19:08:00	210	28.600	9.400	328	1.5	1.2	0.09	0.01	
18-Oct-06	19:38:00	240	28.720	9.520	373	1.5	1.2	0.09	0.01	
18-Oct-06	20:38:00	300	28.880	9.680	-	1.5	1.2	0.09	0.01	
18-Oct-06	21:38:00	360	29.060	9.860	550	1.5	1.2	0.09	0.01	
18-Oct-06	22:38:00	420	29.220	10.020	640	1.5	1.2	0.09	0.01	
18-Oct-06	23:38:00	480	29.365	10.165	730	1.5	1.2	0.09	0.01	

APPENDIX C2: TW06-01 CONSTANT RATE PUMPING TEST DATA

EBA PROJECT NUMBER: 1260009 PROJECT LOCATION: Whitehorse Copper Subdivision

18-Oct-06	23:38:30	480.5	29.150	12.760	-	0	0	0.00	-	Start Recovery
18-Oct-06	23:39:00	481	28.960	12.570	-	0	0	0.00	-	
18-Oct-06	23:39:30	481.5	28.760	12.370	-	0	0	0.00	-	
18-Oct-06	23:40:00	482	28.610	12.220	-	0	0	0.00	-	
18-Oct-06	23:40:30	482.5	28.440	12.050	-	0	0	0.00	-	
18-Oct-06	23:41:00	483	28.280	11.890	-	0	0	0.00	-	
18-Oct-06	23:41:30	483.5	28.125	11.735	-	0	0	0.00	-	
18-Oct-06	23:42:00	484	27.960	11.570	-	0	0	0.00	-	
18-Oct-06	23:42:30	484.5	27.810	11.420	-	0	0	0.00	-	
18-Oct-06	23:43:00	485	27.670	11.280	-	0	0	0.00	-	
18-Oct-06	23:44:00	486	27.365	10.975	-	0	0	0.00	-	
18-Oct-06	23:45:00	487	27.070	10.680	-	0	0	0.00	-	
18-Oct-06	23:46:00	488	26.740	10.350	-	0	0	0.00	-	
18-Oct-06	23:47:00	489	26.510	10.120	-	0	0	0.00	-	
18-Oct-06	23:48:00	490	26.235	9.845	-	0	0	0.00	-	
18-Oct-06	23:50:00	492	25.730	9.340	-	0	0	0.00	-	
18-Oct-06	23:52:00	494	25.265	8.875	-	0	0	0.00	-	
18-Oct-06	23:54:00	496	24.825	8.435	-	0	0	0.00	-	
18-Oct-06	23:56:00	498	24.385	7.995	-	0	0	0.00	-	
18-Oct-06	23:58:00	500	23.985	7.595	-	0	0	0.00	-	
18-Oct-06	0:03:00	505	23.070	6.680	-	0	0	0.00	-	
18-Oct-06	0:08:00	510	22.315	5.925	-	0	0	0.00	-	
18-Oct-06	0:13:00	515	21.650	5.260	-	0	0	0.00	-	
18-Oct-06	0:18:00	520	21.100	4.710	-	0	0	0.00	-	
18-Oct-06	0:28:00	530	20.280	3.890	-	0	0	0.00	-	
18-Oct-06	0:38:00	540	19.655	3.265	-	0	0	0.00	-	
18-Oct-06	0:48:00	550	19.245	2.855	-	0	0	0.00	-	
18-Oct-06	0:58:00	560	18.930	2.540	-	0	0	0.00	-	
18-Oct-06	1:18:00	580	18.490	2.100	-	0	0	0.00	-	
18-Oct-06	1:38:00	600	18.215	1.825	-	0	0	0.00	-	
18-Oct-06	1:58:00	620	18.030	1.640	-	0	0	0.00	-	
18-Oct-06	2:18:00	640	17.860	1.470	-	0	0	0.00	-	
18-Oct-06	2:38:00	660	17.710	1.320	-	0	0	0.00	-	

Notes:

1) Depth to Water below top of sounding tube (Stick-up = x.xxx m)

2) "-" indicates no data or not applicable

3) May be a flow tototalizaer, instantaneous flow meter or other method of flow rate monitoring

APPENDIX C3: STEP DRAWDOWN PUMPING TEST DATA

EBA PROJECT NUMBER: 1260009
PROJECT LOCATION: Whitehorse Copper Subdivision
WELL NAME: TW02-06
PUMP INTAKE DEPTH (m): 56.2 m (184 ft)
STATIC WATER LEVEL (m): 6.310
SCREEN INTERVAL: Bedrock Well
DATUM DESCRIPTION: Top of Sounding Tube
SLOT SIZE ("): N/A
DATUM STICK-UP(m): 1.10 m
AVAILABLE DRAWDOWN(m): 49.8 m (164 ft)
WELL DIAMETER: 152 mm (6")
SCREEN DIAMETER (mm): N/A
TOTAL WELL DEPTH: 61.8 m
OBSERVER'S NAME: Patrick Kenny

DATE	TIME	ELAPSED TIME (min)	DEPTH TO WATER (m)	DRAWDOWN (m)	METER READING [3]	FLOW RATE (USGPM)	FLOW RATE (IGPM)	FLOW RATE (L/s)	SPECIFIC CAPACITY (L/s/m)	COMMENTS
27-Oct-06	13:22:00	0	6.310	0.000	-	-	-	-	-	Start Step 1
27-Oct-06	13:22:30	0.5	7.460	1.150	-	1	0.8314	0.063	0.05	1 USgpm
27-Oct-06	13:23:00	1	7.550	1.240	-	1	0.8314	0.063	0.05	
27-Oct-06	13:23:30	1.5	7.850	1.540	-	4	3.3256	0.252	0.16	
27-Oct-06	13:24:00	2	8.170	1.860	-	2	1.6628	0.126	0.07	
27-Oct-06	13:24:30	2.5	8.340	2.030	-	1	0.8314	0.063	0.03	
27-Oct-06	13:25:00	3	8.500	2.190	-	1	0.8314	0.063	0.03	
27-Oct-06	13:25:30	3.5	8.620	2.310	-	1.2	0.99768	0.076	0.03	
27-Oct-06	13:26:00	4	8.700	2.390	-	19	15.7966	1.199	0.50	
27-Oct-06	13:26:30	4.5	8.910	2.600	-	1.7	1.41338	0.107	0.04	
27-Oct-06	13:27:00	5	9.140	2.830	-	2.2	1.82908	0.139	0.05	
27-Oct-06	13:28:00	6	9.370	3.060	-	1.2	0.99768	0.076	0.02	
27-Oct-06	13:29:00	7	9.550	3.240	-	1.1	0.91454	0.069	0.02	
27-Oct-06	13:30:00	8	8.740	2.430	-	1.1	0.91454	0.069	0.03	
27-Oct-06	13:31:00	9	9.880	3.570	-	1.1	0.91454	0.069	0.02	
27-Oct-06	13:32:00	10	10.055	3.745	-	-	-	-	-	
27-Oct-06	13:34:00	12	10.380	4.070	-	1.1	0.91454	0.069	0.02	
27-Oct-06	13:36:00	14	10.700	4.390	19	1.1	0.91454	0.069	0.02	
27-Oct-06	13:38:00	16	11.000	4.690	-	1.1	0.91454	0.069	0.01	
27-Oct-06	13:40:00	18	11.300	4.990	-	1.1	0.91454	0.069	0.01	
27-Oct-06	13:42:00	20	11.600	5.290	-	1.1	0.91454	0.069	0.01	
27-Oct-06	13:47:00	25	12.280	5.970	27	1.1	0.91454	0.069	0.01	
27-Oct-06	13:52:00	30	12.810	6.500	-	1.1	0.91454	0.069	0.01	
27-Oct-06	13:57:00	35	13.410	7.100	38	1.1	0.91454	0.069	0.01	
27-Oct-06	14:02:00	40	13.995	7.685	-	1	0.8314	0.063	0.01	
27-Oct-06	14:07:00	45	14.650	8.340	49	1	0.8314	0.063	0.01	
27-Oct-06	14:12:00	50	15.110	8.800	-	1	0.8314	0.063	0.01	
27-Oct-06	14:17:00	55	15.610	9.300	59	1	0.8314	0.063	0.01	
27-Oct-06	14:22:00	60	16.070	9.760	64	1	0.8314	0.063	0.01	
27-Oct-06	14:22:30	60.5	16.330	10.020	69	3.4	2.82676	0.215	0.02	Start Step 2
27-Oct-06	14:23:00	61	16.645	10.335	-	2.9	2.41106	0.183	0.02	2 USgpm
27-Oct-06	14:23:30	61.5	16.815	10.505	-	2.2	1.82908	0.139	0.01	
27-Oct-06	14:24:00	62	16.950	10.640	-	2.2	1.82908	0.139	0.01	
27-Oct-06	14:24:30	62.5	17.110	10.800	-	2.2	1.82908	0.139	0.01	
27-Oct-06	14:25:00	63	17.260	10.950	-	2.2	1.82908	0.139	0.01	

APPENDIX C3: STEP DRAWDOWN PUMPING TEST DATA

EBA PROJECT NUMBER: 1260009 PROJECT LOCATION: Whitehorse Copper Subdivision

27-Oct-06	14:25:30	63.5	17.400	11.090	-	2.2	1.82908	0.139	0.01	
27-Oct-06	14:26:00	64	17.590	11.280	-	2.2	1.82908	0.139	0.01	
27-Oct-06	14:26:30	64.5	17.690	11.380	-	2.2	1.82908	0.139	0.01	
27-Oct-06	14:27:00	65	17.890	11.580	-	2.2	1.82908	0.139	0.01	
27-Oct-06	14:29:00	67	18.250	11.940	-	2.2	1.82908	0.139	0.01	
27-Oct-06	14:30:00	68	18.540	12.230	-	2.1	1.74594	0.132	0.01	
27-Oct-06	14:31:00	69	18.755	12.445	-	2.1	1.74594	0.132	0.01	
27-Oct-06	14:32:00	70	19.020	12.710	-	2.1	1.74594	0.132	0.01	
27-Oct-06	14:34:00	72	19.415	13.105	-	2.1	1.74594	0.132	0.01	
27-Oct-06	14:38:00	76	19.255	12.945	-	2.1	1.74594	0.132	0.01	
27-Oct-06	14:40:00	78	19.625	13.315	-	2.1	1.74594	0.132	0.01	
27-Oct-06	14:42:00	80	20.010	13.700	-	2.1	1.74594	0.132	0.01	
27-Oct-06	14:47:00	85	22.030	15.720	113	2.1	1.74594	0.132	0.01	
27-Oct-06	14:52:00	90	23.000	16.690	-	2.1	1.74594	0.132	0.01	
27-Oct-06	14:57:00	95	23.830	17.520	133	2.1	1.74594	0.132	0.01	
27-Oct-06	15:02:00	100	24.725	18.415	-	2	1.6628	0.126	0.01	
27-Oct-06	15:07:00	105	25.270	18.960	154	2	1.6628	0.126	0.01	
27-Oct-06	15:12:00	110	26.385	20.075	-	2	1.6628	0.126	0.01	
27-Oct-06	15:17:00	115	27.920	21.610	174	2	1.6628	0.126	0.01	
27-Oct-06	15:22:00	120	28.180	21.870	-	2	1.6628	0.126	0.01	
27-Oct-06	15:22:30	120.5	28.640	22.330	144	3.5	2.9099	0.221	0.01	Start Step 3
27-Oct-06	15:24:00	122	29.750	23.440	-	4.2	3.49188	0.265	0.01	4 USgpm
27-Oct-06	15:25:00	123	30.510	24.200	-	4.2	3.49188	0.265	0.01	
27-Oct-06	15:26:30	124.5	31.610	25.300	-	4.2	3.49188	0.265	0.01	
27-Oct-06	15:27:00	125	30.510	24.200	-	4.2	3.49188	0.265	0.01	
27-Oct-06	15:28:00	126	32.635	26.325	-	4.2	3.49188	0.265	0.01	
27-Oct-06	15:29:00	127	33.300	26.990	-	4.1	3.40874	0.259	0.01	
27-Oct-06	15:30:00	128	33.950	27.640	-	4.1	3.40874	0.259	0.01	
27-Oct-06	15:31:00	129	34.520	28.210	-	4.1	3.40874	0.259	0.01	
27-Oct-06	15:32:00	130	35.200	28.890	236	4	3.3256	0.252	0.01	
27-Oct-06	15:34:00	132	36.475	30.165	-	4	3.3256	0.252	0.01	
27-Oct-06	15:36:00	134	37.735	31.425	-	4	3.3256	0.252	0.01	
27-Oct-06	15:38:00	136	39.020	32.710	-	4	3.3256	0.252	0.01	
27-Oct-06	15:40:00	138	39.700	33.390	-	4.5	3.7413	0.284	0.01	
27-Oct-06	15:43:00	141	42.900	36.590	281	4.2	3.49188	0.265	0.01	
27-Oct-06	15:47:00	145	46.150	39.840	-	4.1	3.40874	0.259	0.01	
27-Oct-06	15:52:00	150	50.070	43.760	317	4	3.3256	0.252	0.01	
27-Oct-06	15:58:00	156	52.280	45.970	-	-	-	-	-	
27-Oct-06	16:00:00	158	55.100	48.790	342	-	-	-	-	
27-Oct-06	16:01:00	159	54.130	47.820	-	0	0	0.000	-	Start Recovery
27-Oct-06	16:01:30	159.5	53.990	47.680	-	0	0	0.000	-	
27-Oct-06	16:02:00	160	53.550	47.240	-	0	0	0.000	-	
27-Oct-06	16:02:30	160.5	53.430	47.120	-	0	0	0.000	-	
27-Oct-06	16:03:00	161	53.110	46.800	-	0	0	0.000	-	
27-Oct-06	16:03:30	161.5	52.890	46.580	-	0	0	0.000	-	

APPENDIX C3: STEP DRAWDOWN PUMPING TEST DATA

EBA PROJECT NUMBER: 1260009 PROJECT LOCATION: Whitehorse Copper Subdivision

27-Oct-06	16:04:00	162	52.670	46.360	-	0	0	0.000	-	
27-Oct-06	16:04:30	162.5	52.425	46.115	-	0	0	0.000	-	
27-Oct-06	16:05:00	163	52.180	45.870	-	0	0	0.000	-	
27-Oct-06	16:06:00	164	51.640	45.330	-	0	0	0.000	-	
27-Oct-06	16:07:00	165	51.200	44.890	-	0	0	0.000	-	
27-Oct-06	16:08:00	166	50.500	44.190	-	0	0	0.000	-	
27-Oct-06	16:09:00	167	50.170	43.860	-	0	0	0.000	-	
27-Oct-06	16:10:00	168	49.520	43.210	-	0	0	0.000	-	
27-Oct-06	16:12:00	170	48.805	42.495	-	0	0	0.000	-	
27-Oct-06	16:14:00	172	47.800	41.490	-	0	0	0.000	-	
27-Oct-06	16:16:00	174	46.860	40.550	-	0	0	0.000	-	
27-Oct-06	16:18:00	176	45.905	39.595	-	0	0	0.000	-	
27-Oct-06	16:20:00	178	44.960	38.650	-	0	0	0.000	-	
27-Oct-06	16:25:00	183	42.670	36.360	-	0	0	0.000	-	
27-Oct-06	16:30:00	188	40.500	34.190	-	0	0	0.000	-	
27-Oct-06	16:35:00	193	38.490	32.180	-	0	0	0.000	-	
27-Oct-06	16:40:00	198	36.430	30.120	-	0	0	0.000	-	
27-Oct-06	16:45:00	203	34.540	28.230	-	0	0	0.000	-	
27-Oct-06	16:50:00	208	32.870	26.560	-	0	0	0.000	-	
27-Oct-06	16:55:00	213	31.275	24.965	-	0	0	0.000	-	
27-Oct-06	17:00:00	218	29.710	23.400	-	0	0	0.000	-	
30-Oct-06	8:45:00	4043	7.210	0.900	-	0	0	0.000	-	

Notes:

1) Depth to Water below top of sounding tube (Stick-up = x.xxx m)

2) "-" indicates no data or not applicable

3) May be a flow tototalizaer, instantaneous flow meter or other method of flow rate monitoring

APPENDIX C4: CONSTANT RATE PUMPING TEST DATA

EBA PROJECT NUMBER: 1260009
PROJECT LOCATION: Whitehorse Copper Subdivision
WELL NAME: TW02-06
PUMP INTAKE DEPTH (m): 56.2 m (184 ft)
STATIC WATER LEVEL (m): 6.310
SCREEN INTERVAL: Bedrock Well
DATUM DESCRIPTION: Top of Sounding Tube
SLOT SIZE ("): N/A
DATUM STICK-UP(m): 1.10 m
AVAILABLE DRAWDOWN(m): 49.8 m (164 ft)
WELL DIAMETER: 152 mm (6")
SCREEN DIAMETER (mm): N/A
TOTAL WELL DEPTH: 61.8 m
OBSERVER'S NAME: Patrick Kenny

DATE	TIME	ELAPSED TIME (min)	DEPTH TO WATER (m)	DRAWDOWN (m)	METER READING [3]	FLOW RATE (USGPM)	FLOW RATE (IGPM)	FLOW RATE (L/s)	SPECIFIC CAPACITY (L/s/m)	COMMENTS
30-Oct-06	8:45:00	0	7.210	0.000	-	-	-	-	-	
30-Oct-06	8:45:30	0.5	9.240	2.030	-	4	3.3256	0.25	0.12	
30-Oct-06	8:46:00	1	9.720	2.510	-	2	1.6628	0.13	0.05	
30-Oct-06	8:46:30	1.5	9.925	2.715	-	2	1.6628	0.13	0.05	
30-Oct-06	8:47:00	2	10.160	2.950	-	2	1.6628	0.13	0.04	
30-Oct-06	8:47:30	2.5	10.500	3.290	-	2	1.6628	0.13	0.04	
30-Oct-06	8:48:00	3	10.570	3.360	-	2	1.6628	0.13	0.04	
30-Oct-06	8:48:30	3.5	10.790	3.580	-	2	1.6628	0.13	0.04	
30-Oct-06	8:49:00	4	10.950	3.740	-	2	1.6628	0.13	0.03	
30-Oct-06	8:49:30	4.5	10.140	2.930	-	2	1.6628	0.13	0.04	
30-Oct-06	8:50:00	5	10.340	3.130	-	2	1.6628	0.13	0.04	
30-Oct-06	8:51:00	6	11.700	4.490	-	2	1.6628	0.13	0.03	
30-Oct-06	8:52:00	7	12.010	4.800	-	2	1.6628	0.13	0.03	
30-Oct-06	8:53:00	8	12.380	5.170	-	2	1.6628	0.13	0.02	
30-Oct-06	8:54:00	9	12.550	5.340	-	2	1.6628	0.13	0.02	
30-Oct-06	8:55:00	10	12.890	5.680	-	2	1.6628	0.13	0.02	
30-Oct-06	9:00:00	15	14.400	7.190	-	2	1.6628	0.13	0.02	
30-Oct-06	9:05:00	20	15.740	8.530	-	2	1.6628	0.13	0.01	
30-Oct-06	9:10:00	25	16.970	9.760	-	2	1.6628	0.13	0.01	
30-Oct-06	9:15:00	30	18.000	10.790	-	2	1.6628	0.13	0.01	
30-Oct-06	9:25:00	40	19.930	12.720	-	2	1.6628	0.13	0.01	
30-Oct-06	9:35:00	50	21.730	14.520	-	2	1.6628	0.13	0.01	
30-Oct-06	9:45:00	60	23.500	16.290	-	2	1.6628	0.13	0.01	
30-Oct-06	10:05:00	80	26.810	19.600	178	2	1.6628	0.13	0.01	
30-Oct-06	10:25:00	100	30.130	22.920	220	2	1.6628	0.13	0.01	
30-Oct-06	10:45:00	120	33.030	25.820	256	2	1.6628	0.13	0.00	
30-Oct-06	11:15:00	150	37.510	30.300	311	2	1.6628	0.13	0.00	
30-Oct-06	11:45:00	180	42.490	35.280	365	2	1.6628	0.13	0.00	
30-Oct-06	12:15:00	210	47.560	40.350	415	2	1.6628	0.13	0.00	
30-Oct-06	12:45:00	240	51.900	44.690	462	2	1.6628	0.13	0.00	
30-Oct-06	13:15:00	270	56.000	48.790	508	2	1.6628	0.13	0.00	Pump Cavitating
30-Oct-06	13:16:00	271	55.700	48.490		0	0	0.00	-	Start Recovery
30-Oct-06	13:16:30	271.5	55.400	48.190		0	0	0.00	-	
30-Oct-06	13:17:00	272	55.210	48.000		0	0	0.00	-	
30-Oct-06	13:17:30	272.5	55.050	47.840		0	0	0.00	-	
30-Oct-06	13:18:00	273	54.850	47.640		0	0	0.00	-	

APPENDIX C4: CONSTANT RATE PUMPING TEST DATA

EBA PROJECT NUMBER: 1260009

PROJECT LOCATION: Whitehorse Copper Subdivision

WELL NAME: TW02-06

PUMP INTAKE DEPTH (m): 56.2 m (184 ft)

30-Oct-06	13:18:30	273.5	54.640	47.430		0	0	0.00	-	
30-Oct-06	13:19:00	274	54.430	47.220		0	0	0.00	-	
30-Oct-06	13:19:30	274.5	54.240	47.030		0	0	0.00	-	
30-Oct-06	13:20:00	275	54.060	46.850		0	0	0.00	-	
30-Oct-06	13:21:00	276	53.650	46.440		0	0	0.00	-	
30-Oct-06	13:22:00	277	53.190	45.980		0	0	0.00	-	
30-Oct-06	13:23:00	278	52.655	45.445		0	0	0.00	-	
30-Oct-06	13:24:00	279	52.400	45.190		0	0	0.00	-	
30-Oct-06	13:25:00	280	51.990	44.780		0	0	0.00	-	
30-Oct-06	13:27:00	282	51.190	43.980		0	0	0.00	-	
30-Oct-06	13:29:00	284	50.320	43.110		0	0	0.00	-	
30-Oct-06	13:31:00	286	49.560	42.350		0	0	0.00	-	
30-Oct-06	13:33:00	288	48.700	41.490		0	0	0.00	-	
30-Oct-06	13:35:00	290	47.900	40.690		0	0	0.00	-	
30-Oct-06	13:40:00	295	45.900	38.690		0	0	0.00	-	
30-Oct-06	13:45:00	300	43.910	36.700		0	0	0.00	-	
30-Oct-06	13:50:00	305	41.990	34.780		0	0	0.00	-	
30-Oct-06	13:55:00	310	40.040	32.830		0	0	0.00	-	
30-Oct-06	14:15:00	330	33.310	26.100		0	0	0.00	-	
30-Oct-06	14:25:00	340	30.200	22.990		0	0	0.00	-	
30-Oct-06	14:35:00	350	28.130	20.920		0	0	0.00	-	
30-Oct-06	14:45:00	360	24.630	17.420		0	0	0.00	-	
30-Oct-06	14:55:00	370	22.320	15.110		0	0	0.00	-	
30-Oct-06	15:25:00	400	19.960	12.750		0	0	0.00	-	
30-Oct-06	15:55:00	430	18.040	10.830		0	0	0.00	-	
30-Oct-06	16:25:00	460	16.585	9.375		0	0	0.00	-	
30-Oct-06	16:55:00	490	15.380	8.170		0	0	0.00	-	
31-Oct-06	9:00:00	1455	8.670	1.460		0	0	0.00	-	

Notes:

1) Depth to Water below top of sounding tube (Stick-up = x.xxx m)

2) "-" indicates no data or not applicable

3) May be a flow tototalizaer, instantaneous flow meter or other method of flow rate monitoring

APPENDIX C5: TW06-03 STEP DRAWDOWN PUMPING TEST DATA

EBA PROJECT NUMBER: 1260009
PROJECT LOCATION: Whitehorse Copper Subdivision
WELL NAME: TW06-03
PUMP INTAKE DEPTH (m): 25.250 m
STATIC WATER LEVEL (m): 6.835 m-below top of datum
SCREEN INTERVAL: 25.6 - 27.1 m below ground level
DATUM DESCRIPTION: Top of Sounding Tube
SLOT SIZE ("): 2.54 mm (0.100")
DATUM STICK-UP(m): 0.78 m
AVAILABLE DRAWDOWN(m): 17.64 m
WELL DIAMETER: 152 mm (6")
SCREEN DIAMETER (mm): 127 mm (5")
TOTAL WELL DEPTH: 27.1 m
OBSERVER'S NAME: Mark Robertson

DATE	TIME	ELAPSED TIME (min)	DEPTH TO WATER (m)	DRAWDOWN (m)	METER READING [3]	FLOW RATE (USGPM)	FLOW RATE (IGPM)	FLOW RATE (L/s)	SPECIFIC CAPACITY (L/s/m)	COMMENTS
19-Oct-06	13:34:00	0	6.835	0.000	-	-	-	-	-	Start Step 1
19-Oct-06	13:35:00	1	9.580	2.745	-	10.4	8.6	0.7	0.24	10 USgpm
19-Oct-06	13:35:30	1.5	10.340	3.505	-	10.3	8.6	0.6	0.19	
19-Oct-06	13:36:00	2	10.950	4.115	-	10.3	8.6	0.6	0.16	
19-Oct-06	13:36:30	2.5	11.400	4.565	-	10.2	8.5	0.6	0.14	
19-Oct-06	13:37:00	3	12.020	5.185	-	10.2	8.5	0.6	0.12	
19-Oct-06	13:37:30	3.5	12.480	5.645	-	10.2	8.5	0.6	0.11	
19-Oct-06	13:38:00	4	12.750	5.915	-	10.2	8.5	0.6	0.11	
19-Oct-06	13:38:30	4.5	13.170	6.335	-	10.2	8.5	0.6	0.10	
19-Oct-06	13:39:00	5	13.440	6.605	-	10.2	8.5	0.6	0.10	
19-Oct-06	13:40:00	6	14.070	7.235	-	10.2	8.5	0.6	0.09	
19-Oct-06	13:41:00	7	14.600	7.765	-	10.1	8.4	0.6	0.08	
19-Oct-06	13:42:00	8	15.100	8.265	-	10.1	8.4	0.6	0.08	
19-Oct-06	13:43:00	9	15.550	8.715	-	10.1	8.4	0.6	0.07	
19-Oct-06	13:44:00	10	15.965	9.130	105	10.1	8.4	0.6	0.07	
19-Oct-06	13:46:00	12	16.670	9.835	-	10.1	8.4	0.6	0.06	
19-Oct-06	13:48:00	14	17.265	10.430	-	10.1	8.4	0.6	0.06	
19-Oct-06	13:50:00	16	17.735	10.900	-	10.1	8.4	0.6	0.06	
19-Oct-06	13:52:00	18	18.235	11.400	-	10.1	8.4	0.6	0.06	
19-Oct-06	13:54:00	20	18.600	11.765	-	10.1	8.4	0.6	0.05	
19-Oct-06	13:59:00	25	19.325	12.490	-	9.7	8.1	0.6	0.05	
19-Oct-06	14:04:00	30	20.210	13.375	302	10.2	8.5	0.6	0.05	
19-Oct-06	14:09:00	35	20.930	14.095	-	10.1	8.4	0.6	0.05	
19-Oct-06	14:14:00	40	21.580	14.745	404	10.1	8.4	0.6	0.04	
19-Oct-06	14:19:00	45	22.070	15.235	-	10.1	8.4	0.6	0.04	
19-Oct-06	14:24:00	50	22.485	15.650	505	10.1	8.4	0.6	0.04	
19-Oct-06	14:29:00	55	22.815	15.980	-	10.1	8.4	0.6	0.04	
19-Oct-06	14:34:00	60	23.170	16.335	605	10.1	8.4	0.6	0.04	
19-Oct-06	14:34:30	60.5	23.640	16.805	-	3.7	3.1	0.2	0.01	Start Step 2
19-Oct-06	14:35:00	61	22.165	15.330	-	5.5	4.6	0.3	0.02	Valve Back
19-Oct-06	14:36:00	62	21.220	14.385	-	5.6	4.7	0.4	0.02	5.5 USgpm
19-Oct-06	14:36:30	62.5	20.950	14.115	-	5.6	4.7	0.4	0.03	
19-Oct-06	14:37:00	63	22.550	15.715	-	5.6	4.7	0.4	0.02	
19-Oct-06	14:37:30	63.5	20.270	13.435	-	5.6	4.7	0.4	0.03	
19-Oct-06	14:38:00	64	19.900	13.065	-	5.5	4.6	0.3	0.03	
19-Oct-06	14:38:30	64.5	19.670	12.835	-	5.5	4.6	0.3	0.03	

APPENDIX C5: TW06-03 STEP DRAWDOWN PUMPING TEST DATA

EBA PROJECT NUMBER: 1260009 PROJECT LOCATION: Whitehorse Copper Subdivision

19-Oct-06	14:39:00	65	19.470	12.635	-	5.5	4.6	0.3	0.03	
19-Oct-06	14:41:00	67	18.560	11.725	-	5.5	4.6	0.3	0.03	
19-Oct-06	14:42:00	68	18.230	11.395	-	5.5	4.6	0.3	0.03	
19-Oct-06	14:43:00	69	17.930	11.095	-	5.7	4.7	0.4	0.03	
19-Oct-06	14:44:00	70	17.640	10.805	662	5.7	4.7	0.4	0.03	
19-Oct-06	14:46:00	72	17.210	10.375	-	5.7	4.7	0.4	0.03	
19-Oct-06	14:50:00	76	16.640	9.805	-	5.7	4.7	0.4	0.04	
19-Oct-06	14:52:00	78	16.460	9.625	-	5.7	4.7	0.4	0.04	
19-Oct-06	14:54:00	80	16.320	9.485	-	5.7	4.7	0.4	0.04	
19-Oct-06	14:59:00	85	16.090	9.255	-	5.7	4.7	0.4	0.04	
19-Oct-06	15:04:00	90	15.975	9.140	776	5.7	4.7	0.4	0.04	
19-Oct-06	15:09:00	95	15.925	9.090	-	5.7	4.7	0.4	0.04	
19-Oct-06	15:14:00	100	15.900	9.065	834	5.7	4.7	0.4	0.04	
19-Oct-06	15:24:00	110	15.900	9.065	891	5.7	4.7	0.4	0.04	
19-Oct-06	15:29:00	115	15.895	9.060	-	5.7	4.7	0.4	0.04	
19-Oct-06	15:34:00	120	15.875	9.040	949	5.7	4.7	0.4	0.04	
19-Oct-06	15:34:30	120.5	16.120	9.285	-	5.8	4.8	0.4	0.04	Start Step 3
19-Oct-06	15:36:30	122.5	16.620	9.785	-	7.1	5.9	0.4	0.05	7.5 USgpm
19-Oct-06	15:37:00	123	16.840	10.005	-	8.5	7.1	0.5	0.05	
19-Oct-06	15:37:30	123.5	16.950	10.115	-	7.0	5.8	0.4	0.04	
19-Oct-06	15:38:00	124	17.130	10.295	-	7.8	6.5	0.5	0.05	
19-Oct-06	15:38:30	124.5	17.285	10.450	-	7.7	6.4	0.5	0.05	
19-Oct-06	15:39:00	125	17.455	10.620	985	7.7	6.4	0.5	0.05	
19-Oct-06	15:40:00	126	17.745	10.910	-	7.7	6.4	0.5	0.04	
19-Oct-06	15:41:00	127	17.950	11.115	-	7.7	6.4	0.5	0.04	
19-Oct-06	15:42:00	128	18.165	11.330	-	7.7	6.4	0.5	0.04	
19-Oct-06	15:43:00	129	18.350	11.515	-	7.7	6.4	0.5	0.04	
19-Oct-06	15:44:00	130	18.520	11.685	-	7.7	6.4	0.5	0.04	
19-Oct-06	15:47:00	133	18.850	12.015	1027	7.7	6.4	0.5	0.04	
19-Oct-06	15:48:00	134	18.450	11.615	-	7.7	6.4	0.5	0.04	
19-Oct-06	15:50:00	136	19.100	12.265	-	7.7	6.4	0.5	0.04	
19-Oct-06	15:52:00	138	19.220	12.385	-	7.7	6.4	0.5	0.04	
19-Oct-06	15:54:00	140	19.310	12.475	1100	7.7	6.4	0.5	0.04	
19-Oct-06	15:59:00	145	19.475	12.640	-	7.7	6.4	0.5	0.04	
19-Oct-06	16:04:00	150	19.540	12.705	1177	7.6	6.3	0.5	0.04	
19-Oct-06	16:09:00	155	19.600	12.765	-	7.6	6.3	0.5	0.04	
19-Oct-06	16:14:00	160	19.655	12.820	1253	7.6	6.3	0.5	0.04	
19-Oct-06	16:19:00	165	19.700	12.865	-	7.6	6.3	0.5	0.04	
19-Oct-06	16:24:00	170	19.765	12.930	1329	7.6	6.3	0.5	0.04	
19-Oct-06	16:29:00	175	19.825	12.990	-	7.6	6.3	0.5	0.04	
19-Oct-06	16:34:00	180	19.870	13.035	1406	7.6	6.3	0.5	0.04	
19-Oct-06	16:34:30	180.5	18.870	12.035	-	0	0	0	-	Start Recovery
19-Oct-06	16:35:00	181	17.995	11.160	-	0	0	0	-	
19-Oct-06	16:35:30	181.5	17.210	10.375	-	0	0	0	-	
19-Oct-06	16:36:00	182	16.430	9.595	-	0	0	0	-	

APPENDIX C5: TW06-03 STEP DRAWDOWN PUMPING TEST DATA

EBA PROJECT NUMBER: 1260009 PROJECT LOCATION: Whitehorse Copper Subdivision

19-Oct-06	16:36:30	182.5	15.710	8.875	-	0	0	0	-	
19-Oct-06	16:37:00	183	15.070	8.235	-	0	0	0	-	
19-Oct-06	16:37:30	183.5	14.490	7.655	-	0	0	0	-	
19-Oct-06	16:38:00	184	13.870	7.035	-	0	0	0	-	
19-Oct-06	16:38:30	184.5	13.340	6.505	-	0	0	0	-	
19-Oct-06	16:39:00	185	12.865	6.030	-	0	0	0	-	
19-Oct-06	16:40:00	186	12.010	5.175	-	0	0	0	-	
19-Oct-06	16:41:00	187	11.225	4.390	-	0	0	0	-	
19-Oct-06	16:42:00	188	10.585	3.750	-	0	0	0	-	
19-Oct-06	16:43:00	189	10.080	3.245	-	0	0	0	-	
19-Oct-06	16:44:00	190	9.580	2.745	-	0	0	0	-	
19-Oct-06	16:46:00	192	8.840	2.005	-	0	0	0	-	
19-Oct-06	16:48:00	194	8.400	1.565	-	0	0	0	-	
19-Oct-06	16:50:00	196	8.090	1.255	-	0	0	0	-	
19-Oct-06	16:52:00	198	7.875	1.040	-	0	0	0	-	
19-Oct-06	16:54:00	200	7.745	0.910	-	0	0	0	-	
19-Oct-06	16:59:00	205	7.540	0.705	-	0	0	0	-	
19-Oct-06	17:04:00	210	7.450	0.615	-	0	0	0	-	
19-Oct-06	17:09:00	215	7.390	0.555	-	0	0	0	-	
19-Oct-06	17:14:00	220	7.340	0.505	-	0	0	0	-	
19-Oct-06	17:29:00	235	7.300	0.465	-	0	0	0	-	
19-Oct-06	17:24:00	230	7.275	0.440	-	0	0	0	-	
19-Oct-06	17:29:00	235	7.255	0.420	-	0	0	0	-	
19-Oct-06	17:34:00	240	7.235	0.400	-	0	0	0	-	

Notes:

1) Depth to Water below top of sounding tube (Stick-up = 0.78 m)

2) "-" indicates no data or not applicable

3) May be a flow tototalizaer, instantaneous flow meter or other method of flow rate monitoring

APPENDIX C6: TW06-03 CONSTANT RATE PUMPING TEST DATA

EBA PROJECT NUMBER: 1260009
PROJECT LOCATION: Whitehorse Copper Subdivision
WELL NAME: TW06-03
PUMP INTAKE DEPTH (m): 25.250 m
STATIC WATER LEVEL (m): 6.835 m-below top of datum
SCREEN INTERVAL: 25.6 - 27.1 m below ground level
DATUM DESCRIPTION: Top of Sounding Tube
SLOT SIZE ("): 2.54 mm (0.100")
DATUM STICK-UP(m): 0.78 m
AVAILABLE DRAWDOWN(m): 17.64 m
WELL DIAMETER: 152 mm (6")
SCREEN DIAMETER (mm): 127 mm (5")
TOTAL WELL DEPTH: 27.1 m
OBSERVER'S NAME: Mark Robertson

DATE	TIME	ELAPSED TIME (min)	DEPTH TO WATER (m)	DRAWDOWN (m)	METER READING [3]	FLOW RATE (USGPM)	FLOW RATE (IGPM)	FLOW RATE (L/s)	SPECIFIC CAPACITY (L/s/m)	COMMENTS
20-Oct-06	9:20:00	0	6.840	0.000	-	-	-	-	-	
20-Oct-06	9:20:30	0.5	8.170	1.330	-	-	-	-	-	
20-Oct-06	9:21:00	1	8.600	1.760	-	7.4	6.2	0.5	0.27	
20-Oct-06	9:21:30	1.5	9.090	2.250	-	7.7	6.4	0.5	0.22	
20-Oct-06	9:22:00	2	9.580	2.740	-	7.7	6.4	0.5	0.18	
20-Oct-06	9:22:30	2.5	10.010	3.170	-	-	-	-	-	
20-Oct-06	9:23:00	3	10.400	3.560	-	7.7	6.4	0.5	0.14	
20-Oct-06	9:23:30	3.5	10.720	3.880	-	-	-	-	-	
20-Oct-06	9:24:00	4	11.020	4.180	-	-	-	-	-	
20-Oct-06	9:24:30	4.5	11.295	4.455	-	-	-	-	-	
20-Oct-06	9:25:00	5	11.520	4.680	-	7.6	6.3	0.5	0.10	
20-Oct-06	9:26:00	6	11.910	5.070	-	7.6	6.3	0.5	0.09	
20-Oct-06	9:27:00	7	12.210	5.370	-	7.6	6.3	0.5	0.09	
20-Oct-06	9:28:00	8	12.510	5.670	-	7.6	6.3	0.5	0.08	
20-Oct-06	9:29:00	9	12.740	5.900	-	7.6	6.3	0.5	0.08	
20-Oct-06	9:30:00	10	12.935	6.095	77	7.6	6.3	0.5	0.08	
20-Oct-06	9:35:00	15	13.545	6.705	-	7.6	6.3	0.5	0.07	
20-Oct-06	9:40:00	20	13.880	7.040	153	7.6	6.3	0.5	0.07	
20-Oct-06	9:45:00	25	14.090	7.250	191	7.6	6.3	0.5	0.07	
20-Oct-06	9:50:00	30	14.220	7.380	228	7.5	6.2	0.5	0.06	
20-Oct-06	10:00:00	40	14.410	7.570	304	7.6	6.3	0.5	0.06	
20-Oct-06	10:10:00	50	14.540	7.700	379	7.6	6.3	0.5	0.06	
20-Oct-06	10:20:00	60	14.680	7.840	455	7.6	6.3	0.5	0.06	
20-Oct-06	10:40:00	80	14.830	7.990	605	7.5	6.2	0.5	0.06	
20-Oct-06	11:00:00	100	14.960	8.120	756	7.5	6.2	0.5	0.06	
20-Oct-06	11:20:00	120	15.050	8.210	906	7.5	6.2	0.5	0.06	
20-Oct-06	12:20:00	180	15.290	8.450	1357	7.5	6.2	0.5	0.06	
20-Oct-06	12:50:00	210	15.360	8.520	1582	7.5	6.2	0.5	0.06	
20-Oct-06	13:20:00	240	15.450	8.610	1807	7.5	6.2	0.5	0.05	
20-Oct-06	14:20:00	300	15.550	8.710	2256	7.5	6.2	0.5	0.05	
20-Oct-06	15:20:00	360	15.610	8.770	2705	7.5	6.2	0.5	0.05	
20-Oct-06	16:20:00	420	15.670	8.830	3156	7.5	6.2	0.5	0.05	
20-Oct-06	17:20:00	480	15.690	8.850	3605	-	-	-	-	
20-Oct-06	17:20:30	480.5	14.750	7.910	-	0	0	0.00	-	Start Recovery
20-Oct-06	17:21:00	481	13.950	7.110	-	0	0	0.00	-	
20-Oct-06	17:21:30	481.5	13.200	6.360	-	0	0	0.00	-	
20-Oct-06	17:22:00	482	12.630	5.790	-	0	0	0.00	-	
20-Oct-06	17:22:30	482.5	12.100	5.260	-	0	0	0.00	-	
20-Oct-06	17:23:00	483	11.580	4.740	-	0	0	0.00	-	
20-Oct-06	17:23:30	483.5	11.170	4.330	-	0	0	0.00	-	
20-Oct-06	17:24:00	484	10.770	3.930	-	0	0	0.00	-	

APPENDIX C6: TW06-03 CONSTANT RATE PUMPING TEST DATA

EBA PROJECT NUMBER: 1260009 PROJECT LOCATION: Whitehorse Copper Subdivision

20-Oct-06	17:24:30	484.5	10.420	3.580	-	0	0	0.00	-	
20-Oct-06	17:25:00	485	10.150	3.310	-	0	0	0.00	-	
20-Oct-06	17:26:00	486	9.650	2.810	-	0	0	0.00	-	
20-Oct-06	17:27:00	487	9.230	2.390	-	0	0	0.00	-	
20-Oct-06	17:28:00	488	8.890	2.050	-	0	0	0.00	-	
20-Oct-06	17:29:00	489	8.680	1.840	-	0	0	0.00	-	
20-Oct-06	17:30:00	490	8.350	1.510	-	0	0	0.00	-	
20-Oct-06	17:32:00	492	8.130	1.290	-	0	0	0.00	-	
20-Oct-06	17:34:00	494	8.000	1.160	-	0	0	0.00	-	
20-Oct-06	17:36:00	496	7.960	1.120	-	0	0	0.00	-	
20-Oct-06	17:38:00	498	7.780	0.940	-	0	0	0.00	-	
20-Oct-06	17:40:00	500	7.720	0.880	-	0	0	0.00	-	
20-Oct-06	17:45:00	505	7.630	0.790	-	0	0	0.00	-	
20-Oct-06	17:50:00	510	7.570	0.730	-	0	0	0.00	-	
20-Oct-06	17:55:00	515	7.510	0.670	-	0	0	0.00	-	
20-Oct-06	18:00:00	520	7.480	0.640	-	0	0	0.00	-	
20-Oct-06	18:10:00	530	7.410	0.570	-	0	0	0.00	-	
20-Oct-06	18:20:00	540	7.360	0.520	-	0	0	0.00	-	
20-Oct-06	18:30:00	550	7.320	0.480	-	0	0	0.00	-	
20-Oct-06	18:40:00	560	7.300	0.460	-	0	0	0.00	-	
20-Oct-06	19:00:00	580	7.295	0.455	-	0	0	0.00	-	
20-Oct-06	19:20:00	600	7.290	0.450	-	0	0	0.00	-	

Notes:

1) Depth to Water below top of sounding tube (Stick-up = x.xxx m)

2) "-" indicates no data or not applicable

3) May be a flow tototalizaer, instantaneous flow meter or other method of flow rate monitoring

APPEDIX C7: STEP DRAWDOWN PUMPING TEST DATA

EBA PROJECT NUMBER: 1260009
PROJECT LOCATION: Whitehorse Copper Subdivision
WELL NAME: TW04-06
PUMP INTAKE DEPTH (m): 43.2 m (142 ft)
STATIC WATER LEVEL (m): 10.980
SCREEN INTERVAL: Bedrock Well
DATUM DESCRIPTION: Top of Sounding Tube
SLOT SIZE (''): N/A
DATUM STICK-UP(m): 1.10 m
AVAILABLE DRAWDOWN(m): 32.2 m (106 ft)
WELL DIAMETER: 152 mm (6")
SCREEN DIAMETER (mm): N/A
TOTAL WELL DEPTH: 49.6
OBSERVER'S NAME: Patrick Kenny

DATE	TIME	ELAPSED TIME (min)	DEPTH TO WATER (m)	DRAWDOWN (m)	METER READING [3]	FLOW RATE (USGPM)	FLOW RATE (IGPM)	FLOW RATE (L/s)	SPECIFIC CAPACITY (L/s/m)	COMMENTS
25-Oct-06	12:00:00	0	10.980	0.000	-	-	-	-	-	Start Step 1
25-Oct-06	12:00:30	0.5	12.200	1.220	-	4.5	3.7413	0.284	0.23	5 USgpm
25-Oct-06	12:01:00	1	12.450	1.470	-	5	4.157	0.315	0.21	
25-Oct-06	12:01:30	1.5	12.970	1.990	-	5	4.157	0.315	0.16	
25-Oct-06	12:02:00	2	13.470	2.490	-	4.9	4.07386	0.309	0.12	
25-Oct-06	12:02:30	2.5	13.970	2.990	-	5	4.157	0.315	0.11	
25-Oct-06	12:03:00	3	14.260	3.280	-	5	4.157	0.315	0.10	
25-Oct-06	12:03:30	3.5	14.690	3.710	-	5.1	4.24014	0.322	0.09	
25-Oct-06	12:04:00	4	14.910	3.930	-	5	4.157	0.315	0.08	
25-Oct-06	12:04:30	4.5	15.180	4.200	-	5	4.157	0.315	0.08	
25-Oct-06	12:05:00	5	15.445	4.465	51	5	4.157	0.315	0.07	
25-Oct-06	12:06:00	6	15.870	4.890	-	5.2	4.32328	0.328	0.07	
25-Oct-06	12:07:00	7	16.110	5.130	-	5.1	4.24014	0.322	0.06	
25-Oct-06	12:08:00	8	16.310	5.330	-	5.1	4.24014	0.322	0.06	
25-Oct-06	12:09:00	9	16.490	5.510	-	5.1	4.24014	0.322	0.06	
25-Oct-06	12:10:00	10	16.685	5.705	-	5.1	4.24014	0.322	0.06	
25-Oct-06	12:12:00	12	16.970	5.990	-	5.1	4.24014	0.322	0.05	
25-Oct-06	12:14:00	14	17.160	6.180	-	5.1	4.24014	0.322	0.05	
25-Oct-06	12:16:00	16	17.340	6.360	-	5.1	4.24014	0.322	0.05	
25-Oct-06	12:18:00	18	17.480	6.500	-	5.1	4.24014	0.322	0.05	
25-Oct-06	12:20:00	20	17.620	6.640	102	5.1	4.24014	0.322	0.05	
25-Oct-06	12:25:00	25	17.890	6.910	-	5.1	4.24014	0.322	0.05	
25-Oct-06	12:30:00	30	18.110	7.130	153	5.1	4.24014	0.322	0.05	
25-Oct-06	12:35:00	35	18.295	7.315	-	5.1	4.24014	0.322	0.04	
25-Oct-06	12:40:00	40	18.440	7.460	204	5.1	4.24014	0.322	0.04	
25-Oct-06	12:45:00	45	18.555	7.575	-	5.1	4.24014	0.322	0.04	
25-Oct-06	12:50:00	50	18.660	7.680	255	5.1	4.24014	0.322	0.04	
25-Oct-06	12:55:00	55	18.765	7.785	-	5.1	4.24014	0.322	0.04	
25-Oct-06	13:00:00	60	18.850	7.870	306	5.1	4.24014	0.322	0.04	
25-Oct-06	13:00:30	60.5	19.580	8.600	-	10.3	8.56342	0.650	0.08	Start Step 2
25-Oct-06	13:01:00	61	20.040	9.060	-	9.3	7.73202	0.587	0.06	10 USgpm
25-Oct-06	13:01:30	61.5	21.000	10.020	-	10.4	8.64656	0.656	0.07	
25-Oct-06	13:02:00	62	21.600	10.620	-	10.2	8.48028	0.644	0.06	
25-Oct-06	13:02:30	62.5	22.380	11.400	-	10.2	8.48028	0.644	0.06	
25-Oct-06	13:03:00	63	23.115	12.135	-	10.2	8.48028	0.644	0.05	
25-Oct-06	13:03:30	63.5	24.020	13.040	-	10.1	8.39714	0.637	0.05	
25-Oct-06	13:04:00	64	24.510	13.530	-	10.1	8.39714	0.637	0.05	

APPEDIX C7: STEP DRAWDOWN PUMPING TEST DATA

EBA PROJECT NUMBER: 1260009 PROJECT LOCATION: Whitehorse Copper Subdivision

25-Oct-06	13:04:30	64.5	25.130	14.150	-	10.1	8.39714	0.637	0.05	
25-Oct-06	13:05:00	65	25.750	14.770	-	10.1	8.39714	0.637	0.04	
25-Oct-06	13:06:00	66	27.860	16.880	-	10.1	8.39714	0.637	0.04	
25-Oct-06	13:08:00	68	28.760	17.780	-	10.1	8.39714	0.637	0.04	
25-Oct-06	13:09:00	69	29.660	18.680	-	10.1	8.39714	0.637	0.03	
25-Oct-06	13:10:30	70.5	31.600	20.620	-	10.1	8.39714	0.637	0.03	
25-Oct-06	13:12:00	72	33.210	22.230	-	10.1	8.39714	0.637	0.03	
25-Oct-06	13:16:00	76	35.360	24.380	465	10.1	8.39714	0.637	0.03	
25-Oct-06	13:18:00	78	36.425	25.445	-	10.1	8.39714	0.637	0.03	
25-Oct-06	13:20:00	80	37.335	26.355	506	10.1	8.39714	0.637	0.02	
25-Oct-06	13:25:00	85	39.295	28.315	599	10.1	8.39714	0.637	0.02	
25-Oct-06	13:30:00	90	42.360	31.380	616	10.1	8.39714	0.637	0.02	Pump Cavitating
25-Oct-06	13:30:30	90.5	41.440	30.460	-	0	0	0.000	-	Start Recovery
25-Oct-06	13:31:00	91	39.630	28.650	-	0	0	0.000	-	
25-Oct-06	13:31:30	91.5	37.680	26.700	-	0	0	0.000	-	
25-Oct-06	13:32:00	92	36.410	25.430	-	0	0	0.000	-	
25-Oct-06	13:32:30	92.5	34.830	23.850	-	0	0	0.000	-	
25-Oct-06	13:33:00	93	33.300	22.320	-	0	0	0.000	-	
25-Oct-06	13:33:30	93.5	31.860	20.880	-	0	0	0.000	-	
25-Oct-06	13:34:00	94	30.390	19.410	-	0	0	0.000	-	
25-Oct-06	13:34:30	94.5	29.050	18.070	-	0	0	0.000	-	
25-Oct-06	13:35:00	95	28.830	17.850	-	0	0	0.000	-	
25-Oct-06	13:36:00	96	23.590	12.610	-	0	0	0.000	-	
25-Oct-06	13:37:00	97	21.830	10.850	-	0	0	0.000	-	
25-Oct-06	13:38:00	98	20.160	9.180	-	0	0	0.000	-	
25-Oct-06	13:39:00	99	18.960	7.980	-	0	0	0.000	-	
25-Oct-06	13:40:00	100	17.200	6.220	-	0	0	0.000	-	
25-Oct-06	13:42:00	102	16.270	5.290	-	0	0	0.000	-	
25-Oct-06	13:44:00	104	15.750	4.770	-	0	0	0.000	-	
25-Oct-06	13:46:00	106	15.430	4.450	-	0	0	0.000	-	
25-Oct-06	13:48:00	108	15.120	4.140	-	0	0	0.000	-	
25-Oct-06	13:50:00	110	14.710	3.730	-	0	0	0.000	-	
25-Oct-06	13:55:00	115	14.450	3.470	-	0	0	0.000	-	
25-Oct-06	14:00:00	120	14.280	3.300	-	0	0	0.000	-	
25-Oct-06	14:05:00	125	14.130	3.150	-	0	0	0.000	-	
25-Oct-06	14:10:00	130	14.010	3.030	-	0	0	0.000	-	
25-Oct-06	14:15:00	135	13.900	2.920	-	0	0	0.000	-	
25-Oct-06	14:20:00	140	13.820	2.840	-	0	0	0.000	-	
25-Oct-06	14:40:00	160	13.750	2.770	-	0	0	0.000	-	
26-Oct-06	8:45:00	1245	12.840	1.860	-	0	0	0.000	-	

Notes:

1) Depth to Water below top of sounding tube (Stick-up = 1.10 m)

2) "-" indicates no data or not applicable

3) May be a flow tototalizaer, instantaneous flow meter or other method of flow rate monitoring

APPENDIX C8: CONSTANT RATE PUMPING TEST DATA

EBA PROJECT NUMBER: 1260009
PROJECT LOCATION: Whitehorse Copper Subdivision
WELL NAME: TW04-06
PUMP INTAKE DEPTH (m): 43.2 m (142 ft)
STATIC WATER LEVEL (m): 10.980
SCREEN INTERVAL: Bedrock Well
DATUM DESCRIPTION: Top of Sounding Tube
SLOT SIZE ("): N/A
DATUM STICK-UP(m): 1.10 m
AVAILABLE DRAWDOWN(m): 32.2 m (106 ft)
WELL DIAMETER: 152 mm (6")
SCREEN DIAMETER (mm): N/A
TOTAL WELL DEPTH: 49.6
OBSERVER'S NAME: Patrick Kenny

DATE	TIME	ELAPSED TIME (min)	DEPTH TO WATER (m)	DRAWDOWN (m)	METER READING [3]	FLOW RATE (USGPM)	FLOW RATE (IGPM)	FLOW RATE (L/s)	SPECIFIC CAPACITY (L/s/m)	COMMENTS
26-Oct-06	8:45:00	0	12.840	0.000	-	-	-	-	-	
26-Oct-06	8:45:30	0.5	16.500	3.660	-	12	10.0	0.8	0.21	
26-Oct-06	8:46:00	1	16.800	3.960	-	6	5.0	0.4	0.10	
26-Oct-06	8:46:30	1.5	16.760	3.920	-	5	4.2	0.3	0.08	
26-Oct-06	8:47:00	2	16.675	3.835	-	5	4.2	0.3	0.08	
26-Oct-06	8:47:30	2.5	16.665	3.825	-	5	4.2	0.3	0.08	
26-Oct-06	8:48:00	3	16.670	3.830	-	5	4.2	0.3	0.08	
26-Oct-06	8:48:30	3.5	16.690	3.850	-	5	4.2	0.3	0.08	
26-Oct-06	8:49:00	4	16.725	3.885	-	5	4.2	0.3	0.08	
26-Oct-06	8:49:30	4.5	16.740	3.900	-	5	4.2	0.3	0.08	
26-Oct-06	8:50:00	5	16.785	3.945	-	5	4.2	0.3	0.08	
26-Oct-06	8:51:00	6	16.845	4.005	-	5	4.2	0.3	0.08	
26-Oct-06	8:52:00	7	16.925	4.085	-	5	4.2	0.3	0.08	
26-Oct-06	8:53:00	8	16.985	4.145	-	5	4.2	0.3	0.08	
26-Oct-06	8:54:00	9	17.040	4.200	-	5	4.2	0.3	0.08	
26-Oct-06	8:55:00	10	17.090	4.250	56	5	4.2	0.3	0.07	
26-Oct-06	9:00:00	15	17.305	4.465	101	5	4.2	0.3	0.07	
26-Oct-06	9:05:00	20	17.480	4.640	124	5	4.2	0.3	0.07	
26-Oct-06	9:10:00	25	17.620	4.780	147	5	4.2	0.3	0.07	
26-Oct-06	9:15:00	30	17.770	4.930	170	5	4.2	0.3	0.06	
26-Oct-06	9:25:00	40	17.970	5.130	193	5	4.2	0.3	0.06	
26-Oct-06	9:35:00	50	18.130	5.290	239	5	4.2	0.3	0.06	
26-Oct-06	9:45:00	60	18.250	5.410	285	5	4.2	0.3	0.06	
26-Oct-06	10:05:00	80	18.430	5.590	377	5	4.2	0.3	0.06	
26-Oct-06	10:25:00	100	18.575	5.735	469	5	4.2	0.3	0.06	
26-Oct-06	10:45:00	120	18.677	5.837	560	5	4.2	0.3	0.05	
26-Oct-06	11:15:00	150	18.785	5.945	698	5	4.2	0.3	0.05	
26-Oct-06	11:45:00	180	18.890	6.050	835	5	4.2	0.3	0.05	
26-Oct-06	12:15:00	210	18.960	6.120	971	5	4.2	0.3	0.05	
26-Oct-06	12:45:00	240	19.020	6.180	1108	5	4.2	0.3	0.05	
26-Oct-06	13:45:00	300	19.090	6.250	1382	5	4.2	0.3	0.05	
26-Oct-06	14:45:00	360	19.170	6.330	-	5	4.2	0.3	0.05	
26-Oct-06	15:45:00	420	19.245	6.405	1925	5	4.2	0.3	0.05	
26-Oct-06	16:45:00	480	19.320	6.480	2198	5	4.2	0.3	0.05	Start Recovery
26-Oct-06	16:45:30	480.5	18.660	5.820	-	0	0	0.00	-	

APPENDIX C8: CONSTANT RATE PUMPING TEST DATA

EBA PROJECT NUMBER: 1260009 PROJECT LOCATION: Whitehorse Copper Subdivision

WELL NAME: TW04-06 PUMP INTAKE DEPTH (m): 43.2 m (142 ft)

26-Oct-06	16:46:00	481	18.060	5.220	-	0	0	0.00	-	
26-Oct-06	16:46:30	481.5	17.590	4.750	-	0	0	0.00	-	
26-Oct-06	16:47:00	482	17.245	4.405	-	0	0	0.00	-	
26-Oct-06	16:47:30	482.5	16.930	4.090	-	0	0	0.00	-	
26-Oct-06	16:48:00	483	16.710	3.870	-	0	0	0.00	-	
26-Oct-06	16:48:30	483.5	16.505	3.665	-	0	0	0.00	-	
26-Oct-06	16:49:00	484	16.345	3.505	-	0	0	0.00	-	
26-Oct-06	16:49:30	484.5	16.215	3.375	-	0	0	0.00	-	
26-Oct-06	16:50:00	485	16.100	3.260	-	0	0	0.00	-	
26-Oct-06	16:51:00	486	15.905	3.065	-	0	0	0.00	-	
26-Oct-06	16:52:00	487	15.750	2.910	-	0	0	0.00	-	
26-Oct-06	16:53:00	488	15.615	2.775	-	0	0	0.00	-	
26-Oct-06	16:54:00	489	15.510	2.670	-	0	0	0.00	-	
26-Oct-06	16:55:00	490	15.420	2.580	-	0	0	0.00	-	
26-Oct-06	16:57:00	492	15.265	2.425	-	0	0	0.00	-	
26-Oct-06	16:59:00	494	15.145	2.305	-	0	0	0.00	-	
26-Oct-06	17:01:00	496	15.050	2.210	-	0	0	0.00	-	
26-Oct-06	17:03:00	498	14.980	2.140	-	0	0	0.00	-	
26-Oct-06	17:05:00	500	14.915	2.075	-	0	0	0.00	-	
26-Oct-06	17:10:00	505	14.760	1.920	-	0	0	0.00	-	
26-Oct-06	17:15:00	510	14.660	1.820	-	0	0	0.00	-	
26-Oct-06	17:20:00	515	14.580	1.740	-	0	0	0.00	-	
26-Oct-06	17:25:00	520	14.500	1.660	-	0	0	0.00	-	
26-Oct-06	17:35:00	530	14.385	1.545	-	0	0	0.00	-	
26-Oct-06	17:45:00	540	14.295	1.455	-	0	0	0.00	-	
26-Oct-06	17:55:00	550	14.180	1.340	-	0	0	0.00	-	
26-Oct-06	18:05:00	560	14.150	1.310	-	0	0	0.00	-	
26-Oct-06	18:25:00	580	14.040	1.200	-	0	0	0.00	-	
26-Oct-06	18:45:00	600	13.960	1.120	-	0	0	0.00	-	
26-Oct-06	19:05:00	620	13.890	1.050	-	0	0	0.00	-	
26-Oct-06	19:25:00	640	13.830	0.990	-	0	0	0.00	-	
26-Oct-06	19:45:00	660	13.780	0.940	-	0	0	0.00	-	
26-Oct-06	20:15:00	690	13.725	0.885	-	0	0	0.00	-	
26-Oct-06	20:45:00	720	13.675	0.835	-	0	0	0.00	-	

Notes:

1) Depth to Water below top of sounding tube (Stick-up = x.xxx m)

2) "-" indicates no data or not applicable

3) May be a flow tototalizaer, instantaneous flow meter or other method of flow rate monitoring

APPENDIX C8: CONSTANT RATE PUMPING TEST DATA

EBA PROJECT NUMBER: 1260009
PROJECT LOCATION: Whitehorse Copper Subdivision
WELL NAME: TW04-06
PUMP INTAKE DEPTH (m): 43.2 m (142 ft)
STATIC WATER LEVEL (m): 10.980
SCREEN INTERVAL: Bedrock Well
DATUM DESCRIPTION: Top of Sounding Tube
SLOT SIZE ("): N/A
DATUM STICK-UP(m): 1.10 m
AVAILABLE DRAWDOWN(m): 32.2 m (106 ft)
WELL DIAMETER: 152 mm (6")
SCREEN DIAMETER (mm): N/A
TOTAL WELL DEPTH: 49.6
OBSERVER'S NAME: Patrick Kenny

DATE	TIME	ELAPSED TIME (min)	DEPTH TO WATER (m)	DRAWDOWN (m)	METER READING [3]	FLOW RATE (USGPM)	FLOW RATE (IGPM)	FLOW RATE (L/s)	SPECIFIC CAPACITY (L/s/m)	COMMENTS
26-Oct-06	8:45:00	0	12.840	0.000	-	-	-	-	-	
26-Oct-06	8:45:30	0.5	16.500	3.660	-	12	10.0	0.8	0.21	
26-Oct-06	8:46:00	1	16.800	3.960	-	6	5.0	0.4	0.10	
26-Oct-06	8:46:30	1.5	16.760	3.920	-	5	4.2	0.3	0.08	
26-Oct-06	8:47:00	2	16.675	3.835	-	5	4.2	0.3	0.08	
26-Oct-06	8:47:30	2.5	16.665	3.825	-	5	4.2	0.3	0.08	
26-Oct-06	8:48:00	3	16.670	3.830	-	5	4.2	0.3	0.08	
26-Oct-06	8:48:30	3.5	16.690	3.850	-	5	4.2	0.3	0.08	
26-Oct-06	8:49:00	4	16.725	3.885	-	5	4.2	0.3	0.08	
26-Oct-06	8:49:30	4.5	16.740	3.900	-	5	4.2	0.3	0.08	
26-Oct-06	8:50:00	5	16.785	3.945	-	5	4.2	0.3	0.08	
26-Oct-06	8:51:00	6	16.845	4.005	-	5	4.2	0.3	0.08	
26-Oct-06	8:52:00	7	16.925	4.085	-	5	4.2	0.3	0.08	
26-Oct-06	8:53:00	8	16.985	4.145	-	5	4.2	0.3	0.08	
26-Oct-06	8:54:00	9	17.040	4.200	-	5	4.2	0.3	0.08	
26-Oct-06	8:55:00	10	17.090	4.250	56	5	4.2	0.3	0.07	
26-Oct-06	9:00:00	15	17.305	4.465	101	5	4.2	0.3	0.07	
26-Oct-06	9:05:00	20	17.480	4.640	124	5	4.2	0.3	0.07	
26-Oct-06	9:10:00	25	17.620	4.780	147	5	4.2	0.3	0.07	
26-Oct-06	9:15:00	30	17.770	4.930	170	5	4.2	0.3	0.06	
26-Oct-06	9:25:00	40	17.970	5.130	193	5	4.2	0.3	0.06	
26-Oct-06	9:35:00	50	18.130	5.290	239	5	4.2	0.3	0.06	
26-Oct-06	9:45:00	60	18.250	5.410	285	5	4.2	0.3	0.06	
26-Oct-06	10:05:00	80	18.430	5.590	377	5	4.2	0.3	0.06	
26-Oct-06	10:25:00	100	18.575	5.735	469	5	4.2	0.3	0.06	
26-Oct-06	10:45:00	120	18.677	5.837	560	5	4.2	0.3	0.05	
26-Oct-06	11:15:00	150	18.785	5.945	698	5	4.2	0.3	0.05	
26-Oct-06	11:45:00	180	18.890	6.050	835	5	4.2	0.3	0.05	
26-Oct-06	12:15:00	210	18.960	6.120	971	5	4.2	0.3	0.05	
26-Oct-06	12:45:00	240	19.020	6.180	1108	5	4.2	0.3	0.05	
26-Oct-06	13:45:00	300	19.090	6.250	1382	5	4.2	0.3	0.05	
26-Oct-06	14:45:00	360	19.170	6.330	-	5	4.2	0.3	0.05	
26-Oct-06	15:45:00	420	19.245	6.405	1925	5	4.2	0.3	0.05	
26-Oct-06	16:45:00	480	19.320	6.480	2198	5	4.2	0.3	0.05	Start Recovery
26-Oct-06	16:45:30	480.5	18.660	5.820	-	0	0	0.00	-	

APPENDIX C8: CONSTANT RATE PUMPING TEST DATA

EBA PROJECT NUMBER: 1260009 PROJECT LOCATION: Whitehorse Copper Subdivision

WELL NAME: TW04-06 PUMP INTAKE DEPTH (m): 43.2 m (142 ft)

26-Oct-06	16:46:00	481	18.060	5.220	-	0	0	0.00	-	
26-Oct-06	16:46:30	481.5	17.590	4.750	-	0	0	0.00	-	
26-Oct-06	16:47:00	482	17.245	4.405	-	0	0	0.00	-	
26-Oct-06	16:47:30	482.5	16.930	4.090	-	0	0	0.00	-	
26-Oct-06	16:48:00	483	16.710	3.870	-	0	0	0.00	-	
26-Oct-06	16:48:30	483.5	16.505	3.665	-	0	0	0.00	-	
26-Oct-06	16:49:00	484	16.345	3.505	-	0	0	0.00	-	
26-Oct-06	16:49:30	484.5	16.215	3.375	-	0	0	0.00	-	
26-Oct-06	16:50:00	485	16.100	3.260	-	0	0	0.00	-	
26-Oct-06	16:51:00	486	15.905	3.065	-	0	0	0.00	-	
26-Oct-06	16:52:00	487	15.750	2.910	-	0	0	0.00	-	
26-Oct-06	16:53:00	488	15.615	2.775	-	0	0	0.00	-	
26-Oct-06	16:54:00	489	15.510	2.670	-	0	0	0.00	-	
26-Oct-06	16:55:00	490	15.420	2.580	-	0	0	0.00	-	
26-Oct-06	16:57:00	492	15.265	2.425	-	0	0	0.00	-	
26-Oct-06	16:59:00	494	15.145	2.305	-	0	0	0.00	-	
26-Oct-06	17:01:00	496	15.050	2.210	-	0	0	0.00	-	
26-Oct-06	17:03:00	498	14.980	2.140	-	0	0	0.00	-	
26-Oct-06	17:05:00	500	14.915	2.075	-	0	0	0.00	-	
26-Oct-06	17:10:00	505	14.760	1.920	-	0	0	0.00	-	
26-Oct-06	17:15:00	510	14.660	1.820	-	0	0	0.00	-	
26-Oct-06	17:20:00	515	14.580	1.740	-	0	0	0.00	-	
26-Oct-06	17:25:00	520	14.500	1.660	-	0	0	0.00	-	
26-Oct-06	17:35:00	530	14.385	1.545	-	0	0	0.00	-	
26-Oct-06	17:45:00	540	14.295	1.455	-	0	0	0.00	-	
26-Oct-06	17:55:00	550	14.180	1.340	-	0	0	0.00	-	
26-Oct-06	18:05:00	560	14.150	1.310	-	0	0	0.00	-	
26-Oct-06	18:25:00	580	14.040	1.200	-	0	0	0.00	-	
26-Oct-06	18:45:00	600	13.960	1.120	-	0	0	0.00	-	
26-Oct-06	19:05:00	620	13.890	1.050	-	0	0	0.00	-	
26-Oct-06	19:25:00	640	13.830	0.990	-	0	0	0.00	-	
26-Oct-06	19:45:00	660	13.780	0.940	-	0	0	0.00	-	
26-Oct-06	20:15:00	690	13.725	0.885	-	0	0	0.00	-	
26-Oct-06	20:45:00	720	13.675	0.835	-	0	0	0.00	-	

Notes:

1) Depth to Water below top of sounding tube (Stick-up = x.xxx m)

2) "-" indicates no data or not applicable

3) May be a flow tototalizaer, instantaneous flow meter or other method of flow rate monitoring

APPENDIX C9: TW06-05 STEP DRAWDOWN PUMPING TEST DATA

EBA PROJECT NUMBER: 1260009
PROJECT LOCATION: Whitehorse Copper Subdivision
WELL NAME: TW06-05
PUMP INTAKE DEPTH (m): 53.90 m (177 ft)
STATIC WATER LEVEL (m): 7.725 m
SCREEN INTERVAL: Bedrock Well
DATUM DESCRIPTION: Top of Sounding Tube
SLOT SIZE ("): N/A
DATUM STICK-UP(m): 0.68 m
AVAILABLE DRAWDOWN(m): 32.61
WELL DIAMETER: 152 mm (6")
SCREEN DIAMETER (mm): N/A
TOTAL WELL DEPTH: 62.65 m
OBSERVER'S NAME: Patrick Kenny

DATE	TIME	ELAPSED TIME (min)	DEPTH TO WATER (m)	DRAWDOWN (m)	METER READING [3]	FLOW RATE (USGPM)	FLOW RATE (IGPM)	FLOW RATE (L/s)	SPECIFIC CAPACITY (L/s/m)	COMMENTS
23-Oct-06	13:40:00	0	7.725	0.000	-	10	8.314	0.631	-	Start Step 1
23-Oct-06	13:40:30	0.5	9.200	1.475	-	10	8.314	0.631	0.43	10 USgpm
23-Oct-06	13:41:00	1	10.310	2.585	-	10	8.314	0.631	0.24	
23-Oct-06	13:41:30	1.5	11.130	3.405	-	10	8.314	0.631	0.19	
23-Oct-06	13:42:00	2	11.900	4.175	-	-	-	-	-	
23-Oct-06	13:42:30	2.5	12.780	5.055	-	10	8.314	0.631	0.12	
23-Oct-06	13:43:00	3	13.230	5.505	-	-	-	-	-	
23-Oct-06	13:43:30	3.5	13.920	6.195	-	-	-	-	-	
23-Oct-06	13:44:00	4	14.525	6.800	-	-	-	-	-	
23-Oct-06	13:44:30	4.5	15.100	7.375	-	-	-	-	-	
23-Oct-06	13:45:00	5	15.610	7.885	-	-	-	-	-	
23-Oct-06	13:46:00	6	16.670	8.945	-	-	-	-	-	
23-Oct-06	13:47:00	7	17.430	9.705	-	-	-	-	-	
23-Oct-06	13:48:00	8	18.240	10.515	-	-	-	-	-	
23-Oct-06	13:49:00	9	18.860	11.135	-	-	-	-	-	
23-Oct-06	13:50:00	10	19.555	11.830	-	10	8.314	0.631	0.05	
23-Oct-06	13:52:00	12	20.660	12.935	-	-	-	-	-	
23-Oct-06	13:54:00	14	22.620	14.895	-	-	-	-	-	
23-Oct-06	13:56:00	16	23.460	15.735	-	-	-	-	-	
23-Oct-06	14:00:00	20	23.780	16.055	-	-	-	-	-	
23-Oct-06	14:05:00	25	24.930	17.205	-	-	-	-	-	
23-Oct-06	14:10:00	30	26.000	18.275	294	9	7.4826	0.568	0.03	
23-Oct-06	14:15:00	35	27.685	19.960	-	10	8.314	0.631	0.03	
23-Oct-06	14:20:00	40	28.920	21.195	399	-	-	-	-	
23-Oct-06	14:25:00	45	29.820	22.095	-	-	-	-	-	
23-Oct-06	14:30:00	50	30.530	22.805	499	-	-	-	-	
23-Oct-06	14:35:00	55	31.130	23.405	600	-	-	-	-	
23-Oct-06	14:40:00	60	31.645	23.920	-	10	8.314	0.631	0.03	
23-Oct-06	14:40:30	60.5	32.190	24.465	-	15	12.471	0.946	0.04	Start Step 2
23-Oct-06	14:41:00	61	32.670	24.945	-	-	-	-	-	15 USgpm
23-Oct-06	14:41:30	61.5	33.330	25.605	-	15	12.471	0.946	0.04	
23-Oct-06	14:42:00	62	33.740	26.015	-	-	-	-	-	
23-Oct-06	14:42:30	62.5	34.230	26.505	-	15	12.471	0.946	0.04	
23-Oct-06	14:43:00	63	34.775	27.050	-	-	-	-	-	
23-Oct-06	14:43:30	63.5	35.150	27.425	-	-	-	-	-	
23-Oct-06	14:44:00	64	35.680	27.955	-	15	12.471	0.946	0.03	
23-Oct-06	14:44:30	64.5	35.950	28.225	-	15	12.471	0.946	0.03	
23-Oct-06	14:45:00	65	36.330	28.605	-	-	-	-	-	
23-Oct-06	14:47:00	67	37.705	29.980	-	15	12.471	0.946	0.03	
23-Oct-06	14:48:00	68	38.310	30.585	-	15	12.471	0.946	0.03	
23-Oct-06	14:49:00	69	38.870	31.145	-	-	-	-	-	
23-Oct-06	14:50:00	70	39.360	31.635	749	15	12.471	0.946	0.03	

APPENDIX C9: TW06-05 STEP DRAWDOWN PUMPING TEST DATA

EBA PROJECT NUMBER: 1260009 PROJECT LOCATION: Whitehorse Copper Subdivision

23-Oct-06	14:52:00	72	40.330	32.605	-	14	11.6396	0.883	0.03	
23-Oct-06	14:56:00	76	41.830	34.105	-	16	13.3024	1.009	0.03	
23-Oct-06	14:58:00	78	42.630	34.905	-	15	12.471	0.946	0.03	
23-Oct-06	15:00:00	80	42.700	34.975	900	15	12.471	0.946	0.03	
23-Oct-06	15:05:00	85	46.620	38.895	-	-	-	-	-	
23-Oct-06	15:10:00	90	47.925	40.200	1049	15	12.471	0.946	0.02	
23-Oct-06	15:15:00	95	49.430	41.705	-	14	11.6396	0.883	0.02	
23-Oct-06	15:20:00	100	50.520	42.795	1192	-	-	-	-	
23-Oct-06	15:25:00	105	52.090	44.365	-	14	11.6396	0.883	0.02	
23-Oct-06	15:30:00	110	53.110	45.385	1334	13	10.8082	0.820	0.02	
23-Oct-06	15:35:00	115	53.290	45.565	1442	-	-	-	-	
23-Oct-06	15:35:30	115.5	50.500	42.775	-	0	0	0.000	-	Start Recovery
23-Oct-06	15:36:00	116	48.600	40.875	-	0	0	0.000	-	
23-Oct-06	15:36:30	116.5	49.960	42.235	-	0	0	0.000	-	
23-Oct-06	15:37:00	117	45.120	37.395	-	0	0	0.000	-	
23-Oct-06	15:37:30	117.5	43.320	35.595	-	0	0	0.000	-	
23-Oct-06	15:38:00	118	42.090	34.365	-	0	0	0.000	-	
23-Oct-06	15:38:30	118.5	40.950	33.225	-	0	0	0.000	-	
23-Oct-06	15:39:00	119	39.800	32.075	-	0	0	0.000	-	
23-Oct-06	15:40:00	120	38.960	31.235	-	0	0	0.000	-	
23-Oct-06	15:41:00	121	37.970	30.245	-	0	0	0.000	-	
23-Oct-06	15:42:00	122	34.630	26.905	-	0	0	0.000	-	
23-Oct-06	15:43:00	123	32.940	25.215	-	0	0	0.000	-	
23-Oct-06	15:44:00	124	31.770	24.045	-	0	0	0.000	-	
23-Oct-06	15:45:30	125.5	29.920	22.195	-	0	0	0.000	-	
23-Oct-06	15:47:00	127	28.330	20.605	-	0	0	0.000	-	
23-Oct-06	15:49:00	129	26.440	18.715	-	0	0	0.000	-	
23-Oct-06	15:51:00	131	24.940	17.215	-	0	0	0.000	-	
23-Oct-06	15:53:00	133	23.620	15.895	-	0	0	0.000	-	
23-Oct-06	15:55:00	135	22.520	14.795	-	0	0	0.000	-	
23-Oct-06	16:00:00	140	20.410	12.685	-	0	0	0.000	-	
23-Oct-06	16:05:00	145	18.920	11.195	-	0	0	0.000	-	
23-Oct-06	16:10:00	150	17.810	10.085	-	0	0	0.000	-	
23-Oct-06	16:15:00	155	17.240	9.515	-	0	0	0.000	-	
23-Oct-06	16:20:00	160	16.290	8.565	-	0	0	0.000	-	
23-Oct-06	16:25:00	165	15.755	8.030	-	0	0	0.000	-	
23-Oct-06	16:30:00	170	15.270	7.545	-	0	0	0.000	-	
23-Oct-06	16:35:00	175	14.920	7.195	-	0	0	0.000	-	
23-Oct-06	16:40:00	180	14.570	6.845	-	0	0	0.000	-	
23-Oct-06	16:45:00	185	14.280	6.555	-	0	0	0.000	-	
23-Oct-06	16:50:00	190	14.020	6.295	-	0	0	0.000	-	
23-Oct-06	16:55:00	195	13.790	6.065	-	0	0	0.000	-	
23-Oct-06	17:00:00	200	13.580	5.855	-	0	0	0.000	-	
23-Oct-06	17:05:00	205	13.410	5.685	-	0	0	0.000	-	
24-Oct-06	9:06:00	1166	9.955	2.230	-	0	0	0.000	-	

Notes:

1) Depth to Water below top of sounding tube (Stick-up = 0.68 m)

2) "-" indicates no data or not applicable

3) May be a flow tototalizaer, instantaneous flow meter or other method of flow rate monitoring

APPENDIX C10: TW06-05 CONSTANT RATE PUMPING TEST DATA

EBA PROJECT NUMBER:	1260009	PROJECT LOCATION:	Whitehorse Copper Subdivision
WELL NAME:	TW06-05	PUMP INTAKE DEPTH (m):	53.90 m (177 ft)
STATIC WATER LEVEL (m):	7.725 m	SCREEN INTERVAL:	Bedrock Well
DATUM DESCRIPTION:	Top of Sounding Tube	SLOT SIZE (''):	N/A
DATUM STICK-UP(m):	0.68 m	AVAILABLE DRAWDOWN(m):	32.61
WELL DIAMETER:	152 mm (6")	SCREEN DIAMETER (mm):	N/A
TOTAL WELL DEPTH:	62.65 m	OBSERVER'S NAME:	Patrick Kenny

DATE	TIME	ELAPSED TIME (min)	DEPTH TO WATER (m)	DRAWDOWN (m)	METER READING [3]	FLOW RATE (USGPM)	FLOW RATE (IGPM)	FLOW RATE (L/s)	SPECIFIC CAPACITY (L/s/m)	COMMENTS
24-Oct-06	9:06:00	0	9.955	0.000	-	-	-	-	-	
24-Oct-06	9:06:30	0.5	11.55	1.595	-	-	-	-	-	
24-Oct-06	9:07:00	1	12.21	2.255	-	10	8.314	0.631	0.28	
24-Oct-06	9:07:30	1.5	13.145	3.190	-	10	8.314	0.631	0.20	
24-Oct-06	9:08:00	2	13.88	3.925	-	10	8.314	0.631	0.16	
24-Oct-06	9:08:30	2.5	14.72	4.765	-	10	8.314	0.631	0.13	
24-Oct-06	9:09:00	3	15.395	5.440	-	-	-	-	-	
24-Oct-06	9:09:30	3.5	16.15	6.195	-	-	-	-	-	
24-Oct-06	9:10:00	4	16.76	6.805	-	-	-	-	-	
24-Oct-06	9:10:30	4.5	17.28	7.325	-	10	8.314	0.631	0.09	
24-Oct-06	9:11:00	5	17.85	7.895	-	10	8.314	0.631	0.08	
24-Oct-06	9:12:00	6	19.195	9.240	-	10	8.314	0.631	0.07	
24-Oct-06	9:13:00	7	19.815	9.860	-	10	8.314	0.631	0.06	
24-Oct-06	9:14:00	8	20.64	10.685	-	10	8.314	0.631	0.06	
24-Oct-06	9:15:00	9	21.37	11.415	-	10	8.314	0.631	0.06	
24-Oct-06	9:16:00	10	22.05	12.095	108	10	8.314	0.631	0.05	
24-Oct-06	9:21:00	15	24.63	14.675	-	10	8.314	0.631	0.04	
24-Oct-06	9:26:00	20	26.445	16.490	206	10	8.314	0.631	0.04	
24-Oct-06	9:31:00	25	27.73	17.775	-	10	8.314	0.631	0.04	
24-Oct-06	9:36:00	30	28.76	18.805	306	10	8.314	0.631	0.03	
24-Oct-06	9:46:00	40	30.195	20.240	402	10	8.314	0.631	0.03	
24-Oct-06	9:56:00	50	31.21	21.255	-	10	8.314	0.631	0.03	
24-Oct-06	10:06:00	60	32.54	22.585	-	10	8.314	0.631	0.03	
24-Oct-06	10:26:00	80	34.48	24.525	804	10	8.314	0.631	0.03	
24-Oct-06	10:46:00	100	35.68	25.725	987	10	8.314	0.631	0.02	
24-Oct-06	11:06:00	120	36.515	26.560	1184	10	8.314	0.631	0.02	
24-Oct-06	11:36:00	150	37.51	27.555	1474	10	8.314	0.631	0.02	
24-Oct-06	12:06:00	180	38.335	28.380	-	10	8.314	0.631	0.02	
24-Oct-06	12:36:00	210	39.065	29.110	2051	10	8.314	0.631	0.02	
24-Oct-06	13:06:00	240	40.08	30.125	-	10	8.314	0.631	0.02	
24-Oct-06	14:06:00	300	41.05	31.095	2909	10	8.314	0.631	0.02	
24-Oct-06	15:06:00	360	42.83	32.875	3500	10	8.314	0.631	0.02	
24-Oct-06	16:06:00	420	44.54	34.585	4096	10	8.314	0.631	0.02	
24-Oct-06	17:06:00	480	45.5	35.545	4674	10	8.314	0.631	0.02	Start Recovery
24-Oct-06	17:06:30	480.5	43.4	33.445	-	0	0	0.00	-	
24-Oct-06	17:07:00	481	42.62	32.665	-	0	0	0.00	-	

APPENDIX C10: TW06-05 CONSTANT RATE PUMPING TEST DATA

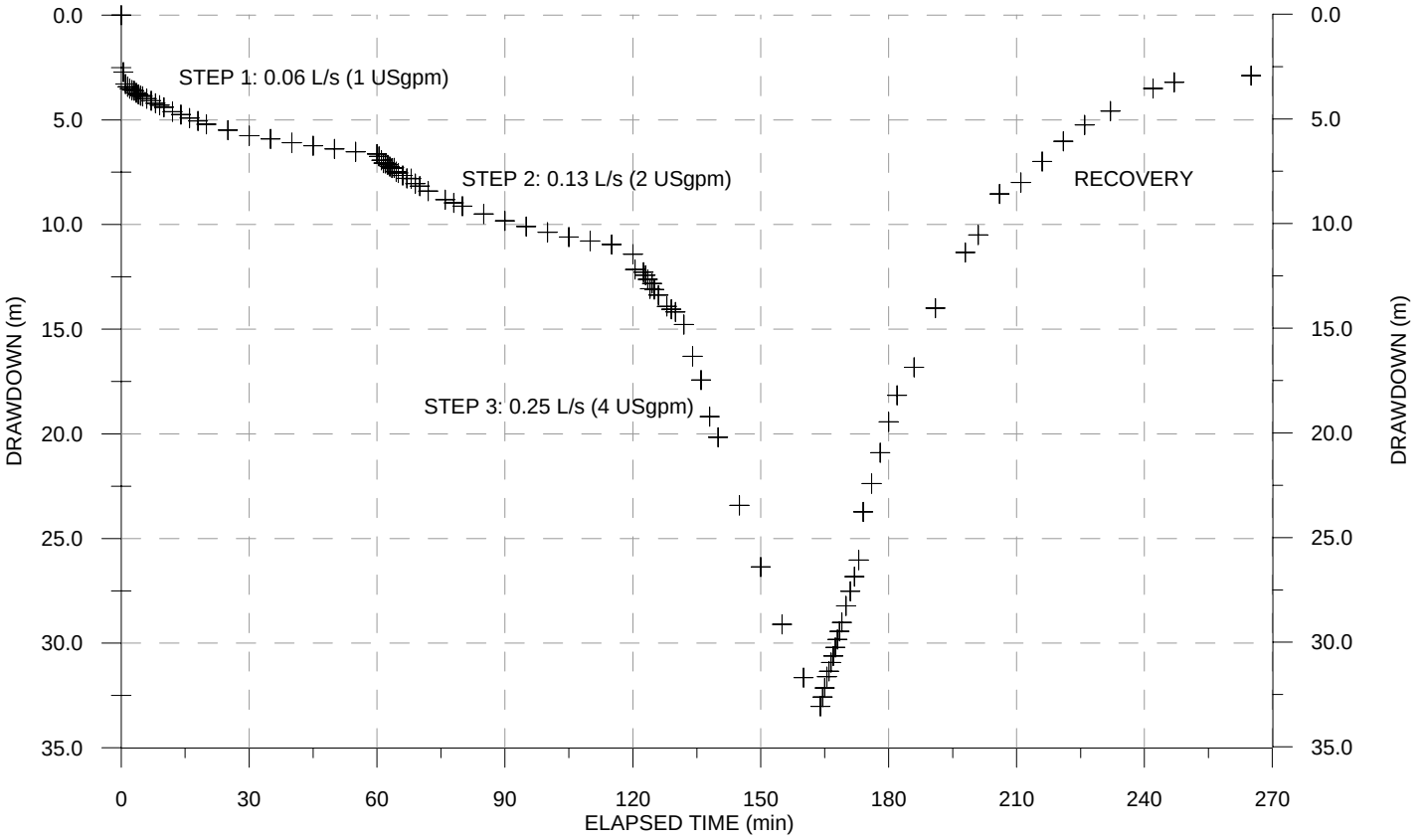
EBA PROJECT NUMBER: 1260009 PROJECT LOCATION: Whitehorse Copper Subdivision

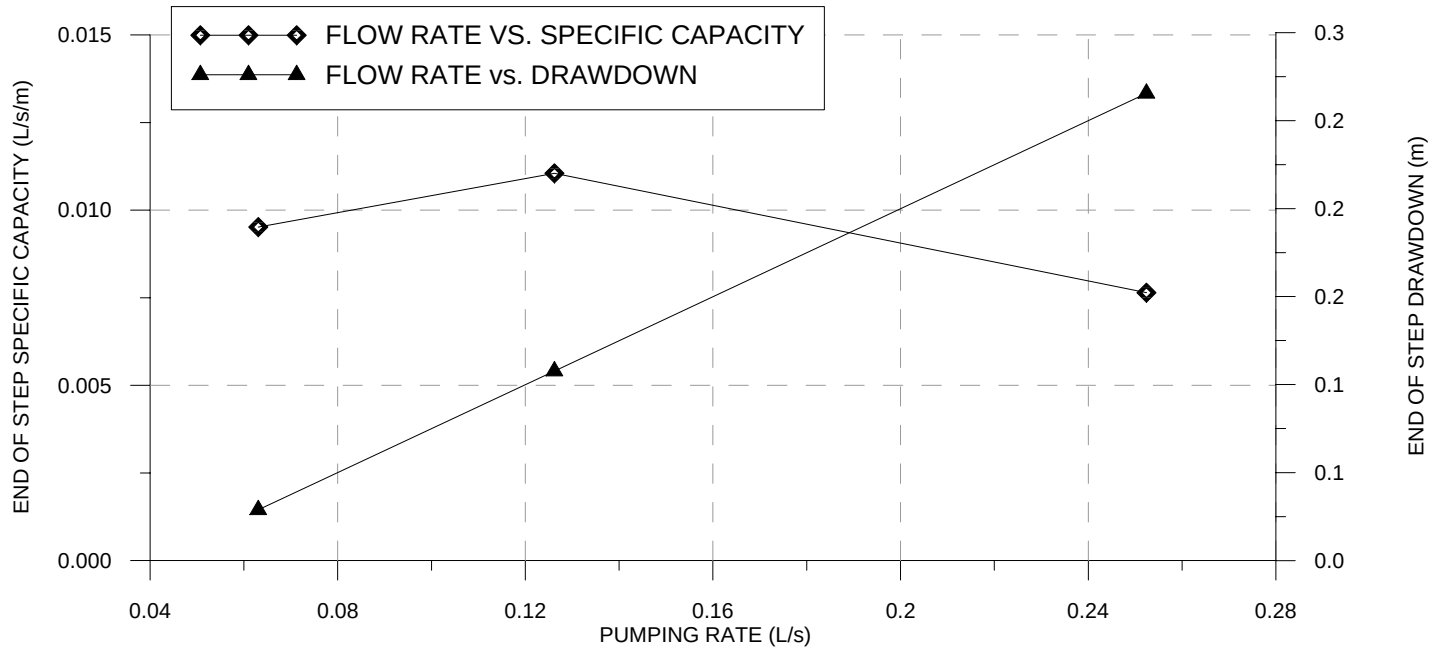
24-Oct-06	17:07:30	481.5	41.73	31.775	-	0	0	0.00	-	
24-Oct-06	17:08:00	482	40.84	30.885	-	0	0	0.00	-	
24-Oct-06	17:08:30	482.5	40	30.045	-	0	0	0.00	-	
24-Oct-06	17:09:00	483	39.22	29.265	-	0	0	0.00	-	
24-Oct-06	17:09:30	483.5	38.445	28.490	-	0	0	0.00	-	
24-Oct-06	17:10:00	484	37.76	27.805	-	0	0	0.00	-	
24-Oct-06	17:10:30	484.5	37.02	27.065	-	0	0	0.00	-	
24-Oct-06	17:11:00	485	36.435	26.480	-	0	0	0.00	-	
24-Oct-06	17:12:00	486	35.2	25.245	-	0	0	0.00	-	
24-Oct-06	17:13:00	487	34.12	24.165	-	0	0	0.00	-	
24-Oct-06	17:14:00	488	33.1	23.145	-	0	0	0.00	-	
24-Oct-06	17:15:00	489	32.12	22.165	-	0	0	0.00	-	
24-Oct-06	17:16:00	490	31.4	21.445	-	0	0	0.00	-	
24-Oct-06	17:18:00	492	29.90	19.945	-	0	0	0.00	-	
24-Oct-06	17:20:00	494	28.58	18.625	-	0	0	0.00	-	
24-Oct-06	17:22:00	496	27.62	17.665	-	0	0	0.00	-	
24-Oct-06	17:24:00	498	26.74	16.785	-	0	0	0.00	-	
24-Oct-06	17:26:00	500	25.97	16.015	-	0	0	0.00	-	
24-Oct-06	17:31:00	505	24.46	14.505	-	0	0	0.00	-	
24-Oct-06	17:36:00	510	23.33	13.375	-	0	0	0.00	-	
24-Oct-06	17:41:00	515	22.47	12.515	-	0	0	0.00	-	
24-Oct-06	17:46:00	520	21.77	11.815	-	0	0	0.00	-	
24-Oct-06	17:56:00	530	20.71	10.755	-	0	0	0.00	-	
24-Oct-06	18:06:00	540	19.91	9.955	-	0	0	0.00	-	
24-Oct-06	18:16:00	550	19.28	9.325	-	0	0	0.00	-	
24-Oct-06	18:36:00	570	18.30	8.345	-	0	0	0.00	-	
24-Oct-06	18:51:00	585	17.73	7.775	-	0	0	0.00	-	
24-Oct-06	19:06:00	600	17.25	7.295	-	0	0	0.00	-	
24-Oct-06	19:36:00	630	16.49	6.535	-	0	0	0.00	-	
24-Oct-06	20:06:00	660	15.855	5.900	-	0	0	0.00	-	
24-Oct-06	20:36:00	690	15.33	5.375	-	0	0	0.00	-	
24-Oct-06	21:06:00	720	14.92	4.965	-	0	0	0.00	-	
25-Oct-06	9:30:00	1464	10.44	0.485	-	0	0	0.00	-	

Notes:
1) Depth to Water below top of sounding tube (Stick-up = x.xxx m)
2) "-" indicates no data or not applicable
3) May be a flow tototalizaer, instantaneous flow meter or other method of flow rate monitoring

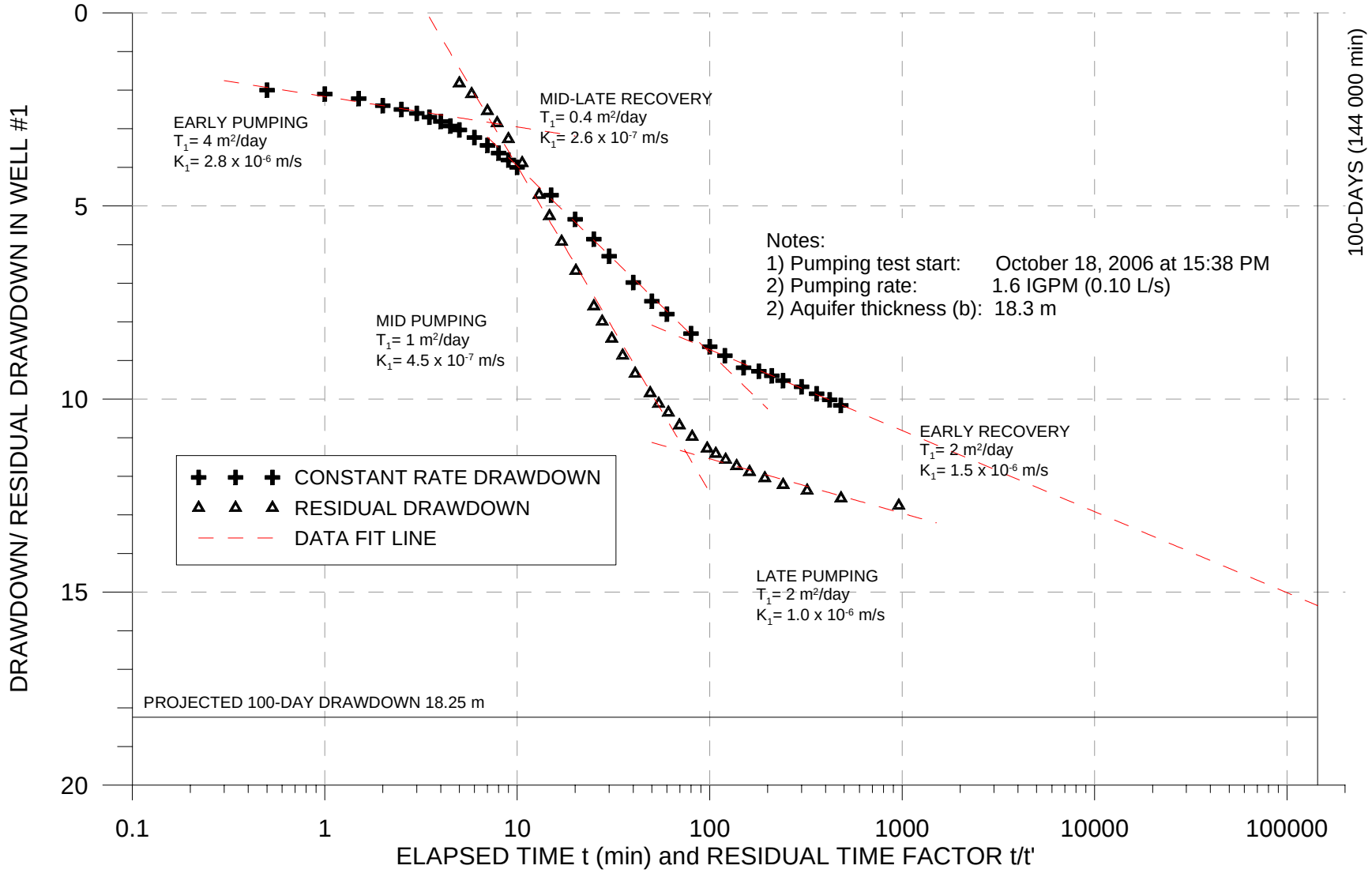
APPENDIX D

APPENDIX D TW06-01 STEP TEST AND CONSTANT RATE TEST ANALYSIS





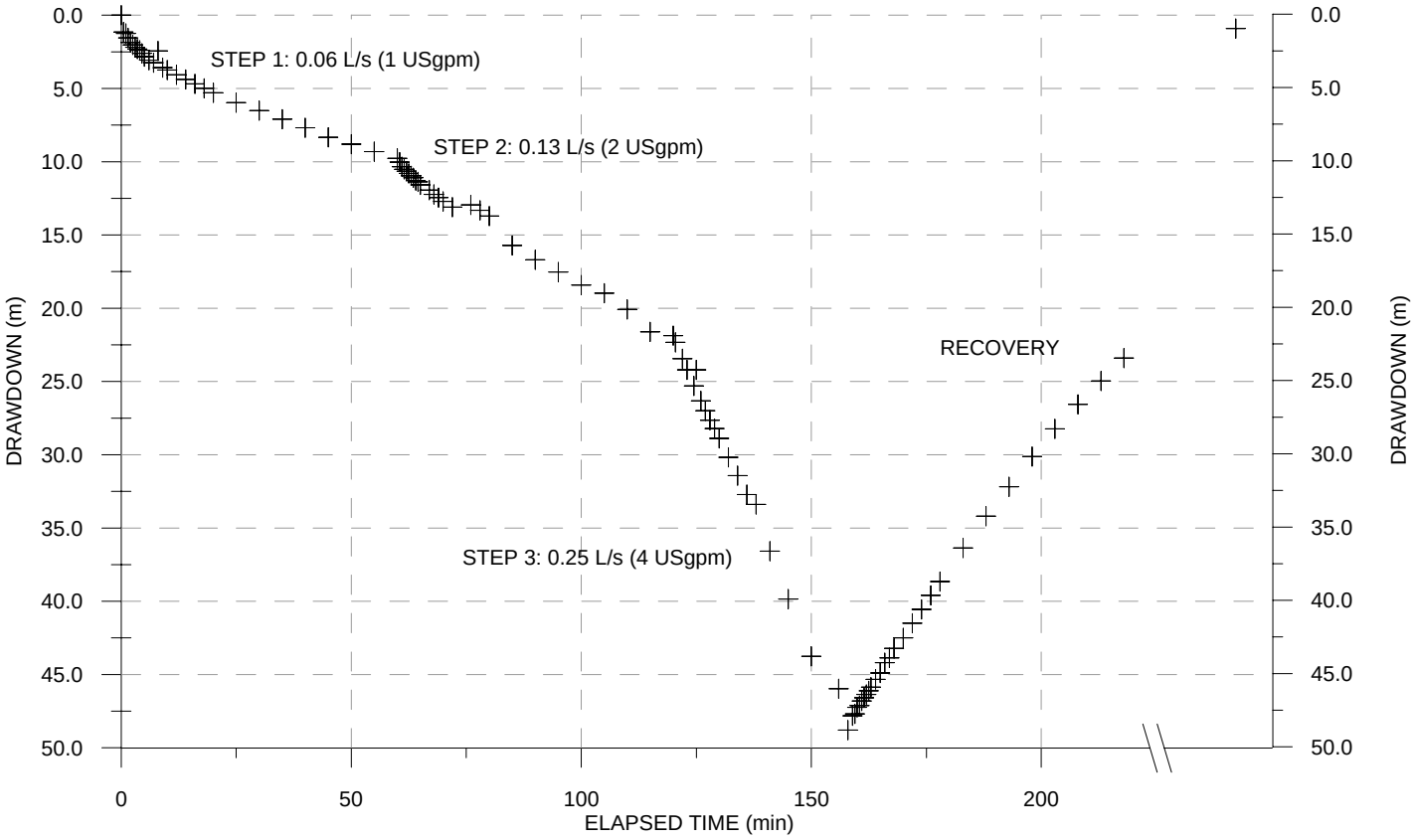
EBA Engineering Consultants Ltd.		PROJECT	HYDROGEOLOGICAL ASSESSMENT FOR WATER SUPPLY WHITEHORSE COPPER SUBDIVISION
CLIENT	LORIMER & Associates Consulting Engineers	TITLE	STEP TEST AND SPECIFIC CAPACITY FOR WELL #1
DATE NOVEMBER 2006	DWN. KSJ / CHKD. RMM	FILE NO. 1260009	DRWG. FIGURE D1

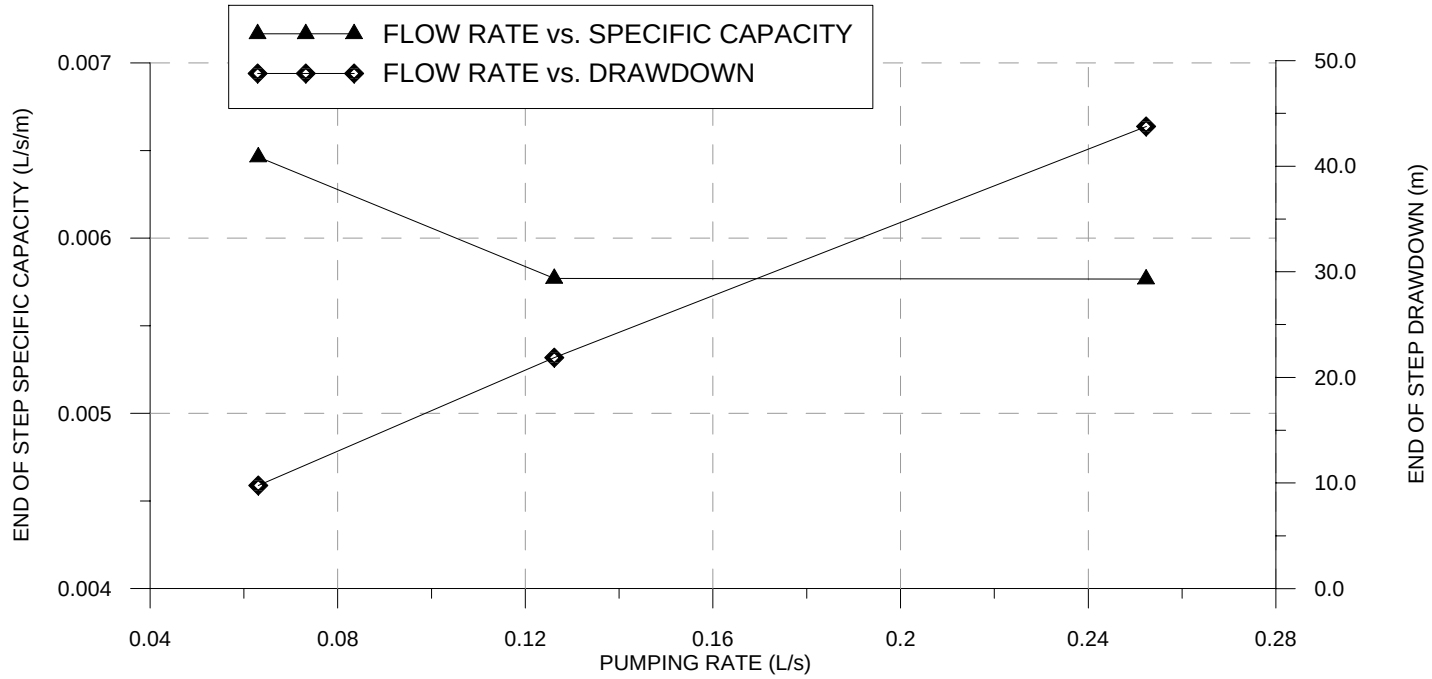


EBA Engineering Consultants Ltd.		PROJECT	HYDROGEOLOGICAL ASSESSMENT FOR WATER SUPPLY WHITEHORSE COPPER SUBDIVISION
CLIENT	LORIMER & Associates Consulting Engineers	TITLE	CONSTANT RATE PUMPING TEST ANALYSIS- TW06-01
DATE OCTOBER 2006	DWN. KSJ CHKD. RMM	FILE NO. 1260009	DRWG. FIGURE D2

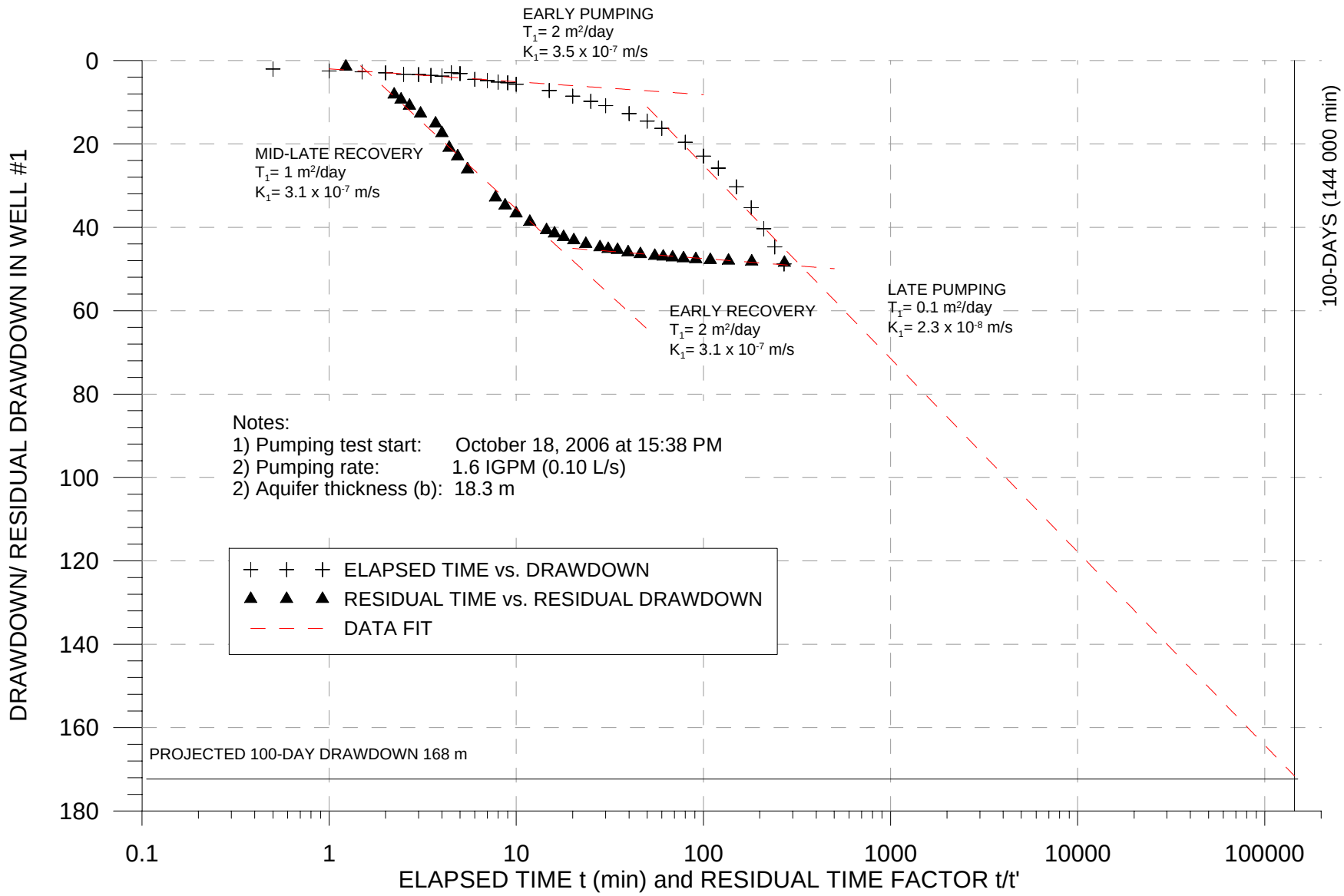
APPENDIX E

APPENDIX E TW06-02 STEP TEST AND CONSTANT RATE TEST ANALYSIS





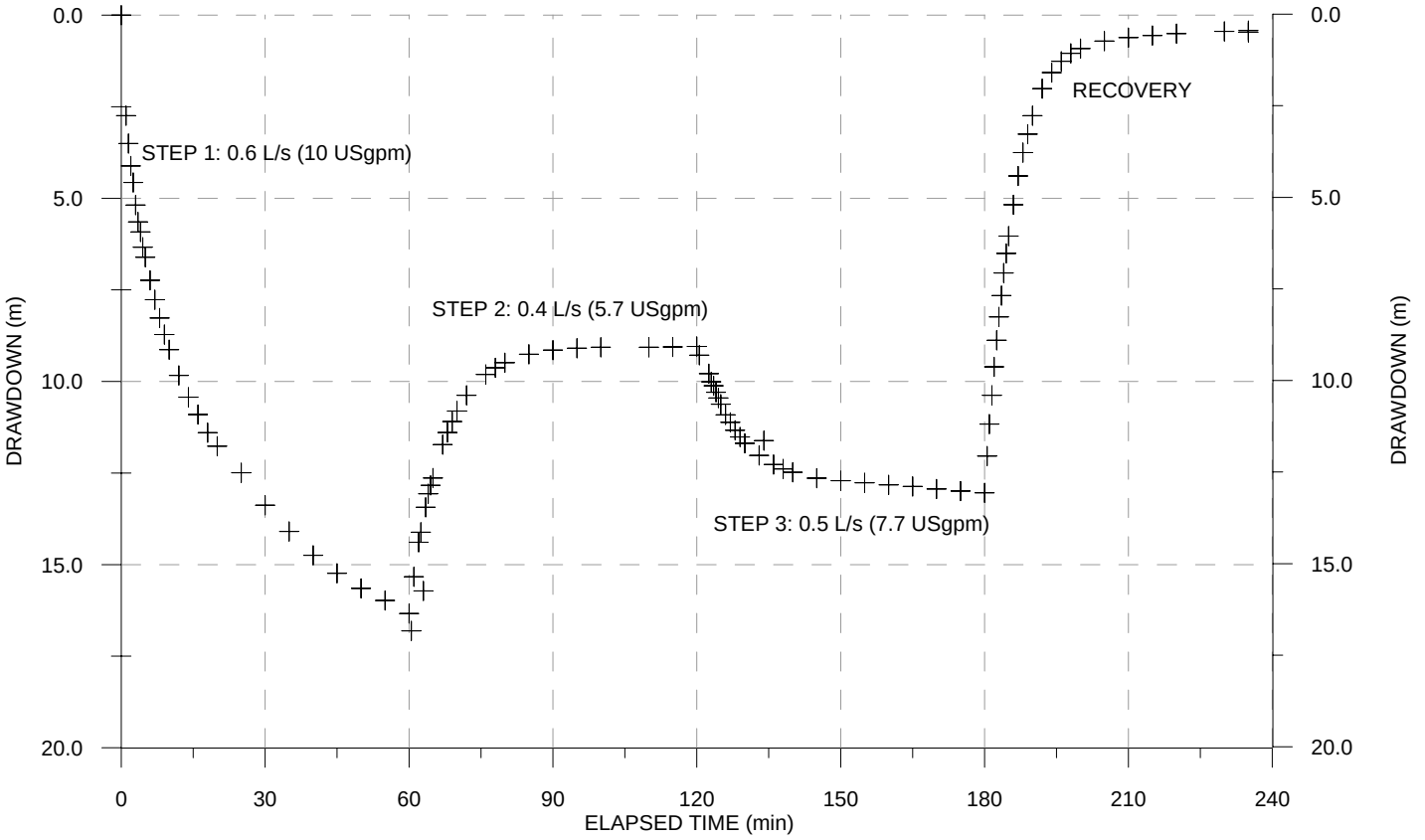
EBA Engineering Consultants Ltd.		PROJECT	HYDROGEOLOGICAL ASSESSMENT FOR WATER SUPPLY WHITEHORSE COPPER SUBDIVISION
CLIENT	LORIMER & Associates Consulting Engineers	TITLE	STEP TEST AND SPECIFIC CAPACITY FOR TW06-02
DATE NOVEMBER 2006	DWN. KSJ / CHKD. RMM	FILE NO. 1260009	DRWG. FIGURE E1

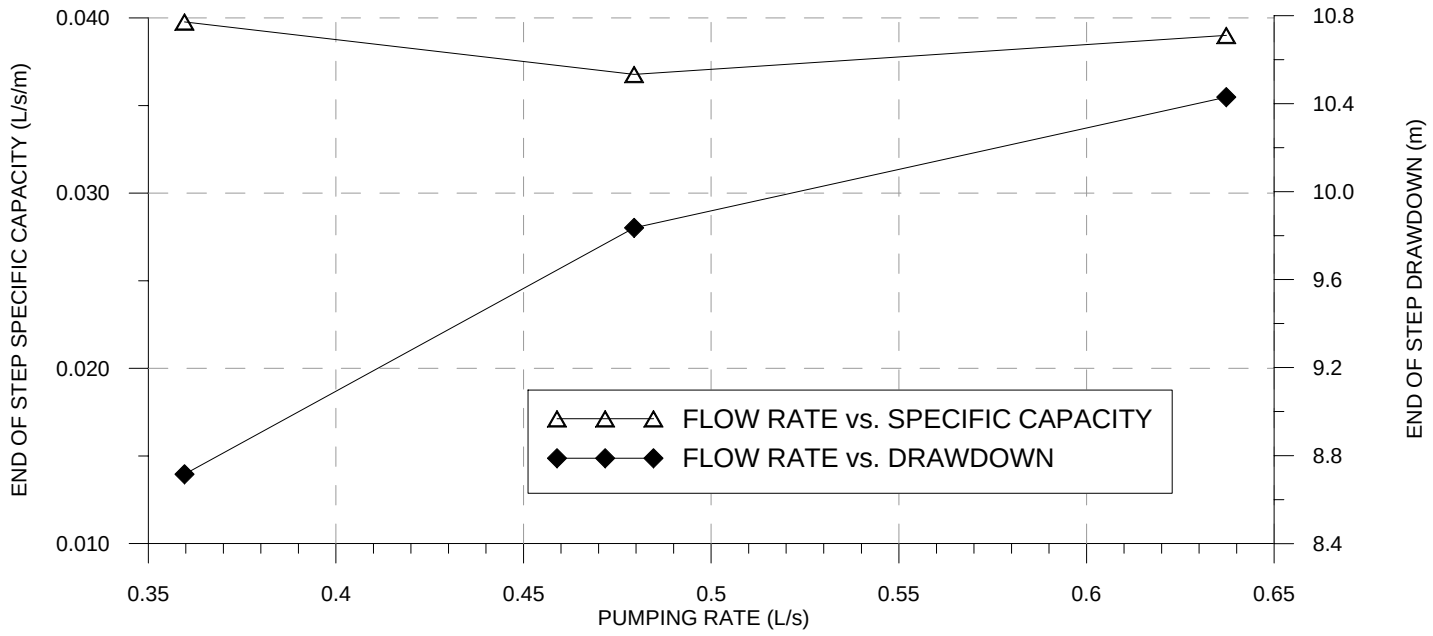


EBA Engineering Consultants Ltd.	PROJECT HYDROGEOLOGICAL ASSESSMENT FOR WATER SUPPLY WHITEHORSE COPPER SUBDIVISION
CLIENT LORIMER & Associates Consulting Engineers	TITLE CONSTANT RATE PUMPING TEST ANALYSIS- TW06-02
DATE OCTOBER 2006 DWN. KSJ CHKD. RMM	FILE NO. 1260009 DRWG. FIGURE E2

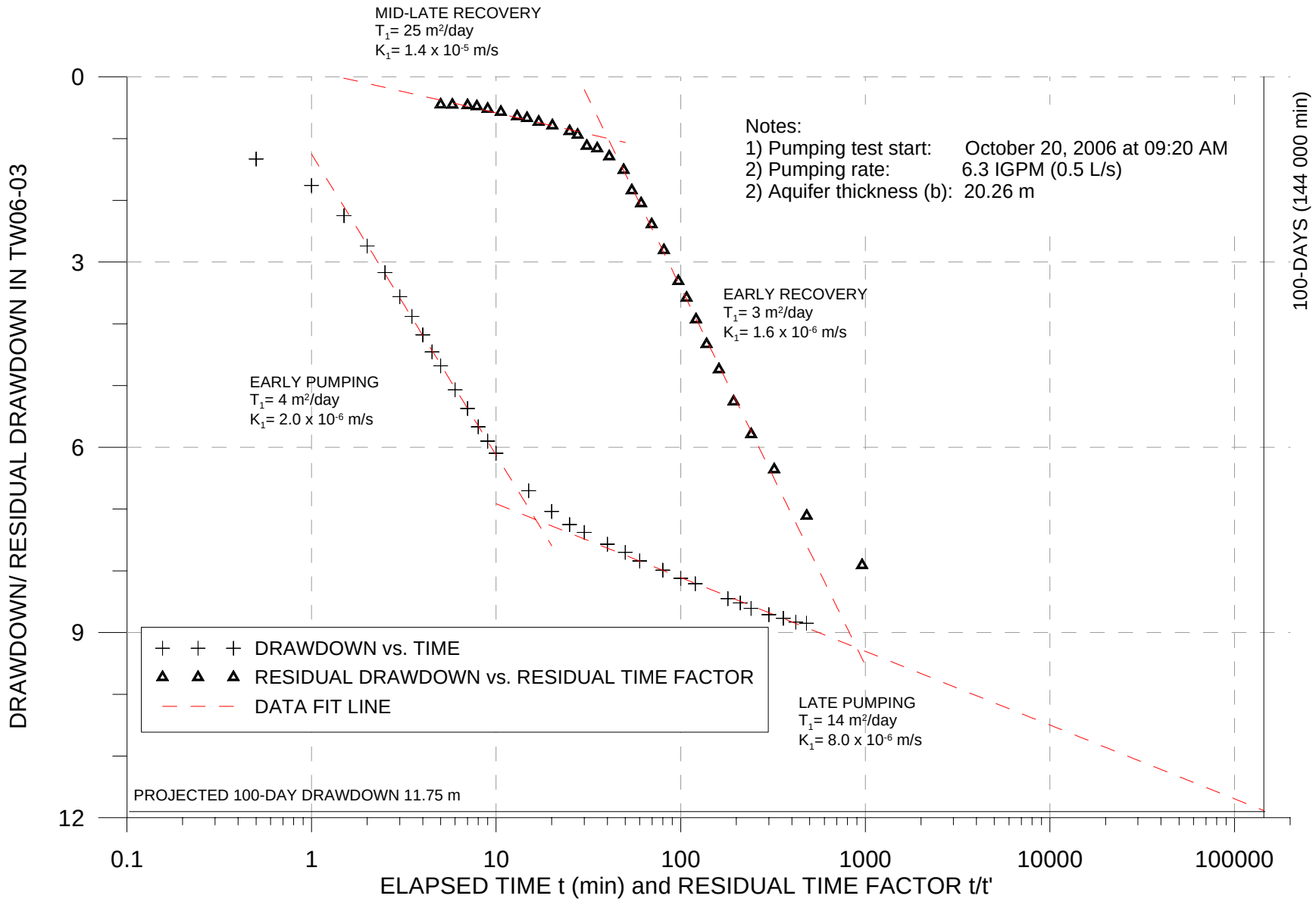
APPENDIX F

APPENDIX F TW06-03 STEP TEST AND CONSTANT RATE TEST ANALYSIS





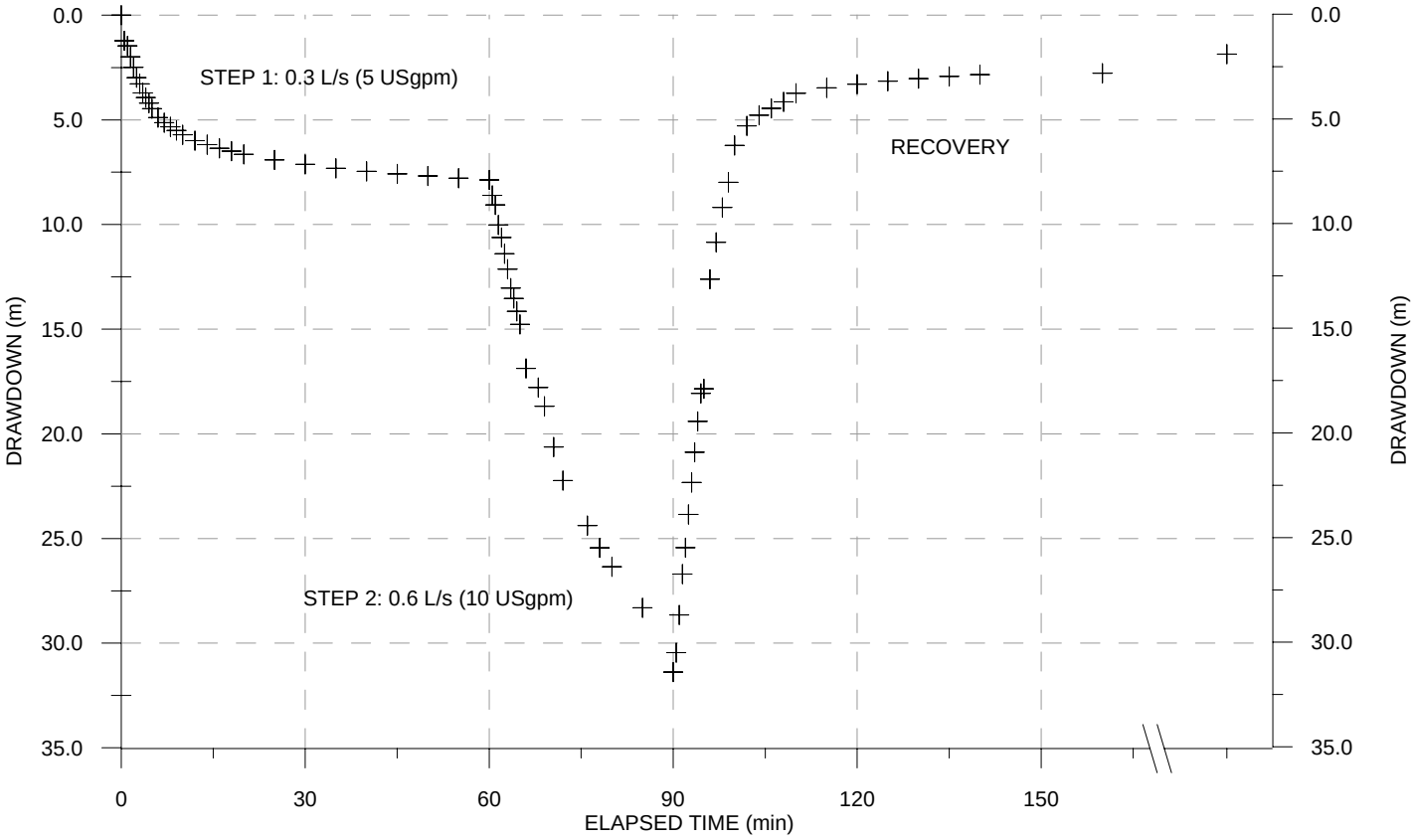
EBA Engineering Consultants Ltd.		PROJECT	HYDROGEOLOGICAL ASSESSMENT FOR WATER SUPPLY WHITEHORSE COPPER SUBDIVISION
CLIENT	LORIMER & Associates Consulting Engineers	TITLE	STEP TEST AND SPECIFIC CAPACITY FOR TW06-03
DATE NOVEMBER 2006	DWN. KSJ / CHKD. RMM	FILE NO. 1260009	DRWG. FIGURE F1

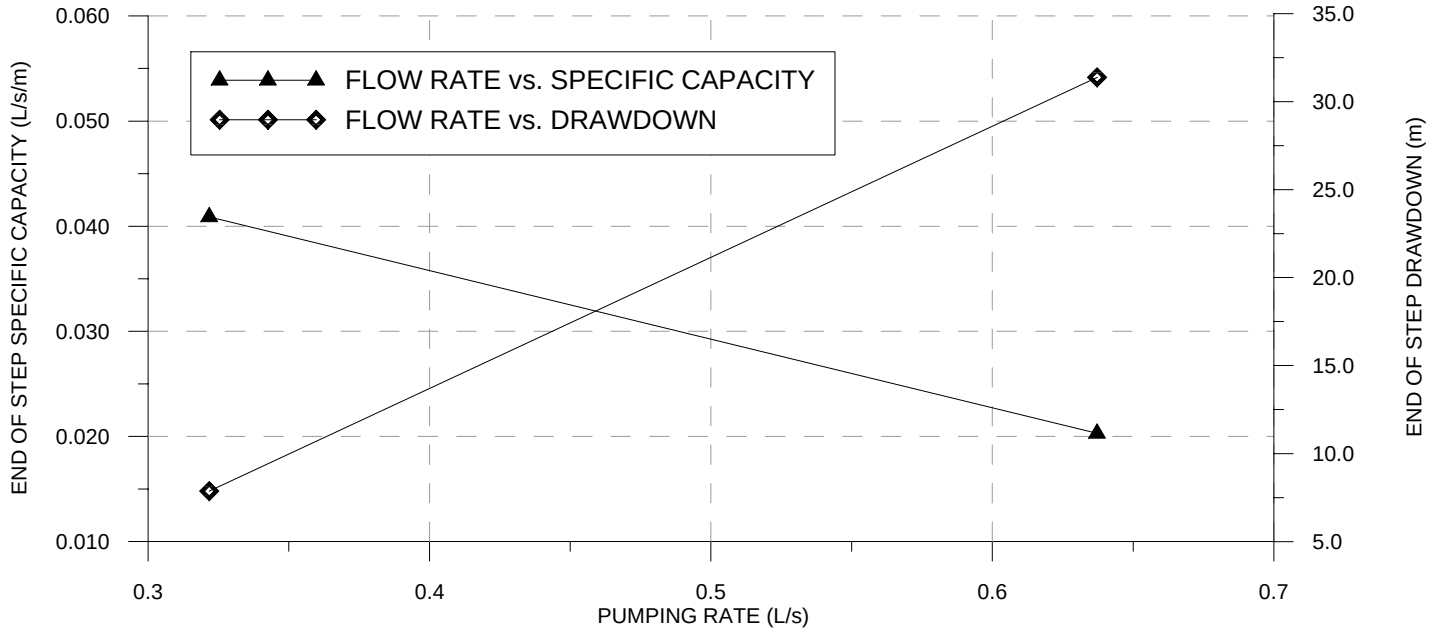


EBA Engineering Consultants Ltd.	PROJECT: HYDROGEOLOGICAL ASSESSMENT FOR WATER SUPPLY WHITEHORSE COPPER SUBDIVISION
CLIENT: LORIMER & Associates Consulting Engineers	TITLE: CONSTANT RATE PUMPING TEST ANALYSIS- TW06-03
DATE: OCTOBER 2006 DWN.: KSJ CHKD.: RMM	FILE NO.: 1260009 DRWG.: FIGURE F2

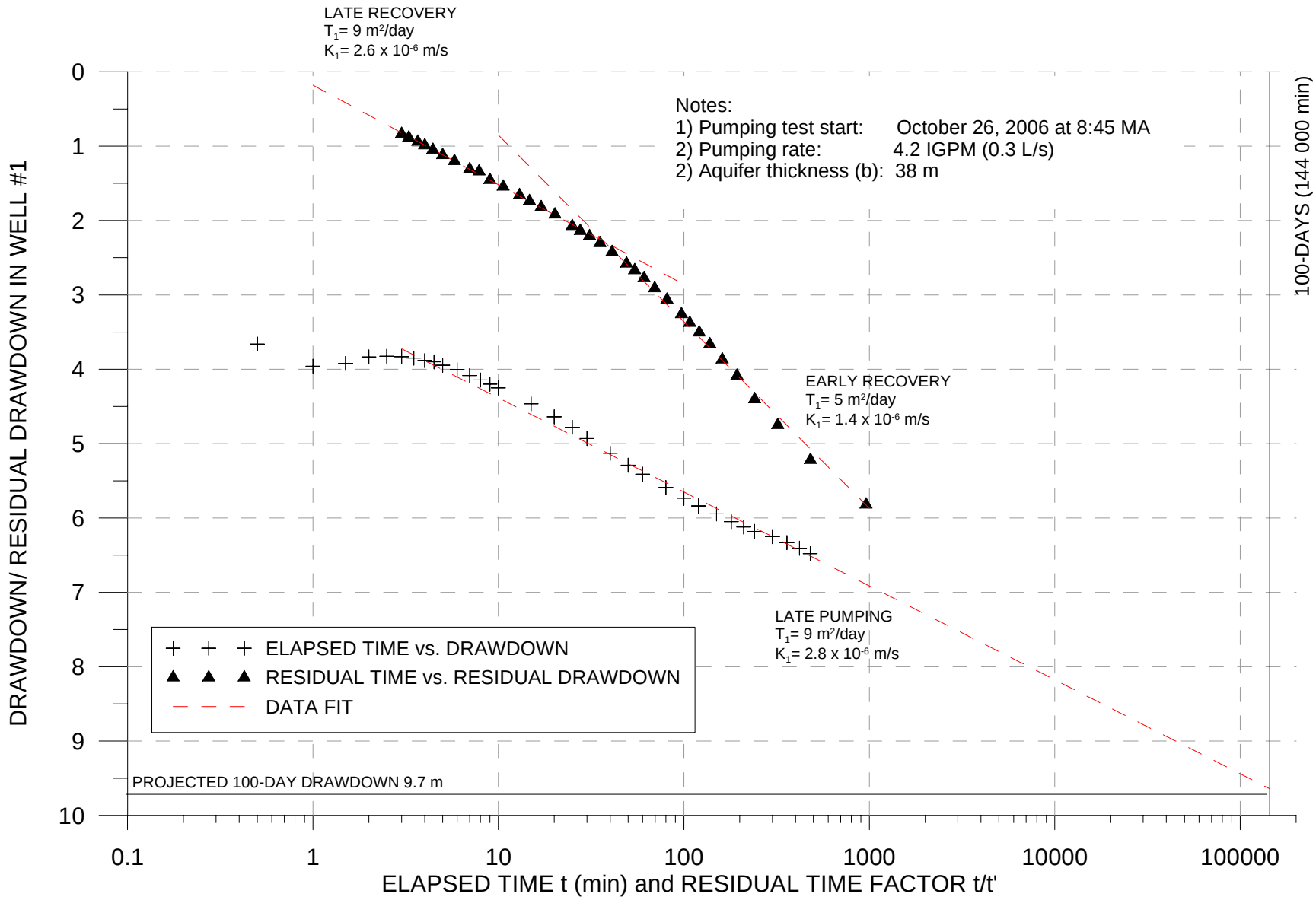
APPENDIX G

APPENDIX G TW06-04 STEP TEST AND CONSTANT RATE TEST ANALYSIS





EBA Engineering Consultants Ltd.		PROJECT	HYDROGEOLOGICAL ASSESSMENT FOR WATER SUPPLY WHITEHORSE COPPER SUBDIVISION
CLIENT	LORIMER & Associates Consulting Engineers	TITLE	STEP TEST AND SPECIFIC CAPACITY FOR TW06-04
DATE NOVEMBER 2006	DWN. KSJ / CHKD. RMM	FILE NO. 1260009	DRWG. FIGURE G1



EBA Engineering Consultants Ltd.

CLIENT LORIMER & Associates Consulting Engineers

PROJECT HYDROGEOLOGICAL ASSESSMENT FOR WATER SUPPLY WHITEHORSE COPPER SUBDIVISION

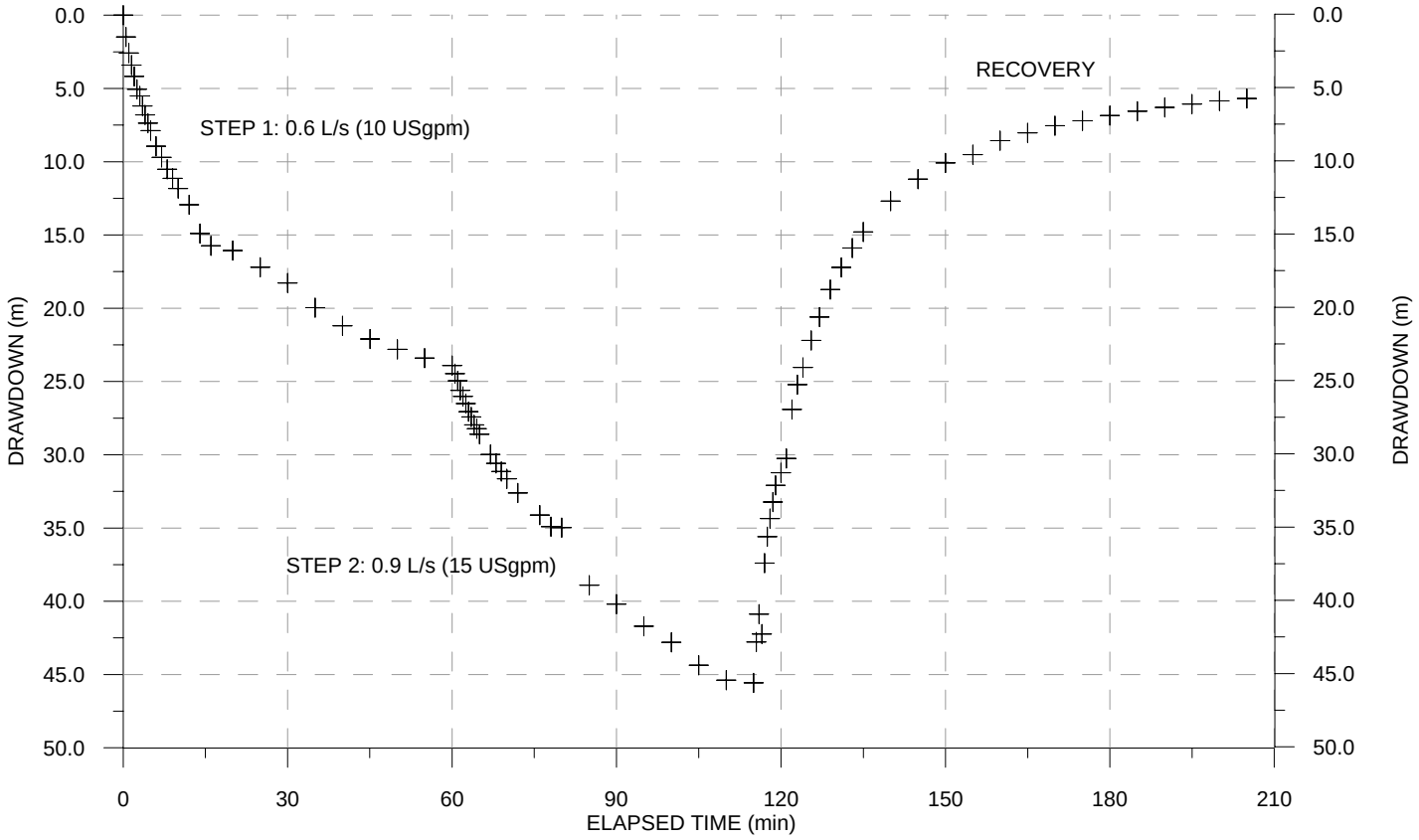
TITLE CONSTANT RATE PUMPING TEST ANALYSIS- TW06-04

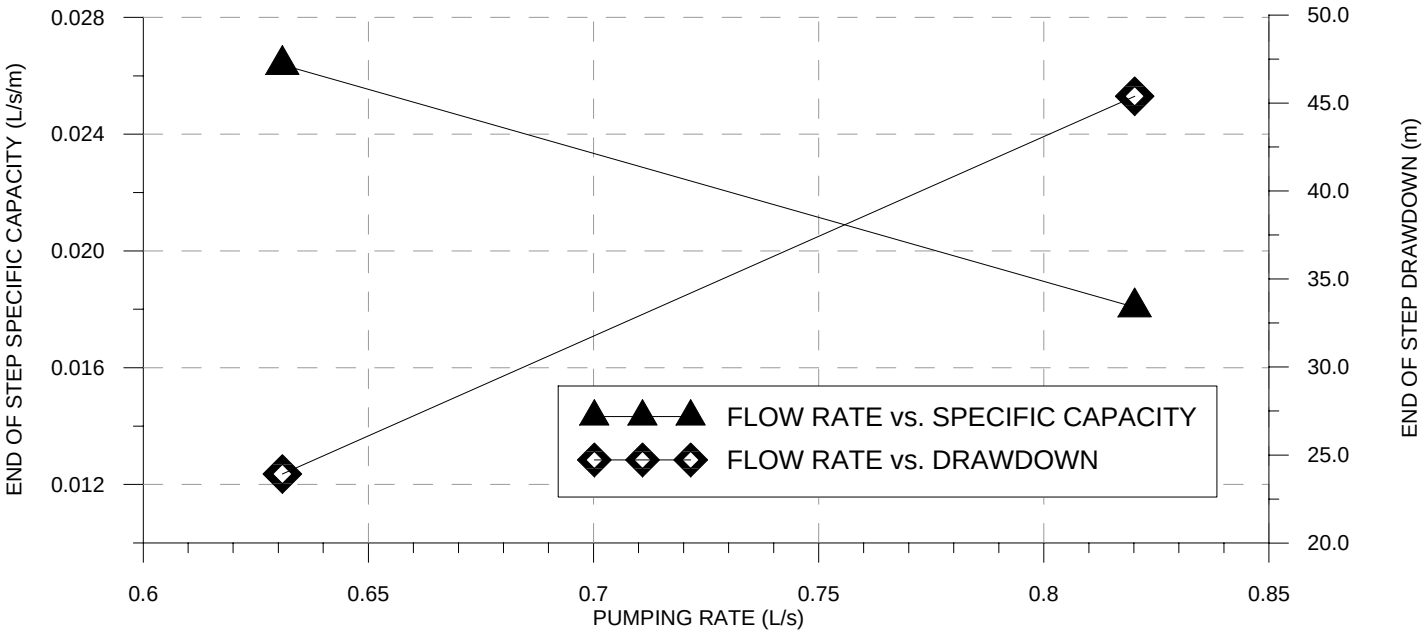
DATE OCTOBER 2006 DWN. KSJ CHKD. RMM

FILE NO. 1260009 DRWG. FIGURE G2

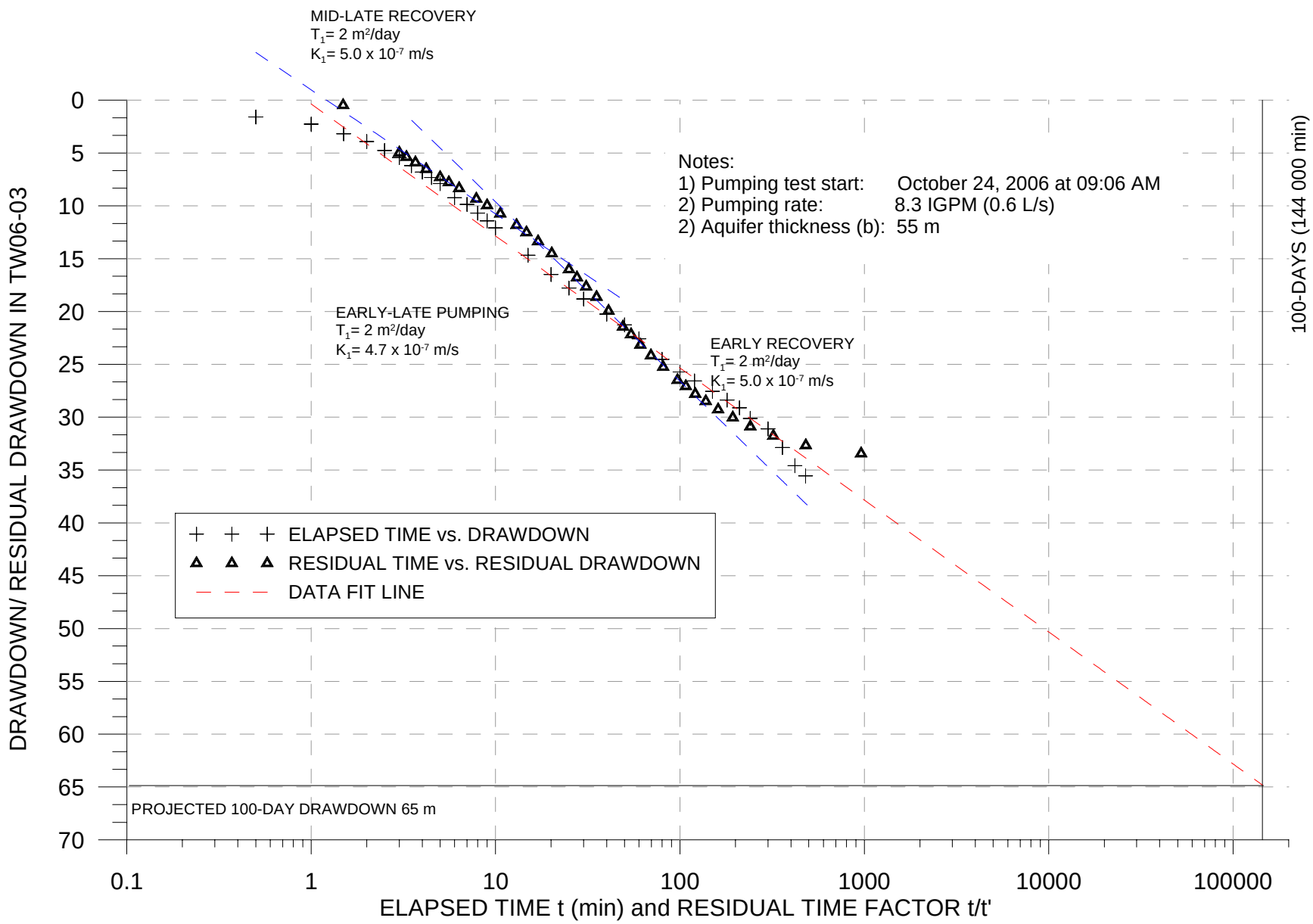
APPENDIX H

APPENDIX H TW06-05 STEP TEST AND CONSTANT RATE TEST ANALYSIS





EBA Engineering Consultants Ltd.		PROJECT	HYDROGEOLOGICAL ASSESSMENT FOR WATER SUPPLY WHITEHORSE COPPER SUBDIVISION
CLIENT	LORIMER & Associates Consulting Engineers	TITLE	STEP TEST AND SPECIFIC CAPACITY FOR TW06-05
DATE NOVEMBER 2006	DWN. KSJ / CHKD. RMM	FILE NO. 1260009	DRWG. FIGURE H1



EBA Engineering Consultants Ltd.

CLIENT LORIMER & Associates Consulting Engineers	PROJECT HYDROGEOLOGICAL ASSESSMENT FOR WATER SUPPLY WHITEHORSE COPPER SUBDIVISION
	TITLE CONSTANT RATE PUMPING TEST ANALYSIS- TW06-03
DATE OCTOBER 2006 DWN. KSJ CHKD. RMM	FILE NO. 1260009 DRWG. FIGURE H2

APPENDIX I

APPENDIX I LABORATORY REPORTS AND CERTIFICATES

ALS Environmental

ANALYTICAL REPORT

EBA ENGINEERING CONSULTANTS LTD.
ATTN: KATHERINE JOHNSTON

Reported On: 08-NOV-06 09:30 PM

CALCITE BUSINESS CENTRE
UNIT 6 - 151 INDUSTRIAL ROAD
WHITEHORSE YT Y1A 2V3

Lab Work Order #: L448107 **Date Received:** 26-OCT-06

Project P.O. #:
Job Reference: 1260009 WHITEHORSE COPPER
Legal Site Desc:
CofC Numbers: 48289

Other Information:

Comments:

Joyce Chow
General Manager, Vancouver

For any questions about this report please contact your Account Manager:

CAN DANG

ALS Canada Ltd.
Part of the **ALS Laboratory Group**
1988 Triumph Street, Vancouver, BC V5L 1K5
Phone: +1 604 253 4188 Fax: +1 604 253 6700 www.alsglobal.com
A Campbell Brothers Limited Company

ALS LABORATORY GROUP ANALYTICAL REPORT

	Sample ID	L448107-1	L448107-2	L448107-3
	Description			
	Sampled Date	18-OCT-06	20-OCT-06	24-OCT-06
	Sampled Time	11:30	17:00	16:00
	Client ID	TW01-06	TW03-06	TW05-06
Grouping	Analyte			
WATER				
Physical Tests	Hardness (as CaCO3) (mg/L)	322	100	162
	Colour, True (CU)	<5.0	<5.0	<5.0
	Conductivity (uS/cm)	207	614	362
	pH (pH)	8.13	8.18	8.19
	Total Dissolved Solids (mg/L)	130	376	220
	Turbidity (NTU)	0.64	5.55	1.64
Anions and Nutrients	Alkalinity, Total (as CaCO3) (mg/L)	112	278	175
	Chloride (Cl) (mg/L)	<0.50	1.07	<0.50
	Fluoride (F) (mg/L)	0.116	0.098	0.172
	Sulfate (SO4) (mg/L)	3.51	78.1	27.6
	Nitrate (as N) (mg/L)	<0.0050	0.0136	<0.0050
	Nitrite (as N) (mg/L)	<0.0010	<0.0010	<0.0010
Total Metals	Aluminum (Al)-Total (mg/L)	<0.010	<0.010	0.050
	Antimony (Sb)-Total (mg/L)	<0.00050	<0.00050	<0.00050
	Arsenic (As)-Total (mg/L)	0.00025	0.00105	0.00025
	Barium (Ba)-Total (mg/L)	0.022	<0.020	0.048
	Boron (B)-Total (mg/L)	<0.10	<0.10	<0.10
	Cadmium (Cd)-Total (mg/L)	<0.00020	<0.00020	<0.00020
	Calcium (Ca)-Total (mg/L)	42.6	29.5	46.4
	Chromium (Cr)-Total (mg/L)	0.0066	<0.0020	<0.0020
	Copper (Cu)-Total (mg/L)	0.0024	0.0196	0.0017
	Iron (Fe)-Total (mg/L)	0.601	0.114	0.236
	Lead (Pb)-Total (mg/L)	0.0016	0.0020	0.0013
	Magnesium (Mg)-Total (mg/L)	52.3	6.49	11.3
	Manganese (Mn)-Total (mg/L)	0.0206	0.202	0.682
	Mercury (Hg)-Total (mg/L)	<0.00020	<0.00020	<0.00020
	Potassium (K)-Total (mg/L)	3.21	1.27	0.81
	Selenium (Se)-Total (mg/L)	0.0034	<0.0010	<0.0010
	Sodium (Na)-Total (mg/L)	14.5	3.7	19.8
	Uranium (U)-Total (mg/L)	0.00916	0.00163	0.0501
	Zinc (Zn)-Total (mg/L)	0.130	<0.050	<0.050

Reference Information

Methods Listed (if applicable):

ALS Test Code	Matrix	Test Description	Analytical Method Reference(Based On)
ALK-COL-VA	Water	Alkalinity by Colourimetric (Automated)	APHA 310.2

This analysis is carried out using procedures adapted from EPA Method 310.2 "Alkalinity". Total Alkalinity is determined using the methyl orange colourimetric method.

ANIONS-CL-IC-VA	Water	Chloride by Ion Chromatography	APHA 4110 "Determination of Anions by IC

This analysis is carried out using procedures adapted from APHA Method 4110 "Determination of Anions by Ion Chromatography" and EPA Method 300.0 "Determination of Inorganic Anions by Ion Chromatography". Anions are determined by filtering the sample through a 0.45 micron membrane filter and injecting the filtrate onto a Dionex IonPac AG18 anion exchange column with a hydroxide eluent stream. Anions routinely determined by this method include: bromide, chloride, fluoride, nitrate, nitrite and sulphate.

ANIONS-F-IC-VA	Water	Fluoride by Ion Chromatography	APHA 4110 "Determination of Anions by IC

This analysis is carried out using procedures adapted from APHA Method 4110 "Determination of Anions by Ion Chromatography" and EPA Method 300.0 "Determination of Inorganic Anions by Ion Chromatography". Anions are determined by filtering the sample through a 0.45 micron membrane filter and injecting the filtrate onto a Dionex IonPac AG18 anion exchange column with a hydroxide eluent stream. Anions routinely determined by this method include: bromide, chloride, fluoride, nitrate, nitrite and sulphate.

ANIONS-NO2-IC-VA	Water	Nitrite by Ion Chromatography	APHA 4110 "Determination of Anions by IC

This analysis is carried out using procedures adapted from APHA Method 4110 "Determination of Anions by Ion Chromatography" and EPA Method 300.0 "Determination of Inorganic Anions by Ion Chromatography". Anions are determined by filtering the sample through a 0.45 micron membrane filter and injecting the filtrate onto a Dionex IonPac AG18 anion exchange column with a hydroxide eluent stream. Anions routinely determined by this method include: bromide, chloride, fluoride, nitrate, nitrite and sulphate.

ANIONS-NO3-IC-VA	Water	Nitrate by Ion Chromatography	APHA 4110 "Determination of Anions by IC

This analysis is carried out using procedures adapted from APHA Method 4110 "Determination of Anions by Ion Chromatography" and EPA Method 300.0 "Determination of Inorganic Anions by Ion Chromatography". Anions are determined by filtering the sample through a 0.45 micron membrane filter and injecting the filtrate onto a Dionex IonPac AG18 anion exchange column with a hydroxide eluent stream. Anions routinely determined by this method include: bromide, chloride, fluoride, nitrate, nitrite and sulphate.

ANIONS-SO4-IC-VA	Water	Sulfate by Ion Chromatography	APHA 4110 "Determination of Anions by IC

This analysis is carried out using procedures adapted from APHA Method 4110 "Determination of Anions by Ion Chromatography" and EPA Method 300.0 "Determination of Inorganic Anions by Ion Chromatography". Anions are determined by filtering the sample through a 0.45 micron membrane filter and injecting the filtrate onto a Dionex IonPac AG18 anion exchange column with a hydroxide eluent stream. Anions routinely determined by this method include: bromide, chloride, fluoride, nitrate, nitrite and sulphate.

COLOUR-TRUE-VA	Water	Colour (True) by Spectrometer	APHA 2120 "Color"

This analysis is carried out using procedures adapted from APHA Method 2120 "Color". Colour (True Colour) is determined by filtering a sample through a 0.45 micron membrane filter followed by analysis of the filtrate using the platinum-cobalt colourimetric method. Aparent Colour is determined without prior sample filtration. Colour is pH dependent. Unless otherwise indicated, reported colour results pertain to the pH of the sample as received, to within +/- 1 pH unit.

EC-PCT-VA	Water	Conductivity (Automated)	APHA 2510 Auto. Conduc.

This analysis is carried out using procedures adapted from APHA Method 2510 "Conductivity". Conductivity is determined using a conductivity electrode.

HARDNESS-CALC-VA	Water	Hardness	CALCULATION

HG-TOT-DW-CVAFS-VA	Water	Total Mercury in Water by CVAFS	EPA 245.7

This analysis is carried out using procedures adapted from "Standard Methods for the Examination of Water and Wastewater" published by the American Public Health Association, and with procedures adapted from "Test Methods for Evaluating Solid Waste" SW-846 published by the United States Environmental Protection Agency (EPA). The procedure involves a cold-oxidation of the acidified sample using bromine monochloride prior to reduction of the sample with stannous chloride. Instrumental analysis is by cold vapour atomic fluorescence spectrophotometry (EPA Method 245.7).

MET-TOT-DW-ICP-VA	Water	Total Metals in Water by ICPAES	EPA SW-846 3005A/6010B

This analysis is carried out using procedures adapted from "Standard Methods for the Examination of Water and Wastewater" published by the American Public Health Association, and with procedures adapted from "Test Methods for Evaluating Solid Waste" SW-846 published by the United States Environmental Protection Agency (EPA). The procedure involves preliminary sample treatment by acid digestion, using either hotblock or microwave oven (EPA Method 3005A) and analysis by inductively coupled plasma - optical emission spectrophotometry (EPA Method 6010B).

Reference Information

MET-TOT-DW-MS-VA Water Total Metals in Water by ICPMS EPA SW-846 3005A/6020

This analysis is carried out using procedures adapted from "Standard Methods for the Examination of Water and Wastewater" published by the American Public Health Association, and with procedures adapted from "Test Methods for Evaluating Solid Waste" SW-846 published by the United States Environmental Protection Agency (EPA). The procedures may involve preliminary sample treatment by acid digestion, using either hotblock or microwave oven (EPA Method 3005A). Instrumental analysis is by inductively coupled plasma - mass spectrometry (EPA Method 6020).

PH-PCT-VA Water pH by Meter (Automated) APHA 4500-H "pH Value"

This analysis is carried out using procedures adapted from APHA Method 4500-H "pH Value". The pH is determined in the laboratory using a pH electrode

TDS-VA Water Total Dissolved Solids by Gravimetric APHA 2540 Gravimetric

This analysis is carried out using procedures adapted from APHA Method 2540 "Solids". Solids are determined gravimetrically. Total dissolved solids (TDS) are determined by filtering a sample through a glass fibre filter, TDS is determined by evaporating the filtrate to dryness at 180 degrees celsius.

TURB-MET-VA Water Turbidity by Meter APHA 2130 "Turbidity"

This analysis is carried out using procedures adapted from APHA Method 2130 "Turbidity". Turbidity is determined by the nephelometric method.

** Laboratory Methods employed follow in-house procedures, which are generally based on nationally or internationally accepted methodologies.

Chain of Custody numbers:

48289

The last two letters of the above test code(s) indicate the laboratory that performed analytical analysis for that test. Refer to the list below:

Laboratory Definition Code	Laboratory Location	Laboratory Definition Code	Laboratory Location
VA	ALS LABORATORY GROUP - VANCOUVER, BC, CANADA		

GLOSSARY OF REPORT TERMS
Surr - A surrogate is an organic compound that is similar to the target analyte(s) in chemical composition and behavior but not normally detected in enviromental samples. Prior to sample processing, samples are fortified with one or more surrogate compounds.
The reported surrogate recovery value provides a measure of method efficiency. The Laboratory control limits are determined under column heading D.L.
mg/kg (units) - unit of concentration based on mass, parts per million
mg/L (units) - unit of concentration based on volume, parts per million
< - Less than
D.L. - Detection Limit
N/A - Result not available. Refer to qualifier code and definition for explanation

Test results reported relate only to the samples as received by the laboratory.
UNLESS OTHERWISE STATED, ALL SAMPLES WERE RECEIVED IN ACCEPTABLE CONDITION.
UNLESS OTHERWISE STATED, SAMPLES ARE NOT CORRECTED FOR CLIENT FIELD BLANKS.
Although test results are generated under strict QA/QC protocols, any unsigned test reports, faxes, or emails are considered preliminary.

ALS Laboratory Group has an extensive QA/QC program where all analytical data reported is analyzed using approved referenced procedures followed by checks and reviews by senior managers and quality assurance personnel. However, since the results are obtained from chemical measurements and thus cannot be guaranteed, ALS Laboratory Group assumes no liability for the use or interpretation of the results.

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Calgary, AB #2 - 21 Highfield Circle SE T2G 5N6 Tel: 403-214-5431 Toll Free: 1-866-722-6231 Fax: 403-214-5430
Burlington, ON 5420 Mainway Drive, Unit 5 L7L 6A4 Tel: 905-331-3111 Toll Free: 1-888-257-3684 Fax: 905-331-4567

CHAIN OF CUSTODY FORM

PAGE 1 OF 1

SEND REPORT TO:

CLIENT: EBA Engineering ATTN.: K. Johnston
ADDRESS: 6-151 Industrial Road
CITY: Whitehorse PROV.: YT POSTAL CODE: Y1A 2V3
TELEPHONE: 8676682071 FAX: 8676684349 SAMPLER: K. Johnston
PROJECT NAME & NO.: Whitehorse Copper QUOTE NO.:
PO NO.: 1260009 ALS CONTACT: Can Dang
REPORT FORMAT: ☐ HARDCOPY ☒ EMAIL - ADDRESS: ksjohnstone@eba.ca
L48107 ☐ FAX ☐ EXCEL ☐ PDF ☐ OTHER:

FOR LAB USE ONLY	SAMPLE IDENTIFICATION	DATE / TIME COLLECTED YYYY-MM-DD	TIME	MATRIX	ANALYSIS REQUESTED: Full DW PACKAGE	NOTES (sample specific comments, due dates, etc.)
	TW01-06	2006-10-18	1:30 pm	GW	X	
	TW03-06	2006-10-20	5pm	GW	X	
	TW05-06	2006-10-24	4pm	GW	X	

TURN AROUND REQUIRED: ☐ ROUTINE ☐ RUSH - SPECIFY DATE: _____ (surcharge may apply)

SEND INVOICE TO: ☐ SAME AS REPORT INVOICE FORMAT: ☐ HARDCOPY ☐ PDF ☐ FAX
☐ DIFFERENT FROM REPORT (provide details below)

SPECIAL INSTRUCTIONS:

RELINQUISHED BY:	DATE	RECEIVED BY:	DATE Oct 26
	TIME	Mel-B	TIME 1:18
RELINQUISHED BY:	DATE	RECEIVED BY:	DATE
	TIME		TIME

FOR LAB USE ONLY

COOLER SEAL INTACT? ☒ YES ☐ NO ☐ N/A
SAMPLE TEMPERATURE: 6 °C FROZEN? ☐ YES ☒ NO
COOLING METHOD? ☒ ICEPACKS ☐ ICE ☐ NONE

SEE WHITEPAPER FOR SOURCE VERSIONR_08

ALS COPY

ALS Environmental

ANALYTICAL REPORT

EBA ENGINEERING CONSULTANTS LTD.
ATTN: KATHERINE JOHNSTON

Reported On: 16-NOV-06 06:18 PM

CALCITE BUSINESS CENTRE
UNIT 6 - 151 INDUSTRIAL ROAD
WHITEHORSE YT Y1A 2V3

Lab Work Order #: L450018 **Date Received:** 01-NOV-06

Project P.O. #:
Job Reference: WHITEHORSE COPPER 1260009
Legal Site Desc:
CofC Numbers: 31314

Other Information:

Comments:

Joyce Chow
General Manager, Vancouver

For any questions about this report please contact your Account Manager:

CAN DANG

ALS Canada Ltd.
Part of the **ALS Laboratory Group**
1988 Triumph Street, Vancouver, BC V5L 1K5
Phone: +1 604 253 4188 Fax: +1 604 253 6700 www.alsglobal.com
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ALS LABORATORY GROUP ANALYTICAL REPORT

		Sample ID	L450018-1	L450018-2			
		Description					
		Sampled Date	26-OCT-06	30-OCT-06			
		Sampled Time	16:45	12:00			
		Client ID	TW02-06	TW04-06			
Grouping	Analyte						
WATER							
Physical Tests	Hardness (as CaCO3) (mg/L)		241	206			
	Colour, True (CU)		<5.0	<5.0			
	Conductivity (uS/cm)		561	462			
	pH (pH)		7.99	8.22			
	Total Dissolved Solids (mg/L)		359	295			
	Turbidity (NTU)		3.75	0.63			
Anions and Nutrients	Alkalinity, Total (as CaCO3) (mg/L)		255	220			
	Chloride (Cl) (mg/L)		6.18	0.78			
	Fluoride (F) (mg/L)		0.122	0.141			
	Sulfate (SO4) (mg/L)		65.2	52.3			
	Nitrate (as N) (mg/L)		<0.0050	<0.0050			
	Nitrite (as N) (mg/L)		<0.0010	<0.0010			
Total Metals	Aluminum (Al)-Total (mg/L)		0.025	0.011			
	Antimony (Sb)-Total (mg/L)		<0.00050	<0.00050			
	Arsenic (As)-Total (mg/L)		0.00042	0.00019			
	Barium (Ba)-Total (mg/L)		<0.020	0.029			
	Boron (B)-Total (mg/L)		<0.10	<0.10			
	Cadmium (Cd)-Total (mg/L)		<0.00020	<0.00020			
	Calcium (Ca)-Total (mg/L)		51.8	44.2			
	Chromium (Cr)-Total (mg/L)		0.0024	<0.0020			
	Copper (Cu)-Total (mg/L)		0.0031	0.0070			
	Iron (Fe)-Total (mg/L)		0.720	0.178			
	Lead (Pb)-Total (mg/L)		0.0029	<0.0010			
	Magnesium (Mg)-Total (mg/L)		27.2	23.3			
	Manganese (Mn)-Total (mg/L)		0.367	0.114			
	Mercury (Hg)-Total (mg/L)		<0.00020	<0.00020			
	Potassium (K)-Total (mg/L)		2.06	2.38			
	Selenium (Se)-Total (mg/L)		<0.0010	<0.0010			
	Sodium (Na)-Total (mg/L)		35.6	27.0			
	Uranium (U)-Total (mg/L)		0.0527	0.00998			
	Zinc (Zn)-Total (mg/L)		0.413	<0.050			

Reference Information

Methods Listed (if applicable):

ALS Test Code	Matrix	Test Description	Analytical Method Reference(Based On)
ALK-COL-VA	Water	Alkalinity by Colourimetric (Automated)	APHA 310.2

This analysis is carried out using procedures adapted from EPA Method 310.2 "Alkalinity". Total Alkalinity is determined using the methyl orange colourimetric method.

ANIONS-CL-IC-VA	Water	Chloride by Ion Chromatography	APHA 4110 "Determination of Anions by IC

This analysis is carried out using procedures adapted from APHA Method 4110 "Determination of Anions by Ion Chromatography" and EPA Method 300.0 "Determination of Inorganic Anions by Ion Chromatography". Anions are determined by filtering the sample through a 0.45 micron membrane filter and injecting the filtrate onto a Dionex IonPac AG18 anion exchange column with a hydroxide eluent stream. Anions routinely determined by this method include: bromide, chloride, fluoride, nitrate, nitrite and sulphate.

ANIONS-F-IC-VA	Water	Fluoride by Ion Chromatography	APHA 4110 "Determination of Anions by IC

This analysis is carried out using procedures adapted from APHA Method 4110 "Determination of Anions by Ion Chromatography" and EPA Method 300.0 "Determination of Inorganic Anions by Ion Chromatography". Anions are determined by filtering the sample through a 0.45 micron membrane filter and injecting the filtrate onto a Dionex IonPac AG18 anion exchange column with a hydroxide eluent stream. Anions routinely determined by this method include: bromide, chloride, fluoride, nitrate, nitrite and sulphate.

ANIONS-NO2-IC-VA	Water	Nitrite by Ion Chromatography	APHA 4110 "Determination of Anions by IC

This analysis is carried out using procedures adapted from APHA Method 4110 "Determination of Anions by Ion Chromatography" and EPA Method 300.0 "Determination of Inorganic Anions by Ion Chromatography". Anions are determined by filtering the sample through a 0.45 micron membrane filter and injecting the filtrate onto a Dionex IonPac AG18 anion exchange column with a hydroxide eluent stream. Anions routinely determined by this method include: bromide, chloride, fluoride, nitrate, nitrite and sulphate.

ANIONS-NO3-IC-VA	Water	Nitrate by Ion Chromatography	APHA 4110 "Determination of Anions by IC

This analysis is carried out using procedures adapted from APHA Method 4110 "Determination of Anions by Ion Chromatography" and EPA Method 300.0 "Determination of Inorganic Anions by Ion Chromatography". Anions are determined by filtering the sample through a 0.45 micron membrane filter and injecting the filtrate onto a Dionex IonPac AG18 anion exchange column with a hydroxide eluent stream. Anions routinely determined by this method include: bromide, chloride, fluoride, nitrate, nitrite and sulphate.

ANIONS-SO4-IC-VA	Water	Sulfate by Ion Chromatography	APHA 4110 "Determination of Anions by IC

This analysis is carried out using procedures adapted from APHA Method 4110 "Determination of Anions by Ion Chromatography" and EPA Method 300.0 "Determination of Inorganic Anions by Ion Chromatography". Anions are determined by filtering the sample through a 0.45 micron membrane filter and injecting the filtrate onto a Dionex IonPac AG18 anion exchange column with a hydroxide eluent stream. Anions routinely determined by this method include: bromide, chloride, fluoride, nitrate, nitrite and sulphate.

COLOUR-TRUE-VA	Water	Colour (True) by Spectrometer	APHA 2120 "Color"

This analysis is carried out using procedures adapted from APHA Method 2120 "Color". Colour (True Colour) is determined by filtering a sample through a 0.45 micron membrane filter followed by analysis of the filtrate using the platinum-cobalt colourimetric method. Aparent Colour is determined without prior sample filtration. Colour is pH dependent. Unless otherwise indicated, reported colour results pertain to the pH of the sample as received, to within +/- 1 pH unit.

EC-PCT-VA	Water	Conductivity (Automated)	APHA 2510 Auto. Conduc.

This analysis is carried out using procedures adapted from APHA Method 2510 "Conductivity". Conductivity is determined using a conductivity electrode.

HARDNESS-CALC-VA	Water	Hardness	APHA 2340B

Hardness is calculated from Calcium and Magnesium concentrations, and is expressed as calcium carbonate equivalents.

HG-TOT-DW-CVAFS-VA	Water	Total Mercury in Water by CVAFS	EPA 245.7

This analysis is carried out using procedures adapted from "Standard Methods for the Examination of Water and Wastewater" published by the American Public Health Association, and with procedures adapted from "Test Methods for Evaluating Solid Waste" SW-846 published by the United States Environmental Protection Agency (EPA). The procedure involves a cold-oxidation of the acidified sample using bromine monochloride prior to reduction of the sample with stannous chloride. Instrumental analysis is by cold vapour atomic fluorescence spectrophotometry (EPA Method 245.7).

MET-TOT-DW-ICP-VA	Water	Total Metals in Water by ICPAES	EPA SW-846 3005A/6010B

This analysis is carried out using procedures adapted from "Standard Methods for the Examination of Water and Wastewater" published by the American Public Health Association, and with procedures adapted from "Test Methods for Evaluating Solid Waste" SW-846 published by the United States Environmental Protection Agency (EPA). The procedure involves preliminary sample treatment by acid digestion, using either hotblock or microwave oven (EPA Method 3005A) and analysis by inductively coupled plasma - optical emission spectrophotometry (EPA Method 6010B).

Reference Information

MET-TOT-DW-MS-VA Water Total Metals in Water by ICPMS EPA SW-846 3005A/6020

This analysis is carried out using procedures adapted from "Standard Methods for the Examination of Water and Wastewater" published by the American Public Health Association, and with procedures adapted from "Test Methods for Evaluating Solid Waste" SW-846 published by the United States Environmental Protection Agency (EPA). The procedures may involve preliminary sample treatment by acid digestion, using either hotblock or microwave oven (EPA Method 3005A). Instrumental analysis is by inductively coupled plasma - mass spectrometry (EPA Method 6020).

PH-PCT-VA Water pH by Meter (Automated) APHA 4500-H "pH Value"

This analysis is carried out using procedures adapted from APHA Method 4500-H "pH Value". The pH is determined in the laboratory using a pH electrode

TDS-VA Water Total Dissolved Solids by Gravimetric APHA 2540 Gravimetric

This analysis is carried out using procedures adapted from APHA Method 2540 "Solids". Solids are determined gravimetrically. Total dissolved solids (TDS) are determined by filtering a sample through a glass fibre filter, TDS is determined by evaporating the filtrate to dryness at 180 degrees celsius.

TURB-MET-VA Water Turbidity by Meter APHA 2130 "Turbidity"

This analysis is carried out using procedures adapted from APHA Method 2130 "Turbidity". Turbidity is determined by the nephelometric method.

** Laboratory Methods employed follow in-house procedures, which are generally based on nationally or internationally accepted methodologies.
The last two letters of the above ALS Test Code column indicate the laboratory that performed analytical analysis for that test. Refer to the list below:

Laboratory Definition Code	Laboratory Location	Laboratory Definition Code	Laboratory Location
VA	ALS LABORATORY GROUP - VANCOUVER, BC, CANADA		

GLOSSARY OF REPORT TERMS
Surr - A surrogate is an organic compound that is similar to the target analyte(s) in chemical composition and behavior but not normally detected in enviromental samples. Prior to sample processing, samples are fortified with one or more surrogate compounds.
The reported surrogate recovery value provides a measure of method efficiency. The Laboratory control limits are determined under column heading D.L. (Detection Limit)
mg/kg (units) - unit of concentration based on mass, parts per million
mg/L (units) - unit of concentration based on volume, parts per million
N/A - Result not available. Refer to qualifier code and definition for explanation

Test results reported relate only to the samples as received by the laboratory.
UNLESS OTHERWISE STATED, ALL SAMPLES WERE RECEIVED IN ACCEPTABLE CONDITION.
UNLESS OTHERWISE STATED, SAMPLES ARE NOT CORRECTED FOR CLIENT FIELD BLANKS.
Although test results are generated under strict QA/QC protocols, any unsigned test reports, faxes, or emails are considered preliminary.

ALS Laboratory Group has an extensive QA/QC program where all analytical data reported is analyzed using approved referenced procedures followed by checks and reviews by senior managers and quality assurance personnel. However, since the results are obtained from chemical measurements and thus cannot be guaranteed, ALS Laboratory Group assumes no liability for the use or interpretation of the results.

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CHAIN OF CUSTODY FORM

L460018

PAGE _____ OF _____

SEND REPORT TO:

CLIENT: EBA ENGINEERING CONSULTANTS LTD
ADDRESS: 6-151 INDUSTRIAL ROAD
CITY: WHITEHORSE PROV.: YT POSTAL CODE: Y1A 2V3
TELEPHONE: 8676682071 FAX: 8676684349 CONTACT: K Johnston
PROJECT NAME & NO.: Whitehorse Comm 1260009 SAMPLER: KSJ
QUOTE NO.: _____ PO NO.: _____ ALS CONTACT: C. Dan
REPORT FORMAT: ☐ HARDCOPY ☒ EMAIL - ADDRESS: ksjohnston@eba.ca
☐ FAX ☐ EXCEL ☐ PDF ☐ OTHER: _____

ANALYSIS REQUESTED:

FOR LAB USE ONLY	SAMPLE IDENTIFICATION	DATE / TIME COLLECTED YYYY-MM-DD	TIME		FULL DW PACKAGE	NOTES (sample specific comments, due dates, etc.)
	TW02-06	2006-10-26	445		X	
	TW04-06	2006-10-30	1200	GW	X	

TURN AROUND REQUIRED: ☐ ROUTINE ☐ RUSH - SPECIFY DATE: _____ (surcharge may apply)

SEND INVOICE TO: ☐ SAME AS REPORT **INVOICE FORMAT:** ☐ HARDCOPY ☐ PDF ☐ FAX
☐ DIFFERENT FROM REPORT (provide details below)

SPECIAL INSTRUCTIONS:

RELINQUISHED BY:	DATE / TIME	RECEIVED BY:	DATE / TIME
			DATE Jan 1
			TIME 722
RELINQUISHED BY:	DATE / TIME	RECEIVED BY:	DATE / TIME

FOR LAB USE ONLY

COOLER SEAL INTACT?	SAMPLE TEMPERATURE	COOLING METHOD?
☐ NO ☐ N/A	5 °C	☒ ICEPACKS ☐ ICE ☐ NONE
	FROZEN? ☐ YES ☒ NO	

ALS COPY

SEE WHITEPAPER FOR SOURCE VERSIONR_07