Hydrogeological Assessment

Appendix D

Whitesand First Nation
Cogeneration and Pellet Mill Project

Hydrogeological Assessment

Prepared By:

Neegan Burnside Ltd.
292 Speedvale Avenue West Unit 20 Guelph ON N1H 1C4

Prepared for:

Sagatay Cogeneration LP, with its General Partner, Sagatay Cogeneration Ltd., and Whitesand First Nation as agent

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1.0 Introduction

Neegan Burnside Ltd. (Neegan Burnside) was retained by the Whitesand First Nation to assist with the development of a Cogeneration Plant and Pellet Mill to be located near Armstrong, Ontario. Part of the work involved securing a water source which can meet the demands of the plant and the associated facilities.

A desktop study of the water demand and a preliminary hydrogeological assessment was completed by Neegan Burnside in July 2012. The desktop study indicated that a water supply with a capacity of approximately 341 L/min (75 Igpm) was required for the proposed facility and that the overburden sand and gravel could possibly provide a suitable water source.

In 2013, wells were drilled and a testing program was completed in order to assess the hydrogeological conditions and the suitability of groundwater as a water source for the site. A draft report was prepared to document these activities. In 2014, a survey was completed to provide accurate elevations of the wells installed in 2013 and other features. This report details the drilling and testing programs and the hydrogeological conditions at the site. It has been updated to include information on groundwater flow that was refined following the site survey.

According to the Technical Guide to Renewable Energy Approvals (MOE, 2013), for water takings over 50,000 L/day, if the water taking is part of a project subject to the Renewable Energy Approval, the water taking does not require a separate Permit to Take Water (PTTW) under the Ontario Water Resources Act. However, the Application for Renewable Energy Approval must contain the information/assessments that would normally be required in respect of a PTTW application. This report is in support of an Application for Renewable Energy Approval of the Whitesand First Nation Cogeneration and Pellet Mill Project, where water takings are expected to exceed 50,000 L/day for the life of the Project.

1.1 Site

The study site is approximately 35 ha in area and is located approximately 2 km south of Armstrong, Ontario (**Figures 1** and **2**). It is currently Crown owned land in an unorganized territory, administered by the Ministry of Natural Resources (MNR). The site was used for a garage, fuel storage, office and possible wood storage, commencing in approximately 1989 under a Land Use Permit. The permit was later amended to include a trailer camp. The site is currently not in use.

2.0 Regional Hydrogeologic Setting

2.1 Overburden Geology

The present day topography and surficial geology of the Armstrong area are primarily a result of the most recent series of glacial advances, known as the Wisconsinan glaciations (**Figure 3**). The advance and retreat of glaciers during this period resulted in the creation of various overburden formations.

The area surrounding the community of Armstrong is predominantly exposed bedrock locally covered by a thin mantle of surficial material with dispersed bedrock knobs. The community itself is built on a glacial outwash plain in a buried bedrock valley, consisting of sand and gravel that is thicker than most of the area, which extends for approximately 40 km in a general northeast – southwest orientation (Zoltai, 1965). Thinly covered or exposed bedrock predominates the area to the west of Armstrong with a glaciolacustrine plain consisting of silty sand deposits commonly found to the east (immediately north of Lake Nipigon).

Review of the surficial geology of the area indicates that Armstrong is located on the northeastern edge of an area of glaciofluvial outwash sand and gravel, which extends approximately 25 km south of the community (MNDM Map 2554) and to Waweig and Bukemiga Lakes. A similar area of outwash occurs to the northeast of Armstrong, which extends for approximately 12 km. These areas are mapped as sandy outwash plains, with sporadic occurrences of bedrock knobs. Both of these areas of sand and gravel outwash deposits are a maximum of 5 km wide. Modern alluvial deposits are also mapped in the area.

The overburden thickness in the Armstrong area was estimated as part of the Armstrong groundwater study (AGS) completed by R.J. Burnside & Associates Limited in 2005 (Burnside, 2005). Data generated by the study indicates that the overburden thickness within the Armstrong area is typically greater than 10 m with some areas in the 3 m to 10 m range. The thicker overburden areas follow a horseshoe shape between MacKenzie Lake and Red Granite Lake around an area identified as a bedrock knob. This orientation corresponds to the material that is identified on the geological mapping as glacial outwash plains.

2.2 Bedrock Geology

Based on review of available mapping, the bedrock in the area is primarily comprised of felsic plutonic rocks, which are locally covered by Nipigon sills of diabasic composition. The mapping also indicates that the above noted granites underlie the area immediately around Armstrong with small areas of Sibley Group sedimentary rocks, and sheets of

diabase typical of that found around Thunder Bay and Lake Nipigon present approximately 2 km southeast of the community. A greenstone belt, which typically hosts large thicknesses of volcanic and weathered volcanic rock, occurs approximately 25 km north of the Armstrong community at Caribou Lake.

Figure 4 includes bedrock elevation data from the Armstrong Groundwater Management and Protection Study (Burnside, 2005). This figure shows that the bedrock elevation virtually mirrors the surface elevation; with bedrock highs occurring in the regions of high elevations and correspondingly lower in the regions of topographical lows. This indicates that a bedrock valley feature is present in the area of Armstrong as described above. The depth to bedrock is shown in Figure 5 using the geologic descriptions from the wells drilled on-site. This cross section indicates a defined bedrock valley in the area of TW2-13.

A more detailed assessment of the bedrock topography is included as Figure 6. This map re-interprets the 2005 data to include the wells drilled at the study site. This data indicates that within the mapped deposit of outwash sand and gravel there is a more defined deeper valley where the depth to the bedrock exceeds 25 m. This valley is interpreted to extend from the study site to Mackenzie Lake. The relatively low permeability of the bedrock is interpreted to control the groundwater flow.

A series of wells were drilled for the Mackenzie Lake Lodge about 1,000 m southwest of the study site in 1999. These wells show a similar trend of depth to bedrock and support the interpretation of the deeper bedrock valley within the larger bedrock depression. Well records for these wells show variation in depth to the bedrock from 18 to 30 m over a distance of less than 100 m.

2.3 Groundwater

The glaciofluvial outwash deposits of sand and gravel contains groundwater that supplies the communal wells in Armstrong (Figure 2). The sand and gravel material that forms the glaciofluvial deposits is the source of on-site groundwater and the material where treated wastewater will be discharged. Although well records for the area indicate that there are occasional layers of lower permeability silty sands, the lower permeability layers may create local semi-confined conditions within the aquifer, but in general, there are no regional low permeability layers that protect the aquifer and none were observed during on-site drilling. Since there are no regional layers of lower permeability, the aquifer is considered to be unconfined. Groundwater recharge within the aquifer occurs through a relatively high rate direct infiltration of precipitation, and recharge from surface streams and wetlands flowing from the topographic highs. Groundwater discharge areas occur within the productive sediments where streams are fed by base flow along the topographic lows.

Based on the presence of the bedrock knobs, the thickness of the outwash deposits varies significantly. A review of Ministry of the Environment (MOE) water well records and on-site wells indicates that the depth to bedrock ranges from 0 to over 30 m below ground surface beneath the area mapped as outwash sand and gravel. The on-site variation is significant over relatively short distances, as seen in Cross Section A-A.' **(Figure 5**).

Based on the 2005 AGS, the groundwater in the area of the study site is interpreted to flow from the northwest and southeast towards the outwash sand and gravel. Flow within the outwash deposits in the bedrock valley was interpreted based on the surface water levels in the surrounding water bodies, Hoodoo Creek and the water levels measured in the on-site wells and the MOE water well database. This information is shown in Figure 7.

Figure 7 indicates that the study site is located close to or on a groundwater divide within the buried bedrock valley. Groundwater beneath the site is interpreted to move toward the centre of the bedrock valley and then to the southwest toward Mackenzie Lake. This flow is interpreted to be directed by the bedrock surface. The groundwater beneath the area northeast of the site is interpreted to be flowing to the northeast towards Red Granite Lake.

A well head protection area (WHPA) was developed for the Armstrong Community wells during the 2005 groundwater study. This WHPA was developed based on a semi-analytic approach to calculating the time of travel (TOT) for groundwater within the overburden aquifer to the well. The capture zones represent the surface expression of areas within the aquifer that contribute water to the well. For the Armstrong Community wells it was determined that: i) the WHPA extended in a south-westerly direction from the area of the D&L Estates to MacKenzie Lake; and ii) the TOT for water migrating into the wells was generally less than 2 years. Based on the outline of the WHPA provided in the groundwater study, it is interpreted that the study site falls outside of the Armstrong Community WHPA.

Considering the groundwater flow interpreted for the study site, it is unlikely that the capture areas for the Armstrong Wells extend to Mackenzie Lake. It is more likely that the capture area spreads to the north and south east of the groundwater divide.

3.0 Site Characteristics

The site is located approximately 2 km south of Armstrong on a topographic high as shown on **Figure 3**. The majority of the site itself is relatively flat and the land slopes slightly down to the northeast. To the north, the land is also flat, but to the south the land falls sharply to a northeast-southwest trending valley which contains several surface water features.

There is no surface water on the site. The ground surface is comprised completely of sand, gravel and cobbles and a significant portion of the site has been cleared, reducing the amount of vegetation, therefore infiltration potential is considered significant and as a result there is little or no pooling or runoff of precipitation. Bedrock is not exposed but cobbles and boulders are visible. A test pit program completed in July 2013 confirms that the shallow soils are predominantly sand and gravel. A geotechnical study was completed in March 2014 and confirms the stratigraphy described above. The Borehole and Test pit locations are shown on **Figure 2** and the logs are included in **Appendix A.**

An existing drilled well, called TW3-90 **(Figure 2**), is present on the site in the centre of the existing cleared area. This well was used for water supply when the site was in operation but the pump is no longer in the well. There are two other water supply wells located within 500 m of the study site, one at the Highway 527 maintenance yard and the other at the Hydro One generating station (**Figure 2**). Both wells are used to supply the relatively low demand for washrooms and vehicle washing at both facilities. Large pressure tanks were observed by Burnside staff at the Highway 527 maintenance yard operated by Carillion, these tanks indicate that the well is likely of low capacity and completed in the bedrock.

We note that the staff at the road maintenance yard indicated that a hydrogeological study had been completed at the site and monitoring was in place at several monitoring wells to ensure that salt contamination was not occurring in the area of the covered salt storage. Two Monitor wells labeled on Figures as MTO-MW1 and MTO-MW2 are located 300 m west and 50 m south of TW2-13, respectively. A report was completed in 2004 by Ecoplans as part of a Phase I and II Environmental Site Assessment for the road maintenance yard. A water well record that corresponds to MTO-MW1, dated 2008 is included in Appendix A and was used to create cross section A-A. The work completed on the MTO site was not made available to the project team but is likely available to MOE staff.

4.0 Drilling Program

A water well drilling rig operated by Mel's Well Drilling of Emo, Ontario was mobilized to the site on Thursday, May 2, 2013. The temperatures during drilling ranged from-10 to 0 degrees Celsius and there was still at least 0.3 m of snow pack. All of the ponds in the area of the site were frozen.

Three test wells were advanced (TW1-13, TW2-13 and TW3-13) using an air rotary rig equipped with a casing hammer. The rig advanced 20 foot (6.10 m) sections of steel casing which were 15.2 cm in diameter. The plain end casing was welded together as the casing was advanced through the overburden. The well locations are shown on Figure 2 and MOE water well records are included in **Appendix A**.

4.1 TW1-13

TW1-13 was drilled at the north corner of the existing cleared site (**Figure 2**). Casing was advanced to the bedrock which was present at 21.64 metres below ground surface (mbgs). Coarse sand and gravel was encountered from ground surface down to the bedrock. The sand and gravel was essentially unsaturated as the static water level was at approximately 21 m, leaving less than 1 m of water sitting above the bedrock surface. As a result, no well screen was installed. The casing was left in place as a monitoring well with a set bolt water well cap.

4.2 TW2-13

TW2-13 was drilled at the opposite corner of the site (**Figure 2**). Bedrock at this location was encountered at 36.88 mbgs. The overlying sediments are comprised of sand and gravel which was similar to that found at TW1-13. Static water level in the well was measured at approximately 28 mbgs on the day after drilling was completed, indicating a saturated thickness of approximately 9 m. It is interpreted that TW2-13 is constructed within a relatively localized bedrock valley.

A section of continuously wound stainless steel screen of length 1.52 m (5 ft) with a 1.27 mm slot opening (50 slot) was installed from 37.80 mbgs to 36.27 mbgs. The screen was installed across the bedrock/overburden contact and opposite 1.2 m of the sand and gravel. The screen slot size was chosen based on the relatively coarse gradation of the sediments encountered during drilling. Following the installation of the screen the well was developed by airlift pumping and surging at rates in excess of 7.6 L/s (100 Igpm). The development process was completed for approximately one hour to remove the fines in the area surrounding the well screen. The well was then pumped using a temporary submersible pump at a rate of 1.9 L/s (25 Igpm) for 1 hour during which time the water level dropped by only 0.01 m.

4.3 TW3-13

A third well, TW3-13, was advanced northwest of TW2-13 in an attempt to encounter the same conditions found at TW2-13. However, bedrock at this location was found at 19.2 mbgs and no significant saturated thickness of sand and gravel was present. The static water level was at 18.6 m, so similar to TW1-13 there was only a thin layer of water on the bedrock surface. The overburden found at this location was similar to the other two locations. No well screen was installed at this location but the open ended casing was left in place as a monitor well with a set bolt well cap.

4.4 TW3-90

The previously existing well on the property was named TW3-90. Very little is known about this well except that it was completed prior to 2000. Although there is no water well record for the well, the driller for Mel's Wells indicated that he had drilled the well with a previous employer. He indicated that the well has a 150 mm diameter casing that extends to a depth of approximately 20 m after which a combination of 125 mm casing and an open bedrock hole extend to a depth of approximately 29 m.

A summary of the on-site wells and static levels is provided in the following table.

Table 4.1 Wells Drilled On Site

	Grade Elevation (m amsl)	Depth (m)	May Static Water Level (m bmp)	July Static Water Level (m bmp)	August 20 Static Water Level (m bmp)
TW1-13	361.44	22.86	22.49	21.81	22.05
TW2-13	361.33	37.80	26.51	25.08	25.65
TW3-13	361.84	19.94	-	19.20	20.10
TW3-90	360.88	29.00	25.63	23.98	24.61
DP	336.85	0.4	-	0.50	0.49

m bmp – metres below measuring point

4.5 Drive Point Piezometers

A drive point piezometer was installed in the closest pond located 250 m south of TW2-13 to determine if extracting water would impact the pond. The drive point piezometer was manually driven to a depth of 0.4 m below the pond. Water levels measured following installation indicated a slight upward gradient based on a 0.01 m higher water level in the drive point, as compared to the pond water level outside the drive point. This very slight difference may be due to the method of measurement.

5.0 Well Testing

5.1 TW2-13

TW2-13 was drilled on May 3, 2013. The following day the well was pumped at 1.9 L/s (25 Igpm) for one hour. At the end of the one hour test the water level in the well had dropped only 0.01 m. Because of the absence of suitable formations at TW1-13 and TW3-13 no testing was conducted at these wells.

In July 2013 Neegan staff returned to the site to conduct additional testing of TW2-13. The temperatures during the testing program ranged between 12 and 25ºC and there were several precipitation events during the testing program.

Two tests were conducted – a step test comprising three steps, each 20 minutes long at rates of 2.2, 3.8 and 5.7 L/s (29, 50 and 75 Igpm); and a 72 hour test at a rate of 5.7 L/s (75 Igpm). Data from the tests is included in **Appendix B**. During the testing a temporary pump was installed into TW2-13 with its intake set approximately 31 m bgs. Water was discharged at the well head during the short step test and via a 300 m length of flat lay hose to a depression located north east of TW2-13 during the 72 hour test (**Figure 2**).

Water level monitoring was conducted in on-site wells and piezometers as part of this testing.

5.1.1 Variable Rate (Step) Test

The static water level in the well prior to testing was 25.09 m below the top of the well casing. The variable rate step test was conducted at rates of 2.2, 3.8 and 5.7 L/s for a duration of 20 min/step. The well was pumped continuously with no recovery between steps. **Table 5.1** provides a summary of the water level response during the step test.

Table 5.1 Results of the Variable Rate Test

Step	Pumping Rate		Pumping Water Level (m)	Drawdown (m)	Specific Capacity L/s/m
	USGPM	L/s			
1	35	2.2	25.10	0.01	221
2	60	3.8	25.12	0.03	126
3	90	5.7	25.15	0.06	95

5.1.2 Constant Rate (72 Hour) Test

For the 72 hour test the well was pumped continuously at a rate of 5.7 L/s. Testing was started at 1700 h on July 9, 2013 and continued until 1700 h on July 12, 2013. There was a significant 23 mm precipitation event between 1500 h and 1700 h just before the test started on July 9 and a second 23 mm event about 24 hours after the test ended.

During the 72-hour test water levels at the other on-site wells (TW1-13, TW3-13 and TW3-90) were monitored. Monitoring of the small pond and the drive point 250 m south of TW2-13 was also completed.

No response to pumping TW2-13 was observed at any of the wells during the tests. This was not considered surprising considering the relatively small drawdown in the pumping well and the unconfined condition of the aquifer. Response to the precipitation events was observed in the drive point and pond.

5.2 TW3-90

While on-site for the drilling program in May 2013, TW3-90 was equipped with a submersible pump and pumped at 1.9 L/s with less than 0.5 m of drawdown. It was determined that the well was capable of at least this pumping rate. In July TW3-90 was pumped for one hour at 0.8 L/s (10 Igpm). At the end of the test the water level in the well had dropped only 0.13 m. Samples for general chemistry and Volatile Organics chemical analysis were collected in July at the end of the one hour pumping test. TW3-90 is suitable to be pumped at rates of up to 2 L/s as a supplementary or back-up water source. A video of this well should be completed to confirm the well construction.

6.0 Water Quality Testing

In order to assess water quality at the site, water samples were collected from wells TW2-13 and TW3-90. All samples were analyzed at accredited laboratories and complete results are included in **Appendix C**. A summary of the samples and analyses is shown in **Table 6.1**.

Table 6.1 Summary of Sample Analyses

Well	Date	Sample I.D.	Analysis
TW2-13	May 2013	TW2 #1 TW2 #2	Dissolved metals, PH Anions and Nutrients
	July 2013	TW2-13 (1 hr.) TW2-13 (16 hr.) TW2-13 (72 hr.) TW2-13 (End)	Water Quality Assessment Package (WQA) WQA Glyphosphate, NTA, Benzo (a) pyrene, Bromate, Pesticides, PCBs VOCs (SWDA Sched. 24) Metals and Inorganics (SWDA Sched. 23) WQA
TW3-90	July 2013	TW3-90 TW3-95	VOCs WQA

During the 72 hour test of TW2-13, samples were collected at 1, 16 and 72 hours to determine it water quality changed over time of pumping. TW3-90 was also tested in July 2013 to collect additional samples for chemical analysis.

7.0 Results and Analysis

7.1 Pumping Test Results

The step test indicated that TW2-13 can produce 5.7 L/s on a short term basis. Due to the relatively small drawdown a pumping rate of 5.7 L/s was selected for the long term test. The decline in specific capacity for this well as shown in **Table 5.1** is typical for wells pumping at higher rates and is probably due to an increase in turbulent flow through the well screen at higher pumping rates. The theoretical capacity of TW2-13 is in excess of 20 L/s based on the graph of discharge versus drawdown, which is more than what is typically pumped from a 150 mm diameter production well. A larger diameter well would be required to test at higher pumping rates.

The results of the 72 hour test are summarized as hydrographs for each on-site well completed at two time scales to show the water level variations during the test and over the spring and summer of 2013. The hydrographs indicate that a pumping rate of 5.7 L/s establishes equilibrium conditions in TW2-13 at 0.06 m of drawdown after less than 5 min of pumping.

The hydrograph for TW1-13 shows a gradual decline of 0.03 m that is interpreted to be a long term trend and not response to pumping as it continued after the test was complete.

The hydrograph of TW3-13 shows a sudden decline in water levels due to a short pumping test that was completed to determine if the water level was representative of the aquifer in the area, as it was significantly above the TW2-13 water level. Less than 20 L of water was removed from the well because of its low capacity. It is interpreted that the water level at TW3-13 is a local water table sitting within a slight localized depression in the bedrock surface. TW3-13 should be abandoned as part of the permanent site works as it is not a representative water level monitoring location related to the water taking at TW2-13.

There was no change in water level at TW3-90 throughout the test. This well is interpreted to be completed in a similar formation as TW2-13 due to its relatively high capacity when it was pumped.

There was a slight decline in water level in the drive point piezometer and pond located south of TW2-13 (**Figure 2**). Water level fluctuations in these locations did not show a strong correlation to pumping. This pond and drive point water levels were interpreted to have risen after a 23 mm rainfall event that occurred just prior to the start of the pumping test. The water levels declined during the test and then a similar 23 mm rainfall on July 13, 2013 caused a 0.02 m rise in the pond and a 0.01 m rise in the drive point water

level. The water level variations are attributed to precipitation events and not the pumping test.

The lack of response in the monitor wells during the test is not unexpected given the minimal drawdown of 0.06 m at TW2-13. The unconfined sand and gravel overburden is highly permeable therefore any drawdowns associated with pumping are expected to be even more insignificant at distance than the 0.06 m noted in the pumping well.

7.2 Aquifer Characteristics

There are two distinct units at the site: i) an overburden layer of relatively permeable sand and gravel and ii) the underlying relatively impermeable granitic bedrock. The materials observed in test pits were also observed to continue to the bedrock at the well drilling locations. The grain size analyses for the sediments sampled in the test pits were described as granular 'B' gravel (**Appendix A**).

Precipitation infiltrates into the coarse sand and gravel and moves down to collect on the bedrock surface. The elevation of the bedrock surface can vary over short distances as observed at TW2-13 and TW3-13 where the wells are less than 150 m apart and have a bedrock elevation difference of approximately 18 m. Bedrock topography at the site therefore determines the saturated thickness of the overburden layer which in turn determines the capacity of a well-constructed into this layer.

A cross-section was prepared to correlate the information from MTO-MW1, TW2-13 and TW3-13 and the surrounding area. It is included as **Figure 5**. It shows the location of the wells and the interpreted bedrock surface. This shows that the isolated bedrock valley encountered by TW2-13 is partially evident on the regional mapping however TW2-13 indicates a deeper than expected bedrock valley. The bedrock surface included in **Figure 4** was improved to include the test wells and a localized bedrock topography map is included as **Figure 6**.

The overburden is considered an unconfined aquifer that exhibits a relatively high hydraulic conductivity and relatively high infiltration rates. The water level in TW2-13 is similar to that in the pond south of the site (**Figure 5 and 7**). It is interpretted that the ponds to the south of TW2-13 are surface expressions of the groundwater present in the sand and gravel above the bedrock.

Time versus drawdown data was not available to estimate the aquifer characteristics. A ratio ($T\ [m^2/d]=1.2SC[m^3/d/m]$) between Specific Capacity and Transmissivity has been developed by Mr. Chris Neville, P.Geo. (Neville, 2007) for wells in Ontario. This builds on previous similar estimations (Driscoll, 1986). Using this method of estimation we calculated the Transmissivity of the aquifer to be approximately 9,850 m^3/d. This

extremely high transmissivity is consistent with the clean sand and gravel observed on-site and the relatively small drawdown observed during testing. The aquifer is approximately 10 m thick in the area of TW2-13. A hydraulic conductivity of 985 m/d or 1×10^{-2} m/s can be calculated. This is consistent with estimates for gravel. (Cherry, 1979) and a Hazen analysis for the sand and gravel sampled in the test pits using an effective size (10% retained) of 1 mm which also results in the hydraulic conductivity of 1×10^{-2} m/s.

The area influenced by pumping TW2-13 will occur within the buried bedrock valley. It will be confined to an area of less than 200 m based on the lack of response at TW3-90. Theoretical calculations of the drawdown cone based on a transmissivity of 9,850 m^2/day, a maximum storativity of 0.3 for an unconfined aquifer and stable water levels in less than one minute, results in a theoretical drawdown cone that is less than 100 m.

The proposed water taking of 5.7 L/s (492 m^3/d or 179,878 m^3/yr) will be sustained by relatively local recharge into the unconfined aquifer. In order to assess the sustainability of the water taking an estimation of infiltration rate can be used to estimate the area required to sustain the water pumped from the unconfined aquifer. A local infiltration rate can be conservatively estimated at 0.25 m/yr for the sand and gravel overburden. An area of about 72 ha or a circular area around the well with a radius of 478 m would be required to provide the infiltration to recharge the proposed water taking. Both the pumping test water level data and recharge calculations indicate that the water taking will cause only localized impacts. As a result the nearby MTO and Hydro yard wells and the more distant Town of Armstrong Wells will not be impacted by pumping at TW2-13.

We note that the unconfined nature of the aquifer over the bedrock will result in variations in water level during the year. Water levels were measured between May and August 20, 2013 to determine the level of variation. The water levels are included in **Table 4.1** and are shown on the long term hydrographs (**Appendix B**).

The original low water levels measured in May are interpreted to represent the end of the winter period when there is very little infiltration because the ground is frozen. Water levels in July are 1.43 m higher than in May. This rise in water levels is interpreted to be due to the spring thaw and recharge to the unconfined aquifer at TW2-13. The water levels observed are likely indicative of a typical annual water level variation. Water levels in August show a continued slow water level decline towards the low observed in May. This amount of water level variation will not adversely impact the TW2-13 water supply.

The permeable nature of the aquifer sediments and its unconfined nature result in the aquifer being very susceptible to contamination. As documented in the Burnside 2005

report, several episodes of contamination have been reported in the area. It is also assumed based on the site hydrogeology that TW2-13 should be considered to be groundwater under direct influence of surface water (GUDI). In order to safe guard the quality of water in the well and aquifer it will be important to manage all potential contaminants on-site. In light of this it is suggested that chemical storage facilities and waste management systems proposed for this site should be designed to ensure that spills or releases cannot readily migrate into the subsurface and negatively affect the water quality of the aquifer.

The proposal for this development includes the on-site disposal of effluent. Details of the quality of effluent are included in the Effluent Management Plan Report under a separate cover. The concentration of organics, inorganics and metals in the effluent will be within Ontario Drinking Water Quality Standards (ODWQS) prior to release to the subsurface. If the effluent does not meet ODWQS for bacteria, the bacteria will be removed via soil treatment in the leaching bed, where a distance of 30 cm (1 ft) of soil can provide a 3 log reduction in bacterial numbers. A properly functioning leaching bed will remove 99 to 100% of bacteria in the effluent. Additional treatment of the organics, inorganics and metals will occur in the subsurface to further decrease their concentrations.

Figure 2 shows the interpreted direction of groundwater flow away from the leaching bed. It is interpreted that effluent will move downward through over 15 m of unsaturated sand and gravel overburden and then laterally with the groundwater flow into the bedrock valley and then toward Mackenzie Lake. TW2-13 draws water from the same unconfined aquifer; however, based on the interpreted groundwater flow direction, the effluent plume from the leaching bed does not intersect the well and therefore should not adversely impact the quality of the water from TW2-13. Also, with the exception of bacteria, the effluent meets ODWQS and should not adversely impact the quality of water from TW2-13. The leaching bed will provide removal of bacteria, achieving 99 to 100% removal within the leaching bed before discharge to the subsurface.

TW2-13 is an excellent source of water. Testing in July 2013 has shown that the required water supply is available on-site from groundwater. If additional water supply sites are to be constructed as part of this project it would be prudent to complete a geophysical survey to map the bedrock surface in the area. Drilling should then be completed in areas where bedrock low points are indicated.

7.3 Water Quality Results

Laboratory analyses of water samples collected from the wells were compared to the Ontario Drinking Water Standards (ODWS). At TW2-13 no parameters exceeded the

standards, and concentrations (or other measurements) did not vary significantly during the test. The results of the major ion analyses are summarized in **Table 7.3**.

Table 7.3 Summary of Water Quality Results During 72-hour Test

Parameter	Unit	ODWS	TW2-13			TW3-90
			1 hr. into Test	16 hrs. into Test	End of Test	
Electrical Conductivity	uS/cm		251	248	240	265
pH		(6.5-8.5)	7.99	7.94	7.68	8.01
Total Hardness (as $CaCO_3$)	mg/L	(80-100)	86	86	88	121
Total Dissolved Solids	mg/L	(500)	146	140	134	154
Chloride	mg/L	(250)	19.2	19.0	18.5	1.29
Nitrate as N	mg/L	10.0	0.31	0.30	0.32	0.88
Sulphate	mg/L	(500)	3.46	3.48	3.42	3.38
Calcium	mg/L		27.3	27.4	27.9	40.1
Magnesium	mg/L		4.29	4.29	4.46	5.11
Sodium	mg/L	20 (200)	12.5	12.3	12.5	2.39
Potassium	mg/L		2.11	2.08	2.13	2.38
Iron	mg/L	(0.3)	<0.010	<0.010	<0.010	<0.010

Notes: ODWS – Ontario Drinking Water Standard (shaded values exceed standard)

The sample from TW3-90 had a total hardness of 121 mg/L which exceeds the operational guideline of 80 to 100 mg/L. However, this is still considered to be relatively soft water for a groundwater source. The hardness values, measured at TW2-13, are well within the guideline and therefore water hardness is not an issue.

The low levels of sodium and chloride indicates that the nearby salt storage facility is likely not significantly impacting the groundwater at TW2-13; possibly due to the fact that the salt storage is likely down gradient of TW2-13. The presence of a low concentration of nitrate supports the unconfined interpretation as this indicates that there is a connection to surface sources such as septic systems and wetlands in the area. The low level of hardness is consistent with the crystalline nature of the sediments and bedrock in the area. Based on the analysis completed it is concluded that the water produced by TW2-13 is of suitable quality to support domestic uses, while the water produced by TW3-90 is suitable based on use of available water softening technologies.

A significant issue for a potable water supply, completed in an unconfined and relatively permeable formation, is the isolation of the water source from surface sources of contamination. There is no separation between the overburden aquifer and the surface and, as a result, is considered groundwater under direct influence of surface water. In

consideration of all the activities that are proposed for the site, it is recommended that the facility should be designed with recognition for the vulnerability of the aquifer.

It is also recommended that TW2-13 be included as part of the surface water sampling program for the Project. Samples for general chemical parameters should be obtained at least twice a year for the first 3 years of operation. If impacts are observed then suitable treatment can be installed for either potable or non-potable purposes.

8.0 Conclusions

Based on the well construction, testing and water quality analysis completed at the subject site, the following conclusions and recommendations can be made.

- TW2-13 can supply water at a rate of at least 5.7 L/s (342 L/min) which exceeds the total water demand for the proposed facility.

- TW2-13 pumping at 5.7 L/s will not adversely impact the existing wells in the surrounding area, including those in Armstrong, Ontario.

- The pump in TW2-13 should be installed at a depth of 34 m below top of casing.

- Depth to bedrock at the site varies considerably over short distances. The thickest overburden appears to be at the south eastern corner of the site.

- TW2-13 is constructed in a portion of a bedrock low where the overburden is thick enough to include a significant saturated layer.

- Groundwater flows from the site to the southeast towards Mackenzie Lake within a buried bedrock valley.

- The unconfined overburden aquifer at the site is comprised of sand and gravel and has a relatively high hydraulic conductivity. The aquifer should be considered highly vulnerable to surface sources of pollution, and the facility should be designed to mitigate potential impacts associated with this vulnerability.

- If TW2-13 is to be used as a potable water supply, a treatment system will be required. A monitoring program should be implemented to determine if the quality changes with time and if the operation itself affects quality.

- TW3-90 is suitable for use as a supplementary or back-up water source at rates of less than 2 L/s.

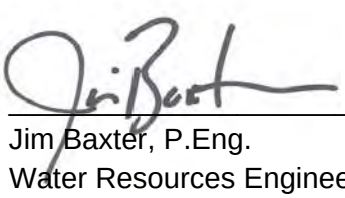
- A video of TW3-90 should be completed if it is to be used as a supplementary water supply. If it is not used it should be equipped and protected as a monitor well to track water levels in the unconfined aquifer.

- TW3-13 and TW1-13 should be abandoned according to O.Reg. 903.

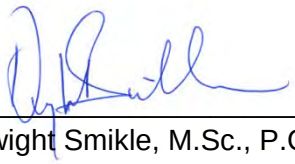
Neegan Burnside Ltd. has prepared this Hydrogeological Assessment for Whitesand First Nation in support of an Application for Renewable Energy Approval of the Whitesand First Nation Cogeneration and Pellet Mill Project. This report has been prepared by Burnside for the sole benefit of Whitesand First Nation, and may not be re-produced by any third party without the express written consent of Whitesand First Nation.

Respectfully submitted,

Neegan Burnside Ltd.

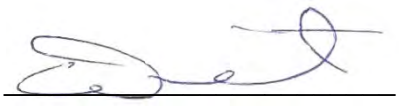
Signature  Date October, 2014
Jim Baxter, P.Eng.
Water Resources Engineer
Neegan Burnside Ltd.

Reviewed by:

Signature  Date October, 2014
Dwight Smikle, M.Sc., P.Geo.
Senior Hydrogeologist
Neegan Burnside Ltd.

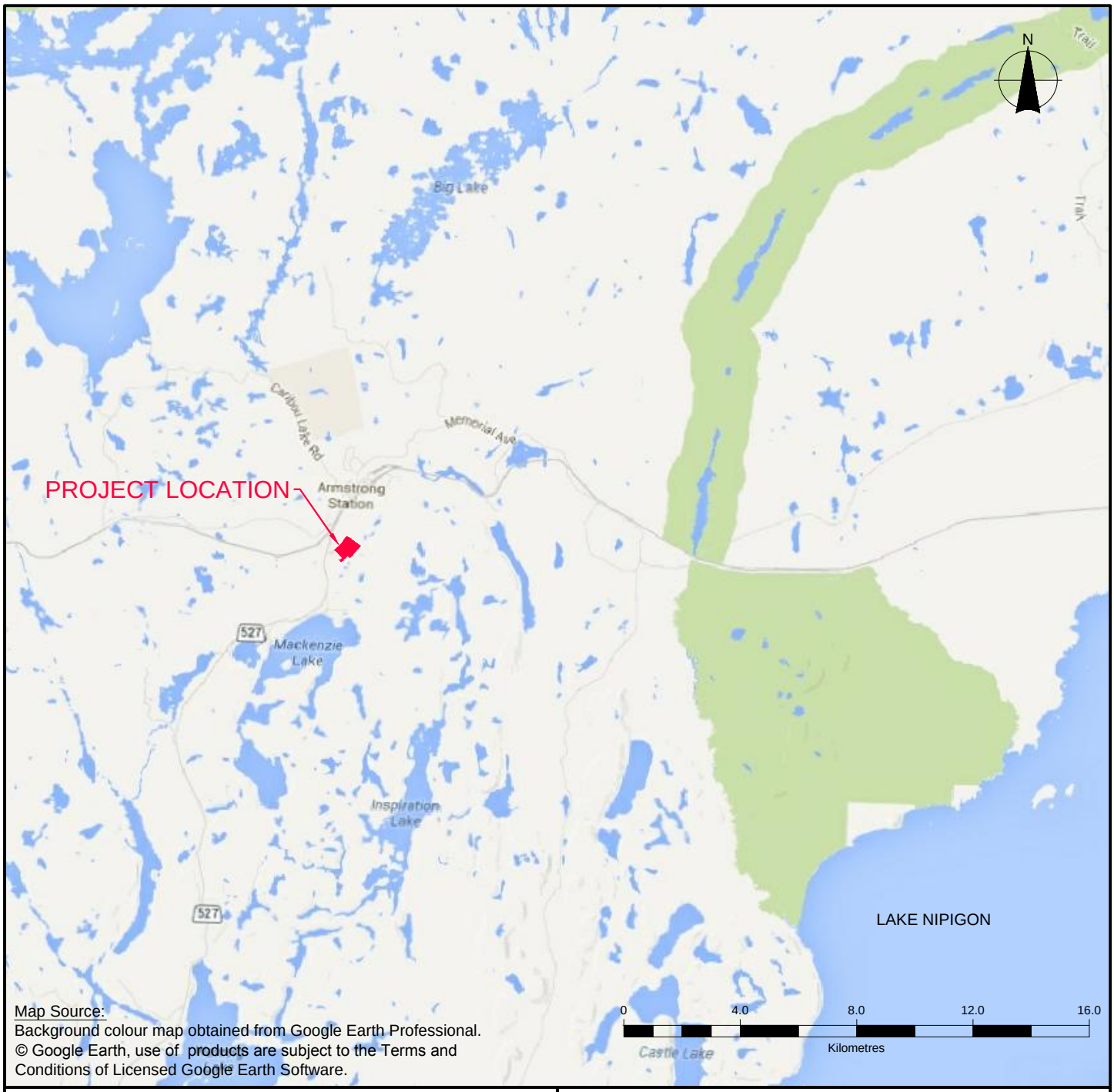
Signature  Date October, 2014
Chris Shilton, P.Eng., LEED ®AP
Project Manager
Neegan Burnside Ltd.

Approved By:

Signature  Date October, 2014
Craig Toset
Project Manager
Whitesand First Nation

NEEGAN BURNSIDE

Figures



Map Source:
Background colour map obtained from Google Earth Professional.
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KEY MAP OF ONTARIO

NEEGAN BURNSIDE

Client

WHITESAND FIRST NATION
COGENERATION & PELLET MILL PROJECT

Figure Title

HYDROGEOLOGICAL ASSESSMENT REPORT

SITE LOCATION KEY MAP

Drawn	Checked	Date	Figure No.
C.S.	J.B.	AUGUST 2014	1
Scale		Project No.	
1:200,000		300030895	

File: \\DRTEETH\Shared Work Areas\030895 - Whitesand Pellet Plant\02_Production REA Drawings\030895 PELLET MILL DRAWING SET.dwg Date Plotted: August 27, 2014 - 11:48 AM

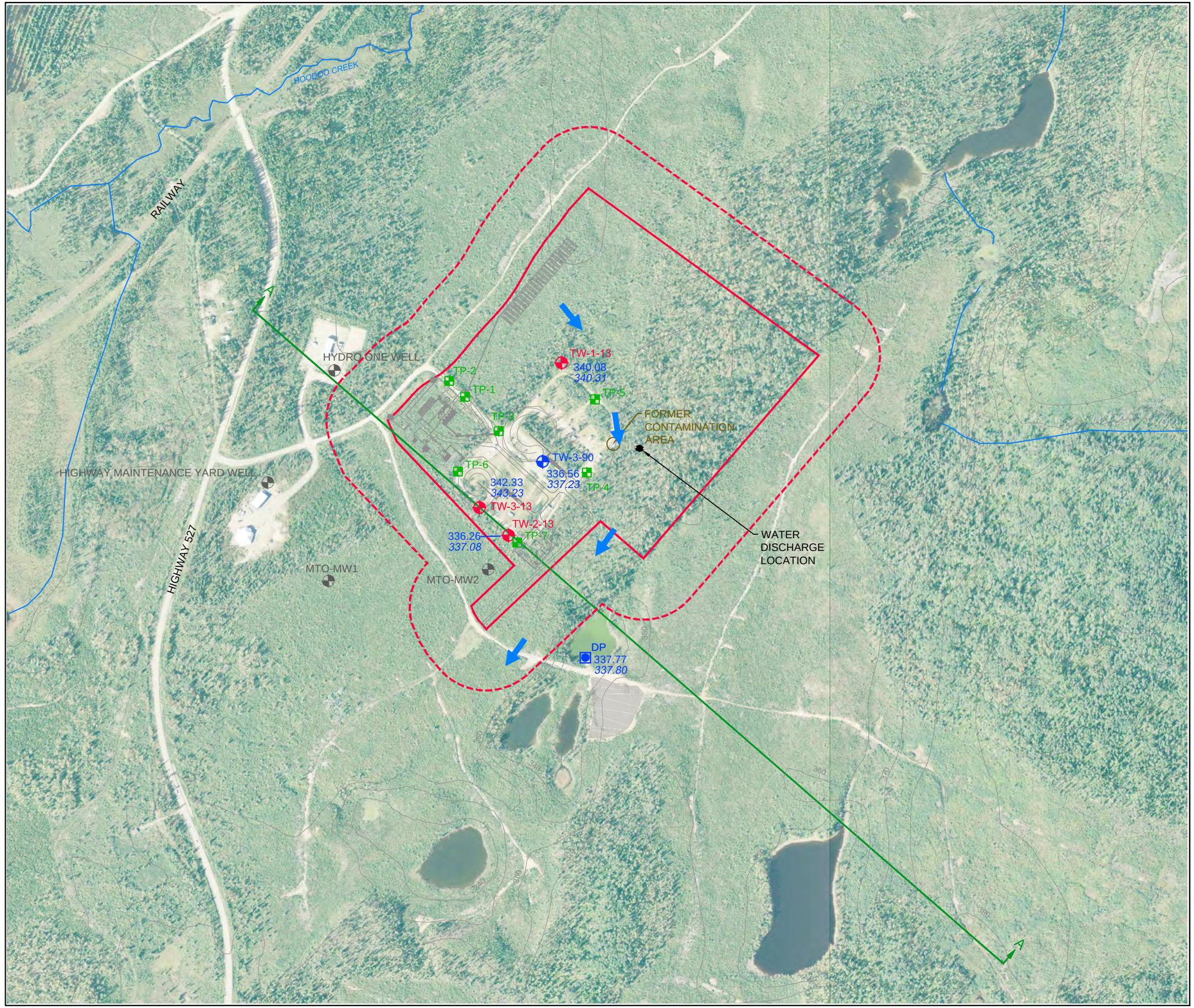


FIGURE 2

WHITESAND FIRST NATION
COGENERATION & PELLET MILL PROJECT
HYDROGEOLOGICAL ASSESSMENT REPORT

SITE PLAN

LEGEND

- APPROXIMATE SITE BOUNDARY
- STUDY AREA 120m SETBACK
- PRIVATE WELL LOCATION
- MONITORING WELL LOCATION By Others, 1990
- MONITORING WELL LOCATION By Neegan Burnside, 2013
- TP-1 — TEST PIT LOCATION By Neegan Burnside, 2013
- DP — DRIVE POINT PIEZOMETER LOCATION By Neegan Burnside, 2013
- A — A — CROSS-SECTION ORIENTATION
- 337.20 / *342.43* — GROUNDWATER ELEVATION (m asl) - July 10, 2013 - August 20, 2013
- INTERPRETED GROUNDWATER FLOW DIRECTION (See Figure 7)

Air Photo Source:
Background 2008 forest resource inventory air photo reproduced with the permission of Ministry of Natural Resources, © Queen's Printer for Ontario

N

0 100 200 400 600
Metres

1:7,500
August 2014
Project Number: 300030895

Projection: UTM Zone 16
Datum: NAD83

Prepared by: C. Sheppard

Verified by: J. Baxter

NEEGAN BURNSIDE

030895 PELLET MILL DRAWING SET.DWG

LAYOUT: HYDROGEOLOGICAL SP

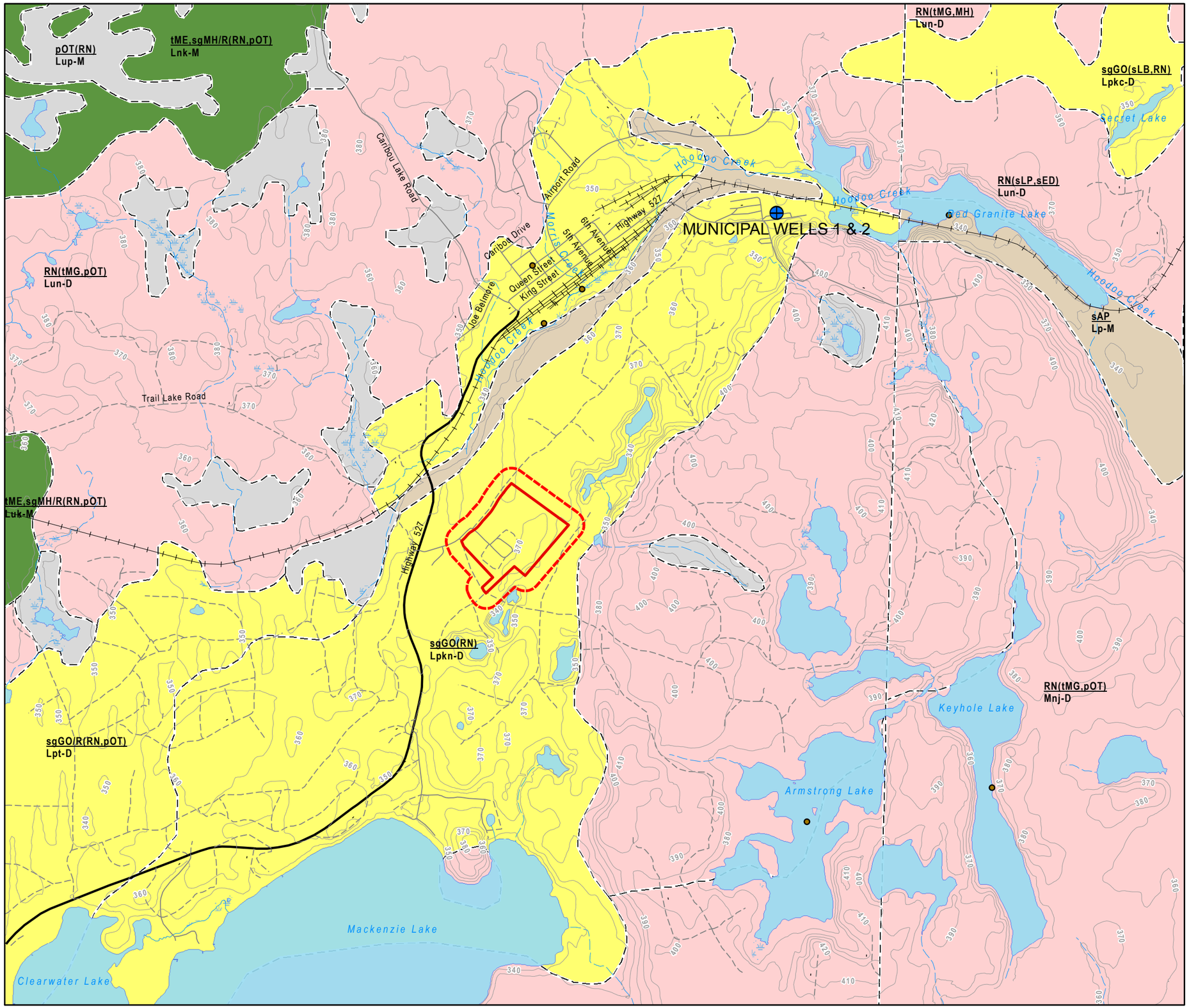
PRINTED: August 27, 2014, 12:47 PM

FIGURE 3

WHITESAND FIRST NATION
COGENERATION & PELLET MILL PROJECT

HYDROGEOLOGICAL ASSESSMENT REPORT

TOPOGRAPHY & SURFICIAL GEOLOGY



LEGEND

- Project Location
- Study Area 120m Setback
- Municipal Water Supply Well
- Canadian Geographic Names (NRCan)
- Contour
- Road: Arterial or Collector: Paved
- Road: Local or Other: Paved
- Road: Local or Other: Unpaved
- Road: Resource / Recreation, Unpaved
- Winter Road
- Rail: Operational; Under Construction, Single
- Watercourse: Intermittent
- Watercourse: Permanent
- Lake; Pond
- Wetland
- Surficial Geology Unit Boundary: NOEGTS (MNDM)
- (GO) Outwash Plain
- (AP) Alluvial Plain
- (ME) End Moraine
- (OT) Organic Terraine
- (RN) Bedrock Knob

Credit:
Ontario Geological Survey, Ministry of Northern Development and Mines, and Northeast Science and Information Section, Ministry of Natural Resources 2005. Digital Northern Ontario Engineering Geology Terrain Study (NOEGTS); Ontario Geological Survey, Miscellaneous Release--Data 160.

N

0 450 900 1,350 1,800 2,250
Metres

1:30,000
August 2014
Project Number: 300030895

Projection: UTM Zone 16
Datum: NAD83

Prepared by: C. Sheppard

Verified by: J. Baxter

NEEGAN BURNSIDE

030895 Hydrogeological Assessment SG.mxd

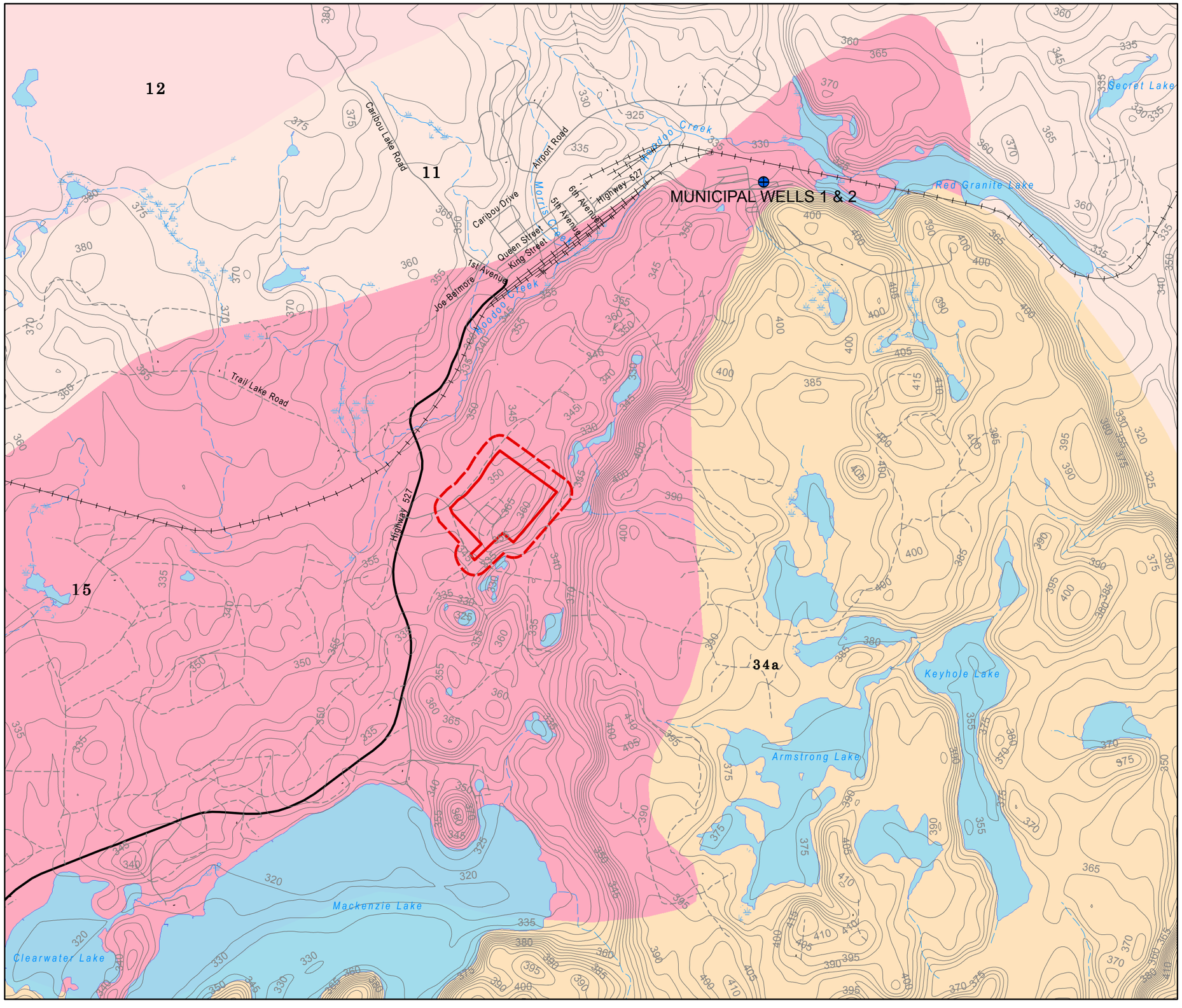
Printed: August 27, 2014, 10:55 AM

FIGURE 4

WHITESAND FIRST NATION
COGENERATION & PELLET MILL PROJECT

HYDROGEOLOGICAL ASSESSMENT REPORT

BEDROCK GEOLOGY & BEDROCK SURFACE CONTOURS



LEGEND

- Project Location
- Study Area 120m Setback
- Municipal Water Supply Well
- Bedrock Surface Contour 5m
- Road: Arterial or Collector:
- Road: Local or Other: Paved
- Road: Local or Other: Unpaved
- Road: Resource / Recreation, Unpaved
- Winter Road
- Rail: Operational; Under Construction, Single
- Watercourse: Permanent
- Watercourse: Intermittent
- Lake; Pond
- Wetland
- 11=Gneissic Tonalite Suite=Tonalite to Granodiorite-Foliated to Gneissic-With Minor Supracrustal Inclusions
- 12=Foliated Tonalite Suite=Tonalite to Granodiorite-Foliated to Massive
- 15=Massive Granodiorite to Granite=Massive to Foliated Granodiorite to Granite
- 34a=Mafic Dikes and Related Intrusive Rocks (Keweenawan Age) (Circa 1.1 to 1.2 Ga)=Logan and Nipigon Mafic Sills (Circa 1100-1115 Ma)

Credit:
Ontario Geological Survey, 2000. Bedrock geology, seamless coverage of the province of Ontario; Ontario Geological Survey, Data Set 6---Revised.

N

0 450 900 1,350 1,800 2,250
Metres

1:30,000
August 2014
Project Number: 300030895

Projection: UTM Zone 16
Datum: NAD83

Prepared by: C. Sheppard

Verified by: J. Baxter

NEEGAN BURNSIDE

030895 Hydrogeological Assessment BG.mxd

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A
NORTH WEST

A'
SOUTH EAST

ELEVATION
(m amsl)

PELLET MILL SITE

HYDRO ONE WELL
OFFSET 13m NE

MTO-MW1
WWR 7110369
OFFSET 302m SW

TP-6 OFFSET 25m NE

TW3-13 OFFSET 5m SW

TW2-13

TP-7 OFFSET 4m SW

DRIVE POINT
PIEZOMETER

CREEK

380
370
360
350
340
330
320

organics
gravel & csand
cobbles with gravel
cobbles & boulders with gravel
sand & gravel
SAND & GRAVEL OVERBURDEN
csand & gravel
granite
bedrock
GRANITE BEDROCK

organics
gravel & cobbles
gravel & cobbles
csand & gravel
bedrock
POND = 337.35m
SATURATED SAND & GRAVEL OVERBURDEN
bedrock

SAND & GRAVEL OVERBURDEN
GRANITE BEDROCK

?

0m
0.5
1.0
1.5
2.0
DISTANCE (km)

FIGURE 5

WHITESAND FIRST NATION
COGENERATION & PELLET MILL PROJECT
HYDROGEOLOGICAL ASSESSMENT REPORT

CROSS-SECTION A-A'

LEGEND

TW-2-13 — WELL LOCATION & NUMBER

EXISTING GROUND PROFILE ALONG THE CROSS-SECTION

GRANULAR SAND & GRAVEL OVERBURDEN

STATIC WATER LEVEL
(July 8, 2013)

GROUNDWATER FLOW ALONG BEDROCK SURFACE

BEDROCK STRATIGRAPHY BASED ON BOREHOLE LOGS

CRYSTALINE GRANODIORITE TO GRANITE BEDROCK

bedrock — GEOLOGICAL STRATIGRAPHY

WELL SCREEN

Horizontal Scale: 1:7,500
Vertical Scale: 1:375
Vertical Exageration: 20X

August 2014
Project Number: 300030895

Prepared by: C. Sheppard
Verified by: J. Baxter

NEEGAN BURNSIDE

030895 PELLET MILL DRAWING SET.DWG
LAYOUT: HYDROGEOLOGICAL XSA
PRINTED: October 15, 2014, 1:20 PM

Sources:

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2. Natural Resources Canada © Her Majesty the Queen in Right of Canada.

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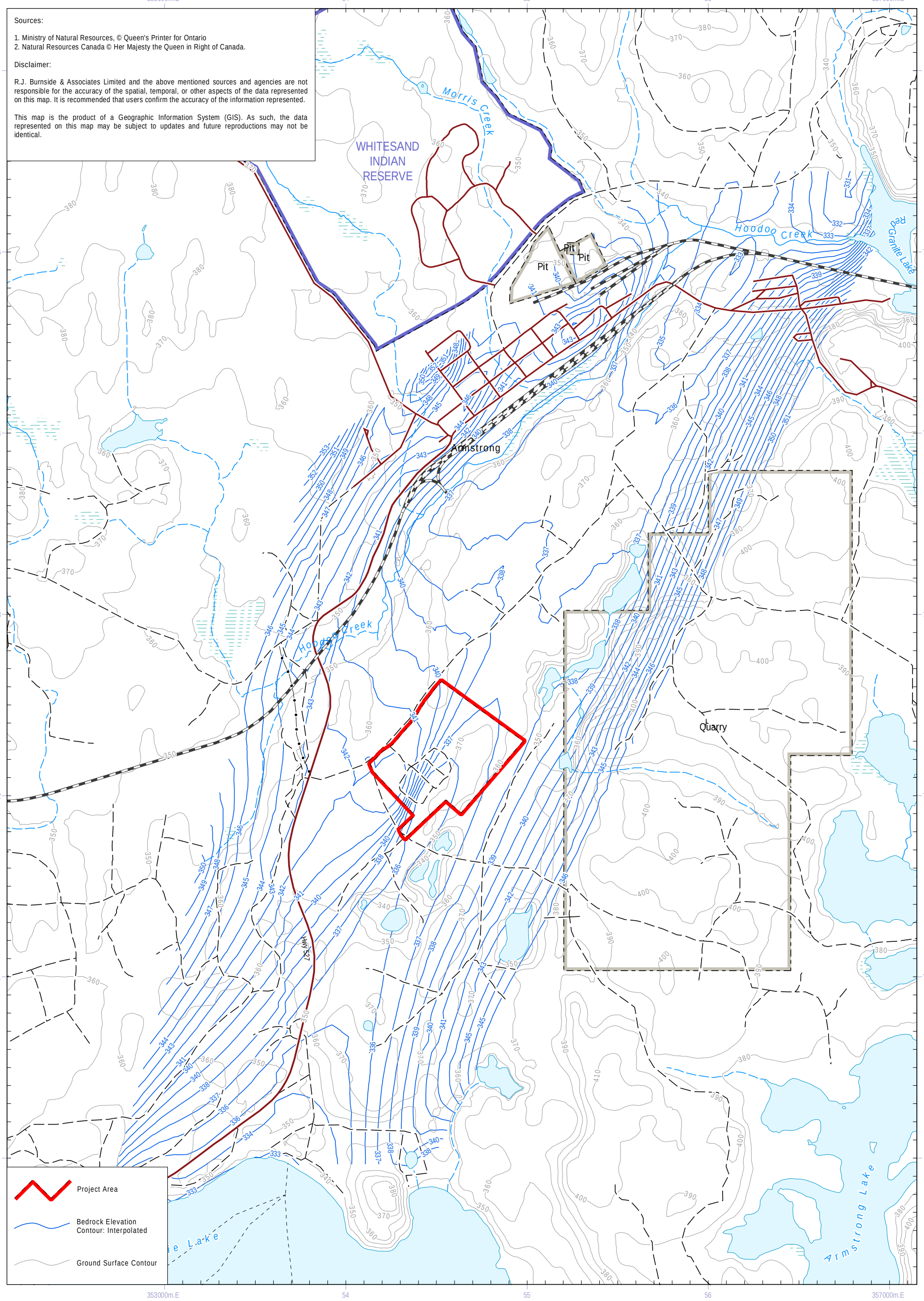
This map is the product of a Geographic Information System (GIS). As such, the data represented on this map may be subject to updates and future reproductions may not be identical.



Datum: North American 1983 CSRS	
Coord. System: NAD 1983 CSRS UTM Zone 16N	
Projection: Transverse Mercator	
Central Meridian: 87°0'0.00"W	
False Easting: 500,000m	False Northing: 0m
Rotation: 0	Scale Factor: 0.99960

N
Grid North

0 500 1,000
Metres

NEEGAN BURNSIDE

Client
WHITESANDS FIRST NATION COGENERATION & PELLET MILL

Map Title
HYDROGEOLOGICAL ASSESSMENT REPORT
INTERPOLATED WATERTABLE ELEVATION

Drawn	Checked	Date	Figure No.
PS	JB	2014/09/05	6
Scale		Project No.	
H 1:20,000		300030895	

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Sources:

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This map is the product of a Geographic Information System (GIS). As such, the data represented on this map may be subject to updates and future reproductions may not be identical.

353000m.E 54 55 56 357000m.E

5576000m.N 75 74 73 72 71 5570000m.N

WHITESAND INDIAN RESERVE

Morris Creek

Hoodoo Creek

Granite Lake

Armstrong Lake

Pit

Pit

Pit

Armstrong

Quarry

Hwy 527

Project

Bedrock Elevation Contour: Interpolated

Datum: North American 1983 CSRS	
Coord. System: NAD 1983 CSRS UTM Zone 16N	
Projection: Transverse Mercator	
Central Meridian: 87°0'0.00"W	
False Easting: 500,000m	False Northing: 0m
Rotation: 0	Scale Factor: 0.99960

N

Grid North

0 500 1,000

Metres

NEEGAN BURNSIDE

Client

WHITESANDS FIRST NATION COGENERATION & PELLET MILL

Map Title

HYDROGEOLOGICAL ASSESSMENT REPORT

INTERPOLATED BEDROCK ELEVATION

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PS	JB	2014/09/05	7
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H 1:20,000		300030895	

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NEEGAN BURNSIDE

Appendix A
Water Well Records and Test Pit Logs

Ontario — Ministry of the Environment

Measurements recorded in: ☐ Metric ☑ Imperial

Well Tag No. *(Place Sticker and/or Print Below)*
Tag#: A136758

TW1-13 Well Record

Regulation 903 Ontario Water Resources Act

Page _____ of _____

Well Owner's Information

First Name	Last Name / Organization	E-mail Address	☐ Well Constructed by Well Owner
	White Sand First Nation		

Mailing Address (Street Number/Name)	Municipality	Province	Postal Code	Telephone No. *(inc. area code)*
P.O Box 68	Armstrong	Ont	P0T 1A0	

Well Location

Address of Well Location (Street Number/Name)	Township	Lot	Concession
	Unorginized		

County/District/Municipality	City/Town/Village	Province	Postal Code
Thunder Bay District	Armstrong	Ontario	P0T 1A0

UTM Coordinates	Zone	Easting	Northing	Municipal Plan and Sublot Number	Other
NAD 83	16	354175	5572287		

Overburden and Bedrock Materials/Abandonment Sealing Record *(see instructions on the back of this form)*

General Colour	Most Common Material	Other Materials	General Description	Depth (m/ft) From	Depth (m/ft) To
Brown	Gravel	Boulders	Coarse	0	73
Red	Granite			73	77

Annular Space

Depth Set at (m/ft) From	To	Type of Sealant Used *(Material and Type)*	Volume Placed *(m³/ft³)*
0	20	38 Hole plug	

Method of Construction

☐ Cable Tool ☐ Diamond
☑ Rotary (Conventional) ☐ Jetting
☐ Rotary (Reverse) ☐ Driving
☐ Boring ☐ Digging
☐ Air percussion
☐ Other, *specify* _____

Well Use

☐ Public ☐ Commercial ☐ Not used
☑ Domestic ☐ Municipal ☐ Dewatering
☐ Livestock ☐ Test Hole ☐ Monitoring
☐ Irrigation ☐ Cooling & Air Conditioning
☐ Industrial
☐ Other, *specify* _____

Construction Record - Casing

Inside Diameter *(cm/in)*	Open Hole OR Material (Galvanized, Fibreglass, Concrete, Plastic, Steel)	Wall Thickness *(cm/in)*	Depth (m/ft) From	Depth (m/ft) To
6	Steel	.188	0	73
6	Open hole		73	77

Construction Record - Screen

Outside Diameter *(cm/in)*	Material (Plastic, Galvanized, Steel)	Slot No.	Depth (m/ft) From	Depth (m/ft) To

Status of Well

☑ Water Supply
☐ Replacement Well
☐ Test Hole
☐ Recharge Well
☐ Dewatering Well
☐ Observation and/or Monitoring Hole
☐ Alteration (Construction)
☐ Abandoned, Insufficient Supply
☐ Abandoned, Poor Water Quality
☐ Abandoned, other, *specify*
☐ Other, *specify*

Water Details

Water found at Depth (m/ft)	Kind of Water	Hole Diameter Depth From	Depth To	Diameter *(cm/in)*
☐ Gas	☐ Fresh ☑ Untested ☐ Other, *specify* Insufficient			
☐ Gas	☐ Fresh ☐ Untested ☐ Other, *specify*			
☐ Gas	☐ Fresh ☐ Untested ☐ Other, *specify*			

Results of Well Yield Testing

After test of well yield, water was:
☐ Clear and sand free
☑ Other, *specify* Dry

If pumping discontinued, give reason:

Pump intake set at *(m/ft)*

Pumping rate *(l/min / GPM)*

Duration of pumping _____ hrs + _____ min

Final water level end of pumping *(m/ft)*

If flowing give rate *(l/min / GPM)*

Recommended pump depth *(m/ft)*

Recommended pump rate *(l/min / GPM)*

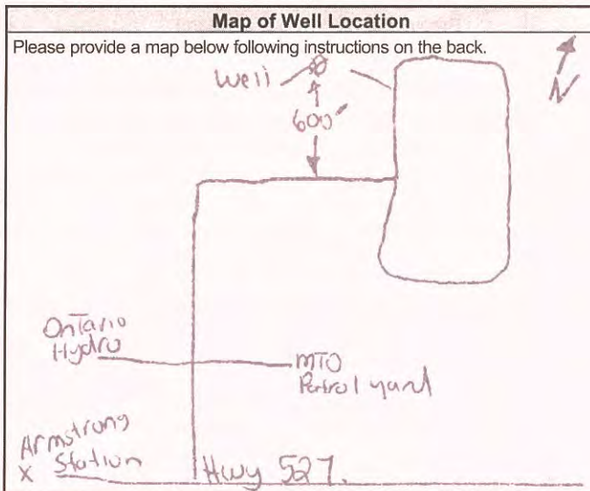
Well production *(l/min / GPM)*

Disinfected? ☐ Yes ☐ No

	Draw Down Time *(min)*	Draw Down Water Level *(m/ft)*	Recovery Time *(min)*	Recovery Water Level *(m/ft)*
Static Level				
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	

Map of Well Location

Please provide a map below following instructions on the back.



Comments:

Well Contractor and Well Technician Information

Business Name of Well Contractor	Well Contractor's Licence No.
Mel Well Drilling	31613

Business Address (Street Number/Name)	Municipality	Province	Postal Code	Business E-mail Address
Box 218	Emo	Ont	P0W 1E0	

Bus. Telephone No. *(inc. area code)*	Name of Well Technician (Last Name, First Name)	Well Technician's Licence No.	Signature of Technician and/or Contractor	Date Submitted
8077482 2895	Jason Tessier	T-12612		2013/05/09

Well owner's information package delivered ☑ Yes ☐ No

Date Package Delivered 2013/05/08

Date Work Completed 2013/05/09

Ministry Use Only

Audit No. Z156624

Received

Well Owner's Copy

Ontario — Ministry of the Environment

Tag#: A136776

TW2-13 Well Record

Regulation 903 Ontario Water Resources Act

Measurements recorded in: ☐ Metric ☑ Imperial

Page ____ of ____

Well Owner's Information

First Name	Last Name / Organization	E-mail Address	☐ Well Constructed by Well Owner
	White Sand First Nation		

Mailing Address (Street Number/Name)	Municipality	Province	Postal Code	Telephone No. (inc. area code)
P.O. Box 68	Armstrong	OnT	P0T 1A0	

Well Location

Address of Well Location (Street Number/Name)	Township	Lot	Concession
	Unorginized		

County/District/Municipality	City/Town/Village	Province	Postal Code
Thunder Bay District	Armstrong	Ontario	P0T 1A0

UTM Coordinates	Zone	Easting	Northing	Municipal Plan and Sublot Number	Other
NAD 83	16	354372	5571951		

Overburden and Bedrock Materials/Abandonment Sealing Record *(see instructions on the back of this form)*

General Colour	Most Common Material	Other Materials	General Description	Depth (m/ft) From	Depth (m/ft) To
Brown	Gravel	Boulders,	Coarse	0	121
Red	Granite			121	124

Proposed Production Well

Annular Space

Depth Set at (m/ft) From	Depth Set at (m/ft) To	Type of Sealant Used (Material and Type)	Volume Placed (m³/ft³)
0	20	3/8 Hole plug	

Method of Construction

☐ Cable Tool ☐ Diamond
☑ Rotary (Conventional) ☐ Jetting
☐ Rotary (Reverse) ☐ Driving
☐ Boring ☐ Digging
☐ Air percussion
☐ Other, *specify* _____

Well Use

☑ Public ☐ Commercial ☐ Not used
☐ Domestic ☐ Municipal ☐ Dewatering
☐ Livestock ☐ Test Hole ☐ Monitoring
☐ Irrigation ☐ Cooling & Air Conditioning
☐ Industrial
☐ Other, *specify* _____

Construction Record - Casing

Inside Diameter (cm/in)	Open Hole OR Material (Galvanized, Fibreglass, Concrete, Plastic, Steel)	Wall Thickness (cm/in)	Depth (m/ft) From	Depth (m/ft) To
6	Steel	.188	0	121
6	open hole		121	124

Construction Record - Screen

Outside Diameter (cm/in)	Material (Plastic, Galvanized, Steel)	Slot No.	Depth (m/ft) From	Depth (m/ft) To
5	Steel	50	119	124
5"	Steel + K Packer		116	119

Status of Well

☑ Water Supply
☐ Replacement Well
☐ Test Hole
☐ Recharge Well
☐ Dewatering Well
☐ Observation and/or Monitoring Hole
☐ Alteration (Construction)
☐ Abandoned, Insufficient Supply
☐ Abandoned, Poor Water Quality
☐ Abandoned, other, *specify*
☐ Other, *specify*

Water Details

Water found at Depth (m/ft)	Kind of Water	
106	☐ Fresh ☐ Untested ☐ Gas ☐ Other, *specify*	
	☐ Fresh ☐ Untested ☐ Gas ☐ Other, *specify*	
	☐ Fresh ☐ Untested ☐ Gas ☐ Other, *specify*	

Hole Diameter

Depth (m/ft) From	Depth (m/ft) To	Diameter (cm/in)

Results of Well Yield Testing

After test of well yield, water was:
☑ Clear and sand free
☐ Other, *specify* _____

If pumping discontinued, give reason:

Pump intake set at (m/ft): 100

Pumping rate (l/min / GPM): 30

Duration of pumping: ____ hrs + ____ min

Final water level end of pumping (m/ft): 92

If flowing give rate (l/min / GPM):

Recommended pump depth (m/ft): 116

Recommended pump rate (l/min / GPM): 30

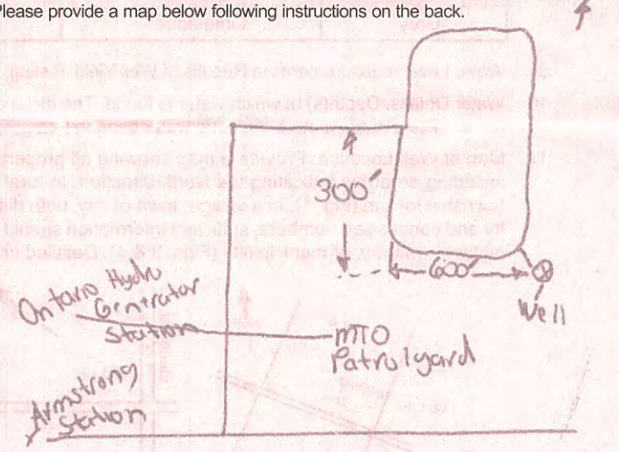
Well production (l/min / GPM): 30+

Disinfected? ☑ Yes ☐ No

	Draw Down Time (min)	Draw Down Water Level (m/ft)	Recovery Time (min)	Recovery Water Level (m/ft)
Static Level		92		
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	92		60	

Map of Well Location

Please provide a map below following instructions on the back.



Comments:

Well Contractor and Well Technician Information

Business Name of Well Contractor	Well Contractor's Licence No.
Mels Well Drilling	3638

Business Address (Street Number/Name)	Municipality	Province	Postal Code	Business E-mail Address
Box 218 F	Emo	Ontario	P0W 1E0	

Bus. Telephone No. (inc. area code)	Name of Well Technician (Last Name, First Name)	Well Technician's Licence No.	Signature of Technician and/or Contractor	Date Submitted
807 482 2895	Sason Tessier	T+2612		2013/05/11

Well owner's information package delivered: ☑ Yes ☐ No

Date Package Delivered: 2013/05/07

Date Work Completed: 2013/05/11

Ministry Use Only

Audit No. Z 156623

Received

0506E (2007/12)

Well Owner's Copy

Ontario — Ministry of the Environment

Measurements recorded in: ☐ Metric ☑ Imperial

Well Tag No. (Place Sticker Below): Tag#: A136777

TW3-13 Well Record

Regulation 903 Ontario Water Resources Act

Page ____ of ____

Well Owner's Information

First Name	Last Name / Organization	E-mail Address	☐ Well Constructed by Well Owner
	White Sand First Nation		

Mailing Address (Street Number/Name)	Municipality	Province	Postal Code	Telephone No. (inc. area code)
P.O. Box 68	Armstrong	Ont	P0T 1A0	

Well Location

Address of Well Location (Street Number/Name)	Township	Lot	Concession
	Unorginized		

County/District/Municipality	City/Town/Village	Province	Postal Code
Thunder Bay District	Armstrong	Ontario	P0T 1A0

UTM Coordinates	Zone	Easting	Northing	Municipal Plan and Sublot Number	Other
NAD 83	16	354314	5572007		

Overburden and Bedrock Materials/Abandonment Sealing Record *(see instructions on the back of this form)*

General Colour	Most Common Material	Other Materials	General Description	Depth (m/ft) From	Depth (m/ft) To
Brown	Gravel	Boulders	Coarse	0	63
Red	Granite			63	67

Annular Space

Depth Set at (m/ft) From	Depth Set at (m/ft) To	Type of Sealant Used (Material and Type)	Volume Placed (m^3/ft^3)
0	20	Hole plug	

Method of Construction

☐ Cable Tool ☐ Diamond
☑ Rotary (Conventional) ☐ Jetting
☐ Rotary (Reverse) ☐ Driving
☐ Boring ☐ Digging
☐ Air percussion
☐ Other, specify ____

Well Use

☐ Public ☐ Commercial ☐ Not used
☑ Domestic ☐ Municipal ☐ Dewatering
☐ Livestock ☐ Test Hole ☐ Monitoring
☐ Irrigation ☐ Cooling & Air Conditioning
☐ Industrial
☐ Other, specify ____

Construction Record - Casing

Inside Diameter (cm/in)	Open Hole OR Material (Galvanized, Fibreglass, Concrete, Plastic, Steel)	Wall Thickness (cm/in)	Depth (m/ft) From	Depth (m/ft) To
6	Steel	.188	0	63
6	Open Hole		63	67

Construction Record - Screen

Outside Diameter (cm/in)	Material (Plastic, Galvanized, Steel)	Slot No.	Depth (m/ft) From	Depth (m/ft) To

Status of Well

☐ Water Supply
☐ Replacement Well
☐ Test Hole
☐ Recharge Well
☐ Dewatering Well
☐ Observation and/or Monitoring Hole
☐ Alteration (Construction)
☐ Abandoned, Insufficient Supply
☐ Abandoned, Poor Water Quality
☐ Abandoned, other, specify ____
☐ Other, specify ____

Results of Well Yield Testing

After test of well yield, water was:
☐ Clear and sand free
☐ Other, specify ____

If pumping discontinued, give reason:

Pump intake set at (m/ft)

Pumping rate (l/min / GPM)

Duration of pumping ____ hrs + ____ min

Final water level end of pumping (m/ft)

If flowing give rate (l/min / GPM)

Recommended pump depth (m/ft)

Recommended pump rate (l/min / GPM)

Well production (l/min / GPM)

Disinfected? ☐ Yes ☐ No

	Draw Down Time (min)	Draw Down Water Level (m/ft)	Recovery Time (min)	Recovery Water Level (m/ft)
Static Level				
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	

Water Details

Water found at Depth (m/ft)	Kind of Water	Hole Diameter Depth From	Hole Diameter Depth To	Hole Diameter (cm/in)
☐ Gas	☐ Fresh ☐ Untested ☐ Other, specify Insufficient			
☐ Gas	☐ Fresh ☐ Untested ☐ Other, specify			
☐ Gas	☐ Fresh ☐ Untested ☐ Other, specify			

Map of Well Location

Please provide a map below following instructions on the back.

Comments:

Well Contractor and Well Technician Information

Business Name of Well Contractor	Well Contractor's Licence No.
Mels Well Drilling	3638

Business Address (Street Number/Name)	Municipality
Box 218	Emo

Province	Postal Code	Business E-mail Address
Ontario	P0W 1E0	

Bus. Telephone No. (inc. area code)	Name of Well Technician (Last Name, First Name)
807 482 2895	Sasan Tessier

Well Technician's Licence No.	Signature of Technician and/or Contractor	Date Submitted
1-2612		2013/05/16

Well owner's information package delivered: ☑ Yes ☐ No

Date Package Delivered: 2013/05/29

Date Work Completed: 2013/05/16

Ministry Use Only

Audit No. Z 156625

Received

Well Owner's Copy

Ontario Ministry of the Environment

Well Tag Number (A 046700
A046700

Well Record
Regulation 903 Ontario Water Resources Act

page 1 of 1

Instructions for Completing Form

- For use in the **Province of Ontario** only. This document is a permanent **legal** document. Please retain for future reference.
- All Sections **must** be completed in full to avoid delays in processing. Further instructions and explanations are available on the back of this form.
- Questions regarding completing this application can be directed to the Water Well Help Desk (Toll Free) at 1-888-396-9355.
- **All metre measurements shall be reported to 1/10th of a metre.**
- Please print clearly in blue or black ink only.

Ministry Use Only
MUN | CON | LOT

Well Owner's Information and Location of Well Information

First Name	Last Name	Mailing Address (Street Number/Name, RR,Lot,Concession)
ONTARIO MINISTRY	OF TRANSPORTATION	615 JAMES ST. SOUTH

County/District/Municipality	Township/City/Town/Village	Province	Postal Code	Telephone Number (include area code)
	THUNDER BAY	Ontario	P7E 6P6	

Address of Well Location (County/District/Municipality)	Township	Lot	Concession
ARMSTRONG PATROL YARD	ARMSTRONG		

RR#/Street Number/Name	City/Town/Village	Site/Compartment/Block/Tract etc.
	ARMSTRONG	

GPS Reading: NAD 83 | Zone 16 | Easting 354116 | Northing 5571865 | Unit Make/Model GARMIN | Mode of Operation: ☐ Undifferentiated ☐ Averaged ☑ Differentiated, specify 3D

Log of Overburden and Bedrock Materials (see instructions)

General Colour	Most common material	Other Materials	General Description	Depth From	Depth To (Metres)
BROWN	COBBLES	SAND, BOULDERS		0	14.9
GREY	GRANITE			14.9	22.1

MW1

MTO -MW1

Hole Diameter

Depth From (Metres)	Depth To (Metres)	Diameter (Centimetres)
0	14.9	25.0
14.9	22.1	10.0

Water Record

Water found at 76 Metres / Kind of Water

- ☐ m ☑ Fresh ☐ Sulphur ☐ Gas ☐ Salty ☐ Minerals ☐ Other:
- ☐ m ☐ Fresh ☐ Sulphur ☐ Gas ☐ Salty ☐ Minerals ☐ Other:
- ☐ m ☐ Fresh ☐ Sulphur ☐ Gas ☐ Salty ☐ Minerals ☐ Other:

After test of well yield, water was ☐ Clear and sediment free ☐ Other, specify

Chlorinated ☐ Yes ☐ No

Construction Record

Inside diam centimetres	Material	Wall thickness centimetres	Depth From	Depth To (Metres)
Casing				
5.0	☐ Steel ☐ Fibreglass ☑ Plastic ☐ Concrete ☐ Galvanized	.02	0	13.0
	☐ Steel ☐ Fibreglass ☐ Plastic ☐ Concrete ☐ Galvanized			
	☐ Steel ☐ Fibreglass ☐ Plastic ☐ Concrete ☐ Galvanized			
Screen				
Outside diam 5.4	☐ Steel ☐ Fibreglass ☐ Plastic ☐ Concrete ☐ Galvanized	Slot No. .010	13.0	22.1
No Casing or Screen				
	☐ Open hole			

Test of Well Yield N/A

Pumping test method	Draw Down Time min	Draw Down Water Level Metres	Recovery Time min	Recovery Water Level Metres
Pump intake set at - (metres)	Static Level			
Pumping rate - (litres/min)	1		1	
Duration of pumping ____hrs +____ min	2		2	
Final water level end of pumping ____metres	3		3	
Recommended pump type. ☐ Shallow ☐ Deep	4		4	
Recommended pump depth. ____metres	5		5	
Recommended pump rate. (litres/min)	10		10	
	15		15	
If flowing give rate - (litres/min)	20		20	
	25		25	
If pumping discontinued, give reason.	30		30	
	40		40	
	50		50	
	60		60	

Plugging and Sealing Record ☐ Annular space ☐ Abandonment

Depth set at - Metres From	Depth set at - Metres To	Material and type (bentonite slurry, neat cement slurry) etc.	Volume Placed (cubic metres)
0	1.2	BENTONITE HOLEPLUG	N/A

Method of Construction

☐ Cable Tool ☐ Rotary (air) ☐ Diamond ☐ Digging
☐ Rotary (conventional) ☐ Air percussion ☐ Jetting ☐ Other
☐ Rotary (reverse) ☑ Boring ☐ Driving

Water Use

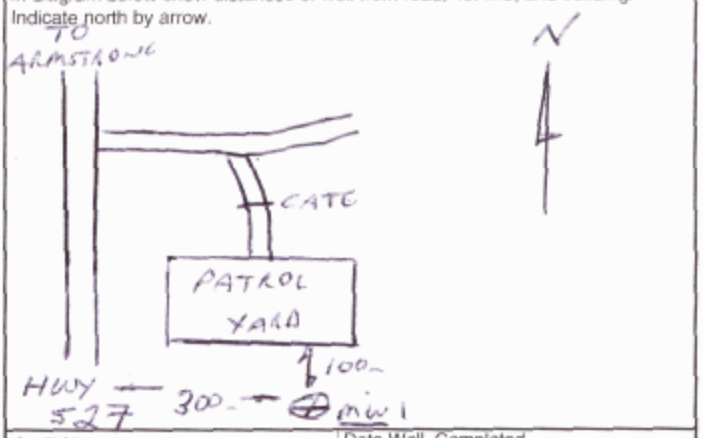
☐ Domestic ☐ Industrial ☐ Public Supply ☑ Other
☐ Stock ☐ Commercial ☐ Not used MONITORING
☐ Irrigation ☐ Municipal ☐ Cooling & air conditioning

Final Status of Well

☐ Water Supply ☐ Recharge well ☐ Unfinished ☐ Abandoned, (Other)
☑ Observation well ☐ Abandoned, insufficient supply ☐ Dewatering
☐ Test Hole ☐ Abandoned, poor quality ☐ Replacement well

Location of Well

In diagram below show distances of well from road, lot line, and building. Indicate north by arrow.



Audit No. Z 70081

Date Well Completed YYYY 2008 MM 8 DD 4

Was the well owner's information package delivered? ☐ Yes ☐ No

Date Delivered YYYY 2008 MM 8 DD

Well Contractor/Technician Information

Name of Well Contractor: TBT ENGINEERING

Well Contractor's Licence No.: 7267

Business Address (street name, number, city etc.): 711 HAROLD CR. THUNDER BAY ONT. P7C5H8

Name of Well Technician (last name, first name): FINKE ALAN

Well Technician's Licence No.: 2544

Signature of Technician/Contractor: X

Date Submitted YYYY 2008 MM 8 DD

Ministry Use Only

Data Source | Contractor

Date Received YYYY AUG 25 2008 MM DD | Date of Inspection YYYY MM DD

Remarks | Well Record Number

0506E (08/2006)

Ministry's Copy

Cette formule est disponible en français

Ontario Ministry of the Environment

Well Tag Number (Place sticker and print number below) A001468

Well Record

Regulation 903 Ontario Water Resources Act

page ___ of ___

Instructions for Completing Form

- For use in the **Province of Ontario** only. This document is a permanent **legal** document. Please retain for future reference.
- All Sections **must** be completed in full to avoid delays in processing. Further instructions and explanations are available on the back of this form.
- Questions regarding completing this application can be directed to the Water Well Management Coordinator at 416-235-6203.
- **All metre measurements shall be reported to 1/10th of a metre.**
- Please print clearly in blue or black ink only.

Ministry Use Only

MUN | CON | LOT

Well Owner's Information and Location of Well Information

[redacted] code)

Address of Well Location (County/District/Municipality): THUNDER BAY | Township | Lot | Concession

RR#/Street Number/Name | City/Town/Village: ARMSTRONG | Site/Compartment/Block/Tract etc.

GPS Reading | NAD: 83 | Zone | Easting: 8900888 | Northing: 5018472 | Unit Make/Model: GARMIN | Mode of Operation: ☐ Undifferentiated ☐ Averaged ☐ Differentiated, specify | 1 QUE

Log of Overburden and Bedrock Materials (see instructions)

General Colour	Most common material	Other Materials	General Description	Depth From	Depth To (Metres)
GRAY	GRAVEL	SAND & BOULDERS	POROUS	0	19.696
FOR 24 HR PUMP TEST RESULTS			CONTACT : [redacted]		
@ R.J. BURNSIDE & ASSOC.					

Hole Diameter

Depth From	Metres To	Diameter Centimetres
0	19.696	35

Water Record

Water found at ___ Metres / Kind of Water

- ___ m ☑ Fresh ☐ Sulphur ☐ Gas ☐ Salty ☐ Minerals ☐ Other:
- ___ m ☐ Fresh ☐ Sulphur ☐ Gas ☐ Salty ☐ Minerals ☐ Other:
- ___ m ☐ Fresh ☐ Sulphur ☐ Gas ☐ Salty ☐ Minerals ☐ Other:

After test of well yield, water was ☑ Clear and sediment free ☐ Other, specify

Chlorinated ☑ Yes ☐ No

Construction Record

Inside diam centimetres	Material	Wall thickness centimetres	Depth From	Metres To
Casing				
25	☑ Steel ☐ Fibreglass ☐ Plastic ☐ Concrete ☐ Galvanized	.927	+1	15.9
	☐ Steel ☐ Fibreglass ☐ Plastic ☐ Concrete ☐ Galvanized			
	☐ Steel ☐ Fibreglass ☐ Plastic ☐ Concrete ☐ Galvanized			
STAINLESS STEEL Screen				
Outside diam	☑ Steel ☐ Fibreglass ☐ Plastic ☐ Concrete ☐ Galvanized	Slot No.		
26.9cm		.80	15.9	18.9
No Casing or Screen				
☐ Open hole				

Test of Well Yield

Pumping test method: SUBMERSE.	Draw Down Time min	Draw Down Water Level Metres	Recovery Time min	Recovery Water Level Metres
Pump intake set at - (metres)	Static Level	8.56		
Pumping rate - (litres/min) 300 USGPM	1		1	
Duration of pumping ___hrs +___ min	2		2	
Final water level end of pumping ___metres	3		3	
Recommended pump type. ☐ Shallow ☐ Deep	4		4	
Recommended pump depth. ___metres	5		5	
Recommended pump rate. (litres/min)	10		10	
If flowing give rate - (litres/min)	15		15	
If pumping discontinued, give reason.	20		20	
	25		25	
	30		30	
	40		40	
	50		50	
	60		60	

Plugging and Sealing Record ☐ Annular space ☐ Abandonment

Depth set at - Metres From	To	Material and type (bentonite slurry, neat cement slurry) etc.	Volume Placed (cubic metres)
15.9	14.2	GRAVEL	NATURAL
14.2	13.3	ENVIROPLUG MEDIUM	1 BAG
13.3	4.5	CEMENT (PORTLAND	30 BAGS
4.5	0	ENVIROPLUG MEDIUM	28 BAGS

Method of Construction

☐ Cable Tool ☐ Rotary (air) ☐ Diamond ☐ Digging
☐ Rotary (conventional) ☐ Air percussion ☐ Jetting ☑ Other
☐ Rotary (reverse) ☐ Boring ☐ Driving DUAL ROTARY

Water Use

☐ Domestic ☐ Industrial ☐ Public Supply ☐ Other
☐ Stock ☐ Commercial ☐ Not used
☐ Irrigation ☑ Municipal ☐ Cooling & air conditioning

Final Status of Well

☑ Water Supply ☐ Recharge well ☐ Unfinished ☐ Abandoned, (Other)
☐ Observation well ☐ Abandoned, insufficient supply ☐ Dewatering
☐ Test Hole ☐ Abandoned, poor quality ☐ Replacement well

Well Contractor/Technician Information

Name of Well Contractor: FRIESEN DRILLERS LTD | Well Contractor's Licence No.: 2211

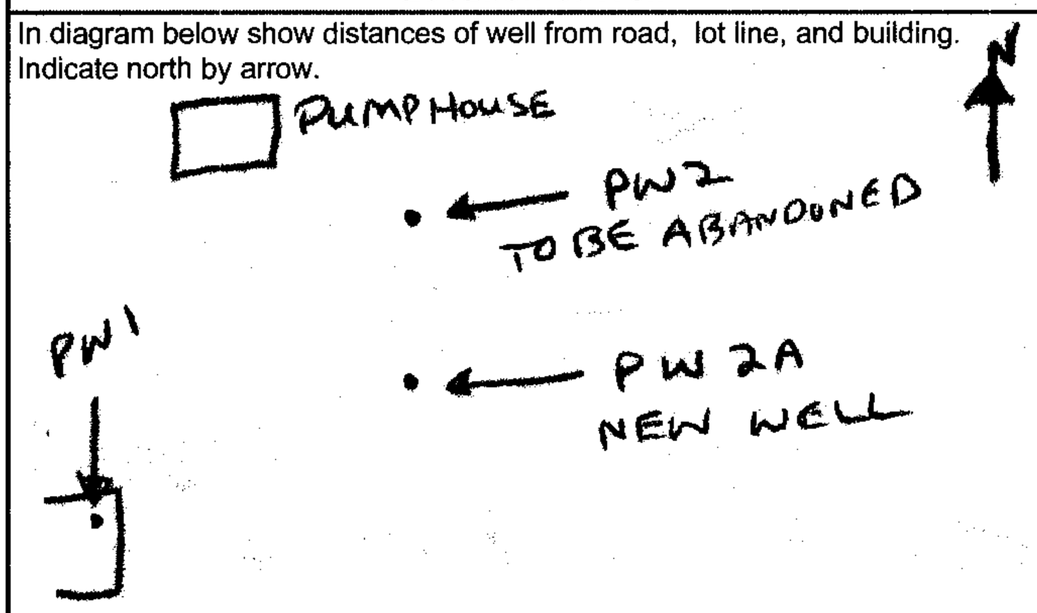
Business Address (street name, number, city etc.): BOX 1 CRP 15 RR 1 STEINBACH MB R5G 1L9 | FRIESEN, JAMES

Name of Well Technician (last name, first name) | Well Technician's Licence No.: T 324

Signature of Technician/Contractor: X [signature] | Date Submitted YYYY MM DD

Location of Well

In diagram below show distances of well from road, lot line, and building. Indicate north by arrow.



SEE ATTACHED SHEET

Audit No. Z 01557 | Date Well Completed: 2005 YYYY 3 MM 7 DD

Was the well owner's information package delivered? ☐ Yes ☒ No | Date Delivered YYYY MM DD

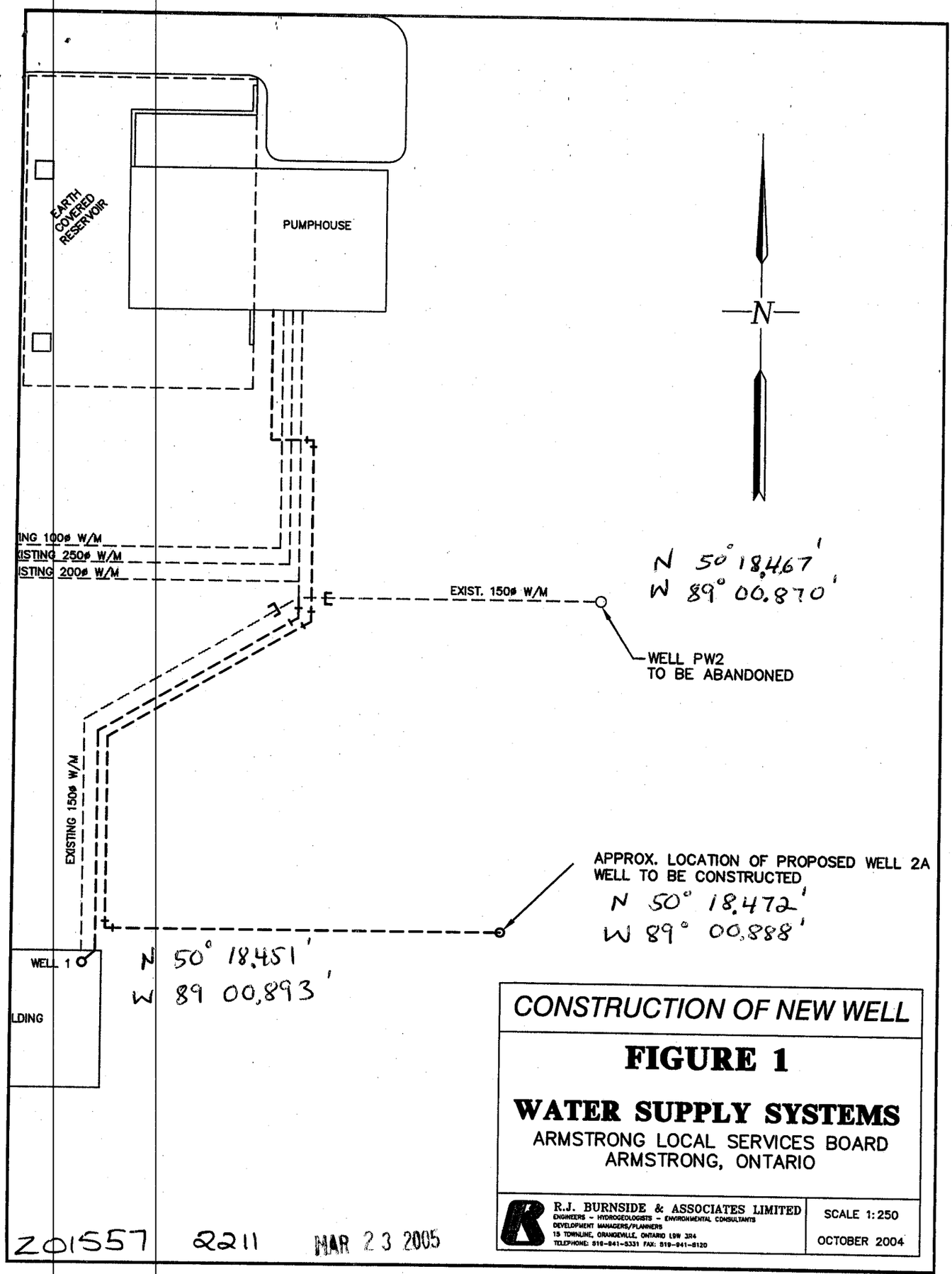
Ministry Use Only

Data Source | Contractor: 2211

Date Received: MAR 23 2005 | Date of Inspection YYYY MM DD

Remarks | Well Record Number

0506E (09/03) Contractor's Copy ☐ Ministry's Copy ☐ Well Owner's Copy ☐ *Cette formule est disponible en français*



CONSTRUCTION OF NEW WELL

FIGURE 1

WATER SUPPLY SYSTEMS

ARMSTRONG LOCAL SERVICES BOARD
ARMSTRONG, ONTARIO

R.J. BURNSIDE & ASSOCIATES LIMITED
ENGINEERS - HYDROGEOLOGISTS - ENVIRONMENTAL CONSULTANTS
DEVELOPMENT MANAGERS/PLANNERS
15 TOWNLINE, ORANGEVILLE, ONTARIO L9W 3R4
TELEPHONE: 519-941-5331 FAX: 519-941-8120

SCALE 1:250

OCTOBER 2004

XREF: M1245 SP.DWG

M1245 NEW WELL.DWG

Ministry of the Environment
Ontario

The Ontario Water Resources Act

WATER WELL RECORD

1. PRINT ONLY IN SPACES PROVIDED
2. CHECK ☒ CORRECT BOX WHERE APPLICABLE

11 — 6104793 — MUNICIP. 6,1,0,0,0 — CON.

COUNTY OR DISTRICT	TOWNSHIP, BOROUGH, CITY, TOWN, VILLAGE	CON. BLOCK, TRACT, SURVEY, ETC	LOT	DATE COMPLETED
Thunder Bay	Unorganized Territory	Plan M264	3	DAY 24 MO 04 YR 92

[redacted] 000 Waldwic Lane Oshkosh WI.

21 — M — RC. — ELEVATION — RC. — BASIN CODE — II — III — IV

LOG OF OVERBURDEN AND BEDROCK MATERIALS (SEE INSTRUCTIONS)

GENERAL COLOUR	MOST COMMON MATERIAL	OTHER MATERIALS	GENERAL DESCRIPTION	DEPTH - FEET FROM	DEPTH - FEET TO
Brown	sand	fine gravel		0	52
black	gravel			52	58
black	granite			58	60

31

32

41 WATER RECORD

WATER FOUND AT - FEET	KIND OF WATER
59	1 ☒ FRESH 2 ☐ SALTY 3 ☐ SULPHUR 4 ☐ MINERALS 6 ☐ GAS
	1 ☐ FRESH 2 ☐ SALTY 3 ☐ SULPHUR 4 ☐ MINERALS 6 ☐ GAS
	1 ☐ FRESH 2 ☐ SALTY 3 ☐ SULPHUR 4 ☐ MINERALS 6 ☐ GAS
	1 ☐ FRESH 2 ☐ SALTY 3 ☐ SULPHUR 4 ☐ MINERALS 6 ☐ GAS
	1 ☐ FRESH 2 ☐ SALTY 3 ☐ SULPHUR 4 ☐ MINERALS 6 ☐ GAS

51 CASING & OPEN HOLE RECORD

INSIDE DIAM INCHES	MATERIAL	WALL THICKNESS INCHES	DEPTH - FEET FROM	DEPTH - FEET TO
6 1/4	1 ☒ STEEL 2 ☐ GALVANIZED 3 ☐ CONCRETE 4 ☐ OPEN HOLE 5 ☐ PLASTIC	.188	0	58
6	1 ☐ STEEL 2 ☐ GALVANIZED 3 ☐ CONCRETE 4 ☐ OPEN HOLE 5 ☐ PLASTIC		58	60
	1 ☐ STEEL 2 ☐ GALVANIZED 3 ☐ CONCRETE 4 ☐ OPEN HOLE 5 ☐ PLASTIC			

SCREEN

SIZE(S) OF OPENING (SLOT NO.)	DIAMETER INCHES	LENGTH FEET

MATERIAL AND TYPE — DEPTH TO TOP OF SCREEN FEET

61 PLUGGING & SEALING RECORD

DEPTH SET AT - FEET FROM	DEPTH SET AT - FEET TO	MATERIAL AND TYPE (CEMENT GROUT LEAD PACKER, ETC.)
0	59	Casing driven shoe,

71 PUMPING TEST

PUMPING TEST METHOD	PUMPING RATE	DURATION OF PUMPING
1 ☒ PUMP 2 ☐ BAILER	20 GPM	1 HOURS 0 MINS

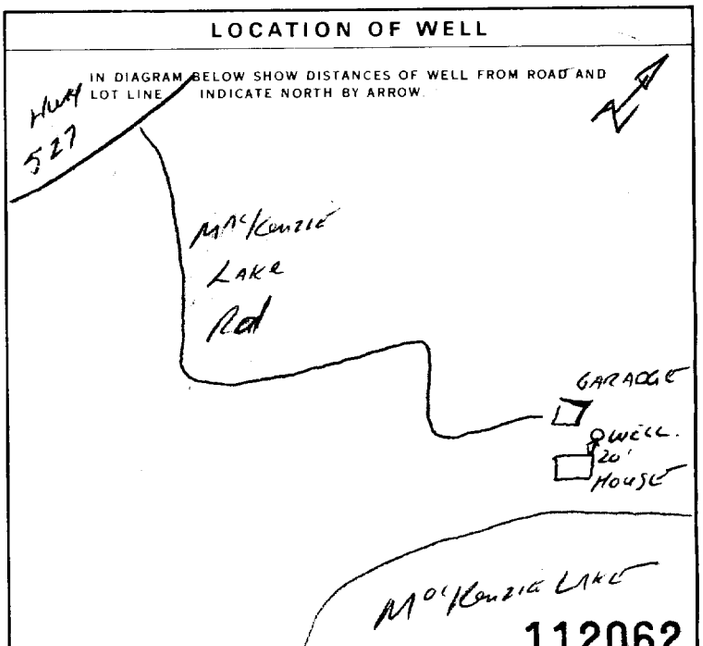
STATIC LEVEL	WATER LEVEL END OF PUMPING	WATER LEVELS DURING 1 ☒ PUMPING 2 ☐ RECOVERY	15 MINUTES	30 MINUTES	45 MINUTES	60 MINUTES
16 FEET	FEET		FEET	FEET	FEET	FEET

IF FLOWING, GIVE RATE	PUMP INTAKE SET AT	WATER AT END OF TEST
GPM	FEET	1 ☒ CLEAR 2 ☐ CLEAR

RECOMMENDED PUMP TYPE	RECOMMENDED PUMP SETTING	RECOMMENDED PUMPING RATE
☒ SHALLOW ☐ DEEP	30 FEET	10 GPM

LOCATION OF WELL

IN DIAGRAM BELOW SHOW DISTANCES OF WELL FROM ROAD AND LOT LINE. INDICATE NORTH BY ARROW.



DRILLERS REMARKS

112062

FINAL STATUS OF WELL

1 ☒ WATER SUPPLY 2 ☐ OBSERVATION WELL 3 ☐ TEST HOLE 4 ☐ RECHARGE WELL 5 ☐ ABANDONED, INSUFFICIENT SUPPLY 6 ☐ ABANDONED, POOR QUALITY 7 ☐ UNFINISHED ☐ DEWATERING

WATER USE

1 ☒ DOMESTIC 2 ☐ STOCK 3 ☐ IRRIGATION 4 ☐ INDUSTRIAL ☐ OTHER 5 ☐ COMMERCIAL 6 ☐ MUNICIPAL 7 ☐ PUBLIC SUPPLY 8 ☐ COOLING OR AIR CONDITIONING 9 ☐ NOT USED

METHOD OF CONSTRUCTION

1 ☐ CABLE TOOL 2 ☐ ROTARY (CONVENTIONAL) 3 ☐ ROTARY (REVERSE) 4 ☐ ROTARY (AIR) 5 ☒ AIR PERCUSSION 6 ☐ BORING 7 ☐ DIAMOND 8 ☐ JETTING 9 ☐ DRIVING ☐ DIGGING ☐ OTHER

CONTRACTOR

NAME OF WELL CONTRACTOR: Campbell + Fraser Inc. — WELL CONTRACTOR'S LICENCE NUMBER: 5557

ADDRESS: RR# 13 Thunder Bay Ontario

NAME OF WELL TECHNICIAN: Rick Fraser — WELL TECHNICIAN'S LICENCE NUMBER: T0155

SIGNATURE OF TECHNICIAN/CONTRACTOR — SUBMISSION DATE: DAY 1 MO MAY YR 92

OFFICE USE ONLY

DATA SOURCE — CONTRACTOR 5557 — DATE RECEIVED MAY 06 1992

DATE OF INSPECTION — INSPECTOR

REMARKS

CSS S

MINISTRY OF THE ENVIRONMENT COPY

FORM NO. 0506 (11/86) FORM 9

Ministry of the Environment
Ontario

The Ontario Water Resources Act

WATER WELL RECORD

6104794

1. PRINT ONLY IN SPACES PROVIDED
2. CHECK ☒ CORRECT BOX WHERE APPLICABLE

11

MUNICIP. 6,1000 CON.

COUNTY OR DISTRICT: Thunder Bay
TOWNSHIP, BOROUGH, CITY, TOWN, VILLAGE: UNORGANIZED TERR.
CON. BLOCK, TRACT, SURVEY ETC: CL 6171 PARTI PLAN 55R8960
LOT:
[redacted] P.O. Box 122 Armstrong Ont P0T 1A0
DATE COMPLETED: DAY 23 MO 04 YR 92 (92)

RC. ELEVATION RC. BASIN CODE II III IV

LOG OF OVERBURDEN AND BEDROCK MATERIALS (SEE INSTRUCTIONS)

GENERAL COLOUR	MOST COMMON MATERIAL	OTHER MATERIALS	GENERAL DESCRIPTION	DEPTH - FEET FROM	TO
Brown	SAND			0	30
	gravel	SAND		30	35
	gravel	STONES		35	50
red	granite		broken Layers	50	63
red	granite		fractured	63	70
red	granite	black Layers		70	195
red	granite	brown Layers		195	225
red	Granite	white & green Layers	SOFT	225	271

31
32

41 WATER RECORD

WATER FOUND AT - FEET	KIND OF WATER
175	1 ☒ FRESH 2 ☐ SALTY 3 ☐ SULPHUR 4 ☐ MINERALS 6 ☐ GAS
256	1 ☒ FRESH 2 ☐ SALTY 3 ☐ SULPHUR 4 ☐ MINERALS 6 ☐ GAS
265	1 ☒ FRESH 2 ☐ SALTY 3 ☐ SULPHUR 4 ☐ MINERALS 6 ☐ GAS
	1 ☐ FRESH 2 ☐ SALTY 3 ☐ SULPHUR 4 ☐ MINERALS 6 ☐ GAS
	1 ☐ FRESH 2 ☐ SALTY 3 ☐ SULPHUR 4 ☐ MINERALS 6 ☐ GAS

51 CASING & OPEN HOLE RECORD

INSIDE DIAM INCHES	MATERIAL	WALL THICKNESS INCHES	DEPTH - FEET FROM	TO
6 1/4	1 ☒ STEEL 2 ☐ GALVANIZED 3 ☐ CONCRETE 4 ☐ OPEN HOLE 5 ☐ PLASTIC	.188	0	73
6 1/8	1 ☐ STEEL 2 ☐ GALVANIZED 3 ☐ CONCRETE 4 ☒ OPEN HOLE 5 ☐ PLASTIC		73	271
	1 ☐ STEEL 2 ☐ GALVANIZED 3 ☐ CONCRETE 4 ☐ OPEN HOLE 5 ☐ PLASTIC			

SCREEN

SIZE(S) OF OPENING (SLOT NO.)	DIAMETER INCHES	LENGTH FEET
MATERIAL AND TYPE	DEPTH TO TOP OF SCREEN FEET	

61 PLUGGING & SEALING RECORD

DEPTH SET AT - FEET FROM	TO	MATERIAL AND TYPE (CEMENT GROUT LEAD PACKER, ETC.)
0	73	Casing drive Shoe
		Aluminite socket

71 PUMPING TEST

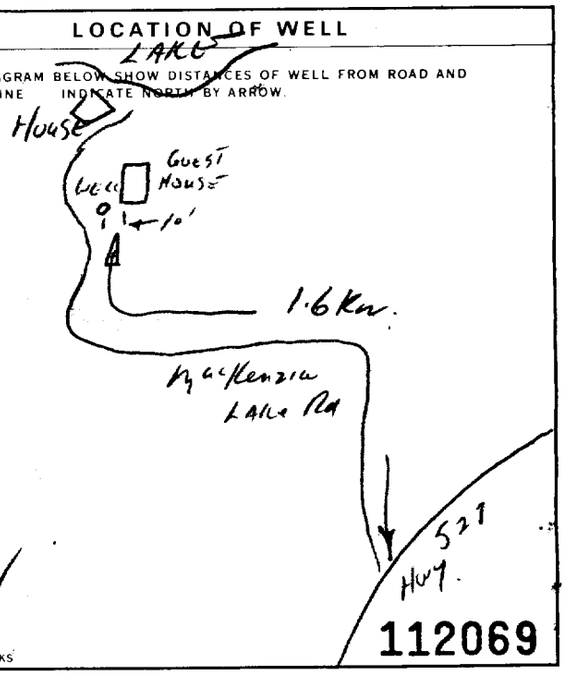
PUMPING TEST METHOD: 1 ☒ PUMP 2 ☐ BAILER
PUMPING RATE: 3 GPM
DURATION OF PUMPING: 2 HOURS
STATIC LEVEL: 40 FEET
WATER LEVEL END OF PUMPING: 250 FEET
WATER LEVELS DURING: 1 ☒ PUMPING 2 ☐ RECOVERY

15 MINUTES	30 MINUTES	45 MINUTES	60 MINUTES
FEET	FEET	FEET	FEET

IF FLOWING GIVE RATE: GPM
PUMP INTAKE SET AT: FEET
WATER AT END OF TEST: 1 ☒ CLEAR 2 ☐ CLOUDY
RECOMMENDED PUMP TYPE: ☐ SHALLOW ☒ DEEP
RECOMMENDED PUMP SETTING: 260 FEET
RECOMMENDED PUMPING RATE: 3 GPM

LOCATION OF WELL

IN DIAGRAM BELOW SHOW DISTANCES OF WELL FROM ROAD AND LOT LINE. INDICATE NORTH BY ARROW.



DRILLERS REMARKS

112069

FINAL STATUS OF WELL

1 ☒ WATER SUPPLY 2 ☐ OBSERVATION WELL 3 ☐ TEST HOLE 4 ☐ RECHARGE WELL 5 ☐ ABANDONED, INSUFFICIENT SUPPLY 6 ☐ ABANDONED, POOR QUALITY 7 ☐ UNFINISHED ☐ DEWATERING

WATER USE

1 ☒ DOMESTIC 2 ☐ STOCK 3 ☐ IRRIGATION 4 ☐ INDUSTRIAL ☐ OTHER 5 ☐ COMMERCIAL 6 ☐ MUNICIPAL 7 ☐ PUBLIC SUPPLY 8 ☐ COOLING OR AIR CONDITIONING 9 ☐ NOT USED

METHOD OF CONSTRUCTION

1 ☐ CABLE TOOL 2 ☐ ROTARY (CONVENTIONAL) 3 ☐ ROTARY (REVERSE) 4 ☐ ROTARY (AIR) 5 ☒ AIR PERCUSSION 6 ☐ BORING 7 ☐ DIAMOND 8 ☐ JETTING 9 ☐ DRIVING ☐ DIGGING ☐ OTHER

CONTRACTOR

NAME OF WELL CONTRACTOR: Campbell & Fraser Inc
WELL CONTRACTOR'S LICENCE NUMBER: 5557
ADDRESS: RR#13 Thunder Bay Ontario
NAME OF WELL TECHNICIAN: Rick Fraser
WELL TECHNICIAN'S LICENCE NUMBER: 10257
SIGNATURE OF TECHNICIAN/CONTRACTOR: Rick Fraser
SUBMISSION DATE: DAY 1 MO. May YR. 92

OFFICE USE ONLY

DATA SOURCE
CONTRACTOR: 5557
DATE RECEIVED: MAY 06 1992
DATE OF INSPECTION
INSPECTOR
REMARKS: CSS S

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FORM NO. 0506 (11/86) FORM 9

Ministry of the Environment
Ontario

The Ontario Water Resources Act

WATER WELL RECORD

1. PRINT ONLY IN SPACES PROVIDED
2. CHECK ☒ CORRECT BOX WHERE APPLICABLE

11 — 6104793 — MUNICIP. 6,1,0,0,0 — CON.

COUNTY OR DISTRICT	TOWNSHIP, BOROUGH, CITY, TOWN, VILLAGE	CON. BLOCK, TRACT, SURVEY, ETC	LOT	DATE COMPLETED
Thunder Bay	Unorganized Territory	Plan M264	3	DAY 24 MO 04 YR 92

[redacted] 000 Waldwic Lane Oshkosh WI.

21 — M — RC. — ELEVATION — RC. — BASIN CODE — II — III — IV

LOG OF OVERBURDEN AND BEDROCK MATERIALS (SEE INSTRUCTIONS)

GENERAL COLOUR	MOST COMMON MATERIAL	OTHER MATERIALS	GENERAL DESCRIPTION	DEPTH - FEET FROM	DEPTH - FEET TO
Brown	sand	fine gravel		0	52
black	gravel			52	58
black	granite			58	60

31

32

41 WATER RECORD

WATER FOUND AT - FEET	KIND OF WATER
59	1 ☒ FRESH 2 ☐ SALTY 3 ☐ SULPHUR 4 ☐ MINERALS 6 ☐ GAS
	1 ☐ FRESH 2 ☐ SALTY 3 ☐ SULPHUR 4 ☐ MINERALS 6 ☐ GAS
	1 ☐ FRESH 2 ☐ SALTY 3 ☐ SULPHUR 4 ☐ MINERALS 6 ☐ GAS
	1 ☐ FRESH 2 ☐ SALTY 3 ☐ SULPHUR 4 ☐ MINERALS 6 ☐ GAS
	1 ☐ FRESH 2 ☐ SALTY 3 ☐ SULPHUR 4 ☐ MINERALS 6 ☐ GAS

51 CASING & OPEN HOLE RECORD

INSIDE DIAM INCHES	MATERIAL	WALL THICKNESS INCHES	DEPTH - FEET FROM	DEPTH - FEET TO
6 1/4	1 ☒ STEEL 2 ☐ GALVANIZED 3 ☐ CONCRETE 4 ☐ OPEN HOLE 5 ☐ PLASTIC	.188	0	58
6	1 ☐ STEEL 2 ☐ GALVANIZED 3 ☐ CONCRETE 4 ☐ OPEN HOLE 5 ☐ PLASTIC		58	60
	1 ☐ STEEL 2 ☐ GALVANIZED 3 ☐ CONCRETE 4 ☐ OPEN HOLE 5 ☐ PLASTIC			

SCREEN

SIZE(S) OF OPENING (SLOT NO.)	DIAMETER INCHES	LENGTH FEET

MATERIAL AND TYPE — DEPTH TO TOP OF SCREEN FEET

61 PLUGGING & SEALING RECORD

DEPTH SET AT - FEET FROM	DEPTH SET AT - FEET TO	MATERIAL AND TYPE (CEMENT GROUT LEAD PACKER, ETC.)
0	59	Casing driven shoe,

71 PUMPING TEST

PUMPING TEST METHOD	PUMPING RATE	DURATION OF PUMPING
1 ☒ PUMP 2 ☐ BAILER	20 GPM	1 HOURS 0 MINS

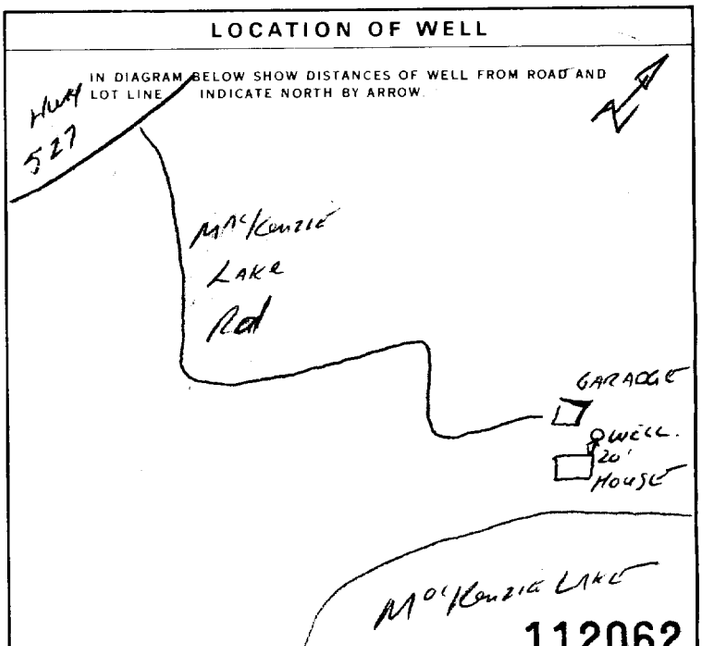
STATIC LEVEL	WATER LEVEL END OF PUMPING	WATER LEVELS DURING 1 ☒ PUMPING 2 ☐ RECOVERY	15 MINUTES	30 MINUTES	45 MINUTES	60 MINUTES
16 FEET	FEET		FEET	FEET	FEET	FEET

IF FLOWING, GIVE RATE	PUMP INTAKE SET AT	WATER AT END OF TEST
GPM	FEET	1 ☒ CLEAR 2 ☐ CLEAR

RECOMMENDED PUMP TYPE	RECOMMENDED PUMP SETTING	RECOMMENDED PUMPING RATE
☒ SHALLOW ☐ DEEP	30 FEET	10 GPM

LOCATION OF WELL

IN DIAGRAM BELOW SHOW DISTANCES OF WELL FROM ROAD AND LOT LINE. INDICATE NORTH BY ARROW.



DRILLERS REMARKS

112062

FINAL STATUS OF WELL

1 ☒ WATER SUPPLY 2 ☐ OBSERVATION WELL 3 ☐ TEST HOLE 4 ☐ RECHARGE WELL 5 ☐ ABANDONED, INSUFFICIENT SUPPLY 6 ☐ ABANDONED, POOR QUALITY 7 ☐ UNFINISHED ☐ DEWATERING

WATER USE

1 ☒ DOMESTIC 2 ☐ STOCK 3 ☐ IRRIGATION 4 ☐ INDUSTRIAL ☐ OTHER 5 ☐ COMMERCIAL 6 ☐ MUNICIPAL 7 ☐ PUBLIC SUPPLY 8 ☐ COOLING OR AIR CONDITIONING 9 ☐ NOT USED

METHOD OF CONSTRUCTION

1 ☐ CABLE TOOL 2 ☐ ROTARY (CONVENTIONAL) 3 ☐ ROTARY (REVERSE) 4 ☐ ROTARY (AIR) 5 ☒ AIR PERCUSSION 6 ☐ BORING 7 ☐ DIAMOND 8 ☐ JETTING 9 ☐ DRIVING ☐ DIGGING ☐ OTHER

CONTRACTOR

NAME OF WELL CONTRACTOR: Campbell + Fraser Inc. — WELL CONTRACTOR'S LICENCE NUMBER: 5557

ADDRESS: RR# 13 Thunder Bay Ontario

NAME OF WELL TECHNICIAN: Rick Fraser — WELL TECHNICIAN'S LICENCE NUMBER: T0155

SIGNATURE OF TECHNICIAN/CONTRACTOR — SUBMISSION DATE: DAY 1 MO MAY YR 92

OFFICE USE ONLY

DATA SOURCE — CONTRACTOR 5557 — DATE RECEIVED MAY 06 1992

DATE OF INSPECTION — INSPECTOR

REMARKS

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FORM NO. 0506 (11/86) FORM 9

Ministry of Environment and Energy
Ontario

The Ontario Water Resources Act
WATER WELL RECORD

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Mark correct box with a checkmark, where applicable.

11 — 6106414 — Municipality 61195 — Con

County or District: THUNDER BAY
Township/Borough/City/Town/Village: ARMSTRONG
Con block tract survey, etc.: PLAN M 250
Lot: 2
Address: 721 GOULDING ST
Date completed: 13 day 07 month 99 year
Northing — RC — Elevation — RC — Basin Code

LOG OF OVERBURDEN AND BEDROCK MATERIALS (see instructions)

General colour	Most common material	Other materials	General description	Depth – feet From	Depth – feet To
GREY	FINE SAND		LOOSE	0	71
GREY	FINE SAND	STONES	PACKED	71	73
GREY	GRANITE	QUARTS	MED	73	106
RED	GRANTE		MED	106	116
GREY	GRANITE	RED STRINGERS	MED	116	140

WATER RECORD

Water found at – feet	Kind of water
75	1 ☒ Fresh 2 ☐ Salty 3 ☐ Sulphur 4 ☐ Minerals 5 ☐ Gas
116	1 ☒ Fresh 2 ☐ Salty 3 ☐ Sulphur 4 ☐ Minerals 5 ☐ Gas
	1 ☐ Fresh 2 ☐ Salty 3 ☐ Sulphur 4 ☐ Minerals 5 ☐ Gas
	1 ☐ Fresh 2 ☐ Salty 3 ☐ Sulphur 4 ☐ Minerals 5 ☐ Gas
	1 ☐ Fresh 2 ☐ Salty 3 ☐ Sulphur 4 ☐ Minerals 5 ☐ Gas

CASING & OPEN HOLE RECORD

Inside diam inches	Material	Wall thickness inches	Depth – feet From	Depth – feet To
6.125	1 ☒ Steel 2 ☐ Galvanized 3 ☐ Concrete 4 ☐ Open hole 5 ☐ Plastic	.188	0	73
6	1 ☐ Steel 2 ☐ Galvanized 3 ☐ Concrete 4 ☒ Open hole 5 ☐ Plastic		73	140
	1 ☐ Steel 2 ☐ Galvanized 3 ☐ Concrete 4 ☐ Open hole 5 ☐ Plastic			

SCREEN

Sizes of opening (Slot No.)	Diameter inches	Length feet

Material and type: — Depth at top of screen feet:

PLUGGING & SEALING RECORD

☐ Annular space ☐ Abandonment

Depth set at – feet From	Depth set at – feet To	Material and type (Cement grout, bentonite, etc.)
0	73	DRIVE SHOE
		GROUT

PUMPING TEST

Pumping test method: 1 ☒ Pump 2 ☐ Bailer
Pumping rate: 3 GPM
Duration of pumping: ..... Hours ..... Mins
Water levels during: 1 ☐ Pumping 2 ☐ Recovery

Static level	Water level end of pumping	15 minutes	30 minutes	45 minutes	60 minutes
4 feet	feet	feet	feet	feet	feet

If flowing give rate: GPM
Pump intake set at: feet
Water at end of test: ☒ Clear ☐ Cloudy
Recommended pump type: ☐ Shallow ☒ Deep
Recommended pump setting: 120 feet
Recommended pump rate: 6 – 10 GPM

FINAL STATUS OF WELL

1 ☒ Water supply 2 ☐ Observation well 3 ☐ Test hole 4 ☐ Recharge well 5 ☐ Abandoned, insufficient supply 6 ☐ Abandoned, poor quality 7 ☐ Abandoned (Other) 8 ☐ Dewatering 9 ☐ Unfinished 10 ☐ Replacement well

WATER USE

1 ☒ Domestic 2 ☐ Stock 3 ☐ Irrigation 4 ☐ Industrial 5 ☐ Commercial 6 ☐ Municipal 7 ☐ Public supply 8 ☐ Cooling & air conditioning 9 ☐ Not used 10 ☐ Other .....

METHOD OF CONSTRUCTION

1 ☐ Cable tool 2 ☐ Rotary (conventional) 3 ☐ Rotary (reverse) 4 ☒ Rotary (air) 5 ☒ Air percussion 6 ☐ Boring 7 ☐ Diamond 8 ☐ Jetting 9 ☐ Driving 10 ☐ Digging 11 ☐ Other .....

LOCATION OF WELL

In diagram below show distances of well from road and lot line. Indicate north by arrow.

170754

Name of Well Contractor: JOHN DERKACZ WATER WELLS LTD — Well Contractor's Licence No.: 1751
Address: RR # 14 THUNDER BAY
Name of Well Technician: JOHN DERKACZ — Well Technician's Licence No.: T-0045
Signature of Technician/Contractor: John Derkacz — Submission date: 19 day 07 mo 99 yr

MINISTRY USE ONLY
Data source — Contractor: 1751 — Date received: AUG 19 1999
Date of inspection — Inspector
Remarks

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Ministry of Environment and Energy
Ontario

The Ontario Water Resources Act
WATER WELL RECORD

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11 — 6106413 — Municipality 61195 — Con.

County or District: THUNDER BAY

Township/Borough/City/Town/Village: ARMSTRONG

Con block tract survey etc.: PLAN M250 PARCEL 153 11

Lot: 4

Address: [redacted] BOX 157 ARMSTRON

Date completed: 14 day 07 month 99 year

Northing — RC — Elevation — RC — Basin Code — ii — iii — iv

LOG OF OVERBURDEN AND BEDROCK MATERIALS (see instructions)

General colour	Most common material	Other materials	General description	Depth – feet From	Depth – feet To
TAN	SAND		PACKED	0	94
BLACK	GRAVEL	STONES	LAYED	94	99

WATER RECORD

Water found at – feet	Kind of water
96	1 [X] Fresh 2 [ ] Salty 3 [ ] Sulphur 4 [ ] Minerals 5 [ ] Gas
	1 [ ] Fresh 2 [ ] Salty 3 [ ] Sulphur 4 [ ] Minerals 5 [ ] Gas
	1 [ ] Fresh 2 [ ] Salty 3 [ ] Sulphur 4 [ ] Minerals 5 [ ] Gas
	1 [ ] Fresh 2 [ ] Salty 3 [ ] Sulphur 4 [ ] Minerals 5 [ ] Gas
	1 [ ] Fresh 2 [ ] Salty 3 [ ] Sulphur 4 [ ] Minerals 5 [ ] Gas

CASING & OPEN HOLE RECORD

Inside diam inches	Material	Wall thickness inches	Depth – feet From	Depth – feet To
6.125	1 [X] Steel 2 [ ] Galvanized 3 [ ] Concrete 4 [ ] Open hole 5 [ ] Plastic	.188	0	96
6	1 [ ] Steel 2 [ ] Galvanized 3 [ ] Concrete 4 [X] Open hole 5 [ ] Plastic		96	99
	1 [ ] Steel 2 [ ] Galvanized 3 [ ] Concrete 4 [ ] Open hole 5 [ ] Plastic			

SCREEN

Sizes of opening (Slot No.)	Diameter inches	Length feet

Material and type: | Depth at top of screen feet:

PLUGGING & SEALING RECORD

[ ] Annular space [ ] Abandonment

Depth set at – feet From	Depth set at – feet To	Material and type (Cement grout, bentonite, etc.)
0	94	DRIVE SHOE
		GROUT

PUMPING TEST

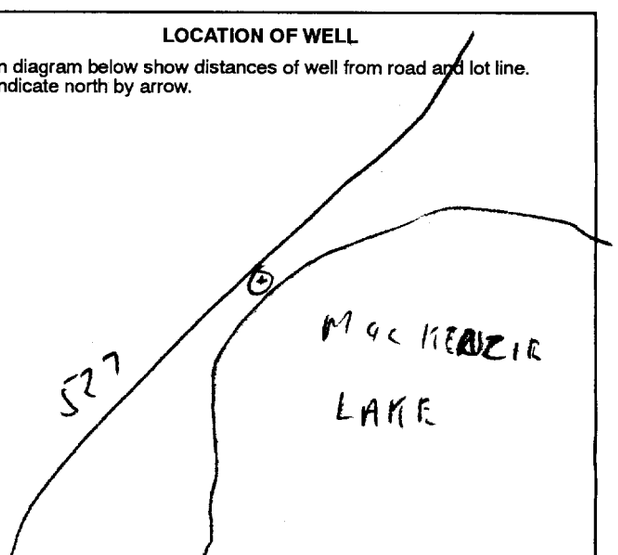
Pumping test method: [X] Pump [ ] Bailer
Pumping rate: 8 GPM
Duration of pumping: 1 Hours ..... Mins

Static level	Water level end of pumping	Water levels during: 1 [ ] Pumping 2 [ ] Recovery			
20 feet	feet	15 minutes feet	30 minutes feet	45 minutes feet	60 minutes feet

If flowing give rate: GPM
Pump intake set at: feet
Water at end of test: [X] Clear [ ] Cloudy
Recommended pump type: [ ] Shallow [X] Deep
Recommended pump setting: 80 feet
Recommended pump rate: GPM

LOCATION OF WELL

In diagram below show distances of well from road and lot line. Indicate north by arrow.



52 - 1/16 695525 170755

FINAL STATUS OF WELL

1 [X] Water supply 2 [ ] Observation well 3 [ ] Test hole 4 [ ] Recharge well 5 [ ] Abandoned, insufficient supply 6 [ ] Abandoned, poor quality 7 [ ] Abandoned (Other) 8 [ ] Dewatering 9 [ ] Unfinished 10 [ ] Replacement well

WATER USE

1 [X] Domestic 2 [ ] Stock 3 [ ] Irrigation 4 [ ] Industrial 5 [ ] Commercial 6 [ ] Municipal 7 [ ] Public supply 8 [ ] Cooling & air conditioning 9 [ ] Not used 10 [ ] Other .....

METHOD OF CONSTRUCTION

1 [ ] Cable tool 2 [ ] Rotary (conventional) 3 [ ] Rotary (reverse) 4 [X] Rotary (air) 5 [ ] Air percussion 6 [ ] Boring 7 [ ] Diamond 8 [ ] Jetting 9 [ ] Driving 10 [ ] Digging 11 [ ] Other .....

Name of Well Contractor: JOHN DERKACZ WATER WELLS LTD — Well Contractor's Licence No.: 1751
Address: RR # 14 THUNDER BAY
Name of Well Technician: JOHN DERKACZ — Well Technician's Licence No.: T-0045
Signature of Technician/Contractor: John Derkacz — Submission date: 18 day 08 mo 99 yr

MINISTRY USE ONLY

Data source — Contractor: 1751 — Date received: AUG 19 1999
Date of inspection — Inspector
Remarks

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0506 (07/94) Front Form 9

Ministry of Environment and Energy
Ontario

The Ontario Water Resources Act
WATER WELL RECORD

Print only in spaces provided.
Mark correct box with a checkmark, where applicable.

11 6106412 Municipality 61195 Con.

County or District: THUNDER BAY
Township/Borough/City/Town/Village: ARM STRONG
Con block tract survey etc.: PARCEL 10134 PLAN M112
Lot: 70
Address: BOX 310 ARMSTRONG
Date completed: 15 day 07 month 99 year
[redacted] ROTARY OUTFITTERS
Northing RC Elevation RC Basin Code ii iii iv

LOG OF OVERBURDEN AND BEDROCK MATERIALS (see instructions)

General colour	Most common material	Other materials	General description	Depth – feet From	Depth – feet To
BROWN	SAND	STONES	PACKED	0	14
TAN	FINE SAND		PACKED	14	58
BLACK	GRANITE	RED STRINGER		58	120

41 WATER RECORD

Water found at – feet	Kind of water
110	1 [X] Fresh 2 [ ] Salty 3 [ ] Sulphur 4 [ ] Minerals 6 [ ] Gas
	1 [ ] Fresh 2 [ ] Salty 3 [ ] Sulphur 4 [ ] Minerals 6 [ ] Gas
	1 [ ] Fresh 2 [ ] Salty 3 [ ] Sulphur 4 [ ] Minerals 6 [ ] Gas
	1 [ ] Fresh 2 [ ] Salty 3 [ ] Sulphur 4 [ ] Minerals 6 [ ] Gas
	1 [ ] Fresh 2 [ ] Salty 3 [ ] Sulphur 4 [ ] Minerals 6 [ ] Gas

51 CASING & OPEN HOLE RECORD

Inside diam inches	Material	Wall thickness inches	Depth – feet From	Depth – feet To
6.125	1 [X] Steel 2 [ ] Galvanized 3 [ ] Concrete 4 [ ] Open hole 5 [ ] Plastic	.188	0	58
6	1 [ ] Steel 2 [ ] Galvanized 3 [ ] Concrete 4 [X] Open hole 5 [ ] Plastic		58	120
	1 [ ] Steel 2 [ ] Galvanized 3 [ ] Concrete 4 [ ] Open hole 5 [ ] Plastic			

SCREEN

Sizes of opening (Slot No.)	Diameter inches	Length feet

Material and type: | Depth at top of screen feet:

61 PLUGGING & SEALING RECORD

[ ] Annular space [ ] Abandonment

Depth set at – feet From	Depth set at – feet To	Material and type (Cement grout, bentonite, etc.)
8	58	DRIVE SHOE
		WELL CUTTINGS

71 PUMPING TEST

Pumping test method: 1 [X] Pump 2 [ ] Bailer
Pumping rate: 2 GPM
Duration of pumping: 1 Hours ..... Mins

Static level feet	Water level end of pumping feet	Water levels during: 1 [ ] Pumping 2 [ ] Recovery	15 minutes feet	30 minutes feet	45 minutes feet	60 minutes feet

If flowing give rate: GPM
Pump intake set at: feet
Water at end of test: [ ] Clear [ ] Cloudy
Recommended pump type: [ ] Shallow [ ] Deep
Recommended pump setting: feet
Recommended pump rate: GPM

LOCATION OF WELL

In diagram below show distances of well from road and lot line.
Indicate north by arrow.

52-1/6 695537 170757

FINAL STATUS OF WELL

1 [X] Water supply 2 [ ] Observation well 3 [ ] Test hole 4 [ ] Recharge well 5 [ ] Abandoned, insufficient supply 6 [ ] Abandoned, poor quality 7 [ ] Abandoned (Other) 8 [ ] Dewatering 9 [ ] Unfinished 10 [ ] Replacement well

WATER USE

1 [X] Domestic 2 [ ] Stock 3 [ ] Irrigation 4 [ ] Industrial 5 [ ] Commercial 6 [ ] Municipal 7 [ ] Public supply 8 [ ] Cooling & air conditioning 9 [ ] Not used 10 [ ] Other .....

METHOD OF CONSTRUCTION

1 [ ] Cable tool 2 [ ] Rotary (conventional) 3 [ ] Rotary (reverse) 4 [X] Rotary (air) 5 [X] Air percussion 6 [ ] Boring 7 [ ] Diamond 8 [ ] Jetting 9 [ ] Driving 10 [ ] Digging 11 [ ] Other .....

Name of Well Contractor	Well Contractor's Licence No.
JOHN DERKACZ WATER WELLS LTD	1751
Address: RR # 14 THUNDER BAY	
Name of Well Technician: JOHN DERKACZ	Well Technician's Licence No.: T-0045
Signature of Technician/Contractor: John Derkacz	Submission date: day 18 mo 07 yr 99

MINISTRY USE ONLY

Data source | Contractor: 1751 | Date received: AUG 19 1999
Date of inspection | Inspector
Remarks

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Well record information

Full well record information. Contains information from the original well record and any subsequent updates.

Well record information:

Well ID

Well ID Number: 7102809
Well Audit Number: *Z55699*
Well Tag Number: *A048649*

This table contains information from the original well record and any subsequent updates.

Well Location

Address of Well Location	
Township	ARMSTRONG AREA (UNSURVEYED)
Lot	
Concession	
County/District/Municipality	THUNDER BAY
City/Town/Village	
Province	ON
Postal Code	n/a
UTM Coordinates	NAD83 — Zone 16 Easting: 351949.00 Northing: 5568996.00
Municipal Plan and Sublot Number	
Other	

Overburden and Bedrock Materials Interval

General Colour	Most Common Material	Other Materials	General Description	Depth From	Depth To
BRWN	SAND		SOFT	0 ft	140 ft
BRWN	STNS		CLN	140 ft	143 ft

Annular Space/Abandonment Sealing Record

Depth From	Depth To	Type of Sealant Used (Material and Type)	Volume Placed

0 ft 60 ft BENTONITE

Method of Construction & Well Use

Method of Construction	Well Use
Rotary (Air)	Domestic

Status of Well

Water Supply

Construction Record - Casing

Inside Diameter	Open Hole or material	Depth From	Depth To
6.25 inch	STEEL	0 ft	140 ft
	OPEN HOLE	140 ft	143 ft

Construction Record - Screen

Outside Diameter	Material	Depth From	Depth To

Well Contractor and Well Technician Information

Well Contractor's Licence Number: 6384

Results of Well Yield Testing

After test of well yield, water was	
If pumping discontinued, give reason	
Pump intake set at	
Pumping Rate	15 GPM
Duration of Pumping	
Final water level	
If flowing give rate	
Recommended pump depth	
Recommended pump rate	
Well Production	
Disinfected?	Y

Draw Down & Recovery

Draw Down Time(min)	Draw Down Water level	Recovery Time(min)	Recovery Water level
SWL			
1		1	
2		2	
3		3	
4		4	
5		5	
10		10	
15		15	
20		20	
25		25	
30		30	
40		40	

45	45
50	50
60	60

Water Details

Water Found at Depth	Kind
	Fresh

Hole Diameter

Depth From	Depth To	Diameter
0 ft	140 ft	10 inch

Audit Number: Z55699

Date Well Completed: June 20, 2007

Date Well Record Received by MOE: March 14, 2008

Updated: July 30, 2014
RateRate
Sharefacebook twitter Email Print
Tags

- Environment and energy,
- Drinking water,
- Well water

Glen Murray

Minister of the Environment and Climate Change

> "Fighting climate change and working to keep our air, land, and water clean will ensure Ontario's prosperity and quality of life for today and for future generations."

Ministry of the Environment and Climate Change

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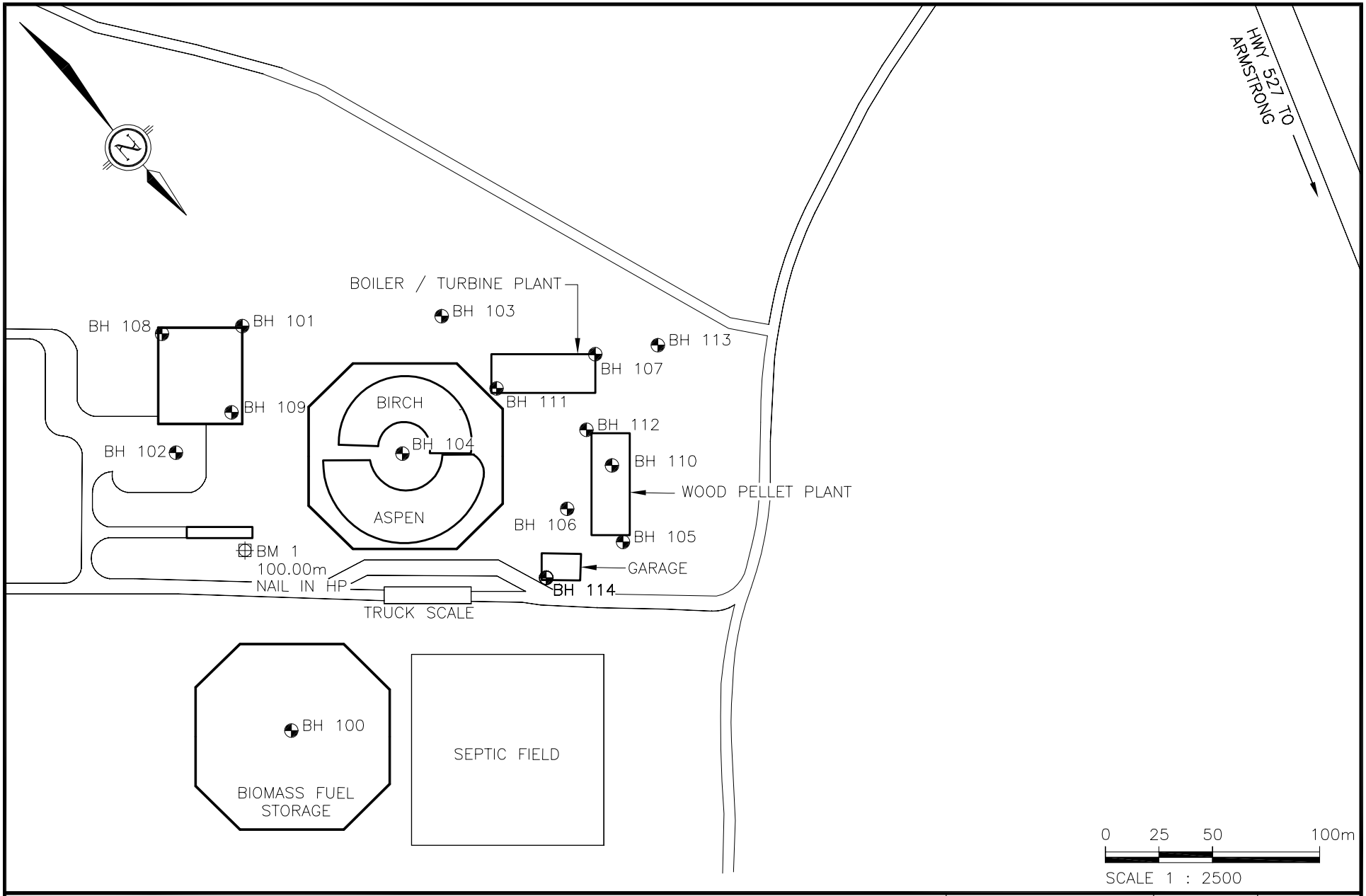

DWG. TITLE:

BOREHOLE LOCATION PLAN

PROJECT:

GEOTECHNICAL INVESTIGATION

WHITESANDS FIRST NATION, ONTARIO

TBT ENGINEERING CONSULTING GROUP

CLIENT: **WHITESANDS FIRST NATION**

DRAWN BY:	PROJECT NO.
D.S.	13-267
APPROVED BY:	DATE:
G.M.	FEB 2014
SCALE:	ENCLOSURE
AS SHOWN	1

File Path: Y:\Projects\2013\13-267 Geotech – Whitesands\TBT AutoCAD\ File Name: Borehole Location Plan.dwg

LOG OF BOREHOLE 100

PROJECT: **Geotechnical Investigation**
LOCATION: **Armstrong Station**
Whitesands First Nations, Ontario
CLIENT: **Whitesands First Nations**
SURFACE ELEV.: **98.6 metres**

EQUIPMENT: **HS Auger / B Casing**
DIAMETER: **200 mm**
DATE: **2014/1/14**
TBT REF. No.: **13-267**

DEPTH	ELEV.	DESCRIPTION	STRAT PLOT	% RECOVERY	TYPE	"N" VALUES
0	98	FILL - SAND & GRAVEL - trace to some silt, brown			AS	
1	97	SAND & GRAVEL - Sandy gravel to gravelly sand with trace to some silt, brown, occasional to numerous cobbles & boulders, dense to very dense			SS	36
2	96				SS	49
3	95				SS	44
4	94				SS	47
5	93				SS	>100
6	92				SS	31
7	91				SS	>100
8	90				SS	29
9	89					

GROUND WATER CONDITIONS

CPT (kPa) 300 600 900 1200 1500 (kPa)
× FIELD SHEAR (kPa) ⊗ Lab Shear (kPa)
■ SPT (N) ◆ DCPT
0 20 40 60 80 100

PLASTIC LIMIT w_P | NATURAL MOISTURE CONTENT w | LIQUID LIMIT w_L
WATER CONTENT (%)
20 40 60

REMARKS

GRAIN SIZE DISTRIBUTION (%)

GR	SA	SI	CL
16	60	(24)	

Auger Refusal at 1.0 m. Advanced 'B' Casing.

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FX: (807) 624-5161
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Web: www.tbte.ca

SAMPLE TYPE LEGEND

AS	Auger Sample
SS	Split Spoon Sample
TW	70mm Thin Wall Tube
CC	Concrete Core
RC	Rock Core
PS	Ponar Sample
CB	Core Barrel
HS	Hiller Peat Sampler

NOTES:

$\times^3$ $\star^3$: Numbers refer to Sensitivity

Enclosure 2

01A BOREHOLE 13-267 WHITE SANDS FIRST NATION.GPJ TBT.GDT 14/2/24

LOG OF BOREHOLE 100

PROJECT: **Geotechnical Investigation**
LOCATION: **Armstrong Station**
Whitesands First Nations, Ontario
CLIENT: **Whitesands First Nations**
SURFACE ELEV.: **98.6 metres**

EQUIPMENT: **HS Auger / B Casing**
DIAMETER: **200 mm**
DATE: **2014/1/14**
TBT REF. No.: **13-267**

DEPTH	ELEV.	DESCRIPTION	STRAT PLOT	% RECOVERY	TYPE	"N" VALUES	GROUND WATER CONDITIONS	DEPTH SCALE
10.3	88.3	End of Borehole at 10.3 m. Auger Refusal.						

SOIL PROFILE | SAMPLES | GROUND WATER CONDITIONS | DEPTH SCALE

CPT (kPa): 300 600 900 1200 1500 (kPa)
FIELD SHEAR (kPa) ⊗ Lab Shear (kPa)
SPT (N) ◆ DCPT
0 20 40 60 80 100

PLASTIC LIMIT w_P | NATURAL MOISTURE CONTENT w | LIQUID LIMIT w_L
WATER CONTENT (%)
20 40 60

REMARKS
GRAIN SIZE DISTRIBUTION (%)
GR SA SI CL

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Web: www.tbte.ca

SAMPLE TYPE LEGEND

AS	Auger Sample
SS	Split Spoon Sample
TW	70mm Thin Wall Tube
CC	Concrete Core
RC	Rock Core
PS	Ponar Sample
CB	Core Barrel
HS	Hiller Peat Sampler

NOTES:

✖[3] ★[3]: Numbers refer to Sensitivity

Enclosure 3

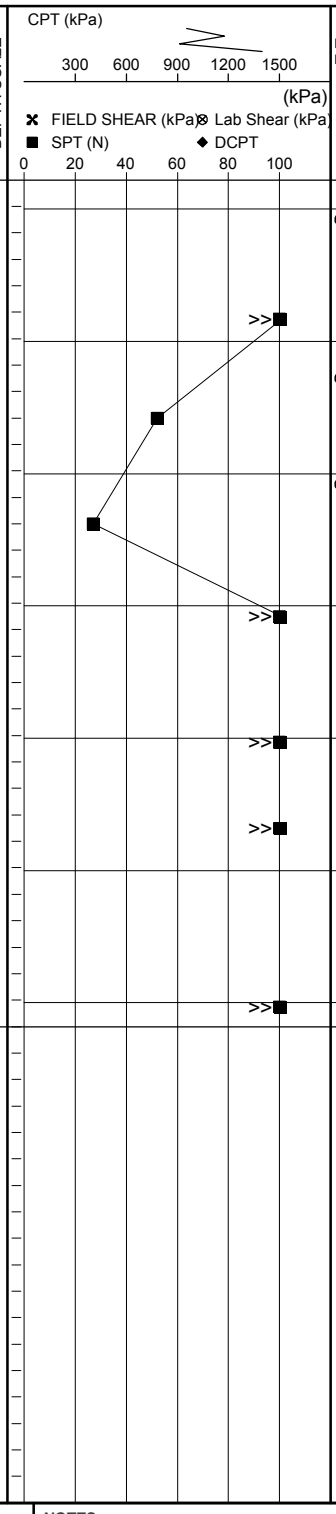
PAGE 2 OF 2

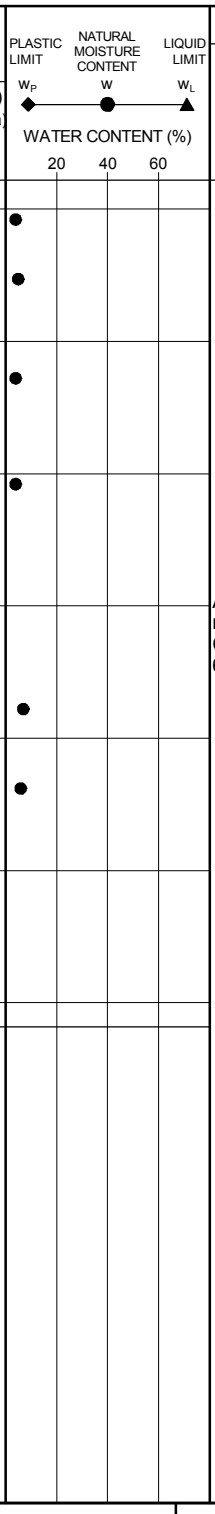
LOG OF BOREHOLE 101

PROJECT: **Geotechnical Investigation**
LOCATION: **Armstrong Station**
Whitesands First Nations, Ontario
CLIENT: **Whitesands First Nations**
SURFACE ELEV.: **99.2 metres**

EQUIPMENT: **HS Auger / B Casing**
DIAMETER: **200 mm**
DATE: **2014/1/16**
TBT REF. No.: **13-267**

DEPTH	ELEV.	DESCRIPTION	STRAT PLOT	% RECOVERY	TYPE	"N" VALUES	GROUND WATER CONDITIONS
0	99	ORGANICS - 50 mm					
		SAND & GRAVEL - Sandy gravel to gravelly sand with trace to some silt, brown, occasional to numerous cobbles & boulders, compact to very dense			AS		
1	98				SS	>100	
					SS	52	
2	97				SS	27	
3	96				SS	>100	
4	95				SS	>100	
5	94				SS	>100	
6	93				SS	>100	
		End of Borehole at 6.4 m. Auger Refusal.					
7	92						
8	91						
9	90						





REMARKS

GRAIN SIZE DISTRIBUTION (%)

GR SA SI CL

53 42 (6)

Auger Refusal at 3.1 m. Advanced 'B' Casing from 3.1 m to 6.1 m.

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SAMPLE TYPE LEGEND

AS	Auger Sample
SS	Split Spoon Sample
TW	70mm Thin Wall Tube
CC	Concrete Core
RC	Rock Core
PS	Ponar Sample
CB	Core Barrel
HS	Hiller Peat Sampler

NOTES:

$\times^3$ $\star^3$: Numbers refer to Sensitivity

Enclosure 4

PAGE 1 OF 1

01A BOREHOLE 13-267 WHITE SANDS FIRST NATION.GPJ TBT.GDT 14/2/24

LOG OF BOREHOLE 102

PROJECT: **Geotechnical Investigation**
LOCATION: **Armstrong Station**
Whitesands First Nations, Ontario
CLIENT: **Whitesands First Nations**
SURFACE ELEV.: **98.8 metres**

EQUIPMENT: **HS Auger**
DIAMETER: **200 mm**
DATE: **2014/1/15**
TBT REF. No.: **13-267**

DEPTH	ELEV.	DESCRIPTION	STRAT PLOT	% RECOVERY	TYPE	"N" VALUES	GROUND WATER CONDITIONS	DEPTH SCALE
0	98	ORGANICS - 50 mm SAND & GRAVEL - Sandy gravel to gravelly sand with trace to some silt, brown, occasional to numerous cobbles & boulders, compact to very dense			AS			
					SS	74		
1	97				SS	70		1
2	96				SS	13		2
3	95				SS	23		3
4	94				SS	>100		4
5	93				SS	34		5
6	92	End of Borehole at 5.8 m. Auger Refusal.						6
7	91							7
8	90							8
9	89							9

CPT (kPa): 300 600 900 1200 1500 (kPa)
× FIELD SHEAR (kPa) ⊗ Lab Shear (kPa)
■ SPT (N) ◆ DCPT
0 20 40 60 80 100

PLASTIC LIMIT w_P | NATURAL MOISTURE CONTENT w | LIQUID LIMIT w_L
WATER CONTENT (%)
20 40 60

REMARKS
GRAIN SIZE DISTRIBUTION (%)
GR SA SI CL
28 63 (9)

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Web: www.tbte.ca

SAMPLE TYPE LEGEND

AS	Auger Sample
SS	Split Spoon Sample
TW	70mm Thin Wall Tube
CC	Concrete Core
RC	Rock Core
PS	Ponar Sample
CB	Core Barrel
HS	Hiller Peat Sampler

NOTES:

× 3 ★ 3 : Numbers refer to Sensitivity

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01A BOREHOLE 13-267 WHITE SANDS FIRST NATION.GPJ TBT.GDT 14/2/24

LOG OF BOREHOLE 103

PROJECT: **Geotechnical Investigation**
LOCATION: **Armstrong Station**
Whitesands First Nations, Ontario
CLIENT: **Whitesands First Nations**
SURFACE ELEV.: **99.0 metres**

EQUIPMENT: **HS Auger**
DIAMETER: **200 mm**
DATE: **2014/1/16**
TBT REF. No.: **13-267**

DEPTH	ELEV.	DESCRIPTION	STRAT PLOT	% RECOVERY	TYPE	"N" VALUES	GROUND WATER CONDITIONS	DEPTH SCALE	REMARKS / GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
		ORGANICS - 100 mm							
		SAND & GRAVEL - Sandy gravel to gravelly sand with trace to some silt, brown, occasional to numerous cobbles & boulders, loose			AS				
1	98				SS	8		1	42 51 (7)
2	97	- - - - - - compact to dense			SS	24		2	
					SS	47			
3	96	End of Borehole at 2.9 m. Auger Refusal.						3	
4	95							4	
5	94							5	
6	93							6	
7	92							7	
8	91							8	
9	90							9	

CPT (kPa): 300 600 900 1200 1500 (kPa)
✖ FIELD SHEAR (kPa) ⊗ Lab Shear (kPa)
■ SPT (N) ◆ DCPT
0 20 40 60 80 100

PLASTIC LIMIT w_P | NATURAL MOISTURE CONTENT w | LIQUID LIMIT w_L
WATER CONTENT (%)
20 40 60

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SAMPLE TYPE LEGEND

AS	Auger Sample
SS	Split Spoon Sample
TW	70mm Thin Wall Tube
CC	Concrete Core
RC	Rock Core
PS	Ponar Sample
CB	Core Barrel
HS	Hiller Peat Sampler

NOTES:

✖[3] ★[3]: Numbers refer to Sensitivity

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01A BOREHOLE 13-267 WHITE SANDS FIRST NATION.GPJ TBT.GDT 14/2/24

LOG OF BOREHOLE 104

PROJECT: **Geotechnical Investigation**
LOCATION: **Armstrong Station**
Whitesands First Nations, Ontario
CLIENT: **Whitesands First Nations**
SURFACE ELEV.: **100.3 metres**

EQUIPMENT: **HS Auger / B Casing**
DIAMETER: **200 mm**
DATE: **2014/1/16**
TBT REF. No.: **13-267**

DEPTH	ELEV.	DESCRIPTION	STRAT PLOT	% RECOVERY	SAMPLES TYPE	"N" VALUES	GROUND WATER CONDITIONS	DEPTH SCALE	REMARKS
0	100	ORGANICS - 100 mm							
		SAND & GRAVEL - Sandy gravel to gravelly sand with trace to some silt, brown, occasional to numerous cobbles & boulders, dense			AS				
					SS	49			46 45 (9)
1	99							1	
					SS	35			
2	98							2	
					SS	41			
3	97	- - - - - - compact			SS	23		3	
									Auger Refusal at 3.6 m. Advanced 'B' Casing from 3.1 m to 10.0 m.
4	96							4	
					SS	25			
5	95							5	
					SS	30			
6	94	- - - - - - - very dense			SS	>100		6	
7	93							7	
					SS	>100			
8	92							8	
9	91				SS	>100		9	

CPT (kPa) 300 600 900 1200 1500 (kPa)
FIELD SHEAR (kPa) Lab Shear (kPa)
SPT (N) DCPT
0 20 40 60 80 100

PLASTIC LIMIT w_P NATURAL MOISTURE CONTENT w LIQUID LIMIT w_L
WATER CONTENT (%)
20 40 60

REMARKS
GRAIN SIZE DISTRIBUTION (%)
GR SA SI CL

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FX: (807) 624-5161
Email: tbte@tbte.ca
Web: www.tbte.ca

SAMPLE TYPE LEGEND

AS	Auger Sample
SS	Split Spoon Sample
TW	70mm Thin Wall Tube
CC	Concrete Core
RC	Rock Core
PS	Ponar Sample
CB	Core Barrel
HS	Hiller Peat Sampler

NOTES:

$\times^3$ $\star^3$: Numbers refer to Sensitivity

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01A BOREHOLE 13-267 WHITE SANDS FIRST NATION.GPJ TBT.GDT 14/2/24

LOG OF BOREHOLE 104

PROJECT: **Geotechnical Investigation**
LOCATION: **Armstrong Station**
Whitesands First Nations, Ontario
CLIENT: **Whitesands First Nations**
SURFACE ELEV.: **100.3 metres**

EQUIPMENT: **HS Auger / B Casing**
DIAMETER: **200 mm**
DATE: **2014/1/16**
TBT REF. No.: **13-267**

DEPTH	ELEV.	DESCRIPTION	STRAT PLOT	% RECOVERY	TYPE	"N" VALUES	GROUND WATER CONDITIONS
	90				SS	>100	
		End of Borehole at 10.4 m.					

SOIL PROFILE | SAMPLES | GROUND WATER CONDITIONS

DEPTH SCALE

CPT (kPa) 300 600 900 1200 1500 (kPa)
FIELD SHEAR (kPa) ⊗ Lab Shear (kPa)
SPT (N) ◆ DCPT
0 20 40 60 80 100

PLASTIC LIMIT w_P | NATURAL MOISTURE CONTENT w | LIQUID LIMIT w_L
WATER CONTENT (%)
20 40 60

REMARKS
GRAIN SIZE DISTRIBUTION (%)
GR SA SI CL

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SAMPLE TYPE LEGEND

AS	Auger Sample
SS	Split Spoon Sample
TW	70mm Thin Wall Tube
CC	Concrete Core
RC	Rock Core
PS	Ponar Sample
CB	Core Barrel
HS	Hiller Peat Sampler

NOTES:

✖[3] ★[3]: Numbers refer to Sensitivity

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LOG OF BOREHOLE 105

PROJECT: **Geotechnical Investigation**
LOCATION: **Armstrong Station**
Whitesands First Nations, Ontario
CLIENT: **Whitesands First Nations**
SURFACE ELEV.: **metres**

EQUIPMENT: **HS Auger**
DIAMETER: **200 mm**
DATE: **2014/1/28**
TBT REF. No.: **13-267**

DEPTH	ELEV.	DESCRIPTION	STRAT PLOT	% RECOVERY	TYPE	"N" VALUES	GROUND WATER CONDITIONS	DEPTH SCALE
0		TOPSOIL - 75 mm						0
		SAND & GRAVEL - Sandy gravel to gravelly sand with trace to some silt, brown, occasional to numerous cobbles & boulders, very dense			AS			
					SS	>100		
1					SS	>100		1
		End of Borehole at 1.4 m. Auger Refusal.						
2								2
3								3
4								4
5								5
6								6
7								7
8								8
9								9

CPT (kPa): 300, 600, 900, 1200, 1500 (kPa)
FIELD SHEAR (kPa) ⊗ Lab Shear (kPa)
SPT (N) ◆ DCPT
0, 20, 40, 60, 80, 100

PLASTIC LIMIT w_P | NATURAL MOISTURE CONTENT w | LIQUID LIMIT w_L
WATER CONTENT (%)
20, 40, 60

REMARKS
GRAIN SIZE DISTRIBUTION (%)
GR SA SI CL

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SAMPLE TYPE LEGEND

AS	Auger Sample
SS	Split Spoon Sample
TW	70mm Thin Wall Tube
CC	Concrete Core
RC	Rock Core
PS	Ponar Sample
CB	Core Barrel
HS	Hiller Peat Sampler

NOTES:

✕[3] ★[3]: Numbers refer to Sensitivity

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01A BOREHOLE 13-267 WHITE SANDS FIRST NATION.GPJ TBT.GDT 14/2/24

LOG OF BOREHOLE 106

PROJECT: **Geotechnical Investigation**
LOCATION: **Armstrong Station**
Whitesands First Nations, Ontario
CLIENT: **Whitesands First Nations**
SURFACE ELEV.: **100.1 metres**

EQUIPMENT: **HS Auger / B Casing**
DIAMETER: **200 mm**
DATE: **2014/1/29**
TBT REF. No.: **13-267**

DEPTH	ELEV.	DESCRIPTION	STRAT PLOT	% RECOVERY	TYPE	"N" VALUES	GROUND WATER CONDITIONS
0	100	TOPSOIL - 50 mm					
		SAND & GRAVEL - Sandy gravel to gravelly sand with trace to some silt, brown, occasional to numerous cobbles & boulders, dense to very dense			AS		
1	99						
					SS	43	
2	98				SS	>100	
					SS	>100	
3	97				SS	>100	
4	96				SS	>100	
5	95				SS	>100	
6	94				SS	>100	
7	93						
8	92				SS	30	
9	91	- - - - - - compact			SS	28	
		End of Borehole at 9.7 m.					

CPT (kPa) 300 600 900 1200 1500 (kPa)
FIELD SHEAR (kPa) ⊗ Lab Shear (kPa)
SPT (N) ◆ DCPT
0 20 40 60 80 100

PLASTIC LIMIT w_P | NATURAL MOISTURE CONTENT w | LIQUID LIMIT w_L
WATER CONTENT (%)
20 40 60

REMARKS

Auger Refusal at 0.75 m. Advanced 'B' Casing.

GRAIN SIZE DISTRIBUTION (%) GR	SA	SI	CL
54	39		(7)
65	28		(7)

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SAMPLE TYPE LEGEND

AS	Auger Sample
SS	Split Spoon Sample
TW	70mm Thin Wall Tube
CC	Concrete Core
RC	Rock Core
PS	Ponar Sample
CB	Core Barrel
HS	Hiller Peat Sampler

NOTES:

✕[3] ★[3]: Numbers refer to Sensitivity

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LOG OF BOREHOLE 107

PROJECT: **Geotechnical Investigation**
LOCATION: **Armstrong Station**
Whitesands First Nations, Ontario
CLIENT: **Whitesands First Nations**
SURFACE ELEV.: **100.3 metres**

EQUIPMENT: **HS Auger / B Casing**
DIAMETER: **200 mm**
DATE: **2014/1/30**
TBT REF. No.: **13-267**

DEPTH	ELEV.	DESCRIPTION	STRAT PLOT	% RECOVERY	TYPE	"N" VALUES	GROUND WATER CONDITIONS	DEPTH SCALE	REMARKS / GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
0	100	ORGANICS - 100 mm						0	
		SAND & GRAVEL - Sandy gravel to gravelly sand with trace to some silt, brown, occasional to numerous cobbles & boulders, dense to very dense			AS				
1	99				SS	44		1	
2	98				SS	35		2	
3	97				SS	>100		3	43 46 (11)
					SS	>100			
4	96							4	
5	95				SS	>100		5	
6	94				SS	>100		6	
7	93	End of Borehole at 6.7 m.						7	Auger Refusal at 0.6 m. Advanced 'B' Casing.
8	92							8	
9	91							9	

CPT (kPa) 300 600 900 1200 1500 (kPa)
× FIELD SHEAR (kPa) ⊗ Lab Shear (kPa)
■ SPT (N) ◆ DCPT
0 20 40 60 80 100

PLASTIC LIMIT w_P NATURAL MOISTURE CONTENT w LIQUID LIMIT w_L
WATER CONTENT (%)
20 40 60

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SAMPLE TYPE LEGEND

AS	Auger Sample
SS	Split Spoon Sample
TW	70mm Thin Wall Tube
CC	Concrete Core
RC	Rock Core
PS	Ponar Sample
CB	Core Barrel
HS	Hiller Peat Sampler

NOTES:

×[3] ★[3]: Numbers refer to Sensitivity

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LOG OF BOREHOLE 108

PROJECT: **Geotechnical Investigation**
LOCATION: **Armstrong Station**
Whitesands First Nations, Ontario
CLIENT: **Whitesands First Nations**
SURFACE ELEV.: **99.0 metres**

EQUIPMENT: **HS Auger**
DIAMETER: **200 mm**
DATE: **2014/1/30**
TBT REF. No.: **13-267**

DEPTH	ELEV.	DESCRIPTION	STRAT PLOT	% RECOVERY	TYPE	"N" VALUES	GROUND WATER CONDITIONS	DEPTH SCALE
		TOPSOIL - 50 mm						
		SAND & GRAVEL - Sandy gravel to gravelly sand with trace to some silt, brown, occasional to numerous cobbles & boulders, dense to very dense			AS			
1	98				SS	42		1
2	97				SS	>100		2
					SS	>100		
3	96				SS	>100		3
		- - - - -						
4	95	- compact			SS	22		4
					SS	33		
5	94	- - - - -						5
		- dense						
6	93	End of Borehole at 5.7 m. Auger Refusal.						6
7	92							7
8	91							8
9	90							9

CPT (kPa)
300 600 900 1200 1500
(kPa)
× FIELD SHEAR (kPa) ⊗ Lab Shear (kPa)
■ SPT (N) ◆ DCPT
0 20 40 60 80 100

PLASTIC LIMIT w_P | NATURAL MOISTURE CONTENT w | LIQUID LIMIT w_L
WATER CONTENT (%)
20 40 60

REMARKS
GRAIN SIZE DISTRIBUTION (%)
GR SA SI CL
46 50 (5)
72 26 (2)

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SAMPLE TYPE LEGEND

AS	Auger Sample
SS	Split Spoon Sample
TW	70mm Thin Wall Tube
CC	Concrete Core
RC	Rock Core
PS	Ponar Sample
CB	Core Barrel
HS	Hiller Peat Sampler

NOTES:

×³ ★³: Numbers refer to Sensitivity

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LOG OF BOREHOLE 109

PROJECT: **Geotechnical Investigation**
LOCATION: **Armstrong Station**
Whitesands First Nations, Ontario
CLIENT: **Whitesands First Nations**
SURFACE ELEV.: **98.9 metres**

EQUIPMENT: **HS Auger**
DIAMETER: **200 mm**
DATE: **2014/1/31**
TBT REF. No.: **13-267**

DEPTH	ELEV.	DESCRIPTION	STRAT PLOT	% RECOVERY	TYPE	"N" VALUES	GROUND WATER CONDITIONS
0	98.9	TOPSOIL - 50 mm					
		SAND & GRAVEL - Sandy gravel to gravelly sand with trace to some silt, brown, occasional to numerous cobbles & boulders, compact to dense			AS		
1	98				SS	35	
2	97				SS	18	
					SS	33	
3	96				SS	>100	
4	95	End of Borehole at 4.1 m. Auger Refusal.					
5	94						
6	93						
7	92						
8	91						
9	90						
	89						

CPT (kPa) 300 600 900 1200 1500 (kPa)
FIELD SHEAR (kPa) Lab Shear (kPa)
SPT (N) DCPT
0 20 40 60 80 100

PLASTIC LIMIT w_P NATURAL MOISTURE CONTENT w LIQUID LIMIT w_L
WATER CONTENT (%)
20 40 60

REMARKS

GRAIN SIZE DISTRIBUTION (%)			
GR	SA	SI	CL
63	30		(7)

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SAMPLE TYPE LEGEND

AS	Auger Sample
SS	Split Spoon Sample
TW	70mm Thin Wall Tube
CC	Concrete Core
RC	Rock Core
PS	Ponar Sample
CB	Core Barrel
HS	Hiller Peat Sampler

NOTES:

$\times^3$ $\star^3$: Numbers refer to Sensitivity

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01A BOREHOLE 13-267 WHITE SANDS FIRST NATION.GPJ TBT.GDT 14/2/24

LOG OF BOREHOLE 110

PROJECT: **Geotechnical Investigation**
LOCATION: **Armstrong Station**
Whitesands First Nations, Ontario
CLIENT: **Whitesands First Nations**
SURFACE ELEV.: **100.1 metres**

EQUIPMENT: **HS Auger**
DIAMETER: **200 mm**
DATE: **2014/1/31**
TBT REF. No.: **13-267**

DEPTH	ELEV.	DESCRIPTION	STRAT PLOT	% RECOVERY	TYPE	"N" VALUES	GROUND WATER CONDITIONS	DEPTH SCALE	CPT (kPa) 300 600 900 1200 1500 (kPa)	PLASTIC LIMIT w_P / NATURAL MOISTURE CONTENT w / LIQUID LIMIT w_L — WATER CONTENT (%) 20 40 60	REMARKS: GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
0	100	TOPSOIL - 50 mm						0			
		SAND & GRAVEL - Sandy gravel to gravelly sand with trace to some silt, brown, occasional to numerous cobbles & boulders, very dense			AS						38 48 (14)
					SS	>100			>>■	●	
1	99	End of Borehole at 1.1 m. Auger Refusal.						1		●	
2	98							2			
3	97							3			
4	96							4			
5	95							5			
6	94							6			
7	93							7			
8	92							8			
9	91							9			

✖ FIELD SHEAR (kPa) ⊗ Lab Shear (kPa)
■ SPT (N) ◆ DCPT

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SAMPLE TYPE LEGEND

AS	Auger Sample
SS	Split Spoon Sample
TW	70mm Thin Wall Tube
CC	Concrete Core
RC	Rock Core
PS	Ponar Sample
CB	Core Barrel
HS	Hiller Peat Sampler

NOTES:

✖[3] ★[3]: Numbers refer to Sensitivity

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01A BOREHOLE 13-267 WHITE SANDS FIRST NATION.GPJ TBT.GDT 14/2/24

LOG OF BOREHOLE 111

PROJECT: **Geotechnical Investigation**
LOCATION: **Armstrong Station**
Whitesands First Nations, Ontario
CLIENT: **Whitesands First Nations**
SURFACE ELEV.: **100.1 metres**

EQUIPMENT: **HS Auger / B Casing**
DIAMETER: **200 mm**
DATE: **2014/1/31**
TBT REF. No.: **13-267**

DEPTH	ELEV.	DESCRIPTION	STRAT PLOT	% RECOVERY	TYPE	"N" VALUES	GROUND WATER CONDITIONS
0	100	TOPSOIL - 100 mm					
		SAND & GRAVEL - Sandy gravel to gravelly sand with trace to some silt, brown, occasional to numerous cobbles & boulders, dense to very dense			AS		
1	99				SS	>100	
2	98				SS	42	
					SS	>100	
3	97				SS	48	
4	96						
5	95				SS	>100	
6	94				SS	34	
7	93	End of Borehole at 6.7 m.					

CPT (kPa) 300 600 900 1200 1500 (kPa)
FIELD SHEAR (kPa) ⊗ Lab Shear (kPa)
SPT (N) ◆ DCPT
0 20 40 60 80 100

PLASTIC LIMIT w_P | NATURAL MOISTURE CONTENT w | LIQUID LIMIT w_L
WATER CONTENT (%)
20 40 60

REMARKS

Auger Refusal at 0.8 m. Advanced 'B' Casing.

GRAIN SIZE DISTRIBUTION (%)
GR SA SI CL
62 32 (6)

TBT Engineering Limited
1918 Yonge Street
Thunder Bay, Ontario P7E 6T9
PH: (807) 624-5160
FX: (807) 624-5161
Email: tbte@tbte.ca
Web: www.tbte.ca

SAMPLE TYPE LEGEND

AS	Auger Sample
SS	Split Spoon Sample
TW	70mm Thin Wall Tube
CC	Concrete Core
RC	Rock Core
PS	Ponar Sample
CB	Core Barrel
HS	Hiller Peat Sampler

NOTES:

$\times^3$ $\star^3$: Numbers refer to Sensitivity

Enclosure 15

PAGE 1 OF 1

LOG OF BOREHOLE 112

PROJECT: **Geotechnical Investigation**
LOCATION: **Armstrong Station**
Whitesands First Nations, Ontario
CLIENT: **Whitesands First Nations**
SURFACE ELEV.: **100.1 metres**

EQUIPMENT: **HS Auger**
DIAMETER: **200 mm**
DATE: **2014/2/1**
TBT REF. No.: **13-267**

DEPTH	ELEV.	DESCRIPTION	STRAT PLOT	% RECOVERY	TYPE	"N" VALUES	GROUND WATER CONDITIONS	DEPTH SCALE	REMARKS: GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
0	100	TOPSOIL - 100 mm						0	
		SAND & GRAVEL - Sandy gravel to gravelly sand with trace to some silt, brown, occasional to numerous cobbles & boulders, dense to very dense			AS				
1	99				SS	34		1	34 57 (9)
					SS	>100			
2	98	End of Borehole at 2.0 m. Auger Refusal.						2	
3	97							3	
4	96							4	
5	95							5	
6	94							6	
7	93							7	
8	92							8	
9	91							9	

CPT (kPa): 300 600 900 1200 1500 (kPa)
FIELD SHEAR (kPa) ⊗ Lab Shear (kPa)
SPT (N) ◆ DCPT
0 20 40 60 80 100

PLASTIC LIMIT w_P | NATURAL MOISTURE CONTENT w | LIQUID LIMIT w_L
WATER CONTENT (%)
20 40 60

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1918 Yonge Street
Thunder Bay, Ontario P7E 6T9
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SAMPLE TYPE LEGEND

AS	Auger Sample
SS	Split Spoon Sample
TW	70mm Thin Wall Tube
CC	Concrete Core
RC	Rock Core
PS	Ponar Sample
CB	Core Barrel
HS	Hiller Peat Sampler

NOTES:

✖[3] ★[3]: Numbers refer to Sensitivity

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PAGE 1 OF 1

LOG OF BOREHOLE 113

PROJECT: **Geotechnical Investigation**
LOCATION: **Armstrong Station**
Whitesands First Nations, Ontario
CLIENT: **Whitesands First Nations**
SURFACE ELEV.: **100.0 metres**

EQUIPMENT: **HS Auger**
DIAMETER: **200 mm**
DATE: **2014/2/1**
TBT REF. No.: **13-267**

DEPTH	ELEV.	DESCRIPTION	STRAT PLOT	% RECOVERY	TYPE	"N" VALUES	GROUND WATER CONDITIONS	DEPTH SCALE	REMARKS: GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
0	100	TOPSOIL - 100 mm						0	
		SAND & GRAVEL - Sandy gravel to gravelly sand with trace to some silt, brown, occasional to numerous cobbles & boulders, compact to very dense			AS				
1	99				SS	24		1	39 50 (11)
					SS	>100			
		End of Borehole at 1.7 m. Auger Refusal.							
2	98							2	
3	97							3	
4	96							4	
5	95							5	
6	94							6	
7	93							7	
8	92							8	
9	91							9	

CPT (kPa): 300 600 900 1200 1500 (kPa)
× FIELD SHEAR (kPa) ⊗ Lab Shear (kPa)
■ SPT (N) ◆ DCPT
0 20 40 60 80 100

PLASTIC LIMIT w_P | NATURAL MOISTURE CONTENT w | LIQUID LIMIT w_L
WATER CONTENT (%)
20 40 60

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1918 Yonge Street
Thunder Bay, Ontario P7E 6T9
PH: (807) 624-5160
FX: (807) 624-5161
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Web: www.tbte.ca

SAMPLE TYPE LEGEND

AS	Auger Sample
SS	Split Spoon Sample
TW	70mm Thin Wall Tube
CC	Concrete Core
RC	Rock Core
PS	Ponar Sample
CB	Core Barrel
HS	Hiller Peat Sampler

NOTES:

×[3] ★[3]: Numbers refer to Sensitivity

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PAGE 1 OF 1

01A BOREHOLE 13-267 WHITE SANDS FIRST NATION.GPJ TBT.GDT 14/2/24

LOG OF BOREHOLE 114

PROJECT: **Geotechnical Investigation**
LOCATION: **Armstrong Station**
Whitesands First Nations, Ontario
CLIENT: **Whitesands First Nations**
SURFACE ELEV.: **100.1 metres**

EQUIPMENT: **HS Auger**
DIAMETER: **200 mm**
DATE: **2014/2/1**
TBT REF. No.: **13-267**

DEPTH	ELEV.	DESCRIPTION	STRAT PLOT	% RECOVERY	TYPE	"N" VALUES	GROUND WATER CONDITIONS
0	100	TOPSOIL - 50 mm					
		SAND & GRAVEL - Sandy gravel to gravelly sand with trace to some silt, brown, occasional to numerous cobbles & boulders, very dense			AS		
1	99				SS	>100	
		End of Borehole at 1.4 m. Auger Refusal.					
2	98						
3	97						
4	96						
5	95						
6	94						
7	93						
8	92						
9	91						

CPT (kPa): 300 600 900 1200 1500 (kPa)
✖ FIELD SHEAR (kPa) ⊗ Lab Shear (kPa)
■ SPT (N) ◆ DCPT
0 20 40 60 80 100

PLASTIC LIMIT w_P | NATURAL MOISTURE CONTENT w | LIQUID LIMIT w_L
WATER CONTENT (%)
20 40 60

REMARKS
GRAIN SIZE DISTRIBUTION (%)
GR SA SI CL

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1918 Yonge Street
Thunder Bay, Ontario P7E 6T9
PH: (807) 624-5160
FX: (807) 624-5161
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SAMPLE TYPE LEGEND

AS	Auger Sample
SS	Split Spoon Sample
TW	70mm Thin Wall Tube
CC	Concrete Core
RC	Rock Core
PS	Ponar Sample
CB	Core Barrel
HS	Hiller Peat Sampler

NOTES:

✖[3] ★[3]: Numbers refer to Sensitivity

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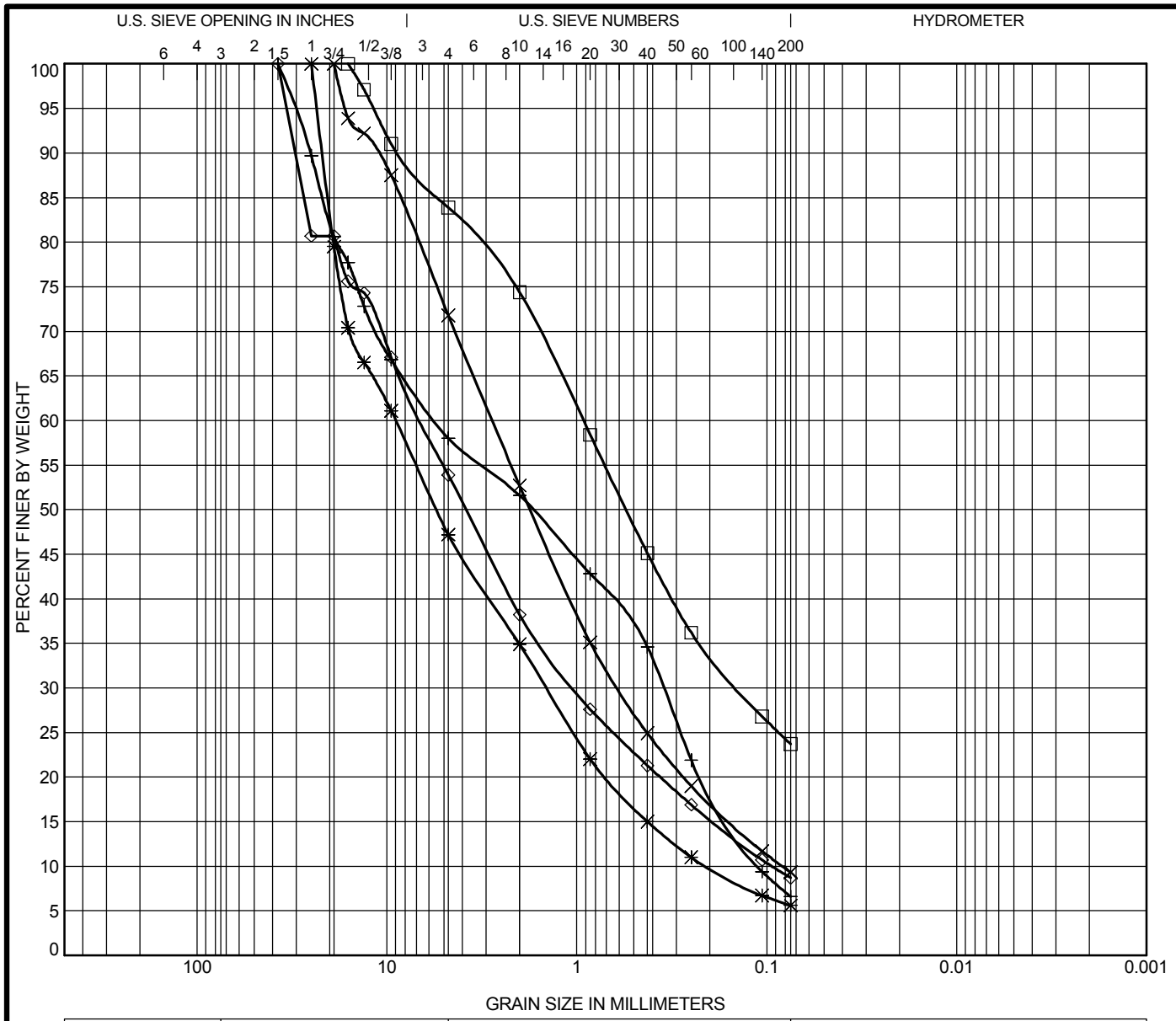

COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

Remarks:

Test Hole	Depth (m)	D100	D60	D30	D10	%Gravel	%Sand	%Silt	%Clay
□ **100**	**0.30**	**16**	**0.926**	**0.142**		**16.1**	**60.2**	**23.7**	
✳ **101**	**2.30**	**25**	**8.993**	**1.445**	**0.205**	**52.8**	**41.6**	**5.6**	
× **102**	**5.30**	**19**	**2.784**	**0.601**	**0.083**	**28.2**	**62.5**	**9.3**	
+ **103**	**1.50**	**37.5**	**5.56**	**0.351**	**0.11**	**42.0**	**51.4**	**6.6**	
◇ **104**	**0.75**	**37.5**	**6.543**	**1.032**	**0.094**	**46.1**	**45.2**	**8.7**	

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1918 Yonge Street
Thunder Bay, Ontario P7E 6T9
Telephone: 807-624-5160
Fax: 807-624-5161

GRAIN SIZE DISTRIBUTION

Project: Geotechnical Investigation

Location: Armstrong Station

Number: 13-267

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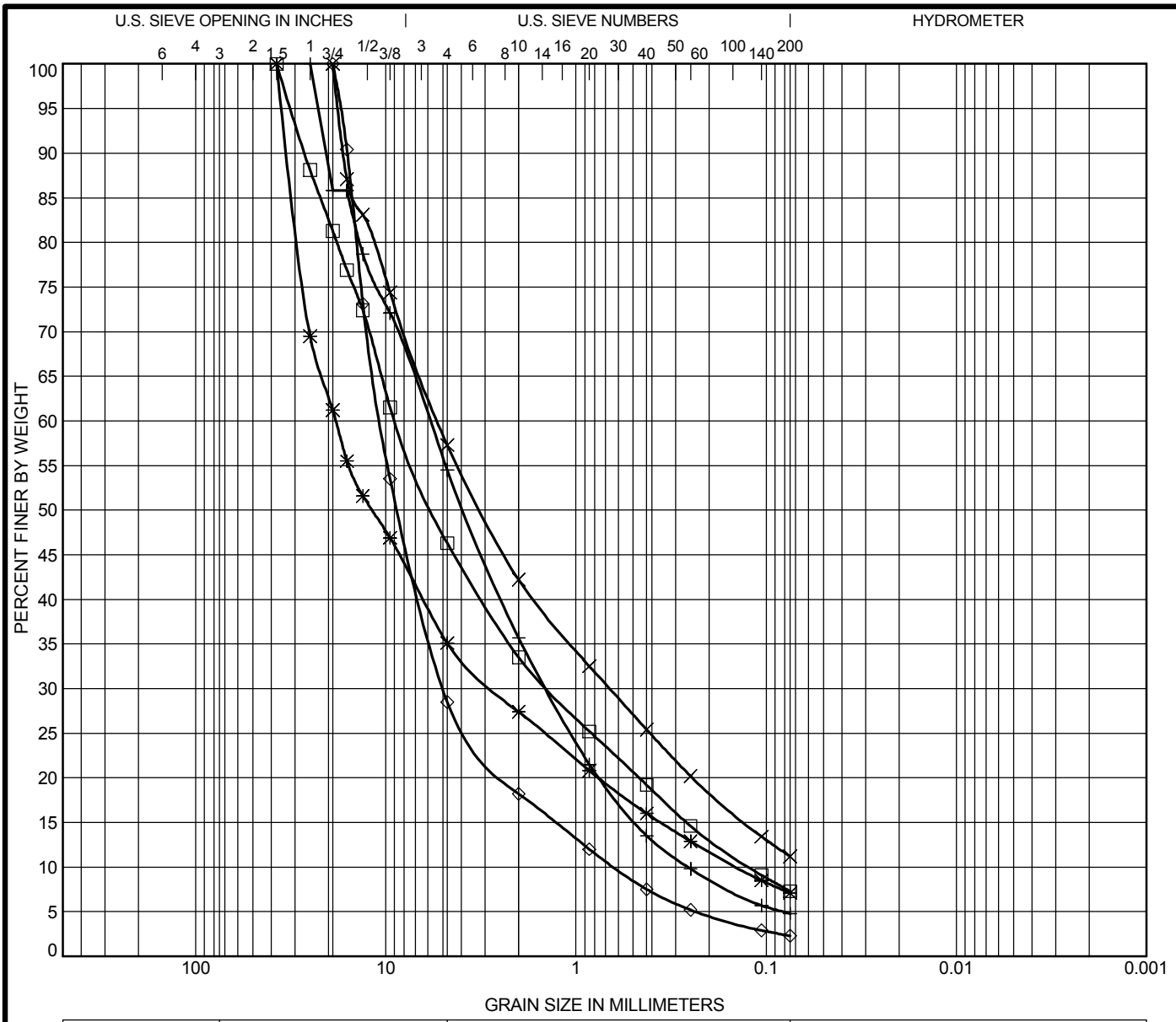

COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

Remarks:

Test Hole	Depth (m)	D100	D60	D30	D10	%Gravel	%Sand	%Silt	%Clay
□ **106**	**6.10**	**37.5**	**8.872**	**1.394**	**0.122**	**53.7**	**39.0**	**7.3**	
✳ **106**	**7.60**	**37.5**	**18.325**	**2.678**	**0.142**	**64.9**	**28.0**	**7.1**	
× **107**	**3.00**	**19**	**5.299**	**0.666**		**42.7**	**46.1**	**11.2**	
+ **108**	**3.80**	**25**	**5.899**	**1.419**	**0.257**	**45.5**	**49.7**	**4.8**	
◇ **108**	**4.60**	**19**	**10.595**	**4.952**	**0.625**	**71.5**	**26.2**	**2.3**	

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1918 Yonge Street
Thunder Bay, Ontario P7E 6T9
Telephone: 807-624-5160
Fax: 807-624-5161

GRAIN SIZE DISTRIBUTION

Project: Geotechnical Investigation

Location: Armstrong Station

Number: 13-267

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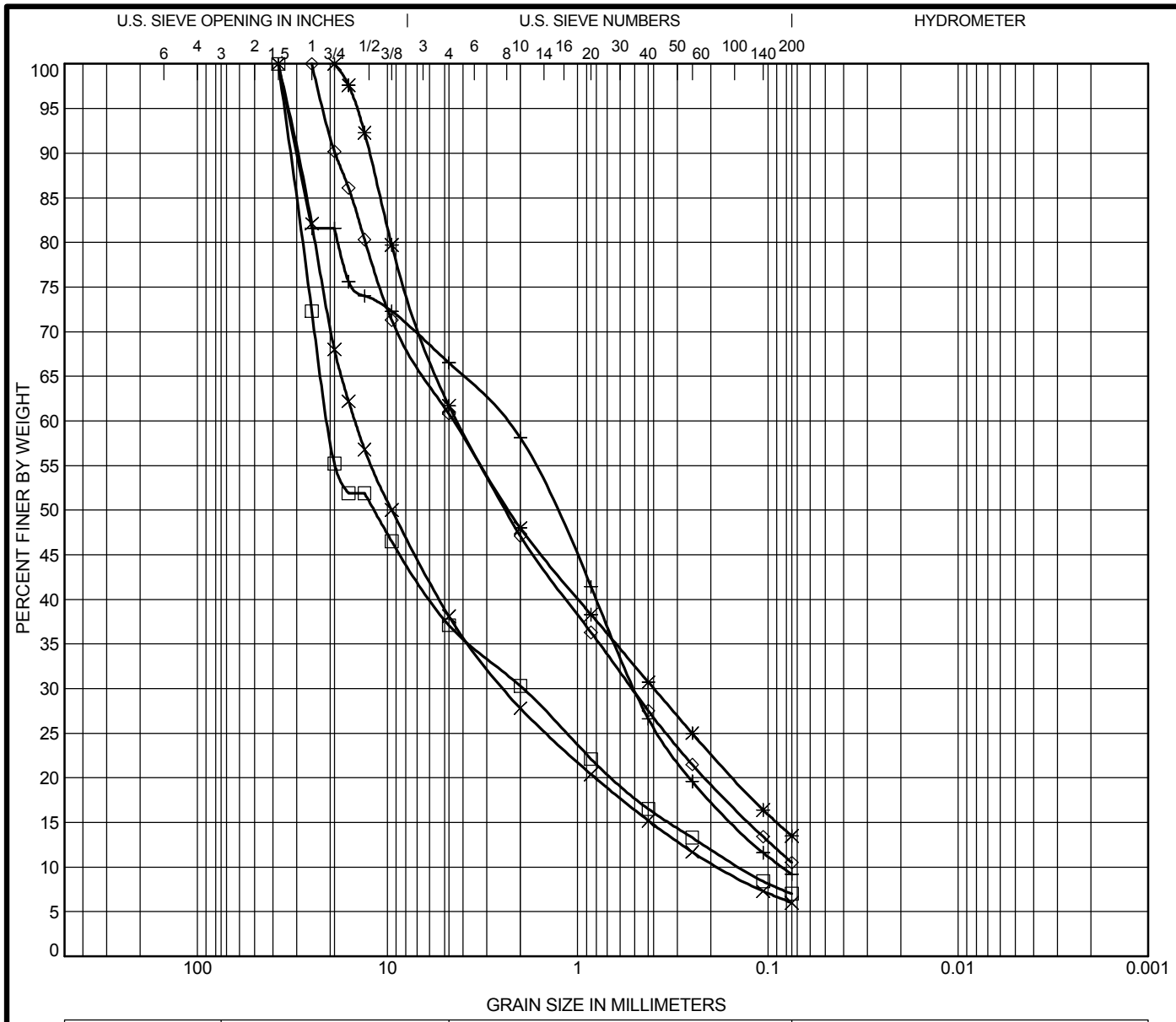

COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

Remarks:

Test Hole	Depth (m)	D100	D60	D30	D10	%Gravel	%Sand	%Silt	%Clay
□ **109**	**3.00**	**37.5**	**20.522**	**1.938**	**0.14**	**62.9**	**30.1**	**7.0**	
✳ **110**	**0.30**	**19**	**4.267**	**0.398**		**38.3**	**48.2**	**13.5**	
× **111**	**1.50**	**37.5**	**14.794**	**2.406**	**0.179**	**61.9**	**32.1**	**6.0**	
+ **112**	**1.50**	**37.5**	**2.432**	**0.498**	**0.084**	**33.5**	**57.3**	**9.2**	
◇ **113**	**0.75**	**25**	**4.516**	**0.517**		**39.2**	**50.3**	**10.5**	

TBT Engineering Ltd.
1918 Yonge Street
Thunder Bay, Ontario P7E 6T9
Telephone: 807-624-5160
Fax: 807-624-5161

GRAIN SIZE DISTRIBUTION

Project: Geotechnical Investigation

Location: Armstrong Station

Number: 13-267

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Table 1
Test Pit Logs and Soil Classification

Whitesands Test Pit logs
Whitesands, Armstrong, ON
Date: 9-Jul-13
Weather Conditions: Clear, 25 C
Job Number 300030895

Test Pit No	Depth Interval	Soil Description	Groundwater
TP 1	**Proposed Septic system site**		
	0.00 - 2.00	Cobbles with Gravel, rounded, refusal on large (>300 mm) cobbles at 2m	moisture present but unsaturated
TP2	**Proposed Septic System**		
	0.00 - 3.70	Cobbles and Gravel, rounded.	moisture present but unsaturated
TP3	**Just east of entrance to cleared area**		
	0.00 - 0.30	Organic silt ...reddish brown	
	0.30 - 2.40	Gravel and Cobbles some sand, rounded, most cobbles less than 200 mm	moist but unsaturated
TP4	**South side of clearing, area previously excavated 1.5 m into a small rise**		
	0.00 - 0.50	Sand and Gravel Fill	
	0.50 - 4.50	Gravel and Cobbles some sand, rounded, all cobbles less than 200 mm	moist but unsaturated
TP5	**East side of the clearing**		
	0.00 - 0.30	Organic reddish brown Silt	
	0.30 - 1.50	Gravel and Cobbles some sand, rounded, all cobbles less than 200 mm	moist but unsaturated
	1.50 - 2.00	Sand and Gravel no cobbles	
	2.00 - 3.50	Gravel and Cobbles some sand, rounded, all cobbles less than 200 mm	moist but unsaturated
TP6	**North West corner of cleared area**		
	0.00 - 0.10	Organic reddish brown Silt	
	0.10 - 0.50	Gravel and Coarse Sand, no cobbles, reddish stained	unsaturated
	0.50 - 1.50	Cobbles with Gravel, rounded, cobbles 100 to 200 mm	moist but unsaturated
	1.50 - 4.00	Gravel and Cobbles some sand, rounded, numerous cobbles greater than 300 mm	moist but unsaturated
TP7	**South West Corner of cleared area near TW2-13**		
	0.00 - 0.10	Organic reddish brown Silt	
	0.10 - 0.50	Gravel and Coarse Sand, no cobbles, reddish stained	unsaturated
	0.50 - 3.00	Cobbles with Gravel, rounded, cobbles up to 300 mm	moist but unsaturated

Logged by J. Baxter
All measurements are in metres unless otherwise indicated.
Soil samples will be retained for three months from date of report.

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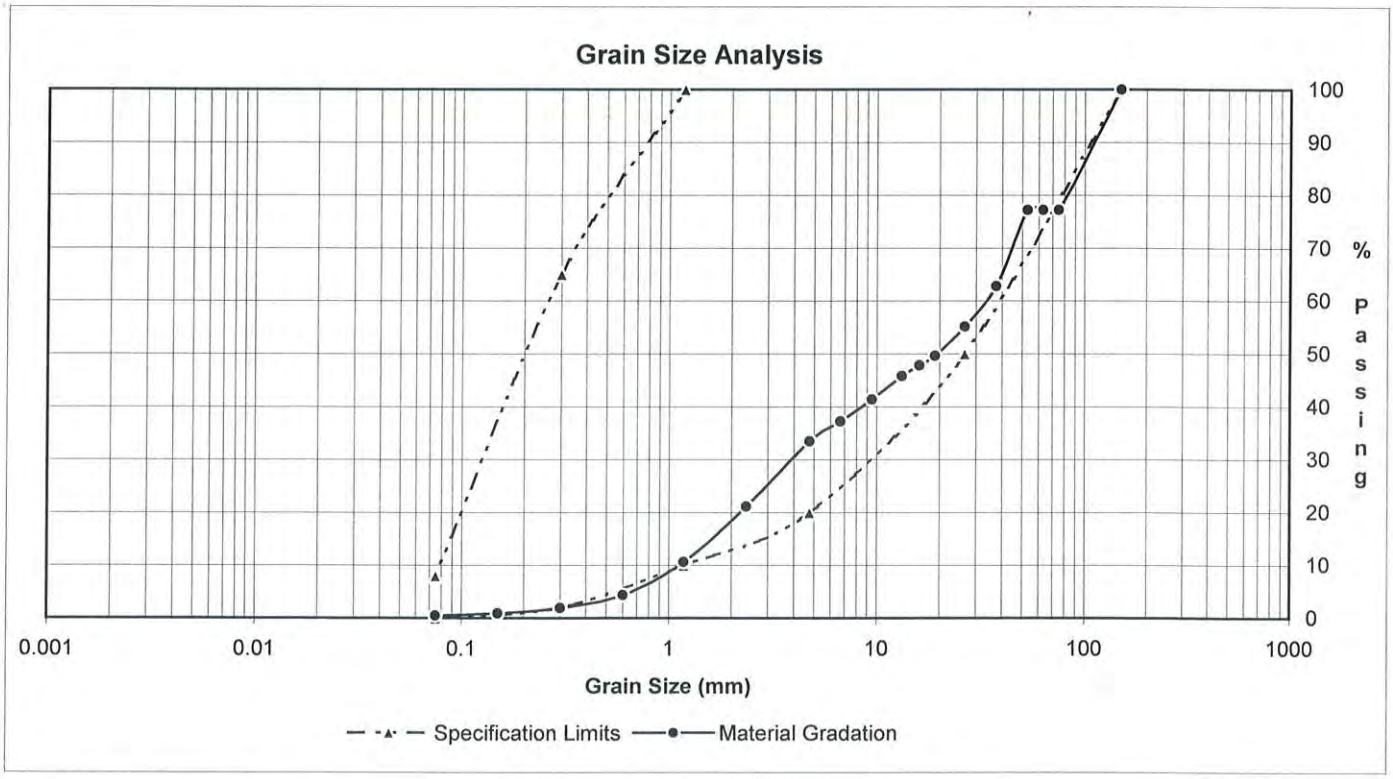
CONSULTING GROUP

TBT Engineering Limited
LABORATORY
711 Harold Cres.,Thunder Bay, ON P7C 5H8
PH: (807) 624-5162 FAX: (807) 624-5163
E-Mail: tbte@tbte.ca

Grain Size Analysis - Granular 'B' Type I

Client:	RJ Burnside and Associates	TBTE Job No.:	13-132
Client Project No.:	Whitesands First Nation Cogen Plant	Lab No.:	13-517
Project Desc.:	Job # 300030895.2000	Contractor:	
Report To:	Jim Baxter	Sampled By/Date:	Client / July 10, 2013
Source of Material	Whitesands FN Cogen Plant - TP # 1 (1-1.2 m)	Tested By/Date:	FV / AV / July 12, 2013
Reported By:	Forch Valela	Reviewed By:	Tim Fummerton

Sieve Size	Percent Passing	OPSS 1010 Specifications
150 mm	100.0	100
75 mm	77.2	
63 mm	77.2	
53 mm	77.2	
37.5 mm	62.8	
26.5 mm	55.2	50-100
19.0 mm	49.6	
16.0 mm	47.8	
13.2 mm	45.8	
9.5 mm	41.4	
6.7 mm	37.3	
4.75 mm	33.5	20-100
2.36 mm	21.1	
1.18 mm	10.6	10-100
600 um	4.3	
300 um	**1.9**	2-65
150 um	0.9	
75 um	0.5	0-8



Remarks: Test Method LS 602, ASTM C136

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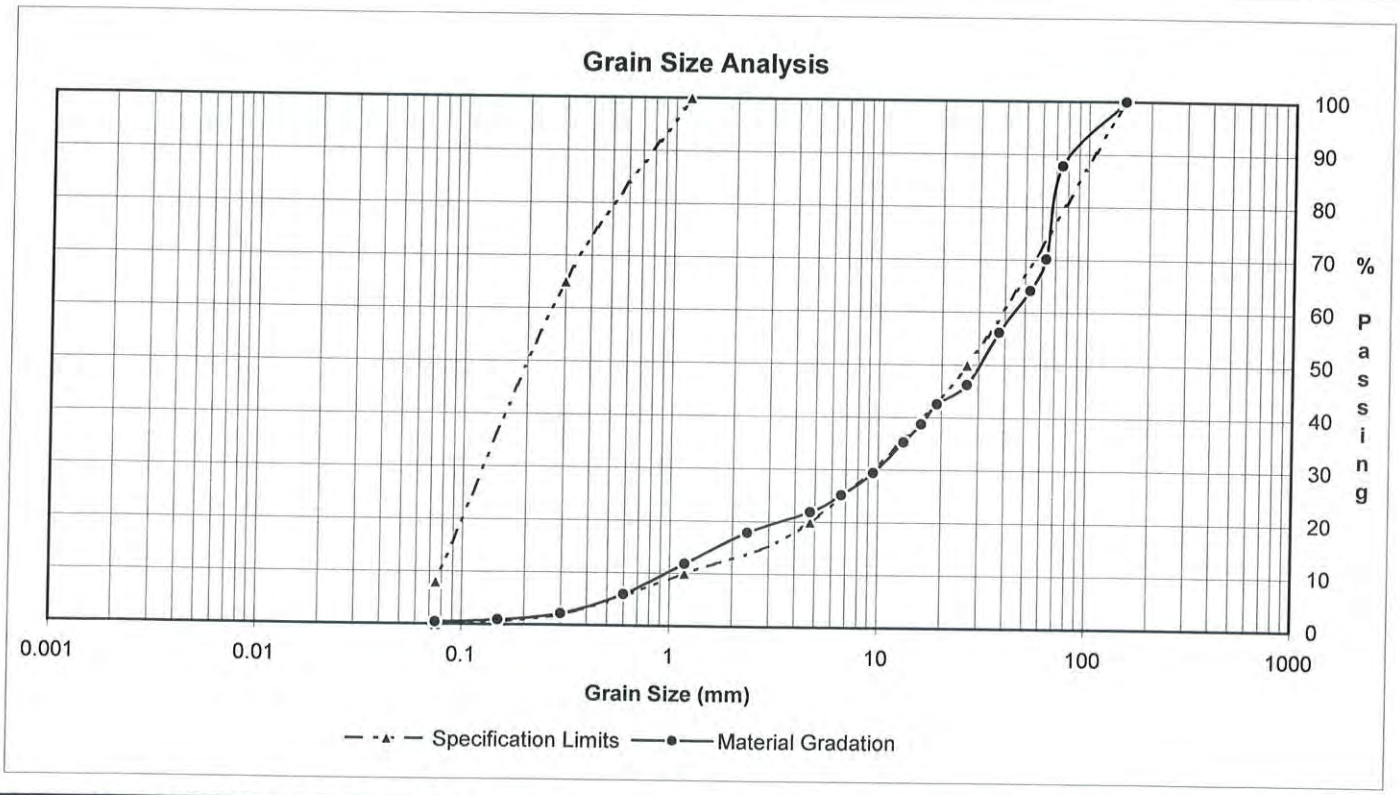
TBT Engineering Limited
LABORATORY
711 Harold Cres.,Thunder Bay, ON P7C 5H8
PH: (807) 624-5162 FAX: (807) 624-5163
E-Mail: tbte@tbte.ca

Grain Size Analysis - Granular 'B' Type I

Client:	RJ Burnside and Associates	TBTE Job No.:	13-132
Client Project No.:	Whitesands First Nation Cogen Plant	Lab No.:	13-518
Project Desc.:	Job # 300030895.2000	Contractor:	
Report To:	Jim Baxter	Sampled By/Date:	Client / July 10, 2013
Source of Material	Whitesands FN Cogen Plant - TP # 2 (1 m)	Tested By/Date:	FV / AV / July 12, 2013
Reported By:	Forch Valela	Reviewed By:	Tim Fummerton

Sieve Size	Percent Passing	OPSS 1010 Specifications
150 mm	100.0	100
75 mm	87.8	
63 mm	70.2	
53 mm	64.2	
37.5 mm	56.2	
26.5 mm	**46.2**	50-100
19.0 mm	42.5	
16.0 mm	38.7	
13.2 mm	35.3	
9.5 mm	29.4	
6.7 mm	25.1	
4.75 mm	21.9	20-100
2.36 mm	17.9	
1.18 mm	11.8	10-100
600 um	6.0	
300 um	2.2	2-65
150 um	0.9	
75 um	0.4	0-8



Remarks: Test Method LS 602, ASTM C136

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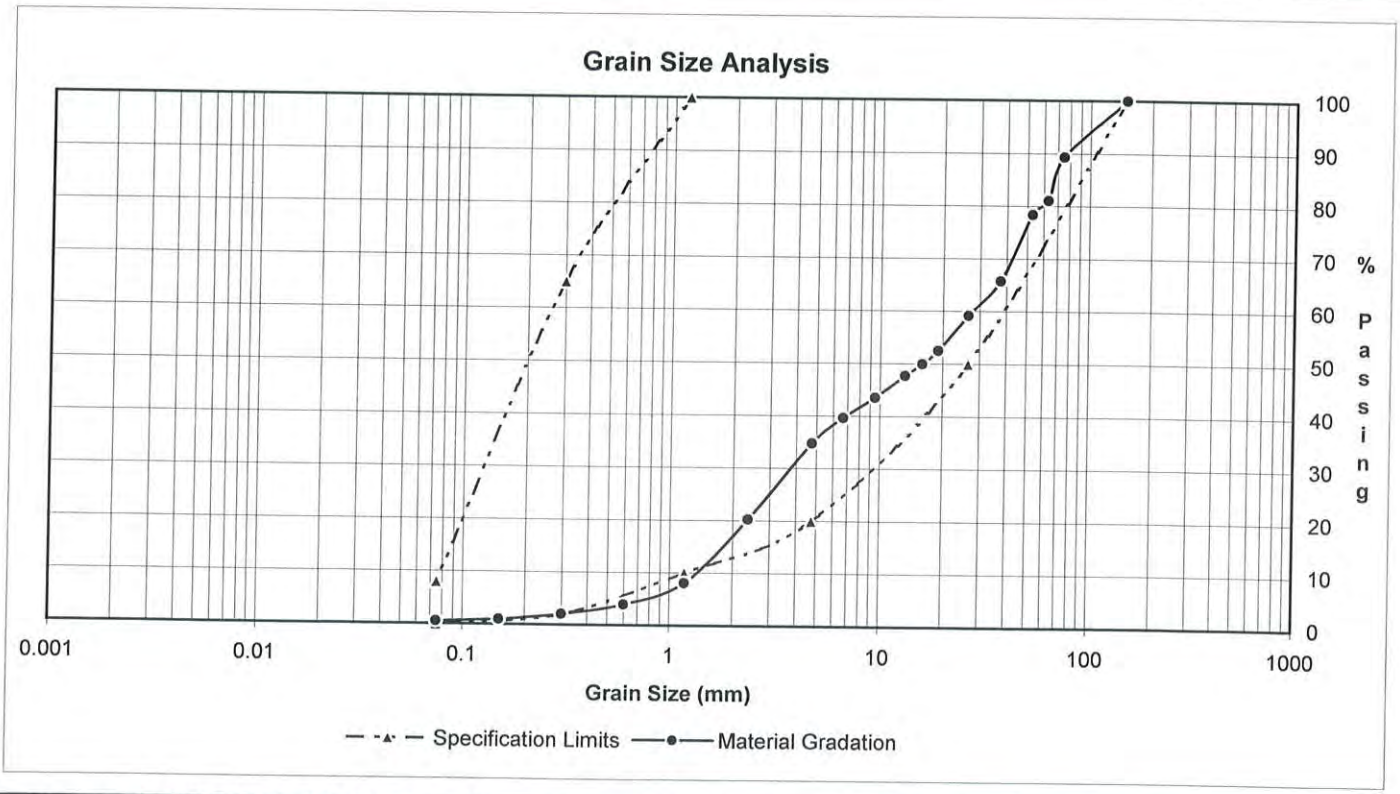
CONSULTING GROUP

TBT Engineering Limited
LABORATORY
711 Harold Cres.,Thunder Bay, ON P7C 5H8
PH: (807) 624-5162 FAX: (807) 624-5163
E-Mail: tbte@tbte.ca

Grain Size Analysis - Granular 'B' Type I

Client:	RJ Burnside and Associates	TBTE Job No.:	13-132
Client Project No.:	Whitesands First Nation Cogen Plant	Lab No.:	13-519
Project Desc.:	Job # 300030895.2000	Contractor:	
Report To:	Jim Baxter	Sampled By/Date:	Client / July 10, 2013
Source of Material	Whitesands FN Cogen Plant - TP # 3 (1.0 m)	Tested By/Date:	FV / AV / July 12, 2013
Reported By:	Forch Valela	Reviewed By:	Tim Fummerton

Sieve Size	Percent Passing	OPSS 1010 Specifications
150 mm	100.0	100
75 mm	89.3	
63 mm	81.0	
53 mm	78.3	
37.5 mm	65.7	
26.5 mm	59.2	50-100
19.0 mm	52.5	
16.0 mm	50.0	
13.2 mm	47.7	
9.5 mm	43.5	
6.7 mm	39.6	
4.75 mm	34.8	20-100
2.36 mm	20.2	
1.18 mm	**8.1**	10-100
600 um	4.0	
300 um	2.1	2-65
150 um	1.0	
75 um	0.5	0-8



Remarks: Test Method LS 602, ASTM C136

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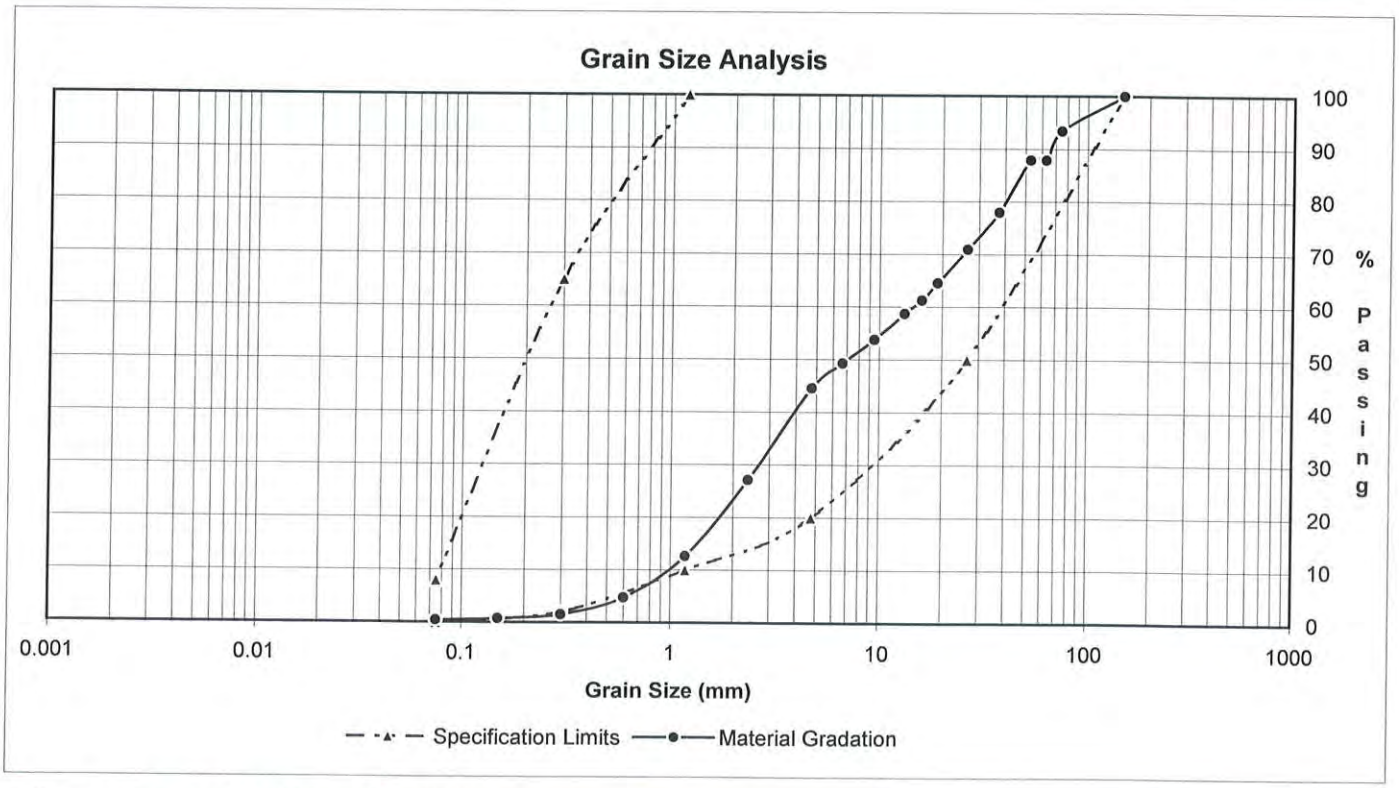
CONSULTING GROUP

TBT Engineering Limited
LABORATORY
711 Harold Cres.,Thunder Bay, ON P7C 5H8
PH: (807) 624-5162 FAX: (807) 624-5163
E-Mail: tbte@tbte.ca

Grain Size Analysis - Granular 'B' Type I

Client:	RJ Burnside and Associates	TBTE Job No.:	13-132
Client Project No.:	Whitesands First Nation Cogen Plant	Lab No.:	13-520
Project Desc.:	Job # 300030895.2000	Contractor:	
Report To:	Jim Baxter	Sampled By/Date:	Client / July 10, 2013
Source of Material	Whitesands FN Cogen Plant - TP # 4 (1.5m)	Tested By/Date:	FV / AV / July 12, 2013
Reported By:	Forch Valela	Reviewed By:	Tim Fummerton

Sieve Size	Percent Passing	OPSS 1010 Specifications
150 mm	100.0	100
75 mm	93.4	
63 mm	87.9	
53 mm	87.9	
37.5 mm	78.0	
26.5 mm	70.9	50-100
19.0 mm	64.5	
16.0 mm	61.2	
13.2 mm	58.7	
9.5 mm	53.7	
6.7 mm	49.3	
4.75 mm	44.6	20-100
2.36 mm	27.1	
1.18 mm	12.6	10-100
600 um	4.7	
300 um	**1.5**	2-65
150 um	0.7	
75 um	0.5	0-8



Remarks: Test Method LS 602, ASTM C136

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CONSULTING GROUP

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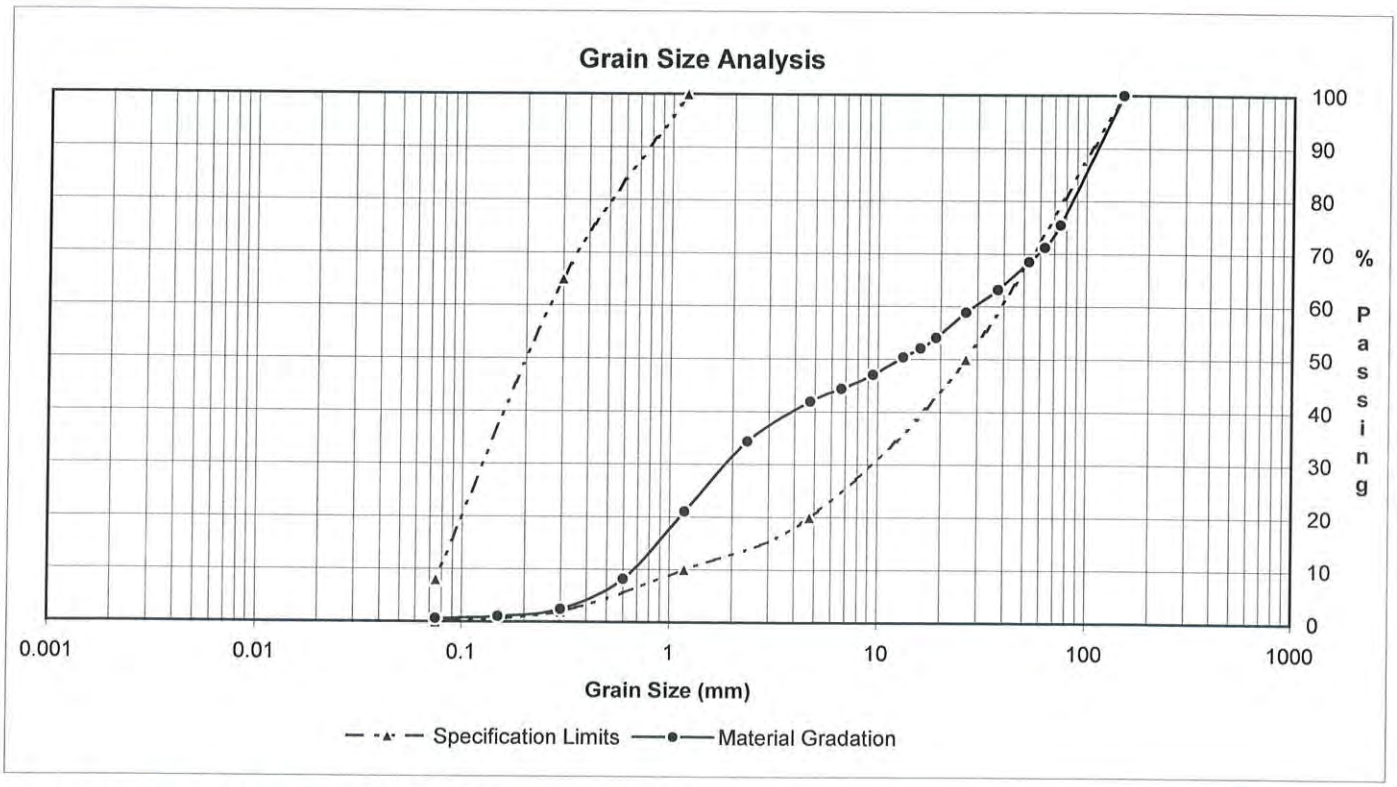
PH: (807) 624-5162 FAX: (807) 624-5163
E-Mail: tbte@tbte.ca

Grain Size Analysis - Granular 'B' Type I

Client:	RJ Burnside and Associates	TBTE Job No.:	13-132
Client Project No.:	Whitesands First Nation Cogen Plant	Lab No.:	13-521
Project Desc.:	Job # 300030895.2000	Contractor:	
Report To:	Jim Baxter	Sampled By/Date:	Client / July 10, 2013
Source of Material	Whitesands FN Cogen Plant - TP # 5 (1.5 m)	Tested By/Date:	FV / AV / July 12, 2013
Reported By:	Forch Valela	Reviewed By:	Tim Fummerton

Sieve Size	Percent Passing	OPSS 1010 Specifications
150 mm	100.0	100
75 mm	75.4	
63 mm	71.2	
53 mm	68.5	
37.5 mm	63.2	
26.5 mm	58.9	50-100
19.0 mm	54.1	
16.0 mm	52.1	
13.2 mm	50.4	
9.5 mm	47.0	
6.7 mm	44.3	
4.75 mm	41.9	20-100
2.36 mm	34.3	
1.18 mm	21.0	10-100
600 um	8.2	
300 um	2.4	2-65
150 um	1.0	
75 um	0.6	0-8



Remarks: Test Method LS 602, ASTM C136

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CONSULTING GROUP

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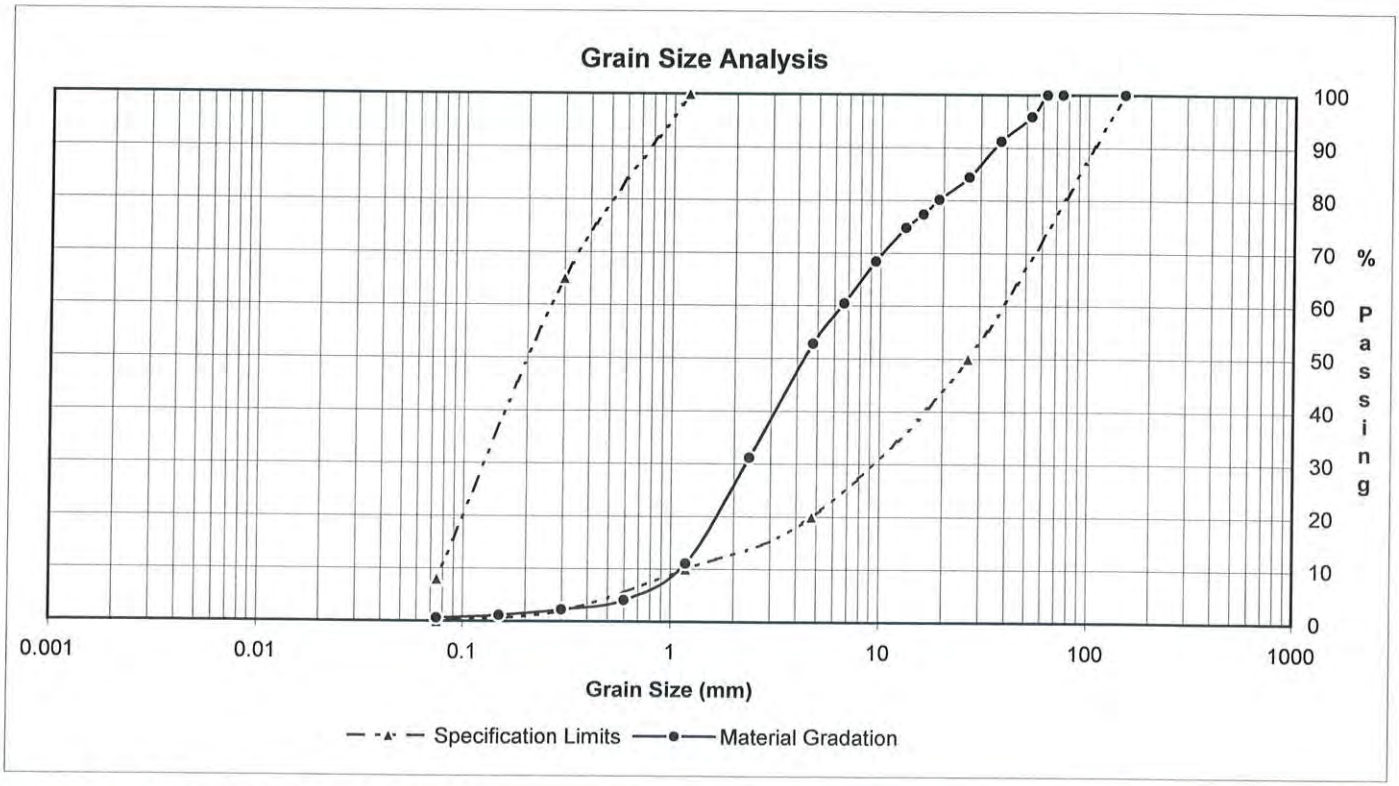
711 Harold Cres.,Thunder Bay, ON P7C 5H8
PH: (807) 624-5162 FAX: (807) 624-5163
E-Mail: tbte@tbte.ca

Grain Size Analysis - Granular 'B' Type I

Client:	RJ Burnside and Associates	TBTE Job No.:	13-132
Client Project No.:	Whitesands First Nation Cogen Plant	Lab No.:	13-522
Project Desc.:	Job # 300030895.2000	Contractor:	
Report To:	Jim Baxter	Sampled By/Date:	Client / July 10, 2013
Source of Material	Whitesands FN Cogen Plant - TP # 6 (1.5 m)	Tested By/Date:	FV / AV / July 12, 2013
Reported By:	Forch Valela	Reviewed By:	Tim Fummerton

Sieve Size	Percent Passing	OPSS 1010 Specifications
150 mm	100.0	100
75 mm	100.0	
63 mm	100.0	
53 mm	95.9	
37.5 mm	91.2	
26.5 mm	84.4	50-100
19.0 mm	80.2	
16.0 mm	77.3	
13.2 mm	74.8	
9.5 mm	68.4	
6.7 mm	60.5	
4.75 mm	52.8	20-100
2.36 mm	31.2	
1.18 mm	11.1	10-100
600 um	4.1	
300 um	2.3	2-65
150 um	1.1	
75 um	0.6	0-8



Remarks: Test Method LS 602, ASTM C136

Table 1
Test Pit Logs and Soil Classification

Whitesands Test Pit logs
Whitesands, Armstrong, ON
Date: 9-Jul-13
Weather Conditions: Clear, 25 C
Job Number 300030895

Test Pit No	Depth Interval	Soil Description	Groundwater
TP 1	**Proposed Septic system site**		
	0.00 - 2.00	Cobbles with Gravel, rounded, refusal on large (>300 mm) cobbles at 2m	moisture present but unsaturated
TP2	**Proposed Septic System**		
	0.00 - 3.70	Cobbles and Gravel, rounded.	moisture present but unsaturated
TP3	**Just east of entrance to cleared area**		
	0.00 - 0.30	Organic silt ...reddish brown	
	0.30 - 2.40	Gravel and Cobbles some sand, rounded, most cobbles less than 200 mm	moist but unsaturated
TP4	**South side of clearing, area previously excavated 1.5 m into a small rise**		
	0.00 - 0.50	Sand and Gravel Fill	
	0.50 - 4.50	Gravel and Cobbles some sand, rounded, all cobbles less than 200 mm	moist but unsaturated
TP5	**East side of the clearing**		
	0.00 - 0.30	Organic reddish brown Silt	
	0.30 - 1.50	Gravel and Cobbles some sand, rounded, all cobbles less than 200 mm	moist but unsaturated
	1.50 - 2.00	Sand and Gravel no cobbles	
	2.00 - 3.50	Gravel and Cobbles some sand, rounded, all cobbles less than 200 mm	moist but unsaturated
TP6	**North West corner of cleared area**		
	0.00 - 0.10	Organic reddish brown Silt	
	0.10 - 0.50	Gravel and Coarse Sand, no cobbles, reddish stained	unsaturated
	0.50 - 1.50	Cobbles with Gravel, rounded, cobbles 100 to 200 mm	moist but unsaturated
	1.50 - 4.00	Gravel and Cobbles some sand, rounded, numerous cobbles greater than 300 mm	moist but unsaturated
TP7	**South West Corner of cleared area near TW2-13**		
	0.00 - 0.10	Organic reddish brown Silt	
	0.10 - 0.50	Gravel and Coarse Sand, no cobbles, reddish stained	unsaturated
	0.50 - 3.00	Cobbles with Gravel, rounded, cobbles up to 300 mm	moist but unsaturated

Logged by J. Baxter
All measurements are in metres unless otherwise indicated.
Soil samples will be retained for three months from date of report.

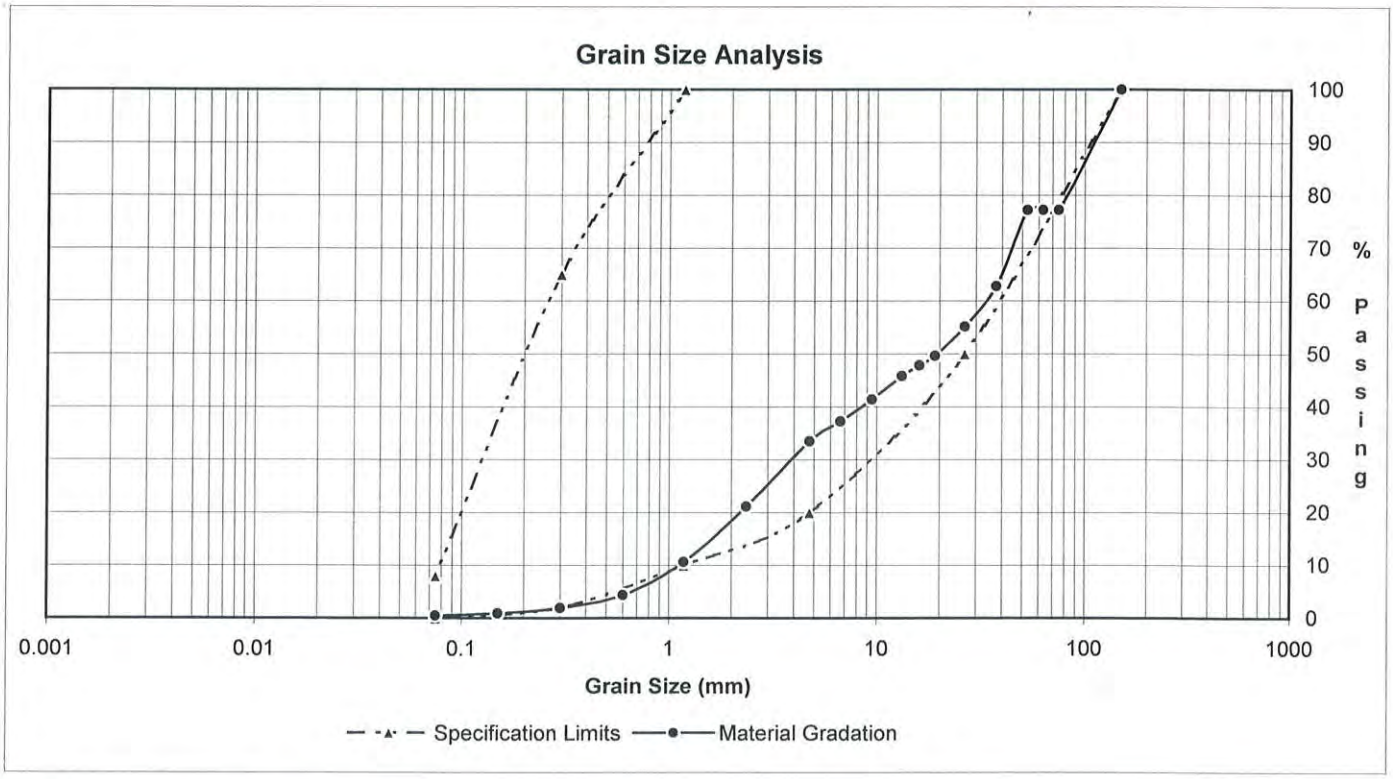
TBT ENGINEERING
CONSULTING GROUP

TBT Engineering Limited
LABORATORY
711 Harold Cres.,Thunder Bay, ON P7C 5H8
PH: (807) 624-5162 FAX: (807) 624-5163
E-Mail: tbte@tbte.ca

Grain Size Analysis - Granular 'B' Type I

Client:	RJ Burnside and Associates	TBTE Job No.:	13-132
Client Project No.:	Whitesands First Nation Cogen Plant	Lab No.:	13-517
Project Desc.:	Job # 300030895.2000	Contractor:	
Report To:	Jim Baxter	Sampled By/Date:	Client / July 10, 2013
Source of Material	Whitesands FN Cogen Plant - TP # 1 (1-1.2 m)	Tested By/Date:	FV / AV / July 12, 2013
Reported By:	Forch Valela	Reviewed By:	Tim Fummerton

Sieve Size	Percent Passing	OPSS 1010 Specifications
150 mm	100.0	100
75 mm	77.2	
63 mm	77.2	
53 mm	77.2	
37.5 mm	62.8	
26.5 mm	55.2	50-100
19.0 mm	49.6	
16.0 mm	47.8	
13.2 mm	45.8	
9.5 mm	41.4	
6.7 mm	37.3	
4.75 mm	33.5	20-100
2.36 mm	21.1	
1.18 mm	10.6	10-100
600 um	4.3	
300 um	**1.9**	2-65
150 um	0.9	
75 um	0.5	0-8



Remarks: Test Method LS 602, ASTM C136

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CONSULTING GROUP

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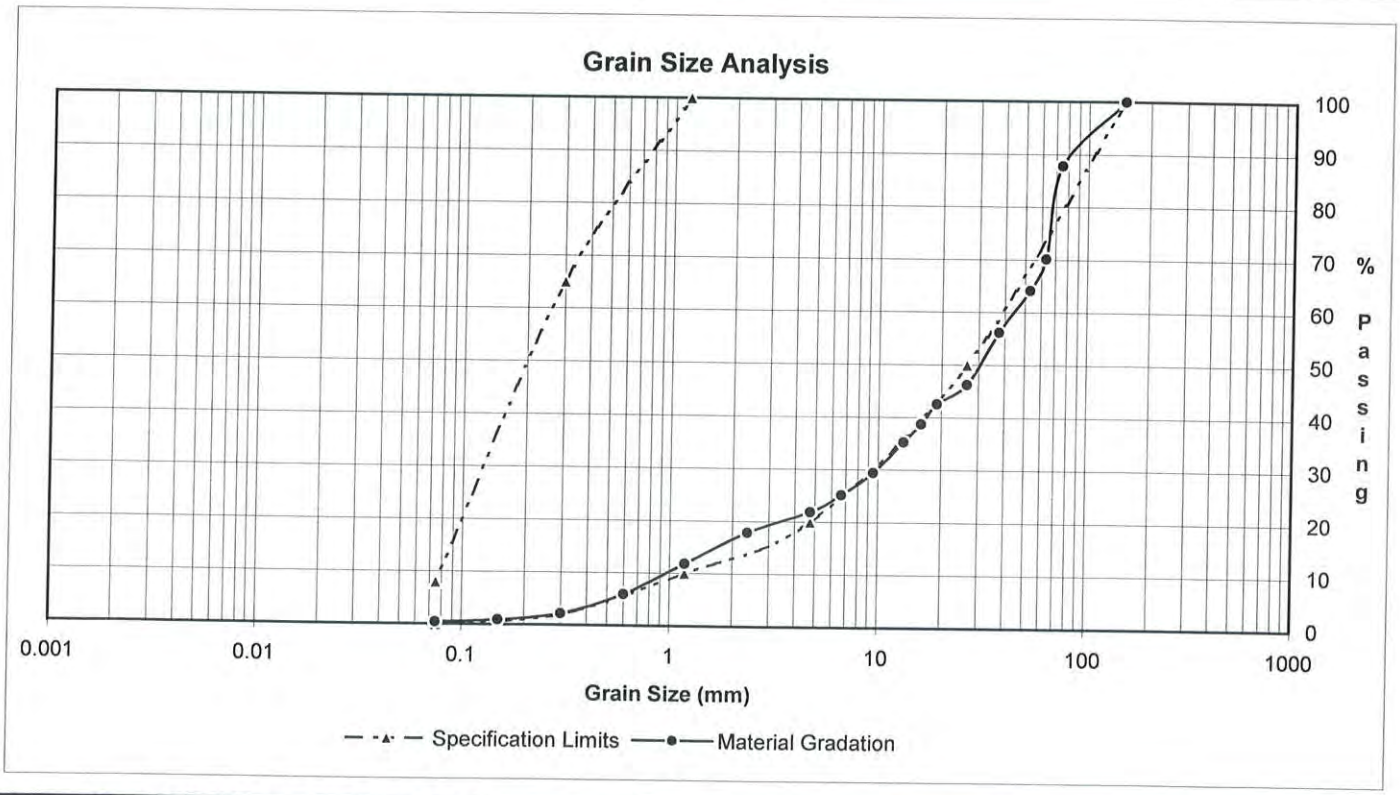
LABORATORY
711 Harold Cres.,Thunder Bay, ON P7C 5H8
PH: (807) 624-5162 FAX: (807) 624-5163
E-Mail: tbte@tbte.ca

Grain Size Analysis - Granular 'B' Type I

Client:	RJ Burnside and Associates	TBTE Job No.:	13-132
Client Project No.:	Whitesands First Nation Cogen Plant	Lab No.:	13-518
Project Desc.:	Job # 300030895.2000	Contractor:	
Report To:	Jim Baxter	Sampled By/Date:	Client / July 10, 2013
Source of Material	Whitesands FN Cogen Plant - TP # 2 (1 m)	Tested By/Date:	FV / AV / July 12, 2013
Reported By:	Forch Valela	Reviewed By:	Tim Fummerton

Sieve Size	Percent Passing	OPSS 1010 Specifications
150 mm	100.0	100
75 mm	87.8	
63 mm	70.2	
53 mm	64.2	
37.5 mm	56.2	
26.5 mm	**46.2**	50-100
19.0 mm	42.5	
16.0 mm	38.7	
13.2 mm	35.3	
9.5 mm	29.4	
6.7 mm	25.1	
4.75 mm	21.9	20-100
2.36 mm	17.9	
1.18 mm	11.8	10-100
600 um	6.0	
300 um	2.2	2-65
150 um	0.9	
75 um	0.4	0-8



Remarks: Test Method LS 602, ASTM C136

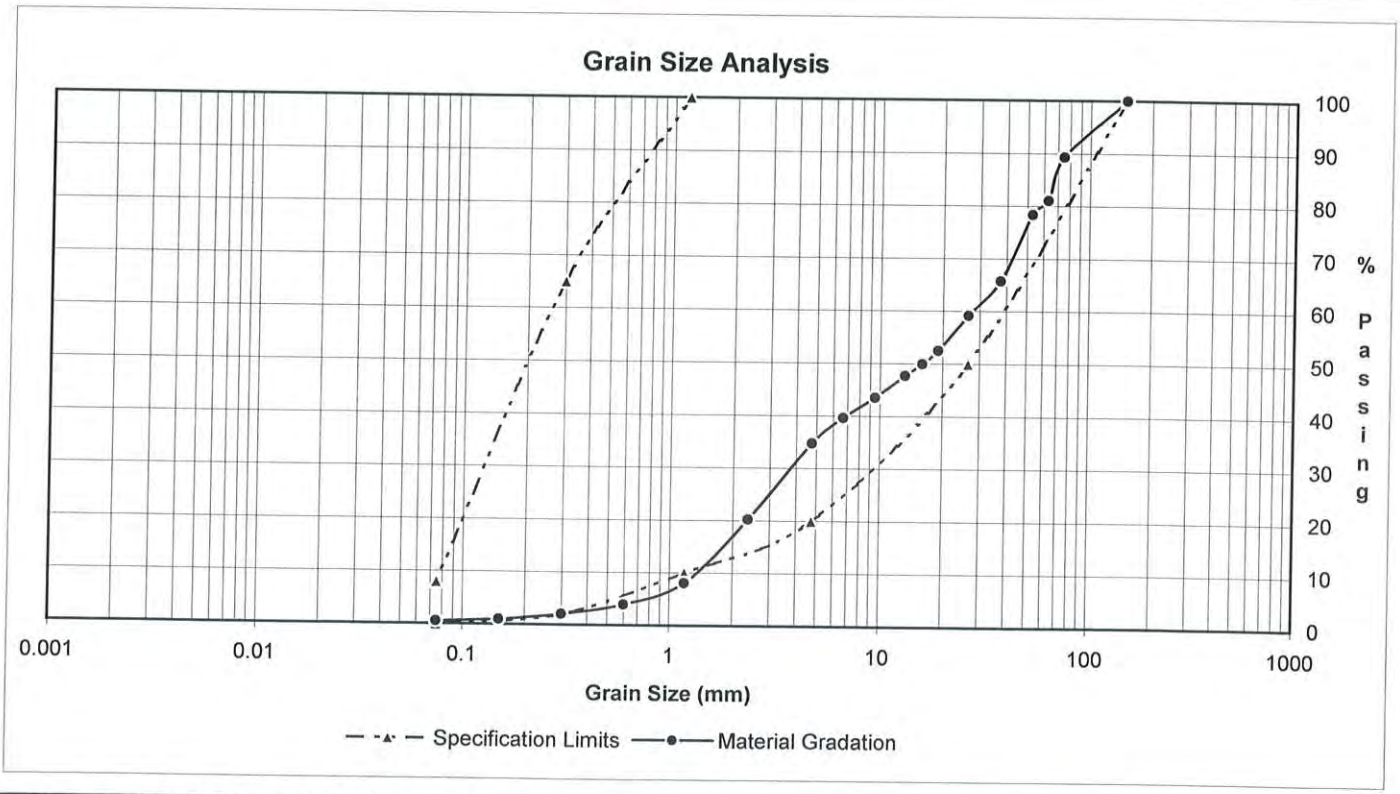
TBT ENGINEERING
CONSULTING GROUP

TBT Engineering Limited
LABORATORY
711 Harold Cres.,Thunder Bay, ON P7C 5H8
PH: (807) 624-5162 FAX: (807) 624-5163
E-Mail: tbte@tbte.ca

Grain Size Analysis - Granular 'B' Type I

Client:	RJ Burnside and Associates	TBTE Job No.:	13-132
Client Project No.:	Whitesands First Nation Cogen Plant	Lab No.:	13-519
Project Desc.:	Job # 300030895.2000	Contractor:	
Report To:	Jim Baxter	Sampled By/Date:	Client / July 10, 2013
Source of Material	Whitesands FN Cogen Plant - TP # 3 (1.0 m)	Tested By/Date:	FV / AV / July 12, 2013
Reported By:	Forch Valela	Reviewed By:	Tim Fummerton

Sieve Size	Percent Passing	OPSS 1010 Specifications
150 mm	100.0	100
75 mm	89.3	
63 mm	81.0	
53 mm	78.3	
37.5 mm	65.7	
26.5 mm	59.2	50-100
19.0 mm	52.5	
16.0 mm	50.0	
13.2 mm	47.7	
9.5 mm	43.5	
6.7 mm	39.6	
4.75 mm	34.8	20-100
2.36 mm	20.2	
1.18 mm	**8.1**	10-100
600 um	4.0	
300 um	2.1	2-65
150 um	1.0	
75 um	0.5	0-8



Remarks: Test Method LS 602, ASTM C136

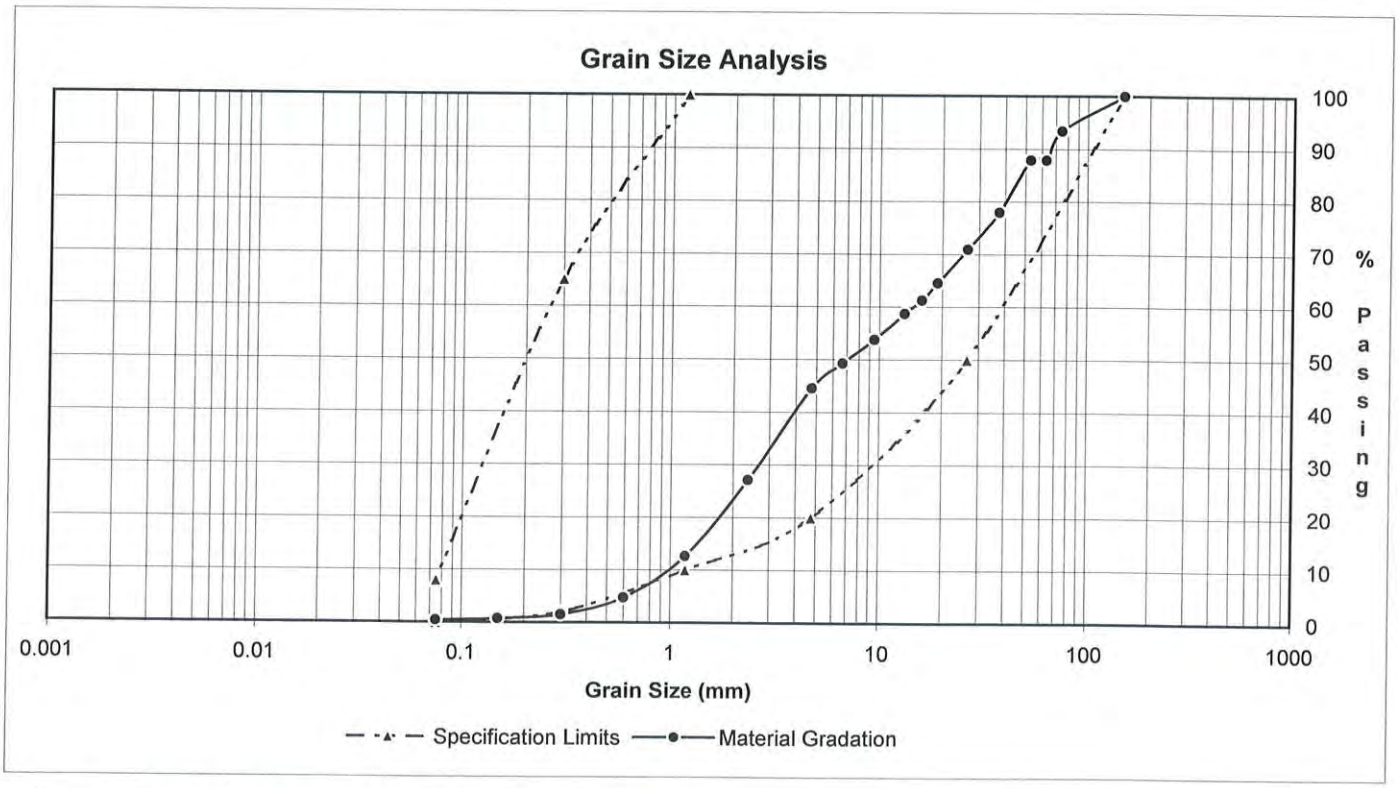
TBT ENGINEERING
CONSULTING GROUP

TBT Engineering Limited
LABORATORY
711 Harold Cres.,Thunder Bay, ON P7C 5H8
PH: (807) 624-5162 FAX: (807) 624-5163
E-Mail: tbte@tbte.ca

Grain Size Analysis - Granular 'B' Type I

Client:	RJ Burnside and Associates	TBTE Job No.:	13-132
Client Project No.:	Whitesands First Nation Cogen Plant	Lab No.:	13-520
Project Desc.:	Job # 300030895.2000	Contractor:	
Report To:	Jim Baxter	Sampled By/Date:	Client / July 10, 2013
Source of Material	Whitesands FN Cogen Plant - TP # 4 (1.5m)	Tested By/Date:	FV / AV / July 12, 2013
Reported By:	Forch Valela	Reviewed By:	Tim Fummerton

Sieve Size	Percent Passing	OPSS 1010 Specifications
150 mm	100.0	100
75 mm	93.4	
63 mm	87.9	
53 mm	87.9	
37.5 mm	78.0	
26.5 mm	70.9	50-100
19.0 mm	64.5	
16.0 mm	61.2	
13.2 mm	58.7	
9.5 mm	53.7	
6.7 mm	49.3	
4.75 mm	44.6	20-100
2.36 mm	27.1	
1.18 mm	12.6	10-100
600 um	4.7	
300 um	**1.5**	2-65
150 um	0.7	
75 um	0.5	0-8



Remarks: Test Method LS 602, ASTM C136

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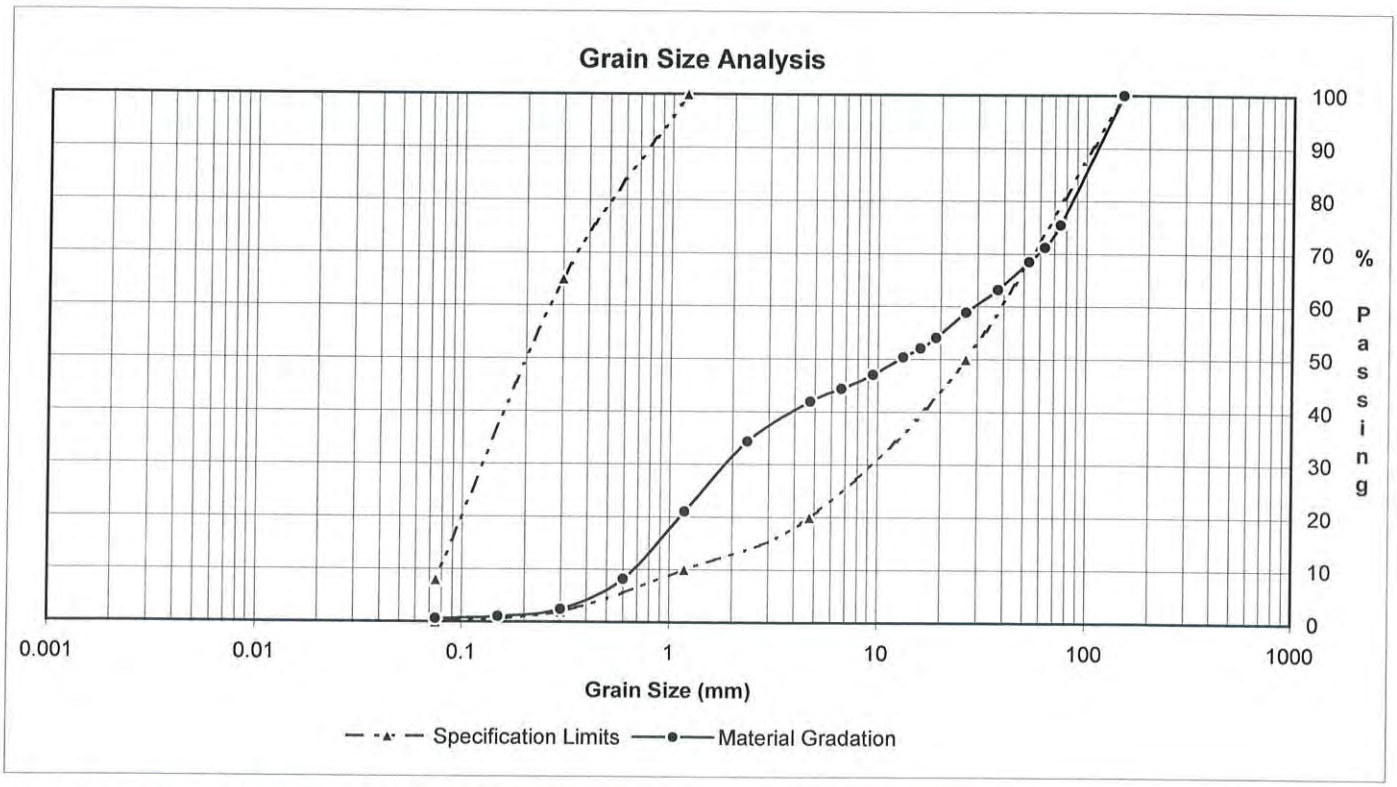
LABORATORY
711 Harold Cres.,Thunder Bay, ON P7C 5H8
PH: (807) 624-5162 FAX: (807) 624-5163
E-Mail: tbte@tbte.ca

Grain Size Analysis - Granular 'B' Type I

Client:	RJ Burnside and Associates	TBTE Job No.:	13-132
Client Project No.:	Whitesands First Nation Cogen Plant	Lab No.:	13-521
Project Desc.:	Job # 300030895.2000	Contractor:	
Report To:	Jim Baxter	Sampled By/Date:	Client / July 10, 2013
Source of Material	Whitesands FN Cogen Plant - TP # 5 (1.5 m)	Tested By/Date:	FV / AV / July 12, 2013
Reported By:	Forch Valela	Reviewed By:	Tim Fummerton

Sieve Size	Percent Passing	OPSS 1010 Specifications
150 mm	100.0	100
75 mm	75.4	
63 mm	71.2	
53 mm	68.5	
37.5 mm	63.2	
26.5 mm	58.9	50-100
19.0 mm	54.1	
16.0 mm	52.1	
13.2 mm	50.4	
9.5 mm	47.0	
6.7 mm	44.3	
4.75 mm	41.9	20-100
2.36 mm	34.3	
1.18 mm	21.0	10-100
600 um	8.2	
300 um	2.4	2-65
150 um	1.0	
75 um	0.6	0-8



Remarks: Test Method LS 602, ASTM C136

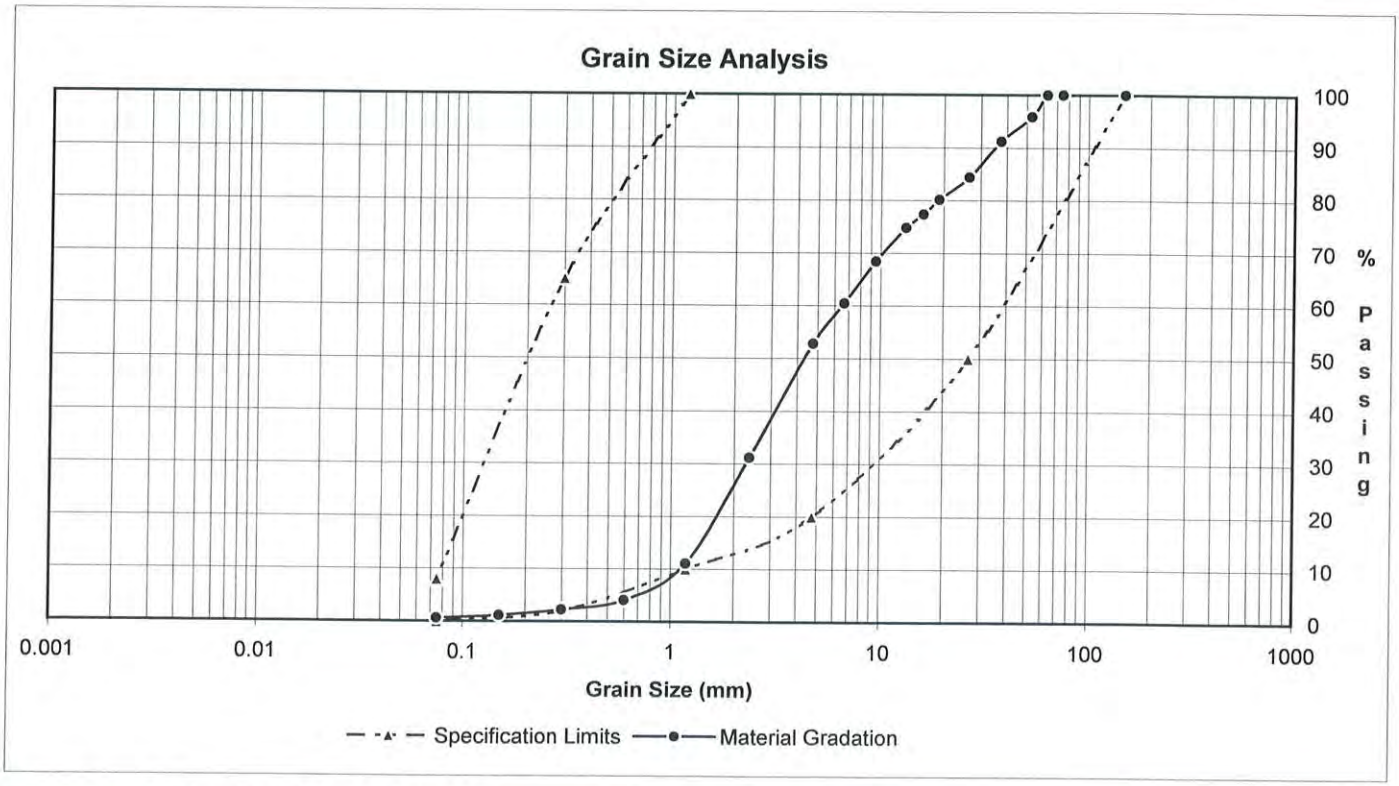
TBT ENGINEERING
CONSULTING GROUP

TBT Engineering Limited
LABORATORY
711 Harold Cres.,Thunder Bay, ON P7C 5H8
PH: (807) 624-5162 FAX: (807) 624-5163
E-Mail: tbte@tbte.ca

Grain Size Analysis - Granular 'B' Type I

Client:	RJ Burnside and Associates	TBTE Job No.:	13-132
Client Project No.:	Whitesands First Nation Cogen Plant	Lab No.:	13-522
Project Desc.:	Job # 300030895.2000	Contractor:	
Report To:	Jim Baxter	Sampled By/Date:	Client / July 10, 2013
Source of Material	Whitesands FN Cogen Plant - TP # 6 (1.5 m)	Tested By/Date:	FV / AV / July 12, 2013
Reported By:	Forch Valela	Reviewed By:	Tim Fummerton

Sieve Size	Percent Passing	OPSS 1010 Specifications
150 mm	100.0	100
75 mm	100.0	
63 mm	100.0	
53 mm	95.9	
37.5 mm	91.2	
26.5 mm	84.4	50-100
19.0 mm	80.2	
16.0 mm	77.3	
13.2 mm	74.8	
9.5 mm	68.4	
6.7 mm	60.5	
4.75 mm	52.8	20-100
2.36 mm	31.2	
1.18 mm	11.1	10-100
600 um	4.1	
300 um	2.3	2-65
150 um	1.1	
75 um	0.6	0-8

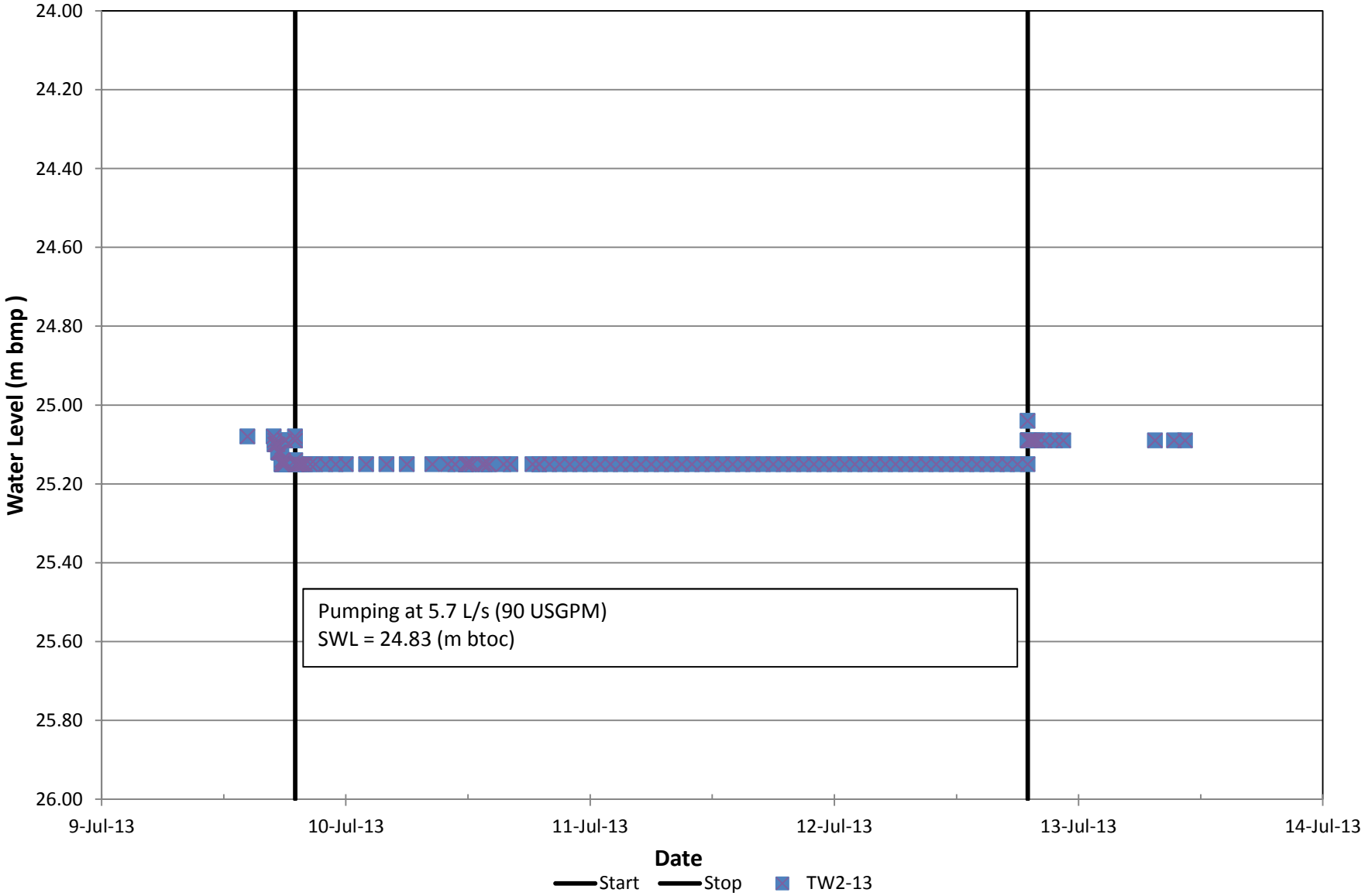


Remarks: Test Method LS 602, ASTM C136

NEEGAN BURNSIDE

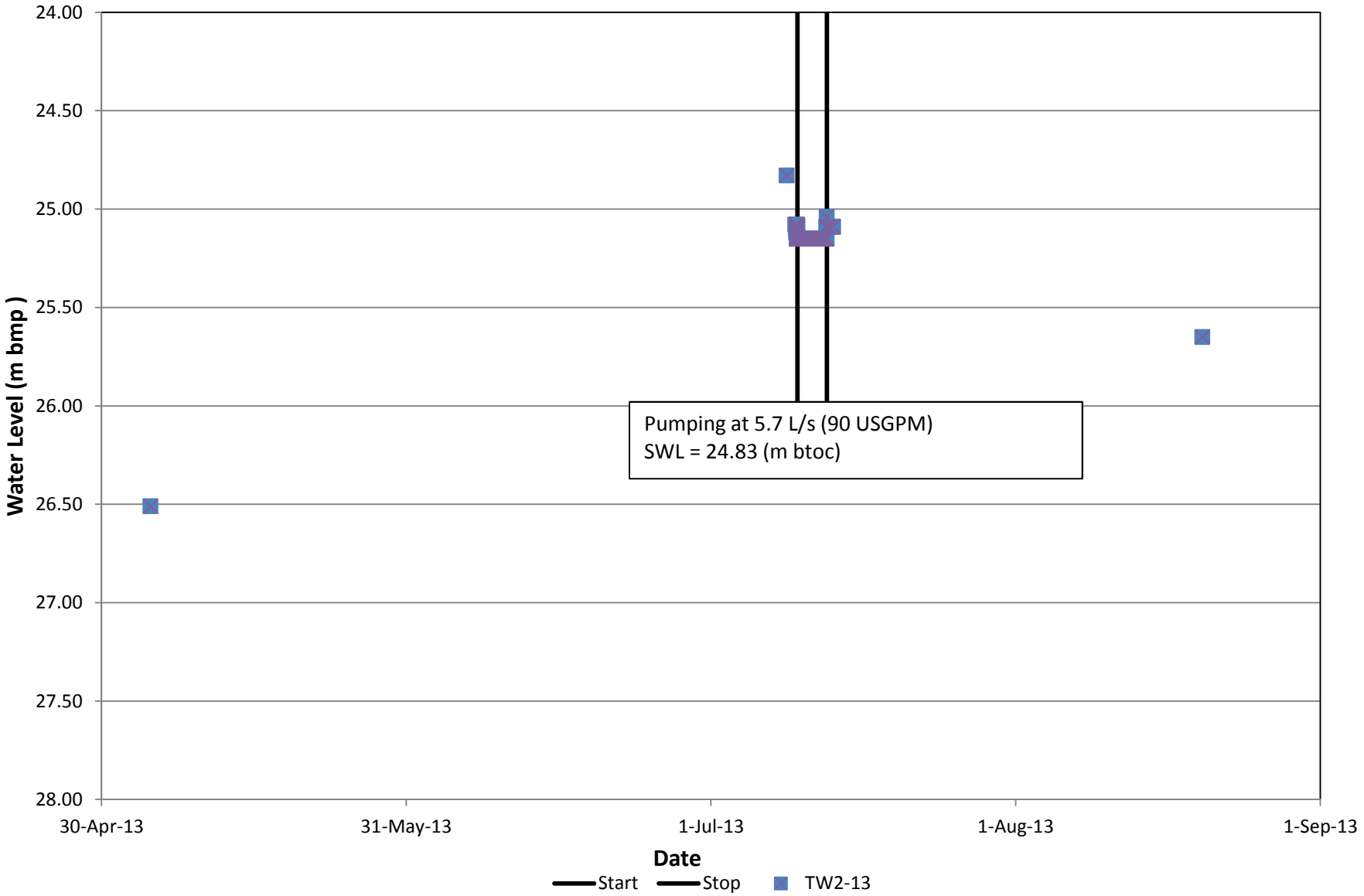
Appendix B
Pumping Test Results

Whitesand First Nation
Long Term Pumping Test TW2-13
July 2013
TW2-13 Water Level Hydrograph



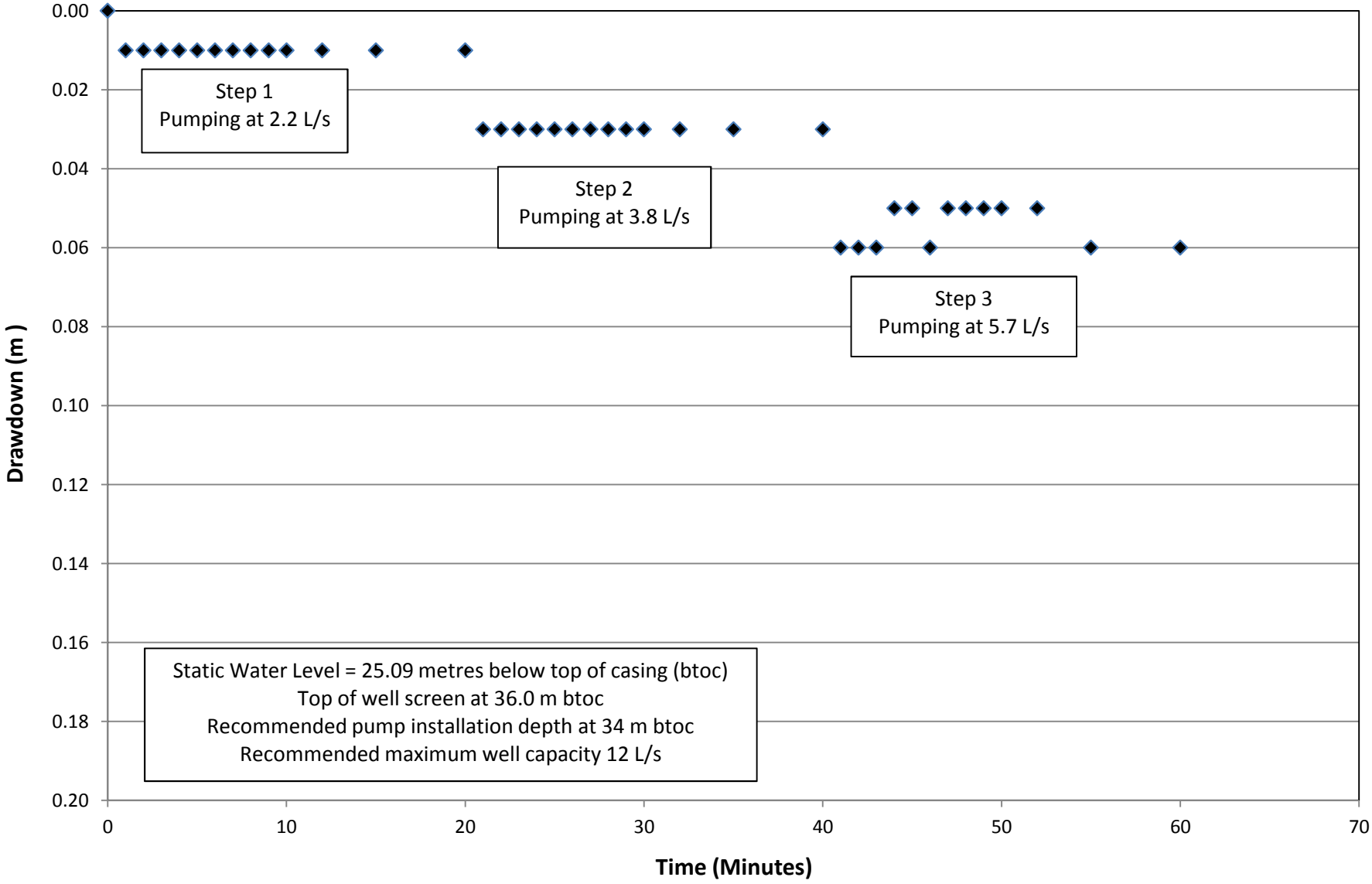
Burnside
File:C:\Users\jbaxter\Documents\AA Burnside Temp Project Files\Whitesands\30895 Whitesand First Nation Hydrograph.xlsx\TW2-13 (2)
Prepared by: SQ
Date: 24 July 2013

Whitesand First Nation
Long Term Pumping Test TW2-13
July 2013
TW2-13 Water Level Hydrograph



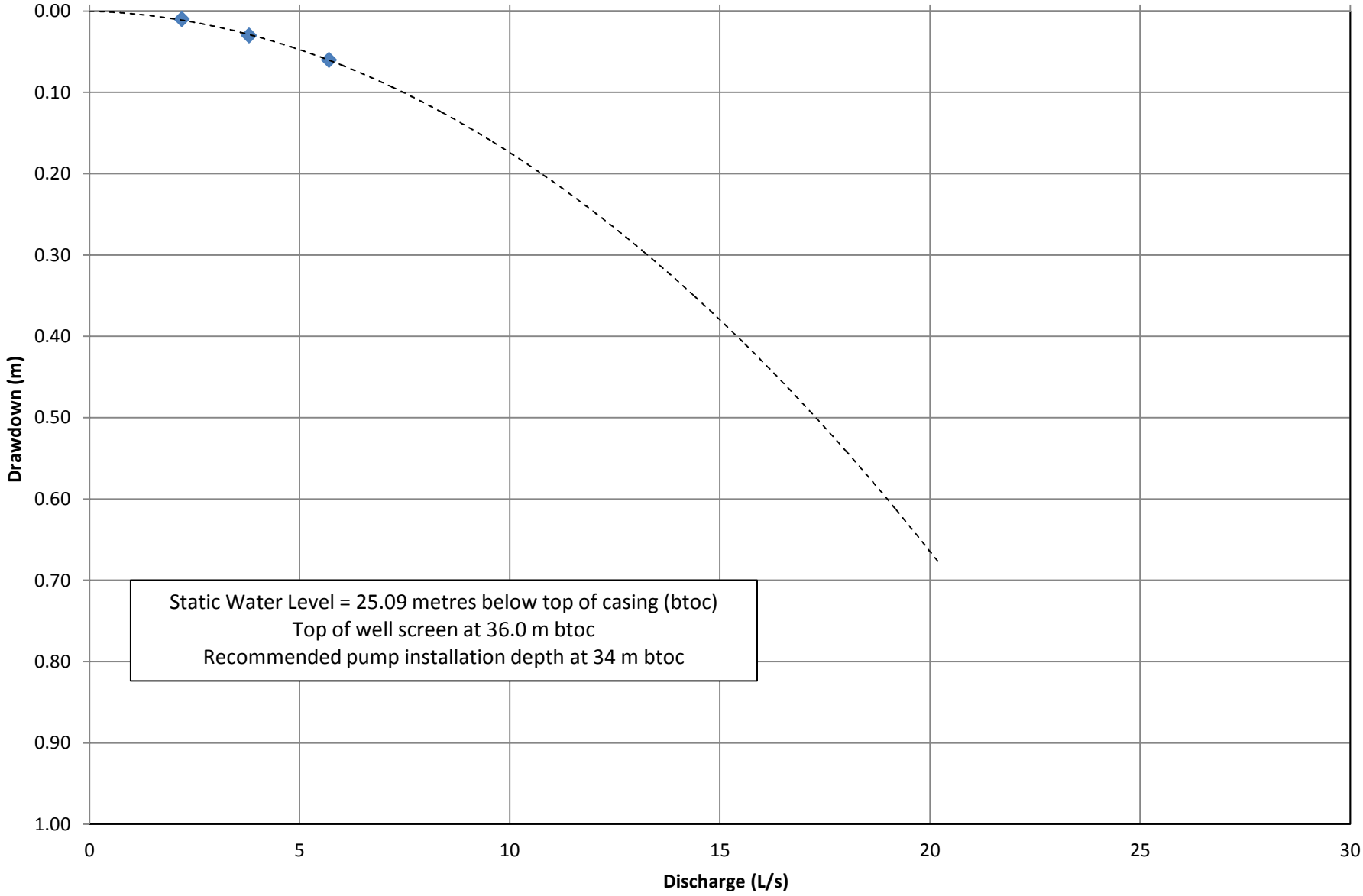
Burnside
File:C:\Users\jbaxter\Documents\AA Burnside Temp Project Files\Whitesands\30895 Whitesand First Nation Hydrograph.xlsx\TW2-13
Prepared by: SQ
Date: 24 July 2013

Whitesand First Nation
Long Term Pumping Test TW2-13
July 2013
TW2-13 Step Test



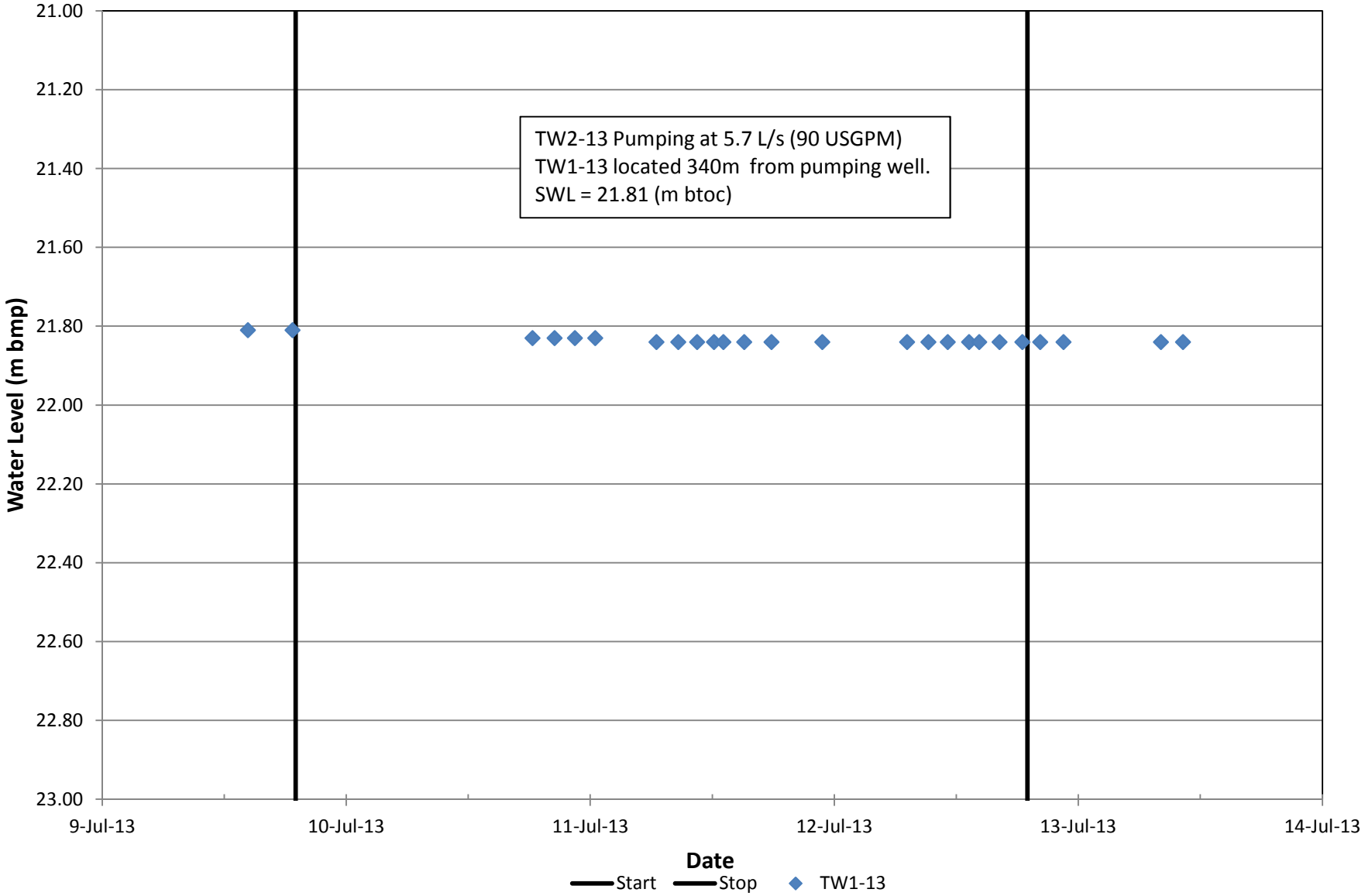
R.J. Burnside & Associates Limited
File:W:\30895 Whitesand First Nation Hydrograph.xlsx\TW2-13 (Step Test)
Prepared by: SQ
Date: 24 July 2013

Whitesand First Nation
Long Term Pumping Test TW2-13
July 2013
TW2-13 Well Performance



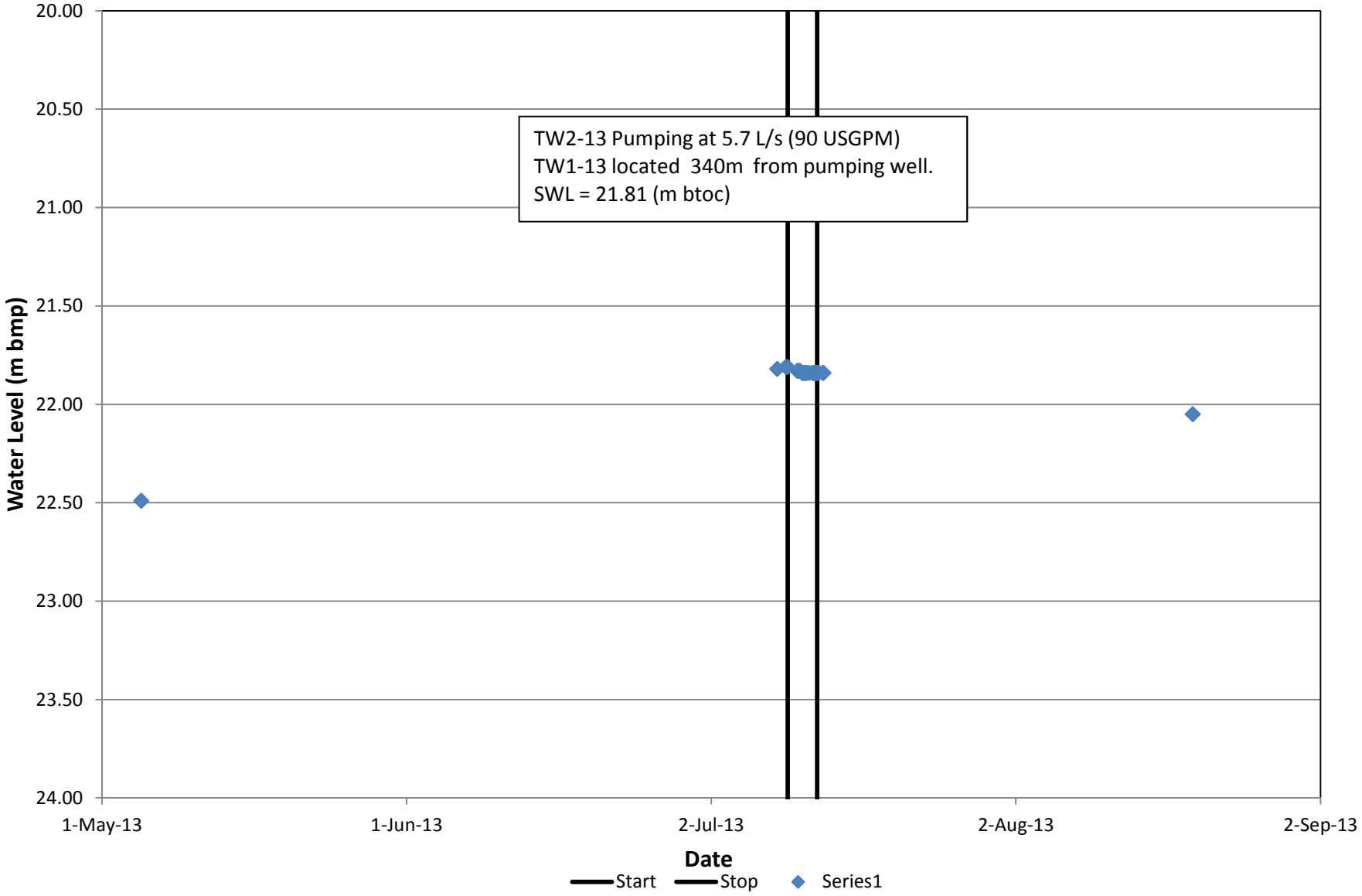
R.J. Burnside & Associates Limited
File:W:\30895 Whitesand First Nation Hydrograph.xlsx\Dist vs Draw
Prepared by: SQ
Date: 24 July 2013

Whitesand First Nation
Long Term Pumping Test TW2-13
July 2013
TW1-13 Water Level Hydrograph



Burnside
File:C:\Users\jbaxter\Documents\AA Burnside Temp Project Files\Whitesands\30895 Whitesand First Nation Hydrograph.xlsx\TW1-13 (2)
Prepared by: SQ
Date: 24 July 2013

Whitesand First Nation
Long Term Pumping Test TW2-13
July 2013
TW1-13 Water Level Hydrograph



Burnside
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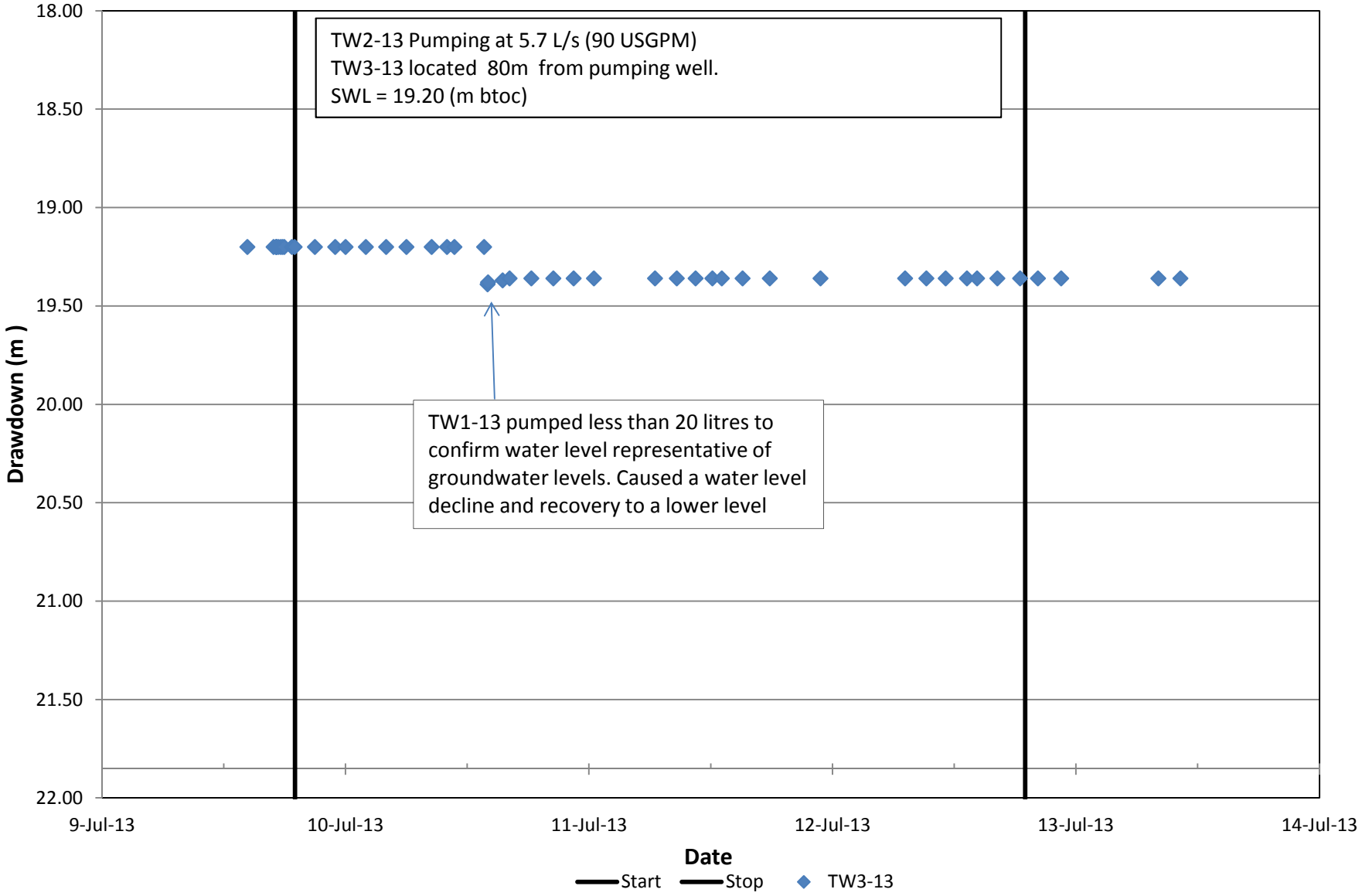
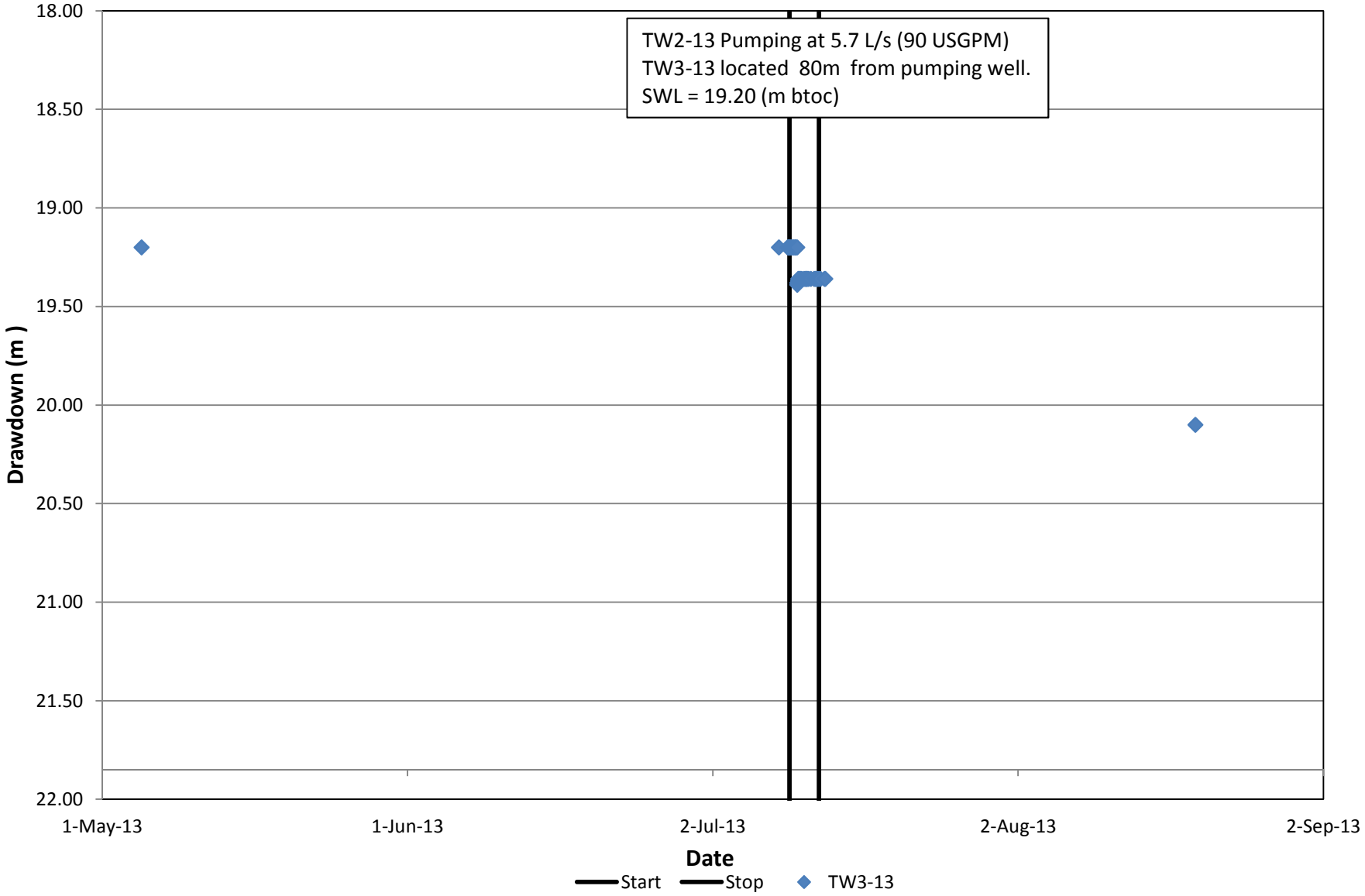
Prepared by: SQ
Date: 24 July 2013

Whitesand First Nation
Long Term Pumping Test TW2-13
July 2013
TW3-13 Water Level Hydrograph



Burnside
File:C:\Users\jbaxter\Documents\AA Burnside Temp Project Files\Whitesands\30895 Whitesand First Nation Hydrograph.xlsx\TW3-13 (2)
Prepared by: SQ
Date: 24 July 2013

Whitesand First Nation
Long Term Pumping Test TW2-13
July 2013
TW3-13 Water Level Hydrograph



Burnside
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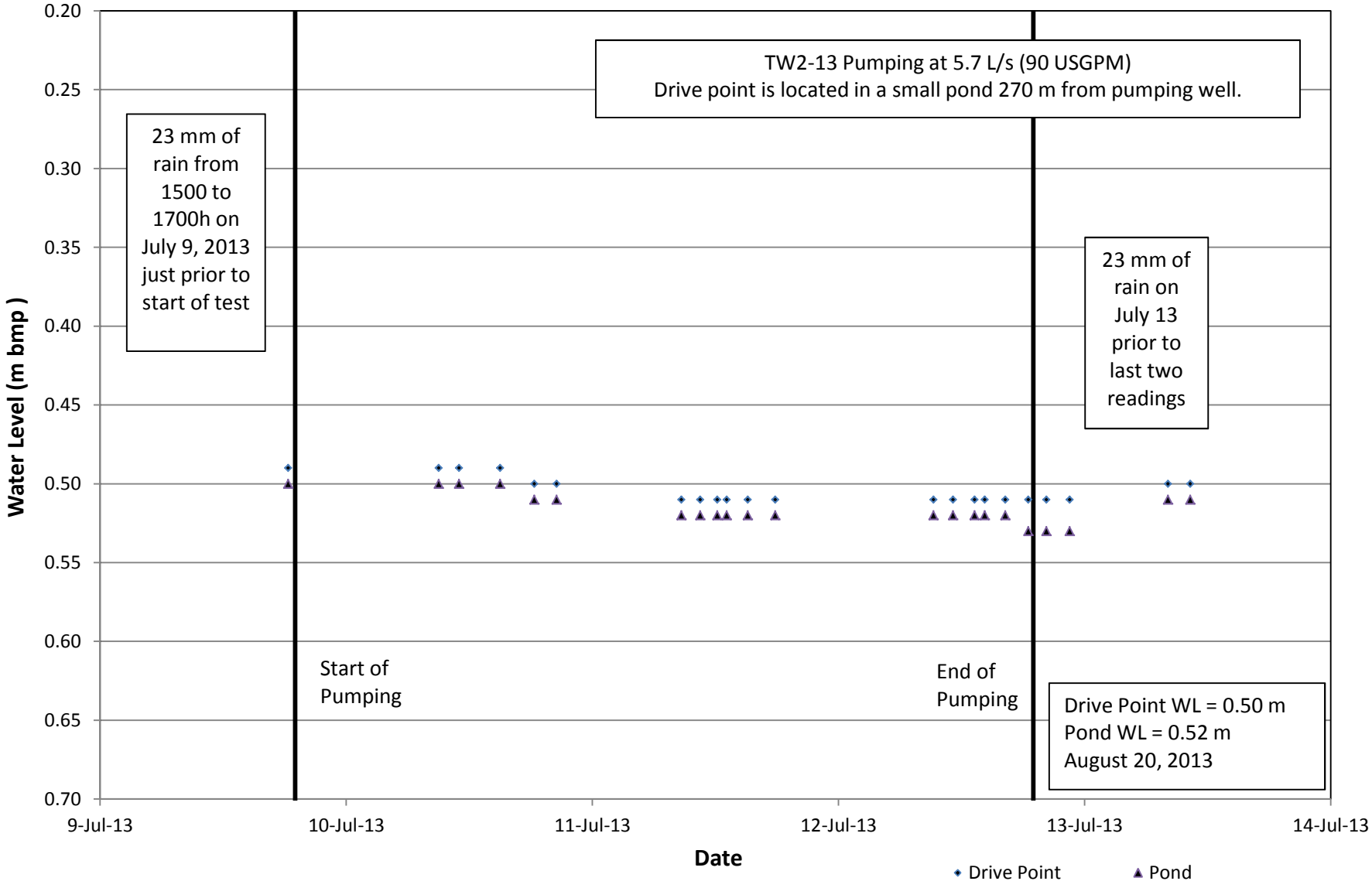
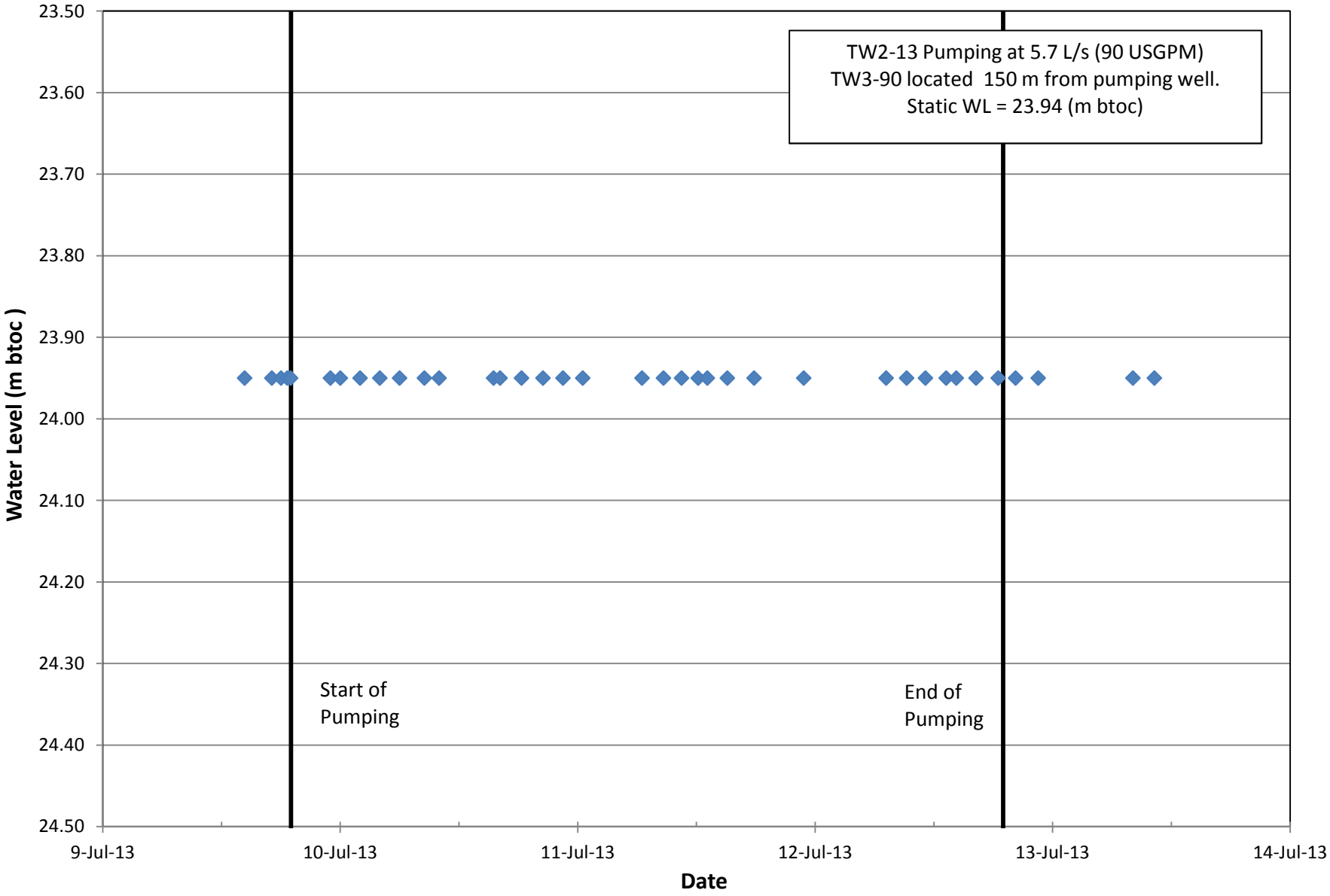
Prepared by: SQ
Date: 24 July 2013

Whitesand First Nation
Long Term Pumping Test TW2-13
July 2013
Drive Point and Pond Hydrograph



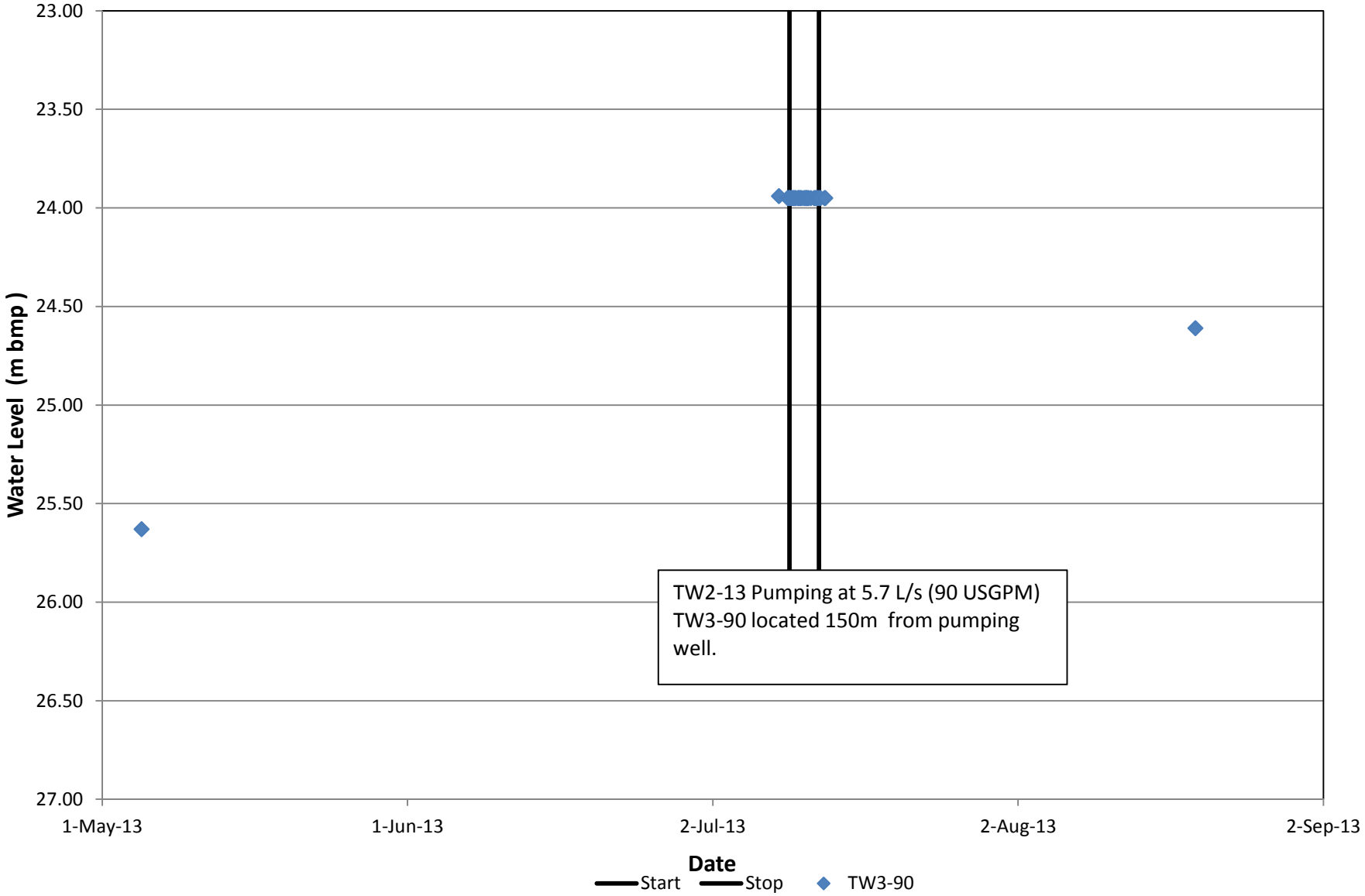
Burnside
File:W:\30895 Whitesand First Nation Hydrograph.xlsx\Drive point
Prepared by: SQ
Date: 24 July 2013

Whitesand First Nation
Long Term Pumping Test TW2-13
July 2013
TW3-90 Water Level Hydrograph



Burnside
File:W:\30895 Whitesand First Nation Hydrograph.xlsx\TW3-90 (2)
Prepared by: SQ
Date: 24 July 2013

Whitesand First Nation
Long Term Pumping Test TW2-13
July 2013
TW3-90 Water Level Hydrograph



Burnside
File:C:\Users\jbaxter\Documents\AA Burnside Temp Project Files\Whitesands\30895 Whitesand First Nation Hydrograph.xlsx\TW3-90
Prepared by: SQ
Date: 24 July 2013

NEEGAN BURNSIDE

Appendix C
Water Quality Test Results

AGAT Laboratories

5835 COOPERS AVENUE
MISSISSAUGA, ONTARIO
CANADA L4Z 1Y2
TEL (905)712-5100
FAX (905)712-5122
http://www.agatlabs.com

Laboratory Results for samples collected during the long term test, July 2013

CLIENT NAME: R.J. BURNSIDE & ASSOCIATES LTD
292 Speedvale Avenue West, Unit 7
Guelph, ON N1H1C4
(519) 823-4995

ATTENTION TO: Jim Baxter

PROJECT NO: 300030895

AGAT WORK ORDER: 13B736929

TRACE ORGANICS REVIEWED BY: Oksana Gushyla, Trace Organics Lab Supervisor

WATER ANALYSIS REVIEWED BY: Mike Muneswar, BSc (Chem), Senior Inorganic Analyst

DATE REPORTED: Jul 30, 2013

PAGES (INCLUDING COVER): 25

VERSION*: 1

Should you require any information regarding this analysis please contact your client services representative at (905) 712-5100

*NOTES

All samples will be disposed of within 30 days following analysis. Please contact the lab if you require additional sample storage time.

AGAT Laboratories

5835 COOPERS AVENUE
MISSISSAUGA, ONTARIO
CANADA L4Z 1Y2
TEL (905)712-5100
FAX (905)712-5122
http://www.agatlabs.com

Certificate of Analysis

AGAT WORK ORDER: 13B736929
PROJECT NO: 300030895

CLIENT NAME: R.J. BURNSIDE & ASSOCIATES LTD

ATTENTION TO: Jim Baxter

Glyphosate in Water

DATE RECEIVED: 2013-07-16

DATE REPORTED: 2013-07-30

				SAMPLE DESCRIPTION:	TW2-13 72hr
				SAMPLE TYPE:	Water
				DATE SAMPLED:	7/11/2013
Parameter	Unit	G / S	RDL	4555942s	
Glyphosate (ug/ml)	mg/L		0.02	<0.02	

Comments: RDL - Reported Detection Limit; G / S - Guideline / Standard

Certified By:

AGAT Laboratories

5835 COOPERS AVENUE
MISSISSAUGA, ONTARIO
CANADA L4Z 1Y2
TEL (905)712-5100
FAX (905)712-5122
http://www.agatlabs.com

Certificate of Analysis

AGAT WORK ORDER: 13B736929
PROJECT NO: 300030895

CLIENT NAME: R.J. BURNSIDE & ASSOCIATES LTD

ATTENTION TO: Jim Baxter

NTA (water)

DATE RECEIVED: 2013-07-16

DATE REPORTED: 2013-07-30

		SAMPLE DESCRIPTION:		TW2-13 72hr
		SAMPLE TYPE:		Water
		DATE SAMPLED:		7/11/2013
Parameter	Unit	G / S	RDL	4555942
Nitrilotriacetic Acid (NTA)*	mg/L	0.4	0.03	<0.03

Comments: RDL - Reported Detection Limit; G / S - Guideline / Standard: Refers to O.Reg.169/03(mg/L)

Certified By:

AGAT Laboratories

5835 COOPERS AVENUE
MISSISSAUGA, ONTARIO
CANADA L4Z 1Y2
TEL (905)712-5100
FAX (905)712-5122
http://www.agatlabs.com

Certificate of Analysis

AGAT WORK ORDER: 13B736929
PROJECT NO: 300030895

CLIENT NAME: R.J. BURNSIDE & ASSOCIATES LTD

ATTENTION TO: Jim Baxter

SDWA Schedule 24 - Benzo(a)pyrene

DATE RECEIVED: 2013-07-16

DATE REPORTED: 2013-07-30

				SAMPLE DESCRIPTION:	TW2-13 72hr
				SAMPLE TYPE:	Water
				DATE SAMPLED:	7/11/2013
Parameter	Unit	G / S	RDL	4555942	
Benzo(a)pyrene	µg/L	0.01	0.01	<0.01	
Surrogate	Unit	Acceptable Limits			
Chrysene-d12	%	60-130		69	

Comments: RDL - Reported Detection Limit; G / S - Guideline / Standard: Refers to SDWA - Schedule 24

Certified By:

AGAT Laboratories

5835 COOPERS AVENUE
MISSISSAUGA, ONTARIO
CANADA L4Z 1Y2
TEL (905)712-5100
FAX (905)712-5122
http://www.agatlabs.com

Certificate of Analysis

AGAT WORK ORDER: 13B736929
PROJECT NO: 300030895

CLIENT NAME: R.J. BURNSIDE & ASSOCIATES LTD

ATTENTION TO: Jim Baxter

SDWA Schedule 24 - Pesticides & PCBs

DATE RECEIVED: 2013-07-16

DATE REPORTED: 2013-07-30

		SAMPLE DESCRIPTION:		TW2-13 72hr
		SAMPLE TYPE:		Water
		DATE SAMPLED:		7/11/2013
Parameter	Unit	G / S	RDL	4555942
Aldicarb	µg/L	9	2.0	<2.0
Bendiocarb	µg/L	40	2	<2
Carbofuran	µg/L	90	5	<5
Carbaryl	µg/L	90	5	<5
Diuron	µg/L	150	10	<10
Triallate	µg/L	230	1	<1
Temephos	µg/L	280	10	<10
Diquat	µg/L	70	5	<5
Paraquat	µg/L	10	1	<1
Aldrin + Dieldrin	µg/L	0.7	0.07	<0.07
DDT + Metabolites	µg/L	30	3	<3
Methoxychlor	µg/L	900	90	<90
Chlordane (Total)	µg/L	7	0.7	<0.7
Heptachlor Epoxide	µg/L		0.2	<0.2
Lindane	µg/L	4	0.4	<0.4
PCB's	µg/L	3	0.2	<0.2
Bromoxynil	µg/L	5	0.5	<0.5
Dicamba	µg/L	120	1	<1
2,4-D	µg/L	100	1	<1
2,4-Dichlorophenol	µg/L	900	0.5	<0.5
Diclofop-methyl	µg/L	9	0.9	<0.9
Dinoseb	µg/L	10	1	<1
Pentachlorophenol	µg/L	60	0.5	<0.5
Picloram	µg/L	190	5	<5
2,4,5-T	µg/L		1	<1
2,3,4,6-Tetrachlorophenol	µg/L	100	0.5	<0.5
2,4,6-Trichlorophenol	µg/L	5	0.5	<0.5
Phorate	µg/L	2	0.5	<0.5
Dimethoate	µg/L	20	2.5	<2.5
Terbufos	µg/L	1	0.5	<0.5
Diazinon	µg/L	20	1.0	<1.0

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SDWA Schedule 24 - Pesticides & PCBs

DATE RECEIVED: 2013-07-16

DATE REPORTED: 2013-07-30

		SAMPLE DESCRIPTION:		TW2-13 72hr
		SAMPLE TYPE:		Water
		DATE SAMPLED:		7/11/2013
Parameter	Unit	G / S	RDL	4555942
Malathion	µg/L	190	5.0	<5.0
Chlorpyrifos	µg/L	90	1.0	<1.0
Parathion	µg/L	50	1.0	<1.0
Azinphos-methyl	µg/L	20	2.0	<2.0
Atrazine + N-dealkylated metabolites	µg/L	5	1.0	<1.0
Trifluralin	µg/L	45	2.0	<2.0
Simazine	µg/L	10	1.0	<1.0
Metribuzin	µg/L	80	2.0	<2.0
Alachlor	µg/L	5	0.5	<0.5
Prometryne	µg/L	1	0.25	<0.25
Metolachlor	µg/L	50	2.0	<2.0
Cyanazine	µg/L	10	1.0	<1.0
Surrogate	Unit	Acceptable Limits		
DCAA (Herbicide Surrogate)	%	50-130		114
TCMX (OC Pesticide Surrogate)	%	50-130		113
Decachlorobiphenyl (OC Pesticide Surrogate)	%	60-130		120

Comments: RDL - Reported Detection Limit; G / S - Guideline / Standard: Refers to SDWA - Schedule 24

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AGAT WORK ORDER: 13B736929
PROJECT NO: 300030895

CLIENT NAME: R.J. BURNSIDE & ASSOCIATES LTD

ATTENTION TO: Jim Baxter

SDWA Schedule 24 - Volatile Organic Compounds

DATE RECEIVED: 2013-07-16

DATE REPORTED: 2013-07-30

		SAMPLE DESCRIPTION:		TW2-13 72hr
		SAMPLE TYPE:		Water
		DATE SAMPLED:		7/11/2013
Parameter	Unit	G / S	RDL	4555942
Vinyl Chloride	µg/L	2	0.2	<0.2
1,1 Dichloroethene	µg/L	14	0.2	<0.2
Dichloromethane	µg/L	50	0.3	<0.3
1,2 - Dichloroethane	µg/L	5	0.2	<0.2
Carbon Tetrachloride	µg/L	5	0.2	<0.2
Benzene	µg/L	5	0.2	<0.2
Trichloroethylene	µg/L	5	0.2	<0.2
Bromodichloromethane	µg/L		0.2	<0.2
Dibromochloromethane	µg/L		0.1	<0.1
Tetrachloroethene	µg/L	30	0.2	<0.2
Chlorobenzene	µg/L	80	0.1	<0.1
Bromoform	µg/L		0.3	<0.3
1,2-Dichlorobenzene	µg/L	200	0.5	<0.5
1,4-Dichlorobenzene	µg/L	5	0.5	<0.5
Trihalomethanes	µg/L	100	0.5	<0.5
Surrogate	Unit	Acceptable Limits		
Toluene-d8	% Recovery	60-130		107
4-Bromofluorobenzene	% Recovery	60-130		92

Comments: RDL - Reported Detection Limit; G / S - Guideline / Standard: Refers to SDWA - Schedule 24

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AGAT WORK ORDER: 13B736929
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CLIENT NAME: R.J. BURNSIDE & ASSOCIATES LTD

ATTENTION TO: Jim Baxter

Volatile Organic Compounds in Water

DATE RECEIVED: 2013-07-16

DATE REPORTED: 2013-07-30

		SAMPLE DESCRIPTION:		TW3-90
		SAMPLE TYPE:		Water
		DATE SAMPLED:		7/12/2013
Parameter	Unit	G / S	RDL	4555933
Dichlorodifluoromethane	µg/L		0.20	<0.20
Chloromethane	µg/L		0.40	<0.40
Vinyl Chloride	µg/L		0.17	<0.17
Bromomethane	µg/L		0.20	<0.20
Chloroethane	µg/L		0.20	<0.20
Trichlorofluoromethane	µg/L		0.40	<0.40
Acetone	µg/L		1.0	<1.0
1,1 Dichloroethylene	µg/L		0.30	<0.30
Methylene Chloride	µg/L		0.30	<0.30
trans- 1,2-dichloroethylene	µg/L		0.20	<0.20
Methyl tert-butyl ether	µg/L		0.20	<0.20
1,1-Dichloroethane	µg/L		0.30	<0.30
Methyl Ethyl Ketone	µg/L		1.0	<1.0
cis- 1,2-Dichloroethylene	µg/L		0.20	<0.20
Chloroform	µg/L		0.20	<0.20
1,2 - Dichloroethane	µg/L		0.20	<0.20
1,1,1-Trichloroethane	µg/L		0.30	<0.30
Carbon Tetrachloride	µg/L		0.20	<0.20
Benzene	µg/L		0.20	<0.20
1,2-Dichloropropane	µg/L		0.20	<0.20
Trichloroethylene	µg/L		0.20	<0.20
Bromodichloromethane	µg/L		0.20	<0.20
cis-1,3-Dichloropropene	ug/L		0.20	<0.20
Methyl Isobutyl Ketone	µg/L		1.0	<1.0
trans-1,3-Dichloropropene	µg/L		0.30	<0.30
1,1,2-Trichloroethane	µg/L		0.20	<0.20
Toluene	µg/L		0.20	<0.20
2-Hexanone	µg/L		0.30	<0.30
Dibromochloromethane	µg/L		0.10	<0.10
Ethylene Dibromide	µg/L		0.10	<0.10
Tetrachloroethylene	µg/L		0.20	<0.20

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Certificate of Analysis

AGAT WORK ORDER: 13B736929
PROJECT NO: 300030895

CLIENT NAME: R.J. BURNSIDE & ASSOCIATES LTD

ATTENTION TO: Jim Baxter

Volatile Organic Compounds in Water

DATE RECEIVED: 2013-07-16

DATE REPORTED: 2013-07-30

		SAMPLE DESCRIPTION:		TW3-90
		SAMPLE TYPE:		Water
		DATE SAMPLED:		7/12/2013
Parameter	Unit	G / S	RDL	4555933
1,1,1,2-Tetrachloroethane	µg/L		0.10	<0.10
Chlorobenzene	µg/L		0.10	<0.10
Ethylbenzene	µg/L		0.10	<0.10
m & p-Xylene	µg/L		0.20	<0.20
Bromoform	µg/L		0.10	<0.10
Styrene	µg/L		0.10	<0.10
1,1,2,2-Tetrachloroethane	µg/L		0.10	<0.10
o-Xylene	µg/L		0.10	<0.10
1,3-Dichlorobenzene	µg/L		0.10	<0.10
1,4-Dichlorobenzene	µg/L		0.10	<0.10
1,2-Dichlorobenzene	µg/L		0.10	<0.10
1,2,4-Trichlorobenzene	µg/L		0.30	<0.30
1,3-Dichloropropene (Cis + Trans)	µg/L		0.30	<0.30
Xylene Mixture (Total)	µg/L		0.20	<0.20
n-Hexane	µg/L		0.20	<0.20
Surrogate	Unit	Acceptable Limits		
Toluene-d8	% Recovery	60-130		95
4-Bromofluorobenzene	% Recovery	70-130		102

Comments: RDL - Reported Detection Limit; G / S - Guideline / Standard

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AGAT WORK ORDER: 13B736929
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CLIENT NAME: R.J. BURNSIDE & ASSOCIATES LTD

ATTENTION TO: Jim Baxter

Bromate (water)

DATE RECEIVED: 2013-07-16

DATE REPORTED: 2013-07-30

				SAMPLE DESCRIPTION:	TW2-13 72hr
				SAMPLE TYPE:	Water
				DATE SAMPLED:	7/11/2013
Parameter	Unit	G / S	RDL	4555942	
Bromate*	mg/L	0.01	0.003	<0.003	

Comments: RDL - Reported Detection Limit; G / S - Guideline / Standard: Refers to O.Reg.169/03(mg/L)

Certified By:

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AGAT WORK ORDER: 13B736929
PROJECT NO: 300030895

CLIENT NAME: R.J. BURNSIDE & ASSOCIATES LTD

ATTENTION TO: Jim Baxter

SDWA Schedule 23 - Metals and Inorganics Parameters

DATE RECEIVED: 2013-07-16

DATE REPORTED: 2013-07-30

		SAMPLE DESCRIPTION:		TW2-13 72hr
		SAMPLE TYPE:		Water
		DATE SAMPLED:		7/11/2013
Parameter	Unit	G / S	RDL	4555942
Antimony	µg/L	6	1.0	<1.0
Arsenic	µg/L	25	0.60	<0.60
Barium	µg/L	1000	0.50	13.2
Boron	µg/L	5000	10	<10
Cadmium	µg/L	5	0.20	<0.20
Chromium	µg/L	50	0.60	0.94
Lead	µg/L	10	0.50	<0.50
Mercury	µg/L	1	0.10	<0.10
Selenium	µg/L	10	0.80	<0.80
Uranium	µg/L	20	0.20	0.54
Nitrate as N	mg/L	10.0	0.05	0.28
Nitrite as N	mg/L	1.0	0.05	<0.05
(Nitrate + Nitrite) as N	mg/L	10.0	0.07	0.28
Fluoride	mg/L	1.5	0.05	<0.05
FreeCyanide	mg/L		0.002	<0.002

Comments: RDL - Reported Detection Limit; G / S - Guideline / Standard: Refers to SDWA -Schedule 23

Certified By:

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AGAT WORK ORDER: 13B736929
PROJECT NO: 300030895

CLIENT NAME: R.J. BURNSIDE & ASSOCIATES LTD

ATTENTION TO: Jim Baxter

Water Quality Assessment

DATE RECEIVED: 2013-07-16

DATE REPORTED: 2013-07-30

		SAMPLE DESCRIPTION:		TW2-13 END
		SAMPLE TYPE:		Water
		DATE SAMPLED:		7/11/2013
Parameter	Unit	G / S	RDL	4556170
Electrical Conductivity	uS/cm		2	240
pH	pH Units		NA	7.68
Saturation pH				7.88
Langelier Index				-0.20
Total Hardness (as CaCO3)	mg/L		10	88
Total Dissolved Solids	mg/L		20	134
Alkalinity (as CaCO3)	mg/L		5	89
Bicarbonate (as CaCO3)	mg/L		5	89
Carbonate (as CaCO3)	mg/L		5	<5
Hydroxide (as CaCO3)	mg/L		5	<5
Fluoride	mg/L		0.05	<0.05
Chloride	mg/L		0.10	18.5
Nitrate as N	mg/L		0.05	0.32
Nitrite as N	mg/L		0.05	<0.05
Bromide	mg/L		0.05	<0.05
Sulphate	mg/L		0.10	3.42
Otrho Phosphate as P	mg/L		0.10	<0.10
Reactive Silica	mg/L		0.05	12.6
Ammonia as N	mg/L		0.02	<0.02
Total Phosphorus	mg/L		0.05	< 0.05
Total Organic Carbon	mg/L		0.5	1.4
Colour	TCU		5	<5
Turbidity	NTU		0.5	<0.5
Calcium	mg/L		0.05	27.9
Magnesium	mg/L		0.05	4.46
Sodium	mg/L		0.05	12.5
Potassium	mg/L		0.05	2.13
Aluminum	mg/L		0.004	0.015
Antimony	mg/L		0.003	<0.003
Arsenic	mg/L		0.003	<0.003
Barium	mg/L		0.002	0.014

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ATTENTION TO: Jim Baxter

Water Quality Assessment

DATE RECEIVED: 2013-07-16

DATE REPORTED: 2013-07-30

		SAMPLE DESCRIPTION:		TW2-13 END
		SAMPLE TYPE:		Water
		DATE SAMPLED:		7/11/2013
Parameter	Unit	G / S	RDL	4556170
Beryllium	mg/L		0.001	<0.001
Boron	mg/L		0.010	0.014
Cadmium	mg/L		0.002	<0.002
Chromium	mg/L		0.003	<0.003
Cobalt	mg/L		0.001	<0.001
Copper	mg/L		0.003	0.004
Iron	mg/L		0.010	<0.010
Lead	mg/L		0.002	<0.002
Manganese	mg/L		0.002	<0.002
Mercury	mg/L		0.0001	<0.0001
Molybdenum	mg/L		0.002	<0.002
Nickel	mg/L		0.003	<0.003
Selenium	mg/L		0.004	<0.004
Silver	mg/L		0.002	<0.002
Strontium	mg/L		0.005	0.035
Thallium	mg/L		0.006	<0.006
Tin	mg/L		0.002	<0.002
Titanium	mg/L		0.002	<0.002
Tungsten	mg/L		0.010	<0.010
Uranium	mg/L		0.002	<0.002
Vanadium	mg/L		0.002	<0.002
Zinc	mg/L		0.005	0.028
Zirconium	mg/L		0.004	<0.004
% Difference/ Ion Balance			0.1	0.8

Comments: RDL - Reported Detection Limit; G / S - Guideline / Standard

4556170 Hold times for Colour, Turbidity & Ammonia parameter were exceeded. Samples were collected Jul 11, received at the Lab on Jul 16 and analysed on Jul 19 & Jul 22.

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Quality Assurance

CLIENT NAME: R.J. BURNSIDE & ASSOCIATES LTD

AGAT WORK ORDER: 13B736929

PROJECT NO: 300030895

ATTENTION TO: Jim Baxter

Trace Organics Analysis

RPT Date: Jul 30, 2013			DUPLICATE				REFERENCE MATERIAL			METHOD BLANK SPIKE			MATRIX SPIKE		
PARAMETER	Batch	Sample Id	Dup #1	Dup #2	RPD	Method Blank	Measured Value	Acceptable Limits		Recovery	Acceptable Limits		Recovery	Acceptable Limits	
								Lower	Upper		Lower	Upper		Lower	Upper
SDWA Schedule 24 - Pesticides & PCBs															
Aldicarb	1	4555942	< 2.0	< 2.0	0.0%	< 2.0	91%	60%	140%	71%	60%	140%	77%	60%	140%
Bendiocarb	1	4555942	< 2	< 2	0.0%	< 2	86%	60%	140%	94%	60%	140%	99%	60%	140%
Carbofuran	1	4555942	< 5	< 5	0.0%	< 5	86%	60%	140%	94%	60%	140%	99%	60%	140%
Carbaryl	1	4555942	< 5	< 5	0.0%	< 5	60%	60%	140%	94%	60%	140%	99%	60%	140%
Diuron	1	4555942	< 10	< 10	0.0%	< 10	102%	60%	140%	96%	60%	140%	107%	60%	140%
Triallate	1	4555942	< 1	< 1	0.0%	< 1	99%	60%	140%	65%	60%	140%	81%	60%	140%
Temephos	1	4555942	< 10	< 10	0.0%	< 10	126%	60%	140%	99%	60%	140%	91%	60%	140%
Diquat	1	4555942	< 5	< 5	0.0%	< 5	114%	60%	140%	97%	60%	140%	102%	60%	140%
Paraquat	1	4555942	< 1	< 1	0.0%	< 1	114%	60%	140%	98%	60%	140%	103%	60%	140%
Aldrin + Dieldrin	1		< 0.07	< 0.07	0.0%	< 0.07	90%	60%	140%	112%	60%	140%	112%	60%	140%
DDT + Metabolites	1		< 3	< 3	0.0%	< 3	98%	60%	140%	105%	60%	140%	114%	60%	140%
Methoxychlor	1		< 90	< 90	0.0%	< 90	96%	60%	140%	102%	60%	140%	115%	60%	140%
Chlordane (Total)	1		< 0.7	< 0.7	0.0%	< 0.7	98%	60%	140%	114%	60%	140%	120%	60%	140%
Heptachlor Epoxide	1		< 0.2	< 0.2	0.0%	< 0.2	96%	60%	140%	102%	60%	140%	103%	60%	140%
Lindane	1		< 0.4	< 0.4	0.0%	< 0.4	98%	60%	140%	103%	40%	130%	112%	30%	150%
PCB's	1		< 0.2	< 0.2	0.0%	< 0.2	102%	60%	140%	101%	60%	140%	106%	60%	140%
Bromoxynil	1		< 0.5	< 0.5	0.0%	< 0.5	90%	60%	140%	80%	40%	130%	NA	30%	150%
Dicamba	1		< 1	< 1	0.0%	< 1	87%	60%	140%	81%	40%	130%	NA	30%	150%
2,4-D	1		< 1	< 1	0.0%	< 1	88%	60%	140%	82%	60%	140%	NA	60%	140%
2,4-Dichlorophenol	1		< 0.5	< 0.5	0.0%	< 0.5	90%	60%	140%	103%	60%	140%	NA	60%	140%
Diclofop-methyl	1		< 0.9	< 0.9	0.0%	< 0.9	102%	60%	140%	87%	40%	130%	NA	30%	150%
Dinoseb	1		< 1	< 1	0.0%	< 1	112%	60%	140%	88%	40%	130%	NA	30%	150%
Pentachlorophenol	1		< 0.5	< 0.5	0.0%	< 0.5	91%	60%	130%	110%	60%	130%	NA	60%	130%
Picloram	1		< 5	< 5	0.0%	< 5	90%	60%	140%	87%	40%	130%	NA	30%	150%
2,4,5-T	1		< 1	< 1	0.0%	< 1	102%	60%	140%	92%	40%	130%	NA	30%	150%
2,3,4,6-Tetrachlorophenol	1		< 0.5	< 0.5	0.0%	< 0.5	101%	60%	140%	91%	60%	140%	NA	60%	140%
2,4,6-Trichlorophenol	1		< 0.5	< 0.5	0.0%	< 0.5	96%	60%	140%	90%	60%	140%	NA	60%	140%
Phorate	1	4555942	< 0.5	< 0.5	0.0%	< 0.5	72%	60%	140%	90%	60%	140%	67%	60%	140%
Dimethoate	1	4555942	< 2.5	< 2.5	0.0%	< 2.5	108%	60%	140%	121%	60%	140%	105%	60%	140%
Terbufos	1	4555942	< 0.5	< 0.5	0.0%	< 0.5	83%	60%	140%	94%	60%	140%	75%	60%	140%
Diazinon	1	4555942	< 1.0	< 1.0	0.0%	< 1.0	80%	60%	140%	110%	60%	140%	94%	60%	140%
Malathion	1	4555942	< 5.0	< 5.0	0.0%	< 5.0	85%	60%	140%	113%	60%	140%	94%	60%	140%
Chlorpyrifos	1	4555942	< 1.0	< 1.0	0.0%	< 1.0	90%	60%	140%	115%	60%	140%	103%	60%	140%
Parathion	1	4555942	< 1.0	< 1.0	0.0%	< 1.0	75%	60%	140%	91%	60%	140%	74%	60%	140%
Azinphos-methyl	1	4555942	< 2.0	< 2.0	0.0%	< 2.0	60%	60%	140%	63%	60%	140%	60%	60%	140%
Atrazine + N-dealkylated metabolites	1	4555942	< 1.0	< 1.0	0.0%	< 1.0	122%	40%	130%	85%	40%	130%	80%	40%	130%
Trifluralin	1	4555942	< 2.0	< 2.0	0.0%	< 2.0	71%	60%	140%	93%	60%	140%	87%	60%	140%
Simazine	1	4555942	< 1.0	< 1.0	0.0%	< 1.0	126%	60%	140%	87%	60%	140%	83%	60%	140%

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5835 COOPERS AVENUE
MISSISSAUGA, ONTARIO
CANADA L4Z 1Y2
TEL (905)712-5100
FAX (905)712-5122
http://www.agatlabs.com

Quality Assurance

CLIENT NAME: R.J. BURNSIDE & ASSOCIATES LTD
AGAT WORK ORDER: 13B736929
PROJECT NO: 300030895
ATTENTION TO: Jim Baxter

Trace Organics Analysis (Continued)

RPT Date: Jul 30, 2013

PARAMETER	Batch	Sample Id	DUPLICATE			Method Blank	REFERENCE MATERIAL			METHOD BLANK SPIKE			MATRIX SPIKE		
			Dup #1	Dup #2	RPD		Measured Value	Acceptable Limits		Recovery	Acceptable Limits		Recovery	Acceptable Limits	
								Lower	Upper		Lower	Upper		Lower	Upper
Metribuzin	1	4555942	< 2.0	< 2.0	0.0%	< 2.0	118%	60%	140%	99%	60%	140%	95%	60%	140%
Alachlor	1	4555942	< 0.5	< 0.5	0.0%	< 0.5	110%	60%	140%	82%	60%	140%	79%	60%	140%
Prometryne	1	4555942	< 0.25	< 0.25	0.0%	< 0.25	103%	60%	140%	84%	60%	140%	81%	60%	140%
Metolachlor	1	4555942	< 2.0	< 2.0	0.0%	< 2.0	110%	60%	140%	82%	60%	140%	81%	60%	140%
Cyanazine	1	4555942	< 1.0	< 1.0	0.0%	< 1.0	119%	60%	140%	102%	60%	140%	99%	60%	140%
SDWA Schedule 24 - Volatile Organic Compounds															
Vinyl Chloride	1		< 0.2	< 0.2	0.0%	< 0.2	103%	60%	140%	95%	60%	140%	93%	60%	140%
1,1 Dichloroethene	1		< 0.2	< 0.2	0.0%	< 0.2	100%	70%	130%	116%	70%	130%	116%	60%	140%
Dichloromethane	1		< 0.3	< 0.3	0.0%	< 0.3	122%	60%	140%	101%	60%	140%	119%	60%	140%
1,2 - Dichloroethane	1		< 0.2	< 0.2	0.0%	< 0.2	103%	60%	140%	106%	60%	140%	98%	60%	140%
Carbon Tetrachloride	1		< 0.2	< 0.2	0.0%	< 0.2	117%	60%	140%	104%	60%	140%	111%	60%	140%
Benzene	1		< 0.2	< 0.2	0.0%	< 0.2	111%	60%	140%	110%	60%	140%	112%	60%	140%
Trichloroethylene	1		< 0.2	< 0.2	0.0%	< 0.2	99%	60%	140%	80%	60%	140%	84%	60%	140%
Bromodichloromethane	1		< 0.2	< 0.2	0.0%	< 0.2	102%	60%	140%	99%	60%	140%	97%	60%	140%
Dibromochloromethane	1		< 0.1	< 0.1	0.0%	< 0.1	120%	60%	140%	119%	60%	140%	119%	60%	140%
Tetrachloroethene	1		< 0.2	< 0.2	0.0%	< 0.2	94%	60%	140%	101%	60%	140%	104%	60%	140%
Chlorobenzene	1		< 0.1	< 0.1	0.0%	< 0.1	109%	60%	140%	103%	60%	140%	110%	60%	140%
Bromoform	1		< 0.3	< 0.3	0.0%	< 0.3	112%	60%	140%	99%	60%	140%	117%	60%	140%
1,2-Dichlorobenzene	1		< 0.5	< 0.5	0.0%	< 0.5	119%	60%	140%	108%	60%	140%	102%	60%	140%
1,4-Dichlorobenzene	1		< 0.5	< 0.5	0.0%	< 0.5	107%	60%	140%	104%	60%	140%	112%	60%	140%
Trihalomethanes	1		< 0.5	< 0.5	0.0%	< 0.5	109%	70%	130%	107%	70%	130%	108%	60%	140%
SDWA Schedule 24 - Benzo(a)pyrene															
Benzo(a)pyrene	1		< 0.01	< 0.01	0.0%	< 0.01	93%	70%	130%	77%	70%	130%	70%	60%	140%
NTA (water)															
Nitrilotriacetic Acid (NTA)*	1					< 0.03	118%	0%	0%		0%	0%		0%	0%
Glyphosate in Water															
Glyphosate (ug/ml)	284	942	< 0.02	< 0.02	NA	< 0.02	103%	80%	120%	101%	70%	130%	100%	60%	140%
Volatile Organic Compounds in Water															
Dichlorodifluoromethane	1		< 0.20	< 0.20	0.0%	< 0.20	106%	60%	130%	83%	60%	130%	113%	60%	130%
Chloromethane	1		< 0.40	< 0.40	0.0%	< 0.40	110%	60%	130%	100%	60%	130%	112%	60%	130%
Vinyl Chloride	1		< 0.17	< 0.17	0.0%	< 0.17	101%	60%	130%	91%	60%	130%	84%	60%	130%
Bromomethane	1		< 0.20	< 0.20	0.0%	< 0.20	103%	60%	130%	109%	60%	130%	91%	60%	130%
Chloroethane	1		< 0.20	< 0.20	0.0%	< 0.20	98%	60%	130%	99%	60%	130%	93%	60%	130%
Trichlorofluoromethane	1		< 0.40	< 0.40	0.0%	< 0.40	102%	60%	130%	95%	60%	130%	88%	60%	130%
Acetone	1		< 1.0	< 1.0	0.0%	< 1.0	83%	60%	130%	127%	60%	130%	115%	60%	130%
1,1 Dichloroethylene	1		< 0.30	< 0.30	0.0%	< 0.30	108%	60%	130%	102%	60%	130%	98%	60%	130%
Methylene Chloride	1		< 0.30	< 0.30	0.0%	< 0.30	87%	60%	130%	104%	60%	130%	108%	60%	130%

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TEL (905)712-5100
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Quality Assurance

CLIENT NAME: R.J. BURNSIDE & ASSOCIATES LTD

AGAT WORK ORDER: 13B736929

PROJECT NO: 300030895

ATTENTION TO: Jim Baxter

Trace Organics Analysis (Continued)

RPT Date: Jul 30, 2013			DUPLICATE				REFERENCE MATERIAL			METHOD BLANK SPIKE			MATRIX SPIKE		
PARAMETER	Batch	Sample Id	Dup #1	Dup #2	RPD	Method Blank	Measured Value	Acceptable Limits		Recovery	Acceptable Limits		Recovery	Acceptable Limits	
								Lower	Upper		Lower	Upper		Lower	Upper
trans- 1,2-dichloroethylene	1		< 0.20	< 0.20	0.0%	< 0.20	114%	60%	130%	116%	60%	130%	94%	60%	130%
Methyl tert-butyl ether	1		< 0.20	< 0.20	0.0%	< 0.20	117%	60%	130%	119%	60%	130%	89%	60%	130%
1,1-Dichloroethane	1		< 0.30	< 0.30	0.0%	< 0.30	114%	60%	130%	111%	60%	130%	104%	60%	130%
Methyl Ethyl Ketone	1		< 1.0	< 1.0	0.0%	< 1.0	111%	60%	130%	118%	60%	130%	97%	60%	130%
cis- 1,2-Dichloroethylene	1		< 0.20	< 0.20	0.0%	< 0.20	119%	60%	130%	115%	60%	130%	90%	60%	130%
Chloroform	1		< 0.20	< 0.20	0.0%	< 0.20	116%	60%	130%	118%	60%	130%	111%	60%	130%
1,2 - Dichloroethane	1		< 0.20	< 0.20	0.0%	< 0.20	111%	60%	130%	112%	60%	130%	113%	60%	130%
1,1,1-Trichloroethane	1		< 0.30	< 0.30	0.0%	< 0.30	112%	60%	130%	110%	60%	130%	96%	60%	130%
Carbon Tetrachloride	1		< 0.20	< 0.20	0.0%	< 0.20	116%	60%	130%	108%	60%	130%	102%	60%	130%
Benzene	1		< 0.20	< 0.20	0.0%	< 0.20	111%	60%	130%	119%	60%	130%	91%	60%	130%
1,2-Dichloropropane	1		< 0.20	< 0.20	0.0%	< 0.20	108%	60%	130%	103%	60%	130%	97%	60%	130%
Trichloroethylene	1		< 0.20	< 0.20	0.0%	< 0.20	111%	60%	130%	88%	60%	130%	94%	60%	130%
Bromodichloromethane	1		< 0.20	< 0.20	0.0%	< 0.20	119%	60%	130%	104%	60%	130%	112%	60%	130%
cis-1,3-Dichloropropene	1		< 0.20	< 0.20	0.0%	< 0.20	106%	60%	130%	118%	60%	130%	96%	60%	130%
Methyl Isobutyl Ketone	1		< 1.0	< 1.0	0.0%	< 1.0	75%	60%	130%	104%	60%	130%	86%	60%	130%
trans-1,3-Dichloropropene	1		< 0.30	< 0.30	0.0%	< 0.30	93%	60%	130%	110%	60%	130%	94%	60%	130%
1,1,2-Trichloroethane	1		< 0.20	< 0.20	0.0%	< 0.20	105%	60%	130%	120%	60%	130%	108%	60%	130%
Toluene	1		< 0.20	< 0.20	0.0%	< 0.20	96%	60%	130%	97%	60%	130%	79%	60%	130%
2-Hexanone	1		< 0.30	< 0.30	0.0%	< 0.30	73%	60%	130%	91%	60%	130%	80%	60%	130%
Dibromochloromethane	1		< 0.10	< 0.10	0.0%	< 0.10	99%	60%	130%	119%	60%	130%	108%	60%	130%
Ethylene Dibromide	1		< 0.10	< 0.10	0.0%	< 0.10	109%	60%	130%	108%	60%	130%	92%	60%	130%
Tetrachloroethylene	1		< 0.20	< 0.20	0.0%	< 0.20	95%	60%	130%	107%	60%	130%	80%	60%	130%
1,1,1,2-Tetrachloroethane	1		< 0.10	< 0.10	0.0%	< 0.10	NA	60%	130%	116%	60%	130%	102%	60%	130%
Chlorobenzene	1		< 0.10	< 0.10	0.0%	< 0.10	103%	60%	130%	106%	60%	130%	92%	60%	130%
Ethylbenzene	1		< 0.10	< 0.10	0.0%	< 0.10	89%	60%	130%	92%	60%	130%	74%	60%	130%
m & p-Xylene	1		< 0.20	< 0.20	0.0%	< 0.20	95%	60%	130%	94%	60%	130%	76%	60%	130%
Bromoform	1		< 0.10	< 0.10	0.0%	< 0.10	107%	60%	130%	116%	60%	130%	110%	60%	130%
Styrene	1		< 0.10	< 0.10	0.0%	< 0.10	83%	60%	130%	87%	60%	130%	77%	60%	130%
1,1,2,2-Tetrachloroethane	1		< 0.10	< 0.10	0.0%	< 0.10	NA	60%	130%	116%	60%	130%	94%	60%	130%
o-Xylene	1		< 0.10	< 0.10	0.0%	< 0.10	81%	60%	130%	81%	60%	130%	78%	60%	130%
1,3-Dichlorobenzene	1		< 0.10	< 0.10	0.0%	< 0.10	114%	60%	130%	101%	60%	130%	79%	60%	130%
1,4-Dichlorobenzene	1		< 0.10	< 0.10	0.0%	< 0.10	110%	60%	130%	101%	60%	130%	88%	60%	130%
1,2-Dichlorobenzene	1		< 0.10	< 0.10	0.0%	< 0.10	103%	60%	130%	108%	60%	130%	90%	60%	130%
1,2,4-Trichlorobenzene	1		< 0.30	< 0.30	0.0%	< 0.30	87%	60%	130%	84%	60%	130%	92%	60%	130%
1,3-Dichloropropene (Cis + Trans)	1		< 0.30	< 0.30	0.0%	< 0.30	100%	60%	130%	114%	60%	130%	95%	60%	130%
Xylene Mixture (Total)	1		< 0.20	< 0.20	0.0%	< 0.20	88%	60%	130%	88%	60%	130%	77%	60%	130%
n-Hexane	1		< 0.20	< 0.20	0.0%	< 0.20	NA	60%	130%	99%	60%	130%	106%	60%	130%

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5835 COOPERS AVENUE
MISSISSAUGA, ONTARIO
CANADA L4Z 1Y2
TEL (905)712-5100
FAX (905)712-5122
http://www.agatlabs.com

Quality Assurance

CLIENT NAME: R.J. BURNSIDE & ASSOCIATES LTD

AGAT WORK ORDER: 13B736929

PROJECT NO: 300030895

ATTENTION TO: Jim Baxter

Trace Organics Analysis (Continued)

RPT Date: Jul 30, 2013			DUPLICATE				REFERENCE MATERIAL			METHOD BLANK SPIKE			MATRIX SPIKE		
PARAMETER	Batch	Sample Id	Dup #1	Dup #2	RPD	Method Blank	Measured Value	Acceptable Limits		Recovery	Acceptable Limits		Recovery	Acceptable Limits	
								Lower	Upper		Lower	Upper		Lower	Upper

Certified By:

AGAT Laboratories
5835 COOPERS AVENUE
MISSISSAUGA, ONTARIO
CANADA L4Z 1Y2
TEL (905)712-5100
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Quality Assurance

CLIENT NAME: R.J. BURNSIDE & ASSOCIATES LTD
AGAT WORK ORDER: 13B736929
PROJECT NO: 300030895
ATTENTION TO: Jim Baxter

Water Analysis

RPT Date: Jul 30, 2013			DUPLICATE				REFERENCE MATERIAL			METHOD BLANK SPIKE			MATRIX SPIKE		
PARAMETER	Batch	Sample Id	Dup #1	Dup #2	RPD	Method Blank	Measured Value	Acceptable Limits		Recovery	Acceptable Limits		Recovery	Acceptable Limits	
								Lower	Upper		Lower	Upper		Lower	Upper
SDWA Schedule 23 - Metals and Inorganics Parameters															
Antimony	1	4555942	< 1.0	< 1.0	0.0%	< 1.0	101%	90%	110%	91%	90%	110%	94%	70%	130%
Arsenic	1	4555942	< 0.60	< 0.60	0.0%	< 0.60	96%	90%	110%	100%	90%	110%	101%	70%	130%
Barium	1	4555942	13.2	13.5	2.2%	< 0.50	95%	90%	110%	100%	90%	110%	102%	70%	130%
Boron	1	4555942	< 10	< 10	0.0%	< 10	105%	90%	110%	95%	90%	110%	105%	70%	130%
Cadmium	1	4555942	< 0.20	< 0.20	0.0%	< 0.20	100%	90%	110%	103%	90%	110%	106%	70%	130%
Chromium	1	4555942	0.94	0.94	0.0%	< 0.60	99%	90%	110%	103%	90%	110%	102%	70%	130%
Lead	1	4555942	< 0.50	< 0.50	0.0%	< 0.50	94%	90%	110%	101%	90%	110%	98%	70%	130%
Mercury	1	455942	<0.10	<0.10	0.0%	< 0.10	99%	90%	110%	103%	90%	110%	97%	80%	120%
Selenium	1	4555942	< 0.80	< 0.80	0.0%	< 0.80	97%	90%	110%	101%	90%	110%	103%	70%	130%
Uranium	1	4555942	0.54	0.59	8.8%	< 0.20	99%	90%	110%	98%	90%	110%	102%	70%	130%
Fluoride	4551746		< 0.05	< 0.05	0.0%	< 0.05	93%	90%	110%	90%	90%	110%	104%	80%	120%
FreeCyanide	1		< 0.002	< 0.002	0.0%	< 0.002	101%	80%	120%	101%	90%	110%	103%	70%	130%
Bromate (water)															
Bromate*	1				100.0%	< 0.01	100%	90%	110%		110%	110%		90%	110%
Water Quality Assessment															
Electrical Conductivity	4560361		2330	2340	0.4%	< 2	102%	80%	120%	NA			NA		
pH	4560361		7.19	7.31	1.7%	NA	98%	90%	110%	NA			NA		
Total Dissolved Solids	1		496	506	2.0%	< 20	98%	80%	120%	NA			NA		
Alkalinity (as CaCO3)	4560361		29	31	5.3%	< 5	97%	80%	120%	NA			NA		
Bicarbonate (as CaCO3)	4560361		29	31	5.3%	< 5	NA	80%	120%	NA			NA		
Carbonate (as CaCO3)	4560361		<5	<5	0.0%	< 5	NA	80%	120%	NA			NA		
Hydroxide (as CaCO3)	4560361		<5	<5	0.0%	< 5	NA	80%	120%	NA			NA		
Fluoride	4561746		<0.25	<0.25	0.0%	< 0.05	93%	90%	110%	90%	90%	110%	104%	80%	120%
Chloride	4561746		45.0	43.5	3.3%	< 0.10	91%	90%	110%	93%	90%	110%	92%	80%	120%
Nitrate as N	4561746		0.94	0.90	0.0%	< 0.05	93%	90%	110%	100%	90%	110%	104%	80%	120%
Nitrite as N	4561746		<0.25	<0.25	0.0%	< 0.05	NA	90%	110%	96%	90%	110%	112%	80%	120%
Bromide	4561746		<0.25	<0.25	0.0%	< 0.05	107%	90%	110%	90%	90%	110%	101%	80%	120%
Sulphate	4561746		14.6	13.9	4.5%	< 0.10	91%	90%	110%	96%	90%	110%	99%	80%	120%
Otrho Phosphate as P	4561746		<0.50	<0.50	0.0%	< 0.10	92%	90%	110%	97%	90%	110%	96%	80%	120%
Reactive Silica	1		13.1	13.1	0.0%	< 0.05	105%	90%	110%	104%	90%	110%	94%	80%	120%
Ammonia as N	1		< 0.02	< 0.02	0.0%	< 0.02	102%	90%	110%	105%	90%	110%	105%	80%	120%
Total Phosphorus	1		0.06	0.06	0.0%	< 0.05	100%	90%	110%	102%	90%	110%	95%	80%	120%
Total Organic Carbon	1		1.9	1.7	11.1%	< 0.5	107%	90%	110%	107%	90%	110%	84%	80%	120%
Colour	1		298	298	0.0%	< 5	103%	90%	110%	NA			NA		
Turbidity	1		484	487	0.6%	< 0.5	100%	90%	110%	NA			NA		
Calcium	1	4556170	27.9	28.4	1.8%	< 0.05	106%	90%	110%	103%	90%	110%	103%	70%	130%
Magnesium	1	4556170	4.46	4.57	2.4%	< 0.05	105%	90%	110%	102%	90%	110%	104%	70%	130%
Sodium	1	4556170	12.5	12.6	0.8%	< 0.05	101%	90%	110%	99%	90%	110%	100%	70%	130%

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5835 COOPERS AVENUE
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Quality Assurance

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AGAT WORK ORDER: 13B736929
PROJECT NO: 300030895
ATTENTION TO: Jim Baxter

Water Analysis (Continued)

RPT Date: Jul 30, 2013			DUPLICATE				REFERENCE MATERIAL			METHOD BLANK SPIKE			MATRIX SPIKE		
PARAMETER	Batch	Sample Id	Dup #1	Dup #2	RPD	Method Blank	Measured Value	Acceptable Limits		Recovery	Acceptable Limits		Recovery	Acceptable Limits	
								Lower	Upper		Lower	Upper		Lower	Upper
Potassium	1	4556170	2.13	2.18	2.3%	< 0.05	104%	90%	110%	101%	90%	110%	101%	70%	130%
Aluminum	1		0.113	0.117	3.5%	< 0.004	102%	90%	110%	100%	90%	110%	97%	70%	130%
Antimony	1		< 0.003	< 0.003	0.0%	< 0.003	102%	90%	110%	95%	90%	110%	101%	70%	130%
Arsenic	1		< 0.003	< 0.003	0.0%	< 0.003	98%	90%	110%	98%	90%	110%	104%	70%	130%
Barium	1		0.007	0.007	0.0%	< 0.002	97%	90%	110%	98%	90%	110%	102%	70%	130%
Beryllium	1		< 0.001	< 0.001	0.0%	< 0.001	103%	90%	110%	101%	90%	110%	101%	70%	130%
Boron	1		0.064	0.066	3.1%	< 0.010	104%	90%	110%	101%	90%	110%	112%	70%	130%
Cadmium	1		< 0.002	< 0.002	0.0%	< 0.002	99%	90%	110%	109%	90%	110%	95%	70%	130%
Chromium	1		< 0.003	< 0.003	0.0%	< 0.003	100%	90%	110%	96%	90%	110%	95%	70%	130%
Cobalt	1		< 0.001	< 0.001	0.0%	< 0.001	98%	90%	110%	98%	90%	110%	97%	70%	130%
Copper	1		< 0.003	< 0.003	0.0%	< 0.003	99%	90%	110%	99%	90%	110%	95%	70%	130%
Iron	1		0.022	0.018	20.0%	< 0.010	108%	90%	110%	92%	90%	110%	100%	70%	130%
Lead	1		< 0.002	< 0.002	0.0%	< 0.002	95%	90%	110%	96%	90%	110%	91%	70%	130%
Manganese	1		0.006	0.006	0.0%	< 0.002	103%	90%	110%	100%	90%	110%	100%	70%	130%
Molybdenum	1		0.003	0.003	0.0%	< 0.002	106%	90%	110%	102%	90%	110%	108%	70%	130%
Nickel	1		< 0.003	< 0.003	0.0%	< 0.003	98%	90%	110%	95%	90%	110%	95%	70%	130%
Selenium	1		< 0.004	< 0.004	0.0%	< 0.004	99%	90%	110%	102%	90%	110%	104%	70%	130%
Silver	1		< 0.002	< 0.002	0.0%	< 0.002	100%	90%	110%	106%	90%	110%	98%	70%	130%
Strontium	1		0.080	0.082	2.5%	< 0.005	101%	90%	110%	101%	90%	110%	109%	70%	130%
Thallium	1		< 0.006	< 0.006	0.0%	< 0.006	97%	90%	110%	96%	90%	110%	90%	70%	130%
Tin	1		< 0.002	< 0.002	0.0%	< 0.002	102%	90%	110%	99%	90%	110%	102%	70%	130%
Titanium	1		< 0.002	0.002	NA	< 0.002	103%	90%	110%	98%	90%	110%	100%	70%	130%
Tungsten	1		< 0.010	< 0.010	0.0%	< 0.010	101%	90%	110%	102%	90%	110%	106%	70%	130%
Uranium	1		< 0.002	< 0.002	0.0%	< 0.002	102%	90%	110%	100%	90%	110%	101%	70%	130%
Vanadium	1		< 0.002	< 0.002	0.0%	< 0.002	101%	90%	110%	97%	90%	110%	99%	70%	130%
Zinc	1		< 0.005	< 0.005	0.0%	< 0.005	100%	90%	110%	102%	90%	110%	104%	70%	130%
Zirconium	1		< 0.004	< 0.004	0.0%	< 0.004	96%	90%	110%	104%	90%	110%	110%	70%	130%

Comments: NA signifies Not Applicable
RPD Qualifier:Titanium - The average for the sample and duplicate is less than 5X RDL, thus, lab's RPD acceptance criteria are not applicable

Certified By:

AGAT Laboratories

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QA Violation

CLIENT NAME: R.J. BURNSIDE & ASSOCIATES LTD

AGAT WORK ORDER: 13B736929

PROJECT NO: 300030895

ATTENTION TO: Jim Baxter

RPT Date: Jul 30, 2013			REFERENCE MATERIAL			METHOD BLANK SPIKE			MATRIX SPIKE		
PARAMETER	Sample Id	Sample Description	Measured Value	Acceptable Limits		Recovery	Acceptable Limits		Recovery	Acceptable Limits	
				Lower	Upper		Lower	Upper		Lower	Upper
NTA (water)											
Nitrilotriacetic Acid (NTA)*		TW2-13 72hr	118%	0%	0%		0%	0%		0%	0%

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Method Summary

CLIENT NAME: R.J. BURNSIDE & ASSOCIATES LTD

AGAT WORK ORDER: 13B736929

PROJECT NO: 300030895

ATTENTION TO: Jim Baxter

PARAMETER	AGAT S.O.P	LITERATURE REFERENCE	ANALYTICAL TECHNIQUE
Trace Organics Analysis			
Glyphosate (ug/ml)	TO 1320	OSHA Method # PV2067	HPLC
Nitrilotriacetic Acid (NTA)*		MTH-CHR-20	GC
Benzo(a)pyrene	ORG-91-5114	EPA 8270D	GC/MS
Chrysene-d12	ORG-91-5114	EPA 8270D	GC/MS
Aldicarb	ORG-91-5101	EPA 531.1 & MOE E3158	HPLC
Bendiocarb	ORG-91-5101	EPA 531.1 & MOE E3158	HPLC
Carbofuran	ORG-91-5101	EPA 531.1 & MOE E3158	HPLC
Carbaryl	ORG-91-5101	EPA 531.1 & MOE E3158	HPLC
Diuron	ORG-91-5101	EPA 531.1 & MOE E3158	HPLC
Triallate	ORG-91-5101	EPA 531.1 & MOE E3158	HPLC
Temephos	ORG-91-5101	EPA 531.1 & MOE E3158	HPLC
Diquat	ORG-91-5102	EPA 549.1	HPLC
Paraquat	ORG-91-5102	EPA 549.1	HPLC
Aldrin + Dieldrin	ORG-91-5112	EPA SW-846 3510 & 8081	GC/ECD
DDT + Metabolites	ORG-91-5112	EPA SW-846 3510 & 8081	GC/ECD
Methoxychlor	ORG-91-5112	EPA SW-846 3510 & 8081	GC/ECD
Chlordane (Total)	ORG-91-5112	EPA SW-846 3510 & 8081	GC/ECD
Heptachlor Epoxide	ORG-91-5112	EPA SW-846 3510 & 8081	GC/ECD
Lindane	ORG-91-5112	EPA SW-846 3510 & 8081	GC/ECD
PCB's	ORG-91-5112	EPA SW-846 3510 & 8082	GC/ECD
Bromoxynil	ORG-91-5110	EPA SW-846 8151	GC/ECD
Dicamba	ORG-91-5110	EPA SW-846 8151	GC/ECD
2,4-D	ORG-91-5110	EPA SW-846 8151	GC/ECD
2,4-Dichlorophenol	ORG-91-5110	EPA SW-846 8151	GC/ECD
Diclofop-methyl	ORG-91-5110	EPA SW-846 8151	GC/ECD
Dinoseb	ORG-91-5110	EPA SW-846 8151	GC/ECD
Pentachlorophenol	ORG-91-5110	EPA SW-846 3510 & 8151	GC/ECD
Picloram	ORG-91-5110	EPA SW-846 8151	GC/ECD
2,4,5-T	ORG-91-5110	EPA SW-846 8151	GC/ECD
2,3,4,6-Tetrachlorophenol	ORG-91-5110	EPA SW-846 8151	GC/ECD
2,4,6-Trichlorophenol	ORG-91-5110	EPA SW-846 8151	GC/ECD
Phorate	ORG-91-5103	EPA SW-846 3510C & 8270 & 8141A	GC/MS
Dimethoate	ORG-91-5103	EPA SW-846 3510C & 8270 & 8141A	GC/MS
Terbufos	ORG-91-5103	EPA SW-846 3510C & 8270 & 8141A	GC/MS
Diazinon	ORG-91-5103	EPA SW-846 3510C & 8270 & 8141A	GC/MS
Malathion	ORG-91-5103	EPA SW-846 3510C & 8270 & 8141A	GC/MS
Chlorpyrifos	ORG-91-5103	EPA SW-846 3510C & 8270	GC/MS
Parathion	ORG-91-5103	EPA SW-846 3510C & 8270 & 8141A	GC/MS
Azinphos-methyl	ORG-91-5103	EPA SW-846 3510C & 8270 & 8141A	GC/MS
Atrazine + N-dealkylated metabolites	ORG-91-5104	EPA SW-846 3510c & 8270 & MOE E3121	GC/MS
Trifluralin	ORG-91-5104	EPA SW-846 3510C & 8270 & MOE E3121	GC/MS
Simazine	ORG-91-5104	EPA SW-846 3510c & 8270 & MOE E3121	GC/MS
Metribuzin	ORG-91-5104	EPA SW-846 3510c & 8270 & MOE E3121	GC/MS
Alachlor	ORG-91-5104	EPA SW-846 8081A & 8082	GC/MS
Prometryne	ORG-91-5104	EPA SW-846 3510c & 8270 & MOE E3121	GC/MS

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Method Summary

CLIENT NAME: R.J. BURNSIDE & ASSOCIATES LTD

AGAT WORK ORDER: 13B736929

PROJECT NO: 300030895

ATTENTION TO: Jim Baxter

PARAMETER	AGAT S.O.P	LITERATURE REFERENCE	ANALYTICAL TECHNIQUE
Metolachlor	ORG-91-5104	EPA SW-846 3510c & 8270 & MOE E3121	GC/MS
Cyanazine	ORG-91-5104	EPA SW-846 3510C & 8270 & MOE E3121	GC/MS
DCAA (Herbicide Surrogate)	ORG-91-5110	EPA SW-846 8151	GC/ECD
TCMX (OC Pesticide Surrogate)	ORG-91-5112	EPA SW-846 3510 & 8081	GC/ECD
Decachlorobiphenyl (OC Pesticide Surrogate)	ORG-91-5112	EPA SW-846 8081A & 8082	GC/ECD
Vinyl Chloride	VOL-91-5001	EPA SW-846 5030 & 8260	(P&T)GC/MS
1,1 Dichloroethene	VOL-91-5001	EPA SW-846 5030 & 8260	(P&T)GC/MS
Dichloromethane	VOL-91-5001	EPA SW-846 5030 & 8260	(P&T)GC/MS
1,2 - Dichloroethane	VOL-91-5001	EPA SW-846 5030 & 8260	(P&T)GC/MS
Carbon Tetrachloride	VOL-91-5001	EPA SW-846 5030 & 8260	(P&T)GC/MS
Benzene	VOL-91-5001	EPA SW-846 5030 & 8260	(P&T)GC/MS
Trichloroethylene	VOL-91-5001	EPA SW-846 5030 & 8260	(P&T)GC/MS
Bromodichloromethane	VOL-91-5001	EPA SW-846 5030 & 8260	(P&T)GC/MS
Dibromochloromethane	VOL-91-5001	EPA SW-846 5030 & 8260	(P&T)GC/MS
Tetrachloroethene	VOL-91-5001	EPA SW-846 5030 & 8260	(P&T)GC/MS
Chlorobenzene	VOL-91-5001	EPA SW-846 5030 & 8260	(P&T)GC/MS
Bromoform	VOL-91-5001	EPA SW-846 5030 & 8260	(P&T)GC/MS
1,2-Dichlorobenzene	VOL-91-5001	EPA SW-846 5030 & 8260	(P&T)GC/MS
1,4-Dichlorobenzene	VOL-91-5001	EPA SW-846 5030 & 8260	(P&T)GC/MS
Trihalomethanes	VOL-91-5001	EPA SW-846 5030 & 8260	(P&T)GC/MS
Toluene-d8	VOL-91- 5001	EPA SW-846 5030 & 8260	(P&T)GC/MS
4-Bromofluorobenzene	VOL-91- 5001	EPA SW-846 5030 & 8260	(P&T)GC/MS
Dichlorodifluoromethane	VOL-91-5001	EPA SW-846 5030 & 8260	(P&T)GC/MS
Chloromethane	VOL-91-5001	EPA SW-846 5030 & 8260	(P&T)GC/MS
Vinyl Chloride	VOL-91-5001	EPA SW-846 5030 & 8260	(P&T)GC/MS
Bromomethane	VOL-91-5001	EPA SW-846 5030 & 8260	(P&T)GC/MS
Chloroethane	VOL-91-5001	EPA SW-846 5030 & 8260	(P&T)GC/MS
Trichlorofluoromethane	VOL-91-5001	EPA SW-846 5030 & 8260	(P&T)GC/MS
Acetone	VOL-91-5001	EPA SW-846 5030 & 8260	(P&T)GC/MS
1,1 Dichloroethylene	VOL-91-5001	EPA SW-846 5030 & 8260	(P&T)GC/MS
Methylene Chloride	VOL-91-5001	EPA SW-846 5030 & 8260	(P&T)GC/MS
trans- 1,2-dichloroethylene	VOL-91-5001	EPA SW-846 5030 & 8260	(P&T)GC/MS
Methyl tert-butyl ether	VOL-91-5001	EPA SW-846 5030 & 8260	(P&T)GC/MS
1,1-Dichloroethane	VOL-91-5001	EPA SW-846 5030 & 8260	(P&T)GC/MS
Methyl Ethyl Ketone	VOL-91-5001	EPA SW-846 5030 & 8260	(P&T)GC/MS
cis- 1,2-Dichloroethylene	VOL-91-5001	EPA SW-846 5030 & 8260	(P&T)GC/MS
Chloroform	VOL-91-5001	EPA SW-846 5030 & 8260	(P&T)GC/MS
1,2 - Dichloroethane	VOL-91-5001	EPA SW-846 5030 & 8260	(P&T)GC/MS
1,1,1-Trichloroethane	VOL-91-5001	EPA SW-846 5030 & 8260	(P&T)GC/MS
Carbon Tetrachloride	VOL-91-5001	EPA SW-846 5030 & 8260	(P&T)GC/MS
Benzene	VOL-91-5001	EPA SW-846 5030 & 8260	(P&T)GC/MS
1,2-Dichloropropane	VOL-91-5001	EPA SW-846 5030 & 8260	(P&T)GC/MS
Trichloroethylene	VOL-91-5001	EPA SW-846 5030 & 8260	(P&T)GC/MS
Bromodichloromethane	VOL-91-5001	EPA SW-846 5030 & 8260	(P&T)GC/MS
cis-1,3-Dichloropropene	VOL-91-5001	EPA SW-846 5030 & 8260	(P&T)GC/MS
Methyl Isobutyl Ketone	VOL-91-5001	EPA SW-846 5030 & 8260	(P&T)GC/MS
trans-1,3-Dichloropropene	VOL-91-5001	EPA SW-846 5030 & 8260	(P&T)GC/MS
1,1,2-Trichloroethane	VOL-91-5001	EPA SW-846 5030 & 8260	(P&T)GC/MS

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Method Summary

CLIENT NAME: R.J. BURNSIDE & ASSOCIATES LTD

AGAT WORK ORDER: 13B736929

PROJECT NO: 300030895

ATTENTION TO: Jim Baxter

PARAMETER	AGAT S.O.P	LITERATURE REFERENCE	ANALYTICAL TECHNIQUE
Toluene	VOL-91-5001	EPA SW-846 5030 & 8260	(P&T)GC/MS
2-Hexanone	VOL-91-5001	EPA SW-846 5030 & 8260	(P&T)GC/MS
Dibromochloromethane	VOL-91-5001	EPA SW-846 5030 & 8260	(P&T)GC/MS
Ethylene Dibromide	VOL-91-5001	EPA SW-846 5030 & 8260	(P&T)GC/MS
Tetrachloroethylene	VOL-91-5001	EPA SW-846 5030 & 8260	(P&T)GC/MS
1,1,1,2-Tetrachloroethane	VOL-91-5001	EPA SW-846 5030 & 8260	(P&T)GC/MS
Chlorobenzene	VOL-91-5001	EPA SW-846 5030 & 8260	(P&T)GC/MS
Ethylbenzene	VOL-91-5001	EPA SW-846 5030 & 8260	(P&T)GC/MS
m & p-Xylene	VOL-91-5001	EPA SW-846 5030 & 8260	(P&T)GC/MS
Bromoform	VOL-91-5001	EPA SW-846 5030 & 8260	(P&T)GC/MS
Styrene	VOL-91-5001	EPA SW-846 5030 & 8260	(P&T)GC/MS
1,1,2,2-Tetrachloroethane	VOL-91-5001	EPA SW-846 5030 & 8260	(P&T)GC/MS
o-Xylene	VOL-91-5001	EPA SW-846 5030 & 8260	(P&T)GC/MS
1,3-Dichlorobenzene	VOL-91-5001	EPA SW-846 5030 & 8260	(P&T)GC/MS
1,4-Dichlorobenzene	VOL-91-5001	EPA SW-846 5030 & 8260	(P&T)GC/MS
1,2-Dichlorobenzene	VOL-91-5001	EPA SW-846 5030 & 8260	(P&T)GC/MS
1,2,4-Trichlorobenzene	VOL-91-5001	EPA SW-846 5030 & 8260	(P&T)GC/MS
1,3-Dichloropropene (Cis + Trans)	VOL-91-5001	EPA SW-846 5030 & 8260	(P&T)GC/MS
Xylene Mixture (Total)	VOL-91-5001	EPA SW-846 5030 & 8260	(P&T)GC/MS
n-Hexane	VOL-91-5001	EPA SW-846 5030 & 8260	(P&T)GC/MS
Toluene-d8	VOL-91-5001	EPA SW-846 5030 & 8260	(P&T)GC/MS
4-Bromofluorobenzene	VOL-91-5001	EPA SW-846 5030 & 8260	(P&T)GC/MS

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Method Summary

CLIENT NAME: R.J. BURNSIDE & ASSOCIATES LTD

AGAT WORK ORDER: 13B736929

PROJECT NO: 300030895

ATTENTION TO: Jim Baxter

PARAMETER	AGAT S.O.P	LITERATURE REFERENCE	ANALYTICAL TECHNIQUE
Water Analysis			
Bromate*			N/A
Antimony	MET-93-6103	EPA SW-846 6020A & 200.8	ICP-MS
Arsenic	MET-93-6103	EPA SW-846 6020A & 200.8	ICP-MS
Barium	MET-93-6103	EPA SW-846 6020A & 200.8	ICP-MS
Boron	MET-93-6103	EPA SW-846 6020A & 200.8	ICP-MS
Cadmium	MET-93-6103	EPA SW-846 6020A & 200.8	ICP-MS
Chromium	MET-93-6103	EPA SW-846 6020A & 200.8	ICP-MS
Lead	MET-93-6103	EPA SW-846 6020A & 200.8	ICP-MS
Mercury	MET-93-6100	EPA SW 846-7470 & 245.1	CVAAS
Selenium	MET-93-6103	EPA SW-846 6020A & 200.8	ICP-MS
Uranium	MET-93-6103	EPA SW-846 6020A & 200.8	ICP-MS
Nitrate as N	INOR-93-6004	SM 4110 B	ION CHROMATOGRAPH
Nitrite as N	INOR-93-6004	SM 4110 B	ION CHROMATOGRAPH
(Nitrate + Nitrite) as N	INOR-93-6004	SM 4110 B	ION CHROMATOGRAPH
Fluoride	INOR-93-6004	SM 4110 B	ION CHROMATOGRAPH
FreeCyanide	INOR-93-6052	MOE CN-3015 & SM 4500 CN- I	TECHNICON AUTO ANALYZER
Electrical Conductivity	INOR-93-6000	SM 2510 B	PC TITRATE
pH	INOR-93-6000	SM 4500-H+ B	PC TITRATE
Saturation pH		SM 2320 B	CALCULATION
Langelier Index		SM 2330B	CALCULATION
Total Hardness (as CaCO3)	MET-93-6105	EPA SW-846 6010C & 200.7	ICP/OES
Total Dissolved Solids	INOR-93-6028	SM 2540 C	BALANCE
Alkalinity (as CaCO3)	INOR-93-6000	SM 2320 B	PC TITRATE
Bicarbonate (as CaCO3)	INOR-93-6000	SM 2320 B	PC TITRATE
Carbonate (as CaCO3)	INOR-93-6000	SM 2320 B	PC TITRATE
Hydroxide (as CaCO3)	INOR-93-6000	SM 2320 B	PC TITRATE
Fluoride	INOR-93-6004	SM 4110 B	ION CHROMATOGRAPH
Chloride	INOR-93-6004	SM 4110 B	ION CHROMATOGRAPH
Nitrate as N	INOR-93-6004	SM 4110 B	ION CHROMATOGRAPH
Nitrite as N	INOR-93-6004	SM 4110 B	ION CHROMATOGRAPH
Bromide	INOR-93-6004	SM 4110 B	ION CHROMATOGRAPH
Sulphate	INOR-93-6004	SM 4110 B	ION CHROMATOGRAPH
Otrho Phosphate as P	INOR-93-6004	SM 4110 B	ION CHROMATOGRAPH
Reactive Silica	INOR-93-6047	AQ2 EPA-122A & SM 4500 SiO2 D	AQ2 DISCRETE ANALYSER
Ammonia as N	INOR-93-6059	QuikChem 10-107-06-1-J & SM 4500 NH3-F	LACHAT FIA
Total Phosphorus	INOR-93-6022	SM 4500-P B&E	SPECTROPHOTOMETER
Total Organic Carbon	INOR-93-6049	EPA 415.1 & SM 5310	SHIMADZU CARBON ANALYZER
Colour	INOR-93-6046	SM 2120 B	SPECTROPHOTOMETER
Turbidity	INOR-93-6044	SM 2130 B	NEPHELOMETER
Calcium	MET-93-6105	EPA SW-846 6010C & 200.7	ICP/OES
Magnesium	MET-93-6105	EPA SW-846 6010C & 200.7	ICP/OES
Sodium	MET-93-6105	EPA SW-846 6010C & 200.7	ICP/OES
Potassium	MET-93-6105	EPA SW-846 6010C & 200.7	ICP/OES
Aluminum	MET-93-6103	EPA SW-846 6020A & 200.8	ICP-MS
Antimony	MET-93-6103	EPA SW-846 6020A & 200.8	ICP-MS
Arsenic	MET-93-6103	EPA SW-846 6020A & 200.8	ICP-MS
Barium	MET-93-6103	EPA SW-846 6020A & 200.8	ICP-MS
Beryllium	MET-93-6103	EPA SW-846 6020A & 200.8	ICP-MS

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PARAMETER	AGAT S.O.P	LITERATURE REFERENCE	ANALYTICAL TECHNIQUE
Boron	MET-93-6103	EPA SW-846 6020A & 200.8	ICP-MS
Cadmium	MET-93-6103	EPA SW-846 6020A & 200.8	ICP-MS
Chromium	MET-93-6103	EPA SW-846 6020A & 200.8	ICP-MS
Cobalt	MET-93-6103	EPA SW-846 6020A & 200.8	ICP-MS
Copper	MET-93-6103	EPA SW-846 6020A & 200.8	ICP-MS
Iron	MET-93-6103	EPA SW-846 6020A & 200.8	ICP-MS
Lead	MET-93-6103	EPA SW-846 6020A & 200.8	ICP-MS
Manganese	MET-93-6103	EPA SW-846 6020A & 200.8	ICP-MS
Mercury	MET-93-6100	EPA SW 846 7470 & 245.1	CVAAS
Molybdenum	MET-93-6103	EPA SW-846 6020A & 200.8	ICP-MS
Nickel	MET-93-6103	EPA SW-846 6020A & 200.8	ICP-MS
Selenium	MET-93-6103	EPA SW-846 6020A & 200.8	ICP-MS
Silver	MET-93-6103	EPA SW-846 6020A & 200.8	ICP-MS
Strontium	MET-93-6103	EPA SW-846 6020A & 200.8	ICP-MS
Thallium	MET-93-6103	EPA SW-846 6020A & 200.8	ICP-MS
Tin	MET-93-6103	EPA SW-846 6020A & 200.8	ICP-MS
Titanium	MET-93-6103	EPA SW-846 6020A & 200.8	ICP-MS
Tungsten	MET-93-6103	EPA SW-846 6020A & 200.8	ICP-MS
Uranium	MET-93-6103	EPA SW-846 6020A & 200.8	ICP-MS
Vanadium	MET-93-6103	EPA SW-846 6020A & 200.8	ICP-MS
Zinc	MET-93-6103	EPA SW-846 6020A & 200.8	ICP-MS
Zirconium	MET-93-6103	EPA SW-846 6020A & 200.8	ICP-MS
% Difference/ Ion Balance		SM 1030 E	CALCULATION

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L4Z 1Y2
www.agatlabs.com · webearth.agatlabs.com
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T Bay temps Cooler 1 = 8.3 / 7.8 / 8.9
2 = 9.1 / 9.3 / 8.9
3 = 8.3 / 8.9 / 9.1
4 = 8.6 / 8.8 / 8.1

Chain of Custody Record

Laboratory Use Only
Arrival Temperature: ① 2.4/2.9/3.0 ② 2.1/2.0/1.7 ③ 3.4/3.9/2.7 ④ 3.4/3.3/3.0 ⑤ 2.7/2.9/2.4
AGAT WO #: 13B736929
Lab Temperature:
Notes:

Client Information

Company: RJ Burnside + Associates
Contact: Jim Baxter
Address:
Phone: 519 823 4995 Fax:
Project: 300036895 PO:
AGAT Quotation #: Whitesands First Nation

Please note, if quotation number is not provided, client will be billed full price for analysis.

Regulatory Requirements

☐ Regulation 153/04 (reg. 511 Amend.)
Table ____ Indicate one
☐ Ind/Com ☐ Res/Park ☐ Agriculture
Soil Texture (check one) ☐ Coarse ☐ Fine

☐ Sewer Use
Region ____ Indicate one
☐ Sanitary ☐ Storm

☐ Regulation 558
☐ CCME
☐ Other (specify)
☐ Prov. Water Quality Objectives (PWQO)
☐ None

Turnaround Time Required (TAT) Required*

Regular TAT
☐ 5 to 7 Working Days

Rush TAT (please provide prior notification)
Rush Surcharges Apply
☐ 3 Working Days
☐ 2 Working Days
☐ 1 Working Day

OR
Date Required (Rush surcharges may apply):

*TAT is exclusive of weekends and statutory holidays

Invoice To

Same: Yes ☑ No ☐
Company:
Contact:
Address:

Is this a drinking water sample? (potable water intended for human consumption) ☐ Yes ☐ No
If "Yes", please use the *Drinking Water Chain of Custody Form*

Is this submission for a **Record of Site Condition?** ☐ Yes ☐ No

Legend Matrix

GW Ground Water
SW Surface Water
SD Sediment
O Oil
P Paint
S Soil

Report Information – reports to be sent to:

1. Name:
   Email:
2. Name:
   Email:

Sample Identification	Date Sampled	Time Sampled	Sample Matrix	# of Containers	Comments Site/Sample Information
TP3 - 1m	13/07/09	900	soil	1	
TP4 - 4m	13/07/09	930	soil	1	
TW1-95	13/07/12	1100	water	6	
TW2-13 26hr	13/07/10	2100	water	6	
TW2-T3 48hr	13/07/11	1900	water	6	
TW2-13 72hr	13/07/12	1900	water	49	

Metals and Inorganics | Metal Scan | Hydride Forming Metals | Client Custom Metals | ORPs: ☐ B-HWS ☐ Cl- ☐ CN- ☐ EC ☐ FOC ☐ Cr+6- ☐ SAR ☐ Hg ☐ pH ☐ NO_3/NO_2 ☐ N- Total | Nutrients: ☐ TP ☐ NH_3 ☐ TKN ☐ NO_3 ☐ NO_2 ☐ NO_3/NO_2 | VOC: ☐ VOC ☐ THM ☐ BTEX | CCME Fractions 1 to 4 | ABNs | PAHs | Chlorophenols | PCBs | Organochlorine Pesticides | TCLP Metals/Inorganics | Sewer Use

*Samples COC dup copies + info = see both COC's attached

(1 - 11ltre Na2S2O3 - broken) = 9 samples received
5 coolers required
T Bay

Samples Relinquished By (Print Name and Sign): PatWeed PatWeed — Date/Time: 13/07/13 2:30pm
Samples Relinquished By (Print Name and Sign): — Date/Time:
Samples Received By (Print Name and Sign): D Foreman D Foreman — Date/Time: July 13/13
Samples Received By (Print Name and Sign): Foreman — Date/Time: July 16/2013 9:30

Pink Copy - Client
Yellow Copy - AGAT
White Copy- AGAT

Page 1 of 1
N°: 21250

Document ID: DW-28-1511-005

R.J. BURNSIDE & ASSOCIATES LTD
ATTN: David Durham
15 TOWNLINE
ORANGEVILLE ON L9W 3R4

Date Received: 06-MAY-13
Report Date: 15-MAY-13 14:35 (MT)
Version: FINAL

Client Phone: 519-941-5331

Certificate of Analysis

Lab Work Order #: L1297574

Project P.O. #: NOT SUBMITTED
Job Reference: 300030895
C of C Numbers:
Legal Site Desc:

Preliminary Water Samples Collected in May 2013

Laura Dowswell
Account Manager

ALS ENVIRONMENTAL ANALYTICAL REPORT

	Sample ID	L1297574-1	L1297574-2			
	Description	GROUND WATE	GROUND WATE			
	Sampled Date	04-MAY-13	04-MAY-13			
	Sampled Time	11:40	12:22			
	Client ID	TW2 #1	TW2 #2			
Grouping	**Analyte**					
WATER						
Physical Tests	pH (pH units)	7.95	8.07			
Anions and Nutrients	Ammonia, Total (as N) (mg/L)		<0.020			
	Chloride (Cl) (mg/L)		26.2			
	Nitrate (as N) (mg/L)		0.233			
	Nitrite (as N) (mg/L)		<0.020			
	Total Kjeldahl Nitrogen (mg/L)		0.134			
	Phosphorus (P)-Total (mg/L)		0.0189			
	Sulfate (SO4) (mg/L)		3.59			
Dissolved Metals	Dissolved Metals Filtration Location	LAB				
	Antimony (Sb)-Dissolved (ug/L)	<0.50				
	Arsenic (As)-Dissolved (ug/L)	<1.0				
	Barium (Ba)-Dissolved (ug/L)	18.0				
	Beryllium (Be)-Dissolved (ug/L)	<0.50				
	Boron (B)-Dissolved (ug/L)	<10				
	Cadmium (Cd)-Dissolved (ug/L)	<0.10				
	Chromium (Cr)-Dissolved (ug/L)	<0.50				
	Cobalt (Co)-Dissolved (ug/L)	<0.50				
	Copper (Cu)-Dissolved (ug/L)	<1.0				
	Lead (Pb)-Dissolved (ug/L)	<1.0				
	Molybdenum (Mo)-Dissolved (ug/L)	0.56				
	Nickel (Ni)-Dissolved (ug/L)	<1.0				
	Selenium (Se)-Dissolved (ug/L)	<5.0				
	Silver (Ag)-Dissolved (ug/L)	<0.10				
	Sodium (Na)-Dissolved (ug/L)	16900				
	Thallium (Tl)-Dissolved (ug/L)	<0.30				
	Uranium (U)-Dissolved (ug/L)	<2.0				
	Vanadium (V)-Dissolved (ug/L)	0.88				
	Zinc (Zn)-Dissolved (ug/L)	<3.0				

* Please refer to the Reference Information section for an explanation of any qualifiers detected.

Reference Information

Qualifiers for Sample Submission Listed:

Qualifier	Description
SFPL	Sample was Filtered and Preserved at the laboratory - Dissolved metals
UIC	Unreliable: Improper Container

Qualifiers for Individual Samples Listed:

Sample Number	Client Sample ID	Qualifier	Description
L1297574-1	TW2 #1	SFPL	Sample was Filtered and Preserved at the laboratory
L1297574-2	TW2 #2	SPL	Sample was Preserved at the laboratory - Nutrients

QC Samples with Qualifiers & Comments:

QC Type Description	Parameter	Qualifier	Applies to Sample Number(s)
Matrix Spike	Barium (Ba)-Dissolved	MS-B	L1297574-1
Matrix Spike	Boron (B)-Dissolved	MS-B	L1297574-1
Matrix Spike	Molybdenum (Mo)-Dissolved	MS-B	L1297574-1
Matrix Spike	Sodium (Na)-Dissolved	MS-B	L1297574-1

Qualifiers for Individual Parameters Listed:

Qualifier	Description
MS-B	Matrix Spike recovery could not be accurately calculated due to high analyte background in sample.

Test Method References:

ALS Test Code	Matrix	Test Description	Method Reference**
CL-R511-WT	Water	Chloride-O.Reg 153/04 (July 2011)	EPA 300.0 (IC)

Aqueous samples are analyzed directly or may be filtered in the laboratory prior to analysis using ion chromatography.

Analysis conducted in accordance with the Protocol for Analytical Methods Used in the Assessment of Properties under Part XV.1 of the Environmental Protection Act (July 1, 2011).

MET-D-UG/L-MS-WT	Water	Diss. Metals in Water by ICPMS (ug/L)	EPA 200.8

The metal constituents of a non-acidified sample that pass through a membrane filter prior to ICP/MS analysis.

Analysis conducted in accordance with the Protocol for Analytical Methods Used in the Assessment of Properties under Part XV.1 of the Environmental Protection Act (July 1, 2011), unless a subset of the Analytical Test Group (ATG) has been requested (the Protocol states that all analytes in an ATG must be reported).

N-TOTKJ-TB	Water	Total Kjeldahl Nitrogen by Colourimetry	APHA 4500-Norg B (modified)

Total Kjeldahl Nitrogen in aqueous matrices is analyzed using an autoanalyzer with colourimetric detection.

NH3-COL-TB	Water	Ammonia by Discrete Analyzer	APHA 4500-NH3 G. (modified)

Ammonia in aqueous matrices is analyzed using discrete analyzer with colourimetric detection.

NO2-IC-TB	Water	Anions by Ion Chromatography	EPA 300.1 (modified)

Anions in aqueous matrices are analyzed using ion chromatography with conductivity and/or UV absorbance detectors.

NO3-IC-TB	Water	Anions by Ion Chromatography	EPA 300.1 (modified)

Anions in aqueous matrices are analyzed using ion chromatography with conductivity and/or UV absorbance detectors.

P-T-COL-TB	Water	Total Phosphorus by Discrete Analyzer	APHA 4500-P B, F, G (modified)

Phosphorus in aqueous matrices is analyzed using discrete Analyzer with colourimetric detection.

PH-R511-WT	Water	pH-O. Reg 153/04 (July 2011)	MOEE E3137A-R511

Analysis conducted in accordance with the Protocol for Analytical Methods Used in the Assessment of Properties under Part XV.1 of the Environmental Protection Act (July 1, 2011).

SO4-IC-TB	Water	Anions by Ion Chromatography	EPA 300.1 (modified)

Anions in aqueous matrices are analyzed using ion chromatography with conductivity and/or UV absorbance detectors.

** ALS test methods may incorporate modifications from specified reference methods to improve performance.

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:

Reference Information

Laboratory Definition Code	Laboratory Location
TB	ALS ENVIRONMENTAL - THUNDER BAY, ONTARIO, CANADA
WT	ALS ENVIRONMENTAL - WATERLOO, ONTARIO, CANADA

Chain of Custody Numbers:

GLOSSARY OF REPORT TERMS

Surrogate - A compound that is similar in behaviour to target analyte(s), but that does not occur naturally in environmental samples. For applicable tests, surrogates are added to samples prior to analysis as a check on recovery.
mg/kg - milligrams per kilogram based on dry weight of sample.
mg/kg wwt - milligrams per kilogram based on wet weight of sample.
mg/kg lwt - milligrams per kilogram based on lipid-adjusted weight of sample.
mg/L - milligrams per litre.
< - Less than.
D.L. - The reported Detection Limit, also known as the Limit of Reporting (LOR).
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.
Analytical results in unsigned test reports with the DRAFT watermark are subject to change, pending final QC review.

ALS Environmental

ADDRESS 1081 Barton Street, Thunder Bay Ontario P7B 5N3 Canada PHONE +1 807 623 6463 FAX +1 807 623 7598
ALS CANADA LIMITED Part of the ALS Group A Campbell Brothers Limited Company www.alsglobal.com

11048 06602

~~L1297545~~ JR L1297574 Page ~~1~~ 1 of —

Company:	RJ BURNSIDE & ASSOC LTD	Regulatory Information	Both questions below must answered for water samples
Contact:	DAVID DURHAM	☒ O. Reg 153 (O. Reg 511 Amend) Table: 2	Are any samples taken from a regulated DW System? ☐ Yes ☒ No
Address:	15 TOWNLINE ORANGEVILLE ON	Record of Site Condition ☐ Yes ☒ No	If yes, an authorized DW COC must be used.
		PWQO ☐ MISA ☐ MMER ☐ CCME ☐	Is the water sampled intended for human consumption? ☐ Yes ☒ No
Phone:	519-941-5331 x249 Fax:	Guideline Required:	
Email:	david.durham@rjburnside.com	TCLP Regulation 558 ☐ Other:	Analysis Request
Project:	300030895 PO:	Service Requested	Please indicate below Filtered, Preserved or both (F, P, F/P)
Quote #		☒ Regular TAT (7 Days)	
Invoice To:	Same as Report: ☒ Yes ☐ No	☐ Priority TAT 50% Surcharge (3-5 Days)	
Company:		☐ Emergency TAT 100% Surcharge (1-2 Days)	
Contact:		Specify Date Required:	
Address:		All TAT quoted material is in business days which exclude statutory holidays and weekends. Samples received past 3:00pm or Saturday/Sunday begin the next day.	
Email:			
Account Manager	Sampler:		

Sample #	Sample Identification (This description will appear on the report)	Date	Time	Sample Type	METALS	NO_2, NO_3, Cl, SO_4	pH	Number of Containers
	TW2 #1 HAND	MAY 4/13	11:40	GW	✓		✓	
	TW2 #2	MAY 4/13	12:22	GW		✓	✓	
	-NOT FILTERED OR PRESERVED							

L1297574-COFC

Special Instructions / Comments

SEE SIF JR

SHIPMENT RELEASE (client use)		SHIPMENT RECEPTION (lab use only)				SHIPMENT VERIFICATION (lab use only)		
Released by:	Date & Time	Received by:	Date & Time	Temp	Cooling Initiated	Verified By:	Date & Time	Observations: Yes / No ? If Yes add SIF
B. DURHAM	6 MAY 1:53		06-MAY-13 1355	18.5	☐ Yes ☑ No		06-MAY-13 1355	

**Failure to complete all portions of this form may delay analysis. **TAT may vary dependant on complexity of analysis and lab workload at time of submission. Please contact the lab to confirm TATs. Any known or suspected hazards relating to a sample must be noted on the chain of custody in the comments section. By use of the form the user acknowledges and agrees with the Terms and Conditions as specified on the back page.

Neegan Burnside Ltd.