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REPORT ON

#### HYDROGEOLOGICAL INVESTIGATION AND TERRAIN EVALUATION PROPOSED RESIDENTIAL SUBDIVISION 3200 REIDS LANE OSGOODE WARD, CITY OF OTTAWA ONTARIO

FILE # 210064

Submitted to:

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## 1.0 INTRODUCTION

Kollaard Associates Inc. was retained by Crestview Innovations Inc. of Ottawa, Ontario to undertake a hydrogeological investigation and terrain evaluation for a site located on Reids Lane. The site is located within Part of Lots 27 & 28, Concession 1, in Osgoode Ward, in the City of Ottawa, Ontario (See Key Plan, Figure 1).

The site consists of an area of 3.5 hectares (35,436 square metres) located on the north side of Osgoode Main Street within the village boundary of Osgoode Ward, Ottawa, Ontario. The site includes two parcels, one of which is the main parcel at 3200 Reids Lane (~33,681.56 m<sup>2</sup>) and the other being the Reids Lane parcel (~1754.63 m<sup>2</sup>). It is proposed to subdivide the site into some 7, average 0.40 hectare lots (minimum 0.4 hectare) for single family dwelling construction purposes. The proposed dwellings will be serviced by private septic systems and wells. The subject site consists mostly of open fields with scattered trees. There are no watercourses on the subject property.

The site is bordered on the west by the Osgoode Link Pathway (a former rail corridor), on the south and north sides by existing residential development and on the east by a municipally-owned woodlot. The existing dwellings to the north and south are serviced by private septic systems and wells.

Based on a review of the surficial geology map for the site area, it is expected that the site is underlain by coarse-textured glaciomarine deposits of sand, gravel, minor silt and clay, predominantly consisting of foreshore and basinal deposits. The bedrock geology map indicates that the bedrock underlying the site consists of dolostone and sandstone of the Beekmantown Group (Attachment A). The site and surrounding areas for at least 500 metres are within similar overburden stratigraphy and bedrock geology. There is no variability in the hydrogeological conditions in the study area and no faults, geological boundaries or significant changes to the overburden stratigraphy were identified within at least 500 metres of the subject site.

## 1.1 **Pre-consultation Process**

Hydrogeological Pre-consultation was carried out between Colleen Vermeersch of Kollaard Associates Inc. and Claire Milloy of Rideau Valley Conservation Authority who was to be the peer review agency on behalf of the City of Ottawa. This meeting was carried out by phone on March 8, 2021. This included background information being provided (by RVCA) from existing hydrogeological reports for adjacent subdivisions and discussion of background water wells sampling. At that time, the consultant asked the peer review authority regarding whether screened overburden wells on older residential dwellings near the site (driven point wells) were to be sampled as part of establishing the water quality for existing development. At that time, Claire Milloy indicated that only existing representative wells should be tested. The existing representative wells being in the same aquifer as the target aquifer for the proposed development. As such, the existing background wells that were sampled included only drilled, bedrock wells considered to be in the same aquifer as the future water supply.

An additional consultation and work plan were discussed with the peer review consultant (Mr. R. Chown of BluMetric) regarding the presence of nitrates in the receiving aquifer. The consultation occurred on October 12, 2023, and the work plan was accepted at that time.

## 2.0 FIELD PROCEDURES

The objectives of this study were:

- to determine the shallow subsurface soil and groundwater conditions relative to the design of Class IV septic sewage disposal systems
- to investigate the potential quantity and quality of groundwater available from drilled wells for domestic supply

## 2.1 Terrain Evaluation

The field work for the terrain evaluation was carried out on February 3 and 4, 2021, during which time a total of six boreholes (numbered BH1 to BH6, inclusive) were put down across the site. The

boreholes were advanced using a track mounted drill rig equipped with a 200 mm hollow stem auger owned and operated by CCC Drilling of Ottawa, Ontario. The approximate locations of the boreholes are provided in Site Plan, Figure 2.

The boreholes were put down throughout the site. The boreholes were advanced to depths of approximately 4.4 to 9.75 metres below the existing ground surface using 200 mm hollow stem augers. Borehole BH1 was continued to a depth of about 14.52 metres below the existing ground surface as a probe hole until bedrock was encountered. A member of our engineering staff recorded the soils types, depths to strata changes, and groundwater conditions at each borehole location. Groundwater conditions at the boreholes were noted at the time of drilling. Groundwater was also measured at a later date in standpipes installed within three of the boreholes at the time of drilling. The water levels in the standpipes for testing of background nitrogen levels. Surficial soil samples were obtained from Boreholes BH1, BH3 and BH5 for laboratory grain size distribution analysis. Two soil samples of underlying soils were also obtained from BH2 and BH4 and underwent hydrometer analysis. All particle analysis results are provided as Attachment C.

To obtain representative samples of the upper groundwater at the site for background testing of nitrogen species, three monitoring wells were installed using the *ASTM Standard D5092-04(2010) Standard Practice for Design and Installation of Groundwater Monitoring Wells.* The monitoring wells installed at BH1, BH3 and BH5 were tested for nitrogen species including nitrites, nitrates, Total Kjeldahl Nitrogen (TKN) and ammonia. Subsequent to the findings of the previous report (May 2023) and peer review comments, additional groundwater evaluation was carried out to characterize background nitrates at the site. On October 17, 2023, an additional five boreholes were constructed using a drill rig. The additional wells were constructed by augering to the desired well depths (generally 3 metres). The soils were characterized using split spoon sampling at 18" lifts, advancing 6" between lifts from 3 metres until silty clay was encountered. All of the additional boreholes were completed as monitoring wells with 5' screen. The Records of Borehole Logs are provided herein.

## Monitoring Well Sampling Procedure

The sampling procedure was carried out using sampling protocols and methods described in *"Association of Professional Geoscientists of Ontario Guidance for Environmental Site Assessments under 153/04 (as amended), April 2011*". On February 12, 2021, the static water levels were

measured in each of the standpipes. The standpipes were subsequently purged of approximately three well volumes, and allowed to recover between purgings, prior to water samples being obtained and tested for nitrogen species, including nitrites, nitrates, TKN and ammonia. As no drilling fluids were used during borehole construction, the purging of three well volumes was considered to be sufficient to obtain groundwater samples that were representative of the groundwater in the shallow aquifer. The standing water in the monitoring well was purged using a mechanical displacement pump. The additional monitoring wells were developed on October 23, 2023. The wells were purged using a similar procedure.

## 2.2 Groundwater Supply Investigation

During the original investigation, to determine the quantity and quality of groundwater available for domestic water supply, three test wells, numbered TW1, TW2 and TW3, were pump tested and sampled. The approximate locations of the test wells are shown on the attached Site Plan, Figure 2. Air Rock Drilling Company Limited of Richmond, Ontario, drilled all three water supply wells on the subject property for the purpose of this hydrogeological investigation on April 26 and 27, 2021. To establish the existing water quality in the area, three offsite neighbouring wells were sampled for water quality. The existing wells that were sampled were considered to be representative of the well construction and aquifer for the future subdivision wells. As such, the existing wells were to be drilled bedrock wells and well records were obtained and matched to the sampled wells. In addition, a review of area well records surrounding the site was carried out. As the site is located in a village, there were a total of about 33 water supply wells identified within about 150 metres of the site. The locations of the test wells, neighbouring sampled wells and other area well records are provided herein as Well Locations, Figure 3. The well records for the wells and the Certificates of Compliance for the test wells are provided herein as Attachment B.

The water well records for the test wells supplied by the well driller indicate that nominal 15 centimetre inside diameter steel casings were installed through the overburden and were set well into the bedrock and grouted in place. The wells were drilled to final depths using a 15 centimetre diameter bit and completed as an open hole in the bedrock. TW1 and TW2 were drilled into the bedrock to final depths of some 76.2 and 74.4 metres, respectively, below the existing ground surface. TW3 was drilled to a depth of 30.5 metres. All three test wells were cased and grouted 3.0 metres into the bedrock with casing lengths of between 18.9 and 20.1 metres.

Pumping tests were conducted on TW1, TW2 and TW3 on May 12, May 10 and May 5, 2021, respectively. The testing consisted of 6 hour duration constant discharge rate pumping tests. During the pumping tests, water level measurements were made on a regular basis to monitor the drawdown of the water level in the wells in response to pumping. After the pumping period, the pump was shut off and the recovery of the water level in the test well was monitored for a period of time. During the pumping tests, water levels at adjacent test wells were monitored, using pressure transducers, to determine the potential interference effects between the wells.

Groundwater samples were collected from the test wells at about hour 3 and at hour 6 of the pumping tests to characterize groundwater quality. The groundwater samples from the test wells were collected and prepared/preserved in the field using appropriate techniques and submitted to Eurofins Environmental Laboratory in Ottawa, Ontario for the chemical, physical and bacteriological analyses listed in the Ministry of the Environment (MOE) guideline entitled Procedure D-5-5, Technical Guideline for Private Wells: Water Supply Assessment, August 1996 in addition to select heavy metals. The temperature, pH, turbidity, sulphide and residual chlorine levels of the groundwater were measured at periodic intervals during the pumping tests. The equipment used for field testing consists of a Hanna Instrument turbidity and free chlorine meter (HI Model 93414), which is calibrated on a regular basis to ensure adequate performance.

Water samples were obtained from three wells servicing existing dwellings located in close proximity to the site at 5560 Lombardy and 5566 Lombardy Drive, located northeast of the site and 5529 Osgoode Main Street, located south of the site. The groundwater samples from the three wells were collected and prepared/preserved in the field using appropriate techniques and submitted to Eurofins Environmental Laboratory in Ottawa, Ontario for the chemical, physical and bacteriological analyses listed in the Ministry of the Environment (MOE) guideline entitled "Technical Guideline for Water Supply Assessment for Subdivision Development on Individual Private Wells," dated July 1992.

## 3.0 TERRAIN EVALUATION

## 3.1 Soil and Groundwater Conditions

This section provides a summarized account of the subsurface soil and groundwater conditions on the subject property based on the information obtained at the borehole locations. Details of the subsurface conditions at the borehole locations are presented in the attached Record of Boreholes.



It is noted that in some cases the stratigraphic boundaries within the overburden represent a transition between soil types rather than an exact plane of geologic change. Subsurface conditions differing somewhat from those reported can be expected to exist at the site.

The six original borehole locations encountered either fill (consisting of topsoil, sand and gravel), or Underlying the surficial organic and/or fill layers, the engineering staff identified the topsoil. predominant surficial soil type at the site as fine to medium sand. Kollaard Associates Inc. (KAI) characterizes soil as fine to medium sand based on textural indicators for grain size. The sand layer was identified to be between 0.7 and 3.0 metres in thickness, where fully penetrated. The sand layer transitioned from red brown to grey at depths of 0.40 metres below ground surface at BH2 and BH3, and between 0.9 and 1.8 metres at the other borehole locations. BH1 was terminated in sand and continued to presumed bedrock as a probe hole. No soils information below 3.7 metres depth is available from that borehole. Large boulders and/or possible bedrock occur at or below 14.5 metres depth at that location. Below the sand deposit at the other five boreholes (BH2-BH6), a layer of grey sandy silty clay was encountered, of between 0.4 and 1.2 metres in thickness. A sand layer of between 0.7 and 1.4 metres in thickness was encountered below the silty sandy clay layer at BH2, BH3, BH4 and BH6. A deposit of grey silty clay was encountered at boreholes BH2, BH4 and BH6. The thickness of this silty clay layer was 2.6 to 3.3 metres at BH2 and BH6. BH4 was terminated within the silty clay layer at a depth of 9.7 metres below existing ground surface. BH2 and BH6 encountered glacial till below the silty clay layer and were terminated on practical refusal on bedrock at depths of 9.0 and 6.7 metres, respectively.

Additional soils information was obtained by BH7-BH11, which were constructed in order to install additional groundwater monitoring standpipes. At those boreholes, the soil conditions consisted of a sand deposit of about 4 to 6 metres in thickness overlying silty clay. These boreholes were terminated within silty clay at 4.4 to 8.2 metres depth.

Kollaard Associates Inc. (KAI) characterizes the receiving aquifer at the site as the red to grey fine to medium sand layer and upper portions of the sandy clay or sandy silty clay that was encountered below the sand at five of the borehole locations. The surficial soil is fine to medium sand based on textural indicators for grain size. Three representative samples were obtained from BH1, BH3 and BH5 from depths of 0.8 to 1.4 metres and submitted to a lab for grain size analyses.



The result of two hydrometer tests (ASTM D422 and D2216) on sample of subsurface silty sand soil (based on initial borehole descriptor) from BH4 at depth of ~5.0 metres indicates the sample consists of fine sand with some silt and trace clay.

The results of a hydrometer test (ASTM D422 and D2216) on a sample of subsurface glacial till soil from BH2 at 8.0 metres depth are reported in the Table below.

The results of the laboratory testing are located in Attachment C.

The hydraulic conductivity was estimated for the coarse grained samples using the particle size analyses, as follows.

 $k = 0.35 (D_{15})^2$ 

Where k = hydraulic conductivity, in cm/s

 $D_{15}$  = the particle diameter where 15% of soil is passing, in mm

Sample	Description	Depth (m)	% Gravel	% Sand	% Silt & Clay	D <sub>15</sub> (mm)	K (cm/s)
BH1-SS2	Fine to medium SAND	0.76 - 1.37m	0.0	96.5	3.5	0.26	2.4 x 10 <sup>-2</sup>
BH2-SS9	GLACIAL TILL (sandy silt, trace clay)	7.62 - 8.22m	17.7	32.1	45.2S 5.0C	NA	~1 x 10 <sup>-5</sup>
BH3-SS2	Fine to medium SAND	0.76 - 1.37m	0.0	94.9	5.1	0.27	2.5 x 10 <sup>-2</sup>
BH4-SS7	Fine to medium SAND	4.52 - 5.18m	0.0	85.9	10.1S 4.0C	0.08	2.2 x 10 <sup>-3</sup>
BH5-SS2	Fine to medium SAND	0.76 - 1.37m	0.0	96.7	3.3	0.29	2.9 x 10 <sup>-2</sup>

Based on the above noted information, the hydraulic conductivity of the fine to medium sand is expected to be ~2.6 x  $10^{-2}$  cm/s. With depth (as in BH4), the percentage of fines increase and the deeper sand deposit has a hydraulic conductivity of 2 x  $10^{-3}$  cm/s. The sand encountered at the site is considered to be a soil of medium permeability.

A sample of glacial till was also obtained (BH2-SS9). As this was a fine grained soil, the hydraulic conductivity was estimated using the hydrometer analysis and comparing it to the USGS Table 3 (supplemental Tables in the OBC). The sample is described by USGS as ML which includes inorganic silts and very fine sands. The coefficient of permeability was estimated based on the shape of the curve and the low percentage of clay to be about 1 x  $10^{-5}$  cm/s and would be considered medium permeability of 20 to 35 min/cm. This corresponds to a sandy glacial till soil.

Groundwater monitoring wells were installed in three boreholes (BH1, BH3 and BH5) during the initial investigation. A total of 5 additional boreholes (BH7 – BH11) were completed with monitoring wells in October 2023. The attached Table X provides groundwater elevations in the Monitoring Wells. The interpreted groundwater flow directions in the receiving aquifer are provided on Figure 6a. This indicates shallow unconfined groundwater flow direction is to the northwest.

Water levels in the water supply wells at the site were recorded after the wells were constructed on May 5, 2021 and again on March 3, 2022, as follows.

Test Well	Top of Casing	Ground Surface	Groundwater El	Elevations (masl)	
	Elevations	Elevations	May 5, 2021	March 3, 2022	
	(masl)	(masl)			
TW1	93.17	92.78	86.45	86.07	
TW2	93.08	92.60	86.55	86.09	
TW3	91.90	91.34	87.37	87.22	

The interpreted groundwater flow direction in the deeper (bedrock) water supply aquifer is to the southeast, as shown on the attached Figure 6b.

## 3.1.1 Shallow Groundwater Sampling

During the initial investigation, a total of three (3) monitoring wells were installed in boreholes. Subsequent to the initial findings, where elevated nitrates were identified to be present at one of the monitoring wells, an additional five monitoring wells were installed on the site. The purpose of the shallow monitoring wells was to establish groundwater flow direction in the receiving aquifer at the site and to measure the existing nitrogen levels. The additional wells were to establish lateral and

vertical extent of nitrogen impacts that were present at BH1 (MW1) and to confirm the groundwater flow directions in the receiving aquifer.

All monitoring wells were constructed using the *ASTM Standard D5092-04(2010) Standard Practice for Design and Installation of Groundwater Monitoring Wells.* The testing includes nitrogen species nitrates, nitrites, Total Kjeldahl Nitrogen and ammonia. For details on construction and purging procedures see Section 2.1. For monitoring well locations, see Site Plan, Figure 2. The monitoring well construction logs are provided within the Record of Boreholes BH1-BH11 at the end of this document. Monitoring wells were installed in BH1, BH3, BH5, and BH7-BH11, inclusive.

The initial three shallow monitoring wells on the site were sampled on two occasions, February 12, 2021 and March 3 and 11, 2022. Due to the elevated nitrate levels at BH1 (MW1), repeated testing was carried out at that location on June 17, 2022 and February 9, 2023. The nitrate levels persisted in that location and did not decline over time. As such, a work plan was presented to the peer review consultant and additional monitoring wells BH7-BH11 were constructed to determine the lateral and vertical extent of nitrogen impact. The laboratory results are provided as Attachment D and a summary of background nitrogen levels is provided as Table IX.

The monitoring wells BH8, BH9, BH10 and BH11 were screened within the first soil stratigraphic unit identified at the site which is the fine to medium sand. The wells were screened over a 5 feet interval with tops of screens at depths of between 2.4 to 4.0 metres. These monitoring wells were installed to intercept the water table (receiving aquifer) and to capture the down gradient and cross gradient areas from BH1.

The monitoring well at BH7 was installed into the second stratigraphic unit identified at the site which was identified to be a silty clay deposit. It is located in close proximity to BH1 to determine whether the nitrogen impacts were present at depth. The monitoring well was sealed at the interface between the sand and clay in order to obtain a representative water sample from the second soil unit. This well was screened from about 6.6 to 8.1 metres within silty clay.



#### 3.1.2 Discussion of Elevated Nitrates in the Receiving Aquifer

#### Lateral Migration of Nitrates Across Subject Property

The nitrate levels in the most up gradient monitoring well onsite (BH1) have fluctuated from about 5.8 mg/L to 19.3 mg/Lin four sampling events from 2021 to 2023. All other monitoring wells (total of six in shallow receiving aquifer screened at about the same depth as BH1) have nitrate levels which are either below reporting limits (i.e. <0.10 mg/L) or less than 1 mg/L.

Groundwater flow directions and hydraulic gradients at the site are discussed (Section 4.4) and indicate that lateral groundwater flow at the site occurs at about 1.2 m/day. As the nitrates at BH1 have been elevated since at least 2021 and the travel time to other monitoring wells is between ~40 to ~90 days, there has been no change or increase in nitrates in the down gradient wells. As such, the nitrates in that location at BH1 are not spreading over time and are isolated to that location. It is possible that the elevated nitrates at BH1 are due to a former barn building in that area (based on aerial photographs and a previous Phase I ESA at the site).

#### Vertical Migration of Nitrates from Surficial Aquifer to Bedrock Water Supply Aquifer

A deeper standpipe (installed at BH7 and screened from ~6.7 to 8.2 metres) within the upper portion of the silty clay layer and in close proximity of BH1 had no nitrates detected at that depth. This indicates that the deeper overburden near BH1 is not impacted from the nitrates present within the shallow aquifer.

Based on the sampling of the onsite bedrock water supply wells, offsite bedrock wells and driven point wells that exist along Osgoode Main Street, there is no indication that nitrates are migrating vertically from the unconfined surficial aquifer to the deeper confined bedrock aquifer at or up gradient of the site.

The concentration of nitrates at the closest bedrock wells (5503 and 5529 Osgoode Main) to the driven point wells (3216 Reids Lane, 5535 Osgoode Main and 5519 Osgoode Main) indicates no detectible nitrates in the bedrock wells despite nitrate levels of 12 to 31 mg/L in the driven point wells. This indicates that there is no vertical migration of the surficial contaminants downward to the bedrock aquifer. Glacial till and silty clay soils underlie the surficial sand aquifer and are sufficiently thick to act as an aquitard. The bedrock wells are considered to be under confined aquifer

conditions based on the pumping tests carried out at the site. These soil conditions and the presence of the confining unit or aquitard between the aquifers, have demonstrated that the deeper bedrock water supply aquifer is protected from the presence of elevated nitrates in the surficial aquifer.

Based on the above noted information, it is considered that the bedrock water supply aquifer is protected from nitrate impact from the surficial aquifer at the site. This means that the future wells at the site are protected from the increased nitrates that may occur in the surficial aquifer under post development conditions. This has been established by evaluating the conditions on the up gradient lands which have been developed at a much higher density and yet have not affected the target water supply aquifer in the existing development.

## 3.1.3 Land and Water Use Conflicts

The following summarizes former uses of the subject property and the current and historical uses of properties within the site vicinity which have been evaluated in terms of the potential for groundwater contamination on the subject property.

Dillon Consulting completed a Phase I Environmental Site Assessment (ESA) in November 2016, with subsequent reports regarding debris removal, subsurface investigation, groundwater monitoring and decommissioning of monitoring wells. Based on a review of those reports, the following is noted.

- The Phase I ESA identified a former Imperial Oil fuel depot which was located offsite on an adjacent property near the southwest corner of the subject site. The offsite property was part of the former Canadian Pacific railway and the source for onsite minor soil and groundwater impacts in that portion of the site. Dillon reviewed Phase I and II ESA reports that were prepared by AMEC in 2001 and 2003 for an offsite property identified as 'Former Imperiol Oil Facility, Main Street at CP Rail Right-of-Way, Osgoode, ON. Dillon indicates that ..."activities at the Imperiol Oil site encroached upon the subject site".
- Fill materials and debris piles across the site represent on site potential sources of contamination.
- Former retail fuel outlets or service garages existed at 5514, 5491, 5543 and 5566 Osgoode Main Street. These are identified as up gradient to the subject property with potential for groundwater contamination (due to PHCs and/or VOCs).



- A soil and groundwater investigation was carried out November 2017 with a total of four soil samples plus one duplicate sample were collected and tested for metals, select VOCs, PAHs and PCBs. Some of the soil samples exceeded the standards for PAHs, lead and arsenic. A total of five groundwater monitoring wells were installed across the site. Those wells were screened in the upper overburden aquifer at depths of between about 0.9 to 5 metres. The overburden groundwater flow direction was estimated to be to the north. Water samples were tested for metals, select VOCs (BTEX), PHCs and PAHs. The only exceedance was vanadium at three locations, which were slightly above the allowable limits for potable water. The source of vanadium was considered to be the silty clay soils which are known to have naturally occurring elevated vanadium levels. The report concludes that the groundwater at the site was not impacted by debris and fill materials that caused soil impacts. The report recommended additional testing of groundwater to confirm the initial testing results.
- In July 2018, the five monitoring wells were retested and the only exceedances were vanadium, at the same three locations. A subsequent review by the MOECC agreed that there was no groundwater impacts from the debris and fill materials at the site and the wells could be abandoned. A subsequent monitoring well decommissioning was carried out and records of well abandonment were provided and registered with the MOECC.

Kollaard Associates Inc. carried out a Phase I Environmental Site Assessment for the site on October 19, 2022, in accordance with O. Reg. 153/04, which is the required standard for development approval. It was confirmed at that time, based on reviews of historical aerial photographs, chains of title for the two legal properties comprising the site, and site visits, that the only previous use of the subject property was for farming purposes. As such, there was no trigger for the property to require a Record of Site Condition. There were Potentially Contaminating Activities at the site, namely that illegal dumping had occurred on the subject property. The Phase I ESA findings are summarized below:

The results of the Phase I ESA indicate that there are two significant environmentally related issues identified at the subject site. The following APECs are identified to be present at the site based on one historical activity at the site and on one of the adjacent properties.

As such, Kollaard Associates considers that there are two APECs on the subject site as follows:

Crestview Innovations Inc. June 12, 2024

- APEC 1: Fill and/or Debris impacting soil: There were soil impacts noted (by Dillon previous investigations) at three locations of the subject property related to debris from illegal dumping which occurred between 1987 and 2000. Of a total of four soil samples, two samples had exceedances for PAHs, one had an exceedance for arsenic and one had an exceedance for lead. These soil samples were collected by Dillon Consulting in 2017.
- APEC 2: The former fuel depot impacted soil at the southwest corner of the site from Total Petroleum Hydrocarbons (as noted by AMEC, 2003). Updated soil testing is necessary for PHCs F1-F4 to determine if soil impacts remain at the site. Previous soil impacts were measured in one soil sample collected in 2003 by AMEC.
- No documentation has been provided to indicate whether any soil excavation had occurred subsequent to the previous soil investigations. Kollaard Associates Inc. proposes to update the soils testing to determine whether any soil impacts remain on site.
- A previous environmental investigation carried out by Dillon Consulting included groundwater sampling of a total of five monitoring wells that included two wells near the former fuel depot in the southwest corner of the site and three monitoring wells installed by Dillon Consulting near the former debris piles. In December 2017 and subsequently in July 2018, all the wells were tested for the following parameters; metals, Volatile Organic Compounds (VOCs), PHC F1-F4, semi-volatiles (PAHs). The concentrations of the above noted parameters were all within the Table 2 Standards (O. Reg. 153/04 Table 2 Standards 2011, for potable groundwater).
- The report concluded that based on the second round of groundwater testing (subsequent to the previous testing that occurred in December 2017) that groundwater was not impacted from the fill and debris that were encountered in the shallow soils at the property.
- Based on the above noted APECs, updated soil sampling for PHC F1-F4 at APEC 2 and PAHs and metals at APEC 1 is necessary to confirm whether there are soil impacts since the time of the previous investigations. Kollaard Associates Inc. considers that no further groundwater investigation is necessary, based on the review of the Dillon investigations, which included groundwater monitoring.

Kollaard Associates Inc. carried out a Phase 2 Environmental Site Assessment on January 24, 2023. The following summarizes the findings of that study:



- The field program for the Phase II ESA was carried out by putting down a total of eight (8) test pits to address two APECs. APEC 1 is identified in three areas where fill materials were previously identified to contain the following one or more of the following contaminants above allowable limits arsenic, lead (metals) and PAHs. APEC 2 is located in the southwest corner of the property adjacent to a former bulk fuel storage facility where previous soil contamination at that location consisted of Petroleum Hydrocarbon fractions F1 to F4 The soil analytical results were compared against Ontario Ministry of the (PHCs). Environment (MECP) "Soil, Groundwater and Sediment Standards for Use under Part XV.1 of the Environmental Protection Act, dated April 15, 2011, Table 2: Full Depth Generic Site Ground Condition Standards in а Potable Water Condition for Residential/Parkland/Institutional Use for coarse textured soils.
- Based on the results of the Phase II ESA the following summary and conclusions are provided:
- APEC 1: The fill materials present at the site are within allowable limits for PAHs and metals, with the exception of one sample. A total of twelve (12) samples of the fill materials within APEC 1 were obtained from a total of six test pits on November 7, 2022. These were tested for metals and PAHs. No presence of PAHs above method reporting limits was reported for a total of ten (10) samples. Two samples obtained from TP3 had the presence of PAHs, including one sample which had an exceedance of two PAHs identified as benzo(a)pyrene and dibenz(a,h)anthracene. That test pit (TP3) encountered some asphalt pieces mixed in with fill materials. A second visit was carried out and one additional soil sample was obtained from below the fill materials and in the native soils. There was no presence of PAHs or metals above method reporting limits in the deeper sample obtained within the same test pit. The exceedance encountered in one sample (TP3-2) is due to the presence of asphalt in the soil sample rather than representative of the fill materials/soils present at the site. It is considered that once the asphalt is removed from the site, the remaining soils can remain on site. It is recommended that the asphalt be removed from the site by separating it from the soils and disposing or recycling the asphalt accordingly. The fill materials that are considered to be soil have been characterized and are acceptable for reuse on the site, once sorting has occurred to separate the asphalt pieces. As such, it is considered that the appropriate reuse of fill materials can be addressed and managed through the Excess Soil Regulations and no further soil characterization is necessary.

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- APEC 2: The soils adjacent to the former fuel storage property have a presence of PHCs F1-F4 and BTEX (gasoline compounds) within allowable limits. At APEC 2, two test pits were put down with a total of four soil samples obtained and tested for both PHC F1-F4 and select VOCs (benzene, toluene, ethylbenzene and xylene). There was a presence of PHC F3 and F4 within one sample (TP8-1). However, the levels encountered were within the allowable limits. A deeper sample obtained from the same test pit encountered no presence of any PHCs or BTEX compounds. A second test pit (TP7) encountered no presence of any PHCs or BTEX. As such, the soil impacts from the former fuel storage facility are within allowable limits. No further assessment or soil characterization is considered necessary.
- Due to the presence of solid waste encountered throughout the site, the following Phase II ESA recommendation is made. There is solid waste present at the site on the ground surface in various locations, which was not fully assessed due to the limitations of vegetation that has since obscured visual and physical access to the debris. Debris that was observed includes metals, concrete, wood, plastic bottles, tin, roofing shingles and other solid waste. The underlying soils and groundwater have been assessed and are not impacted by the solid waste present on the ground surface at the site. Any solid waste should be disposed of at an appropriately licensed landfill at the time of development.

The majority of former offsite sources of contamination, namely retail fuel outlets and automotive garages are no longer active, with the exceptions of 5543 Osgoode Main Street and 5566 Osgoode Main Street (Drummond's Gas Bar). These properties are sufficiently distant, between 40 and 140 metres to the east and southeast of the subject property, such that it is unlikely that there would be any impact on the subject site. The Drummond's gas station had all the previous tanks removed and has been updated with new tanks. Current gas stations are far less likely to cause impacts due to the use of double-walled insulated tanks which are usually constructed using fibreglass that does not degrade and leak, compared to the former use of steel tanks. It should also be noted that many of the existing water supply wells servicing dwellings on Osgoode Main Street are sand point wells. If there were issues with hydrocarbon impacts from nearby commercial development, those wells are much more likely to be impacted. Based on the review of the above noted reports and the current development near the site, there are no concerns with respect to the quality of groundwater supply at the site from the offsite land uses and the historical use of the site.

A review of Permit to Take Water Mapping for a 1 kilometre radius around the site indicates that there are no major water taking activities in the area. The area surrounding the site is mostly developed, with the exception of a vacant parcel to the east. The recent groundwater pumping tests at the site indicate that there is sufficient water supply at the site to support development. As such, there are no concerns with existing development impacting the quantity of water supply at the site.

## 3.2 Class IV Sewage Disposal Systems

This section discusses the implications of the site-specific terrain conditions in terms of the feasibility of installing Class IV sewage disposal systems within the proposed subdivision.

## 3.2.1 Sewage System Envelopes

The septic system envelope area (septic envelope) represents the area on a lot set aside for the construction of the leaching bed and is for the leaching bed only and does not include that area required for the septic tank or the isolation/separation distances required by the Ontario Building Code. The deposit or disposal of any materials or the placement of any structure or the operation of any equipment, other than material, structures or equipment required for the construction of the sewage system within or upon the septic envelope is prohibited.

The size of the septic envelopes are a function of the percolation time of the native soil in the vicinity of the septic envelope and/or the fill used for construction of a septic bed and the daily effluent loading to the septic bed. The native sandy soil at the site is of medium permeability, with an approximate percolation rate of 4 to 6 min/cm (based on Supplementary Guideline Table 2 Approximate Relationships of Soil Types to Permeability and Percolation rate in the Ontario Building Code). The groundwater table at the site is expected to be within 0.9 metres of the ground surface, based on shallow groundwater monitoring wells.

As a conservative approach to determining the expected largest septic system envelope required to service a single family dwelling at this site, a septic system envelope size was calculated assuming a partially raised bed using a percolation rate of 8 minutes per centimetre for the imported sand required and a daily sewage flow of 3000 litres. A design flow of 3000 litres per day is suitable for a

five bedroom dwelling with 250 square metres of finished area and 30 fixture units. The following formulae were used to calculate the size of the septic envelope:

The larger of

$$A = \frac{Q}{8}$$
 OR  $A = \frac{1.6QT}{200}$  plus

4:1 Leaching Bed Side Slopes

Where Q = daily sewage flow for the proposed dwelling (i.e., 3,000 litres per day) T = percolation rate of imported fill material

The size of the septic envelopes, based on the conservative approach described above, is approximately 375 square metres. In view of the minimum proposed lot sizes of about 4055 square metres, and average lot sizes of about 4290 square metres, sufficient area exists at each of the proposed lots for the construction of a conventional septic system that meets the requirements of the Ontario Building Code.

Prior to establishing the actual septic envelope (leaching bed) location on any particular lot, several test holes should be excavated to determine the consistency/variability of the overburden in the vicinity of the proposed septic envelope and percolation rate tests should be carried out to determine the actual envelope area and whether imported mantles are required.

Other site-specific considerations with respect to the locations of the septic envelopes (leaching beds) on the proposed lots are as follows:

- assuming that shallow groundwater flow within the upper overburden is from topographically higher areas to topographically lower areas, the septic envelopes should be situated in the topographically lower areas with the wells on the topographically higher areas
- the separation distances between septic envelopes and properly constructed drilled and cased wells should be at least twice the grade raise plus 15 metres for partially to fully raised beds as required by the Ontario Building Code

## 3.2.2 Leaching Bed Design Considerations

The design of leaching beds is a combination of a number of interrelated factors including effluent discharge volume, properties of the soil materials in the leaching bed, length of distribution lines and the subsurface conditions. The construction of individual septic disposal systems on the proposed lots should be carried out in accordance with the specifications set out in the Ontario Building Code.

The design must ensure that the bottom of the absorption trenches is at least 0.9 metres above bedrock or soils that are unsuitable for treatment of septic effluent (those with excessively low permeability), and at least 0.9 metres above the seasonally high groundwater table.

Based on the soil and groundwater conditions at the site, partially raised septic system leaching beds are likely to be used. The actual leaching bed type appropriate for each lot will depend on the individual lot specific soil and groundwater conditions.

Any partially raised leaching beds should be constructed of imported sand having a percolation time of between 6 and 8 minutes per centimetre with less than 5 percent passing the #200 (0.074 mm) sieve. It is recommended that gradation analyses be carried out on any potential sand fill prior to leaching bed construction in order to verify that the percolation time of the fill material is acceptable.

## 3.3 Groundwater Impact Assessment

## 3.3.1 Criteria

The Ministry of the Environment (MOE) Procedure D-5-4 provides guidelines for evaluating "the ability of the lands identified by and restricted to the development document, to treat sewage effluent to meet acceptable limits". The guideline requires that the representative background nitrate levels in the receiving groundwater be determined. Where background levels are greater than 10 milligrams per litre the ministry indicates development of the site should not be supported unless it can be demonstrated that existing levels of nitrates are the results of historical agricultural practices on the site. In addition, the guideline requires demonstration that the site is not obviously hydrogeologically sensitive such as karstic areas, areas of fractured bedrock exposed at the surface, areas of thin soil cover or areas of highly permeable soils.

The guideline indicates that the assessment involves a three step process.

Step 1 regards lot size considerations. Where the lot size for each private residence within the development is an average of one hectare or larger and no lot is smaller than 0.8 hectares, and provided the site is not hydrogeologically sensitive, the risk that impact limits may be exceeded by individual systems is considered acceptable.

Step 2 is in regards to septic system isolation considerations. Developments are considered low risk when it can be demonstrated that sewage effluent is hydrogeologically isolated from existing or potential supply aquifers. For this case the most probable groundwater receiver for sewage is to be defined through information obtained through a test pit or test hole program, and the most probable lower hydraulic or physical boundary of the groundwater receiving sewage effluent is to be defined. The guideline indicates hydrogeologic information concerning lands up to 500 metres beyond the actual development boundary may be required. When it can be demonstrated that the sewage will not enter supply aquifers the lot density of the proposed development is determined based on the space required to install a suitable septic system at each lot in accordance with the Ontario Building Code.

Step 3 is in regards to contaminant attenuation considerations. For this case, it is required to assess the risk that the on-site sewage systems within the proposed development will cause a concentration of nitrate in groundwater above 10 milligrams per litre at the down gradient boundary of the site.

## 3.3.2 Site Conditions Evaluation

In order to evaluate the background water quality conditions in the receiving aquifer, three shallow monitoring wells were installed at the site and tested for nitrogen species. The construction details are provided in Section 2.1, the Records of Boreholes are appended to the report and groundwater levels are reported in Section 3.1. Background nitrogen concentrations from the shallow groundwater receiving effluent were reported (Section 3.1.1) and the original laboratory testing results are in Attachment D. The Site Plan, Figure 2, shows the locations of the monitoring wells.

The Ministry of the Environment, Conservation and Parks (MECP) Guideline D-5-4 indicates that:

".....where nitrate concentrations between 0 and 10 mg/l are found, the MOECC may also decide not to support development if the proponent's consultant cannot provide a reasonable explanation for the existing levels of nitrate concentrations in the groundwater. However, if it can be demonstrated that existing levels of nitrates are the result of historical agricultural practices on the site (for example farming, feed lot, etc.), the proponent may be able to argue that the nitrate levels will decline after development"

The background nitrate levels were generally less than reporting limits <0.10 mg/L N-NO<sub>3</sub> up to 0.72 mg/L N-NO<sub>3</sub>), with the exception of the monitoring well, BH1, which had levels of ~6 to 20 mg/L N-NO<sub>3</sub>. The location of BH1 is where there was a former large building (likely a barn) and may have been locally impacted by nitrogen or nitrogen. All of the down gradient monitoring wells (Table IX) indicate that nitrate levels are very low and have continued to be low from 2021 to the present time. The hydraulic gradients ~1.2 m/day would indicate that if the nitrate levels were spreading laterally, there would be impact in the down gradient wells over time. As the levels did not show an increase, the nitrates impacts are considered to be isolated.

The site is not obviously hydrogeologically sensitive as no karstic areas, areas of fractured bedrock exposed at the surface or areas of highly permeable soils are indicated to be present at the site. Three soil samples of the surficial sandy soils were obtained and laboratory grain size distribution analysis was carried out. The surficial soils consist mainly of fine sand with low silt/clay content (3 to 5%) which has an average estimated hydraulic conductivity of ~ 2.6 x  $10^{-2}$  cm/s (Section 3.1). The soil can be characterized as poorly graded sand. This is considered to be a soil of medium permeability.

The subsurface soils were also sampled. A sample of silty sand from BH4 had 14% fines (silt and clay sized particles) and the underlying glacial till at BH2 contained 50% fines. The silty clay was not sampled, however, it is expected to be of low permeability as it would be considered a fine grained soil. The underlying soils are of medium to low permeability.



The surficial and underlying soils at the site are of medium to low permeability and the overburden thickness at the site is at least 15 metres or more in thickness. Based on the soils information, the site is not considered to be hydrogeologically sensitive.

The water supply aquifer at the site is considered to be confined, based on the following:

- The piezometric surfaces in the three water supply wells (see cross sections, Figures 4 and 5) are above the top of the aquifer (bedrock elevation); and
- the shape of the drawdown response curve observed in the pumping tests closely resembles the ideal response of a confined aquifer; and
- the storativity coefficient calculated using the drawdown response in adjacent wells is ~ 2.0 x 10<sup>-4</sup>, whereas specific yield in an unconfined aquifer is typically orders of magnitude higher; and
- Based on the depth and type of soils onsite, there is a confining unit consisting of silty clay and/or glacial till which are some 9 metres to 15 metres in thickness.

As the water supply aquifer is confined, this is indicative that there is some confining unit that prevents direct vertical migration of surface water into the water supply at depth. This is also indicative that the site is not hydrogeologically sensitive.

The minimum lot size proposed for the development is about 0.40 hectares. Accordingly, the above noted "Step 1" does not apply to this site. Hydrogeological isolation between the receiving and water supply aquifers was not evaluated for this site. Thus, "Step 3" was addressed for this site.

## 3.3.3 Step 3 Assessment

The most probable groundwater receiver for sewage effluent is the red to grey fine to medium sand layer and upper portions of the sandy clay or sandy silty clay that was encountered below the sand at five of the borehole locations. To obtain a general indication as to the potential impact of septic effluent on the properties adjoining the proposed development, a nitrate dilution model was used. A daily effluent loading of 1000 litres per day per septic system was assumed and the expected impact of septic systems at this site was determined by considering the attenuation of nitrate in the effluent from an assumed 40 milligrams per litre (mg/l) (NO<sub>3</sub> as N) after the septic system treatment to the property boundary by dilution as a result of the infiltration of meteoric water only. The

following provides the basis whereby the infiltration reduction factors for the site were chosen for the dilution calculations.

Topographic, soil and land cover infiltration factors were selected from *Table 2* of the MOE *Hydrological Technical Information Requirements for Land Development Applications*. The following is a discussion of each of the infiltration reduction factors chosen for the site.

A soil infiltration factor of 0.40 for open sandy loam is appropriate for the septic effluent dilution calculations, based on the permeability of the soils encountered across the site. Given the continuous nature of the sandy overburden at the site, with between 3 and 5 % silt/clay content in all three sieve analyses, and all six borehole logs describe the surficial soil as fine to medium sand, a terrain map was not considered to be required to delineate the terrain distribution across the property.

The site is characterized by rolling terrain with highest elevations within the southeast portion of the site sloping to the northwest. The steepest slope across the site is to the northwest of about 6 metres over one kilometre and average slope across the site is to the northwest of about 3.0 metres per kilometre. The site is considered to be rolling with a slope infiltration factor of 0.20. Using *Table 10* of the Thornthwaite and Mather *Instructions and Tables for Computing Potential Evapotranspiration and the Water Balance*, a soil water holding capacity of 100 millimetres was provided for the sandy overburden at the site. The value was chosen based on the combination of mainly pasture (deep-rooted crops) in fine sand. However, post-development, it is expected that the site will be mainly grassed (shallow-rooted crops) and the soil is fine sand. The corresponding soil water holding capacity of the site for post development conditions is expected to be between about 50-75 millimetres. The selection of 100 millimetres is conservative, as it overestimates the applicable soil moisture retention for the soils, which results in underestimating the available moisture for infiltration.

The type of land cover observed at the site at the time of site visits and by use of satellite imagery consists mostly of cultivated lands, although there are scattered trees and shrubs across the site. It is expected that the post-development conditions at the site will consist mainly of grassy areas with few trees and shrubs. The land cover infiltration factor of 0.10 was selected, which corresponds to cultivated lands. This is a conservative prediction as it does not account for the

mature trees which may be retained or the landscape trees and shrubs that will likely be cultivated on properties post development.

In order to determine water surplus estimates for the site area, a water surplus model was obtained using published information from Environment Canada (EC) for the City of Ottawa. The water balance model output the average yearly moisture surplus value, based on monthly moisture surplus averages for the period from 1939 to 2021. The expected moisture surplus or net potential infiltration for the site area was estimated at 379 millimetres. The water balance model output data, provided by EC, are provided as Attachment E.

Hard Surfaced Areas post-development were calculated as follows. The total roadway area for the site is 1965 square metres, as provided by Novatech. The other hard surfaced areas are as follows; dwellings (320 square metres), driveways (996 square metres ~ 142 square metres per lot) and miscellaneous impervious areas of 700 square metres (~100 square metres per lot). These allow for other impervious areas on each lot such as decks, pools, etc. The total hard surfaced areas using these values for post-development conditions are 5,901 m<sup>2</sup>.

Post-development conditions include a stormwater management pond, roadside ditches and grassed swales as well as downspouts from the roofs of the dwellings. All of these measures reduce runoff and promote groundwater infiltration on site. The natural background conditions at the site are sandy soil which is expected to readily infiltrate precipitation. The performance of grassed swales in these conditions could be as much as 50%, which reduces the impact of the hard surfaced areas significantly. Even when runoff exceeds the capacity of the swales and roadside ditches, the stormwater pond is also designed to infiltrate groundwater. The use of lot level conveyances and infiltration are not considered in the calculations for sewage dilution. As such, the sewage attenuating capacity of the site is expected to be higher than what is predicted herein.

The results of the sewage dilution calculations indicate that the expected concentration of nitrate at the site boundary due to the proposed 7 sewage systems is about 9.9 milligrams per litre (Attachment E). This is within the Ministry of the Environment acceptable nitrate impact limit of 10 milligrams per litre.

Based on the impact assessment, the development of the site on private sewage disposal systems is not expected to have an adverse impact on groundwater resources in the site area.

#### 4.0 GROUNDWATER SUPPLY INVESTIGATION

#### 4.1 Supply Aquifer

As mentioned above, a bedrock geology map for the site area indicates that dolostone and sandstone of the Beekmantown Group underlie the site.

#### Area Well Record Review

A review of area well records was carried out including an area surrounding the site of some 150 metres indicating some 32 wells, five of these being non water supply wells (shallow monitoring wells for geotechnical/environmental purposes) and one well record which was a well casing extension above grade. The location of all 34 water wells registered with the Ontario Well Records database are provided in a map (Attachment B) and the information of each well record is tabulated in Table III, describing well casing lengths, well depths, description of overburden stratigraphy and bedrock types and yield information. Based on a review of area water well records, the predominant soil type of overlying till (variably described consists sand as sand/gravel/clay/hardpan/till/stones) with total overburden depths ranging from ~8 to 17 metres. The area well record review indicates that of the 34 water wells that are present within 150 metres of the site, twenty (20) wells have encountered sufficient well yields at depths of 10 to 31 metres depth. A total of nine (9) wells have been drilled to depths of 73 to 104 metres and have encountered sufficient well yields. Some five (5) wells have been drilled to depths of between 36 Well yields were generally tested at rates of greater than 22 L/minute up to 76 and 41 metres. L/minute and available drawdowns for the area wells were at least 3.7 or more metres up to 40 or more metres. Water quality was described as fresh (16 wells), untested (14 wells) and mineralized (1 well) or sulphur and mineralized (1 well). Water quality descriptions were included in some 18 well records, with 16 of these reporting water quality as fresh and two reporting water quality to be mineralized or sulphur and minerals. The well depths of these two wells are reported to be 24 to 27 metres.

## Onsite Well Record Review

The MOE well records for the test wells indicate the primary material encountered was limestone during drilling for all three test wells. Well Records for Onsite Wells are provided in Attachment B. Geological cross-sections of the site were prepared using soils and bedrock information from the MOE well records for the test wells and the Records of Boreholes. The geological cross sections are provided as Figures 4 and 5.

The test wells noted the following conditions:

TW1 and TW2 indicate water bearing fractures at depths of some 72 to 74 metres within limestone with sandstone mix and were drilled to depths of some 74 to 76 metres.

TW3 encountered water bearing fractures at depths of about 21 and 28 metres within limestone and was drilled to a final depth of 30 metres.

The test wells were found to be representative of other area wells where the majority (20 of 34 wells) have found sufficient yield within the upper limestone aquifer and some wells (9 of 34 wells) have been drilled deeper into the limestone aquifer to encounter a second fracture zone at or below 73 metres.

## 4.2 Water Quality

The results of the chemical, physical and bacteriological analyses of water samples obtained from the test wells are provided as Attachment F and field water quality data is provided in Table I. A summary of the laboratory test results is attached as Tables II and III. The water quality as determined from the results of the analyses is favourable. The water meets all the Ontario Drinking Water Standards (ODWS) health and aesthetic parameters tested for at the test wells except for the following:

- hardness at all of the wells
- total dissolved solids at all of the wells
- hydrogen sulphide at TW1 and TW2
- iron at TW2 and TW3

- organic nitrogen at TW1 and TW3
- sodium above 20 mg/l at all of the wells

#### Hardness

The water samples from all of the test wells are considered hard by water treatment standards. Water with hardness above 80 to 100 milligrams per litre as CaC0<sub>3</sub> is often softened for domestic use. The hardness at the test wells ranges from about 211 to 310 milligrams per litre. Water softening by conventional sodium ion exchange will reduce hardness and scaling on fixtures. However, it may also introduce relatively high concentrations of sodium into the drinking water, which may contribute a significant percentage to the daily sodium intake for a consumer on a sodium restricted diet. Where ion exchange water softeners are used, a separate unsoftened water supply could be used for drinking and culinary purposes.

#### **Total Dissolved Solids**

The total dissolved solids (TDS) were measured at 539 to 618 milligrams per litre, the three test wells, above the ODWS of 500 milligrams per litre. The Ryznar Stability Indices (RSI) and Langelier Saturation Indices (LSI) were calculated for the samples and gave RSI values of between 7.1 and 7.5 and LSI values between 0.25 and 0.5. The values of RSI that are close to 7 and slightly above 7, indicate that the formation of calcium carbonate (i.e. scaling) does not lead to a protective corrosion inhibitor film on metal fixtures and pipes. However, there RSI value is less than 8, indicating that the water is not corrosive either. LSI values are corresponding positive, but close to zero, which indicates that the water has borderline scale potential, such that minor changes in the water quality, temperature could change the scale or corrosive potential of the water. The effect of elevated TDS levels on drinking water depends on the individual components, which are principally chlorides, sulphates, calcium, magnesium and bicarbonates. Depending on which parameters are elevated, TDS exceedances can include hardness, taste, mineral deposition or corrosion. In this case, all the test well water samples have high levels of hardness and elevated chlorides (155 to 180 mg/l) albeit within the operational guideline for hardness and the aesthetic objective (AO) for chlorides. Chloride is less than the AO and consequently the water palatability is still considered to be good. Therefore, the effect of elevated TDS is considered to be mostly associated with elevated hardness, which can cause mineral deposition, due to the potential for scale to form. As hardness is the cause of the elevated TDS, it is considered that treatment to reduce hardness (ion exchange water softeners) will reduce the mineral deposition associated with the TDS levels.



## Hydrogen Sulphide

Hydrogen sulphide levels at TW1 and TW2 are above the aesthetic objective of 0.05 mg/l. TW1 had sulphide levels of 1.10 mg/l and TW2 had lower levels at 0.24 to 0.27 mg/l. Hydrogen sulphide produces an odour and can affect the taste of water. When present in water with iron, it can also cause black staining of laundry items, black deposits on pipes and fixtures. Treatment to reduce sulphide includes aeration. Higher levels of sulphide where iron staining is also an issue (rust staining) may require treatment using chlorination followed by iron filter. Based on the sulphide levels at the site, it is considered that aeration is sufficient to reduce sulphide in the treated water. Well construction recommendations are also made later in this document to ensure that excessive sulphide levels are avoided in future wells at the proposed subdivision.

Three offsite wells were sampled and also had exceedances for hydrogen sulphide. The highest level was at 5560 Lombardy Drive with a hydrogen sulphide level of 8.3 mg/l. The well record for that well indicated that water fractures were encountered at 41 metres depth. In addition, a report for the adjacent subdivision located west of the site entitled "*Report on Site Conditions and Hydrogeology for Top Drawer Holdings Ltd., Proposed Subdivision, Village of Osgoode, March 1978 by Oliver, Mangione, McCalla & Associates Ltd.*" was reviewed with regards to water quality. That report indicated that one of the test wells, drilled to 44 metres depth encountered sulphur water at a depth of about 38 metres depth. Based on this and the occurrence of high levels of hydrogen sulphide at one of the offsite wells (5560 Lombardy Drive), Kollaard Associates Inc. is providing well construction recommendations to ensure that the future wells avoid very elevated levels of hydrogen sulphide that are associated with the water fractures encountered at 38 to 41 metres depth.

## Iron

The level of iron at TW2 and TW3 was elevated for the first water samples obtained after three hours (iron levels of 0.46 and 0.54 mg/l), compared to the AO of 0.3 mg/l. However, by the end of the pumping tests, the iron levels were within aesthetic objectives for all three test wells and ranged from 0.11 to 0.21 mg/l. Three other area wells that were sampled also had iron levels within the acceptable limit of 0.3 mg/l. As a result, iron is considered to be within the aesthetic objective of 0.3 mg/l. It should also be noted that water softening to reduce hardness can also decrease iron.



## Organic Nitrogen

Organic nitrogen levels at TW1 and TW3 were 0.20 and 0.17 mg/l, respectively, compared to the operational guideline (OG) of 0.15 mg/l. Organic nitrogen is calculated by subtracting the ammonia from the Total Kjeldahl Nitrogen. Organic nitrogen has an OG due to its interaction with chlorine used in water treatment causing taste problems in the treated water. There is a correlation between DOC and organic nitrogen. Organic nitrogen levels above 0.15 mg/l are associated with DOC levels of 0.6 mg/l or greater. As groundwater is typically not treated using chlorine, the potential presence of organic nitrogen in some wells does not require treatment.

## <u>Sodium</u>

The sodium levels at all three test wells were between 64 and 98 mg/l, above the 20 milligrams per litre advisory level, whereby the local Medical Officer of Health should be notified when the sodium concentration exceeds 20 mg/L so that this information may be communicated to local physicians for their use with patients on sodium restricted diets. The sodium levels were well within the aesthetic objective of 200 mg/l.

## 4.3 Water Quality in Neighbouring Wells

During the initial investigation in April and May 2021, a letter was circulated to all the residents on Lombardy Drive that were closest to the site as well as canvassing along Osgoode Main Street carried out by Kollaard Associates Inc. This included the following addresses 5531, 5533, 5535, 5537, 5538, 5549, 5554, 5560 and 5566 Lombardy Drive. On Osgoode Main Street, door to door canvassing was carried out on two occasions at all the properties that border the site from the south (5495 – 5535 Osgoode Main Street). One home owner (5529 Osgoode Main Street) indicated that they would provide a water sample and complete a well questionnaire. Other residents were either not home when canvassing occurred or did not respond to the letter that was dropped off at their property. One home owner responded to the letter but declined to contribute a water sample. Through canvassing, the presence of driven point (aka sand point) wells was noted at some of the dwellings along Osgoode Main Street. During pre-consultation with RVCA, it was indicated that these wells were not required to be sampled as the water quality in these wells is obtained from the overburden aquifer and is not representative of the water supply aquifer that is targeted for the proposed subdivision.

Neighbours of the site along Lombardy Drive and Osgoode Main Street were canvassed with regards to their servicing. At that time, some of the property owners/tenants along Osgoode Main

Street indicated that the wellheads were either below grade or that sand point wells were in use. One property owner indicated that they do not have a sewage system but a holding tank. The following three wells were sampled as the owners indicated that they had drilled wells and sewage systems.

#### 5529 Osgoode Main Street

- water treatment: iron filter
- water potability: owner drinks water and indicates sulphur odour is present sometimes
- routine bacterial testing: Not since purchase (6 years previous), at which time results were acceptable
- septic system type, age, location and performance: conventional sewage system replaced within last 10 years and no issues
- Well location in east side yard and sewage system in rear yard

## 5560 Lombardy Drive

- water treatment: aeration, chlorination, iron filter, water softener
- water potability: owner indicates sulphur is a nuisance and treatment equipment maintenance is excessive and problematic. A lot of frustration as adjacent neighbours don't have similar water quality complaints/issues and onerous treatment costs.
- routine bacterial testing: No, but no issues
- septic system type, age, location and performance: original conventional sewage system in front yard, ~5 years old
- Well location in back yard and sewage system in front yard

#### 5566 Lombardy Drive

- water treatment: proprietary filter media, iron filter and water softener
- water potability: Owner indicates sulphur is present.
- routine bacterial testing: No, but no issues
- septic system type, age, location and performance: original conventional sewage system in front yard, ~5 years old



## • Well location in back yard and sewage system in front yard

A summary of the water quality obtained from the neighbouring wells and copies of well records (where available) are provided as Table II and Attachment B. The original laboratory test results are provided as Attachment G.

Well records for the wells at 5560 and 5566 Lombardy Drive were available for review. The well records indicate that the well depths are 49 metres and 73 metres, respectively. The well at 5529 Osgoode Main Street is much older and no well record could be confirmed. The well cap could not be removed at the time of the site visit to confirm well depth. However, based on the similarity of water quality in that well to the subject wells, it is considered to be obtaining water from the same formation as other bedrock wells in the area. The test wells on the site are between 30 metres in depth (TW3) and 74 and 76 metres in depth for TW1 and TW2, respectively.

The water quality at the existing wells was generally similar to that of the recently constructed test wells, with exceedances of TDS, hardness and hydrogen sulphide. The exception is the well at 5560 Lombardy Drive, which had very high levels of hydrogen sulphide. That well had a hydrogen sulphide level of 8.3 mg/l in the raw water. At the time of sampling the treated water was also sampled to confirm that hydrogen sulphide could be treated to within the aesthetic objective. The treated water had a hydrogen sulphide level of <0.01 mg/l.

## Sampling of Driven Point (Sand point) Wells

Well records review indicates that these wells are not documented and the depths of these wells could not be established with any certainty. However, based on the soil types present in the onsite boreholes and monitoring wells, the sand layer at the site extends to maximum depths of between ~ 4 to 6 metres. The water table is high (less than 2 metres below ground surface) and as driven point wells are generally installed into the water table, they can vary in depth from about 2.5 metres to about 7.6 metres. If driven by weighted hammer or high-pressure water (rather than hand driven), the wells can extend to 15 metres when soil conditions permit (i.e. provided that compacted clay and till or boulders are not encountered). In this case, the maximum depth of driven point wells in this area is probably up to 6 metres as the silty clay underlying the sand would not yield sufficient water and would likely clog the well screens. These wells are highly vulnerable to contamination as there is no separation between any source of contaminants from the surface and the well inlet.

These wells are also susceptible to water shortages during low recharge seasons (summer, drought) and the small diameter (typically 2.5 to 5.0 cm) limits the amount of water available for domestic use.

In order to evaluate the possible source of the nitrates in the shallow receiving water encountered onsite, several water supply wells located up gradient of the site along Osgoode Main Street were sampled for nitrogen species. The civic addresses where water samples were obtained are provided on Figure 3. These dwellings are indicated to be serviced with driven point (i.e. sand point) wells, based on the information provided by the home owners. As driven point wells are not typically exposed at ground surface (connected to plumbing pipes below the frost line) visual confirmation of well locations could not be made. A total of four nearby wells were sampled, as follows: 3216 Reids Lane, 5503, 5519 and 5535 Osgoode Main Street. The original laboratory results are provided as Attachment D. The laboratory results indicate the following nitrate levels in three of the four sampled wells; 12.3 mg/L at 5535 Osgoode Main Street, 30.8 mg/L at 3216 Reids Lane and 22.3 mg/L at 5519 Osgoode Main Street. The nitrate level was <0.10 mg/L at 5503 Osgoode Main Street. This well was later confirmed to be a drilled bedrock well (based on a matching well record using the online database which indicates a drilled well was constructed at that address in 2003). As such, the well at 5503 Osgoode Main Street is not obtaining water from the same aquifer as the other properties and that is why the nitrates were not present in that water sample.

The above noted properties that exist along Osgoode Main Street are all undersized with regards to space for sewage systems and potential for sewage impacts. Although depth of driven point wells could not be determined as no well records were available for review The lot sizes of these properties vary from 0.04 to 0.15 hectares (~0.10 to 0.37 acres). It is considered that these lot sizes are not sufficient to attenuate the nitrates from sewage systems to within acceptable limits. Generally, lot sizes of about 0.4 hectares are necessary to sufficiently dilute sewage effluent, based on the sandy soil conditions in the area. It is understood that some of these properties are not large enough to have sewage systems and at least one of them (3216 Reids Lane) is serviced using a sewage holding tank as the site cannot accommodate a sewage system. These properties have been developed for up to 100 years or more. Generally, they cannot be developed further as the lot sizes are too small to allow for adequate servicing and lot density is not expected to change. As such, the up gradient properties along Osgoode Main Street represent a stable source of nitrogen in the receiving aquifer that has been present for a long time. There have been no significant



changes to development in the area up gradient of the subject site, which has been fully developed dating back to before the earliest available aerial photograph was reviewed for the site (1976 using the City of Ottawa online GeoMaps). As such, it is considered to be a steady state plume, rather than an advancing plume. This is supported by calculating the travel time of groundwater across the site, which provides an indicator of how long the dissolved nitrates in the groundwater up gradient of the site could take to travel across the subject property. This calculation (see below) indicates that it could take from ~1 to ~3 years for sewage effluent from offsite (at or near 3216 Reids Lane) to migrate across the subject property. As the properties have been developed for significantly longer than that, the source of contaminant is considered to be in a steady state (i.e. the contaminant input is not increasing or decreasing). The monitoring wells at the site did not encounter elevated nitrates except for one location.

Further discussion with regards to the proposed development and risk of water quality impacts to or from these properties along Osgoode Main Street is provided (Section 4.4 and 4.5).

## 4.3 Water Quantity

The rawdown and recovery data and plots for TW1, TW2 and TW3 are provided as Attachments H, I and J, respectively. The drawdown and recovery data provided were measured with reference to the top of the well casing at each test well location.

The pumping test data for the test wells were analyzed using the method of Cooper and Jacob (1946). Although the assumptions on which these equations are based are not strictly met, this method provides a reasonable estimate of the aquifer transmissivity. The analysis of the data obtained during the pumping tests is summarized in the attached Table IV. The water levels in observation wells were monitored during the pumping tests at TW1, TW2 and TW3 and the data are provided as Table VII. Where observation well drawdown had occurred, with interference between TW1 and TW2 during the pumping tests at those wells, corresponding curves of that data are provided as Attachment K. TW3 was too distant from TW2 and TW3 for any significant drawdown to be measured.

The following sections discuss the results of the analysis of the data obtained during the pumping tests with respect to test well yields.

## 4.3.1 Test Well TW1

The six hour duration pumping test was carried out at a discharge rate of 65 litres per minute. The static water level prior to testing was about 6.86 metres below the top of the well casing and the water level after six hours of pumping was about 8.24 metres below the top of the well casing for a total drawdown at the end of pumping of 1.38 metres. The available drawdown in the well is about 36 metres. The specific capacity of the well at this pumping rate is approximately 68 cubic metres per day per metre of drawdown.

Based on the pumping test drawdown data the transmissivity of the aquifer is estimated to be 288  $m^2$ /day. Based on the recovery data the aquifer transmissivity is estimated to be 192  $m^2$ /day. The average transmissivity of the bedrock aquifer in the area of TW1 is estimated to be 240  $m^2$ /day. At the end of pumping, 95 percent recovery of the total drawdown in the static water level created during pumping occurred in about 14 minutes.

Based on the data obtained during the pumping test, it can be concluded that the well is capable of sustaining a short term yield of at least 65 litres per minute and that during the course of the six hour pumping period about 4 percent of the available drawdown in the test well was utilized.

## 4.3.2 Test Well TW2

The six hour duration pumping test was carried out at a discharge rate of 62 litres per minute. The static water level prior to testing was about 6.68 metres below the top of the well casing and the water level after six hours of pumping was about 7.72 metres below the top of the well casing for a total drawdown at the end of pumping of about 1.04 metres. The available drawdown in the well is about 36.6 metres. The specific capacity of the well at this pumping rate is approximately 86 cubic metres per day per metre of drawdown.

Based on the pumping test drawdown data the transmissivity of the aquifer is estimated to be 181  $m^2$ /day. Based on the pumping test recovery data, the transmissivity of the aquifer is estimated to be 203  $m^2$ /day. The average transmissivity of the bedrock aquifer in the vicinity of TW2 is calculated to be about 192  $m^2$ /day. At the end of pumping 95 percent recovery of the total drawdown in the static water level created during pumping occurred within about 75 minutes.

Based on the data obtained during the pumping test, it can be concluded that the well is capable of sustaining a short term yield of at least 62 litres per minute and that during the course of the six hour pumping period about 3 percent of the available drawdown in the test well was utilized.

# 4.3.3 Test Well TW3

The six hour duration pumping test was carried out at a discharge rate of 65 litres per minute. The static water level prior to testing was about 4.53 metres below the top of the well casing and the water level after six hours of pumping was about 4.76 metres below the top of the well casing for a total drawdown at the end of pumping of 0.23 metres. The available drawdown in this well is about 20.5 metres. The specific capacity of the well at this pumping rate is approximately 410 cubic metres per day per metre of drawdown.

Based on the pumping test drawdown data the transmissivity of the aquifer is estimated to be 192  $m^2$ /day. Based on the pumping test recovery data, the transmissivity of the aquifer is estimated to be 203  $m^2$ /day. The average transmissivity of the bedrock aquifer in the vicinity of TW3 is calculated to be about 192  $m^2$ /day. At the end of pumping 90 percent recovery of the total drawdown in the static water level created during pumping occurred after 111 minutes. After 7 hours and 25 minutes, the static water level had recovered 100%.

Based on the data obtained during the pumping test, it can be concluded that the well is capable of sustaining a short term yield of at least 65 litres per minute and that during the course of the six hour pumping period about 1 percent of the available drawdown in the test well was utilized.

## 4.3.4 Interference Effects

During pumping of the test wells, observation well drawdown was observed in each of the other test wells to measure interference effects. The data were obtained from pressure transducer loggers and confirmed with manual measurements. The transducer data is provided as Table 7. The mutual interference effects were calculated for a centrally located well (Lot 2) and the well interference at the property boundary was calculated for the down gradient property line along the north side of the site.

In order to estimate the maximum interference between future wells at the site, calculations were carried out to predict the cumulative thirty year drawdown due to the proposed 7 domestic wells at a central well in the proposed subdivision. The cumulative drawdown at the test wells was calculated for a thirty year pumping rate of 1100 litres per day which allows for four persons per household. The following formula was used for the calculation:

$$s = \frac{2.3Q}{4\pi T} \log\left(\frac{2.25Tt}{r^2 S}\right)$$

where Q = 30 year pumping rate, 1100 L/day T = average transmissivity, 203  $m^2/day$ t = duration, 30 years S = storativity, 2.4 x  $10^{-4}$ s = expected drawdown due to each of the other 6 wells r = distance between the observation well and the pumped well, m

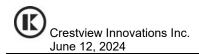
The results of the calculations indicate the thirty year drawdown at a centrally located well due to the interference from the other 6 wells in the subdivision is about 0.038 metres. The mutual well interference at the property boundary due to the 7 proposed wells was also estimated to determine the impact of the proposed development on water supply outside of the site. The expected thirty year drawdown at the site boundary was found to be about 0.044 metres.

Attachment B contains MOE Well Records of surrounding existing wells that were available for The indicated depths of the existing wells range from about 24 to 73 metres and review. accordingly are within an aquifer similar to the test wells which range in depth from about 30 to 76 metres. Based on the estimated thirty year drawdown noted above, the expected drawdown is minimal. All wells for which the MOE Well Records were obtained have sufficient available drawdown such that the slight drop in water level that may occur should have no significant impact on water supply at our adjacent to the proposed subdivision. This provides reasonable assurance of adequate water supply in the proposed subdivision as well as at the existing wells.

## TW1 observation well interference

June 12, 2024

During the pumping of TW1, pressure transducer logging was carried out at TW2 and TW3, located some 45 metres and 117 metres distance, respectively, from TW1. Total drawdown observed at TW2 and TW3 was about 0.39 metres and 0.00 metres, respectively. There was no drawdown response at TW3, which is considered to be due to the greater distance between that well and the



pumped well. In fact, water levels rose slightly in that well during the test and then declined shortly after the test was completed (during recovery interval). It is possible that the water level rose due to the change (i.e. drop) in pressure at the piezometric surface that occurred as a result of the pumping of the adjacent well. The drop in pressure can contribute to a small rise in water levels of adjacent wells, due to the decrease in pressure head. This is indicative that there is a likely connection between the wells, but that the distance between them did not contribute to a drop in water level.

### TW2 observation well interference

During the pumping of TW2, pressure transducer logging was carried out at TW1 and TW3, located some 45 metres and 117 metres distance, respectively, from TW2. Total drawdown observed at TW1 and TW3 was about 0.42 metres and 0.04 metres, respectively.

### TW3 observation well interference

During the pumping of TW3, pressure transducer logging was carried out at TW1 and TW2, located some 117 metres and 118 metres distance, respectively, from TW3. There was no measurable drawdown response in either observation well during the pumping test at TW3. This was considered to be due to the distance between this well and the other wells.

Based on the interference observations, especially that between TW1 and TW3, which are constructed on adjacent proposed lots some 45 metres apart, it is considered that the level of interference is acceptable and will not cause unacceptable drawdown in adjacent future wells at the property.

## 4.4 Groundwater Flow Directions

The groundwater flow directions and gradients in the receiving and water supply aquifers were determined based on the results of a topographic survey of the site and using the static water levels measured at the standpipes (overburden receiving aquifer) and test wells (bedrock water supply aquifer). The site is located in the Rideau Valley watershed, however, the South Nation watershed exists across most of Osgoode Village and the lands to the east and south are in that watershed.

Water levels were measured on several occasions and are provided in the attached Table X.

# 4.4.1 Receiving Aquifer

The static water level elevations measured on various dates for the following monitoring wells installed at BH1, BH3, BH5, BH7-BH11, inclusive, are reported in Table X. Based on that data, the receiving aquifer flow direction is indicated to be northwest across the site (see Figure 6A), generally following the topographic slope at the site. The hydraulic gradients were also calculated (Attachment L) and indicated that the average lateral groundwater flow is about 1.2 metres per day. Vertical hydraulic gradient was established at the location of BH1, based on the installation of a deep standpipe (BH7) and indicate that there is a downward gradient at that location. The vertical groundwater flow is about 0.5 m/day.

Based on the gradients and the permeability of the sandy soil (calculated in Section 3.1), groundwater flow across the site migrates in a lateral direction of about 1.2 m/day (based on water elevations taken February 27, 2024). The groundwater flow direction is expected to be to the northwest across the site. The groundwater flow direction in the shallow aquifer is consistent with the topographical slopes at the site and the local influence of the Rideau River to the west/northwest.

## 4.4.2 Bedrock Water Supply Aquifer

The static water elevations at TW1, TW2 and TW3 are provided below. Based on that data, the supply aquifer groundwater flow direction is indicated to be east-southeast across the site (see Figure 6b). A review of Source Protection Mapping for communal wells in Wellhead Protection Areas for Richmond, Kemptville and Greely (Shadow Ridge subdivision) all indicate that the regional groundwater flow direction in those areas is predominantly eastward, which follows a similar trend that was measured in the onsite water supply wells. As such, the groundwater flow direction observed in the onsite wells is considered to be representative of the regional flow directions which are predominantly eastward.

Test Well	Top of Casing								
	Elevations	Elevations	May 5, 2021	March 3, 2022					
	(masl)	(masl)							
TW1	93.17	92.78	86.45	86.07					
TW2	93.08	92.60	86.55	86.09					

	Hydrogeological Inve	estigation and Terrain Evaluation
Crestview Innovations Inc.		3200 Reids Lane, Ottawa, Ontario
June 12, 2024	-38-	210064

<b>T</b> 14/0			07.07	07.00
1003	91.90	91.34	87.37	87.22
_				_

The site is located on the border of the RVCA and SNC watersheds. The regional groundwater trend in South Nation is primarily eastward in the western part of that watershed.

# 4.5 Development Impacts and Neighbouring Land Uses

A description of existing and historical land uses at and near the site with the potential to impact the water supply at the site was previously noted (Section 3.1.2 Land and Water Use Conflicts). The existing land use up gradient of the site in terms of the deeper bedrock aquifer (i.e west-northwest) consists of scattered single family dwellings and agricultural lands, with the Rideau River some 2.4 kilometres to the west. The results of the water quality testing at the test wells indicate that there is no significant impact on the deeper aquifer at the site due to the surrounding residential and agricultural development.

The topographical slopes and the shallow groundwater flow direction within the overburden at the site are to the northwest, based on the shallow monitoring wells installed as part of the current hydrogeological and terrain investigation. A review of current and historical land uses in the area suggests that the up gradient land (to the south and southeast) is fully developed with residential and commercial development including up gradient potential sources of contamination, especially hydrocarbons, due to current and former automotive garages and service stations. Previous environmental investigation was carried out by Dillon Consulting which included soil and groundwater testing. In 2017 and 2018, two rounds of groundwater testing were carried out on five shallow monitoring wells installed across the subject property. The overburden groundwater flow direction was estimated to be to the north, based on those monitoring wells. Water samples were tested for metals, select VOCs (BTEX), PHCs and PAHs. The concentrations of the above noted parameters were all within the Table 2 Standards (O. Reg. 153/04 Table 2 Standards 2011, for potable groundwater). Since that time, there has been no new development of properties that could cause hydrocarbon contamination at the subject site. It is considered that there are no current impacts at the site from up gradient sources. All three drilled water supply wells installed at the site were tested on March 4, 2022, for PHCs F1-F4 and VOCs. None of the tested parameters were measured above the method reporting limits, indicating that there was no presence of any of these parameters in the water supply wells.

Based on the sampling of sand point wells up gradient of the site, and the nitrate level in one onsite shallow monitoring well, there are elevated nitrogen (nitrate) levels in the receiving aquifer up gradient of the site and an isolated elevated groundwater nitrate level onsite. The monitoring wells onsite have not observed any increase in nitrates at the site, despite the elevated nitrates in the up gradient properties.

# 4.5.1 Impact to Surface Water Quality and Quantity

There are no surface water bodies at the site or within at least 250 metres or more. The closest water body is an unnamed watercourse that exists some 280 metres east-northeast of the site that is a tributary to the Doyle Creek municipal drain. Since the receiving aquifer at the site flows to the northwest, it is unlikely that the post development site could impact the surface water body that is up gradient of the site.

# 4.6 Well Construction Methodology

Future wells drilled on the site should be constructed with a minimum 6 metres length of casing through the overburden and set at least 3 metres into the sound bedrock. The steel casing placed in the auger holes should be pressure grouted or displacement grouted into place. The material used to seal the annular space could consist of either a cement grout or a commercially available bentonite grout product. Cement grout mixtures should be allowed to set for a minimum two day period for normal cement or twelve hours for a high early strength cement prior to advancing the well further into bedrock. If a bentonite grout product is used, drilling need only be suspended for a few hours depending on the product used. Bentonite grout has the additional advantage of remaining flexible when set and therefore will not crack or shrink thereby ensuring as well as possible that surface water or shallow groundwater will not migrate along the annular space and into the well bore.

Once the casing has been sealed, the well should be advanced uncased in the bedrock until a water supply of sufficient quantity and quality is encountered, as per the following Table.

Target Depths	Bedrock	Target	Target	Well	Comments
(in order of	Description	Fracture	Well Depth	Yields	



preference)		depths (metres)	(metres)	(L/min)	
1	Upper Limestone	20 to 31	30 to 31	60 to 65	If insufficient well yields then proceed to Target Aquifer 2
2	Deeper Limestone with possible secondary sandstone mix	72 to 75	74 to 76	60 to 65	Water quality will yield hydrogen sulphide in the range of 0.3 to 1.2 mg/L, requiring treatment using aeration.

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Avoidance Depths	Bedrock Description	Avoidance Fracture depths (metres)	Comments
Between Target Aquifer 1 and 2	Limestone	36 to 41	Proceed to Target Aquifer 2. If water fractures are encountered at these depths, they are likely to encounter hydrogen sulphide levels of 8 mg/L, which requires oxidizing chemicals and/or filtration, possible other pre- treatment, costly and requires significant maintenance.

The completed well should then be developed to maximize the yield. The well casings should be completed at least 400 millimetres above the highest point on the finished ground surface within three metres radially from the well after surface drainage is directed away from the well. The casing should be fitted with a pitless adapter to facilitate below ground plumbing and electrical connections. Surface grading should be completed to direct surface water away from the well in order to ensure that water will not collect or pond in the vicinity of the well.

## 4.7 Post Development Monitoring Program

The results of this investigation indicate acceptable existing and expected impact on the groundwater quality at this site based on the assessment of existing neighbouring land uses and the proposed development. The existing background nitrate impacts within the receiving aquifer at the site are generally acceptable for development. The elevated nitrate levels encountered in the up gradient portion of the site are from long time development on undersized properties that have been developed for greater than fifty years. This is considered to be a stable source that is not advancing or increasing on the subject site. There is also no indication of nitrate impacts in the bedrock water supply aquifer in the existing development up gradient of the site, based on the

testing of two bedrock wells that are located up gradient of the site or int he water supply wells that are located onsite. This combined with the soil conditions at the site indicate that a confining unit/aquitard of silty clay and glacial till soils is present at the site. This is reasonable assurance that there is sufficient protection of the water supply at the site from existing and future sewage systems.

The local hydrogeological conditions and existing water quantity and quality all indicate that the impact of the proposed development will not significantly impact the overall groundwater quality and quantity at the site. Septic effluent dilution calculations, which by experience are known to be a conservative estimate of actual impact, indicate that septic system impact at the site is within MECP requirements. There are only seven residential lots proposed for development. Accordingly, a groundwater monitoring program is not considered necessary for this site.

It is understood that a dedicated well, constructed similarly to the drilled water wells that were constructed onsite is to be provided for the City of Ottawa.

# 5.0 SUMMARY AND CONCLUSIONS

The report findings indicate that there is sufficient water quality and quantity to supply the proposed development, with appropriate treatment recommendations. The interference calculations indicate that the impact to water supply on the existing development is within allowable limits.

The groundwater impact assessment indicates that the proposed development impact will not cause Based on the terrain evaluation and groundwater supply investigation at the proposed residential subdivision and the subsequent analysis of the data collected, the following summary and conclusions are provided:

1) Class IV sewage disposal systems with partially raised leaching beds will likely be used at this site depending on the lot specific soil and groundwater conditions. The leaching beds should be constructed to conform to the specifications set out in the Ontario Building Code. Any partially raised leaching beds should be constructed of imported sand having a percolation time of between 6 and 8 minutes per centimetre with less than 5 percent passing the #200 (0.074 mm) sieve. It is recommended that gradation analyses be carried out on

any potential sand fill prior to leaching bed construction in order to verify that the percolation time of the fill material is acceptable.

2) There is a sufficient groundwater supply of acceptable drinking water quality in the bedrock aquifer system to satisfy the water requirements of the proposed subdivision. It is indicated that most wells will be drilled to depths of about 30 metres to 76 metres and that individual well yields of 62 to 65 litres per minute will be typical. The following Table provides well construction details to be followed for any future wells on the subject property:

Target Depths (in order of preference)	Bedrock Description	Target Fracture depths (metres)	Target Well Depth (metres)	Well Yields (L/min)	Comments
1	Upper Limestone	20 to 31	30 to 31	60 to 65	If insufficient well yields then proceed to Target Aquifer 2
2	Deeper Limestone with possible secondary sandstone mix	72 to 75	74 to 76	60 to 65	Water quality will yield hydrogen sulphide in the range of 0.3 to 1.2 mg/L, requiring treatment using aeration

Avoidance Depths	Bedrock Description	Avoidance Fracture depths (metres)	Comments
Between Target Aquifers 1 and 2	Limestone	36 to 41	If water fractures are encountered at these depths, they may encounter high hydrogen sulphide levels of ~ 8 mg/L, treatment requires oxidizing chemicals and/or filtration, possible other pre-treatment, costly and requires significant maintenance

The area well record review indicates that of the 34 water wells that are present within 150 metres of the site, twenty (20) wells have encountered sufficient well yields at depths of 10 to 31 metres depth. A total of nine (9) wells have been drilled to depths of 73 to 104 metres and have encountered sufficient well yields. Some five (5) wells have been drilled to depths of between 36 and 41 metres.

The study findings recommend the following with regards to construction and placement of water supply wells at the site:

- The well water supply at the site is suitable to provide in excess of 3000 litres/day, which is sufficient for a typical single family dwelling. The minimum well yield, as per MOE D-5-5, is 22.7 litres per minute (5 igpm).
- Well Placement: Wells should be located at least twice the grade raise plus 15 metres from the fully raised leaching beds, and at least 15 metres from septic tanks. Clearance distances for treatment units and distribution piping shall conform to OBC Tables 8.2.1.6. A and 8.2.1.6. B. Wells should be located such that surface water will not pool around the wellhead and the ground surface around the well should be the highest point for at least 3 metres radially outward.
- Well casings should be extended a minimum of 0.4 metres above the final finished ground surface at the well.
- Casing for wells shall extend through the overburden and set into the sound bedrock. The typical casing depth will be between some 18 to 21 metres, depending on the bedrock depth at each well location.
- Grouting procedure:

- the annulus of the casing should be pressure injection grouted from the bottom of the casing up

-the material used to seal annular space could consist of either a cement grout or a commercially available bentonite grout product and should be allowed to set prior to advancing the well further into bedrock; minimum two day period for normal cement, minimum twelve hours for a high early strength cement, or a few hours for a bentonite grout, depending on the product used

-the well grouting operation and well casing length should be inspected and approved by an experienced hydrogeologist or geotechnical engineer to ensure that the grouting procedure and casing length are in accordance with the site hydrogeological investigation report and Ont. Reg. 903

- 3) There is a sufficient groundwater of acceptable drinking water quality in the bedrock aquifer system at this site as it meets all the ODWS concentrations for all health related chemical, physical and bacteriological parameters tested except for the following:
  - Hardness:

Future wells at the site are expected to have hardness levels of between about 211 to 310 milligrams per litre. The recommended water treatment consists of ion exchange water softeners and maintaining a separate unsoftened water supply for drinking and culinary purposes.

• Total dissolved solids:

Some future wells at the site may slightly exceed the aesthetic objective of 500 mg/l for TDS at levels of 539 to 618 milligrams per litre. The Ryznar Stability Indices (RSI) and Langelier Saturation Indices (LSI) were calculated for the samples where TDS exceed with RSI of 7.1 to 7.5, and LSI of 0.25 and 0.50, indicate that the formation of calcium carbonate (i.e. scaling) does not lead to a protective corrosion inhibitor film on metal fixtures and pipes. However, there RSI value is less than 8, indicating that the water is not corrosive either. LSI values are corresponding positive, but close to zero, which indicates that the water has borderline scale potential, such that minor changes in the water quality, temperature could change the scale or corrosive potential of the water. The noted levels of TDS and the individual components that contribute to it include hardness and elevated chlorides (155 to 180 mg/l) albeit within the operational guideline for hardness and the aesthetic objective (AO) for chlorides. Treatment that removes hardness (i.e. water softeners) will reduce the scale potential. The palatability of water with chlorides less than the aesthetic objective of 250 mg/l are considered to be good.

• Hydrogen Sulphide:

Future wells constructed to depths of 36 metres and deeper are expected to encounter hydrogen sulphide above the aesthetic objective of 0.05 mg/l, at levels of ~ 0.24 to 1.10 mg/l. Hydrogen sulphide produces an odour and can affect the taste of water. When present in water with iron, it can also cause black staining of laundry items, black deposits on pipes and fixtures. Well construction methods are provided to ensure that very high levels of hydrogen sulphide can be avoided. This requires that wells that are deeper than 30.5 metres should be constructed to at least 72 metres to ensure that the water fractures that produce excessive hydrogen sulphide levels (up to 8 mg/l) are avoided. Treatment to reduce sulphide includes aeration. Higher levels of sulphide where iron staining is also an issue (rust staining) may require treatment using chlorination followed by iron filter. Based on the sulphide levels at the site, it is considered that aeration is sufficient to reduce sulphide in the treated water. The type

of treatment should be established on a case-by-case basis by a water treatment specialist based on the analysis of chemical parameters tested for each individual well. Through consultation with a water treatment company, based on the hydrogen sulphide levels noted at two of the test wells, the recommended treatment is air capsulate unit (i.e. Zentec Air Capsulate Filter). These units can be supplied by any water treatment company or their equivalent in other brands. The typical cost of the system is ~ \$2,200 plus installation fees. These systems typically have a warranty of up to 20 years and have a regenerative filter so there is little maintenance or replacement parts.

• Organic Nitrogen:

Organic nitrogen levels may be slightly elevated at 0.17 to 0.20 mg/l, in some future wells, compared to the operational guideline (OG) of 0.15 mg/l. Organic nitrogen is calculated by subtracting the ammonia from the Total Kjeldahl Nitrogen. Organic nitrogen has an OG due to its interaction with chlorine used in water treatment causing taste problems in the treated water. There is a correlation between DOC and organic nitrogen. Organic nitrogen levels above 0.15 mg/l are associated with DOC levels of 0.6 mg/l or greater. As groundwater is typically not treated using chlorine, the potential presence of organic nitrogen in some wells does not require treatment.

• Sodium:

The sodium levels at all three test wells were between 64 and 98 mg/l, above the 20 milligrams per litre advisory level, whereby the local Medical Officer of Health should be notified when the sodium concentration exceeds 20 mg/L so that this information may be communicated to local physicians for their use with patients on sodium restricted diets. The sodium levels were well within the aesthetic objective of 200 mg/l. It is recommended that if water softeners are used to treat hardness and TDS levels, that an untreated drinking water tap is installed in the kitchen to ensure that excessive sodium levels in treated water are not consumed. The City of Ottawa public health should be notified of the sodium exceedance in the raw water supply.

4) Mutual water level interference effects between neighbouring wells in the proposed subdivision are expected to be minimal. The impact of future wells at the proposed subdivision on neighbouring existing wells is expected to be minimal. 5) Future wells drilled on this property should be constructed with casing through the upper portion of bedrock and set into the sound bedrock. Minimum casing lengths of about 18 to 21 metres are typical depending on depth to bedrock at each well location. The annulus of the casing should be grouted using a pressure injection method. Casing and grouting should extend to at least 6 metres below the existing ground surface. Well casings should be extended a minimum of 0.4 metres above the final finished ground surface at the well. Ontario Building Code setbacks shall be maintained.

Crestview Innovations Inc.

June 12, 2024

- 6) It is considered that the type of existing surrounding land use adjacent to the subject property should not impact the subject site from a water supply or water quality point of view.
- 7) Based on the terrain assessment and including construction recommendations and mitigative measured proposed for this development, the groundwater impacts from the proposed 7 lots at this site are within acceptable limits established by the MECP and there is no adverse impact on the use of groundwater on existing and future down gradient properties.

8) The study findings recommend the following with regards to construction of septic systems at the site:

- Partially raised leaching beds will likely be required at this site depending on the lot specific soil and groundwater conditions.
- Leaching beds should be constructed to conform to the specifications set out in the Ontario Building Code.
- Imported sand with a percolation time of between 6 and 8 minutes per centimetre and less than 5 percent passing the #200 (0.074 mm) sieve should be used to construct the raised leaching beds.
- In situ percolation rate tests and/or gradation analyses should be carried out on any potential sand fill or native sand material prior to leaching bed construction in order to verify that the percolation time is acceptable.
- The locations of sewage systems and wells should be placed in accordance with the Lot Development Plan with sewage systems located on the west sides of the lots with wells in the east side of the lots. This will ensure that wells are up gradient of sewage systems on

each lot and maximize separation distances between sewage systems and wells on adjacent properties.

- Any change to the placements of the wells and/or sewage systems on any individual lot shall ensure that there is no impairment to the placement of wells and sewage systems on adjacent lots and that the other lots can still follow the Preliminary Grading & Site Servicing Plan.
- The wells must be accessible for servicing in future. This is interpreted as a minimum 3 to 5 metres of space between the front and rear yards where a drill rig could access the rear yard. Based on the side yard setbacks of at least 3 to 5 metres that are provided in the attached Lot Development Plan, it is considered that this is sufficient space to ensure well access.

## Test Well Abandonment:

There are currently three test wells that were drilled on the subject site including TW1 (Lot 7), TW2 (Lot 6) and TW3 (Lot 1). These wells can be used as future water supply wells provided that the following is verified and/or carried out:

- wells shall be minimally three metres from the property lines in order to ensure that positive drainage is occurring away from the well head;
- wells shall meet or exceed the minimum separation distances to sewage systems and sewage tanks indicated by the Ontario Building Code; and
- wells should be protected from damage during construction.

Existing on-site monitoring wells, including the boreholes BH1, BH3 and BH5, should be properly decommissioned in accordance with Ontario Well Regulation 903. A record of well abandonment should be produced for each well, prior to any construction at the site.

9) The maximum building footprint, based on the Terrain Study, is 600 m<sup>2</sup>, which includes driveways and single family dwellings. Larger building envelopes and/or coach houses and/or ground source heat pumps have not been evaluated as part of the Hydrogeology and Terrain Study. Any proposed use of these systems and/or larger building footprints and coach houses would require a hydrogeological assessment and/or terrain analysis.

12) Homeowners should be provided with information regarding well water testing, well maintenance and water and energy conservation. Homeowners should be referred to the MOE publication *Water Supply Wells – Requirements and Best Management Practices* manual, April 2015. Additional information and links on water conservation measures are offered at the *wellaware.ca* website.

# 6.0 **RECOMMENDATIONS**

The following recommendations are made, based on the report findings:

- 1) Well Construction:
  - All wells drilled on this property shall be constructed in accordance with Ontario Well Regulations 903. The well casing shall extend through the overburden and sealed into the bedrock with suitable sealant. The typical casing depth will be between some 18 to 21 metres, depending on the bedrock depth at each well location.
  - It is recommended that drinking water wells be drilled to the target depths, as noted below in order of preferred water supply, and well construction should proceed as follows:

# TARGET DEPTH 1:

The preferred target depth is within the upper limestone aquifer where well yields in the range of 60 to 65 L/minute are anticipated. Where well yield is not sufficient, effort should be made, including surging or fracturing of the well at the preferred Target Depth 1 (as described in the Table below), to improve yield. If sufficient well yield is not achieved, then proceed to drill well as noted for Target Depth 2.

# > TARGET DEPTH 2:

The well should be extended to the second target depth, where limestone and sandstone mix are encountered, as noted below.

## > <u>AVOIDANCE DEPTH:</u>

Most area wells are not drilled to these depths. If insufficient water is encountered at Target Depth 1, wells should be drilled to the Target Depth 2.

Target Depths (in order of preference)	Bedrock Description	Target Fracture depths (metres)	Target Well Depth (metres)	Well Yields (L/min)	Comments
1	Upper Limestone	20 to 31	30 to 31	60 to 65	If insufficient well yields then proceed to Target Aquifer 2
2	Deeper Limestone with possible secondary sandstone mix	72 to 75	74 to 76	60 to 65	Water quality will yield hydrogen sulphide in the range of 0.3 to 1.2 mg/L, requiring treatment using aeration

Avoidance Depths	Bedrock Description	Avoidance Fracture depths (metres)	Comments
Between Target Aquifers 1 and 2	Limestone	36 to 41	If water fractures are encountered at these depths, they may encounter high hydrogen sulphide levels of ~ 8 mg/L, treatment requires oxidizing chemicals and/or filtration, possible other pre-treatment, costly and requires significant maintenance.

- The locations of the existing test wells on Proposed Lots 1, 6 and 7 are considered to be suitable such that these wells can remain in place and be used as the water supply wells for those lots as shown in the Lot Development Plan, provided that all development setbacks and Ontario Building Code setback distances are maintained. If any water supply well(s) is to be abandoned, it shall be decommissioned by a licensed well contractor and a record of well abandonment shall be provided to the City and the Ministry of the Environment, Conservation and Parks prior to any building permit being issued for that lot.
- Grouting procedure:

- Certificate of Well Compliance shall be provided to the City of Ottawa and be certified by a Professional Geoscientist or a Professional Engineer and shall be constructed and located as per the Lot Development Plan (Figure 7) and this report including provision of a Certificate of Well Compliance to the City of Ottawa for any new future well(s); and

- The entire annulus of the casing should be pressure injection grouted from the bottom of the casing up; and

- The material used to seal annular space could consist of either a cement grout or a commercially available bentonite grout product and should be allowed to set prior to advancing the well further into bedrock.

- 2) The wells must be accessible for servicing in future. This is interpreted as a minimum 3 to 5 metres of space between the front and rear yards where a drill rig could access the rear yard. Based on the side yard setbacks of at least 3 to 5 metres that are provided in the attached Lot Development Plan, it is considered that this is sufficient space to ensure well access.
- 3) Water Quality and Quantity:

The water quality at the site meets all health and aesthetic objectives except for the following:

> Sodium

Sodium is above the medical advisory level of 20 mg/L for those who require a sodium reduced diet. When sodium levels exceed 20 mg/L, the local Medical Officer of Health should be informed so that the information can be relayed to local physicians. Sodium levels in untreated raw drinking water are expected to be ~60 to 100 mg/L.

> Hardness and Total Dissolved Solids

Future wells at the site are expected to have hardness levels of between about 211 to 310 milligrams per litre. Total dissolved solids may be present above 500 mg/L, due to excessive hardness and the water has scale forming potential. Recommended treatment consists of water softeners and maintaining a separate unsoftened water supply, if desired, for drinking and culinary purposes.

> Hydrogen Sulphide

For wells that obtain water from the deeper target depth, they are expected to encounter hydrogen sulphide above the aesthetic objective of 0.05 mg/l, at levels of ~ 0.24 to 1.10 mg/l. Hydrogen sulphide produces an odour and can affect the taste of water. When present in water with iron, it can also cause black staining of laundry items, black deposits on pipes and fixtures. Well construction methods are provided to ensure that very high levels of hydrogen sulphide can be avoided. This requires that wells that are deeper than 30.5 metres should be constructed to at least 72 metres to ensure that the water fractures that produce excessive hydrogen sulphide levels (up to 8 mg/l) are avoided. Where hydrogen sulphide is present, it is recommended that the type of treatment should be

established on a case-by-case basis by a water treatment specialist based on the analysis of chemical parameters tested for that individual well. An aeration system (i.e. Zentec Air Capsulate Filter). These units can be supplied by any water treatment company or their equivalent in other brands. The typical cost of the system is ~ \$2,200 plus installation fees. These systems typically have a warranty of up to 20 years and have a regenerative filter so there is little maintenance or replacement parts.

- 4) Sewage Systems:
- The proposed sewage systems to service each lot shallow be partially raised Class IV leaching beds, depending on the lot specific soil and groundwater conditions. The use of Level IV treatment systems may be installed if desired to achieve higher treatment and reduce space requirements.
- The proposed sewage systems shall be located in the general locations as shown in the Lot Development Plan (Figure 7). While the exact placement of the dwelling, well and sewage system on each lot may vary somewhat from what is shown, the general layout shall be maintained.
- 5) The maximum building footprint for each lot is 320 square metres.
- 6) Coach houses or Secondary dwelling units would require an evaluation of the well water quality, quantity and the adequacy of the existing septic system and groundwater impact assessment at the time of application for a building permit for the secondary unit or coach house.
- 7) Open loop groundwater heat pumps are not approved for use on this property due to the proximity of neighbouring wells and potential for well interference.
- 8) Homeowners shall be made aware of their responsibilities with regards to well maintenance in accordance with O. Reg. 903 and proper sewage system construction and maintenance requirements. Homeowners are referred to the following resources:
  - MOE publication Water Supply Wells Requirements and Best Management Practices manual, April 2015 available at <<u>https://www.ontario.ca/document/water-</u> <u>supply-wells-requirements-and-best-practices</u>>. Additional information and links on water conservation measures are offered at the *wellaware.ca* website.



Ontario Wastewater Association <u>https://www.oowa.org/homeowner-resources/</u> for sewage system information and maintenance resources.

Regards,

Kollaard Associates Inc.

PROFESSIONAL LICENSED ENG July/16/24 NF C. E. VERMEERSCH 100183397 Po ONT NCE OF

Colleen Vermeersch, P. Eng.



# **BOREHOLE BH01**

**PROJECT:**Proposed Residential Subdivision

CLIENT: Crestview Innovations Inc.

LOCATION: 3200 Reids Lane

PENETRATION TEST HAMMER: 63.5 kg, Drop, 0.76 mm

PROJECT NUMBER:210064 DATE OF BORING: 2021-02-10 SHEET:1 of 1

DEPTH SCALE (meters)	SOIL PROFI	LE			SA	AMPL	ES			<b>HEAR</b> Cu. kF		REN		1	DY PE	NAI NE	MIC TRA		ONE ON		КЕ (%)	PIEZOMETER OR STANDPIPE
H SC. eters			РГОТ		ER	Е	0.3m			EARS						Т	EST	Г			MOISTURE CONTENT (%)	INSTALLATION
É L E L	DESCRIPTION	DEPTH	STRATA PLOT	ELEV.	NUMBER	түре	BLOWS/0.3m	0		Cu. kl		0	o				s/300				MOI	
	Topsoil (FILL)	(m) 0.00	<u>م ۲</u>	(m) 92.89				0 2	<u>20 4</u>	40	<u>60</u>	80	100	0	20	40	) 6	0	80	100	0	
- 7	Yellow brown sand and gravel	0.15	<u>××××</u>	92.74 92.59	1	SS	WН	-														
t 7	(FILL)////////	0.70	1	92.19	2	SS	WH								_					_	-	
	Red brown fine to medium /	1.37		91.52	0	00																
2.0	SAND, trace silt / Grey fine to medium SAND				3	SS	WН								-						-	
t 1					4	SS	WН															
					5	SS	wн															
4.0	Borehole continued as	3.66		89.23	-	00																
	probehole																					
																						Water observed in
6.0																					-	borehole at
																						approximately 1.5 metres below the
															_							existing ground surface, February
[ ]																						4, 2021. Water measured in
8.0															_							standpipe at approximately 0.5
																						metres below the
																						existing ground surface, February
10.0																						12, 2021.
12.0																					-	
[ ]																						
_14.0_															-		_				-	
<u>+                                     </u>	Practical refusal on large	14.52		78.37																		
	boulder or bedrock																					
DEPTH	I SCALE: 1 to 100																		LOC	GGE	<b>=D</b> : D	Г
BORIN	G METHOD: Power Auger					AUGI	ER TY	<b>PE:</b> 2	200 m	nm Ho	ollow	Ste	em						CHE	ECK	<b>(ED:</b> 8	SD



# **BOREHOLE BH02**

**PROJECT:**Proposed Residential Subdivision

CLIENT: Crestview Innovations Inc.

LOCATION:3200 Reids Lane

PENETRATION TEST HAMMER: 63.5 kg, Drop, 0.76 mm

						SAMPLES UNDIST SHEAR STRENGTH D											_				
DEPTH SCALE (meters)	SOIL PROFI	ILE			SAMPLES			$\_$ x Cu. kPa x									IIC C RAT			MOISTURE CONTENT (%)	PIEZOMETER OR STANDPIPE
SC. ters			гот		R		3m										EST			ΪŢ	INSTALLATION
TH (me	DESCRIPTION	DEPTH	STRATA PLOT	ELEV.	NUMBER	түре	BLOWS/0.3m	REI 0	N SHE	<b>EAR</b> Cu. I		EN	GTH 0		b	lows	/ <b>300</b> i	mm		SIS	
DEF			STRA	(m)	l∃	-	BLO				60	8	0100							≥ö	
	TOPSOIL	(m) 0.00	711 - 7	91.16						Ĭ	Ť				20						
	Grey fine to medium SAND	0.40		90.76	1	SS	WH														
		0.40		50.70																	
					2	ss	WН							-							
								-													
					3	ss	wн														Ţ
2.0	Grey SILTY CLAY, some sand	1.80		89.36		55	VVII							-							
	Grey fine to medium SAND,	2.60		88.56	4	SS	WH														
	some silt, trace clay													_				_			
					5	ss	wн														
								-													
4.0	Grey SILTY CLAY	3.86		87.30	6	ss	wн	1										_			
					0	33															Water observed in borehole at
								1													approximately 1.8
					7	SS	WH														metres below the existing ground
								1													surface, February
								0	×												4, 2021.
6.0								0	×												
					8	ss	wн	1													
					0	33															
								0	×												
	Grey silty sand, trace to some	7.15		84.01				ľ													
	gravel, cobbles and boulders.							1													
8.0	trace clay (GLACIAL TILL)				9	SS	wн														
								-													
			H)		10	<u> </u>															
			1			SS	WН														
	End of borehole in GLACIAL TILL	8.99		82.17																	
	TILL																				

DEPTH SCALE: 1 to 75

LOGGED: DT

BORING METHOD: Power Auger

AUGER TYPE: 200 mm Hollow Stem

CHECKED: SD

PROJECT NUMBER:210064 DATE OF BORING: 2021-02-04 SHEET:1 of 1



# **BOREHOLE BH03**

**PROJECT:**Proposed Residential Subdivision

CLIENT: Crestview Innovations Inc.

LOCATION:3200 Reids Lane

PENETRATION TEST HAMMER: 63.5 kg, Drop, 0.76 mm

ocALE (ers)	SOIL PROF	ILE			SA	AMPL	ES	-	DIS x		IEAI ;u. k	-		IGTH X				IC CO RATI			₩ %	PIEZOMETER OF STANDPIPE
ucrin sur (meters)	DESCRIPTION	DEPTH	STRATA PLOT	ELEV.	NUMBER	түре	BLOWS/0.3m	<b>R</b> 0	<b>ЕМ</b> о 20	C		STRI kPa 60	C	5 <b>TH</b> 5 0 100 (	n <sup>,</sup>	blc 20		ST 300 n 60	<b>1m</b> 8010	0	MOISTURE CONTENT (%)	INSTALLATION
_	TOPSOIL	(m) 0.00	<u>×17</u> .	(m) 90.39	1	SS	wн			<u> </u>						20	40	00	001			
	Grey fine to medium SAND	0.40		89.99																		
_	Grey SILTY CLAY, some sand	1.10		89.29	2	SS	wн							_								¥ ₹
2.0					3	SS	wн							_			_					
	Grey fine to medium SAND, some silt, trace clay	2.33		88.06	4	SS	wн															
	End of borehole in SAND	2.89	<u> </u>	87.50																		

Water observed in borehole at approximately 0.9 metres below the existing ground surface, February 4, 2021. Water measured in standpipe at approximately 1.4 metres below the existing ground surface, February 12, 2021.

PROJECT NUMBER:210064

SHEET:1 of 1

DATUM:GEODETIC

DATE OF BORING: 2021-02-04

DEPTH SCALE: 1 to 75

LOGGED: DT

BORING METHOD: Power Auger

AUGER TYPE: 200 mm Hollow Stem

CHECKED: SD



# **BOREHOLE BH04**

**PROJECT:**Proposed Residential Subdivision

CLIENT: Crestview Innovations Inc.

LOCATION:3200 Reids Lane

PENETRATION TEST HAMMER: 63.5 kg, Drop, 0.76 mm

PROJECT NUMBER:210064 DATE OF BORING: 2021-02-03 SHEET:1 of 1

DATUM:GEODETIC

DEPTH SCALE (meters)	SOIL PROF	ILE			SA	MPL	ES			<b>IEA</b> Cu. k		RE	NGTH ×			NET	IIC C				PIEZOMETER OR STANDPIPE
H SC eters	RECORDENCY		PLOT		BER	ц	/0.3m	REM	N SHE	AR	STR	RENO	GTH			TI	EST			STU	INSTALLATION
EPT (m	DESCRIPTION	DEPTH	STRATA PLOT	ELEV.	NUMBER	түре	BLOWS/0.3m	0	(	Cu. I	kPa		0				300				
	Topsoil (FILL)	(m) 0.00	00	(m) 92.54 92.39				02	<u>20 4</u>	10 	60	8	0100	0	20	40	60	3 (	30100	)	
	Yellow brown sand and gravel (FILL)	0.15		92.39	1	SS	WH														
						~~~															
- 🕇	TOPSOIL	1.15		91.39	2	SS	WH														Σ
	Red brown fine to medium SAND, trace silt	1.30		91.24	3	SS	wн	-													<u>-</u>
2.07	Grey fine to medium SAND	1.80		90.74	5	33	VVII														
					4	SS	wн	1													
					-	00	••••	-													
					5	SS	wн	1													
	Grey SILTY CLAY, some sand	3.60		88.94				-													
4.0	·				6	SS	WН														Water observed in
								-													borehole at
+	Grey fine to medium SAND,	4.72		: 87.82	7	SS	WН														approximately 1.5 metres below the
	some silt, trace clay							-													existing ground surface, February
					8	SS	WН														4, 2021.
6.0	Grey SILTY CLAY	6.09		86.45																	
	GIEV SILTT CLAT	0.09		00.45	9	SS	WH														
								0	×												
								0	×												
								-													
8.0					10	SS	WH													_	
								0		×											
								0				×									
						~~~	\	1													
					11	SS	WН														
	End of borehole in SILTY CLAY	9.75		82.79																	
DEPTH	<b>I SCALE</b> : 1 to 75																	LC	OGG	ED: I	от
	G METHOD: Power Auger						ер ту	<b>PE:</b> 2	200 m	m L		w St	om					C		KED:	SD

AUGER TYPE: 200 mm Hollow Stem



# **BOREHOLE BH05**

**PROJECT:**Proposed Residential Subdivision

CLIENT: Crestview Innovations Inc.

LOCATION:3200 Reids Lane

PENETRATION TEST HAMMER: 63.5 kg, Drop, 0.76 mm

#### PROJECT NUMBER:210064 DATE OF BORING: 2021-02-03 SHEET:1 of 1

DATUM:GEODETIC

ALE	SOIL PROF	ILE			SA	MPL	ES	U				<b>R ST</b> kPa		GTH X				Ļ	₽ (%)	PIEZOMETER OR STANDPIPE
DEPTH SCALE (meters)	DESCRIPTION	DEPTH	STRATA PLOT	ELEV.	NUMBER	түре	BLOWS/0.3m	0	REM o	SHI	EAR	s <b>STR</b> kPa 60	ENG c	TH	bl	EST /300	) mi		MOISIURE CONTENT (%)	INSTALLATION
	TOPSOIL	0.00	<u> </u>	91.37	1	SS	8			<u> </u>				100 0						500 500
	Red brown fine to medium SAND	0.45		90.92	2	SS	12													
	Grey fine to medium SAND	1.20		90.17																
2.0					3	SS	4										_	_		
· _				•	4	SS	3													
- <u>-</u>	Grey SILTY CLAY, some sand	3.20		88.17	5	SS	2													
4.0					6	SS	32													
	End of borehole in SILTY CLAY	4.42		86.95																
																				Water observed in borehole at approximately 1.2 metres below the existing ground surface, February 3, 2021. Water measured in standpipe at approximately 1.7 metres below the ovicting ground

LOGGED: DT

existing ground surface, February 12, 2021

BORING METHOD: Power Auger

DEPTH SCALE: 1 to 75

AUGER TYPE: 200 mm Hollow Stem

CHECKED: SD



DEPTH SCALE (meters)

2.0-

4.0

6.0

TILL

Kollaard Associates Engineers

# **BOREHOLE BH06**

**PROJECT:**Proposed Residential Subdivision

CLIENT: Crestview Innovations Inc.

LOCATION: 3200 Reids Lane

PENETRATION TEST HAMMER: 63.5 kg, Drop, 0.76 mm

#### UNDIST SHEAR STRENGTH DYNAMIC CONE SAMPLES MOISTURE CONTENT (%) PIEZOMETER OR SOIL PROFILE Cu. kPa PENETRATION STANDPIPE х х TEST INSTALLATION STRATA PLOT BLOWS/0.3m NUMBER **REM SHEAR STRENGTH** TYPE DESCRIPTION blows/300 mm DEPTH ELEV. Cu. kPa 0 0 20 40 60 **80100**0 40 60 80100 0 20 (m) (m) TOPSOIL 0.00 <u>, 17</u> <u>1</u>90.32 SS 1 2 Red brown fine to medium 0.35 89.97 SAND, trace silt $\nabla$ Grey fine to medium SAND 0.90 89.42 2 SS 4 3 SS 5 Grey SILTY CLAY, some sand 1.90 88.42 Grey fine to medium SAND, 2.29 88.03 4 SS 20 some silt, trace clay Grey SILTY CLAY 3.00 87.32 5 SS 2 0 × Water observed in 0 × borehole at approximately 0.9 metres below the 6 SS WΗ existing ground surface, February × 4, 2021. Grey silty sand, some gravel, 5.64 34.68 cobbles and boulders, trace clay (GLACIAL TILL) 7 SS 2 End of borehole in GLACIAL 6.70 83.62

DEPTH SCALE: 1 to 75

LOGGED: DT

BORING METHOD: Power Auger

AUGER TYPE: 200 mm Hollow Stem

CHECKED: SD

PROJECT NUMBER:210064 DATE OF BORING: 2021-02-04 SHEET:1 of 1



# **BOREHOLE BH07**

PROJECT NUMBER:210064

SHEET:1 of 1

DATUM:GEODETIC

**DATE OF BORING:** 2023-10-17

**PROJECT:**Proposed Residential Subdivision

CLIENT:Crestview Innovations Inc.

LOCATION: 3200 Reids Lane

PENETRATION TEST HAMMER: 63.5 kg, Drop, 0.76 mm

ALE (s)	SOIL PROF	ILE			SA	AMPL	ES		DIS <sup>-</sup> x	<b>т SH</b> С	EAF	<b>R ST</b> I Pa	REN	IGTH ×		DY PE	<b>NET</b>	IIC CO	ONE ON	RE . (%)	PIEZOMETER OR STANDPIPE
DEPTH SCALE (meters)	DESCRIPTION	DEPTH	STRATA PLOT	ELEV.	NUMBER	түре	BLOWS/0.3m		<b>EM</b> 0	SHE C	AR : Cu. k	<b>STRI</b> Pa		o <b>TH</b>	-	bl		EST '300 r	nm	MOISTURE CONTENT (%)	INSTALLATION
ā	Augered through sand	(m) 0.00	T.	(m) 92.92	z		B	0	20	4	0	60	80	0100	0	20	40	60	80100	<u> </u>	
	materials	0.00																			
t -																					
_ 1.0 _	-															_				-	
[ ]																					
	-																				¥¥
2.0																					
				· · ·																	
	-																				
3.0	Oneu fin e te me dium CAND	0.05						4												_	
	Grey fine to medium SAND	3.05		89.87	1	SS	5														
[ ]						00	U														
4.0	-							-													Groundwater measured in
4.0					2	SS	5														standpipe at about 1.7 metres
								4													below the existing
	-							1													ground surface, October 23, 2023.
5.0					3	SS	16														
	-							-													
	-							1													
[ ]	-				4	SS	6														
6.0	-							1												_	
E -	Grey SILTY CLAY	6.10		86.82	5	SS	1														
					5	33	I														
7.0	-							1													
	-				6	SS	1														
	-							1													
-																					
8.0																				_	
	End of borehole in SILTY	8.23		84.69																	
	CLAY																				
DEPTH	H SCALE: 1 to 50																		LOGG	ED: CI	
	NG METHOD: Power Auger						ER TY		20	10 m·	т Џ.	ollow	v St	-m					CHECI		
	C. METTOD. I OWOLAUYOL					1001		•	20			5101	. 00							(	~ •



# **BOREHOLE BH08**

**PROJECT:**Proposed Residential Subdivision

CLIENT:Crestview Innovations Inc.

LOCATION: 3200 Reids Lane

PENETRATION TEST HAMMER: 63.5 kg, Drop, 0.76 mm

<u>_</u>	SOIL PRO	FILE			SA	MPL	ES		IST SH	I <b>EAR</b> Su. kF	STF Pa	RENGTH X	ים P	ENE <sup>1</sup>	IIC CO	ONE ION	RE (%)	PIEZOMETER STANDPIPE
(meters)	DESCRIPTION	DEPTH	STRATA PLOT	ELEV.	NUMBER	TYPE	BLOWS/0.3m	REI	0 (	Cu. kF		ength o		lows	EST /300 r		MOISTURE CONTENT (%)	INSTALLATIO
		(m)		(m)	~		B	0 2	<u>20 4</u>	0 (	60	<b>80 100</b> C	) 20	40	60	80100	) 0	
-	Augered through sand materials	0.00		90.87														Ţ
)																		
- - -																		
0 -																		
-	Grey fine to medium SAND	3.05		87.82	1	SS	13	-										
) _ _ _					2	SS	18					_					_	
	Grey SILTY CLAY	4.57		86.30	3	SS	wн										_	
	End of borehole in SILTY CLAY	5.18	44444	85.69			1	L	1				1					

Groundwater measured in standpipe at about 0.3 metres below the existing ground surface, October 23, 2023.

DEPTH SCALE: 1 to 50

LOGGED: CI

BORING METHOD: Power Auger

AUGER TYPE: 200 mm Hollow Stem

CHECKED: CV

PROJECT NUMBER:210064 DATE OF BORING: 2023-10-17 SHEET:1 of 1



# **BOREHOLE BH09**

**PROJECT:**Proposed Residential Subdivision

CLIENT:Crestview Innovations Inc.

LOCATION: 3200 Reids Lane

PENETRATION TEST HAMMER: 63.5 kg, Drop, 0.76 mm

ALE (	SOIL PRO	FILE			S	AMPL	ES		DIS <sup>-</sup> ×	T SH	I <b>EAI</b> Su. k	<b>R ST</b> Pa		IGTH ×		DYI PF		IIC (	NE N	я (%)	PIEZOMETER OR STANDPIPE
DEPTH SCALE (meters)	DESCRIPTION	DEPTH	STRATA PLOT	ELEV.	NUMBER	түре	BLOWS/0.3m	R		SHE		STR	ENG	o STH 0			NET TE bws/			MOISTURE CONTENT (%)	INSTALLATION
B		(m)		(m)	ž		BLG		20		0			0100	0					) 20	
_	Augered through sand materials	0.00		91.91																	V
-																					
_																					
1.0																					
-																					
_																					
2.0																				-	
_																					
-																					
	Grey fine to medium SAND, some silt	3.05		88.86																	
-	some sit				1	SS	15														
_																					
4.0	Grey SILTY CLAY	3.81		88.10																	
-					2	SS	WH														
	End of borehole in SILTY CLAY	4.42		87.49	L																J
	OLAT																				
																					Groundwater measured in
																					standpipe at about 0.2 metres
																					below the existin around surface.
																					October 23, 2023

LOGGED: CI

BORING METHOD: Power Auger

AUGER TYPE: 200 mm Hollow Stem

CHECKED: CV

PROJECT NUMBER:210064 DATE OF BORING: 2023-10-17 SHEET:1 of 1



# **BOREHOLE BH10**

**PROJECT:**Proposed Residential Subdivision

CLIENT:Crestview Innovations Inc.

LOCATION:3200 Reids Lane

PENETRATION TEST HAMMER: 63.5 kg, Drop, 0.76 mm

SALE	SOIL PROP	FILE	i .	1	SA	MPL	ES		T SHE Cu	<b>AR S</b> ı. kPa	TREN	NGTH X	1	DYI PE	NET	IC CO RATI	ONE ON	RE Г (%)	PIEZOMETER OR STANDPIPE
DEPTH SCALE (meters)	DESCRIPTION	DEPTH	STRATA PLOT	ELEV. (m)	NUMBER	түре	BLOWS/0.3m	<b>REM</b> 0 0 20	Сι	AR STI J. kPa		0	0		ows/	ST 300 n	nm 80100	MOISTURE CONTENT (%)	INSTALLATION
	Augered through sand materials	<u>(m)</u> 0.00		91.71								0 100		20					¥ ∭
1.0				· · · ·															
- 2.0																			
-				· · · · ·															
3.0	Grey fine to medium SAND, some silt, trace clay	3.05		88.66	1	SS	2	-											
4.0																			
_				· · ·	2	SS	8												
5.0					3	SS	21											_	
	Grey SILTY CLAY	5.33		86.38	4	SS	WН												<u>· · .<del>]</del>· .</u> ]
	End of borehole in SILTY CLAY	5.94	<u> </u>	85.77				<u>I I</u>			<u> </u>							1	·
																			Groundwater measured in standpipe at about 0.8 metres below the existing ground surface, October 23, 2023.

DEPTH SCALE: 1 to 50

LOGGED: CI

BORING METHOD: Power Auger

AUGER TYPE: 200 mm Hollow Stem

CHECKED: CV

PROJECT NUMBER:210064 DATE OF BORING: 2023-10-17 SHEET:1 of 1



# **BOREHOLE BH11**

**PROJECT:**Proposed Residential Subdivision

CLIENT:Crestview Innovations Inc.

LOCATION: 3200 Reids Lane

PENETRATION TEST HAMMER: 63.5 kg, Drop, 0.76 mm

cALE s)	SOIL PROF	FILE		1	SA	AMPL	ES				<b>AR ST</b> kPa	REN	NGTH X	1	DY PE		RA	ON FIOI	E N	IRE Г (%)	PIEZOMETER OR STANDPIPE
DEPTH SCALE (meters)	DESCRIPTION	DEPTH	STRATA PLOT	ELEV.	NUMBER	түре	BLOWS/0.3m	0	0	Cu.	<b>R STR</b> kPa		0			ows				MOISTURE CONTENT (%)	INSTALLATION
 	Augered through sand materials	(m) 0.00	0	(m) 91.83				0	20	40	60	80	<u>0100</u>	0	20	40	60	) 8	<u>soi oo</u>		
<u>1.0</u>																				_	Ţ
<u>2.0</u>   3.0																				-	
 	Grey fine to medium SAND, some silt, trace clay	3.05		88.78	1	SS	2	-													
4.0					2	SS	8													-	
5.0					3	SS	5													_	
·	Grey SILTY CLAY	5.33		86.50	4	ss	wн														
	End of borehole in SILTY CLAY	5.94		85.89																	
																					Groundwater measured in standpipe at about 1.4 metres below the existing ground surface, October 23, 2023.

DEPTH SCALE: 1 to 50

LOGGED: CI

BORING METHOD: Power Auger

AUGER TYPE: 200 mm Hollow Stem

CHECKED: CV

PROJECT NUMBER:210064 DATE OF BORING: 2023-10-17 SHEET:1 of 1

# TABLE I

# FIELD WATER QUALITY MEASUREMENTS FOR TEST WELLS

						Free	
		рН					
st Started	( <sup>0</sup> C)		(μs)	(ppm)	(NTU)	(mg/l)	
1	9.3	7.7	980	497	1.9	0.0	
	9.3	8.0	990	500	0.6	-	
3	9.5	7.9	988	478	0.8	0.0	
4	9.6	7.7	940	480	0.6	-	
	9.4	7.8	960	480	0.4	-	
6	9.4	7.7	955	385	0.6	0.0	
1	9.5	8.3	666	337	1.6	0.0	
	9.5	7.9	788	395	0.7	-	
3	9.5	7.8	788	400	1.0	0.0	
4	9.5	7.3	840	430	1.0	-	
5	9.5	7.8	775	400	0.6	-	
6	9.5	7.8	850	430	0.6	0.0	
1	9.4	7.5	832	400	8.1	0.0	
	9.4	7.3	855	435	4.5	-	
3	9.5	7.8	885	445	1.7	0.0	
4	9.4	7.8	880	447	0.9	-	
5	9.5	7.6	903	463	0.6	-	
6	9.5	7.4	880	445	0.5	0.0	
	2 3 4 5 6 1 2 3 4 5 6 1 2 3 4 5	Pumping (°C)         Temp. (°C)           1         9.3           2         9.3           3         9.5           4         9.6           5         9.4           6         9.4           1         9.5           2         9.5           3         9.5           4         9.6           5         9.4           6         9.4           1         9.5           2         9.5           3         9.5           4         9.5           5         9.5           6         9.5           1         9.4           2         9.4           3         9.5           4         9.4           5         9.5	Pumping ist StartedTemp. ( $^0$ C)pH19.37.729.38.039.57.949.67.759.47.869.47.719.58.329.57.939.57.849.57.359.57.869.57.819.47.529.47.339.57.849.47.859.57.6	Pumping ist StartedTemp. ( $^{0}$ C)pHConductivity (µs)19.37.798029.38.099039.57.998849.67.794059.47.896069.47.795519.58.366629.57.978839.57.878849.57.384059.57.877569.57.885019.47.583229.47.385539.57.888549.47.888059.57.6903	$\begin{array}{c c c c c c c c c c c c c c c c c c c $	$\begin{array}{c c c c c c c c c c c c c c c c c c c $	$\begin{array}{c c c c c c c c c c c c c c c c c c c $

# SUMMARY OF SUBDIVISION WATER CHEMISTRY FOR TEST AND SAMPLED WELLS

Parameter	Guideline	TV	V1	TV	V2	T۱	N3	5529 Osgoode	5560 Lombardy	5566 Lombardy
		3hr	6hr	3hr	6hr	3hr	6hr	Main	Lonibaray	Loniburuy
Alkalinity [mg/l]	OG 500	143	142	139	140	154	157	132	172	178
Chloride [mg/l]	AO/MCCRT 250	178	180	155	165	167	173	163	222	187
Colour [TCU]	AO 5 MCCRT 7	<2	<2	<2	<2	<2	2	2	<2	<2
Conductivity [uS/cm]		951	945	829	879	879	916	862	1160	1050
DOC [mg/l]	AO 5	1.8	2.0	1.8	2.1	1.9	1.9	1.8	1.2	1.5
Fluoride [mg/l]	MAC 1.5	0.83	0.85	0.94	0.89	0.17	0.16	1.19	1.48	0.69
Hydrogen Sulphide [mg/l]	AO 0.05	1.10	1.10	0.27	0.24	<0.01	<0.01	1.22	8.30 (raw) <0.01 (treated)	0.30
Ammonia [mg/l]		0.307	0.303	0.290	0.307	0.171	0.168	0.387	0.381	0.320
Nitrite [mg/l]	MAC 1.0	<0.50	<0.50	<0.10	<0.10	<0.10	<0.10	<0.10	<0.50	<0.50
Nitrate [mg/l]	MAC 10.0	<0.50	<0.50	<0.10	<0.10	<0.10	<0.10	<0.10	<0.50	<0.50
рН		8.19	8.20	8.05	8.01	8.01	8.08	8.21	8.35	8.17
Phenols [mg/l]		<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
Sulphate [mg/l]	AO 500	44	44	47	41	49	50	23	46	60
Tannin & Lignin [mg/l]		0.1	0.1	0.1	0.2	0.7	0.6	<0.10	0.2	0.4
TDS [mg/l]	AO 500	618	614	539	571	571	595	560	754	682
<b>TKN</b> [mg/l]		0.391	0.504	0.272	0.323	0.184	0.337	0.503	0.698	0.505
Organic Nitrogen [mg/l]	AO 0.15	0.08	0.20	0.00	0.02	0.01	0.17	0.12	0.32	0.18
Turbidity [NTU]	AO 5.0	2.2	1.1	5.7	1.2	3.2	1.5	2.4	28.3	1.8
Hardness [mg/l]	OG 100	229	229	211	233	298	310	161	170	234
Ion Balance		1.01	1.01	0.97	1.01	1.00	1.02	0.88	1.03	1.03
Calcium [mg/l]		44	44	40	44	65	68	30	35	46
Magnesium [mg/l]		29	29	27	30	33	34	21	20	29
Potassium [mg/l]		11	11	11	11	4	4	9	9	10
Sodium [mg/l]	AO 200	98	98	78	80	64	67	78	171	126
lron [mg/l]	A0 0.3	0.16	0.11	0.46	0.14	0.54	0.21	0.20	0.11	0.07
Manganese [mg/l]	AO 0.05	0.01	0.01	0.02	0.01	0.01	0.01	0.01	<0.01	0.01

### TABLE III

### SUMMARY OF HEAVY METALS TESTING IN SUBDIVISION TEST WELLS

Parameter	Guideline	τv	V1	τv	V2	τv	V3
		3hr	6hr	3hr	6hr	3hr	6hr
Aluminum [mg/l]	OG 0.1	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Arsenic [mg/l]	IMAC 0.01	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Boron [mg/l]	IMAC 5.0	0.53	0.54	0.57	0.58	0.06	0.06
Barium [mg/l]	MAC 1.0	0.08	0.07	0.26	0.20	0.32	0.33
Cadmium [mg/l]	MAC 0.005	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Cobalt [mg/l]	*0.0038	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Chromium [mg/l]	MAC 0.05	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Copper [mg/l]	AO 1.0	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Mercury [mg/l]	MAC 0.001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Lead [mg/l]	MAC 0.010	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Antimony [mg/l]	IMAC 0.006	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Selenium [mg/l]	MAC 0.05	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Strontium [mg/l]	** 7.0	3.92	3.87	3.28	3.64	0.662	0.677
Uranium [mg/l]	MAC 0.02	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Vanadium [mg/l]	*0.0062	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Zinc [mg/l]	AO 5.0	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01

Guideline refers to Ontario Drinking Water Standards, Objectives and Guidelines except where noted \* O. Reg 153/04 standard Table 2 for potable groundwater \*\* Health Canada health related maximum

### TABLE IV

### SUMMARY OF PUMPING TEST RESULTS AND WELL PARAMETERS

Well	Тр	Tr	Tav	Q	SC	ho	hf	Td	TD	CS	AD
	(m²/day)	(m²/day)	(m²/day)	(m <sup>3</sup> /day)	(m³/day/m)	m	m	m	m	m	m
TW1	288	192	240	94.3	68.3	6.86	8.24	1.38	76.20	0.60	36.4
TW2	181	203	192	88.9	85.7	6.68	7.72	1.04	74.37	0.60	36.6
TW3	192	163	177	94.3	409.8	4.53	4.76	0.23	30.48	0.60	20.5

Average Transmissivity:

203 m<sup>2</sup>/day

Well	% Available Drawdown Used
TW1	3.79%
TW2	2.83%
TW3	1.12%

Note:	Tp:	Transmissivity as calculated from pumping data (m <sup>2</sup> /day)
Tr:		Transmissivity as calculated from recovery data (m <sup>2</sup> /day)
	Tav:	Average transmissivity (average of pumping and recovery) (m <sup>2</sup> /day)
	Q:	Test pumping rate (m <sup>3</sup> /day)
	SC:	Specific Capacity (m <sup>3</sup> /day/m)
	ho:	Static water level (below top of casing) at beginning of pumping test (metres)
	hf:	Water level (below top of casing) at end of 6 hour pumping test (metres)
	Td:	Total drawdown (metres)
	TD:	Total depth of well (below ground surface) (metres)
	CS:	Casing stickup above ground surface (metres)
	AD:	Approximate available drawdown (metres)

### August 2021

#### TABLE V MUTUAL WELL INTERFERENCE AT CENTRAL LOT

Storativity	2.4.E-04	
Transmissivity T Q Duration Duration 2.3Q/(4piT)	2.E-03 1100 1.27E-05	L/day m <sup>3</sup> /s years

based on storativity estimate using drawdown in observation wells (cooper-jacob straight-line) average calculated value using cooper-jacob

Lot	Distance	30 Year Drawdown		
	[m]	[m]		
1	47.8	0.007		
3	49.5	0.007		
4	138	0.006		
5	110	0.006		
6	108	0.006		
7	126	0.006		
Cumulative aquifer drawdown				
at centre we	II [metres]	0.038		

#### 210064

#### TABLE VII

#### DRAWDOWN IN OBSERVATION WELLS DURING PUMPING TESTS

DATE 5-May-21 PUMPED WELL: TW3 OBSERVATION WELL: TW1 DISTANCE BETWEEN PUMPED WELL AND OBSERVATION WELL, r: PUMPING RATE, Q:

117.2 metres

94.3 m3/day

Time Lapsed	Depth	h-ho
(minutes)	(metres)	(metres)
0	-6.73	
15	-6.73	0.00
30	-6.73	0.00
45	-6.74	0.01
60	-6.75	0.02
75	-6.76	0.03
90	-6.74	0.01
105	-6.73	0.00
120	-6.72	0.00
135	-6.72	-0.01
150	-6.72	-0.01
165	-6.74	0.01
180	-6.74	0.02
195	-6.74	0.02
210	-6.74	0.01
225	-6.74	0.01
240	-6.74	0.01
255	-6.74	0.01
270	-6.74	0.01
285	-6.73	0.01
300	-6.73	0.00
315	-6.74	0.01
330	-6.74	0.01
345	-6.73	0.00
360	-6.74	0.02
375	-6.76	0.03
390	-6.73	0.00
405	-6.73	0.00
420	-6.73	0.01

#### DATE 5-May-21 PUMPED WELL: TW3 OBSERVATION WELL: TW2 DISTANCE BETWEEN PUMPED WELL AND OBSERVATION WELL, r: PUMPING RATE, Q:

	94.3	m3/day
Time Lapsed	Depth	h-ho
(minutes)	(metres)	(metres)
0	-6.63	0
15	-6.63	0.00
30	-6.63	0.00
45	-6.63	0.00
60	-6.64	0.01
75	-6.65	0.03
90	-6.66	0.03
105	-6.64	0.01
120	-6.63	0.00
135	-6.63	0.00
150	-6.62	-0.01
165	-6.62	-0.01
180	-6.64	0.01
195	-6.65	0.02
210	-6.65	0.02
225	-6.64	0.01
240	-6.64	0.01
255	-6.64	0.02
270	-6.64	0.01
285	-6.64	0.01
300	-6.64	0.01
315	-6.63	0.00
330	-6.64	0.01
345	-6.64	0.01
360	-6.63	0.00
375	-6.65	0.02
390	-6.67	0.04
405	-6.63	0.00
420	-6.63	0.01

117.6 metres

#### DATE 10-May-21 PUMPED WELL: TW2 OBSERVATION WELL: TW1 DISTANCE BETWEEN PUMPED WELL AND OBSERVATION WELL, r: PUMPING RATE, Q:

88.9 m3/day **Time Lapsed** Depth h-ho (minutes) (metres) (metres) 0 -7.07 0 15 -7.39 0.32 30 -7.41 0.34 -7.43 45 0.36 60 -7.44 0.37 75 -7.44 0.37 90 -7.44 0.37 105 -7.45 0.38 120 -7.45 0.38 -7.46 0.39 135 -7.46 150 0.39 -7.46 0.39 165 180 -7.47 0.40 195 -7.47 0.40 210 -7.48 0.40 225 -7.49 0.42 240 -7.49 0.42 255 -7.49 0.42 270 -7.49 0.42 285 -7.49 0.42 300 -7.49 0.42 315 -7.50 0.43 330 -7.50 0.43 345 -7.50 0.43 360 -7.50 0.43 375 -7.19 0.12 390 -7.17 0.10 405 -7.17 0.10 420 -7.17 0.10 435 -7.15 0.08 450 -7.14 0.07 -7.14 0.07 465 480 -7.13 0.06 495 -7.15 0.08 510 -7.14 0.07 525 -7.14 0.07 540 -7.14 0.07 555 -7.13 0.06 570 -7.13 0.06 -7.13 585 0.06 -7.13 0.05 600 615 -7.13 0.06 630 -7.12 0.05 645 -7.12 0.04 660 -7.14 0.07 675 -7.11 0.04 690 -7.10 0.03 -7.09 705 0.02 720 -7.09 0.02 735 -7.08 0.01 750 -7.08 0.01

45 metres

DATE 10-May-21 PUMPED WELL: TW2 OBSERVATION WELL: TW3 DISTANCE BETWEEN PUMPED WELL AND OBSERVATION WELL, r: PUMPING RATE, Q:

VELL, r:	117.6 metres 88.9 m3/day				
Time Lapsed	Depth	h-ho			
(minutes)	(metres)	(metres)			
0	-4.61	0			
15	-4.61	0.00			
30	-4.65	0.03			
45	-4.61	0.00			
60	-4.60	-0.02			
75	-4.61	0.00			
90	-4.61	0.00			
105	-4.61	-0.01			
120	-4.60	-0.01			
135	-4.61	-0.01			
150	-4.62	0.01			
165	-4.62	0.01			
180	-4.60	-0.01			
195	-4.63	0.02			
210	-4.64	0.03			
225	-4.63	0.02			
240	-4.65	0.04			
255	-4.64	0.03			
270	-4.62	0.01			
285	-4.61	0.00			
300	-4.61	0.00			
315	-4.61	0.00			
330	-4.61	0.00			
345	-4.60	-0.02			
360	-4.60	-0.02			
375	-4.59	-0.02			
390	-4.60	-0.02			
405	-4.60	-0.02			
420	-4.61	0.00			
435	-4.62	0.01			
450	-4.61	0.00			
465	-4.61	0.00			
480	-4.62	0.00			
495	-4.61	0.00			

#### DATE 12-May-21 PUMPED WELL: TW1 OBSERVATION WELL: TW2 DISTANCE BETWEEN PUMPED WELL AND OBSERVATION WELL, r: PUMPING RATE, Q:

	94.3 m3/day			
Time Lapsed	Depth	h-ho		
(minutes)	(metres)	(metres)		
0	-6.73	0		
15	-7.02	0.29		
30	-7.03	0.30		
45	-7.04	0.31		
60	-7.04	0.31		
75	-7.06	0.33		
90	-7.06	0.33		
105	-7.06	0.33		
120	-7.07	0.34		
135	-7.07	0.34		
150	-7.07	0.34		
165	-7.08	0.35		
180	-7.09	0.36		
195	-7.10	0.37		
210	-7.09	0.36		
225	-7.09	0.36		
240	-7.09	0.36		
255	-7.09	0.36		
270	-7.11	0.38		
285	-7.11	0.38		
300	-7.11	0.38		
315	-7.11	0.38		
330	-7.12	0.39		
345	-7.12	0.39		
360	-7.12	0.39		
375	-6.80	0.07		
390	-6.80	0.06		
405	-6.78	0.05		
420	-6.78	0.05		
435	-6.77	0.04		
450	-6.77	0.04		
465	-6.76	0.03		
480	-6.77	0.04		
495	-6.75	0.02		
510	-6.77	0.04		
525	-6.75	0.02		
540	-6.74	0.01		
555	-6.73	0.00		

44.6 metres

DATE 12-May-21 PUMPED WELL: TW1 OBSERVATION WELL: TW3 DISTANCE BETWEEN PUMPED WELL AND OBSERVATION WELL, r: PUMPING RATE, Q:

VELL, r:		metres m3/day
Time Lapsed	Depth	h-ho
(minutes)	(metres)	(metres)
0	-4.65	0
15	-4.66	0.00
30	-4.64	-0.02
45	-4.64	-0.01
60	-4.63	-0.02
75	-4.63	-0.02
90	-4.62	-0.03
105	-4.61	-0.04
120	-4.62	-0.03
135	-4.60	-0.05
150	-4.61	-0.05
165	-4.60	-0.05
180	-4.62	-0.04
195	-4.62	-0.04
210	-4.61	-0.04
225	-4.60	-0.05
240	-4.61	-0.04
255	-4.62	-0.04
270	-4.62	-0.03
285	-4.61	-0.04
300	-4.62	-0.04
315	-4.62	-0.04
330	-4.61	-0.04
345	-4.63	-0.03
360	-4.61	-0.04
375	-4.61	-0.04
390	-4.60	-0.06
405	-4.61	-0.04
420	-4.61	-0.04
435	-4.62	-0.04
450	-4.63	-0.03
465	-4.61	-0.04
480	-4.64	-0.01
495	-4.63	-0.02
510	-4.66	0.01
525	-4.65	0.00

## TABLE VIII ESTIMATE OF STORATIVITY BY COOPER-JACOB METHOD

A curve of drawdown versus time was generated for observation wells as an adjacent well was pumped (see Table 7 and Attachment K) Based on the Cooper-Jacob formula, the following values of storativity were calculated.

Pump well	Observation	r	Q	t <sub>o</sub>	Т	S
	Well	(m)	(m <sup>3</sup> /day)	(min)	(m²/day)	
TW2	TW1	44.6	88.9	1.4	180.7	2.0E-04
TW1	TW2	44.6	94.3	1.2	288	2.7E-04
						2.4E-04

## 210064

## August 2021

#### TABLE VI WELL INTERFERENCE AT PROPERTY BOUNDARY

Storativity	2.4.E-04	
Transmissivity T Q Q Duration Duration 2.3Q/(4piT)	2.E-03 1100 1.27E-05	L/day m <sup>3</sup> /s years

based on storativity estimate using drawdown in observation wells (cooper-jacob straight-line) average calculated value using cooper-jacob

Lot	Distance	30 Year Drawdown
	[m]	[m]
1	29.2	0.007
2	55.7	0.007
3	100	0.006
4	192	0.006
5	158	0.006
6	145	0.006
7	145	0.006
Cumulative a	quifer drawdown	
at north prop	erty corner [m]	0.044

## 210064

#### TABLE IX - BACKGROUND NITROGEN IN SURFICIAL AQUIFER

LOCATION	Units		MW1						
DATE		12-Feb-21	03-Mar-22	17-Jun-22	08-Feb-23	20-Nov-23	28-Feb-24		
N-NH3	mg/L	<0.010	<0.010	0.02	<0.020	<0.020	<0.020		
TKN	mg/L	0.393	0.737	0.292	0.572	0.674	0.5		
N-NO2	mg/L	0.17	0.16	<0.10	0.14	0.19	0.12		
N-NO3	mg/L	5.8	19.7	8.11	19.3	18.8	15.6		

LOCATION	Units	MW3				
DATE		12-Feb-21	03-Mar-22	20-Nov-23		
N-NH3	mg/L	<0.010	0.028	<0.020		
TKN	mg/L	0.331	0.397	0.374		
N-NO2	mg/L	<0.10	<0.10	<0.10		
N-NO3	mg/L	<0.10	<0.10	0.28		

LOCATION	Units	MW5					
DATE		12-Feb-21	03-Mar-22	20-Nov-23	28-Feb-24		
N-NH3	mg/L	0.031	<0.010	0.047	<0.020		
TKN	mg/L	0.245	0.309	0.494	0.31		
N-NO2	mg/L	<0.10	<0.10	<0.10	<0.10		
N-NO3	mg/L	<0.10	0.72	<0.10	0.34		

LOCATION	Units	M	N7	MW8		MW9		MW10		MW11	
DATE		20-Nov-23	28-Feb-24								
N-NH3	mg/L	0.023	<0.020	1.11	0.037	0.065	0.087	0.032	0.224	0.208	0.155
TKN	mg/L	0.703	0.676	1.46	0.229	0.503	0.524	0.415	0.806	0.569	0.442
N-NO2	mg/L	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
N-NO3	mg/L	<0.10	<0.10	<0.10	<0.10	<0.10	0.22	<0.10	<0.10	<0.10	<0.10

Location	Ground Surface elevation	Casing elev	Stick up	Water Elevations				
	metres	metres	metres	12-Feb-21	03-Mar-22	23-Oct-23	20-Nov-23	27-Feb-24
BH1	92.89	93.85	0.96	92.5	91.33	-	91.38	91.65
BH3	90.39	91.49	1.1	89.25	90.37	-	-	89.69
BH5	91.37	92.50	1.13	89.64	90.13	-	-	90.68
BH7	92.92	93.98	1.06	-	-	91.22	91.36	91.62
BH8	90.87	91.86	0.99	-	-	90.57	90.64	90.4
BH9	91.02	91.91	0.89	-	-	90.82	90.76	90.61
BH10	91.71	92.64	0.93	-	-	90.91	90.82	90.74
BH11	91.83	92.74	0.91	-	-	90.43	-	91.15

TABLE X GROUNDWATER ELEVATIONS-RECEIVING AQUIFER AND WATER SUPPLY AQUIFER

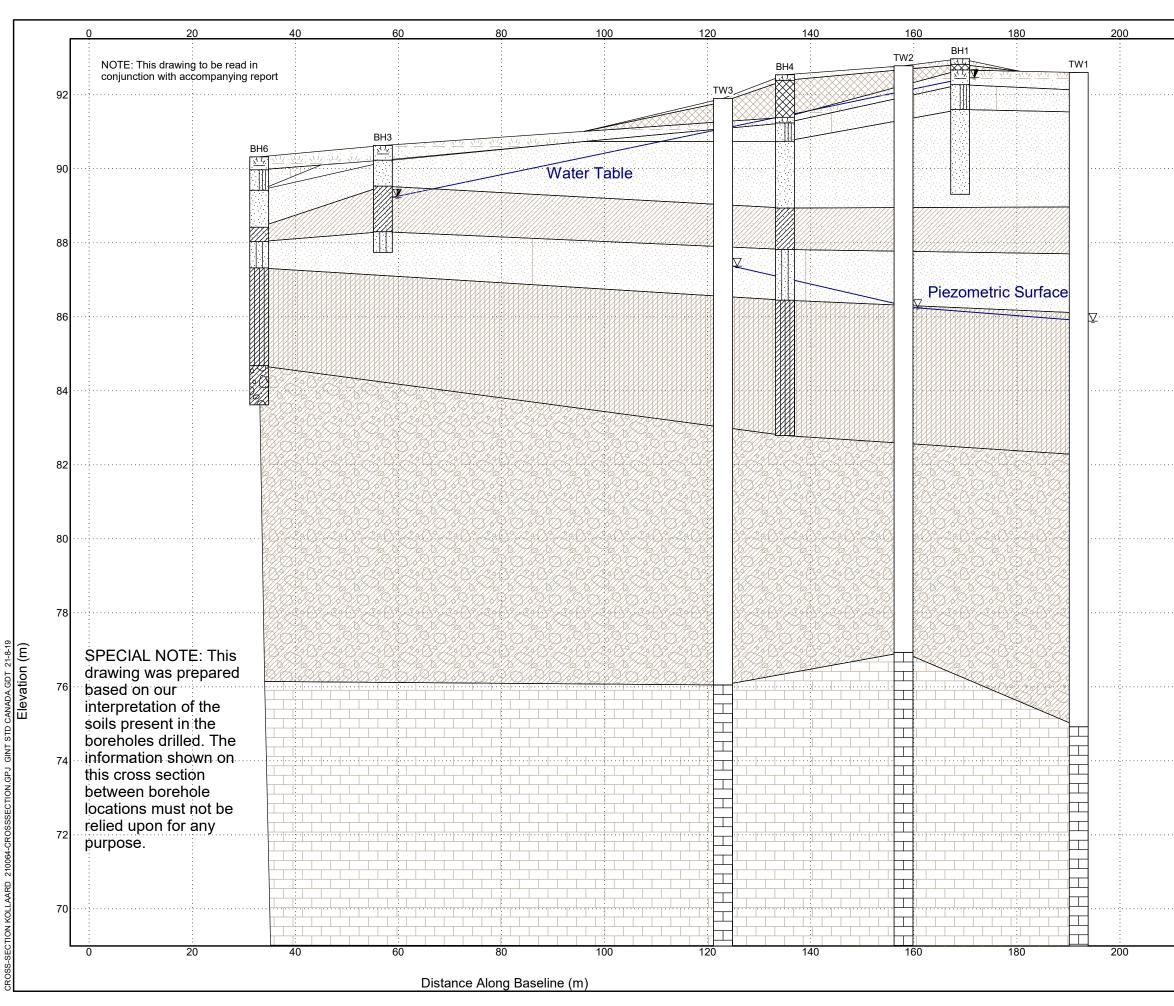


# FIGURE 2 Approximate Water Well Location Approximate Borehole (Monitoring ♥ Well) Location BH1 (MW1) Approximate Receiving Aquifer Flow Direction Approximate Water Supply Aquifer Flow Direction This drawing to be read in conjunction with accompanying report. REV. NAME DATE DESCRIPTION Kollaard Associates Engineers PO, BOX 189, 210 PRESCOTT ST KEMPTVILLE ONTARIO KOG 1 JO FAX (613) 258–0475 http://www.kollaard.ca MILES YANG PROJECT: PROPOSED RESIDENTIAL SUBDIVISION LOCATION: 3200 REIDS LANE OSGOODE, ONTARIO DRAWING: SITE PLAN *date:* AUGUST 2021 DESIGNED BY: SCALE: DRAWN BY: CV 1:1000

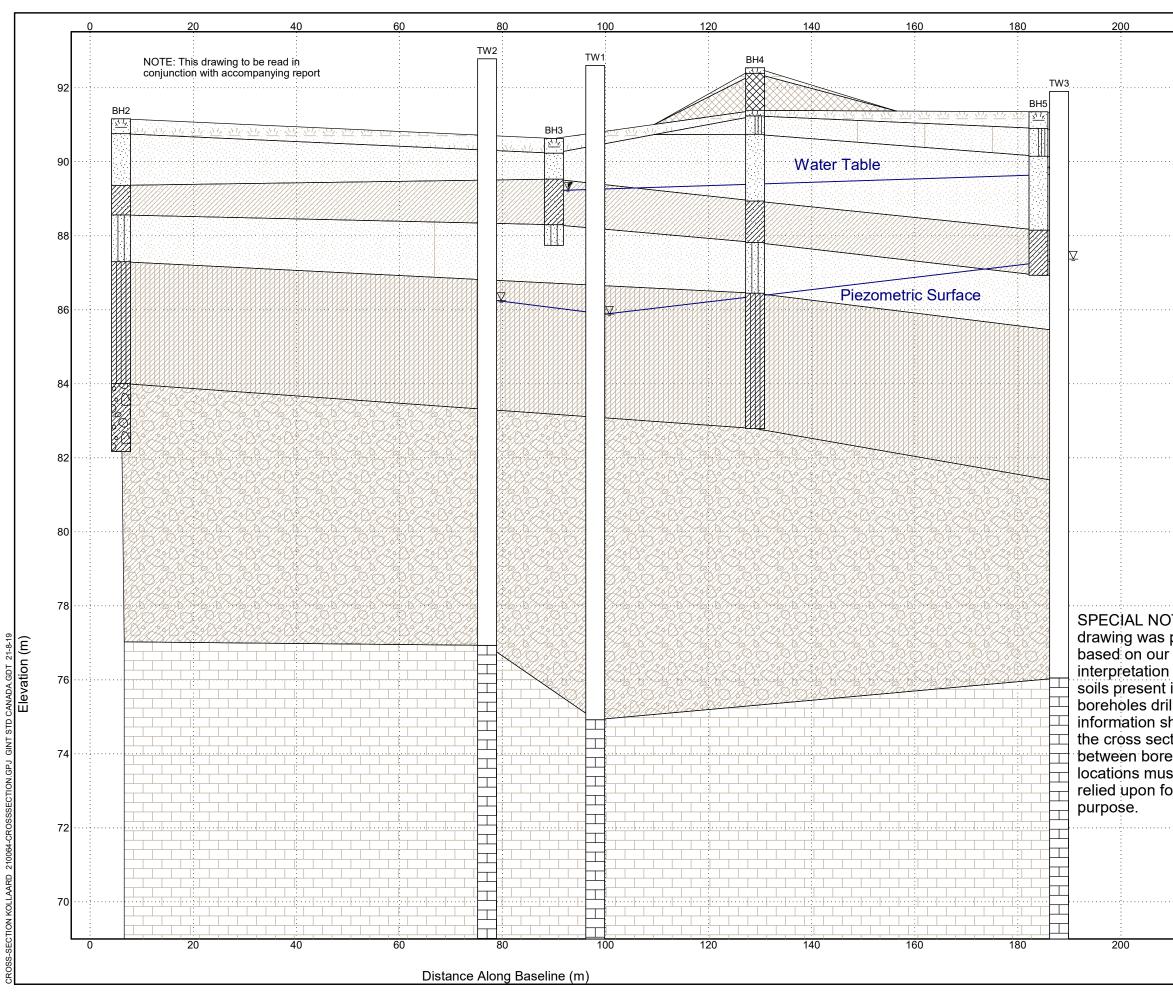
210064



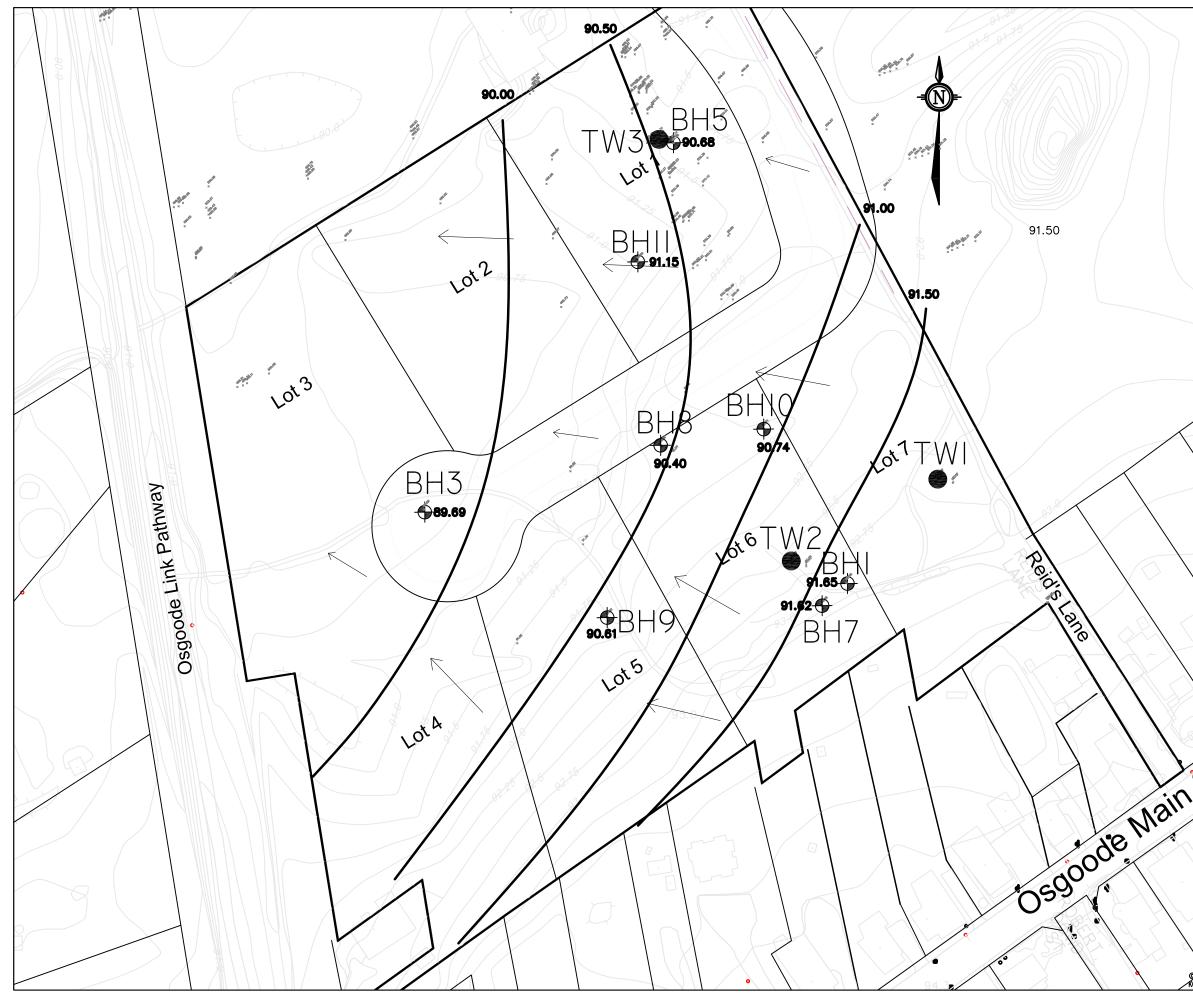
	FIGURE 3				
	TW1	Approximo	ate Water Well Location		
	NOTE:	This dro conjunc report.	awing to be read in tion with accompanying		
$Y \setminus M_{2}$					
THE VIEW	REV. NAME	DATE	DESCRIPTION		
	PO, BOX 18 KEMPTVILLE KOG 1J0 F	Engineer 9, 210 PRES ONTARIO AX (613) 250	COTT ST (613) 860-0923		
	http://www.	kollaard.ca			
	CLIENT:	MIL	ES YANG		
10 11 .	PROJECT: Pl		RESIDENTIAL		
and the second	LOCATION:	SUBL	DIVISION		
2.5	LOUATION:		REIDS LANE DE, ONTARIO		
111	DRAWING:	DE4 4115			
3 - 9		LOC	SAMPLED WELL CATIONS		
200	DESIGNED —	BY:	DATE: AUGUST 2021		
and the second	DRAWN BY CV		<i>SCALE:</i> 1:2000		
© COPYRIGHT 2023	KOLLAARD	FILE NUMB			
KOLLAARD ASSOCIATES INCORPORATED		210	0064		



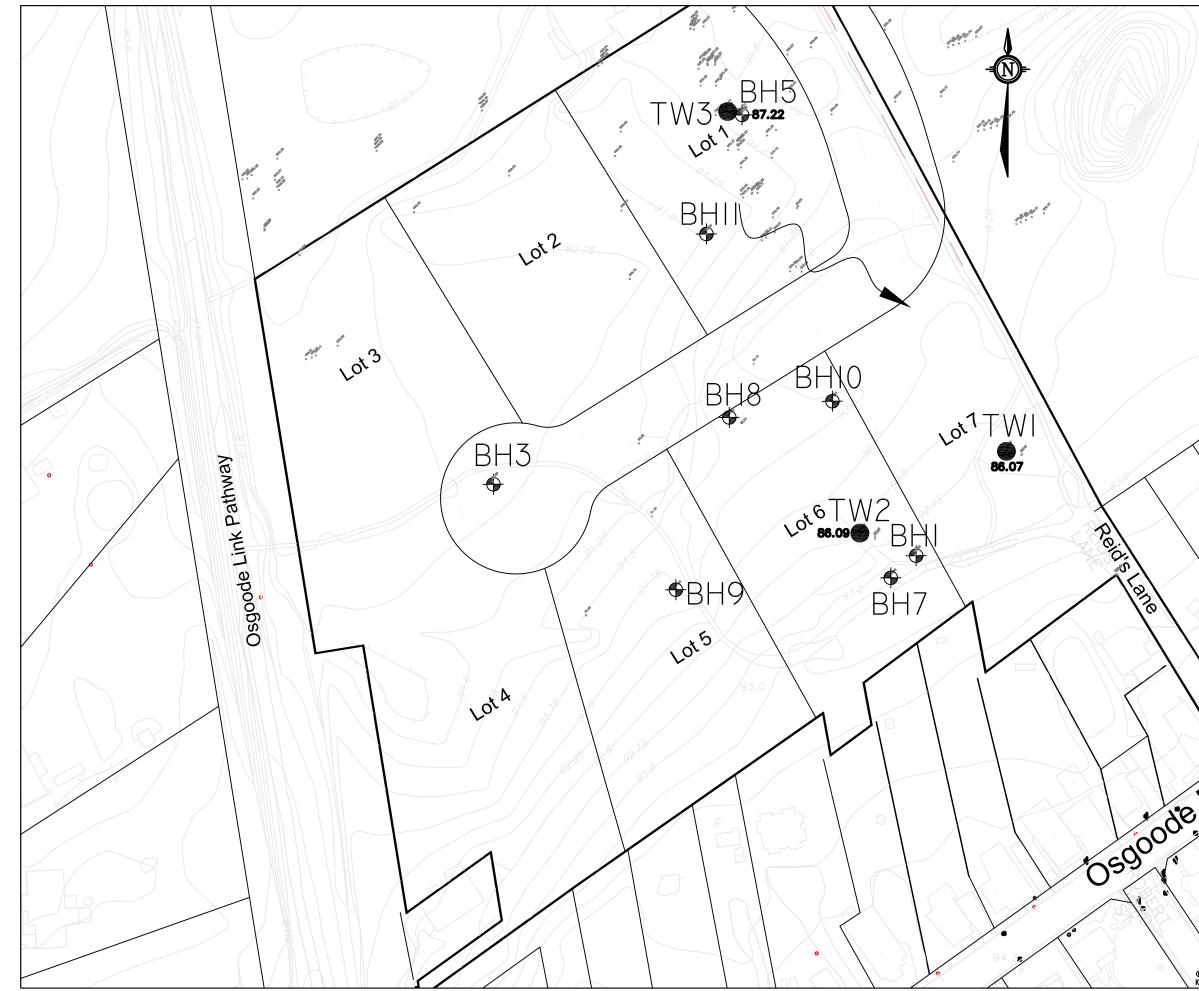
220		FIGURE 4					
	12		PSOIL				
			llow brov avel (FILI	vn sand and _)			
9	0	Red brown fine to medium SAND, trace silt					
	8	Gr	ey fine to	o medium SAND			
		Gr	ey sandy	CLAY, trace silt			
	6	Gre	ey SILTY	SAND			
	4		ey SILTY				
		gra	avel, cobl	and, trace to some bles and boulders, GLACIAL TILL)			
	2		MESTON	IE BEDROCK			
	0	Kollaard Associates					
7	8	210 Prescott P.O. Box 189 Kemptville, C K0G 1J0 F	Ontario	info@kollaard.ca			
		<i>CLIENT:</i> Miles Ya	ng				
7	6	<i>PROJECT:</i> Proposed Residential Subdivision					
7	·4	<i>LOCATION:</i> 3200 Reids Lane. Osgoode. Ottawa. Ontario					
7	2	DRAWIN East-We	G: st Cross	Section			
	-	DESIGNE CV	ED BY:	<i>DATE:</i> July 2021			
	0	DRAWN CI	BY:	SCALE: 1:100			
220		<i>PROJEC</i> 210064	T NUMBI	ER:			



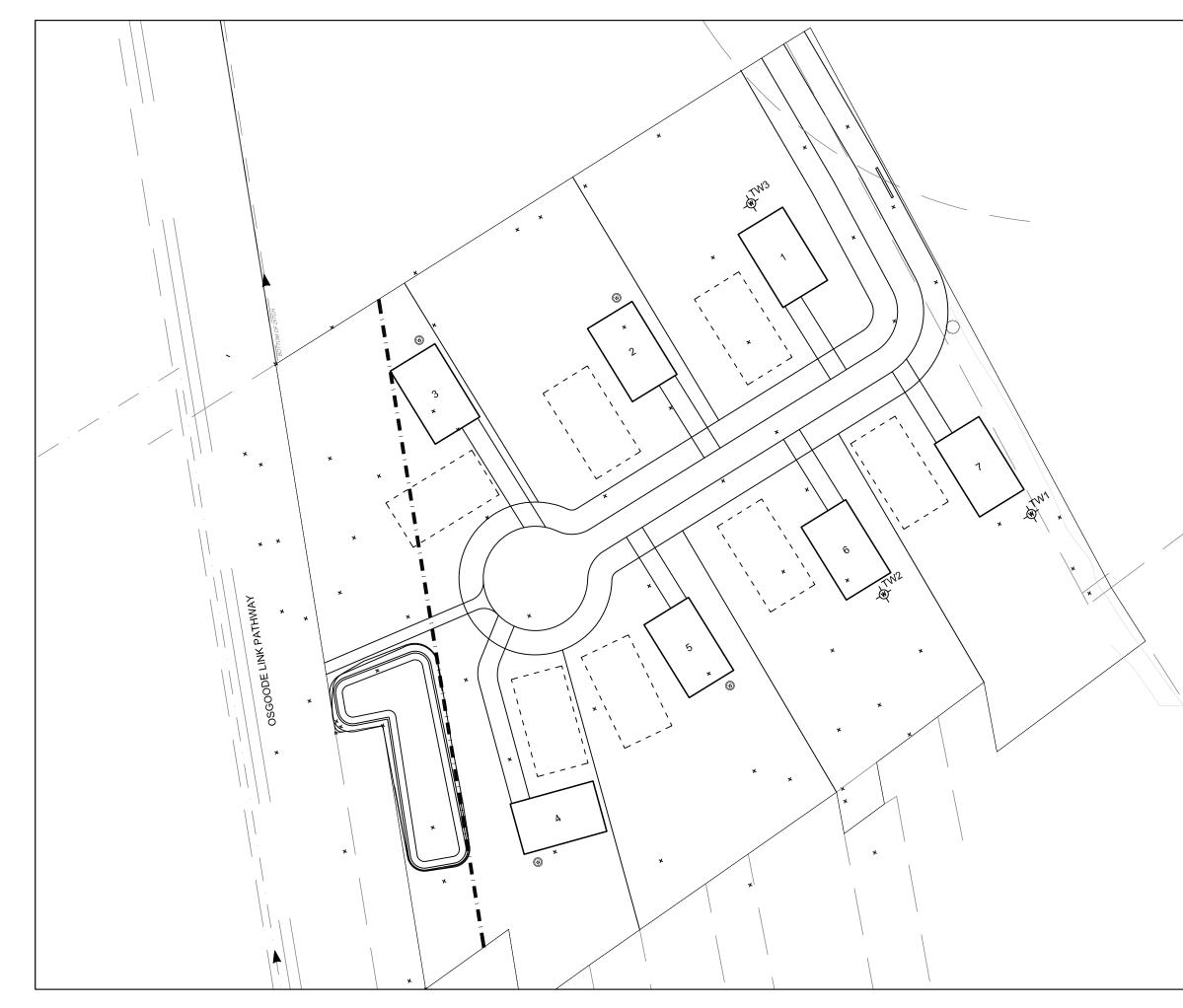
220	FIGURE 5				
52	Yellow brown sand and gravel (FILL)				
90	Red brown SAND, trac	fine to medium e silt			
88	Grey fine to	medium SAND			
	Grey sandy	CLAY, trace silt			
	Grey SILTY	' SAND			
	Grey SILTY	' CLAY			
04	gravel, cobl	and, trace to some bles and boulders, GLACIAL TILL)			
82		E BEDROCK			
	Kollaard Ass	sociates			
	210 Prescott Street, Unit P.O. Box 189 Kemptville, Ontario K0G 1J0 Fax: 613-258-	info@kollaard.ca			
DTE: This prepared r	<i>CLIENT:</i> Miles Yang				
n of the 76 in the illed. The	PROJECT: Proposed Reside	ntial Subdivision			
shown on ction ehole <sup>74</sup> ist not be	<i>LOCATION:</i> 3200 Reids Lane. Osgoode. Ottawa.	Ontario			
or any 72	DRAWING: North-South Cros	s Section			
	DESIGNED BY: CV	<i>DATE:</i> July 2021			
70	DRAWN BY: Cl	SCALE: 1:100			
220	PROJECT NUMBI 210064				



		FIGUF	RE 6A
	TW1		
	Ex Ex	sting Wat	er Well Location
		proximate II) Locati	Borehole (Monitoring on
	91.30 <b>GW</b>	ELEVATIO	)N
	F Appr Flow	oximate f Direction	Receiving Aquifer
	(	This drawi conjunctio report.	ng to be read in n with accompanying
	REV. NAME D	TE D	ESCRIPTION
		(ollaar ngineers	d Associates
	PO, BOX 189, KEMPTVILLE ON KOG 1JO FAX http://www.kollo	210 PRESCOT ARIO (613) 258-0	info@kollaard.ca
	CLIENT:	MILES	5 YANG
L. veel	PROJECT: PRC		RESIDENTIAL
Sti-	LOCATION:	SUBDIV	ISION
in Street.			TIDS LANE , ONTARIO
	DRAWING:		
			DUNDWATER FLOW AQUIFER
	DESIGNED BY —	• 	<i>date:</i> APRIL 2024
	<i>drawn by:</i> CV		<i>SCALE:</i> 1:1000
COPYRIGHT 2023	KOLLAARD FIL	<i>E NUMBER:</i> 21006	
		-	



		FICI	IRE 6B
		FIGU	
	TW1	Existing W	ater Well Location
92.6			
	BH1	(MW1)	te Borehole (Monitoring
		Well) Loco	ution
	91.30	GW ELEVA	TION
	<u> </u>	oproximate ow Directio	Water Supply Aquifer
	1		
$\langle \rangle$	NOTE:	This dra	wing to be read in
$\langle \rangle \rangle$	NOTE.		ion with accompanying
	REV. NAME	DATE	DESCRIPTION
	(K)	Kollaa Engineers	ard Associates
	KEMPTVILLE	AX (613) 258	info@kollggrd.cg
	CLIENT:	MIL	ES YANG
Listre	PROJECT: P	ROPOSED	RESIDENTIAL
Naim :	LOCATION:	SUBD	DIVISION
Je Main Stre			REIDS LANE DE, ONTARIO
	DRAWING: INTERF	RETED G	ROUNDWATER FLOW
		ATER SUP	DPLY AQUIFER
	DESIGNED — DRAWN B		AUGUST 2021
	C٧		1:1000
© COPYRIGHT 2023 KOLLAARD ASSOCIATES INCORPORATED			064



		FIGUF	RE 7
	TW1 	proximate	Water Well Location
	Р	roposed W	ater Well Location
			ewage system posed house
/		This drawi conjunctio report.	ng to be read in n with accompanying
	2 CV 07		revised per Novatech
	1 CV 02 REV. NAME D	-,	etback distances ESCRIPTION
	PO, BOX 189, KEMPTVILLE ON	Kollaar Engineers 210 PRESCOT TARIO	d Associates
	KOG 1JO FAX http://www.koll	(613) 258–0 aard.ca	475
	CLIENT:	MILES	5 YANG
		DPOSED F SUBDIV	RESIDENTIAL ISION
	LOCATION:		TIDS LANE , ONTARIO
	DRAWING: LOT	DEVELOP	PMENT PLAN
	DESIGNED B	Y:	DATE: AUGUST 2021
	DRAWN BY: CV		<i>SCALE:</i> 1:1000
	KOLLAARD FI	LE NUMBER:	
© COPYRIGHT 2024 Kollaard Associates incorporated		2100	64



## ATTACHMENT A

## SURFICIAL AND BEDROCK GEOLOGY MAPS

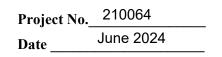
## BEDROCK GEOLOGY MAP



Ontario Geological Survey of Ontario, Bedrock Geology Map MRD 126-REV1, issued 2011

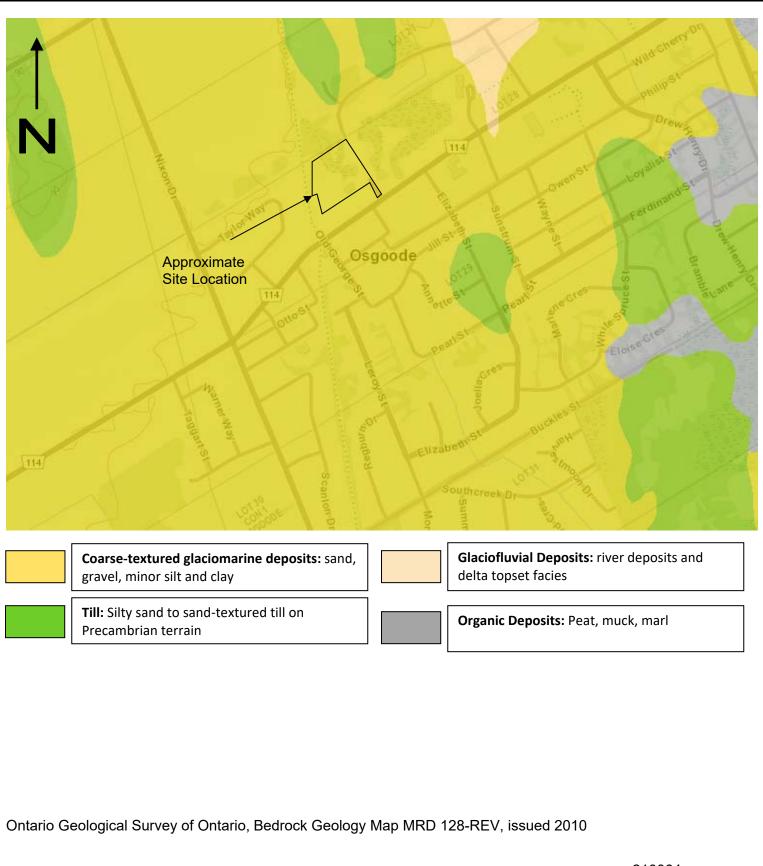
Oxford Formation (Beekmantown Group):

Primary Lithology: dolostone brown-grey to green-grey, thin- to thick-bedded, very fine- to medium-grained dolostone; with local thin glauconitic shale beds, and interbeds of quartz sandstone and shaly dolostone





## SURFICIAL GEOLOGY MAP



Kollaard Associates

 Project No.
 210064

 Date
 June 2024



## ATTACHMENT B

## CERTIFICATE OF WELL COMPLIANCES AND MOE WATER WELL RECORDS FOR TEST WELLS AND AREA WELL RECORDS

	nts record	ded in:	Metric M	Imperial		A318366			n 903 Ontario V Pag		of
Vell Own	er's Info	rmation	-	V							
irst Name		en stadige stadie	Last Name/C	Organizatio	n	Constant and a second	E-mail Address		2010-0000000000000000000000000000000000		Constructed
alling Addr	one /Street	t Number/Na	Cr	estviev		ation Inc.	Province	Postal Code	- Teleshee		ell Owner
	scade		ine)			Municipality Ottawa	ON		6R9	e No. (Inc.	area code)
Vell Locat	tion	DINE			NG SIGN	Quava			1043		
		on (Street Nu	mber/Name)			Township		Lot	Concess	ion	
3200 ounty/Distri	Reids					Osgode City/Town/Village		P/L	27428 1 Province	Postal	Code
									Ontario		
Otta TM Coordin		Easting	N	orthing		Oscoode Municipal Pan and Subl	lot Number	-1	Other		
NAD 8		8 452	113	4999	346	4R-20040 ord (see Instructions on II	CHOITS 4-19	うノ		Mariana Mari	u. gestels
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			Sand		or (	Cobble			4.	From '	
-					4	OPPIC				25	38
			Clay	-			/ Dealerd	1		38	1
Grey			Grave				Packed	)		.58	56 160 /
	.		Lime:		1.1	6.0 2	1001	ALin		160	244
Grey			Lime		w	Ten o	nd store	NAL'Y		244	250 /
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and the second second	Sectory forces	M~	ES-	<u>C</u>	wel		OF C	- <u>-</u>		Constant Constant	Contraction of the second
Depth Set a	at (ma	President and the second	Annular Type of Sea	2010.0007.0007813120.00		Volume Blaced	After test of well yield	l, water was:	Draw Down	Re	covery
From	То		(Material an			Volume Blaced	Clear and sand	free	Time Water Le	vel Time ( (min)	Water Level (m/ft)
66 '	56 (	Neato	ement			9.36	If pumping discontinu	ed, give reason:	Static Anon		30.2 4
56 '	0'	Bentor	nite slurry	ц° .	1	21			Level 29	1	~
	11 - 11 - 11 - 11 - 11 - 11 - 11 - 11						Pump intake set at (m	<b>(iii)</b>	2 2 2 2 2	2	20,0
							240	0	- 8.9		3.5
Metho	d of Con	struction									
Cable Tool					Well Us	se	Pumping rate (Vmin /	GPLA	3 A.d	3	10,7
		Diamond			Comme	ercial 🔲 Not used	20	ЭРИ)	4 29.4	4	2,9"
Rolary (Con Rolary (Rev		Diamond		mestic		ercial Not used	20 Duration of pumping 1 hrs +0	mìn	309.0 199.4 599.5	4 6	2,9"
Rotary (Con Rotary (Rev Boring		Jetting		mestic estock jation	Comme	ercial Not used	20 Duration of pumping 4 hrs + 0 Final water level end d	mìn	91.0	4	22,9"
Rolary (Con Rolary (Rev		U Jetting		mestic estock jation	Comme	ercial Not used eal Dewatering le Monitoring	20 Duration of pumping 1 hrs +0	min of purnping (m/ft)	91.0	4	22,9"
Rotary (Con Rotary (Rev Boring) Ar percussi other, speci	verse)	Jetting Driving Digging struction R	Cord - Cas	mestic estock jation ustrial er, specify ing	Comme Municip Test Ho	ercial Not used hal Dewatering le Monitoring & Air Conditioning Status of Well	20 Duration of pumping hrs +0 Final water level end of 0.2 ~ If flowing give rate (Vm	min ôf pumping (m/ft) nin/GPM)	1099.8 1599.9	4 <del>6</del> 5 10	22,9"
Rotary (Con Rotary (Rev Boring) Ar percussi Ober, speci Inside Diameter	verse)	Jetting Driving Digging struction R OR Material Fibreglass,	ecord - Cas	mestic estock aation ustrial er, specify ing Dept	Comme Municip Test Ho Cooling	ercial Dewatering le Dewatering le Monitoring & Air Conditioning	20 Duration of pumping <u><u><u></u></u><u></u><u></u><u></u><u></u><u></u><u></u><u></u><u></u><u></u><u></u><u></u><u></u><u></u><u></u><u></u><u></u><u></u></u>	min ôf pumping (m/ft) nin/GPM)	1009.8 1509.9 20 30.0	4 5 10 15	22,9"
Rotary (Con Rotary (Rev Boring) Ar percussi Ober, speci Inside Diameter	verse)	Jetting Driving Digging struction R OR Material	Bor Uve Indu Colh ecord - Cas Wall Thickness (cross	mestic estock lation ustrial er, specify ing Depti From	Comme Municip Test Ho Cooling	ercial   Not used lal   Dewatering le   Monitoring & Air Conditioning Status of Well Vater Supply Replacement Well   Test Hole	20 Duration of pumping <u>hrs</u> + <u>o</u> Final water level end of <u>30.2</u> '' If flowing give rate (t/m Recommended pump	min ôf purnping (m/h) nin/GPM) o depth (n <b>(fi)</b>	10 9.8 15 99.9 20 30.0 25 30.0	4 5 5 10 15 20 25	22,9"
Rotary (Con Rotary (Rev Boring) Ar percussi Ober, speci Inside Diameter	verse)	Jetting Driving Digging struction R OR Material Fibreglass,	ecord - Cas Wall Thickness (critin)	mestic estock aation ustrial er, specify ing Dept	Comme Municip Test Ho Cooling	ercial   Not used lal   Dewatering le   Monitoring & Air Conditioning Status of Well Viater Supply Replacement Well	20 Duration of pumping <u><u><u></u></u><u></u><u></u><u></u><u></u><u></u><u></u><u></u><u></u><u></u><u></u><u></u><u></u><u></u><u></u><u></u><u></u><u></u></u>	min ôf purnping (m/h) nin/GPM) o depth (n <b>(fi)</b>	10 99.8 15 99.9 20 30.0 25 30.0 30 20.1	4 5 10 15 20 25 30	22,'9'
Rotary (Con Rotary (Rev Boring) Ar percussi Ober, speci Inside Diameter	Verse) in Con Open Hole (Galvanized Concrete, P	Driving Driving Digging Struction R OR Material Fibreglass, fastic, Steel)	Bor Uve Indu Colh ecord - Cas Wall Thickness (cross	mestic estock lation ustrial er, specify ing Depti From	Comme Municip Test Ho Cooling	ercial   Not used lal   Dewatering le   Moniforing & Air Conditioning Status of Well Vater Supply Replacement Well Replacement Well Replacement Well Replacement Well	20 Duration of pumping hrs +0 Final water level end i 30.2 '' If flowing give rate (Im Recommended pump (Imin(CePM))	min ôf purnping (m/tt) nin/GPM) o depth (n <b>/tt)</b> o rate	10 9.8 15 99.9 20 30.0 25 30.0	4 2 5 10 15 20 25 30 40	
Rotary (Con Rotary (Rev Boring) Ar percussi Ober, speci Inside Diameter	verse) is Con Open Hole (Galvanized Concrete, P Steel	Driving Driving Digging Struction R OR Material Fibreglass, fastic, Steel)	Bor Uve Indu Colh ecord - Cas Wall Thickness (cross	mestic estock ation ustrial er, specify mg Depti From +2 4	Comme Municip Test Ho Cooling	Incial   Not used Inal   Dewatering Inal   Dewatering Inal   Dewatering Inal   Not used Inal   Not used	20 Duration of pumping <u><u><u></u></u><u></u><u></u><u></u><u></u><u></u><u></u><u></u><u></u><u></u><u></u><u></u><u></u><u></u><u></u><u></u><u></u><u></u></u>	min ôf purnping (m/tt) nin/GPM) o depth (n <b>/tt)</b> o rate	10 99.8 15 99.9 20 30.0 25 30.0 30 20.1	4 2 5 10 15 20 25 30 40 50	
Rotary (Con Rotary (Rev Boring) Ar percussi Ober, speci Inside Diameter	verse) is Con Open Hole (Galvanized Concrete, P Steel	Driving Driving Digging Struction R OR Material Fibreglass, fastic, Steel)	Bor Uve Indu Colh ecord - Cas Wall Thickness (cross	mestic estock ation ustrial er, specify mg Depti From +2 4	Comme Municip Test Ho Cooling	ercial   Not used lal   Dewatering le   Moniforing & Air Conditioning Status of Well (Vater Supply Replacement Well Dewatering Well Deservation and/or Monitoring Hole Alteration (Construction) Abandoned,	20 Duration of pumping <u><u>hrs</u>+<u></u> Final water level end to <u>30.2</u> If flowing give rate (thr Recommended pump (trnif(GPM) Well production (thr)</u>	min ôf purnping (m/tt) nin/GPM) o depth (n <b>/tt)</b> o rate	10 99.8 15 99.9 20 30.0 25 30.0 30 20.1	4 2 5 10 15 20 25 30 40	20,7 28,9"
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## **CERTIFICATE OF WELL COMPLIANCE**

## I (Jeremy Hanna) AIR ROCK DRILLING CO. LTD. - DO HEREBY CERTIFY

that I am licensed to drill water wells in the Province of Ontario, and that I have

supervised the drilling of the water well on the property of :

OWNER: CA	ESTVIE	W IN	NOVAT	ON 1	VC.
Location:#	3200	REIDS	LANE	, Dee	oode
LOT: 07	CON:	PLAN # 4R-	20040	STE# Part	415
Ottawa-Carleton	/ Geographical T	ownship of	OSqu	ode	
			L L		

I CERTIFY FURTHER that, I am aware of the well drilling requirements, the guidelines, recommendations and regulations of the Ministry of the Environment governing well installations in the Province of Ontario, and the standards specified in any subdivision agreement and hydrogeological report applicable to this site and City Standards.

AND DO HEREBY CERTIFY THAT the said well has been drilled, cased, grouted (cement or bentonite) as applicable and constructed in strict conformity with the standards required.

Day of\_APRIL Signed this

Jeremy Hanna (T3632)

Air Rock Drilling Co. Ltd. (C-7681)

The Engineer on behalf of the Landowner set out above, Certifies that he/she has inspected the well and it was constructed in accordance with the specifications in O.Reg 903, this report and the Hydrogeological Report with regards to casing length and grouting requirements.

Signed this <u>11+4</u> d	lay of	May	, 20	,	TAGA 318366
Clemen					2021241
(Engineer) Shaping our future together Ensemble, formons notre avenur	City of Client S 8263 Vir	Engi P.O 210	llaard Assoc neers Box 189 Prescott Street notville, Ontario	t, Unit 1	

	Ministr	vation and Parks		ag#:A31839	2 Print Below)			Well	1000
Measurements		Metric Metric		A318392		Regulatio	n 903 Ontario I Pa		sources , of
Well Owner's	s Information	$\sim N$		Webs the data set the	and the state of the	Marata			
First Name		Last Name/Organ	ization	vation Inc.	E-mail Address				Construct
Mailing Address	(Street Number/Na		AIGAA IIIIIO	Municipality	Province	Postal Cod	e Telephor		/ell Owner
	ade Drive			Ottawa	ON		6R9		
Well Location					a part and the sol				
3200 R	Location (Street Nu leids Lane	umber/Name)		Township Osgoode		Lot P/L		sion	
County/District/M				City/Town/Village			Province	Posta	al Code
	a Carleton	NI-363		Osgoode			Ontario		
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Depth Set at (n From   T	Ø	Type of Sealant L (Material and Typ	Jsed	Volume Placed	After test of well yield, well	water was:	Draw Down Time Water Le	R	ecovery Water Lev
	27 Neat o	cement		10.9	Other, specify			(min)	(m/ft)
52 0	. Bento	nite slurry	tanan Ara Pananan	21	If pumping discontinue	d, give reason:	Level Da	54	27:8
		n nar i kasin ting nari					126.7	1	22.5
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Rotary (Convent Retary (Reverse Boring Air percussion	Diamono ional) Jetting	Domestic Livestock	Comm	ercial Dewatering	20 Duration of pumping	in	327.2 427.6 527.7 1027.7	4	
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## **CERTIFICATE OF WELL COMPLIANCE**

## I (Jeremy Hanna) AIR ROCK DRILLING CO. LTD. - DO HEREBY CERTIFY

that I am licensed to drill water wells in the Province of Ontario, and that I have

supervised the drilling of the water well on the property of :

OWNER: CRESTVIEW INNOVATION IN	<u>íc</u> .
Location: # 3200 REIDS LANE, OSAC	ode
LOT: 0-28 CON: 1 PLAN # 4R-20040 STE# Port.	945
Ottawa-Carleton / Geographical Township of Sqood e	

I CERTIFY FURTHER that, I am aware of the well drilling requirements, the guidelines, recommendations and regulations of the Ministry of the Environment governing well installations in the Province of Ontario, and the standards specified in any subdivision agreement and hydrogeological report applicable to this site and City Standards.

AND DO HEREBY CERTIFY THAT the said well has been drilled, cased, grouted (cement or bentonite) as applicable and constructed in strict conformity with the standards required.

Day of APRIL Signed this

Jeremy Hanna (T3632)

Sha

Air Rock Drilling Co. Ltd. ( C-7681 )

The Engineer on behalf of the Landowner set out above, Certifies that he/she has inspected the well and it was constructed in accordance with the specifications in O.Reg 903, this report and the Hydrogeological Report with regards to casing length and grouting requirements.

Signed this <u>11+6</u> de	ay of May	2021, T	AGA318392
Allerance			TW#2073 2021242
(Engineer)	(K	Kollaard Associates	
appres our future together Ensemble, formons notre avenir	City of Ottawa Client Service Centre 8763 Virtoria Street	P.O. Box 189 210 Prescott Street, Unit 1 Kemptville, Ontario K0G 1	J0 anne internationals

## CERTIFICATE OF WELL COMPLIANCE

## I (Jeremy Hanna) AIR ROCK DRILLING CO. LTD. - DO HEREBY CERTIFY

that I am licensed to drill water wells in the Province of Ontario, and that I have

supervised the drilling of the water well on the property of :

OWNER: CRESTVIEW INNOVATION INC.
Location:# 3200 REIDS LANE, OSgoode
LOT: a 24 CON: 1 PLAN # 4R-20040 STE# Part 415
Ottawa-Carleton / Geographical Township of Sqood e

I CERTIFY FURTHER that, I am aware of the well drilling requirements, the guidelines, recommendations and regulations of the Ministry of the Environment governing well installations in the Province of Ontario, and the standards specified in any subdivision agreement and hydrogeological report applicable to this site and City Standards.

AND DO HEREBY CERTIFY THAT the said well has been drilled, cased, grouted (cement or bentonite) as applicable and constructed in strict conformity with the standards required.

Day of APRIL Signed this

Jeremy Hanna (T3632)

Air Rock Drilling Co. Ltd. (C-7681)

The Engineer on behalf of the Landowner set out above, Certifies that he/she has inspected the well and it was constructed in accordance with the specifications in O.Reg 903, this report and the Hydrogeological Report with regards to casing length and grouting requirements.

Signed this c	lay of	May	,20	21 ,	TAG A318365 TW#30F3
(Engineer)					2021240.
Shaping our future together Ensemble, formons notre avenir	City of Orta Client Servi 8343 Victoria	Engineers P.O. Box 210 Pres	k 189 scott Street, l		

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	Address	SG ODE	Main St. Date compl	A 1 1
21 1 2 M	Northing		evation RC Basin Code	
LOG General colour Most common material	OF OVERBURDEN AND BEDR Other materials	ROCK MATERIALS (	(see instructions) General description	Depth - feet
BROWN Sand		P	acked	From To O \+
GREY CLay GREY CLAY 5 5		<u> </u>	hick ARD Pay	14 30
CONV	tones ne	M.	AKD PAN ED HARD	50 80
	/ //			
54	0F 64 ca	sing		
	DRIVE S	hoe	~ .	· · · · · · · · · · · · · · · · · · ·
j	Bags of	Bentonit	e Quick GRO	out-
31            32				
41 WATER RECORD 51				65 75 80 neter 34-38 Length 39-40
Water found at - feet Kind of water Kind of water insk dian insk dian insk dian insk dian insk dian insk insk insk dian insk insk dian insk i	n Material thickness es inches	Depth - feet           From         To           Ø         § 33 <sup>16</sup>	Z       (Slot No.)         W	inches feet Depth at top of screen <sup>30</sup>
15-18 1 □ Fresh 3 □ Sulphur 19 4 □ Minerale	1         Steel         12           2         Galvanized         3           3         Concrete         4           4         Open hole         5	0 53° 53 80		feet
2 Saity 6 Gas	-18 1 Steel 19 2 Galvanized 3 Concrete	20-23	61 PLUGGING & SEA	Abandonment
25-28 1 C Fresh 3 Sulphur 29 4 Minerals 24	4 □ Open hole 5 □ Plastic <sup>-25</sup> 1 □ Steel <sup>26</sup>	27-30	0° 53 Ben-	e (Cement grout, bentonite, etc.)
2 □ Saity 6 □ Gas 30-33 1 □ Fresh 3 □ Sulphur 34 60 2 □ Saity 6 □ Gas	<ul> <li>2 Galvanized</li> <li>3 Concrete</li> <li>4 Open hole</li> <li>5 Plastic</li> </ul>		18-21 22-25 <b>Quic</b> 26-29 30-33 80	L GROUT
71	11-14 Duration of pumping SPM 15-16 17-18 Hours Mins	In diagra Indicate UNIOS 05600	LOCATION OF WELL	
Static level Water level end of pumping <sup>25</sup> Water levels during <sup>19-21</sup> <sup>22-24</sup> 15 minutes 30 minut	Pumping         2         Recovery           es         45 minutes         60 minutes         35.37	In diagra Indicate	m below show distances of well fr	om road and lot line.
E 26 reet 60 feet 40 feet 60	29-31 feet 60 feet 60 feet	JILLE		, <b>N</b>
If flowing give rate GPM Recommended pump type Recommended pump type Recommended pump type	Water at end of test         42           feet         Clear         Cloudy           43:45         Recommended         46-49	05600	'	ן ' ר
Shallow X Deep pump setting 70	feet pump rate // GPM	Ŭ		
FINAL STATUS OF WELL 54 1 Water supply 5 Abandoned, insuffici 2 Observation well 6 Abandoned, poor qu	ent supply <sup>9</sup> □ Unfinished ality <sup>10</sup> □ Replacement well			
Cost hole			• PH SGODDE Main	1
WATER USE     55-56       1 Domestic     5 Commercial       2 Stock     6 Municipal	9 □ Not use 10 □ Other	0 5	SGOODE Main	st.
3 Irrigation 7 Public supply 4 Industrial 8 Cooling & air condition				
METHOD OF CONSTRUCTION         57           1         Cable tool         5         Air percussion           2         Rotary (conventional)         6         Boring	<sup>9</sup> □ Driving <sup>10</sup> □ Digging	eokge		
3 Gotary (reverse)     7 Diamond     Action of the second of the se	11 🗋 Other	5		244318
B. MOORE WELL DRIL	Well Contractor's Licence No.	Data source Date of inspection	58 Contractor 59-62 Dat	e received 0 2003 63-68 80
Box 436 OSGODE O	N. KON 2WO	Ш Ш П П П П П П П П П П П П П П П П П П		
BOD MOORE	7-0319	A Remarks		CSS.ES3
Signature of Technikary/Conference	day mcOl yr 03	NIW		0506 (07/00) Front Form 9
2 - MINISTRY OF THE ENVIRON	MENT COPY			

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Ministry of the Environment

Well Tag No. (Place Sticker and/or Print Below)

Tag#: A152369

Well Record

Regulation 903	Ontario Water	Resources	Act
	Page	of	

Measurements recorded in: 🗌 Metric 🛛 🙀 Imperial	I ay#	. A 102000	Pa	ige of
Well Owner's Information				
First Name Last Name / Organization	n	E-mail Address		Well Constructed
Baresite Construction	Municipality	Province	Postal Code Telepho	by Well Owner
2354 Summerside Drive			KI4MIBI4613	ne No. (inc. area code)
Well Location	- manona		NUTURE	2215121
Address of Well Location (Street Number/Name)	Township		Lot Conces	sion
5572 Lombardy Drive	OSgoode		ot1+21+22	
County/District/Municipality	City/Town/ <del>/</del> Illage	4	Province	Postal Code
UTM Coordinates Zone , Easting , Northing	Municipal Pten and Su	L blot Number	Ontario Other	
	621 RP4R-14B2B			20
Overburden and Bedrock Materials/Abandonment Sea	aling Record (see instructions on t	he back of this form)	ion ran in O.	<u></u>
General Colour Most Common Material	Other Materials	Gene	ral Description	Depth ( <i>m/ft</i> ) From To
Brown Fill		Sof	-fa.	Ø a'
		Sof		a' 3'
		~		
		Fac	ked	3'54'6
Grey Limestone		Ha	rel	54'6" 101'
				· · ·
Annular Space			Results of Well Yield Testin	
Depth Set at ( <i>m/ft</i> ) Type of Sealant Used	Volume Placed	After test of well yield,	water was: Draw Dowr	Recovery
From To (Material and Type)	(m³/ft³)	Clear and sand fr	ee Time Water L (min) (m/ft	evel Time Water Level
59'6" 49'6" Cement Pressure Gr	outed 13,54	If pumping discontinue	Static	
49'6" & Bentonite Pressure G			Level 131	
			1 15.7	7 1 15,9
		Pump intake set at (m	2 \5	7 2 15,9
		Pumping rate (Ilmin / 0		
Method of Construction	Well Use			
	Commercial Not used	- Duration of pumping -		3 4 15.8
Rotary (Reverse)	Test Hole Monitoring	hrs + O m		1 5 15.8
Boring Digging Irrigation	Cooling & Air Conditioning	Final water level end of		1 10 15.7
Other, specify Other, specify		If flowing give rate (I/m		
Construction Record - Casing	Status of Well			
Inside Open Hole OR Material Wall Depth Diameter (Galvanized, Fibreglass, Thickness		Recommended pump	depth (m/ft) 20 16.	
(cm/in) Concrete, Plastic, Steel) (cm/in) From	To Replacement Well	80'	25 1610	25 15,6
9718" Mud Ø	59 '6' Recharge Well	Recommended pump ( <i>Ilmin   GPM</i> )	30 1010	) 30
	59'6' Dewatering Well Observation and/or		PW1 10 11 1	40
614" Steel .188 \$	Monitoring Hole	Well production (Ilmin-	GPM)	
6/8" Open Hole 59'6"	101   Alteration (Construction)	Disinfected?	50 161	
	Abandoned, Insufficient Supply	Yes No V	<u>e5</u> 60 16.3	60
Outside Donth (	Abandoned, Poor		Map of Well Location	
Diameter (Plastic, Galvanized, Steel) Slot No. From	To Water Quality	Please provide a map b	elow following instructions on the	<u> </u>
	specify		Lombardy Dri	PN PN
	Other, specify	#5572		
		40010		
Water Details	Hole Diameter		200'	
Water found at Depth Kind of Water: Fresh Untested	Depth ( <i>m/ft)</i> Diameter From To ( <i>cmlin</i> )			
→ 5' (m/ft) □ Gas □ Other, specify         Water found at Depth Kind of Water: □ Fresh ☑ Untested	\$ 59'6"976"	2	1 1 Van 1	
		)	0 0 <u>80</u>	
Water found at Depth Kind of Water: Fresh Untested	59'6" 101' 648"			
(m/ft) Gas Other, specify				
Well Contractor and Well Technician				
Business Name of Well Contractor	Well Contractor's Licence No.			
Hashess Address (Street Number/Name)	4 8 4 4	Commente		
POBOX 1083	Municipality	Comments: 165Chlorin	e after Drillin	9
Province Postal Code Business E-mail Addres	SS KNESCOTT	& Chlorin	e after Yield	Tent
ON KOENTO		Well owner's Date Pac		stry Use Only
Bus.Telephone No. (inc. area code) Name of Well Technician (Las	st Name, First Name)	information package	H0518 Audit No.	
Vell Technician's Licence No. Signature of Technician and/or Contr	odd	Data 10/	k Completed Z 1	76050
TATA S 4.15	ractor Date Submitted 30		40508	14.0 000
J506E (2007/12)         © Queen's Printer for Ontario, 2007	Ministry's Copy	I del		<u>1 9 7014</u>
	minior à a AAbà			

Ministry of the Environment and Climate Change	Well Tag No. (Place Sticker and		Regulation 903 Ontario	Nell Record
Measurements recorded in: 🗌 Metric 🛛 Imperial	Tag#: A19	3335	Paç	ge of
Well Owner's Information				
First Name Last Name / Organization		E-mail Address		Well Constructed by Well Owner
Mailing Address (Street Number/Name)	Municipality			ne No. (inc. area code)
<u>2354 Summerside Driv</u> Well Location	<u>e Manstick</u>	ION K	HMIBHIGHB	SHIDIHU
Address of Well Location (Street Number/Name)	Township	L	1	
<u>5566 Lombardy Drive</u> County/District/Municipality	City/Town/Village	¢Ç	$\frac{1}{10000000000000000000000000000000000$	Postal Code
C Hawa	Municipal Plan and Suble		Ontario	KD 19 Jakuto
UTM Coordinates Zone Easting Northing	Municipal Plan and Suble		tim - Other	
NAD 8 3 1 8 4 5 8 4 9 8 1 8 4 4 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9			0.00	
General Colour Most Common Material	Other Materials	General	Description	Depth ( <i>m/ft)</i> From To
Brown Sand				<u>Ø</u> <u>3'</u>
Brown Sand		Soft		3' 15'
Grey Sand	Gravel	Packed		15' 55'6'
Grey Limestone		Hand		55'6' 241'
· · · · · · · · · · · · · · · · · · ·				
				<u> </u>
Annular Space           Depth Set at (m/ft)         Type of Sealant Used	Volume Placed	After test of well yield, wate		n Recovery
From To (Material and Type)	(m³/ft³)	Clear and sand free	Time Water Lo (min) (m/ft)	evel Time Water Level ) (m/n) (m/n)
60.6" 40' Cement Pressure G		If pumping discontinued, g	ive reason: Static 20 t	5 150.8
40' Ø Bentonite Pressure (	Strotted 13.54		1 32-	
	· · · · · · · · · · · · · · · · · · ·	Pump intake set at (m/ft)	2 20,0	5 2 123.5
	·	230' Pumping rate (1/min / GPI	3 46.7	7 3 1179
Method of Construction	Well Use	20 a pr	·	5 4 129 5
Rotary (Conventional)	Municipal Dewatering	Duration of pumping	5 59,9	
Rotary (Reverse)     Driving     Livestock       Boring     Digging     Irrigation	Test Hole Monitoring Cooling & Air Conditioning	Final water level end of pu		
Air percussion		150.8		
Construction Record - Casing	Status of Well	If flowing give rate (I/min )		as 1.210
Diameter (Galvanized, Fibreglass, Thickness	h ( <i>m/ft</i> ) 🛛 Water Supply	Recommended pump de	pth (m/ft)	
(cm/in) Concrete, Plastic, Steel) (cm/in) From	Test Hole	Recommended pump rate		
9718" (OpenHole) 0	606 G	(Vmin/GPM)	30 <u>34</u>	
61/4" Steel 188 0	60'6' Observation and/or Monitoring Hole	Well production (I/min) / G	PM)	4 40 20.7
6/8' OpenHale 60'6"		Disinfected?	50 148.3	
	Abandoned, Insufficient Supply	Ves 🗌 No /40	60 156.8	60 20,45
Construction Record - Screen	Abandoned, Poor ( <i>m/ft</i> ) Water Quality		Map of Well Location w following instructions on the	he hack
Diameter (Plastic, Galvanized, Steel) Slot No.	To Abandoned, other,			AU
	specify			2
	Other, <i>specify</i>		Lombardy	Drive
Water Details	Hole Diameter	and the second se	#5566 1	
Water found at Depth Kind of Water: Fresh Untested				
( <i>m/ft</i> ) Gas Other, specify Water found at Depth Kind of Water: Fresh Untested	14			
( <i>m/ft</i> )  Gas  Other, <i>specify</i>	104." DAV 1.Va"		× >0 +	
Water found at Depth Kind of Water: Fresh Untested			80	
(m/ft) Gas Other, specify Well Contractor and Well Technicia	I Information	. Li falante continue la	rillion	
Business Name of Well Contractor 1425486 Ontario Ltd	Well Contractor's Licence No.			
Business Address (Street Number/Name)	A & A -	Comments:	· · · · · ·	
POBOX 1083	Prescott	140 Childrin	e after Drillin	S.
Province Postal Code Business E-mail Add	-		Cafter field	
Bus.Telephone No. (inc. area code) Name of Well Technician (i	Last Name, First Name)	information	Audit No	nistry Use Only <sup>o.</sup> Z242999
61B1912548B5 Feral mon	Tohnathan	delivered	Completed	Gazya G Spanis (1997 - Sager Carr
Well Technician's Licence No. Signature of Technician and/or Co	Distractor Date Submitted	Date Work		
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Ministry's Copy

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Ontario	Ministry of the Environm and Climate Change	ent Well Tag No. (Place S	ticker and/or Print Below)	1		I Record
Measurements recorded		al Tag# A1934		Regulation 90:	3 Ontario Wate Page_	er Resources Act
Well Owner's Inform	ation Last Name / Organ			-		
Banosite (	Constructi	(NAT)	E-mail Address		-	Well Constructed by Well Owner
Mailing Address (Street No	umber/Name) ummerpide	Drive Manat	Province	Postal Code		D. (inc. area code)
Well Location						
Address of Well Location (	Street Number/Name) <u>mbardy Driv</u>	re Osacc	$\sim 10$	Lot otlot 314	Concession	1411-830
County/District/Municipalit	y	City/Town/Village	h	Pro	vince	Postal Code
UTM Coordinates Zone E	asting Northing		ocd ( nd Sublot Number	Oth	ntario	<u>kchdel</u>
	<u>15010188 4999</u>	A 5AA Pats 17 In Sealing Record (see instruction	<u>18 RP4R-14828</u>	<u>ŝ</u>		······································
	lost Common Material	Other Materials		eral Description	F	Depth ( <i>m/ft)</i> From ∣ To
Brown S	andy Clay		Pac	ad		<u>A</u> LO
Brown	Sand		Pad	ed		0' 25'
Grown	Sand	Gravel	Pad	<u>ed</u>		151/551
over L	imestore		Ha	rd	5	5' 161'
		··· · · · · · · · · · · · · · · · · ·				
		<u></u>				
	Annular Spac			Results of Well Y		
Depth Set at ( <i>m/it</i> ) From To	Type of Sealant U (Material and Typ		ced After test of well yield,	free Tin		Recovery Time Water Level
60' 40' G	emont Pressue	Grouted 6.77	If pumping discontinue	ed give reason: Sta	tic	(min) (m/ft)
40' ¢ B	entonite Pressu	re Grouted 13.5				1 1215
			Pump intake set at (r			1 131.5
			Pumping rate ( <i>l/min /</i>			3 1724
Method of Constr	Diamond Public	Well Use	used 7as	xm 4	37.7	4 120
Rotary (Conventional)	Jetting 🛛 🖾 Domestic	🗌 Municipal 🔛 Dew	vatering Duration of pumping			5 11/ 25
Boring [	Digging Irrigation	Test Hole Mor				10 1015
Air percussion Other, specify	Industrial	ecify	If flowing give rate (//	5 min / GPM) 11	5 66.85	15 62 55
	uction Record - Casing	Status of I	Netl	20		20 75.55
Inside Open Hole OR Diameter (Galvanized, Fi (cm/in) Concrete, Plas	breglass, Thickness	Depth ( <i>m/ft</i> ) Xater Supp om To Replacemen		2 depth ( <i>m/it</i> )	5 6, 75	25 64 Å
and is mind	Hale) Q	Test Hole		p rate 3	DGK 2	30 55,7
L'alle Lepen	188 (	b 60 <sup>1</sup> Dewatering	S C 3 S	000 41		40 41,2
6/2" (nent		Monitoring H	lole	5	125.1	50 31,3
me jupen		Construction Construction Alteration (Construction Alteration		145 60	_	60 25.1
	ruction Record - Screen	Insufficient 5	Poor	Map of Well L	· · · · · · · · · · · · · · · · · · ·	
Outside Diameter (cm/in) (Plastic, Galvani	SIOUNO, I	Depth ( <i>m/ft</i> ) Water Quali om To Abandoned,	· //	DEIOW TOIlOWING INSTR	Joions on the Da	ск. AN
(0.1.1.9)		specify		ī. \	1 - 2	* • 72
		Other, speci	ify sime sime second	<u> </u>	<u>ardy or</u>	
	Vater Details	Hole Diameter		1		ŝ
Water found at Depth Kind	d of Water: 🛄 Fresh 🔂 Unt Other, specify	ested Depth ( <i>m/ft</i> ) Di From To (	ameter ( <i>cm/īn</i> )	↓   <del>{ → s</del> ð   80'	1 200	
	d of Water: Fresh Unt	ested \$ 600' 9	18	1 ton	5 MO' W	
(m/ft) Gas	Other, <i>specify</i> d of Water:	ested 60' 161' 6	<u>/////////////////////////////////////</u>	180.		
( <i>m/ft</i> ) 🗌 Gas 🔲						
Business Name of Well Cor	Contractor and Well Tech	nician Information Well Contractor's Lice	nce No.			
1425486 Outor	riolto wenorillina	487				
Business Address (Street N	Number/Name)	Municipality	- Comments: 145Chlor	me after	Drillin	.Q
Province Posta	I Code Business E-ma		Star Start CO	YVV (Pro-		
Bus.Telephone No. (inc. area	code) Name of Well Techni	cian (Last Name, First Name)	information	Package Delivered	Audit No. 🍞	<u>ry Use Only</u> 2 <u>4</u> 3 <u>0</u> 19
LGAR MADEMIN	85 Feraus	miJohnathan		Nork Completed		LJULJ
Well Technician's Licence No.	Signature of Technician and	or Contractor Date Submitted	BO DNO RE	1/ 6/ 1/ 6D	Received	
0506E (2014/11)				<u>a i ∼i vivi "∿</u> ∳‱"		Printer for Ontario, 2014

Ministry of the Environment and Climate Change	Well Tag No. (Place Sticker a	Regulatio	=	Vell Record
Measurements recorded in: 🛄 Metric 😡 Imperial	Tag# 191934	13	Page	
Well Owner's Information First Name Comparison Variable V	0	E-mail Address		
Bareaite Constructio Mailing Address (Street Number/Name)	$\overline{\mathbf{N}}$			Well Constructed by Well Owner
_2354 Summer ide	Municipality	HOVINCE Postal Code		No. (inc. area code)
Well Location Address of Well Location (Street Number/Name)				
5554 Lamberdunicie	Township OS accede	Lot	Concessions	
County/District/Municipality	City/Towh/Village		Province	Postal Code
UTM Coordinates Zone Easting Northing	Municipal Plan and Sub	lot Number	Ontario Other	KPABUD
NAD         8         3         1943         964		<u> R-14828</u>		
General Colour Most Common Material	Other Materials	General Description	n	Depth ( <i>m/ft</i> ) From   To
Brown Clay		Paded		¢ 8'
Brown Sand	ρ	Padied		8'15'
Grey Sand	Gravel	Paded		15' 51'6"
Grey Limestone		Havd		516" 121
		· · · · · · · · · · · · · · · · · · ·		
				· · · · · · · · · · · · · · · · · · ·
Annular Space           Depth Set at (m/ft)         Type of Sealant Used	Volume Placed	Results of We After test of well yield, water was:	ell Yield Testing	and the second sec
From To (Material and Type)	(m³/ft³)	Clear and sand free	11	el Time Water Level
566 466 Cement Pressue Groc		Other, specify     If pumping discontinued, give reason:	(min) (m/ft) Static	(min) (m/ft)
466 Q Bentonite Prossure Gran	atua 13.54		Level 16,7	5 1 50.85
		Pump intake set at (m/ft)	2 22,19	2 457
Method of Construction		Pumping rate (I/min / GPM)	3 25.2	3 42,4
Cable Tool Diamond Public	Well Use	Fapm	4 27	4 39 3
	Municipal     Dewatering     Test Hole     Monitoring	Duration of pumpirig	5 28.6	5 5 36
Boring     Digging     Irrigation     State     Digging     Industrial	Cooling & Air Conditioning	Final water level end of pumping ( <i>m/t</i> ) 56.4	10 35	10 23,4
Other, specify Other, specify Other, specify		If flowing give rate (I/min / GPM)	15 39,5	15 18,2
Construction Record - Casing	(m/ft) 🔀 Water Supply	Recommended pump depth (m/ft)	20 43	20 17.6
Diameter (Galvanized, Fibreglass, (cm/in) Concrete, Plastic, Steel) (cm/in) From	To Replacement Well	110'	25 45.8	25 17,05
9718" (Open Hole) Ø	566 Recharge Well	Recommended pump rate (Vmin / GPM)	30 47.5	30 17-,025
	566 <sup>1</sup> Observation and/or Monitoring Hole	Well production (//w/n / GPM)	40 52.8	40 7-
6/8" Open Hole 566"	Image: Alternation (Construction)	Disinfected?	50 54,85	5 50 17
V.	Abandoned, Insufficient Supply	AYes No 140	60 564	60 16,975
Outside Material Depth	Abandoned, Poor	Map of Wo Please provide a map below following	all Location	back
Diameter (cm/in)         (Plastic, Galvanized, Steel)         Slot No.         From	To Abandoned, other, specify			
	Other, specify	Lomba	<u>edy Dei</u>	ve M
		A H	554	
Water Details Water found at Depth Kind of Water: Fresh Untested	Hole Diameter	200 3		
\\\\5' (m/ft) [] Gas [] Other, specify	From To (cm/in)			
Water found at Depth Kind of Water: Fresh Untested (m/ft) Gas Other, specify	Ø 56°6" 948"	1 182	E 1	
Water found at Depth Kind of Water: Fresh Untested	566" 121 6/8"		30'	
(m/ft) Gas Other, specify	Information			
Business Name of Well Contractor	Well Contractor's Licence No.			
Business Address (Street Number/Name)	Municipality	Comments:		
Province Postal Code Rusinger E mail Addr	Prescott	Comments: 140 Chlorine after ( Chlorine afte	, Qiant	
Province Postal Code Business E-mail Addr		Well owner's Date Package Delivered		try Use Only
Bus Telephone No. (inc. area code) Name of Well Technician (La		package delivered	Audit No	
Vell Technician's Licence No. Signature of Technician and/or Con		Date Work Completed	P.C.C.	C TOTO
2181519 3506E (2014/11)	- BOX64VBD	$\square NO 30 + 6 + 10$	Interim a district and	Drinter for O
e de la companya de l	Ministry's Copy		© Queen's	Printer for Ontario, 2014

314/44 GROUND WATER BRAN UTM 1 1 B Z 4 5 2 1 9 0 E Ontario Water Resources Commission Act ONTABIO WATER RESOURCES CONCERNINGN Elev RECORD Basin Township, Village, Town or City Lot 2% Date completed  $2_{(day)}$ Con. Co Address 220 Ellendale ð 00 Owner. (print in block letters) **Pumping Test Casing and Screen Record** 31 Inside diameter of casing...... Static level 8 G.P.M. Test-pumping rate Total length of casing. 60 Pumping level Type of screen Duration of test pumping / hr Length of screen Water clear or cloudy at end of test Depth to top of screen 8 G.P.M. Recommended pumping rate Diameter of finished hole 75 feet below ground surface with pump setting of Water Record Well Log Depth(s) at which water(s) found Kind of water From То Overburden and Bedrock Record (fresh, salty, ft. ft. sulphur) Ð D 100 20 6 36 59 3 Location of Well For what purpose(s) is the water to be used? Jost of In diagram below show distances of well from road and lot line. Indicate north by arrow Is well on upland, in valley, or on hillside? Drilling or Boring Firm Capi Address 1243 076 Licence Number Name of Driller or Borer. Address 1463 Date (Signature of Licensed Drilling or Boring Contractor) Form 7 10M-62-1152 088.58 OWRC COPY

314/44 GROUND WATER BRAN UTM 1 1 B Z 4 5 2 1 9 0 E Ontario Water Resources Commission Act ONTABIO WATER RESOURCES CONCERNINGN Elev RECORD Basin Township, Village, Town or City Lot 2% Date completed  $2_{(day)}$ Con. Co Address 220 Ellendale ð 00 Owner. (print in block letters) **Pumping Test Casing and Screen Record** 31 Inside diameter of casing...... Static level 8 G.P.M. Test-pumping rate Total length of casing. 60 Pumping level Type of screen Duration of test pumping / hr Length of screen Water clear or cloudy at end of test Depth to top of screen 8 G.P.M. Recommended pumping rate Diameter of finished hole 75 feet below ground surface with pump setting of Water Record Well Log Depth(s) at which water(s) found Kind of water From То Overburden and Bedrock Record (fresh, salty, ft. ft. sulphur) Ð D 100 20 6 36 59 3 Location of Well For what purpose(s) is the water to be used? Jost of In diagram below show distances of well from road and lot line. Indicate north by arrow Is well on upland, in valley, or on hillside? Drilling or Boring Firm Capi Address 1243 076 Licence Number Name of Driller or Borer. Address 1463 Date (Signature of Licensed Drilling or Boring Contractor) Form 7 10M-62-1152 088.58 OWRC COPY

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Ontario Ministry of the Environment				er Resources Act /ELL RECORD
Print only in spaces provided. Mark correct box with a checkmark, where appli		15338		
County or District Carbeton	Township/Borough/City		wa Con block tract	
	Address	SG ODE	Main St. Date compl	A 1 1
21 1 2 M	Northing		evation RC Basin Code	
LOG General colour Most common material	OF OVERBURDEN AND BEDR Other materials	ROCK MATERIALS (	(see instructions) General description	Depth - feet
BROWN Sand		P	acked	From To O \+
GREY CLay GREY CLAY 5 5		<u> </u>	hick ARD Pay	14 30
CONV	tones ne	M.	AKD PAN ED HARD	50 80
	/ //			
54	0F 64 ca	sing		
	DRIVE S	hoe	~ .	· · · · · · · · · · · · · · · · · · ·
j	Bags of	Bentonit	e Quick GRO	out-
31            32				
41 WATER RECORD 51				65 75 80 neter 34-38 Length 39-40
Water found at - feet Kind of water Kind of water insk dian insk dian insk dian insk dian insk dian insk insk dian insk insk dian insk insk dian insk insk dian insk insk dian insk insk dian insk insk dian dian di dian dian dian di dian dian di dian	n Material thickness es inches	Depth - feet           From         To           Ø         § 33 <sup>16</sup>	Z       (Slot No.)         W	inches feet Depth at top of screen <sup>30</sup>
15-18 1 □ Fresh 3 □ Sulphur 19 4 □ Minerale	1         Steel         12           2         Galvanized         3           3         Concrete         4           4         Open hole         5	0 53° 53 80		feet
2 Saity 6 Gas	-18 1 Steel 19 2 Galvanized 3 Concrete	20-23	61 PLUGGING & SEA	Abandonment
25-28 1 C Fresh 3 Sulphur 29 4 Minerals 24	4 □ Open hole 5 □ Plastic <sup>-25</sup> 1 □ Steel <sup>26</sup>	27-30	0° 53 Ben-	e (Cement grout, bentonite, etc.)
2 □ Saity 6 □ Gas 30-33 1 □ Fresh 3 □ Sulphur 34 60 2 □ Saity 6 □ Gas	<ul> <li>2 Galvanized</li> <li>3 Concrete</li> <li>4 Open hole</li> <li>5 Plastic</li> </ul>		18-21 22-25 <b>Quic</b> 26-29 30-33 80	L GROUT
71	11-14 Duration of pumping SPM 15-16 17-18 Hours Mins	In diagra Indicate UNIDAS OSEOD	LOCATION OF WELL	
Static level Water level end of pumping <sup>25</sup> Water levels during <sup>19-21</sup> <sup>22-24</sup> 15 minutes 30 minut	Pumping         2         Recovery           es         45 minutes         60 minutes         35.37	In diagra Indicate	m below show distances of well fr	om road and lot line.
E 26 reet 60 feet 40 feet 60	29-31 feet 60 feet 60 feet	JILLE		, <b>N</b>
If flowing give rate GPM Recommended pump type Recommended pump type Recommended pump type	Water at end of test         42           feet         Clear         Cloudy           43:45         Recommended         46-49	05600	'	ן ' ר
Shallow X Deep pump setting 70	feet pump rate // GPM	Ŭ		
FINAL STATUS OF WELL 54 1 Water supply 5 Abandoned, insuffici 2 Observation well 6 Abandoned, poor qu	ent supply <sup>9</sup> □ Unfinished ality <sup>10</sup> □ Replacement well			
Cost hole			• PH SGODDE Main	1
WATER USE     55-56       1 Domestic     5 Commercial       2 Stock     6 Municipal	9 □ Not use 10 □ Other	0 5	SGOODE Main	st.
3 Irrigation 7 Public supply 4 Industrial 8 Cooling & air condition				
METHOD OF CONSTRUCTION         57           1         Cable tool         5         Air percussion           2         Rotary (conventional)         6         Boring	<sup>9</sup> □ Driving <sup>10</sup> □ Digging	eokge		
3 Gotary (reverse)     7 Diamond     Action of the second of the se	11 🗋 Other	5		244318
B. MOORE WELL DRIL	Well Contractor's Licence No.	Data source Date of inspection	58 Contractor 59-62 Dat	e received 0 2003 63-68 80
Box 436 OSGODE O	N. KON 2WO	Ш Ш П П П П П П П П П П П П П П П П П П		
BOD MOORE	7-0319	A Remarks		CSS.ES3
Signature of Technikary/Conference	day mcOl yr 03	NIW		0506 (07/00) Front Form 9
2 - MINISTRY OF THE ENVIRON	MENT COPY			

Ontario Ministry of the Environ		Well A 071208	Print Below)	Well Record Regulation 903 Ontario Water Resources Act
Measurements recorded in: Metric	Imperial	AOTIZOS		Page of
Well Owner's Information			and the second sec	

550 County/Dis	2 Oc strict/Municip	Sapode	Ma	'n	С	OSq ade		23	Provinc			Code
	Inates Zone	Easting		orthing		Unicipal Plan and Sublo	t Number		Onta	1110	KO	AI WO
						d (see instructions on the	back of this form)	REE	11112			
General C		Most Comm	the second se			er Materials	General D	escription	1		Dep From	th ( <i>m/ft</i> ) To
2	0	. /					1/	/				20
Brou		sand					Mano	,			0	de D
Tellou	5 (c	arse	Sand				Sof 1			2	.5	9.7
		6.0					SOFT			9.	2	13.5
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Grea		limesto	ne.				layered	1		1	4.9	24.3
5							5					
			Annula	Space			Resu	Its of W	ell Yiel	d Testing	41.11	
Depth Se	et at (m/ft)		Type of Sea			Volume Placed	After test of well yield, wate		Dra	aw Down		lecovery
From	То		(Material ar		6	$(m^3/ft^3)$	Clear and sand free		III a second	Water Leve		
$\bigcirc$	6	cia	no.t	arou	+	4BQO	Other, specify		(min)	(m/ft)	(min)	(m/ft)
	0	CUI	. cons	Jug	-		If pumping discontinued, gi	ve reason:	Static Level	2.80		8-51
									1	8.m	1	8.08
							Pump intake set at (m/ft)					D*
							10		2	8.07	2	7.94
			-				Pumping rate (Vmin / GPM	ŋ	3	8.19	3	7.83
Met	hod of Con	struction	111111		Well Us		56	/			4	7.81
Cable To		Diamond		iblic mestic	Commer		Duration of pumping		4	8.25	4	1.01
Rotary (	Conventional) Reverse)	Jetting		vestock	Test Hol		hrs + min		5	8.30	5	7.80
Boring		Digging		igation		& Air Conditioning	Final water level end of pur	nping (m/ft)	10	8.41	10	
Air percu				dustrial			8.51					
Other, s				her, specify			If flowing give rate (Vmin-/	GPM)	15	8.47	15	
		struction R	1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1			Status of Well			20	8.47	20	
Inside Diameter		OR Material d, Fibreglass,	Wall Thickness		h ( <i>m/ft</i> )	Water Supply Replacement Well	Recommended pump dep	oth ( <i>m/tt</i> )	1.1.1.1.1.1.1	8.47	25	
(cm/in)	Concrete, F	Plastic, Steel)	(cm/in)	From	To	Test Hole	Recommended pump rate		20	0.71	20	
1550	Ste	1	418	+.60	149	Recharge Well	(Vmin / GPM)	3	30	8.48	30	
1000			0	1100	- <i>"</i> ,	Dewatering Well     Observation and/or	56		40	8.48	40	
1555	Open +	Hole		14.9	24.3	Monitoring Hole	Well production (Vmin / GI	PM)			50	
	· ·					Alteration	Disinfected?		50	8,50	50	
						(Construction)	Yes No		60	8.51	60	-
	Co	Instruction R	ecord - Scn	oon		Insufficient Supply		Map of W	ell Loc	ation	11111	C. C. C. C. C. C. C. C.
Outside	T		0010-001	Contra da contra	h ( <i>m/l</i> t)	Abandoned, Poor Water Quality	Please provide a map belo			the second s	back.	124
Diameter (cm/in)		iterial vanized, Steel)	Slot No.	From	То	Abandoned, other,		1. 0	1 4			10 (
Contently	```					specify		Join S	Ren			
	100					Other, specify			10			
							8		P	0.54		
		Water Det	ails	THURSDAY	Н	ole Diameter	i c		151			
Water four	nd at Depth	Kind of Wate		Untested	j Dept	h (m/ft) Diameter	51		1-1	5502		
20 (1	n/ft) Gas	Other, spe	cify		From	To (cm/in)	1 Contraction of the second se					
Water four	nd at Depth	Kind of Wate	r: Fresh	Untested	0	6 21.23	5		ell.			
		Other, spe			6	24.3 15.55	2		for-			
		Kind of Wate		Untesteo	0	(1) (J.D)		L				
(1	n/ft) Gas	Other, spe	cify									
		ell Contracto	or and Wel	I Technicia		the second s						
Business	Name of Well	Contractor	11	2.11		Il Contractor's Licence No.		1				
Business	OG rg	et Number/Na	)ell L	Icillin	9	nicipality	Comments:	Lion	RD			
// Do	D - J	GAR	Can +			Jation	sommente.					
Province	Konte	960 ostal Code	Busines	s E-mail Ad	dress	ration						
P				ΛA			Well owner's Date Packa	age Deliver	red	Minis	stry Us	e Only
Bus. Telephone No. (inc. area code) Name of Well Technician (Last Name, First Name)					advage							
		291 No. Signature					delivered Date Work	the second se	the second se	~	al	J341
Well Technic	cian's Licence	No. Signature	of Technici	an and or C			Yes			N		6 9908
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0506E (12/20	007)					Ministry's Copy				© Queen'	s Printer f	for Ontario, 2007

Table III: Summary of Well Record Information from Area Wells

						Available	Water	Yield Test				
Well No	Soil Depth	Soil Desc.	Bedrock desc.	Casing Depth	Total Depth	Drawdown	Desc.	Test rate	Static Level	Specific Capacity	Spec. Cap.	
	m			m	m	m		L/min	m	L/min*m	m²/day	
1507117	17.69	Hardpan, boulders	Limestone	17.69	46.97	-	Fresh	22.7	5.49	1.31	1.9	
1507118	18.00	Sand, Clay, Hardpan	Limestone	18.91	40.57	13.42	Fresh	30.3	9.46	3.42	4.9	
1507132	11.59	Gravel, Boulders, Rocks	Limestone	2.75	24.40	16.78	Fresh	22.7	6.10	6.77	9.7	
1510042	11.90	Overburden	Limestone	13.12	19.83	10.68	Fresh	37.9	6.10	12.41	17.9	
1512448	9.76	Sand and cobbles	Limestone	14.34	13.73	7.93	Fresh	37.9	1.83	12.41	17.9	
1517055	8.85	Sand, Sand & clay	Limestone	8.85	9.46	3.66	Fresh	113.6	2.44	53.19	76.6	
1517062	8.85	Sand, Sand & clay	Limestone	8.85	10.68	5.80	Fresh	189.3	1.83	68.94	99.3	
1517063	8.24	Sand, Sand & clay	Limestone	8.85	12.20	3.66	Fresh	113.6	2.44	53.19	76.6	
1517843	13.42	Sand & gravel	Limestone	14.03	19.22	4.58	Fresh	113.6	4.58	24.82	35.7	
1518085	11.59	Sand, Sand & gravel	Limestone	11.90	22.88	9.15	Fresh	37.9	3.05	8.27	11.9	
1518482	11.29	Clay, Hardpan	Limestone	8.85	12.20	5.49	Fresh	75.7	3.66	13.79	19.9	
1518483	8.85	Sand, Hardpan	Limestone	9.46	12.20	6.10	Fresh	113.6	3.05	18.61	26.8	
1519019	12.51	Sand, Hardpan	Limestone	13.12	15.25	6.10	Fresh	75.7	3.05	12.41	17.9	
1519660	9.76	Sand, Sand & gravel	Limestone	9.76	12.20	5.49	Fresh	227.1	2.14	248.20	357.4	
1521685	14.03	Sand, Hardpan	Limestone	14.64	25.93	19.83	Fresh	34.1	4.58	1.72	2.5	
1529556	15.86	Sand, Sand & clay	Limestone	16.17	26.84	4.27	Minerals	45.4	6.41	7.84	11.3	
1533843	15.25	Sand, Clay	Limestone	16.17	24.40	13.42	ohur & Mine	45.4	7.93	4.38	6.3	
A030765	14.93	Sand & gravel	Limestone & Sandstone	16.46	73.46	37.52	Untested	45.7	7.48	83.09	119.7	
A071208	14.90	Sand, Clay	Limestone	14.90	24.30	11.20	Fresh	56.0	7.80	78.87	113.6	
A093967	2.90	Sand - Montoring well	Unknown	-	2.90	-	-	-	-	-	-	
A094398	3.40	Sand - Abandoned 7 Monitoring wells	Unknown	-	0.00	-	-	-	-	-	-	
A117467	14.95	Sand, Clay, Till	Limestone	16.47	21.96	8.02	Untested	45.0	4.18	45.45	65.5	
A119667	1.21	Sand, Clay & stones	Limestone & Sandstone	17.67	83.20	37.26	Untested	61.0	8.45	2.13	3.1	
A169050	15.86	Sand, Sand & gravel	Limestone	17.54	30.81	19.55	Untested	75.7	4.85	275.77	397.1	
A165032	14.32	Sand, Till	Limestone & Sandstone	15.84	75.58	17.39	Untested	54.5	5.46	19.96	28.7	
A193395	16.93	Sand, Sand & gravel	Limestone	18.45	73.51	54.75	-	75.7	6.25	1.90	2.7	
A207699	13.12	Sand, gravel, clay	Limestone	14.95	73.20	37.67	Untested	75.7	5.03	48.67	70.1	
A193411	16.78	Sandy clay, Sand & gravel	Limestone	18.30	49.11	39.47	Untested	26.5	6.28	0.74	1.1	
A193412	15.71	Clay, Sand & gravel	Limestone	17.23	36.91	28.40	Untested	26.5	5.15	2.20	3.2	
A182518	4.57	Sand & clay - Monitoring well	Unknown	-	4.57	-	-	-	-	-	-	
A182515	4.57	Sand & clay - Monitoring well	Unknown	-	4.57	-	-	-	-	-	-	
A182517	3.96	Sand & clay - Monitoring well	Unknown	-	0.00	-	-	-	-	-	-	
A229142	13.42	Sand, Gravel & boulders	Limestone & Sandstone	16.47	73.20	34.34	Untested	75.7	8.36	354.57	510.6	
A252762	14.34	Sand, Clay	Limestone	13.42	30.50	19.92	Untested	75.7	4.48	275.77	397.1	
A236933	15.71	Sand & stones	Limestone	17.23	36.91	26.23	Untested	75.7	4.27	134.16	193.2	
A304984	12.81	Sand, gravel, clay	Limestone	15.86	103.70	35.26	Untested	75.7	7.44	118.19	170.2	
A318365	15.86	Sand & stones, clay & stones	Limestone	18.91	30.50	19.73	Untested	75.7	4.67	275.77	397.1	
A318366	17.08	Sand & stones, clay, gravel	Limestone	20.13	76.25	35.72	Untested	75.7	6.98	34.00	49.0	
A318392	15.86	Sand, Clay, Gravel	Limestone & Sandstone	18.91	74.42	35.84	Untested	75.7	6.86	46.83	67.4	
A308544	-	Unknown - Raised casing	-	-	-		-	-	-	-	-	

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OTM 1/18 2 1415121/161					7117
5 R 419191910171	<u>0</u> N	ONTARIO		LEUWERE BRANCH	
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10+28			Recor		1 1-
County or Territorial District	arleton	Township	, Village, Town or	CityO.Sgaath	2 tup
		V L	Village, Town or (	City)	
Date completed	<b>.</b>				
(day)	(month)	(year)			
Pipe and Casing	Record			Pumping Test	
Casing diameter (s)		Sta	tic level	T ft	
Length(s)		Pu	mping rateS.	60 gal pl	A. Allen
Type of screen Length of screen		1	mping level7. ration of test		,,
Length of screen					<u> </u>
Well Log				Water Record	
Overburden and Bedrock Record	From ft.	To ft.	Depth(s) at which water(s) found	No. of feet water rises	Kind of water (fresh, salty, or sulphur)
hardpan boulders	0	58			
limiting rock	58	154	154	136	fresh
	· · · · · · · · · · · · · · · · · · ·				
For what purpose(s) is the water	to be used?			ocation of Well	nn
Is water clear or cloudy?	ean		-	w show distances of ne. Indicate north	
Is well on upland, in valley, or on	hillside?	sland			NORTH
Drilling firm	seco p	ma			<b>∧</b>
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Name of Driller	, Sims		c'ter	20	UT.
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Licence Number					
I certify that the statements of fact		A CONTRACTOR OF	Ŧ		
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Date Cal 10 Jel	gnature of Licent		•		-> EAST
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Form 5

314/44 GROUND WATER BRAN UTM 1 1 B Z 4 5 2 1 9 0 E Ontario Water Resources Commission Act ONTABIO WATER RESOURCES CONCERNINGN Elev RECORD Basin Township, Village, Town or City Lot 2% Date completed  $2_{(day)}$ Con. Co Address 220 Ellendale ð 00 Owner. (print in block letters) **Pumping Test Casing and Screen Record** 31 Inside diameter of casing...... Static level 8 G.P.M. Test-pumping rate Total length of casing. 60 Pumping level Type of screen Duration of test pumping / hr Length of screen Water clear or cloudy at end of test Depth to top of screen 8 G.P.M. Recommended pumping rate Diameter of finished hole 75 feet below ground surface with pump setting of Water Record Well Log Depth(s) at which water(s) found Kind of water From То Overburden and Bedrock Record (fresh, salty, ft. ft. sulphur) Ð D 100 20 6 36 59 3 Location of Well For what purpose(s) is the water to be used? Jost of In diagram below show distances of well from road and lot line. Indicate north by arrow Is well on upland, in valley, or on hillside? Drilling or Boring Firm Capi Address 1243 076 Licence Number Name of Driller or Borer. Address 1463 Date (Signature of Licensed Drilling or Boring Contractor) Form 7 10M-62-1152 088.58 OWRC COPY

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				WATER RESOURC	DES
UTM 1/ 18 2 415 2050 E				PHISION	
Co.15 2 4 9 9 8 9 2 0 The Ontario Water Re	Jule	Commission	A-11	MAY 1 7 196	5
Elev 3 2 0 3 2 0 WATER WE				ONTARIO WATE	2
Besinty or District carleton				A DESCRIPTION OF THE OWNER OWNER	SION
	Townsh	ip, Village, T	own or City pril 14	th, 1965	
Con. 1 Lot 29	Date co	mpleted	(day	month	year)
Owner Canadian Legion (print in block letters)	Address	0 <b>s</b> go	ode Ont.		
Casing and Screen Record			Pumping		
Inside diameter of casing. 2"					
Total length of casing 9	Test	t-pumping ra	.te 360	G.P.1	4. G.F.M.
Type of screen	Pun	nping level	•	<b>131</b> 31?	
Length of screen			oumping		
Depth to top of screen				test <b>clea</b> r	•
Diameter of finished hole <b>2</b> "	Rec	ommended p	umping rate	300 G	P.H. CAR
					w ground surface
Well Log		<b>i</b> 1		T	· Record
Overburden and Bedrock Record		From ft.	To ft.	Depth(s) at which water(s) found	Kind of water (fresh, salty,
Gravel		0	5	Touna	sulphur) Fresh
Bolders		5	34		///_31/
Rocks		34	381	0.01	
Limestone		38	80 •	801	
For what purpose(s) is the water to be used? Legion Hall			Location	j j of Well	
For what purpose(s) is the water to be used.		In diagram		distances of wel	l from
Is well on upland, in valley, or on hillside?				icate month by	
Drilling or Boring Firm				- ,	m
J.B. Dufresne & Co. Ltd.				NEW	
Address 1014 Maitland Ave.		j v	FART 1	allowin	
Ottawa, Ontario.	45	BULE	40-	∠	**
Licence Number 1307		11 ]	15	<u></u>	
Name of Driller or Borer <b>F. Laramee</b>		•	«L <sup>b</sup>		
Address 21A Garneau, Hull Que.		1 W	JUL		
Date April 19th, 1965		I re	5600DE 57ATI	811	
I or J. B. Dufresne & Co. Ltd.			STAT		
(Signature of Licensed Drilling or Boring Contractor)	••••				
Form 7 15M-60-4138		Table Tabl			
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316141 1510042 184452200 41874999020 The Ontario Water Resources Commission Act 5 8 0 3 1 5 24 WENDER BOUND ER 2151 in County or District Cartten Osgoode Juny inshite Malage, Town or City O59000 e Con. Becker Front I Lot 2828 Date completed Jan 28, 1969 ONTABIO WATE? day month year) commissions goode **Pumping Test** Casing and Screen Record Static level 20 F1 511 Inside diameter of casing Test-pumping rate /0 G.P.M. 431 Total length of casing Pumping level 35 Ft Type of screen Duration of test pumping. / h r Length of screen Water clear or cloudy at end of test Clear Depth to top of screen..... Diameter of finished hole 6-11 Recommended pumping rate 5-10 G.P.M. Water Record Well Log Kind of water Depth(s) at To ft. From ft. (fresh, salty, sulphur) which water(s) found Overburden and Bedrock Record 39 Over burden 0 rest 32 For what purpose(s) is the water to be used? Heinse Location of Well In diagram below show distances of well from road and lot line. Indicate north by arrow. Is well on upland, in valley, or on hillside? upland Drilling or Boring Firm C.V. Mornison Frankuille ..... Licence Number 3104 Name of Driller or Borer P. QuINN Address Frank Ville Address ..... 1969 an 2d Date..... (Signature of Licensed Prilling or Boring Contractor - OSGOOD Form 7 15M-60-4138 OWRC COPY

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	T	00	pood		0	10		DATE COMPL		8-53
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10		51 CAS	ING & OPE	N HOLE RE		SIZE(S) (SLOT	) OF OPENING NO.1	31-33 DIAME		LENGTH 39-40
HATER FOUND	KIND OF WATER	INSIDE DIAM. MAT INCHES	TERIAL THIC	VALL DEF CKNESS ICHES FROM	TH - FEET	HATER MATER	AND TYPE		INCHES DEPTH TO TOP OF SCREEN	
10-13 1 04/2 2 1	FRESH <sup>3</sup> SULPHUR <sup>14</sup> SALTY <sup>4</sup> MINERAL		EEL 12	88 0	47-16	s l				FEE1
15-18 1 U	SALTY 4 MINERAL	-6 -66P	NCRETE	-47	2-54	61	PLUGG	ING & SEA	LING REC	
20-23 1	24	17-18 1 🗍 ST		1	20-23	DEPTH S	ET AT - FEET	ATERIAL AN		MENT GROUT
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ſ	OUNTY OF DISTRICT	2. CHECK X CORI	TOWNSHIP. BOROUGH. CITY. TOWN VILLAG		CON. BLOCK TRACT. SUR		Lot 25-27
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	. <u>L</u>	10 12			KOA		
	ENERAL COLOUR	MOST	OG OF OVERBURDEN AND BEDI	ROCK MATERIA		DEPT	- FEET
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╞	grey	fill				0	5
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						/	
	4 WA1		51   CASING & OPEN HOLE	RECORD	SIZE(S) OF OPENING (SLOT NO)	31-33 DIAMETER 34 34 L	71 80 ENGTH 39 40
F		KIND OF WATER	INSIDE MATERIAL WALL DIAM MATERIAL THICKNESS INCHES INCHES	DEPTH - FE,ET FROM TO 13-16	W MATERIAL AND TYPE	INCHES DEPTH TO TOP OF SCREEN	41-41 30
-	CA 15-11 1 1	FRESH J C SULPHUR 12 SALTY 4 C MINERAL	64 : GALVANIZED CO4 : CONCRETE CO4 : OPEN HOLE	0 48	61 PLUGGIN	G & SEALING RECO	RD
	2 🗆	FRESH 3 [] SULPHUR 24 SALTY 4 [] MINERAL	17-18 □ STEEL 19 1 □ GALVANIZED 3 □ CONCRETE 4 © OPEN HOLE	+8 85	10-13 14-17	LEAD PAR	T GROUT
	2 🗌 30-33 ! 🔲	FRESH         3         D         SULPHUR         23         34         34         34         35         36         <	24-25 :	27-30	18-21 22-25 26-29 30-33 80	Means Cemen	quille
	PUMPING TEST MET	HOD IS PUMPING RATE	0-14 DURATION OF PUMPING	]	LOCATION O	FWELL	
F	STATIC LEVEL	WATER LEVEL 25	GPN HOURS NINS VELS DURING 2 PUMPING 2 RECOVERY	IN DIA LOT LI	GRAM BELOW SHOW DISTANCE INE. INDICATE NORTH BY AR	S OF WELL FROM ROAD AN ROW.	ID
VG TEST	15 FEET	80 FEET 80 26-28 FEET 90 POINT INTAKE SE				X	$\uparrow$
PUMPING	GIVE RATE	GPM P TYPE RECOMMENDED	FEET 1 CLEAR 2 CLOUDY			t t	N.
	SHALLOW	DEEP SETTING	80 FEET PRATE GPM			ŧ.	
Γ	FINAL STATUS	34 I WATER SUPPLY 2 OBSERVATION WELL 3 TEST HOLE	5 ABANDONED, INSUFFICIENT SUPPLY 6 ABANDONED, POOR QUALITY 7 UNFINISHED			Con the	
-	OF WELL	DONESTIC	S CONMERCIAL				
	WATER USE	3 IRRIGATION	Dept, Not used		Main St		
	METHOD OF	CABLE TOOL ROTARY (CONVENTIO ROTARY (REVERSE)	DNAL) DIAMOND			in the second seco	
	DRILLING	A D ROTARY (AIR)	DRIVING 3644	DRILLERS REMARKS	S:	071	L07
RACTOR		ains Vell	Dilling 3644			AUG 1 4 198	7
	NAME OF DRILLER	OR BORER	etanond O.J.				
CON	SIGNATURE OF CO	NUMETOR	SUBMISSION DATE DAY 30 NO 4 Y87	OFFICE			
<b>6</b> .	MINISTRY					FORM NO. 0506	-77 FORM 7

E 14 A

Ministry of Environment and Energy		The	Ontario Water Re NATER WELL	sources Act RECORD
Print only in spaces provided. Mark correct box with a checkmark, where applicable.	<u>11</u> 1 2	529556	Municipality Con. 15 10 10 10 10 10 10 10 10 10 10	22 23 24
County or District	Township/Borough/City/Town/Mil	lage	Con block tract survey,	etc. Lot 25-27 28
	Address		Date completed	19-53 17 97
	35/5 Lion Northing	RC Elevation RC	Basin Code ii	day month year
	17 18 24 RBURDEN AND BEDROCK	MATERIALS (see instructi	<u>31</u> O <b>NS)</b>	47
General colour Most common material	Other materials	1	description	Depth - feet From To
Brown Sand		Packer	)	0 15
GREY Sand		PackEI	>	15 18
GRET CLAY		Kunny	$(\mathcal{Q}_{X,n})$	18 26 01 59
GREY Clay & Ston	es	HARD	HARD	52 88
GRET Limestone		INED		100
	55' OF 64"	Casing		
	/ HEAVY D	RIVE Shoe		
	I WELL Ca	ρ		
3	Bags of C	ement		
	B.W	<u>.</u>		
31				
32 10 14 15 21 21 41 WATER RECORD 51	CASING & OPEN HOLE REC	CORD Sizes of Sizes of Sizes of Sizes of		31-38 Length 39.40
Water found Kind of water diam at - feet inches	Material thickness From	Jeptn - leet	in	ches teet Depth at top of screen 30
6 13 1 Fresh 3 Sulphur 14 6 14 14 1 Minerals	Steel <sup>12</sup> <b>i 88 O</b> Galvanized Concrete			41-44 feet
	Open hole Plastic	<b>3 88</b> 61	PLUGGING & SEALIN	
20-23 1 C Fresh 3 Culphur 24 2 C C C C C C C C C C C C C C C C C C C	Steel <sup>19</sup> Galvanized Concrete	Depth set at	- feet Material and type (Cel	Abandonment
25-28 ; C Fresh 3 C Sulphur 29 5 C	Open hole Plastic	From 013	10 .	FGROUT
2 Gais 60 2 0	Galvanized Concrete	27-30 18-21	22-25	
Minerals	Open hole Plastic			
Pumping test method     10     Pumping rate     11-14     Du       71     I     Pumping at     1     Pumping rate     1     Du	ration of pumping 15-16 Hours		CATION OF WELL	ad and lot line
Static level Water level end of pumping 25 Water levels during 1 KPu		In diagram below snow Indicate north by arrow		ad and lot line.
<sup>2</sup> 7 40 30 <sup>26.78</sup> 40 <sup>29.31</sup>	$\begin{array}{c} \text{60 minutes} \\ \text{40} \\ \text{feet} \end{array} \begin{array}{c} \text{60 minutes} \\ \text{40} \\ \text{feet} \end{array}$	mai et	IN Roll	20#114
	ater at end of test 42 Clear & Cloudy	Main St	. 192 OF 0560	ODED
A Recommended pump type	ecommended 46-49			Sopt
50-53	6 GPM			BORDENST
FINAL STATUS OF WELL 54 Water supply 5 Abandoned, insufficient supp			Hess	)\$
Observation well     Obse		i linit ch	180' 1	Antiact
WATER USE 55-56		S.		Phillip st.
Domestic 5 Commercial 2 Stock 6 Municipal 1 Irritation 7 Public supply	s 🗋 Not used	W N Pumped	WELL FOR	RIES
4 🗌 Industrial 🥫 🗌 Cooling & air conditioning		U with 51	hallow w	LJet
METHOD OF CONSTRUCTION 57	9 Driving	pump-	WELL FOR Mallow W water cree S Level 981	28
2       Actary (conventional)       6       Boring         3       Rotary (reverse)       7       Diamond         4       Rotary (air)       8       Jetting	16 Digging	Pumpino	s Level 981	76425
Name of Well Contractor	Well Contractor's Licence No.	Data 58 Contracct	07 59-62 Date rec	
B. MOORE WELL DRILLING	6455		155 AU	
Address Main 37. Box 436 OSGOC Name of Well Technician	Well Technician's Licence No.	5		
Name of Well Technician Bob MOORE Signature of Technician Sontractor	7-0517			
Signature of Technician Sontractor	Submission date day 24 mo 7 yr 97			0506 (07/94) Front Form 9
	-			SSOC (S7/34) FIGHL FOIL 8

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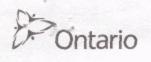
• • • • • • • • • • • • • • • • • • •		,		· · · · · · · · · · · · · · · · · · ·
Ontario Ministry of the Environment				er Resources Act /ELL RECORD
Print only in spaces provided. Mark correct box with a checkmark, where appli		15338		
County or District Carbeton	Township/Borough/City		wa Con block tract	
	Address	SG ODE	Main St. Date compl	A 1 1
21 1 2 M	Northing		evation RC Basin Code	
LOG General colour Most common material	OF OVERBURDEN AND BEDR Other materials	ROCK MATERIALS (	(see instructions) General description	Depth - feet
BROWN Sand		P	acked	From To O \+
GREY CLay GREY CLAY 5 5		<u> </u>	hick ARD Pay	14 30
CONV	tones ne	M.	AKD PAN ED HARD	50 80
	/ //			
54	0F 64 ca	sing		
	DRIVE S	hoe	~ .	· · · · · · · · · · · · · · · · · · ·
j	Bags of	Bentonit	e Quick GRO	out-
31            32				
41 WATER RECORD 51				65 75 80 neter 34-38 Length 39-40
Water found at - feet Kind of water Kind of water insk dian insk dian insk dian insk dian insk dian insk insk dian insk insk dian insk insk dian insk insk dian insk insk dian insk insk dian insk insk dian dian di dian dian dian di dian dian di dian	n Material thickness es inches	Depth - feet           From         To           Ø         § 33 <sup>16</sup>	Z       (Slot No.)         W	inches feet Depth at top of screen <sup>30</sup>
15-18 1 □ Fresh 3 □ Sulphur 19 4 □ Minerale	1         Steel         12           2         Galvanized         3           3         Concrete         4           4         Open hole         5	0 53° 53 80		feet
2 Saity 6 Gas	-18 1 Steel 19 2 Galvanized 3 Concrete	20-23	61 PLUGGING & SEA	Abandonment
25-28 1 Crists 3 Sulphur 29 4 Minerals 24	4 □ Open hole 5 □ Plastic <sup>-25</sup> 1 □ Steel <sup>26</sup>	27-30	0° 53 Ben-	e (Cement grout, bentonite, etc.)
2 □ Saity 6 □ Gas 30-33 1 □ Fresh 3 □ Sulphur 34 60 2 □ Saity 6 □ Gas	<ul> <li>2 Galvanized</li> <li>3 Concrete</li> <li>4 Open hole</li> <li>5 Plastic</li> </ul>		18-21 22-25 <b>Quic</b> 26-29 30-33 80	L GROUT
71	11-14 Duration of pumping SPM 15-16 17-18 Hours Mins	In diagra Indicate UNIDAS OSEOD	LOCATION OF WELL	
Static level Water level end of pumping <sup>25</sup> Water levels during <sup>19-21</sup> <sup>22-24</sup> 15 minutes 30 minut	Pumping         2         Recovery           es         45 minutes         60 minutes         35.37	In diagra Indicate	m below show distances of well fr	om road and lot line.
E 26 reet 60 feet 40 feet 60	29-31 feet 60 feet 60 feet	JILLE		, <b>N</b>
If flowing give rate GPM Recommended pump type Recommended pump type Recommended pump type	Water at end of test         42           feet         Clear         Cloudy           43:45         Recommended         46-49	05600	'	ן ' ר
Shallow X Deep pump setting 70	feet pump rate // GPM	Ŭ		1
FINAL STATUS OF WELL 54 1 Water supply 5 Abandoned, insuffici 2 Observation well 6 Abandoned, poor qu	ent supply <sup>9</sup> □  Unfinished ality 10  □  Replacement well			
Cost hole			• PH SGODDE Main	1
WATER USE     55-56       1 Domestic     5 Commercial       2 Stock     6 Municipal	9 □ Not use 10 □ Other	0 tr	SGOODE Main	st.
3 Irrigation 7 Public supply 4 Industrial 8 Cooling & air condition				
METHOD OF CONSTRUCTION         57           1         Cable tool         5         Air percussion           2         Rotary (conventional)         6         Boring	<sup>9</sup> □ Driving <sup>10</sup> □ Digging	eokge		
3 Gotary (reverse) 7 Diamond 4 Rotary (air) 6 Jetting	11 🗋 Other	5		244318
B. MOORE WELL DRIL	Well Contractor's Licence No.	Data source Date of inspection	58 Contractor 59-62 Dat	e received 0 2003 63-68 80
Box 436 OSGODE O	N. KON 2WO	Ш Ш П П П П П П П П П П П П П П П П П П		
BOD MOORE	7-0319	A Remarks		CSS.ES3
Signature of Technikary/Contrator	day mcOl yr 03	NIW		0506 (07/00) Front Form 9
2 - MINISTRY OF THE ENVIRON	MENT COPY			

🕅 Ontario	Ministry of the Environment	Well Taç	A 03(	765	er below)	Regulation 90	We 3 Ontario Water	Record
Instructions for Complet	ing Form	A	250	J765	5		p	age of
• For use in the Province	of Ontario only.	This document is	a perma	anent <b>lega</b>	al document. P	⊐ lease retain for futu	re reference.	* · ·
<ul> <li>All Sections must be concerning con</li></ul>	mpleted in full to	avoid delays in pl cation can be dir	rocessing ected to	g. Further the Water	instructions and Well Manager	d explanations are av	ailable on the ba	ck of this form.
<ul> <li>All metre measuremer</li> </ul>	nts shall be repo	rted to 1/10 <sup>th</sup> of a	metre.		wenmanager	Ministry Us		· · · · · · · · · · · · · · · · · · ·
Please print clearly in b     Well Owner's Information		<b>3</b>	tion	MUN	C	ON ON		LOT
AFirst Name	Last Name	ity of OHa.	un Mai	ling Addres	s (Street Numbe	er/Name, RR,Lot,Con	cesșion)	
LOSqoode Yout County/District/Municipality	N Centre Town	ship/City/Town/Villa	U U.			Hain Stre al Code Tele	et ephone Number (	include area code)
City of OH awa		Sacode	•			AAWO 6	135802	424 54322a
Address of Well Location (Count		ty) <b>C</b>		nship 0590	nd o	Lot Dia	Conce	
RR#/Street Number/Name	de Main	51. 4	C	ity/Town/V	illage		artment/Block/Tra	
GPS Reading NAD 🛰 Zo	one Easting	Northing	U	nit Make/M	1960el Mode	of Operation: 🗌 Und	differentiated	Averaged
Log of Overburden and E	8 45 193 Redrock Materia	1 - 4999	099	Garn	in		ferentiated, specify	
General Colour Most commo		Other Materials			Genera	I Description	Dep	
RELADE PORTA	100 × 1						Fro	m <u>To</u>
Black Ashpha					Ha	ba	C	1 15
Brown San					50	SPI-	.15	5 2113
Grey Sam	<u>a</u> 6	ravel Sta	ne		Soht	Packed	2.1	
Grey Lime	stone	Dolostan			Hanc	1	14,0	13 64,31
Grey Sand	stone	Doloston	e l		Han	1	64.3	31 73:46
					1997 - 1997			
						· · · · · · · · · · · · · · · · · · ·		
Hole Diameter		Constructi	on Recor			Тае	st of Well Yield	
Depth Metres Diameter	Inside		Vall	Depth	Metres	Pumping test method		Recovery
From To Centimetres		laterial thic	kness –	From	To	5 ub sible	Time Water Level	Time Water Level
0 1646 25.08			metres	FION	10		min Metres Static 7,48	min Metres 8,03
1646 7346 15,23	X Steel	Casi Fibreglass	ng		1	(metres) 45.7 Pumping rate -91		1 7,74
			8	$\bigcirc$	16,46	(litres/min)		
Water Record Water found at Metres / Kind of Water	Galva	nized		Not the second s		Duration of pumping	2 7.84	2 7.65
m Fresh Sulphur	41 s	Fibreglass				Final water level end of pumping 803	3 7.88	37,70
Gas Salty Minerals		L				Recommended pump	479	4 7,59
TI m Fresh Sulphur	Steel					type.		
Gas Salty Minerals	Plasti	c Concrete nized				Recommended pump depth. 45 metres		3 7.57
m Fresh Sulphur	· · · · · · · · · · · · · · · · · · ·	Scr	een			Recommended pump	10 7.96	10 7.53
Gas Salty Minerals	Outside diam	Fibreglass Slo	t No.			rate. (litres/min) If flowing give rate -	15	15 7.50
After test of well yield, water was	Plast					(litres/min)	20 7,98 25 8,00	20 <b>7,48</b> 25
Clear and sediment free Other, specify	Galva				<u> </u>	If pumping discontin- ued, give reason.	30 8.01	30
	<b>Ø</b> ∯Open	No Casing			72 41	÷	40 8,01	40 50
Chlorinated 🙀 Yes 🗌 No				16.46	73,46		60 8.03	60
Plugging and S Depth set at - Metres Material and b	ealing Record	Annular space	Aba	ndonment Placed	In diagram below	Location of show distances of well fr		nd huilding
From To			(cubi¢ n	netres)	Indicate north by		om road, rot inic, a	
	nite Pine	sure	1.30					
	· · · · · · · · · · · · · · · · · · ·							
							15	
Cable Tool	Method of Constra	Diamond		Digging				
Rotary (conventional) X Air per		Jetting		)ther			12 1	
Rotary (reverse) Boring	Water Use	Driving				Hain Stree	t Osgooc	le
Domestic Industr	ial /	Public Supply	<u>;</u> □ c	Other	··· •			
Stock Comm		_ Not used _ Cooling & air condi	tioning		Audit No.	33210 Dat	te Well Completed	
Water Supply Recharge w	Final Status of W		Abondon	rd (Other)	Z			5 11 29
Observation well Abandoned	, insufficient supply	Dewatering	Abandone		Was the well ow package delivered	nor o information		
	, poor quality htractor/Technicia	Replacement well				Ministry Us	e Only	
Name of Well Contractor Splash Well		Well Cont	ractor's Lice	ence No.	Data Source	Со		7
Business Address (street name, num	ber, city etc.)	J N			Date Received		407	YY MM DD
P.O. BOX 108 Name of Well Technician (last name,	5, Krecc first name)		nician's Lic	ence No	MAR Remarks		Il Record Number	·
Signature of Technician/Contractor	bk		442		T CONDING			
Signature of Technician/Contractor	······			13 ක්රි				
0506E (09/03)	Contractor's	Copy Ministry			ner's Copy 🗌	Cette fo	ormule est dispor	ible en français

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Ontario Ministry of the Environ		Well A 071208	Print Below)	Well Record Regulation 903 Ontario Water Resources Act
Measurements recorded in: Metric	Imperial	AOTIZOS		Page of
Well Owner's Information			and the second sec	

550 County/Dis	2 Oc strict/Municip	Sapode	Ma	'n	C	OSq ade		23	Provinc		Postal	
	Inates Zone	Easting		orthing		Unicipal Plan and Sublo	t Number		Onta	r10	KO	A1 100
						d (see instructions on the	back of this form)			The second		
General Co		Most Comm	the second se			er Materials	General D	escription	·		Dep From	th ( <i>m/ft</i> ) To
2	0	. /					1/	/				20
Brou		sand					Mano	(			0	de)
Tellow	5 (c	arse	Sand				Sofl			2	.5	9.7
		6.0					SOFT			9.	2	13.5
Grey		ing	/				2	/		1	2 0	1119
Grey	0	grave/					Packed	1		1	2-2	1401
Grea		limesto	ne.				layered	1		10	4.9	24.3
5							5					
			Annula	Space			Res	ults of We	ell Yield	d Testing	11111	
Depth Se	et at (m/ft)		Type of Sea			Volume Placed	After test of well yield, wate	and the second se	Dra	w Down		lecovery
From	То		(Material ar		6	$(m^3/ft^3)$	Clear and sand free		III a secol	Water Level		
$(\mathcal{D})$	6	cia	no.t	arou	+	4BQO	Other, specify		(min)	(m/ft)	(min)	(m/ft)
U	0	CIT	nam)	Jroa	-	129	If pumping discontinued, gi	ve reason:	Static Level	1.80		8-51
									1	8	1	8.08
							Pump intake set at (m/ft)			8.m		D*
							10		2	8.07	2	7.94
							Pumping rate (Vmin / GPN	1)	3	8.19	3	7.83
Meth	hod of Con	struction	111 111 11		Well Use		56	, ,			4	7.81
Cable To		Diamond		iblic mestic	Commer		Duration of pumping		4	8.25	4	1.01
Rotary (	Conventional) Reverse)	Jetting		vestock	Municipa     Test Hole		hrs + min		5	8.30	5	7.80
Boring		Digging		igation		& Air Conditioning	Final water level end of pur	mping (m/ft)	10	8.41	10	
Air percu				dustrial			8.51					
Other, s				her, specify			If flowing give rate (Vmin-/	GPM)	15	8.47	15	
		struction R	1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1		- (m)	Status of Well			20	8.47	20	
Inside Diameter		OR Material d, Fibreglass,	Wall Thickness		h ( <i>m/ft</i> )	Water Supply Replacement Well	Recommended pump de	pth ( <i>m/tt)</i>	1.1.1	8.47	25	
(cm/in)	Concrete, F	Plastic, Steel)	(cm/in)	From	To	Test Hole	Recommended pump rate	0	20	0=71	20	
1550	Ste	1	418	+.60	149	Recharge Well	(Vmin / GPM)	0	30	8.48	30	
1000			0	11100	· / /	Dewatering Well     Observation and/or	56		40	8.48	40	
1555	Open +	Hole		14.9	24.3	Monitoring Hole	Well production (Vmin / Gi	PM)			50	
	· ·					Alteration	Disinfected?		50	8,50	50	
						(Construction)	Yes No		60	8.51	60	
	Co	Instruction R	ecord - Scn	oon		Insufficient Supply		Map of W	ell Loc	ation	11111	
Outside	T	iterial	0010-001	Contra da contra	h ( <i>m/l</i> t)	Abandoned, Poor Water Quality	Please provide a map belo			and the second se	back.	124
Diameter (cm/in)		vanized, Steel)	Slot No.	From	То	Abandoned, other,		1. 0	1 4			10 1
(analy						specify	[	Jain S	Ren			
						Other, specify			15			
							2		M	and		
	-	Water Det	ails		Н	ole Diameter	6		150			
Water four	nd at Depth	Kind of Wate	r: Urresh	Untested		h (m/ft) Diameter	10		1	5502		
		Other, spe			From	To (cm/in)	C					
Water four	nd at Depth	Kind of Wate	r: Fresh	Untested	O	6 21.23	2		isc1			
		Other, spe		-	6	24.3 15.55	-					
		Kind of Wate		Untested				L				
(//		Other, spe										
Rusines N	We Name of Well	Contractor	or and Wel	I Technicia		I Contractor's Licence No.						
- Allow		2011 actor	111	2.11.		- unit source country red.		1.	0.0			
Business A	Address (Stre	et Number/Na	) <i>er L</i> me)	Icillin,	9 Mu	nicipality	Comments:	Loon	K()			
1178	Pat	900	Fast		A	Jation						
Province		960 ostal Code			dress							
Onte		OAJC		NA				age Deliver	ed	the second se		e Only
Bus.Teleph	ione No. (inc. i	area code) Na	me of Well	Technician			information package	YMM	plo	Audit No. 2	0	15/1
613	7875	291 No. Signature	Migi	hache	renier		Date Work	Completed	the second se	1	51	1041
Well Technic	cian's Licence	No. Signature	of Technici	an and or C			Yes 2001	902	LIS	M	tw m	A 7508
	7 2	the	1	25	×	0090220	200	100	11	Received	o Printer	for Optania 2007
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Ministry of the Environment

A 093967 4093967

Well Tag No. for Master Well (Place Sticker and/or Print Below)

Master Well Record for Cluster Well Construction Regulation 903 Ontario Water Resources Act

547	13 mari	n st									a Contraction
County/Disf	strict/Municipality		setting.		wn/Villag					Province Ontario	Postal Code
UTM Coordi	linates Zone Eastir	ng Northing	3	GPS Unit Make Model				Mode of C	peration:	Undifferentiated	Averaged
	The second se	18911499		Garn		Et.	ex	Differen	ntiated, specify		
Overbu	urden and Bedrocl	k Materials (see inst	tructions on th			(Metres)	Depth	(Metres)	Hole	Details Diamet	
General Colour	Most Common Material	Other Materials	Gener Descrip		From	To	From	То		(Centime	
BIK	TOD Soil		soft, d	Iry	0	.31	0	2.9	8.25		
Brn	medium Su	n	soft di	nt	,31	1.5					
Bra	Top Soil medium So medium So	end	Soft, Sat	wratal		29					
0.14	i ice up _	Crito -	500, 50	ind							
									Wat	ter Use	
							Public		ndustrial	Not used	Other, specify
							Dome			Dewatering Monitoring	
							Irrigat			Cooling & Air Con	ditioning
							Cable	Taol		Construction	aging
							Rotar	y (Conventio	nal) 🗌 Diamo	ond 🗌 Bo	ring
							Rotar	y (Reverse) y (Air)		Direct j	her, specify
									Statu	is of Well	
							Test			doned, Insufficient S	
								acement Well Intering Well		doned, Poor Water	
							Altera	ation (Constr	uction) 🗌 Aban	doned, other, speci	ly
							No Ca Open Ho		Screen Used	Static Wa	ter Level Test
	<u> </u>	Construction D	alieto					Yes			etres
Inside Diar		Material		Wall		(Metres)	Galve	anized		creen reglass Conc	rete Plastic
(Centimet U.03	01	, fibreglass, concrete, - Riser	gannand,	368	From	1.35	Outside I	Diameter (C		Slot No. 1D	
-1.03	PVL		•	200	120	2.9	4	1:82			
	Tre	Screen			1125	an	Water fo	ound at Dep	Water D	etails of Water	
		<u> </u>									Sulphur 🗌 Minera
							Water fo	ound at Dep Metres	행동님을 걸 때에서 전망했다.	of Water esh Salty 🗍	Sulphur 🔄 Minera
Depth Set	at (Metres)	r Space/Abandonme Type of Sealant	and the second se	cord	Volun	ne Used	Water fo	ound at Dep	oth Kind	of Water	
From	To	(Material and T)	/pe)		(Cubic	: Metres)					Sulphur Minera
1.22		and					Disinfect	ed 🗌 Yes	No If no, pro	vide reason: Date	Master Well Complet
											ional Cluster Well
							and the second se	ells in Clus	and the second se	Please indicate	I of land and cluste Number of Cluster W
							Total W	ells on this	Property	Information Log	Sheets Submitted
					1.00			4	riopeny	1	-
							Detailer	Map must	and and the second s	of Well Cluster	larger than legal siz
							(8.5"x	14"). Sketch	es are not allov	ved.	
the second second second second											ning the cluster to
										ormation concern	ing the elusion to
							the Dire	etor upon	facunar		
	Well Con	restor and Wall To	shalelan Info	mation			the Dire	etor upon	renuect		
Business N	Well Contract	tractor and Well Te	chnician Info		tractor's Li	icence No	the Dire	etor upon	ranuast		
Ste	Varne of Well Contract	Sampling		Well Con	tractor's Li 2 G	icence No	the Dire	elor upon	rariilae†		
Ste		Sampling		Well Con	24	icence No	the Dire	etor upon	request	ry Use Only	
Ste	Varne of Well Contract	tor SCIMPINE ame, number, RB) Sea CV CVet de Business E-1	mail Address	Well Con	29 noni	d Util	Audit No	eter upon	winisu	Well Contractor 1	No,
Business A	Address (Street No./N 47 West ( 60 Lyk	tor SCIMPINE ame, number, RB) Sea CV CVet de Business E-1	ek Muni	Well Con	29 noni	icence No 1 2 Util 1. con	Audit No	M 01	winist	and the second se	
Business A #2-10 Province	Address (Street No./N 47 WEST 60 LYK	tor SCIMP ING ame, number, RRI) SEA OLY CYEE de Business E- Business E- Name of Well Techn	mail Address	Well Con icipality UCM Strout ne, First N	nuni nuni laso	1 1 Util 1.con	Audit No Date Rd	M O	winist	Well Contractor 1	
Business A #2-10 Province	Address (Street No./N 47 WEST 60 LYK	tor SCIMP ING ame, number, RRI) SEA OLY CYEE de Business E- Business E- Name of Well Techn	mail Address	Well Con icipality UCM Strout ne, First N	nuni nuni laso	d Util	Audit No Date Rd	M O	winist	Well Contractor 1	



Ministry of the Environment



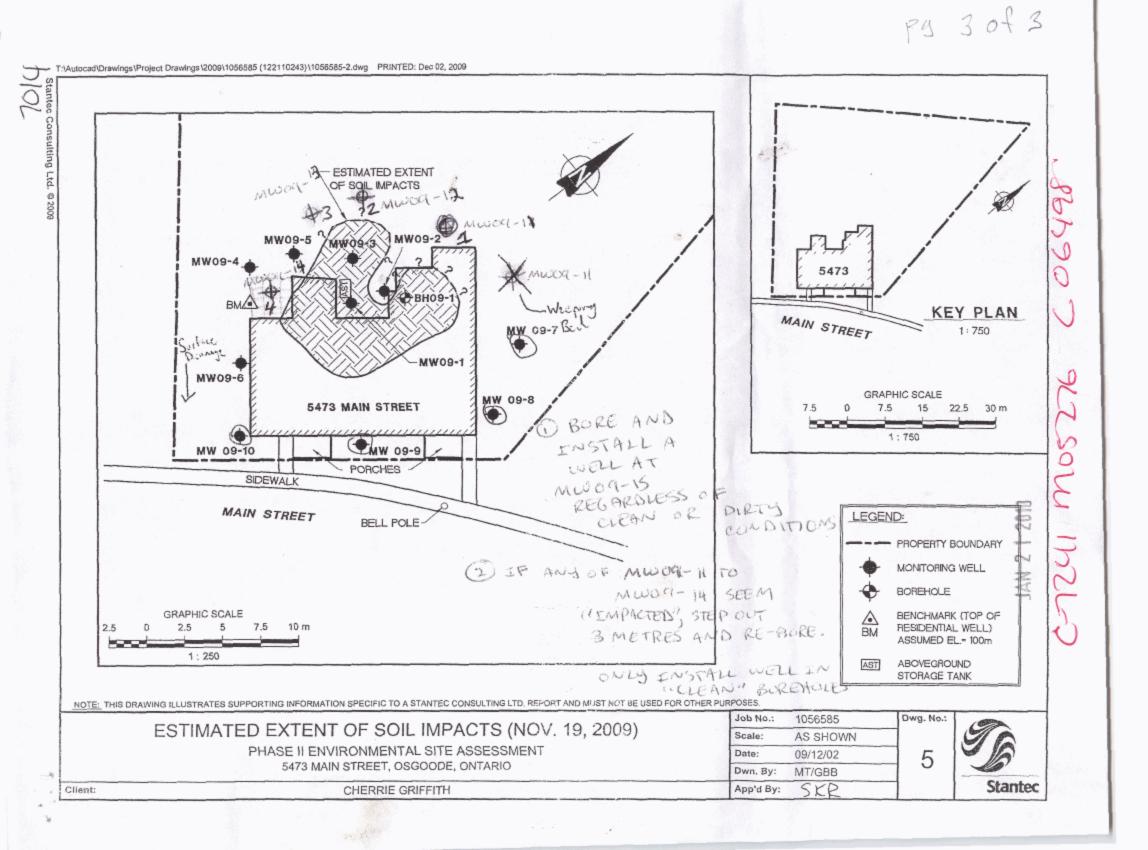
**Cluster Well Information for Cluster Well Construction** 

Consent

Regulation 903 Ontario Water Resources Act

Page 2 \_ of \_ 3 7014

5473 main st	0	LOI			ownonip			obdin	yr blothou wan	lopulity	Signature of Technician/Contractor	Date (yyyy/mm/dd)
City/Town/Village Provi 05400de Ont		tal Code	1 1 1		Model Etrex	Construction of the second	le of Oper entiated, s		differentiated	Averaged		
Well # UTM Coordinates	Full Depth of Hole (metres)	Hole Diameter (cm)	Method of Construction	Casing Material	NAME OF ALL OF	Screen Inte	erval (metres) To	Annular Space Sealant Used	Static Water Level (metres)	Abandonment Sealant Used	Comments	Date of Completion (yyyy/mm/dd)
2 184518914999094	29	8.25	Direct	PVL	1.35	1.35	2.9	Benseal				2009/12/1
3 18451888 499 9090	2.9	8.25	12	1,	1.35	1.35	2.9	h				ч
4 184518904999083	2.9	8.25	ъ	()	1.35	1.35	2.9	1				11
								11				
								1-11-12-1				
<u>Illinnhinni</u>												
Junihum								Mar I.				
<u> </u>												
								Section Sec				
Well Contractor and Well Technician In	formation		A delegant (C	New of March 1970			Municipa	like		Dessings	Date 1st Well in Cluster Constructed Date Last V	Vell in Cluster Constructed
Business Name of Well Contractor Strata Stil Sumpling		#2	-141 We	Street Number/Na St Beauly	tech		Municipa	mond 1		Province ON	Ministry Use Only	
HUBIC 6 905 764	No. (inc. area c 1+930+	ode)	Vell Contractor	4 1 V	siness E-mail	Address	stract	asoil.	com		JAN 2 1 2010	ected (yyyy/mm/dd)
Name of Well Technician (First Name, Last Name) Muin, Mike			34	4 1 v 's Licence No. Da 4 3 2	te Submitted (y	/3[	Signatur	e of Technician	to		c 06498	5276
1991 (11/2006)	1			CALL N		/inistry's			B. 1791		© Queen's	Printer for Ontario, 2006



Ontario

ments

recorded in

Ministry of the Environment

Imperial

Metric

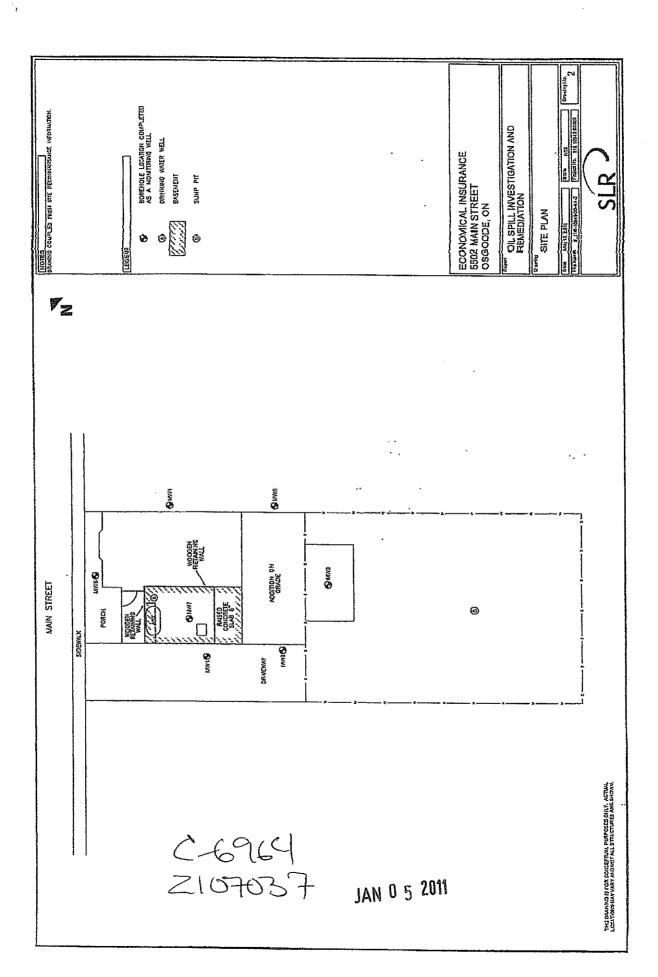
Well Tag No. (Place Sticker and/or Print Below) Abandonment NOIL

Well Record

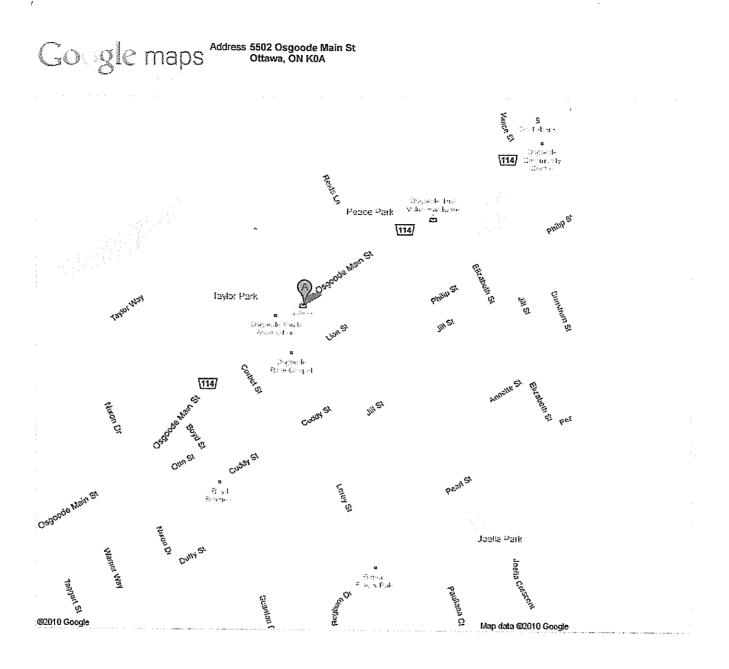
Regulation 903 Ontario Water Resources Act

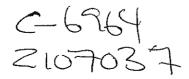
Well Location						
Address of Well Location (Street Number/Name)	Township		Ċ	oncession		
5502 Main Street	National	Capital Region				
County/District/Municipality	City/Town/Village	. 0	Province Ontai	-	Postal	Code
UTM Coordinates Zone, Easting, Northing	Municipal Plan and		Other			
NAD 8 3 1 8 4 5 2 0 3 4 4 9 9		Sasist Halliss.	0.00			
Overburden and Bedrock Materials/Abandonmen		on the back of this form)	1			
General Colour Most Common Material	Other Materials	General Desc	ription	F	Dept	h ( <i>m/ft)</i>
<u> </u>		Sand		0		3.4
brown		Ling		<i>L</i>	·	2.4
· · · · · · · · · · · · · · · · · · ·						·····
		····				
	well tan	ic enlosed				
	7					
<u> </u>			N . 1			
R.+	otal of 1 wells	were decomm	ISSPORE	a		
Annular Spac	e	Results	of Well Yield	Testing	977997465	
Depth Set at (m/ft) Type of Sealant U				v Down		covery
From To (Material and Type	e) (m³/ff³)	Clear and sand free	( <i>min</i> )		Time	Water Level (m/ft)
0 0.05 topsoil		If pumping discontinued, give re	ason: Static			
0.05 0.15 hole plug			Level			
	ent, growt 15/itre		1		1	
D.153.40 bentonile, com	en grout is time	Pump intake set at (m/ft)	2		2	
		Pumping rate (I/min / GPM)	3		3	
Method of Construction	Well Use					
Cable Tool Diamond Public	Commercial Not us	I Duration of pumping	4		4	
Rotary (Conventional) Jetting Domestic     Rotary (Reverse) Driving Livestock			5		5	
Boring Digging Irrigation	Cooling & Air Conditioning	Final water level end of pumping	g (m/it) 10		10	
Air percussion Industrial	ecify				4.5	
		If flowing give rate (I/min / GPM	n) 15		15	
	Depth ( <i>m/ft</i> ) User Supply	Recommended pump depth (i	20		20	
Diameter (Galvanized, Fibreglass, Thickness	om   To   Replacement V		25		25	
(cm/in) Concrete, Plastic, Steel) (cm/in) Fro	Test Hole	Recommended pump rate				
	Recharge Well     Dewatering Well		30		30	
	Observation an	11	40		40	
	Monitoring Hole		50		50	
	(Construction)	Disinfected?	60		60	
	Abandoned, Insufficient Su				80	
Construction Record - Screen	Abandoned, P	VARIOUVARGEOMEDICOSTONISA UVARIOUSCOMO ACCURATIONACIÓN A CONTRACTORIA DE CONTRA ENCONTRACTORIA DE CONTRACTORIA DE CONTRACTO	of Well Loca		00/880/00	
Diameter Statement of Slot No.	Depth (m/ft) Water Quality		lowing instruction	ns on the bad	СК.	
(cm/in) (r lasuc, Galvanized, Gleen) Fro	specify					
	decommiss	ioned				
	Other, specify					
			_ 1	CAL	d	
			olan			
Water Details	Hole Diameter ested Depth ( <i>m/ft</i> ) Diam	Dite Dite	plan	000		
Water found at Depth Kind of Water: Fresh Unter		inter ini area n	nero	are	-	
	ested Depth ( <i>m/ft</i> ) Diam From To (cm	neter in) area 1	plan	are	-	
Water found at Depth Kind of Water: Fresh Unter <b>1.98</b> ( <i>m/ft</i> ) Gas Other, specify Water found at Depth Kind of Water: Fresh Unter ( <i>m/ft</i> ) Gas Other, specify	ested Depth ( <i>m/ft</i> ) Diarr From To ( <i>cm</i> ested 0 3.4 5.7	reter (in) 7 2 3 3 4 3 3 4 3 3 4 3 3 4 3 1 4 3 1 4 3 1 4 3 1 4 3 1 4 3 1 4 3 1 4 3 1 4 3 1 4 3 1 4 3 1 4 3 1 4 3 1 4 3 1 4 3 1 4 3 1 4 3 1 4 3 1 4 3 1 1 4 3 1 1 1 1	nerp	are	-	
Water found at Depth       Kind of Water:       Fresh       Unter         1.98       (m/ft)       Gas       Other, specify         Water found at Depth       Kind of Water:       Fresh       Unter         (m/ft)       Gas       Other, specify       Unter         (m/ft)       Gas       Other, specify       Unter         Water found at Depth       Kind of Water:       Fresh       Unter         Water found at Depth       Kind of Water:       Fresh       Unter	ested Depth ( <i>m/ft</i> ) Diarr From To ( <i>cm</i> ested 0 3.4 5.7	in) area r	plan neip ed.	are	-	
Water found at Depth       Kind of Water:       Fresh       Unterstand         1.98       (m/ft)       Gas       Other, specify         Water found at Depth       Kind of Water:       Fresh       Unterstand         (m/ft)       Gas       Other, specify       Unterstand	ested Depth (m/ft) Diarr From To (cm ested 0 3.4 5.1 ested	neter fin) 7 enclos	plan nerp ed.	are	-	
Water found at Depth       Kind of Water:       Fresh       Unterstand         Image:	ested Depth ( <i>m/ft</i> ) Diarr From To ( <i>cm</i> ested 3.4 5.7 ested nician Information		plan neip ed.	are	-	
Water found at Depth       Kind of Water:       Fresh       Unterstand         I.98       (m/ft)       Gas       Other, specify         Water found at Depth       Kind of Water:       Fresh       Unterstand         (m/ft)       Gas       Other, specify       Water found at Depth         Water found at Depth       Kind of Water:       Fresh       Unterstand         (m/ft)       Gas       Other, specify       Water found         (m/ft)       Gas       Other, specify       Water found         Well       Contractor and Well       Techn         Business Name of Well       Contractor       Mell	ested Depth (m/ft) Diarr From To (cm ested 3.4 5.7 ested 1.5.7 nician Information Well Contractor's Licence	a No.	plan neip ed.	are	-	
Water found at Depth       Kind of Water:       Fresh       Unterstand         Image:	ested Depth (m/ft) Diarr From To (cm ested 3.4 5.7 ested 1.1 nician Information		plan neip ed.	are		
Water found at Depth       Kind of Water:       Fresh       Untername         1.98       (m/ft)       Gas       Other, specify         Water found at Depth       Kind of Water:       Fresh       Untername         (m/ft)       Gas       Other, specify       Untername         (m/ft)       Gas       Other, specify       Untername         Water found at Depth       Kind of Water:       Fresh       Untername         (m/ft)       Gas       Other, specify       Untername         Well Contractor and Well Techn       Business Name of Well Contractor       OGS       IN C         Business Address (Street Number/Name)       Intername       Intername       Intername	ested Depth ( <i>m/ft</i> ) Diarr From To ( <i>cm</i> ested 3.4 5.7 ested well Contractor's Licence 6   9   6   9	≥ No. -+	plan neip ed.	are	_	,
Water found at Depth       Kind of Water:       Fresh       Unterstand         1.98       (m/ft)       Gas       Other, specify         Water found at Depth       Kind of Water:       Fresh       Unterstand         (m/ft)       Gas       Other, specify       Water found at Depth       Kind of Water:       Fresh       Unterstand         (m/ft)       Gas       Other, specify       Water found at Depth       Kind of Water:       Fresh       Unterstand         (m/ft)       Gas       Other, specify       Well Contractor and Well Techn         Business Name of Well Contractor       OGS       INC       OC	ested Depth (m/ft) Diarr From To (cm ested 0 3.4 5.7 ested 1 5.7 ested 1 5.7 ested 1 5.7 mician Information Well Contractor's Licence 6   9   6   Municipality	≥ No. -+	plan nerp ed.			
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Water found at Depth       Kind of Water:       Fresh       Untername         1.98       (m/ft)       Gas       Other, specify         Water found at Depth       Kind of Water:       Fresh       Untername         (m/ft)       Gas       Other, specify       Water found at Depth       Kind of Water:       Fresh       Untername         (m/ft)       Gas       Other, specify       Water found at Depth       Kind of Water:       Fresh       Untername         (m/ft)       Gas       Other, specify       Water found at Depth       Kind of Water:       Fresh       Untername         (m/ft)       Gas       Other, specify       Well Contractor and Well Techn       Business Name of Well Contractor       OGS       NC         Business Address (Street Number/Name)       Side       Herman       Herman       Herman         S518       Herman       Poleton       Side       Herman         Orthan O       Kio/Ai i Alo       Side       Herman         Bus.Telephone No. (inc. area code)       Name of Well/Fednicion       Kio/Ai i Alo	ested Depth (m/ft) Diarr From To (cm ested A 3.4 5.7 ested A 3.4 5.7 Well Contractor's Licence 6   9   6   9 Municipality Read A Address C @ bellnet. Ca cian (Last Name, First Name)	Well owner's Date Package D information package	elivered	Ministr	y Use	
Water found at Depth       Kind of Water:       Fresh       Untername         1.98       (m/ft)       Gas       Other, specify         Water found at Depth       Kind of Water:       Fresh       Untername         (m/ft)       Gas       Other, specify       Water found at Depth       Kind of Water:       Fresh       Untername         (m/ft)       Gas       Other, specify       Water found at Depth       Kind of Water:       Fresh       Untername         (m/ft)       Gas       Other, specify       Water found at Depth       Kind of Water:       Fresh       Untername         (m/ft)       Gas       Other, specify       Well Contractor and Well Techn       Business Name of Well Contractor       OGS       NC         Business Address (Street Number/Name)       Side       Herman       Herman       Herman         S518       Herman       Poleton       Side       Herman         Orthan O       Kio/Ai i Alo       Side       Herman         Bus.Telephone No. (inc. area code)       Name of Well/Fednicion       Kio/Ai i Alo	ested Depth (m/ft) Diarr From To (cm ested A 3.4 5.7 ested A 3.4 5.7 Well Contractor's Licence 6   9   6   9 Municipality Read A Address C @ bellnet. Ca cian (Last Name, First Name)	Well owner's information package delivered     Date Package D	Ielivered	Ministr	y Use	0niy 037
Water found at Depth       Kind of Water:       Fresh       Untername         Image: I	ested Depth (m/ft) Diarr From To (cm ested A 3.4 5. ested A 3.4 5. ested Well Contractor's Licence 6   9   6   Municipality Read Municipality Read Municipali	Well owner's Date Package D information package Y Y Y Y	Ielivered	Ministr	<u>y Use</u> .07	037

5502 Main St. Osgoda



DAD5828219 / F: DT GTG2 / 52 / 90





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Ministry of )ntario the Environment Metric Imperial

Well Tag No.

Township

diar Drint Relow A117467

Well Record Regulation 903 Ontario Water Resources Act \_\_\_\_of\_\_\_ Page

Concession

1

Measurements recorded in:

Address of Well Location (Street Number/Name) RIVE 27. accore County/District/Municipality Province City/Town/Villages KOAXWO Ontario Municipal Plan and Sublot Number UTM Coordinates 2 451 980 49946: HEZE NAD 8 3 Overburden and Bedrock Materials/Abandonment Sealing Record (see instructions on the back of this form) Depth (m/ft) General Description Most Common Material Other Materials General Colour From Str \$ /5/4 GARY O.AO ALL .83 64 CLAY GRET 6.41 ERAVEL BOUNDERS CREY 712 96 SKFY MESP (72' **Results of Well Yield Testing** Annular Space After test of well yield, water was Recovery Volume Placed Draw Down Depth Set at (m/ft) Type of Sealant Used Time Water Level Time Water Level rial and Type) (min) (m/ft) (m/ft) (min) Other, specify Ind 4.18 Static If pumping discontinued, give reason: Level 4.00 1 1 Pump intake set at (11/77) 5.03 2 2 5.07 ASUPA (10 gpm) ration of pumping 3 6 3 Well Use Method of Construction 5.11 4 4.4 Not used Public Diamond Commercial Cable Tool Rotary (Conventional) Domestic Jetting Municipal 5.13 5 hrs + O min 5 Driving Livestock Test Hole Monitoring Rotary (Reverse) Final water level end of pumping (19/17) Irrigation Cooling & Air Conditioning Boring Digging 5.27 10 10 J. Am Air percussion Other, specify Industrial Other, specify 15 15 f flowing give rate (/min / GPM) -----**Construction Record - Casing** Status of Well 5.43 20 20 Depth (m/ft) Open Hole OR Material X Water Supply d pump depth (m/ft) Inside Wall Diameter (cm/in) (Galvanized, Fibreglass, Concrete, Plastic, Steel) Thickness (cm/in) 12m (40' 551 Replacement Well 25 25 From То Test Hole Recommended pump rate 430 Sill 5.57 0.48 +0.61 GAT. 30 30 Recharge Well 51pm aggm Dewatering Well 5.65 40 40 4.78 Observation and/or Monitoring Hole 130 pm l 5.74 50 4-2 50 Alteration (Construction) 60 42 60 Abandoned, Insufficient Supply Yes 🗌 No Map of Well Location Construction Record - Screen //// Abandoned, Poor Oútside Diameter Please provide a map below following instructions on the back Water Quality Depth (m/ft) Material (Plastic, Galvanized, Steel) Slot No Abandoned, other, From To (cm/in) specify Other, specify Water Details **Hole Diameter** Water found at Depth Kind of Water: Fresh Untested Lombady-Depth (m/ft) Diameter (cm/in To Komba 21.96 5,24 Water found at Depth Kind of Water: Fresh Untested (m/ft) Gas Other, specify Water found at Depth Kind of Water: Fresh Untested (m/ft) Gas Other, specify Well Contractor and Well Technician Information Business Name of Well Contracto tractor's Licence No SPILLING INC STANTA Comments Business  $\alpha$ Chell no dallin Well owner's Ministry Use Only Date Package Delivered information package delivered cian (Last Name First Name) Audit No. z 133002 1094 10 Completed Yes OCT 0 4 2011 OF 11092 No 0506E (2007/12) Ministry's Copy

Ministry of the Environment

Well	Tag No. (Place Sticker a	and/or Print Below)
	A119667	A119667

Well Record

n 903 Ontario Water Resources Act

Well Location									
	ocation (Street Nu ert Dowd Roa			rownship Osgoode	Lot 29	Con	cession 1		
County/District/M	lunicipality			City/Town/Village	29	Province		Postal	Code
Ottawa Ca UTM Coordinates		, North		Osgoode Municipal Plan and Subl	ot Number	Ontario	)		
NAD 8 3			999169						
Overburden and General Colour	î.	als/Abandonm		ord (see instructions on the ner Materials	e back of this form) General Description			Dep	th ( <i>m/ft</i> )
•	*				General Description	21	1	From	To
<u>Brown</u> Red	Sand Sand						0	1.21	
Grey	Sand	·····					1.21		
Grey	Clay		Stor	nee			3.65	5 7.61 16.15	
Grey	-	stone		ues	· · · · · · · · · · · · · · · · · · ·		1		57.90
Grey & Wh		lstone							83.20
				·····					
Depth Set at (m	o/ft)	Annular Sp Type of Sealant	A week of the processing of the set of the s	Volume Placed	Results of V After test of well yield, water was:	Vell Yield Te		Ř	ecovery
From To		(Material and T		(m³/ft³) 46m <sup>3</sup>	Clear and sand free	Time Wa			Water Level (m/ft)
17.67 0	17.67 0 Grouted Bentonite Slurry				If pumping discontinued, give reason	Static	3 <b>.</b> 45	{/////)	(inony
							3.86	1	35.31
					Pump intake set at (m/ft)	_	9.95	2	<u>34.54</u>
		·····			60.95 Pumping rate (I/min / GPM)		1.15	3	33.70
Method of	f Construction		Well Us	A CANADA MANAGAMAN AND A CANADA MANAGAMAN ANA ANA ANA ANA ANA ANA ANA ANA ANA	22.75		l.96	4	32.95
Rotary (Convent	🗓 🛄 🛄 🛄 🙀	X Domes	itic 🗌 Municipa	al Dewatering	Duration of pumping 1 hrs + min		2,82	5	32.95
Boring		Irrigatio	on Cooling	le Monitoring & Air Conditioning	Final water level end of pumping (m/	<del>?</del> }	5.17	10	28.67
X Air percussion		_ Industri			37.06 If flowing give rate ( <i>l/min / GPM</i> )			15	20.07
	Construction R	ecord - Casing		Status of Well	In nowing give rate (mini / Grwy		9.40	20	
Diameter (Galv	n Hole OR Material vanized, Fibreglass,	Wall Thickness	Depth ( <i>m/ft)</i> From To	X Water Supply	Recommended pump depth (m/ft) 45.71		2.15	25	
	crete, Plastic, Šteel)	(0.12.11.9		Test Hole     Recharge Well	Recommended pump rate	24	+.70	30	
15.86	Steel	.48 +	.45 17.67	<ul> <li>Dewatering Well</li> </ul>	( <i>l/min / GPM</i> ) 22.75	20	5.95	40	
				Observation and/or     Monitoring Hole	Well production (I/min / GPM)			50	
				Alteration (Construction)	Disinfected?		5.05	60	
	Construction R	ecord - Screen		Abandoned, Insufficient Supply		Vell Locatio	'.06		
Outside Diameter (Diami	Material	Slot No.	Depth (m/ft)	Abandoned, Poor Water Quality	Please provide a map below followin			ock.	
(cm/in) (Plasti	c, Galvanized, Steel)		From To	Abandoned, other, specify	Ky! /	1	10.	5 6-001	36
				Other, specify			1 01	LAB	Æ
					67		1		
Water found at De	Water Det epth Kind of Water			lole Diameter	Hall		1		
81.98m/ft)	Gas Other, spe	cify	From	To (cm/in)	KUBER DOU	D ROAD			
	epth Kind of Water Gas Other, spe			17.67 15.86					
Water found at De	epth Kind of Water	: 🗌 Fresh 🗌 U	ntested 17.67	83.20 15.23					
(m/ft) []	Gas Other, spe	-						Poj	
Business Name of	Well Contractor		chnician Informat	II Contractor's Licence No.				17	
	ter Supply (Street Number/Na		1	5 5 8 nicipality	Comments:			ł	
Box 490			S	tittsville					
Province Ontario	Postal Code K 2 S 1 A	Business E-r	nail Address		Well owner's Date Package Delive	red 1	Minist	VIIco	Οπίν
Bus.Telephone No.	(inc. area code) Na	O OTTIC me of Well Tech	ce	Water, ca First Name)	information package	22.92.2555	t No.	17271683114	
6 1 3 8 3 Well Technician's Lice	6 1 7 6 6 ence No. Signature	Milber,	Stephen nd/or Contractor Dat	e Submitted	delivered XOY/YO XYes Date Work Complete		z1	.39	714
	7	5 m	A .	011/1028		2 6 Red	FB 0	<b>q</b> 701	2

Ontario	Ministry of	Well Tag No. (Place Sticker and/or Print Below)	Well Record				
	the Environment	A165032	Regulation 903 Ontario Water Resources Act				
Measurements recorded	in: 🛛 Metric 🗌 Imperial	$- T_{aa} \# \Delta 165032 - \dots$	Page of				
		- 1204 + 01000					

	cation (Street Number/Name)		Township	***************************************	Lot	***************************************	Concess		
	rdy Street		Osgoode						
County/District/Mur	-		City/Town/Village	//////////////////////////////////////	······································	Prov	ince	Post	al Code
Ottawa Car			Osgoode			On	tario		
UTM Coordinates Z		9	Municipal Plan and Su	ublot Number		Othe	۶ <b>۲</b>		<u> </u>
NAD 83	1845199249	99614				**************************************			
Í	Bedrock Materials/Abandonme	nt Sealing Reco	ord (see instructions on	the back of this form)					
General Colour	Most Common Material	Otl	her Materials	Genera	I Description	7		De From	pth ( <i>m/ft</i> )
Brown	Soil	Stones			***************************************	******		<u> </u>	3.3
Grey	Sandy Soil	Boulde		Loose				<u>२</u> २५	7.6
Grey	Till	Large	Boulders	Packed	~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~		NIAA-A	7.61	14.3
Grey	Limestone			Medium	vana		······································	14.32	*
<u>Grey &amp; Whit</u>	<u>te Sandstone</u>					54.86			
	Annular Space			Re	sults of We		Id Testinc		
Depth Set at ( <i>m/ft</i> ) From To	Type of Sealant Us (Material and Type		Volume Placed	After test of well yield, wat	ter was:	2	aw Down		ecovery
15.84 0	Grouted Bentonite		(m³/ft³) .504m <sup>3</sup>	□ Clear and sand free □ Other, <i>specify</i>		Time (min)	Water Leve (m/ft)	el Time ( <i>min</i> )	Water Level (m/ft)
		DLULLY	• <u>JU4</u> m	If pumping discontinued, g	give reason:	Static Level	5.46		
						1	6.52	1	6.49
				Pump intake set at ( <i>m/ft</i> ) 30.47		2	7.05	2	5.95
Method of Co	onstruction	Well Use		Pumping rate (I/min / GPI	<i>v</i> )	3	7.26	3	5.80
Cable Tool	Diamond     Public	Commerce Commerce		1 54.5		1			

<b>X</b> Rotary	(CoMandional) Usetting		ublic omestic				Duration of pumping	4	7.42	4	5.72
☐ Rotary	(Reverse)	· · · · · · · · · · · · · · · · · · ·	vestock	Test Ho	ole 🗍 Monitorir	ing	1 hrs + min	5	7.53	5	5.68
Image: Air percent			igation dustrial		& Air Conditioning		Final water level end of pumping (m/ft)	10		10	and the second
Other, s			her, specify				8.19		7.86	IU	5.58
	Construction F	Record - Ca	sina		Status of Well		If flowing give rate (I/min / GPM)	15	7.99	15	5.51
Inside Diameter	Open Hole OR Material	Wall		h ( <i>m/ft</i> )	X Water Supply		Paramandad	20	8.05	20	
(cm/in)	(Galvanized, Fibreglass, Concrete, Plastic, Steel)	Thickness (cm/in)	From	To	Replacement We	ell	Recommended pump depth (m/ft) 22.85	ΔE	0.00		5.51
9719					Test Hole		Recommended pump rate	25	8.10	25	5.48
27.13	Open		0	15.84	Recharge Well      Dewatering Well		( <i>I/min / GPM</i> )	30	8.12	30	5.47
15.86	Stee1	.48	+.45	15.84			45.5	40	0 1 /	10	
				LJ.04	Monitoring Hole		Well production (I/min / GPM)		8.14	~V	5.46
^// ^	u			-	Alteration (Construction)		Disinfected?	50	8.17	50	5.46
······					Abandoned,		Σ]Yes □ No	60	8.19	<u>~</u> ~	**************************************
Autoida	Construction R	ecord - Scre	en		Insufficient Supply	~ <b>a</b> a · :	Map of Wel				5.46
Diameter	ለ እስከ የሚመረግ የሚመረግ እና የመረግ የመረግ የሚመረግ በመረግ የሚመረግ በመረግ እና የሚመረግ የሚመረግ የሚመረግ የሚመረግ የሚመረግ የሚመረግ የሚመረግ የሚመረግ የሚመረግ በ						Please provide a map below following in	ISTO ICTIE	ation	-1/	
(cm/in)	(Plastic, Galvanized, Steel)		From	To	Abandoned, other, specify		Construction and the second se			or. L	オ
					specny			Sector and the sector of the s	<b>)</b>	A	
					Other, specify				1		
					······································			≫X	<b>)</b>		
Wator found	Water Deta	ails		Ho	le Diameter						
71 62	at Depth Kind of Water:	Fresh X	Untested	4144s E						No. And No. An	
Water found	ft) Gas Other, spec	ify	······································	From	To (cm/in)						
	at Depth Kind of Water:		JUntested	0	15.84 15.86	<u>;</u>		OM	BARAY S	·	
Water found	ft) Gas Other, spec at Depth Kind of Water:	TTTTTTTTTTTTTTTTTTTTTTTTTTTTTTTTTTTTTT		5.84	75.58 14.91	10010401111010011				£.	L.
	t) Gas Other, spec		Untested  -		12.00 14.91						
											Ś
<b>Business Nan</b>	ne of Well Contractor	and well I	echnician	Warden and a second	And the second secon						S
Capital	Water Supply ]	Ltd.		vven (	Contractor's Licence No.						
Business Add	ress (Street Number/Nam	e)		L Munic	5 5 8		*****				
Box 490					Lttsville		omments:		### <del>**********************************</del>		
<sup>p</sup> rovince		Business E	-mail Addre	SS	COATTTG						
Ontario		offi	ce@ca	pitalwa	iter.ca		ell owner's Date Package Delivered				
Sus. Lelephone	No. (inc. area code) Name	e of Well Tec	hnician /l ac	+ Nlama III	st Name)	infc	Imation		Ministry	Use O	nly
0138	361766	Miller	Stanh	0.0			ckage ivered 2 0 1 6 0 3 1	0	idit No.7	RR	41R
	's Licence No. Signature of	Technician a	and/or Contr	actor Date S	ubmitted	X	JYes Date Work Completed				
)506E (2007/12)		lan-		20	1600322		No 2016030	9	AND 2.(	20	
2	© Queen's Printer for Ontario	, 2007	$\sim$		Ministry's Copy	Sministry we show					
ana		STATION MARKS MALLAND STATES			∞ 194 <sup>6</sup>						

Measurements rec		Well Tag No. (Place Sticker al Tag #: A		Regulation 903 Ontario Water Resources				
Well Owner's Ir	·			J				
First Name	Last Name / Organizati	on	E-mail Address		Well Constructed			
Baresite Mailing Address (St	Construct: und	Municipality	Province	Postal Code	by Well Owner Telephone No. (inc. area code)			
	ummersido Drive	Manoticle	ON	KUMIBU	6133715171			
Well Location		Taunahin		Lot	Concession			
n	cation (Street Number/Name)	Township		~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~	Concession			
County/District/Mur	nicipality	City/Towh/Village		Provi				
UTM Coordinates Z	One, Easting , Northing	Municipal Plan and Suble	ot Number	Ont	ario			
	184520424999	A	Sublot#3	6				
	Bedrock Materials/Abandonment S				Depth (m/ft)			
General Colour	Most Common Material	Other Materials		eral Description	From To			
Brown	Sand		Fill	1	$\phi 4'$			
Brown	Sand		Packer		4' 11'			
Grey		Stones)	Packer		11 45			
Grey	Clay	Gravel	Packe	_d	45' 52'			
Grey	Limestone		Hare		52' 101"			
Cable Tool Cable Tool Cable Tool Cable Tool Cable Tool Convertion Convertion Called Convertion Con	(Naterial and Type)         (Naterial and Type)         (Naterial and Type)         Office Pressure Trend         Bentonite Pressure Trend         Bentonite Pressure Trend         Bentonite Pressure Trend         Diamond         Diamond       Public         Image: Diamond       Public         Image: Diamond       Public         Diamond       Public         Image: Diamond       Image: Diamond         Imad	(m³/ft³) inc Growted (G, 777 minc Growted 20, 31 minc Growted 20, 31 Well Use Commercial Not used Municipal Dewatering Test Hole Monitoring Cooling & Air Conditioning Cooling & Air Conditioning Status of Well Municipal Dewatering Municipal Dewatering Municipal Dewatering Municipal Dewatering Municipal Dewatering Municipal Dewatering Municipal Dewatering Municipal Dewatering Municipal Dewatering Municipal Dewatering Well G7 'G' Dewatering Well Dewatering Well Dewatering Hole	After test of well yield, After test of well yield, Clear and sand f Other, specify If pumping discontinue Pump intake set at (r Pumping rate (l/min / Duration of pumping hrs + 0 Final water level end of (6,8) If flowing give rate (l/min Recommended pum (l/min / GPM) Og Well production (l/min Disinfected? Yes No	free       Time (min)         ad, give reason:       Static Level $n/ft$ 2 <i>GPM</i> )       3 $m$ 4 $min$ 5         of pumping (m/ft)       10 $min / GPM$ )       15 $p$ depth (m/ft)       20 $p$ depth (m/ft)       20 $p$ rate       30 $n / GPM$ )       50 $p (\mathbf{M})$ 50 $p (\mathbf{M})$ 50 $below$ following instruct	Recovery         Water Level (m/ft)       Time (m/ft)       Water Level (m/ft) $15.9$ $16.8$ $16.2$ $16.5$ $16.3$ $16.4$ $16.3$ $416.4$ $16.3$ $416.4$ $16.3$ $416.4$ $16.3$ $516.35$ $16.45$ $1016.35$ $16.45$ $1016.35$ $16.45$ $1016.35$ $16.65$ $2016.35$ $16.65$ $2016.35$ $16.7$ $2516.35$ $16.7$ $2516.35$ $16.7$ $2016.35$ $16.67$ $3016.1$ $16.7$ $3016.1$ $16.85$ $5016.1$ $16.85$ $5016.1$ $16.85$ $5016.1$ $16.85$ $5016.1$ $16.85$ $5016.1$ $16.85$ $5016.1$ $16.85$ $5016.1$ $16.85$ $5016.1$ $16.85$ $5016.1$ $16.85$ $5016.1$ $16.85$ $5016.1$ $16.85$ <t< th=""></t<>			
$\begin{array}{c c} & (m/ft) & G \\ \hline \\ Water found at Dep \\ \hline \\ & (m/ft) & G \\ \hline \\ Water found at Dep \\ \hline \\ & (m/ft) & G \\ \hline \\ & \\ \\ \\ \\ \\ \\ \\ \\ \\ \\ \\ \\ \\ \\ \\ \\$	bth       Kind of Water:       Fresh       Unteste         ias       Other, specify	$\frac{d}{d} = \frac{d}{2} + \frac{576''}{101'} + \frac{178''}{101'} + \frac{1}{6} + $	Well owner's Date F information package delivered	Package Delivered	Drilling <u>RieldTeat</u> Ministry Use Only Audit Noz 197240			
- Lawrence - Lawr	Dueen's Printer for Ontario, 2007	Ministry's Copy			Received Ke			
(=		winisuy s copy						

D) Onta	Ministry <b>rio</b> and Clir	of the Environm	ient Well Tag	No. (Place Sticker a	nd/or Print Below		n 903 Ontari		ecord
Measurements re		Vietric 🗌 Imper	ial M/CO			<u> </u>	21166	Page	
Well Owner's First Name	Ľ	.ast Name / Orgar	nization		E-mail Addr	ress		Well	Constructed
		CITY OF	GILANDA	Australia	Brovinco	Postal Code	Tolop		ell Owner
	Street Number/Nar	10 West 54		Nunicipality	Province	KIP11			area code)
Well Location				•			J 1/ / /		
	Ocation (Street Nu			ownship		Lot	Conc	ession	
County/District/M				City/Town/Village		<u>.</u>	Province	Posta	Code
UTM Coordinates	Zone Fasting	, Northin		259000	ot Number		Ontario Other		
NAD 8 3	184520	049490	19305	1					
	<u></u>			rd (see instructions on the	T	General Description	1966 (1976) -	Der	oth ( <i>m/ft</i> )
General Colour	Most Com	non Material	Un	er Materials	71		E	From ·	<u> </u>
RRN	Top Son		- 14		SO PI			. 77	396
12RY	Sona		SIFT Class		SOFT			3.96	4.57
	J 1 1	, <u>.</u>		······································	<u> </u>				
			•						
		Annular Spa	and the second secon			Results of W	· · · · · · · · · · · · · · · · · · ·		
Depth Set at (m From T		Type of Sealant I (Material and Typ		Volume Placed (m³/ft³)	After test of well	and free		r Level Time	ecovery Water Level
0.3	] concr	ete/mor	www.s.A		Other, spec	ntinued, give reason:	Chatia	n/ft) (min)	(m/ft)
.31 1.2	2 bent	onite			i in pumping aisco	munueu, give reason.	Level		
1.22 4.1	57 1: 20	1 Same	4		Pump intake se	•t at (m/ft)		1	
							2	2	
Method o	f Construction		Well Us	e	Pumping rate (#	/min / GPM)	3	3	
Cable Tool	itional)	f Domesti	Comme		Duration of pur	nping	4	4	
Rotary (Reverse Boring	e) 🗌 Driving	Livestoci	k 🗹 Test Ho	le 🛛 Monitoring	hrs +	min end of pumping (m/ft,	5	5	
Air percussion	Digging	/ Irrigation	1	& Air Conditioning	i Final water level	end of pumping ( <i>mm</i> ,	10	10	
Other, specify		Cher, s			If flowing give ra	ate (I/min / GPM)	15	15	
	Construction R	Wall	Depth ( <i>m/ft</i> )	Status of Well	Recommended	pump depth (m/īt)	20	20	
Diameter (Gal (cm/in) Cond	vanized, Fibreglass, crete, Plastic, Steel)	Thickness (cm/in) F	rom To	Replacement Well			25	25	
4.03 P	VC	,368 (	1.57	Recharge Well	Recommended (I/min / GPM)	pump rate	30	30	
				Dewatering Well     Observation and/or	Well production	(I/min / GPM)	40	40	
				<ul> <li>Monitoring Hole</li> <li>Alteration</li> </ul>	Disinfected?		50	50	
				- (Construction)	Ves N	lo	60	60	
	Construction R	ecord - Screen		Insufficient Supply			ell Locatior		n (an an a
Outside Diameter (Plasti	Material ic, Galvanized, Steel)	Slot No.	Depth ( <i>m/ft)</i> rom To	Water Quality Abandoned, other,	Please provide a	a map below following	instructions o	n the back.	A
(cm/in) (1 1230	11/		52 4.57	specify		RS-7	5m/C		T.
1.00 1	~ _	10 1	- 1-3 ]	Other, specify		e T	2		$\sim$
	Water De			ole Diameter					
Water found at D	epth Kind of Wate		tested Dept	h (m/ft) Diameter			· · · · ·	12/	
	Gas Other, spe epth Kind of Wate		From	To (cm/in) 4.578,25			100m	1 AN	
	Gas Other, spe					¢.	Í	1 E	\
Water found at D	epth Kind of Wate	r: Fresh Un	tested				~		
(m/ft)	Gas Other, spe	· · · · · · · · · · · · · · · · · · ·	nician Informat			·		- 11.	air
Business Name of		len en e	We	II Contractor's Licence No.			05900	le	
Strata Business Address	(Street Number/Na			<u>7                                    </u>	Comments:		059		
165 ×		Cost		Morleham	Commettes:				
Province	Postal Code	Business E-m	ail Address	fasoil iom	Well owner's	Date Package Deliver	od I warm	Minister 11-	Only
Bus.Telephone No.	(inc. area code) Na	me of Well Techn	ician (Last Name,	First Name)	information		Audit	Ministry Us No.z 21	23 <u></u> 10
905940 Well Technician's Lic	274/9 xence No. Signature	MA La	1.1.1	1 Fes	delivered _	7 7 7 7 7 7 7 7 7 8 8 8 1 8 1 8 1 9 1 7 1 7 1 7 1 8 1 8 1 9 1 9 1 9 1 9 1 9 1 9 1 9 1 9		DEC 22	-037
					No /	BOUT TIK	3 9 Reco		
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Ministry of the Environmen and Climate Change Measurements recorded in:	Well Tag	g No. (Place Sticker ar	#: A182517	Regulation			r Resc	ecord
Well Owner's Information					<u> </u>			
First Name / Organiza	ation		E-mail Address		<u>1499 - 24 - 27 - 28 - 29</u>		Well C	Constructed
CITY OF								ll Owner
Mailing Address (Street Number/Name)		Nunicipality IHawa	Province	Postal Code	Te Th	lephone Na	. ( <i>I</i> nc. a	area code)
110 Laurier Autnue West, 3th		II JANAN		LAUTIU				
Well Location Address of Well Location (Street Number/Name)	<u>ר </u>	ownship		Lot	C(	oncession	<u>-analan</u>	<u>01999333333333333</u>
A 3200 Reids Land								
County/District/Municipality		City/Town/Village			Province		Postal	Code
UTM Coordinates Zone , Easting , Northing		Mana Junicipal Plan and Suble	at Number		Ontar Other	10		
NAD 8 3 18 45 201 4 9	and the second se	Authopar Flan and Subic	number		other			
Overburden and Bedrock Materials/Abandonment		rd (see instructions on the	back of this form)	and an account	2008-1946 2008-1946	November	19462	
General Colour Most Common Material		er Materials		ral Description		F	Dept rom	th ( <i>m/ft)</i>   To
BRN toposoil			50 M			6	)	. 3/
	a. lit		Soft			τ,	31	3.35
	<u>51 PT</u>		C. H			3.	35	7.96
<u>G/<y< u=""> 5, 15</y<></u>	<u>clary</u>		2011			1.	).	1-10
~								
Annular Space			Julian management and a second s	Results of We				
Depth Set at (m/ft)         Type of Sealant Use           From         To         (Material and, Type)		Volume Placed (m³/ft³)	After test of well yield, Clear and sand fr			v Down Vater Level		ecovery Water Level
	1	,,	Other, specify		(min)		(min)	(m/ft)
	aument		If pumping discontinue	d, give reason:	Static Level			
. 31,76 Dentonite					1		1	
, 76 3.96 hilter sand			Pump intake set at (n	o/ft)				
			i unp maio soc ac n	wity	2		2	
	Well Us		Pumping rate (I/min /	GPM)	3		3	
Method of Construction					4		4	
Rotary (Conventional)      Jetting      Domestic	Municip	al 🗌 Dewatering	Duration of pumping	-1-	5			
Rotary (Reverse)     Driving     Livestock	Test Ho	- ·		nin formation (or mi	-		5	- <u>; · · · · · · · · · · · · · · · · · · ·</u>
□ Boring □ Digging □ Irrigation □ Air percussion ∧ ↓ ∧ 1 □ Industrial	Cooling	& Air Conditioning	Final water level end o	r pumping (m/n)	10		10	
Air percussion Airect Push Dother, specify	ify		If flowing give rate (I/n	nin / GPM)	15		15	
Construction Record - Casing and		Status of Well			20		20	
Inside Open Hole OR Material Wall D Diameter (Galvanized, Fibreglass, Thickness _	epth ( <i>m/ft</i> )	Water Supply	Recommended pump	depth (m/ft)				
(cm/in) Concrete, Plastic, Steel) (cm/in) From	n To	Replacement Well	· · · · · · · · · · · · · · · · · · ·		25		25	
4.03 PVC 368 0	91	Recharge Well	Recommended pump (I/min / GPM)	rate	30		30	
	• /	Dewatering Well     Observation and/or			40		40	
		Monitoring Hole	Well production (I/min	/ GPM)				·····
		Alteration (Construction)	Disinfected?		50		50	
		Abandoned,	Yes 🗌 No		60		60	
Construction Record - Screen	<u>2002/20</u> 20/	Insufficient Supply		Map of We				l'energener
Diamatar I Meterica I Clathia I	epth ( <i>m/ft)</i>	Water Quality	Please provide a map	below following	instruction	ns on the ba	ck.	M
(cm/in) (Plastic, Galvanizeo, Steel) Fron		Abandoned, other, specify			Ì	101		14 A
4.82 PUG 10 .91	1 3.96			55	111	/W/	\	N)
		Other, <i>specify</i>			Same and the second	16		s w
			/	2		$\langle \rangle$	1	
Water Details		th (m/ft) Diameter		Ę		$\langle \rangle$	0	1
( <i>m/ft</i> ) Gas Other, <i>specify</i>	From	To (cm/in)					S	
Water found at Depth Kind of Water: Fresh Unter	sted U	3.96 8.25				)	$\langle \ $	
(m/ft) Gas Other, specify					Km			1
Water found at Depth Kind of Water: Fresh Unter	sted			\`?'	)			5 V
( <i>m/ft</i> ) Gas Other, <i>specify</i>							ľ	, <u>n</u> ,
Well Contractor and Well Techni							,	
Business Name of Well Contractor	• 90	Contractor's Licence No.						North Contraction of the Contrac
Strate Dro Lling Grav Business Address (Street Number/Name)		nicipality a	Comments:		and the second se	KA AIP	Ŧ	
165 Shie & Court		nicipality Nockham	49999999	0560	SODE	KY MI	đ.	
Province Postal Code Business E-mail	Address /	Arr .		<u> </u>				
ON LIREUP. Wrecor		hasoil.com	Well owner's Date P	ackage Delivere		Ministr		
Bus. Telephone No. (inc. area code) Name of Well Technicia	an (Last Name,	First Name)	package	Y Y M M	00	Audit No	21	2339
Well Technician's Licence No. Signature of Technician and/o				Vork Completed			2 2	2017
		VIV 1712010	$\square$ No $20$	67861	399 R	eceived	(ins	EUI
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1/ ()ntario and Climate Change	ag No. (Place Sticker ar	I		000 0-4-4	Well R	
Measurements recorded in: ☑ Metric □ Imperial	2518 Tag#	: A182518	< _ ()			of
Well Owner's Information			<u></u> A			
First Name Last Name / Organization	<u>6</u>	E-mail Address				onstructed
Mailing Address (Street Number/Name)	Municipality	Province	Postal Code		none No. (inc. a	
110 Laurier Avenue West, 5th Plour	DAtawa	UN	KIPIJ			
Well Location Address of Well Location (Street Number/Name)	Township		Lot	Conc	ession	
3200 Reids Lane				Di	Destal	<u>O-de</u>
County/District/Municipality	City/Town/Village			Province Ontario	Postal	
UTM Coordinates Zone Easting Northing	Municipal Plan and Suble	ot Number		Other		
NAD 8 3 1 9 4 5 20 7 8 4 9 9 4 0 7 Overburden and Bedrock Materials/Abandonment Sealing Rec	ord (see instructions on the	back of this form)		Maran Brancia		
	ther Materials		al Description		Dept From	h ( <i>m/ft)</i> ∣ To
BRN top soil		50 1.			0	.31
BRN sond silt		5019-			. 31	3.96
GORY SITE dung		SOPT			3.96	4.57
						*
						·······
Annular Space           Depth Set at (m/#)         Type of Sealant Used	Volume Placed	After test of well yield, v	esults of We	II Yield Te Draw Do	manage and the second s	ecovery
From To (Material and Type)	(m³/ft³)	Clear and sand fro		Time Wate	r Level Time	Water Level
0.31 conciper (monument		Other, specify     If pumping discontinued	t rive reason:	(min) (r Static	n/ft) (min)	(m/ft)
.311.22 bentonike			a, give redeent	Level 1	1	
1.22 9.5 Tyther sound		Pump intake set at (m	y/ft}			- <u></u>
		- p	~	2	2	
Method of Construction Well I	Jse	Pumping rate (I/min / C	ЭРМ)	3	3	
Cable Tool Diamond Dublic Comr Rotary (Conventional) Jetting Domestic Munic		Duration of pumping		4	4	· · · ·
Rotary (Reverse)     Driving     Livestock     Test I	Hole 🗹 Monitoring	hrs + m	iin	5	5	· · · · · · · · · · · · · · · · · · ·
Air percussion 1. An 1 Industrial	ng & Air Conditioning	Final water lever end or	pumping (mm)	10	10	
Cother, specify 11 - CAPUS Other, specify		If flowing give rate (I/m	iín / GPM)	15	15	
Construction Record - Casing     Inside Open Hole OR Material Wall Depth (m/ft)	Status of Well	Recommended pump	depth (m/ft)	20	20	
Diameter (Galvanized, Fibreglass, Thickness ( <i>cm/in</i> ) Concrete, Plastic, Steel) ( <i>cm/in</i> ) From To	Replacement Well			25	25	
403 PVC 368 0 1.50	Recharge Well	Recommended pump (I/min / GPM)	rate	30	30	
	Dewatering Well	Well production (I/min.	(GPM)	40	40	
	Monitoring Hole			50	50	
	— (Construction) Abandoned,	Disinfected?		60	60	
Construction Record - Screen	Insufficient Supply	antan ang ang ang ang ang ang ang ang ang a	Map of We	II Location	Y ng Mathang Mar	d unwang da
Outside Material Depth (m/ft) Diameter (Plastic, Galvanized, Steel) Slot No. From To	Water Quality	Please provide a map t	below following i	nstructions o	n the back.	4
	specify		Ø.	21		Ň
4.82 PVC 10 1.52 9.5	Other, specify		T		and the second	
Water Details Water found at Depth Kind of Water: Fresh Untested Do	Hole Diameter epth (m/ft) Diameter		particular and the second s		>	
(m/ft) Gas Other, specify	To (cm/in) 4578,25				5 \ 	
Water found at Depth Kind of Water: Fresh Untested	7.3 / 5/2)				$\mathcal{D}$	
(m/ft) Gas Other, specify Water found at Depth Kind of Water: Fresh Untested			155n		151	
(m/ft) Gas Other, specify				No. of Concession, Name	\Sa.\	- The second
Well Contractor and Well Technician Inform Business Name of Well Contractor	Nation Well Contractor's Licence No.				161	Main
Strata Diviling Group	7241				5900de	
	Municipality Markham	Comments:	and the second sec			
Province Postal Code Business E-mail Address	111					
ON LITREVAINTCORDS	Krobesoll-Com	Well owner's Date Pa information	ackage Delivere		Ministry Use	
Bus.Telephone No. (inc. area code) Name of Well Technician (Last Nam	e, First Name) れたノ	package <u>y y</u>	يساهدهم المصيحة فيصحبه المحمد		<sup>t No</sup> Z 21	2338
Well Technician's Licence No. Signature of Technician and/or Contractor		Yes /	/ork Completed		EC 22 :	2017
	30111112010		4 1 16 16	S 🛈 Rece		
	Ministry's Cop	Y		ê,	U	- 400 Mar 199 ALV 199

Ministry of the Environment and Climate Change	Well Tag No. (Place Sticker and		Regulation 903 Ontario	Well Record
Measurements recorded in: 🗌 Metric 🛛 Imperial	Tag#: A19	3335	Pa	ge of
Well Owner's Information				
First Name Last Name / Organization		E-mail Address		Well Constructed by Well Owner
Mailing Address (Street Number/Name)	Municipality			ne No. (inc. area code)
<u>2354 Summerside Driv</u> Well Location	<u>e Manstick</u>	00 14	<u>-MMIBHIGIB</u>	SHIDIHU
Address of Well Location (Street Number/Name)	Township		ot Conces	
<u>5566 Lombardy Drive</u> County/District/Municipality	City/Town/Village	<u> </u>	stitleral Ca	Postal Code
O Hawa	Municipal Plan and Suble		Ontario	KD MA ALLO
UTM Coordinates Zone Easting Northing	Municipal Plan and Suble	Number plant	Conter Other	
NAD 8 3 1 8 4 8 2 1 5 4 4 9 9 9 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0			830	
General Colour Most Common Material	Other Materials	General	Description	Depth ( <i>m/ft)</i> From To
Brown Sand		<u> </u>		Ø 3'
Brown Sand		Saft		315
Grey Sand	Gravel	Packed		15' 55'6'
Grey Limestone		Hand		55'6' 241'
Depth Set at (m/fi) Type of Sealant Used	Volume Placed	Res After test of well yield, wat	er was: Draw Down	and a second
From To (Material and Type)	(m³/ft³)	🔀 Clear and sand free		evel Time Water Level
60'6" 40' Coment Pressure @	Fronted 6.77	Other, specify	ive reason	
40' @ Bentonite Pressure (	Grouted 13.54		1 32-	
		Pump intake set at (m/ft,		5 2 1335
		2301		
Method of Construction	Well Use	Pumping rate (I/min / GP	· · · · · · · · · · · · · · · · · · ·	
Cable Tool Diamond Public Rotary (Conventional) Jetting Diamond Domestic	Commercial Not used Municipal Dewatering	Duration of pumping		5 4 109.5
Rotary (Reverse)     Driving     Livestock	Test Hole Monitoring	Final water level end of pu	5 59,9	8 5 101.7
Air percussion	Cooling & Air Conditioning	150.8	10 25.3	7 10 68.2
Other, specify Other, specify Construction Record - Casing		If flowing give rate (I/min	<i>(GPM)</i> 15 ЮЧ.	35 15 45.2
Inside Open Hole OR Material Wall Dept	th (m/ft) Xater Supply	Recommended pump de	pth (m/ft) 20 117.	9 20 31.2
Diameter (Galvanized, Fibreglass, Thickness (cm/in) Concrete, Plastic, Steel) (cm/in) From	To Replacement Well	<u> </u>	25 127.0	@ 25 <u>24</u> ]
9718" (OpenHate) 0	んべい 🗍 Recharge Well	Recommended pump ra	30 154.	G16 08 F.
61/4" Steel ,188 Q	Control (Control (Contro) (Contro) (Contro) (Contro) (Contro) (Cont	Well production (//min)		4 40 20,7
			50 48	35 50 20.55
6/8" OpenHola 60'6"	Construction)	Disinfected? ⊠Yes □No \५(		
Construction Record - Screen	Insufficient Supply		Map of Well Location	
Diameter Louis Matchail to No.	th ( <i>m/ft</i> ) Water Quality	Please provide a map bel	ow following instructions on t	he back.
( <i>cm/in</i> ) (Plastic, Galvanized, Steel) Site No. From	To Specify			* * *
	Other, <i>specify</i>		Lombardy	orive
			···	אין איז
Water Details Water found at Depth Kind of Water: Fresh Untested	Hole Diameter Depth (m/ft) Diameter		#5566	
( <i>m/ft</i> ) □Gas □Other, specify	From To (cm/in)			
Water found at Depth Kind of Water: Fresh Untested				
(m/ft) Gas Other, specify Water found at Depth Kind of Water: Fresh Untested	60'6" 241' 61/6"		80'	
(m/ft)  Gas Other, specify				
Well Contractor and Well Technicia Business Name of Well Contractor	an Information Well Contractor's Licence No.			
1425486 Ontario Ltd		3		
Business Address (Street Number/Name)	Municipality	Comments:	e ofter Drillin	
PORX 1083 Province Postal Code Business E-mail Adv	dress	6 Chloriv	a after Pield	treat
OW KOLE ITO		Well owner's Date Pack	age Delivered Mi	nistry Use Only
Bus Telephone No. (inc. area code) Name of Well Technician (	- man	Information package delivered	Audit No	• <b>z</b> 242999
Well Technician's Licence No. Signature of Technician and/or C	ontractor Date Submitted	Date Work	Completed	/ 1 8 2016
1218159 1610000	2 Sterrondon	DNO SIGIX	CE M HI CO LO Receive	d – –
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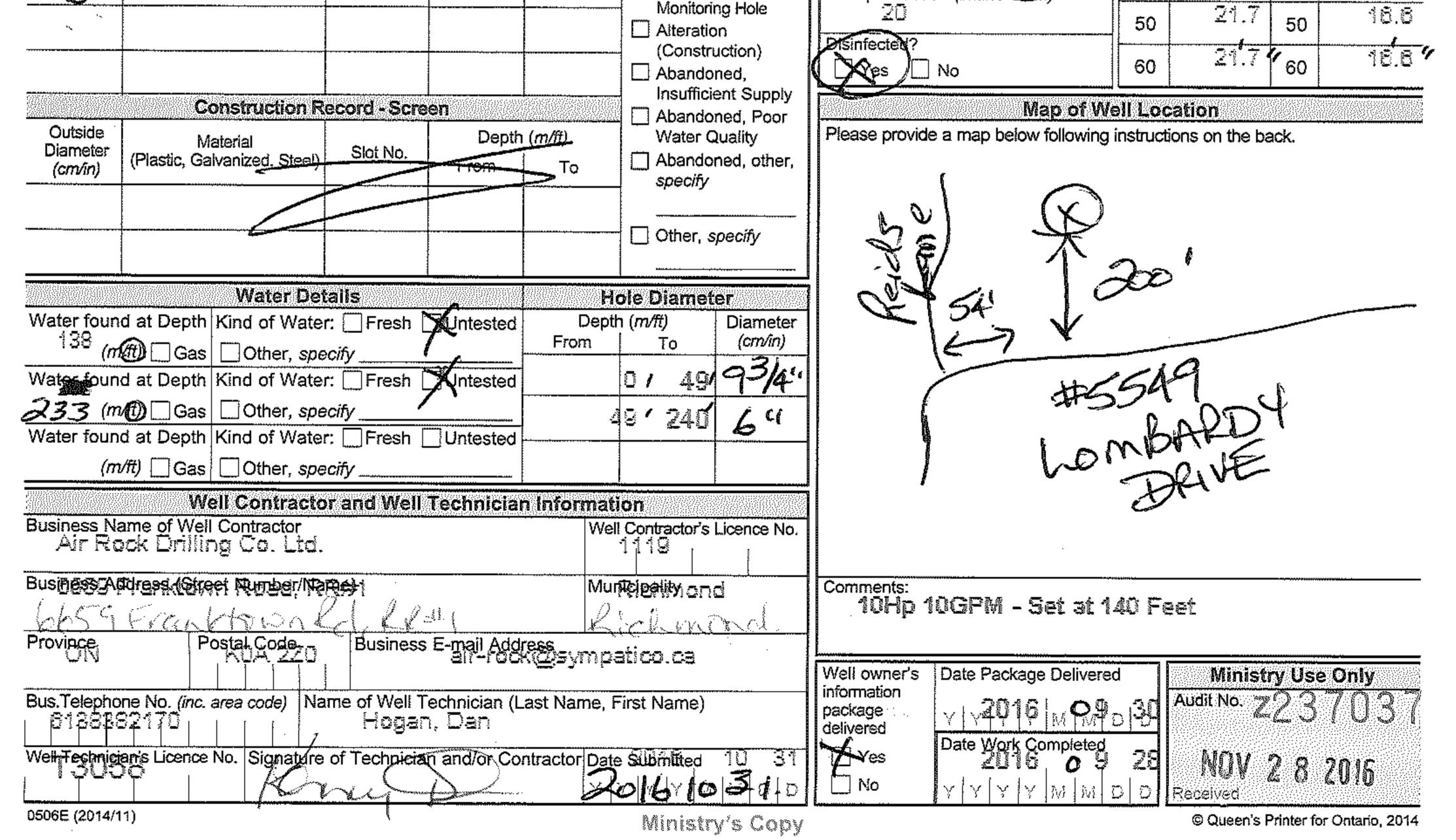
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Ontario	Ministry of the Environme and Climate Change	ent Well Tag No. (Place Sticker	and/or Print Below)		V	Vell R	Record
Measurements recorded		al Tag#A193411		Regulation 9	<b>03 Ontario V</b> Pag		ources Act
Well Owner's Inform	ation Last Name / Organi						
Banosite (	Constructi	(NA)	E-mail Address			by We	Constructed ell Owner
Mailing Address (Street Nu	umber/Name) <u>uvmmendicke</u>	Drive Manotic	Province	Postal Code		e No. (inc. ⊰ [→] \	area code)
Well Location							
Address of Well Location (	Street Number/Name) nbardy Driv	re Osacod	0	Lot otlot 34	Concessi 13 2 PLC		<u>4m-830</u>
County/District/Municipalit	y y	City/Town/Village	A ~	P	rovince	Postal	
UTM Coordinates Zone E	asting Northing		blot Number		<b>Intario</b>	<u> </u>	UJJAI
NAD 8 3 \	151210188 4994	A 5999 Parts 17(18 It Sealing Record (see instructions on t	<u> RP4R-14828</u>				
	lost Common Material	Other Materials		al Description		Dep From	th ( <i>m/ft)</i> │ To
Brown S	andy Clay		Pack	ed		0	
Brown	Sand 1		Pada	<u> </u>		101	251
<u>Grown i</u>	Sand	Gravel	Pada	<u>ed</u>		<u>as'</u>	551
over L	imestore		Hav	-d		55'	161
						<u>,,,,,</u> ,,,	
							-
	Annular Space			esults of Well			
Depth Set at ( <i>m/it</i> ) From To	Type of Sealant U (Material and Type		After test of well yield, w	e T	Draw Down ime Water Le		ecovery Water Level
60' 40' G	ement Pressue	Grouted 6.77	Other, specify      If pumping discontinued		min) (m/ft) tatic	(min)	(m/ft)
40' ¢ B	entonite Pressu	re Grouted 13,54			evel 20.1		10+10
	·		Pump intake set at (m)	/ft)			<u>1315</u>
			Pumping rate (1/min / G		$\frac{2}{3}$ $\frac{3}{2}$ $\frac{3}{2}$ $\frac{3}{2}$	× - < 3	126.7
Method of Constr	Diamond Public	Well Use	- I - an		4 37.7	4	120
Rotary (Conventional)	Jetting Z Domestic	Municipal Dewaterin	g Duration of pumping		5 1	5	<u>100</u>
Boring [		Test Hole     Monitoring     Cooling & Air Conditioning	Final water level end of			10	$\frac{11010}{1015}$
Air percussion Other, specify	Industrial	ecify	If flowing give rate (Vm	5 in / GPM)	15 66.8	メ <u> <u> 「</u> 15</u>	CAK
1	uction Record - Casing	Status of Well			20 77	<u>、</u> ス 20	75.55
Inside Open Hole OR Diameter (Galvanized, Fi (cm/in) Concrete, Plast	breglass, Thickness	Depth ( <i>m/ft</i> ) X Water Supply m To Replacement Well	Recommended pump		25 6, 7	ς 25	64.8
and is mind.	Hale) (		Recommended pump (I/min / GPM)	rate		2 30	55,7
L'UN Stad	188 9	B 60 Dewatering Well	Well production (14min)		40 111.3	3 40	41.2
6/2" Ovent		Monitoring Hole	from production (mining		50 125.	50	31.3
<u>un labor</u>		Construction (Construction)	Disinfected?	45		3 60	25.1
~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~	ruction Record - Screen	Insufficient Supply		Map of Well			
Outside Diameter (cm/in) (Plastic, Galvani	" I Clothia I	Depth ( <i>m/ft</i> ) Water Quality	Please provide a map b	eiow toliowing ins	structions on the	Dack.	1N
(		specify	-	ī.		×	<b>`</b>
		Other, specify	A determined in the second sec	1 #55	ardy (	26104	
	Vater Details	Hole Diameter				20	
Water found at Depth Kind	d of Water: 🛄 Fresh 🖾 Unte Other, specify	ested Depth ( <i>m/ft</i> ) Diamete From To ( <i>cm/in</i> )	r (		3 40' V	200'	
	d of Water: Fresh Unte	ested <u>\$ 66' 9</u> 76'	<u>}</u>	( Cast	8 W W		
(m/ft) Gas Water found at Depth Kind	Other, <i>specify</i> d of Water:	ested 60' 161' 678'		120			
(m/ft) 🗌 Gas 🔲							
Business Name of Well Cor	ontractor and Well Techi htractor	nician Information Well Contractor's Licence No	<u></u> 5.				
Hastele Ontar	Wellorillina	41817F					
Business Address (Street N	iumper/Name)		Comments: 145 Chlori	ne after	Drill	ng [	 
Province Posta	I Code Business E-ma		Contraction of the second seco	I VSE COMPA			rest
Bus.Telephone No. (inc. area	code) Name of Well Technic	cian (Last Name, First Name)		ckage Delivered	Audit No.	istry Use Z2 []	<u>2019</u> 2019
LGAR GADEMB	95 Feraus	miJohnathan_	delivered	k (o M k 4) ork Completed			~~~~
12181519	Signature of Techniclan and/	or Contractor Date Submitted		161111	Received	<u>ee</u> n ()	7015
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Ministry of the Environment and Climate Change	Well Tag No. (Place Sticker a	Regulatio	=	Vell Record
Measurements recorded in: 🛄 Metric 😡 Imperial	Tag# 191934	13	Page	
Well Owner's Information First Name Comparison Variable V	0	E-mail Address	- 	
Bareaite Constructio Mailing Address (Street Number/Name)	$\overline{\mathbf{N}}$			Well Constructed by Well Owner
_2354 Summer ide	Municipality	HOVINCE Postal Code		No. (inc. area code)
Well Location Address of Well Location (Street Number/Name)				
5554 Lamberdunicie	Township OS accede	Lot	<u>31 Plan</u> -	
County/District/Municipality	City/Towh/Village		Province	Postal Code
UTM Coordinates Zone Easting Northing	Municipal Plan and Sub	lot Number	Ontario Other	KPABUD
NAD         8         3         1943         964         964         964         964         964         964         964         964         964         964         964         964         964         964         964         964         964         964         964         964         964         964         964         964         964         964         964         964         964         964         964         964         964         964         964         964         964         964         964         964         964         964         964         964         964         964         964         964         964         964         964         964         964         964         964         964         964         964         964         964         964         964         964         964         964         964         964         964         964         964         964         964         964         964         964         964         964         964         964         964         964         964         964         964         964         964         964         964         964         964         964         964         964		<u> R-14828</u>		
General Colour Most Common Material	Other Materials	General Description	<u>ו</u>	Depth ( <i>m/ft</i> ) From   To
Brown Clay		Paded		¢ 8'
Brown Sand	ρ	Padied		8'15'
Grey Sand	Gravel	Paded		15' 51'6"
Grey Limestone		Havd		516" 121
		· · · · · · · · · · · · · · · · · · ·		
				· · · · · · · · · · · · · · · · · · ·
Annular Space           Depth Set at (m/ft)         Type of Sealant Used	Volume Placed	Results of We After test of well yield, water was:	ell Yield Testing	and the second sec
From To (Material and Type)	(m³/ft³)	Clear and sand free	10	el Time Water Level
566 466 Cement Pressue Groc		Other, specify     If pumping discontinued, give reason:	(min) (m/ft) Static	(min) (m/ft)
466 Q Bentonite Prossure Gran	atua 13.54		Level 16,7	5 1 50.85
		Pump intake set at (m/ft)	2 22,19	2 457
Method of Construction		Pumping rate (I/min / GPM)	3 25.2	3 42,4
Cable Tool Diamond Public	Well Use	Fapm	4 27	4 39 3
	Municipal     Dewatering     Test Hole     Monitoring	Duration of pumpirig	5 28.6	5 5 36
Boring     Digging     Irrigation     State     Digging     Industrial	Cooling & Air Conditioning	Final water level end of pumping ( <i>m/t</i> ) 56.4	10 35	10 23,4
Other, specify Other, specify Other, specify		If flowing give rate (I/min / GPM)	15 39,5	15 18,2
Construction Record - Casing	(m/ft) 🔀 Water Supply	Recommended pump depth (m/ft)	20 43	20 17.6
Diameter (Galvanized, Fibreglass, (cm/in) Concrete, Plastic, Steel) (cm/in) From	To Replacement Well	110'	25 45.8	25 17,05
9718" (Open Hole) Ø	566 Recharge Well	Recommended pump rate (Vmin / GPM)	30 47.5	30 17-,025
	566 <sup>1</sup> Observation and/or Monitoring Hole	Well production (//w/n / GPM)	40 52.8	40 7-
6/8" Open Hole 566"	Image: Alternation (Construction)	Disinfected?	50 54,85	5 50 17
V.	Abandoned, Insufficient Supply	AYes No 140	60 56.4	60 16,975
Outside Material Depth	Abandoned, Poor	Map of Wo Please provide a map below following	all Location	back
Diameter (cm/in)         (Plastic, Galvanized, Steel)         Slot No.         From	To Abandoned, other, specify			
	Other, specify	Lomba	cdy Dci	ve M
		A H	554	
Water Details Water found at Depth Kind of Water: Fresh Untested	Hole Diameter	200 3		
\\S'(m/ft) □Gas □Other, specify	From To (cm/in)		7	
Water found at Depth Kind of Water: Fresh Untested (m/ft) Gas Other, specify	Ø 56°6" 948"	1 182	EF 1	
Water found at Depth Kind of Water: Fresh Untested	566" 121 6/8"		80'	
(m/ft) Gas Other, specify				
Business Name of Well Contractor	Well Contractor's Licence No.			
Business Address (Street Number/Name)	Municipality	Comments:		
POBOX 1083	Prescott	140 Chlorine akter	DAILLING	·····
Province Postal Code Business E-mail Addr	ess	Well owner's Date Package Delivered		try Use Only
Sus.Telephone No. (inc. area code) Name of Well Technician (La		information package delivered	Audit No	
Vell Technician's Licence No. Signature of Technician and/or Con		Date Work Completed		C perc
2181519	- BOXBANBD	$\square NO = 3 (S   X   G   X   V   I$		
e de la companya de l	Ministry's Copy		© Queen's	Printer for Ontario, 2014

Tag#: A 207699 nt Below) Ministry of the Environment Well Record )ntario and Climate Change Regulation 903 Ontario Water Resources Act A207699 Measurements recorded in: Metric Imperial Page of Address of Well Location (Street Number/Name) Township Lot Concession 5549 Lombardy Drive Osgoode 27 County/District/Municipality City/Town/Village Province Postal Code Ottawa Carleton Osqcode KOA 2 Ontario UTM Coordinates Zone , Easting Municipal Plan and Sublot Number Northing Other 462000 P 3 4999637 4M830 NAD | 8 | 3 S/L 29 Overburden and Bedrock Materials/Abandonment Sealing Record (see instructions on the back of this form) Depth (mag) General Colour Most Common Material Other Materials **General Description** From To Sand + Gravel & Bubes + Ciay 431 100 Grey Limestone 43 1 138 / Grey Limestone 138 233 / Grey Limestone 233 240

·	····			······	·····					· · · · · · · · · · · · · · · · · · ·	
		······			·····						
			Annular				Results of We	il Yiel	d Testing		
_ •	et at (ma)		Type of Sea			Volume Placed	After test of well yield, water was:	·	aw Down	Recovery	
From	To 39'	Neat o	(Material an	d Type)		(m200) 10.9	Clear and sand free           Other, specify		Water Level	F	}
39 / D' Bentonite slumy		· ·.· ·.	50.4	Other, specify NOT LESTER If pumping discontinued, give reason:	Static		(min)	(m/ft) 21.7			
**.*.*					·····			1	19.9	1	18.7
							Pump intake set at (mat)	2	20.1	2	18.2
Metł	l nod of Cor	struction			Well Us	e	Pumping rate (I/min / Pumping	3	20.4	3	17.9
Cable To	ol					cial	בע Duration of pumping	4	20.7	4	17.7
Rotary (F	Conventional) Reverse)			estock	Municipa		1 hrs + 0 min	5	20.9	5	17.5
Boring	ssion	Digging		jation ustrial	Cooling a	& Air Conditioning	Final water level end of pumping (m/ft)	10	21.2	10	1
Other, sr				ier, <i>specify</i> _		4	If flowing give rate (I/min / GPM)	15	21.5	15	18.7
Inside	1	OR Material	ecord - Cas Wall		) ( <i>m</i> @)	Status of Well	Recommended pump depth (n%)	20	21.7	20	16.6
Diameter (cm/@)	(Galvanized	t, Fibreglass, Plastic, Steel)	Thickness (cnvin)	From	To	Z Replacement Well	140	25	21.7	25	16.8
6 44"	Steel		.188"	+21	491	Test Hole     Recharge Well	Recommended pump rate	30	21.7	30	18.8
6"	Орел і	iole		49'	2401	Dewatering Well	Well production (I/min / @DAP)	40	21.7	40	16.8





Measurements recorded in:

Ministry of the Environment and Climate Change

🛄 Imperial

🔲 Metric

# Tag#:A229142 Print Below) A229142

# Well Record

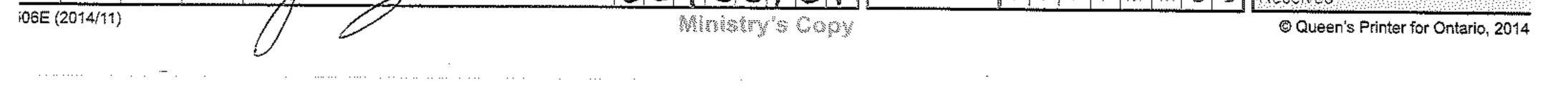
of

**Regulation 903 Ontario Water Resources Act** 

Page

	cation (Street Number/Name) JOODE Main	Towns O	hip sgoode	Lot X	Concess	ion	
County/District/Mur Ottawa (	Carleton	City/To	wn/Village SCIOOCIE	I	Province Ontario	Postal	Code
JTM Coordinates 2 NAD   8   3 Overburden and	Zone Easting Northing 18 451988   49991 Bedrock Materials/Abandonment Se	37 <sub> </sub> P	pal Plan and Sublot Numbe Ian 393		Other S/L 44		
General Colour	Most Common Material	Other Ma		General Descri	ption		th ( <i>m</i> æ
	Sand					From ⊡ ≪	27 1
							1
	Gravel	٩r	Boulders			271	44 6
Grey	Gravel Limestone	Ŷ	Bouiders		······································	271	44 < 207 (
Grey Grey		Ť	Souiders		······································		

		······	·····							
	····									
				·		······································				
		innular Space				Results of W	eli Yiel	d Testing		
Depth Set at ( <i>m/</i> ② From To 진식 식식	• •	e of Sealant Used aterial and Type)		Volume Placed		After test of well yield, water was:		aw Down		ecovery
<del>3</del> 4 44 4	Neat ceme		ī	10.93		Clear and sand free	(min)	Water Level (m/ft)	ume (min)	vvater Level ( <i>m/ft</i> )
	Bentonite s		· ·	10.3		If pumping discontinued, give reason:	Static	- <u>- 1</u> - 1		28.110
							Level	$\frac{214}{28.2}$		27.8
									1	
						Pump intake set at (mt)	2	28.3	2	27.8
						Pumping rate (Vmin / @M)	3	28.4	3	27.7
Method of Con Cable Tool	Diamond	Public	Well Use		· · · · · · · · · · · · · · · · · · ·	20	4	28.5		27.6
Rotary (Conventional)			Commerc		E	Duration of pumping		28.6	4	
Rotary (Reverse)	Driving		Test Hole		- H	hrs +min	5	20.U	5	27.4
☐ Boring ↓Air percussion	Digging	Irrigation Industrial	Cooling &	Air Conditioning		Final water level end of pumping (m/ft)	10	28.8	10	27.4
Other, specify		Other, specify					15	28.8	15	27.4
Con	struction Recor	d - Casing		Status of Well		If flowing give rate (Vmin / GPM)		28.8	-15	27.4
Inside Open Hole	OR Material	<u>1</u>	n ( <i>m©</i> )	Water Supply		Recommended pump depth (m)	20		20	
Diameter (Galvanized (cm/o) Concrete, P		ckness mage From	То	Replacement We		140 (	25	28.8	25	27.4
61/4" Steel		88" +2	54/	Test Hole     Recharge Well		Recommended pump rate	30	28.11	30	27.4
			240/	Dewatering Well		(1/min LGPM) 20 GPM		28.11		27.4
6'/4" Open H	148 C		240.	Observation and/o	'or	Well production (Vmin / CPD)	40		40	
				Monitoring Hole		20 <b>*</b>	50	28.11	50	27.4
······································				(Construction)		Disinfected?	60	28.11	60	27.4 7
				Abandoned, Insufficient Supply	у					
Outside	struction Recor	<u>I</u>	( <i>(</i> 51)	Abandoned, Poor Water Quality	r	Map of W Please provide a map below followi				
Diameter	terial ranized, Steel) SI	ot No. From	( <i>m/ñ</i> ) To	Abandoned, other	r,		iy msu		e Dack	•
			,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,	specify			$\sim$			and the second se
	$\rightarrow$			Other, specify		L CL				
	Water Details	<u> </u>	<u> </u>	le Diameter		$\sim \lambda$				
Vater found at Depth K	Kind of Water:	Fresh Untested	Depth	(m/ft) Diamete	:er					
( <i>m/\Curristication Gas</i>	_Other, specify _			To (cm/in)			5	A95		_
Vater found at Depth K		Fresh Untested	1	1 54/97/4	¥4	4	きン		SE.	- -
( <i>m/ft</i> ) ☐ Gas [ √ater found at Depth K	Other, specify		54	' 240' 61/4	<b>e</b> ¶		Q	3001		
	Other, specify _	Fresh Untested					$) \cup ]$			
		d Well Technician				JUL-1	$\mathbf{M}$	WHIN		
		a vyeli lechincial				LEE \	6	GL		
usiness Name of Well ( Ar Rock Dnilling	Collite.			Contractor's Licence N	VU	STE 1				
ušidės Aterst (Stree	Rundervarie)		Mæj	 siþælitønd		Comments:				
······		·····		-		Comments: 1/2 HP 10 GPM SET AT	140 F			
'ovinge Pos		usiness E-mail Add	Bympatic	co.ca						·······
Is Telephone Mar (inter					88	Well owner's Date Package Delivere		Ministr	76. 603800 -	
us Telephone No. (inc. ar Sitesezition		anna, Jeremy	ast Name, Fil	rst Name)		package	j Z	Audit No. 🎢	2/(	5999
រាក្រុះ an's Licence N	lo. Signature of Te	chnician and/or Cor	<u>tractor Data</u>	Submitte®7 31	3 7	Yes Date Work Completed	-			
	Jun		R	18 AD BI				S	-01	0 2018

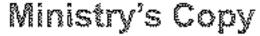


Onta	Ministry of the Environn and Climate Change		Bogulati	<b>Well Record</b> on 903 Ontario Water Resources Act
Measurements re	corded in: 🔲 Metric 🛛 🖾 Impe	Tag#:A2	36933	Page of
Address of Well 1	cation (Street Number/Name)	Township	Lot	Concession
A ANY LONG	-ombardy Dri	x Osaoode	otlat	#37. Concession #= 1
County/District/Mu		City/Town/Village		Province Postal Code
<u>OHAUSA</u>	- Carleton	<u> </u>	• • • • • • • • • •	Ontario (40 A a u C
UTM Coordinates NAD   8   3	Zone Easting Northin	g Municipal Plan and Sublo		Other
	18461 GAR LIGE	MMBBIPLANYMN-83	CPT9222	
	<u> \영식6\ 역구용 니역</u> I Bedrock Materials/Abandonm	<u> 시니니(영상) 이지, 서파 - 영국</u> Int Sealing Record <i>(see instructions on the</i>	back of this form)	
	184519구8444 Bedrock Materials/Abandonm Most Common Material	NUU88NULANUM-83 Int Sealing Record (see instructions on the Other Materials	<u>ે પે પે પુચ્ચે કે સ</u> back of this form) General Descripti	on Depth ( <i>m/ft</i> ) From To
Overburden and	an a			on $V$ Depth $(m/ft)$ From To $V$ $U$ $U$
Overburden and General Colour	Most Common Material	Other Materials		on $\frac{\text{Depth}(m/ft)}{\text{From}}$ $\frac{\sqrt{2}}{\sqrt{5}}$ $\frac{\sqrt{5}}{\sqrt{5}}$
Overburden and General Colour	Most Common Material	Other Materials		on $\frac{\text{Depth}(m/ft)}{\text{From}}$ $0 \\ 16 \\ 16 \\ 16 \\ 16 \\ 16 \\ 16 \\ 16 \\ 1$
Overburden and General Colour	Most Common Material	Other Materials Stones Stones		$\frac{\text{From}}{\sqrt{2}} \frac{\text{To}}{\sqrt{5}}$

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		+ <sup>-</sup> - <sup>-</sup>									·····
			Annular	Space			Results of We	ll Yiel	d Testing		
_ •	et at ( <i>m/ft</i> )		Type of Sea			Volume Placed	After test of well yield, water was:		aw Down	F	Recovery
From			(Material an			(m³/ft³)	Clear and sand free	Time (min)	Water Level		
56'6"	466	Cemer	t Pread	ueGr	outed	FF.0	Other, specify	Static	(m/ft)	(min)	(m/ft)
466	¢	Berton	+ + P			1354	If pumping discontinued, give reason:	Level			15.85
		UCRION	wrie	<u>Northe C</u>	<u>voula</u>			1	15.2	1	14.65
<b></b>			·····				Pump intake set at (m/ft)	2	~ ~	2	111 (.
							1011		15.3	2	41710
Meth	nord of Co	nstruction			Well Us		Pumping rate (I/min / GPM)	3	15.4	3	1455
Cable To	a yyn gener a far yn	Diamond	Pul	olic			abapm	4	15.4	4	2
	Conventional)	······	. —	mestic	Municipa	<u> </u>	Duration of pumping				
Rotary (F	Reverse)	Driving		estock	Test Hole		$\underline{ \ } hrs + \underline{\bigcirc } min$	5	15.45	5	1415
🔄 Boring	esion	🗌 Digging		gation ustrial		& Air Conditioning	Final water level end of pumping (m/ft)	10	15.5	10	:4,4
Other, sp				usulai ier, specify _				15		15	
	Coj	nstruction R	ecord - Cas	inc		Status of Well	If flowing give rate (Vmin / GPM)		15.65		14.35
Inside		o OR Material	Wall		ነ ( <i>m/i</i> ጀ)	Water Supply	Recommended pump depth (m/ft)	20	15.7	20	14.5
Diameter (cm/in)	(Galvanize	d, Fibreglass, Plastic, Steel)	Thickness (cm/in)	From	То	Replacement Well	100'	25	15.75	25	143
61/4"	Stee		.188	+2	56'6"	E Test Hole	Recommended pump rate (I/min / GPM)	30	15.8	30	14.25
• • • • •				$\overline{\overline{}}$		Dewatering Well	10apm	40	15.8	40	14.2
6/16)	Oper	, hole		56'5''	191	Observation and/or Monitoring Hole	Well production (Vmin) GPM)				
						Alteration	Disinfected?	50	15:8	50	14,2
······································			***		· · · · · · · · · · · · · · · · · · ·	(Construction)	Yes INO 140	60	15,85	60	14.2
	Co.	nstruction R	ecord - Ser			Insufficient Supply	Map of We		· · · · · · · · · · · · · · · · · · ·		
Outside				I	n ( <i>m/ft</i> )	Abandoned, Poor Water Quality	Please provide a map below followin			ie bac	<u></u>
Diameter (cm/in)		aterial vanized, Steel)	Slot No.	From	To	Abandoned, other,		0			
(0//2/1/)					· · · · · · · · · · · · · · · · · · ·	specify					
				·		Other, specify		1 <del>49, ************************************</del>		1001507600071 <del></del>	
:		:					(Lo	mb	ardy D	riv	< د
	<u> </u>	Water Def	ails			ole Diameter					
Water found	d at Depth	Kind of Water	~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~	지Untested		n ( <i>m/ft</i> ) Diameter					
· · · · ·		Other, spe			From	To (cm/in)					
Water found	d at Depth	Kind of Water	: Fresh	Untested	$\downarrow \phi$	566"978"	# 5533				
** ***********************************		Other, spe			S. Y. IV	1 1 1 1 1 11 11					
		Kind of Water		Untested	<u>26 6</u>	191 10116					
(111		Other, spe			anter enter anternationer		2005 N				
Business Na	ame of Well	ell Contractor	oo ja aa	lecnnicia	~~~~~	on I Contractor's Licence No.	1 KC & I				
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	<u>-&gt;_\(\)</u>	et Number/Na	a series of the series of the	<u></u>	Mu	nicipality	Comments:	i/~		73	
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Province	P	ostal Code	Business	E-mail Add		**************************************	Comments: 146 Chiorine abte & Chiorine oft	jin (	reld	and and	201
$\Delta N \Delta$	) K		and the second s				Well owner's Date Package Delivered	d	Minisi		e Only
Bus Telepho	ne No. (inc.	area code) Na	me of Well T	echnician (	Last Name, I	First Name)	information package QQVA®BA	XG.	Audit No. Z	29	2468
<u>GUBP</u>	<u>uph</u>	<u>18051-</u>	<u>erqu</u>	Jon	Job	a <u>athon</u>	Date Work Completed				2019
	e	No. Signature	ot lechnicia	n and/or Co		e Submitted	No DIGUIGIARI	$\cap$	ri fii	υl	7012



# 0506E (2014/11)





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		nformation	<u> </u>	<u></u>				<u>]</u>		Faye_		<u> </u>
First Name	10		Last Name/O Vib	÷	on Studios	Inc	E-mail Address					onstructed
-		treet Number/Na	ame)	- ution		lunicipality	Province	Postal Code		lephone N	o. (inc. a	area code)
<u>5488</u> Well Loca		<u>goode Mai</u>	<u>n Street</u>			<u>Osgoode</u>	<u> </u>		<u>ww</u>			
		cation (Street Nu			T	ownship	an Hendernad a na Anara a sa hafa sa falanga	Lot	1	oncession	2005-1109-01-119-	WITH SUMERICE IN
County/Dist		qoode Mai	n Street		C	Osgoode Dity/Town/Village		28&2	Province	-	Postal	Code
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Overburde General Co	en som en	outpartering services and as an end	rials/Abando	nment	agardean chan an ann	ord (see instructions on the		eral Description			_ Dept	n (m@
			Sand	. <b>q</b> -	Clau	of Gravel	9 Bou	· · ·			From ' D	42 (
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Grey	4	3 lack	Limes	tone	w/wh	not Soudsto	e mx_				334 (	340 ′
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			Annular	Space			www.andowenee.https://www.andowenee.https://www.andowenee.https://www.andowenee.https://www.andowenee.https://w	Results of Wa	and (Performance)	and the second sec	and the second second second	a damp days when a should be the
Depth Se From	То	)	Type of Sea (Material ar		d	Volume Placed (m <sup>3</sup> ft <sup>2</sup> )	After test of well yield.	free	Time V	v Down Vater Level	Time	Water Level
52 ′	42		cement			10.9	Other, specify _		(min) Static	(m/ft) 24 <sup>1</sup> 4 <sup>1</sup>	(min)	(m/ft) 26.5 1
42 ′	0 ′	Bento	nite slurry			16.8				<u>44 9 .</u> 24.8	1	24.4
							Pump intake set at (n		2	24.8	2	24.4
		<u></u>					300 Pumping rate (I/min / 0		3	24.9	3	24.4
Meti	00102063006380	Construction	ar ang pelangan penersi san	blic	Well Us	rcial 🗌 Not used	20		4	24.9	4	24.4
Rotary (C	Conventi	ional) 🗌 Jetting		mestic estock	☐ Municipa ☐ Test Hol	al 🗍 Dewatering	Duration of pumping	min	5	24.9	5	24.4
	_		g  ⊒lmi	gation lustrial		& Air Conditioning	Final water level end	of pumping (m/ft)	10	25.2	10	24.4
Other, sp			$\Sigma \square \square$	ner, specif			20.5 If flowing give rate (/m	nin/GPM)	15	25.4	15	24.4
Inside	Oper	Construction	Record - Cas Wall		epth (m®	Status of Well	Recommended pump	o depth (m/fb)	20	25.6	20	24.4
Diameter (cm/i	(Galv	anized, Fibreglass, crete, Plastic, Steel)	Thickness	From	То	Replacement Well		40 4	25	25.8	25	24.4
6'14"	Ste	el	.188″	+2	1 52 r	Recharge Well     Dewatering Well	Recommended pump (I/min/研究) 20	o rate	30	25.9	30	24.4
61/8	Ор	en Hole		52 <sup>4</sup>	′ 340 <b>′</b>	Observation and/or     Monitoring Hole	Well production (//min	(CERAP	40	26.2	40	24.4
						Alteration (Construction)	20 Disinfected?		50	26.4	50	24.4
						Abandoned, Abandoned, Insufficient Supply		2-11-21-1-1-1-1-1-1-1-1-1-1-1-1-1-1-1-1	60	26.5	60	24.4
Outside		Construction Material		1	epth (m/ft)	Abandoned, Poor Water Quality	Please provide a ma	Map of Wap of Wap below followi			ne back	<b>FN</b>
Diameter (cm/in)	(Plasti	c, Galvanized, Stee	el) Slot No.	From	То	Abandoned, other, specify			88			
		۰ <u>ــــ</u>			>	Other, specify		#54 050 M	202	DE		
						<u> </u>		m M	AIN	hEF	-	
Water foun	CONTRACTOR AND	Water D opth Kind of Wat				th (m.43) Diameter			ST	<u> </u>	<u> </u>	
		Gas Other, s		∠. ⊡Untes	From tod	To (cm/i <b>0</b> )		60FT		EMB	W,	<b>`</b>
	n/ft) 🗌	·				52 ' <u>340 ' 6'/8</u> "		×		k	pa	
		epth Kind of Wat Gas Other, s	—	Untes	ted`	52 340 870		$\bigotimes$		Ta	she wall	et.
		Well Contrac	tor and Well	Techni	Company of the Analysis of the Analysis	tion				<b>/</b> '		
		f Well Contractor rilling Co. Ltc			W	ell Contractor's Licence No 7681				/	· ·	
_		(Street Number/			M	Richmond	Comments:			210	ົ	. Fr
Province	<u> </u>	Postal Code		s E-mail	Address		LY2tt	- 100/	<u>{V} (</u>	<u>, RD</u>	~	40
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	3 2 3 4	cence No. Signatu	ure of Technicia	an and/or	- <del>Cont</del> ractor Da	ate <b>28vpm</b> itted 10 30		2 <b>020 10</b> ' Y Y M M	07 D D 6	) <b>KOM</b> os	) <b>9</b> 20	10
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Ministry of the Environment, Conservation and Parks Measurements recorded in:	Well Tan No_(Place Sticker and/or Part Below) Tag#:A308544	Well Record Regulation 903 Ontario Water Resources Act Page of

Address of Well L	ocation (Street Number/Name)	inst	Township	de.	Lot	Concess	ion 
County/District/M	Unicipality OTOW O		City/Town/Village	goode		Province Ontario	Postal Code Kialai2 Wa
UTM Coordinates NAD   8   3	Zone Easting Northing	1306	Municipal Plan and Sub	Number		Other	
Overburden an General Colour	d Bedrock Materials/Abandonmen Most Common Material	Sealing Rei	c <b>ord</b> (see instructions on the Other Materials	The second s	ra! Description		Depth ( <i>m/ft</i> )
							From To
	Raiso		1.10	$\int a S$	<u> </u>	aß	110
	1.4136	7[	wur		<u> </u>	1.00	
	grade	ÎN_	<u>qCcora</u>	lance	Wi	th	
	regulation	÷η	903	Ve	"(	Was	Santized
	Annular Space		an a	in stand of the second in the	Results of W	ell Yield Testin	/ /
Depth Set at (n From T	n/ft) Type of Sealant Us o (Material and Type		Volume Placed (m³/ft³)	After test of well yield,			vel Time Water Level
		٦	-	Other, specify	d, give reason:	( <i>min</i> ) ( <i>m/ft</i> ) Static Level	(min) (m/ft)
		+				1	1
		<b>y</b>		Pump intake set at (m/	•	2	9 2
Method o	Diarnond	Well L		Pumping rate (I/min / G.	PM)	3	4
Rotary (Conven Rotary (Reverse	tional)		pal Dewatering	Duration of pumping	nig/ /	5/ /	5
Boring Air percussion	Digging Irrigation	¥ =7	o & Air Conditioning	Final water level end or	tpumping (m/it)		10
Other, specify _	Construction Record - Casing		Status of Well	If flowing give rate (I/mi	n/GPM)	45 20	20
Diameter (Gal	Ivanized, Fibreglass, Thickness	Depth ( <i>m/ft)</i>	Water Supply	Recommended pump	depth <i>(m/ft)</i>	25	25
			Test Hole     Recharge Well	Recommended pump (I/min / GPM)	rate	30	30
			Dewatering Well     Observation and/or     Monitoring Hole	Well production (1/min /	GPM)	40	40
			Alteration (Construction)	Disinfected?		50 60	60
	Construction Record - Screen		Abandoned, Insufficient Supply	Yes No	Map of W		
Outside Diameter (cm/in) (Plas	Material tic, Galvanized, Steel)	Depth ( <i>m/ft)</i> n   To	Water Quality	Please provide a mar	below followi	ng instructions o	n the back.
	A/XA		specify		Ησιζ	>	
			Other, specify	12	Houst	~	$\succ$
	Water Details epth Kind of Water: DFresh Unter		Hole Diameter           opth (m/ft)         Diameter           To         (cm/in)	> vien (	ocation		Z
Water found at D		sted 5r	51	t 14 Peet		I	are k
(m/ft) [	Gas Other, <i>specify</i>	 sted		e l	يق ا		qu
(m/ft)	Gas Other, specify Well Contractor and Well Techr				Y .	[	••
Business Name of	of Well Contractor	1	Vell Contractor's Licence No.	05908	de	main	St
L / 1/1A	s (Street Numper/Name)	- A 1	Municipality	Comments:			
Province	Manotic T Main Postal Code Business E-main	Address	electric a	Well owner's Date P	ookogo Dellarga		1-1-1-1-1-1-1-1-1-1-1-1-1-1-1-1-1-1-1-
	. (inc. area code) Name of Well Technic	`/ <b>n</b> .	e, First Name)	information package	ackage Delivera 2 { 0 8		<b>Z</b> 319370
Well Technician's	25784 Staller		Date Submitted	Yes			IG 2 6 2021
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Ministry of the Environment and Climate Change Measurements recorded in: 🗌 Metric 🕅 Imperial

Well Tag No. (Place Sticker and/or Print Below) NO TAG FOUND

Well Record

Regulation 903 Ontario Water Resources Act Page of 5-22/50

CITY OF OTTAWA

Address of Well Location (Street Number/Name)	Township	Lot	Concess	12567	
3200 Reids Lone	Township	Lot	Condess	ION	
County/District/Municipality	City/Town/Village	3 j	Province Ontario	Posta	Code
UTM Coordinates Zone Easting Northing	Orecode Ol Municipal Plan and Sublo	towyt Number	Offer		
NAD 8 3 1 8 45 19 5 2 4999 25 4					
Overburden and Bedrock Materials/Abandonment Sealing Red General Colour Most Common Material O	cord (see instructions on the other Materials	e back of this form) General Description		Den	ith ( <i>m/<u>ft</u>)</i>
		General Description	<u> </u>	From	
			·····	····	
Annular Space		Results of We			
Depth Set at (m/ft) Type of Sealant Used	Volume Placed	After test of well yield, water was:	Draw Down	R	ecovery
From     To     (Material and Type)       O     2     Hole     Plug	( <i>m³/ft³</i> )	Clear and sand free  Other, specify	Time Water Le (min) (m/ft)	vel Time (min)	Water Level (m/ft)
		If pumping discontinued, give reason:	Static Level		
2 13 Bentonite Sturry			1	1	
		Pump intake set at (m/ft)	2	2	
		Pumping rate ( <i>Vmin / GPM</i> )	3	3	
Method of Construction Well U Cable Tool Diamond Public Comm	<u>an amang mang ang ang ang ang ang ang ang ang ang </u>	rumping rate (vmin / GPM)	4	4	
Rotary (Conventional)     Jetting     Domestic     Munici	—	Duration of pumping			
Rotary (Reverse)     Driving     Livestock     Test H       Boring     Digging     Irrigation     Coolin	ole 🛛 🖉 Monitoring g & Air Conditioning	hrs +min Final water level end of pumping (m/ft)	5	5	
Air percussion hand pull Industrial	J J		10	10	
Construction Record - Casing	Status of Well	If flowing give rate (I/min / GPM)	15	15	
Inside Open Hole OR Material Walt Depth (m/ft)	Water Supply	Recommended pump depth (m/ft)	20	20	
Diameter (Galvanized, Fibreglass, Thickness (cm/in) Concrete, Plastic, Steel) (cm/in) From To	Replacement Well     Test Hole		25	25	
2.047 pue ,154 +2 3	Recharge Well	Recommended pump rate (I/min / GPM)	30	30	
	Dewatering Well     Observation and/or	Well production (I/min / GPM)	40	40	
	Monitoring Hole		50	50	
	(Construction)	Disinfected?	60	60	
Construction Record - Screen	Insufficient Supply	Map of We	Location		
Outside Material Depth (m/ft) Diameter (Plastic, Galvanized, Steel) Slot No. From To	Water Quality	Please provide a map below followir	ng instructions o	n the back	
	specify				
2375 IOVE 10 3 13	<u>∧ of needed</u> Other, specify				
	Hole Diameter				
(m/ft) Gas Other, specify	To (cm/in)	An			
Water found at Depth Kind of Water: Fresh Untested		1 11W03-0	W-same		
( <i>m/ft</i> ) Gas Other, <i>specify</i> Water found at Depth Kind of Water: Fresh Untested		MWO3-0 ON MAP	k		
( <i>m/ft</i> ) Gas Other, <i>specify</i>		ON MAP	3		
Well Contractor and Well Technician Informa	stores as a second contraction of the rest of the second se				
Business Name of Well Contractor W Strata Drilling Group	Vell Contractor's Licence No. 7   2   4   1				
Business Address (Street Number/Name) / N	Iunicipality	Comments:	2 4		
165 Shields Court Province Postal Code Business E-mail Address	Markham	Dillon General	Centracto	<u>.</u>	
ON 43 RISIVE Wrecords @ 57	Frantasoil-com	Well owner's Date Package Delivere	d Mir	istry Use	Only
Bus Telephone No. (inc. area code) Name of Well Technician (Last Name	e, First Name)	Information package YYYYMMM	Audit No	Z30	2833
Well Technician's Licence No. Signature of Technician and/or Contractor D		Yes     Date Work Completed	]	0 0 0 0	
		DNO PA(PR/	D P Received	R 0 8 21	
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Ministry of the Environment and Climate Change Measurements recorded in: 
Metric Metric

Well Tag No. (Place Sticker and/or Print Below) NO TAG FOUND

Well Record Regulation 903 Ontario Water Resources Act

of Star.

CITY OF OTTAWA

Address of Well Location (Street Nymber/Name)	Township	Lot		ncession	367	÷.,
J200 Reits Lave County/District/Municipality	City/Town/Village		Province	T	Postal	Codo
County/District/Municipality	95900 i	Ottang	Ontar			
UTM Coordinates Zone Easting Northing NAD   8   3   18   4 5   19   4 5   49   9   9   2   7   1	Municipal Plan and Sublo	t Number	Other		l	
NAD   8   3   1   5   4   5   1   9   4   5   4   9   9   9   7   1           Overburden and Bedrock Materials/Abandonment Sealing Ref	Cord (see instructions on the	e back of this form)				
	Other Materials	General Description			Dept -rom	th ( <i>m/ft</i> )   To
Annular Space           Depth Set at (m/ft)         Type of Sealant Used	Volume Placed	Results of We After test of well yield, water was:	111-11-11-11-11-11-11-11-11-11-11-11-11	Testing v Down	R	BCOVERY
From To (Material and Type)	(m³/ft³)	Clear and sand free	Time W	Vater Level (m/ft)	Time (min)	Water Level (m/ft)
		If pumping discontinued, give reason:	Static Level		1	
2 15 Bentomite Skirly			1		1	
		Pump intake set at (m/ft)	2		2	
		Pumping rate (Vmin / GPM)	3		3	
Method of Construction         Well           Cable Tool         Diamond         Public         Common		Pumping rate (umin / GPW)	4		4	
Rotary (Conventional)	cipal 🗌 Dewatering	Duration of pumping hrs + min	5		5	
Rotary (Reverse)     Driving     Livestock     Livestock     Livestock     Digging     Irrigation     Coolin	Hole Monitoring	Final water level end of pumping (m/ft)	_		10	
Air percussion     Arrowshow     Define the specify			15		15	
Construction Record - Casing	Status of Well	If flowing give rate (Vmin / GPM)			<u> </u>	
Inside Open Hole OR Material Wall Depth (m/ti) Diameter (Galvanized, Fibreglass, Thickness	Water Supply	Recommended pump depth (m/ft)	20		20	
(cm/in) Concrete, Plastic, Steel) (cm/in) From To	Replacement Well	Recommended pump rate	25		25	
2.047 pre 154 + 2 5	Recharge Well     Dewatering Well	(I/min / GPM)	30		30	
	Observation and/or     Monitoring Hole	Well production (Vmin / GPM)	40		40	
	Alteration (Construction)	Disinfected?	50		50	
	Abandoned, Insufficient Supply	Yes No	60		60	
Construction Record - Screen Outside Depth (m/m)	Abandoned, Poor Water Quality	Map of W Please provide a map below followi			e back	
Outside         Material         Depth (m/n)           Diameter         (cm/n)         (Plastic, Galvanized, Steel)         Slot No.         From         To	Abandoned, other,					
2.375 PUR 10 5 15						
	Other, specify					
Water Details	Hole Diameter		$\sim$			
	epth ( <i>m/ft</i> ) Diameter	MWO3-		+-		
(m/ft)     Gas     Other, specify     From       Water found at Depth     Kind of Water:     Fresh     Untested			x n			
(m/ft) Gas Other, specify		1 ON MIT				
Water found at Depth Kind of Water: Fresh Untested ( <i>m/ft</i> ) Gas Other, <i>specify</i>						
Well Contractor and Well Technician Inform	ation					
Business Name of Well Contractor Strata Dr.illing Group	Well Contractor's Licence No.					
Business Address (Street Number/Name)	<u> </u>	Comments;	)			*****
165 Shields Court	Markham	Dillon General	l Gr	ntroide	n N	
Province Postal Code Business E-mail Address <i>N</i> (3 R 8 V) brecords of sterts	usql.com	Well owner's Date Package Deliver				e Only
Bus. Telephone No. (inc. area code) Name of Well Technician (Last Nam		information package YYYYWMM				2886
9059407919595 Beatty Brian Well Technician's Licence No. Signature of Technician and/or Contractor	Date Submitted	Date Work Completed		MAR O		
3 6 1 6	YYYYMMDD		8 J B	Received		
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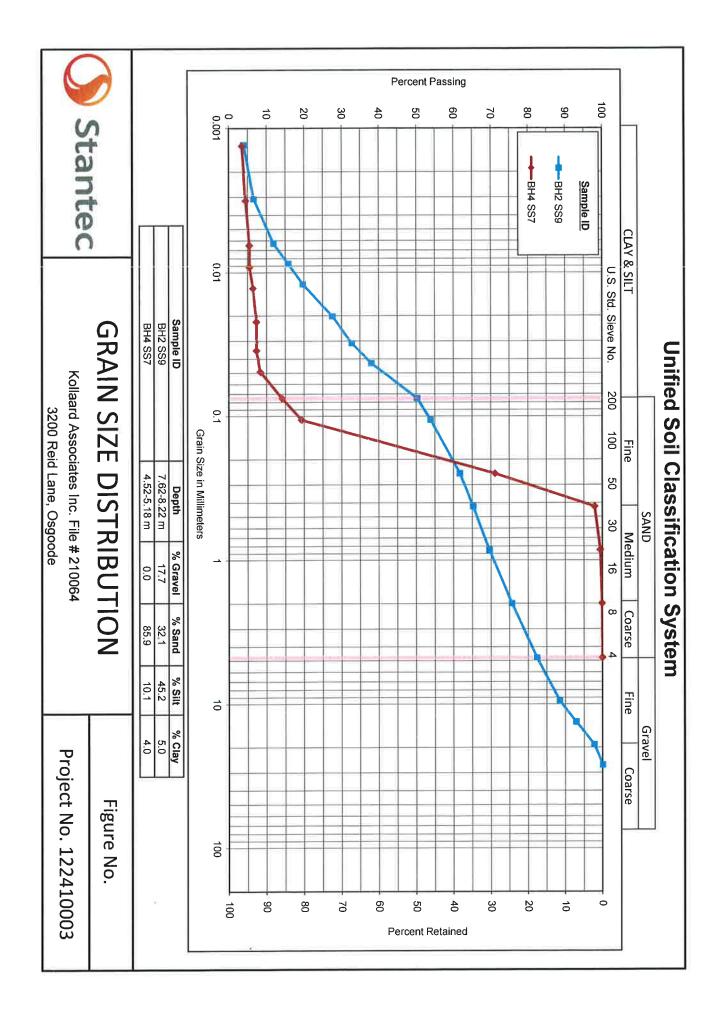
# ATTACHMENT C

### GRAIN SIZE ANALYSES OF REPRESENTATIVE SOIL SAMPLES

### **Grain Size Distribution Analysis** Kollaard Associates Engineers SAND 100 90 80 70 PERCENT PASSING 60 50 40 30 20 10 0 0.1 10 0.01 1 100 **GRAIN SIZE** (millimetres) SIEVE SIZE (mm) 0.300 76.2 53 26.5 19.0 16 13..2 9.5 4.75 2.36 1.180 0.600 0.15 0.075 SAMPLE PASSING 100.0 99.8 99.3 89.2 21.4 5.8 3.7 CLIENT: Crestview Innovations Inc. PROJECT: 3200 Reids Lane,Ossgoode OUR REF.: 210064 TYPE OF MATERIAL: Sand INTENDED USE: Residential DATE SAMPLED: February 3, 2021 DATE TESTED: February 11, 2021 SOURCE: BH1 - 0.76-1.37 SAMPLE NO: SS2 REMARKS: Kollaard Associates Engineers Issued by: Box 189, 210 Prescott Street Dean Tataryn, B.E.S., EP Kemptville, Ontario K0G 1J0 Date: February 12, 2021 (613) 860-0923, FAX: (613) 258-0475

### **Grain Size Distribution Analysis** Kollaard Associates Engineers SAND 100 90 80 70 PERCENT PASSING 60 50 40 30 20 10 0 0.1 10 0.01 1 100 **GRAIN SIZE** (millimetres) SIEVE SIZE (mm) 0.300 76.2 53 26.5 19.0 16 13..2 9.5 4.75 2.36 1.180 0.600 0.15 0.075 SAMPLE PASSING 100.0 99.0 83.7 19.0 7.1 5.2 CLIENT: Crestview Innovations Inc. PROJECT: 3200 Reids Lane,Ossgoode OUR REF.: 210064 TYPE OF MATERIAL: Sand INTENDED USE: Residential DATE SAMPLED: February 3, 2021 DATE TESTED: February 11, 2021 SOURCE: BH3 - 0.76 - 1.37 SAMPLE NO: SS2 REMARKS: Kollaard Associates Engineers Issued by: Dean Tartaryn, B.E.S. EP Box 189, 210 Prescott Street Kemptville, Ontario K0G 1J0 Date: February 12, 2021 (613) 860-0923, FAX: (613) 258-0475

### **Grain Size Distribution Analysis** Kollaard Associates Engineers SAND 100 90 80 70 PERCENT PASSING 60 50 40 30 20 10 0 0.1 10 0.01 1 100 **GRAIN SIZE** (millimetres) SIEVE SIZE (mm) 0.600 0.300 76.2 53 26.5 19.0 16 13..2 9.5 4.75 2.36 1.180 0.15 0.075 SAMPLE PASSING 100.0 99.9 93.8 17.5 4.7 3.4 CLIENT: Crestview Innovations Inc. PROJECT: 3200 Reids Lane,Ossgoode OUR REF.: 210064 TYPE OF MATERIAL: Sand INTENDED USE: Residential DATE SAMPLED: February 3, 2021 DATE TESTED: February 11, 2021 SOURCE: BH5 - 0.76 - 1.37 SAMPLE NO: SS2 REMARKS: Kollaard Associates Engineers Issued by: Box 189, 210 Prescott Street Dean Tataryn, B.E.S. Kemptville, Ontario K0G 1J0 Date: February 12, 2021 (613) 860-0923, FAX: (613) 258-0475





Source: Material Type: Project: Client:

> Kollaard Associates Inc. File # 210064 3200 Reid Lane, Osgoode

Sampled By: Date Sampled:

Kollaard Associates Inc.

February 4, 2021 Denis Rodriguez

PROJECT DETAILS

Project No .:

122410003 LS702

Test Method:

Sample No.:

Sample Depth

7.62-8.22 m 6SS BH2 Soil

Date Tested:

February 15, 2021

Tested By:

# **Particle-Size Analysis of Soils**

# AASHTO T88 LS702

	Demont Densing Conneted (0/)
64.1	Percent Passing No. 200 Sieve (%)
)) 20.26	Sample Weight after Hydrometer and Wash (g)
1) 56.48	Oven Dry Mass In Hydrometer Analysis (g)
1. 1. S. 1	WASH TEST DATA

0.26	Percent Loss in Sieve (%)
1059.20	Sample Weight After Sieve (g)
1062.00	Sample Weight Before Sieve (g)
	PERCENT LOSS IN SIEVE

Percent Loss in Sieve (%)	Percent Loss in Sieve (%)	0.26
SIEV	SIEVE ANALYSIS	SIS
Sieve Size mm	Cum. Wt. Retained	Percent Passing
75.0		100.0
63.0		100.0
53.0		100.0
37.5		100.0
26.5	0.0	100.0
19.0	25.1	97.6
13.2	76.8	92.8
9.5	122,9	88.4
4.75	187.6	82.3
2.00	258.9	75.6
Total (C + F) <sup>1</sup>	1059.20	
0.850	4,50	69.60
0.425	7.77	65.22
0.250	10.43	61.66
0.106	16.24	53.88
0.075	18.98	50.21

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-Lab Stand	1200
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29.0         37.99         10.55404         9.4853         0.013126         0.04200           25.0         32.75         11.25404         9.84835         0.013126         0.021312           21.0         27.51         11.87404         9.84835         0.013126         0.02023           15.0         19.65         12.80404         9.84835         0.013126         0.02023           12.0         15.72         13.26904         9.84835         0.013126         0.00873           9.0         15.72         13.26904         9.84835         0.013126         0.00873           9.0         11.79         13.73404         9.84835         0.013126         0.00873           5.0         6.5492         14.35404         9.84835         0.013126         0.00628           3.0         3.9295         14.86404         9.61570         0.012970         0.003113	21.0 21.0 22.0 22.0	122.0     7.0       19.0     7.0       16.0     7.0       10.0     7.0       10.0     7.0	30 1 60 1 250 1 1440 1	10:03 AM 10:33 AM 1:43 PM 9:33 AM	15-Feb-21 16-Feb-21
37.99         11053444         9.84935         0.013126           32.75         11.25404         9.84835         0.013126           27.51         11.87404         9.84835         0.013126           19.65         12.80404         9.84835         0.013126           15.72         13.26904         9.84835         0.013126           11.79         13.73404         9.84835         0.013126           6.5492         14.35404         9.84835         0.013126           6.5492         14.35404         9.61570         0.012970	21.0 21.0 22.0			10:03 AM 10:33 AM 1:43 PM	15-Feb-21
37.99         10.5444         9.84335         0.013126           32.75         11.25404         9.84835         0.013126           27.51         11.87404         9.84835         0.013126           19.65         12.80404         9.84835         0.013126           15.72         13.26904         9.84835         0.013126           11.79         13.73404         9.84835         0.013126           11.79         13.73404         9.84835         0.013126	21.0			10:03 AM 10:33 AM	
37.99         1025404         9.84835         0.013126           32.75         11.25404         9.84835         0.013126           27.51         11.87404         9.84835         0.013126           19.65         12.80404         9.84835         0.013126           15.72         13.26904         9.84835         0.013126	21.0			10:03 AM	15-Feb-21
37.99         10.53404         9.84835         0.013120           32.75         11.25404         9.84835         0.013126           27.51         11.87404         9.84835         0.013126           19.65         12.80404         9.84835         0.013126					15-Feb-21
37.99         10.53404         9.84835         0.013126           32.75         11.25404         9.84835         0.013126           27.51         11.87404         9.84835         0.013126	21.0	I	15 2	9:48 AM	15-Feb-21
37.99 10.55404 3.84535 0.013126 32.75 11.25404 9.84835 0.013126	21.0	28.0 7.0	5 2	9:38 AM	15-Feb-21
37.99 10.63404 9.84633 0.013120	21.0	32.0 7.0	2 3	9:35 AM	15-Feb-21
	21.0	36.0 7.0	1 36	9:34 AM	15-Feb-21
	ĉ	1 g/L	Mins g/L		
	T, R	Divisions Divisions	T Divis	Time	Date
Corrected Reading   Percent Passing   Urameter	i emperature Corre	s c	Elapsed Time H <sub>s</sub>		

Note 1: (C + F) = Coarse + Fine

PAN

20.26

Soil Classification Specific Gravity (G<sub>s</sub>) Sg. Correction Factor (α)

Mass of Dispersing Agent/Litre

0.978 2.750

40

Liquid Limit (LL)

SOIL INFORMATION

Plasticity Index (PI)

Oven Dried Mass (W <sub>o</sub> ), (g)
Air Dried Mass (W <sub>a</sub> ), (g) 101.21
Hygroscopic Corr. Factor (F=W <sub>o</sub> /W <sub>n</sub> ) 0.9983
Air Dried Mass in Analysis (M <sub>a</sub> ), (g)
Oven Dried Mass in Analysis (M <sub>n</sub> ), (g)
Percent Passing 2.0 mm Sieve (P <sub>10</sub> ), (%)
Sample Represented (W), (g)

CALCULATION OF DRY SOIL MASS	ASS
ren Dried Mass (W <sub>o</sub> ), (g)	101.04
Dried Mass (W <sub>a</sub> ), (g)	101.21
groscopic Corr. Factor (F=Wo/Wa)	0.9983
r Dried Mass in Analysis (M <sub>a</sub> ), (g)	56.58
ven Dried Mass in Analysis (M <sub>o</sub> ), (g)	56.48
ercent Passing 2.0 mm Sieve (P10), (%)	75.62
ample Represented (W), (g)	74.69

53.0	6.48
63.0	6.58
75.0	.9983
	01.21
Sieve Size	01.04
	1 212
Perce	
Sample W	

START TIME 9:33 AM

HYDROMETER DETAILS	
Volume of Bulb (V <sub>B</sub> ), (cm <sup>3</sup> )	63.0
Length of Bulb (L <sub>2</sub> ), (cm)	14.47
Length from '0' Reading to Top of Bulb (L1), (cm)	10,29
Scale Dimension (h <sub>s</sub> ), (cm/Div)	0.155
Cross-Sectional Area of Cylinder (A), (cm <sup>2</sup> )	27.25
Meniscus Correction (H <sub>m</sub> ), (g/L)	1.0

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	ıalysis
	is of
LS70;	Soils
N	-

**AASHTO T88** 

12.25	Percent Passing Corrected (%)	obcine: 3 2024
12.3	Percent Passing No. 200 Sieve (%)	laard Assoclates Inc.
87.02	Sample Weight after Hydrometer and Wash (g)	LS702
99.19	Oven Dry Mass In Hydrometer Analysis (g)	122410003
	WASH TEST DATA	

0.02	Percent Loss in Sieve (%)
623.40	Sample Weight After Sieve (g)
623.50	Sample Weight Before Sieve (g)
	PERCENT LOSS IN SIEVE

PAN	0.075	0.106	0.250	0.425	0.850	Total (C + F) <sup>1</sup>	2.00	4.75	9.5	13.2	19.0	26.5	37.5	53.0	63.0	75.0	Sleve Size mm	SIEVE	Percent Los	Sample Weight After Sieve (g)
86.94	85.18	80.00	28.60	1.99	0.44	623.40	0.7	0.0									Cum. Wt. Retalned	<b>IE ANALYSIS</b>	Percent Loss in Sieve (%)	After Sieve (g)
	14.11	19.32	71.09	97.88	99,44	WE ST	99.9	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	Percent Passing	SIS	0.02	623.40

V:101216\active\laboratory\_standing\_offers\2021 Laboratory Standing Offers\122410003 Kollaard Associates InclFebruary 11\_Hydrometer\_Limit\_MC\_Kollaard# 210064\Hydrometer-Lab Standing Offers.xlsx

		State State		HYD	HYDROMETER ANALYSIS	NALYSIS	相よいななど		2 2 E E -		and a second
		Elapsed Time	ч	ŗ	Temperature	Corrected Reading	Percent Passing			100	Diameter
Date	Time	-1	Divisions	Divisions	ŗ	R=H <sub>s</sub> -H <sub>c</sub>	P	-	ц	×	0
		Mins	g/L	g/L	റ്	g/L	%	am	Poise		mm
15-Feb-21	9:41 AM		12.0	3.5	22.0	8.5	8.37	14.35404	9.61570	0.012970	0.04914
15-Feb-21	9:42 AM	2	11.0	3.5	22.0	7,5	7.39	14.50904	9.61570	0.012970	0.03493
15-Feb-21	9:45 AM	υ	11.0	3.5	22.0	7.5	7.39	14.50904	9.61570	0.012970	0.02209
15-Feb-21	9:55 AM	15	10.0	3,5	21.5	6.5	6.40	14.66404	9.73081	0.013047	0.01290
15-Feb-21	10:10 AM	30	9.0	3,5	21.5	5,5	5.42	14.81904	9.73081	0.013047	0.00917
15-Feb-21	10:40 AM	8	9.0	3.5	21.5	5.5	5.42	14.81904	9.73081	0.013047	0.00648
15-Feb-21	1:50 PM	250	8.0	3,5	22	4.5	4.43	14,97404	9,61570	0.012970	0.00317
16-Feb-21	9:40 AM	1440	7.0	3,5	22	3,5	3.45	15.12904	9.61570	0.012970	0.00133
Remarks:							Reviewed By:	Brian	Press	54	
							Date:	Fring	NOXY 23	231244	
											) R

START TIME

9:40 AM

Cross-Sectional Area of Cylinder (A), (cm<sup>2</sup>)

Meniscus Correction (H<sub>m</sub>), (g/L)

Scale Dimension (h<sub>s</sub>), (cm/Div)

0.155 10 29 14.47

27.25

10

Length from '0' Reading to Top of Bulb (L1), (cm)

Length of Bulb (L2), (cm) Volume of Bulb (V<sub>B</sub>), (cm<sup>3</sup>)

CALCULATION OF DRY SOIL MASS	SS
Oven Dried Mass (W <sub>o</sub> ), (g)	80_13
Air Dried Mass (Wa), (g)	80.22
Hygroscopic Corr. Factor (F=Wo/Wa)	0.9989
Air Dried Mass in Analysis (Ma), (g)	99.30
Oven Dried Mass in Analysis (M <sub>o</sub> ), (g)	99.19
Percent Passing 2.0 mm Sieve (P10), (%)	99.89
Sample Represented (W), (g)	99.30

Specific Gravity (G<sub>s</sub>)

Soil Classification Plasticity Index (PI) Liquid Limit (LL)

SOIL INFORMATION

Mass of Dispersing Agent/Litre Sg. Correction Factor (a)

> 0.978 2 750

24

g

HYDROMETER DETAILS

63.0

CALCULATION OF DRY SOIL MASS	NASS
ven Dried Mass (W <sub>o</sub> ), (g)	80_13
ir Dried Mass (W <sub>a</sub> ), (g)	80.22
ygroscopic Corr. Factor (F=W₀/W₃)	0.9989
ir Dried Mass in Analysis (M <sub>a</sub> ), (g)	99.30
ven Dried Mass in Analysis (M <sub>o</sub> ), (g)	99.19
ercent Passing 2.0 mm Sieve (P10). (%)	99.89
ample Represented (W), (g)	99.30

Date Tested: Febr	ested By: Den	Date Sampled: Feb	Sampled By: Kollaard
February 15, 2021	Denis Rodriguez	February 3, 2021	Kollaard Associates Inc.

Source:

Sample Depth Sample No .:

4.52-5.18 m

BH4 SS7 Soil Project: Client:

Kollaard Associates Inc. File # 210064 3200 Reid Lane, Osgoode

PROJECT DETAILS

Project No.: Test Method:

Material Type:

CALCULATION OF DRY SOIL MASS	ASS
Oven Dried Mass (W <sub>a</sub> ), (g)	80_13
Air Dried Mass (W <sub>a</sub> ), (g)	80.22
Hygroscopic Corr. Factor (F=Wo/Wa)	0.9989
Air Dried Mass in Analysis (M <sub>a</sub> ), (g)	99.30
Oven Dried Mass in Analysis (M <sub>o</sub> ), (g)	99.19
Percent Passing 2.0 mm Sieve (P10), (%)	99.89
Sample Represented (W), (g)	99.30



# ATTACHMENT D

### RESULTS OF LABORATORY NITROGEN TESTING OF RECEIVING AQUIFER SAMPLES

### **Certificate of Analysis**

# **Environment Testing**

Client: Attention: PO#:	Kollaard Associates Inc. 210 Prescott St., Box 189 Kemptville, ON K0G 1J0 Ms. Colleen Vermeersch		Report Number: Date Submitted: Date Reported: Project: COC #:	1947810 2021-02-12 2021-02-18 210064 211512	
Invoice to:	Kollaard Associates Inc.	Page 1 of 3			

### Dear Colleen Vermeersch:

Please find attached the analytical results for your samples. If you have any questions regarding this report, please do not hesitate to call (613-727-5692).

**Report Comments:** 

🛟 eurofins

APPROVAL:

Addrine Thomas, Inorganics Supervisor

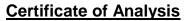
All analysis is completed at Eurofins Environment Testing Canada Inc. (Ottawa, Ontario) unless otherwise indicated.

Eurofins Environment Testing Canada Inc. (Ottawa, Ontario) is accredited by CALA, Canadian Association for Laboratory Accreditation to ISO/IEC 17025 for tests which appear on the scope of accreditation. The scope is available at: <u>http://www.cala.ca/scopes/2602.pdf</u>.

Eurofins Environment Testing Canada Inc. (Ottawa, Ontario) is licensed by the Ontario Ministry of the Environment, Conservation, and Parks (MECP) for specific tests in drinking water (license #2318). A copy of the license is available upon request.

Eurofins Environment Testing Canada Inc. (Ottawa, Ontario) is accredited by the Ontario Ministry of Agriculture, Food, and Rural Affairs for specific tests in agricultural soils.

Please note: Field data, where presented on the report, has been provided by the client and is presented for informational purposes only. Guideline values listed on this report are provided for ease of use (informational purposes) only. Eurofins recommends consulting the official provincial or federal guideline as required. Unless otherwise stated, measurement uncertainty is not taken into account when determining guideline or regulatory exceedances.



Client:	Kollaard Associates Inc.	Report Number:	1947810
	210 Prescott St., Box 189	Date Submitted:	2021-02-12
	Kemptville, ON	Date Reported:	2021-02-18
	KOG 1J0	Project:	210064
Attention:	Ms. Colleen Vermeersch	COC #:	211512
PO#:			
Invoice to:	Kollaard Associates Inc.		

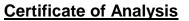
				Lab I.D. Sample Matrix Sample Type Sampling Date Sample I.D.	1542143 GW 2021-02-12 MW2	1542144 GW 2021-02-12 MW4	1542145 GW 2021-02-12 MW6
Group	Analyte	MRL	Units	Guideline			
Nutrients	N-NH3	0.010	mg/L		<0.010	<0.010	0.031
-	Total Kjeldahl Nitrogen	0.100	mg/L		0.393	0.331	0.245
Others	N-NO2	0.10	mg/L		0.17	<0.10	<0.10
F	N-NO3	0.10	mg/L		5.80	<0.10	<0.10

Guideline =

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\* = Guideline Exceedence

Results relate only to the parameters tested on the samples submitted. Methods references and/or additional QA/QC information available on request.



Client:	Kollaard Associates Inc.
	210 Prescott St., Box 189
	Kemptville, ON
	K0G 1J0
Attention:	Ms. Colleen Vermeersch
PO#:	
Invoice to:	Kollaard Associates Inc.

🛟 eurofins

1947810
2021-02-12
2021-02-18
210064
211512

### QC Summary

An	alyte	Blank	QC % Rec	QC Limits
Run No 396258 Method C SM4500-NC	Analysis/Extraction Date 20 03-F	)21-02-16 <b>Ana</b>	alyst SKH	
N-NO2		<0.10 mg/L	96	
N-NO3		<0.10 mg/L	103	
Run No 396301 Method EPA 350.1	Analysis/Extraction Date 20	)21-02-17 Ana	alyst SKH	
N-NH3		<0.010 mg/L	100	80-120
Run No 396312 Method EPA 351.2	Analysis/Extraction Date 20	)21-02-17 <b>Ana</b>	alyst SKH	
Total Kjeldahl Nitr	ogen	<0.100 mg/L	112	70-130

Guideline =

\* = Guideline Exceedence

Results relate only to the parameters tested on the samples submitted. Methods references and/or additional QA/QC information available on request.



146 Colonnade Rd, Unit 8, Ottawa, ON K2E 7Y1 (613) 727-5692

### **OFFICIAL CERTIFICATE OF ANALYSIS : 3769872**

### **WORK REQUEST : 100257032** Report Date : 2023-11-27

Kollaard Associates Inc.	Reception Date : Proiect :	2023-11-20 210064
210 Prescott St., Box 189 Kemptville, ON	Sampler :	NA
K0G 1J0 Attention : Colleen Vermeersch	PO Number : Temperature :	Not Applicable 8 °C

Analysis	Quantity	External Method
Ammonia, Total (Water, Colorimetry)	8	Modified from EPA 350.1
Nitrate (Water, Colorimetry)	8	Modified from SM 4500-NO3-F
Nitrite (Water, Colorimetry)	8	Modified from SM 4500-NO3-F
Total Kjeldahl Nitrogen (Water, Colorimetry)	8	Modified from EPA 351.2

### Criteria :

A: Ontario Regulation 169/03 (Groundwater, Non-Potable)

### Sample status upon receipt :

7379224 7379225 7379226 7379227 7379228 7379229 7379230 7379231 Compliant

### **Certificate Comments :**

7379231

Sediment not included in TKN analysis.

### Notes :

- All analysis is completed at Eurofins Environment Testing Canada Inc. (Ottawa, Ontario) unless otherwise stated.
- Eurofins Environment Testing Canada Inc. is accredited by CALA, Canadian Association for Laboratory Accreditation to ISO/IEC 17025 for tests which appear on the scope of accreditation. The scope is available at https://directory.cala.ca/
- Please note: Field data, where presented on the report, has been provided by the client and is presented for informational purposes only. Guideline or regulatory limits listed on this report are provided for ease of use (informational purposes) only. Eurofins recommends consulting the official guideline or regulation as required. Unless otherwise stated, measurement uncertainty is not taken into account when determining guideline or regulatory exceedances.

Legend :		
RL : Reporting limit QC : Reference material (QC)	N/A : Not applicable 1 : Results in annex	<ul> <li>* : Analysis conducted by external subcontracting</li> <li>^ : Analysis not accredited</li> </ul>

www.eurofins.ca

Page 1 of 4

3769872-V1

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146 Colonnade Rd, Unit 8, Ottawa, ON K2E 7Y1 (613) 727-5692

### **OFFICIAL CERTIFICATE OF ANALYSIS - EXCEEDENCE SUMMARY**

Client : Kollaard Associates Inc.

	Project: 210	064				Rece	eption Date :	2023-11-20	)
	Eurofins	Client Sample			11	Exceeded Criteria			
Sample No	Identification	Analyte	Result	Units	Α	В	С	1	
	Nitrate (Water,	Colorimetry)							
	7379224	BH1	Nitrate (as Nitrogen)	18.8	mg/L	10			1



146 Colonnade Rd, Unit 8, Ottawa, ON K2E 7Y1 (613) 727-5692

### **OFFICIAL CERTIFICATE OF ANALYSIS - RESULTS**

Client : Kollaard Associates Inc. Project : 210064

				Eurofins S	ample No :	7379224	7379225	7379226	7379227	7379228
			Matrix :			Ground Water	Ground Water	Ground Water	Ground Water	Ground Water
				Sam	pling Date :	2023-11-20	2023-11-20	2023-11-20	2023-11-20	2023-11-20
			Client	Sample Ide	entification :	BH1	BH3	BH5	BH7	BH8
Nutrients				Criteria						
	RL	Unit	A	В	С					
Ammonia, Total (Water, Colorimetry)										
Ammonia (Total, as Nitrogen)	0.02	mg/L				<0.020	<0.020	0.047	0.023	1.11
Nitrate (Water, Colorimetry)										
Nitrate (as Nitrogen)	0.1	mg/L	10			18.8	0.28	<0.10	<0.10	<0.10
Nitrite (Water, Colorimetry)										
Nitrite (as Nitrogen)	0.1	mg/L	1			0.19	<0.10	<0.10	<0.10	<0.10
Total Kjeldahl Nitrogen (Water, Colorimetry)										
Total Kjeldahl Nitrogen	0.1	mg/L				0.674	0.374	0.494	0.703	1.46
				Eurofins S	ample No :	7379229	7379230	7379231		
					Matrix :	Ground	Ground	Ground		
						Water	Water	Water		
					pling Date :	2023-11-20	2023-11-20	2023-11-20		
<b>N</b> 4 5 - 4			Client	•	entification :	BH9	BH10	BH11		
Nutrients	RL	Unit	A	Criteria В	С					
		Unit								
Ammonia, Total (Water, Colorimetry)	0.00	mg/L				0.065	0.032	0.208		
Ammonia (Total, as Nitrogen)	0.02	mg/∟				0.005	0.032	0.208		
Nitrate (Water, Colorimetry)	0.4	mg/L	10			<0.10	<0.10	<0.10		
Nitrate (as Nitrogen)	0.1	my/∟	10			<b>NU. IU</b>	<b>NO. 10</b>	<b>NU. 10</b>		
Nitrite (Water, Colorimetry)	0.1	mg/L	1			<0.10	<0.10	<0.10		
Nitrite (as Nitrogen)	0.1	my/∟	1			NU. IU	NU. 10	NU. 10		
Total Kieldahl Nitrogen (Water, Colorimetry)		mg/L				0 502	0.415	0.569		
Total Kjeldahl Nitrogen	0.1	mg/L				0.503	0.415	0.009		

Approved by :

Raheleh Zafari, Ottawa, Environmental Chemist, PhD

www.eurofins.ca

Page 3 of 4

3769872-V1

Reception Date: 2023-11-20

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### **OFFICIAL CERTIFICATE OF ANALYSIS - QUALITY CONTROL**

				<b>D</b> . 1	QC	2	Matrix S	Spike	Dupli	cate
Parameter		Unit	RL	Blank	Recovery %	Range %	Recovery %	Range %	RPD %	Range %
Ammonia, Total (Water, Colori	metry)									
	Metho	od : Ammonia (N	Nater, Colorir	netry). Interna	l method: OTT-	I-NUT-WI46	201.			
Ammonia (Total, as Nitrogen)		mg/L	0.02	<0.020	101	80-120	115	80-120	-	0-20
Associated	Samples : 7379224	, 7379225, 737	9226, 737922	27, 7379228, 7	379229, 737923	30, 7379231		A	Prep Date: analysis Date:	2023-11-24 2023-11-24
Nitrate (Water, Colorimetry)										
	Method .	Nitrates/Nitrate	es (Water, Co	lorimetry). Inte	rnal method: O	TT-I-NUT-WI	46199.			
Nitrate (as Nitrogen)		mg/L	0.1	<0.10	106	80-120				
Associated	Samples : 7379224	, 7379225, 737	9226, 737922	27, 7379228, 7	379229, 737923	30, 7379231		A	Prep Date: analysis Date:	2023-11-22 2023-11-22
Nitrite (Water, Colorimetry)										
	Method .	Nitrates/Nitrate	es (Water, Co	lorimetry). Inte	rnal method: O	TT-I-NUT-WI	46199.			
Nitrite (as Nitrogen)		mg/L	0.1	<0.10	93	80-120				
Associated	Samples : 7379224	, 7379225, 737	9226, 737922	27, 7379228, 7	379229, 737923	30, 7379231		A	Prep Date: Analysis Date:	2023-11-22 2023-11-22
Total Kjeldahl Nitrogen (Water	, Colorimetry)									
	Me	ethod : TKN (Wa	ater, colorime	try). Internal m	ethod: OTT-I-N	UT-WI46201	-			
Total Kjeldahl Nitrogen		mg/L	0.1	<0.100	104	70-130	102	70-130	11	0-20

Where RPD % is reported as "-" the calculation is not available because one or both of the duplicates is within 5 times the RL.



146 Colonnade Rd, Unit 8, Ottawa, ON K2E 7Y1 (613) 727-5692

### **OFFICIAL CERTIFICATE OF ANALYSIS : 3834193**

### WORK REQUEST : 100268463 Report Date : 2024-03-01

Kollaard Associates Inc.	Reception Date :	2024-02-28
210 Prescott St., Box 189	Project :	210064
Kemptville, ON	Sampler :	NA
K0G 1J0	PO Number :	Not Applicable
Attention : Colleen Vermeersch	Temperature :	11 °C

Analysis	Quantity	External Method
Ammonia, Total (Water, Colorimetry)	7	Modified from EPA 350.1
Nitrate (Water, Colorimetry)	7	Modified from SM 4500-NO3-F
Nitrite (Water, Colorimetry)	7	Modified from SM 4500-NO3-F
Total Kjeldahl Nitrogen (Water, Colorimetry)	7	Modified from EPA 351.2

### Criteria :

A: Ontario Regulation 169/03 (Groundwater, Non-Potable)

### Sample status upon receipt :

7543456 7543457 7543458 7543459 7543460 7543461 7543462 Compliant

### Certificate Comments :

7543456 7543460 7543461 Sediment not included in TKN analysis.

### Notes :

- All analysis is completed at Eurofins Environment Testing Canada Inc. (Ottawa, Ontario) unless otherwise stated.

- Eurofins Environment Testing Canada Inc. is accredited by CALA, Canadian Association for Laboratory Accreditation to ISO/IEC 17025 for tests which appear on the scope of accreditation. The scope is available at https://directory.cala.ca/
- Please note: Field data, where presented on the report, has been provided by the client and is presented for informational purposes only. Guideline or regulatory limits listed on this report are provided for ease of use (informational purposes) only. Eurofins recommends consulting the official guideline or regulation as required. Unless otherwise stated, measurement uncertainty is not taken into account when determining guideline or regulatory exceedances.

Legend :		
RL : Reporting limit QC : Reference material (QC)	N/A : Not applicable 1 : Results in annex	* : Analysis conducted by external subcontracting ^ : Analysis not accredited

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3834193-V1

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### **OFFICIAL CERTIFICATE OF ANALYSIS - EXCEEDENCE SUMMARY**

Client : Kollaard Associates Inc.

	Project : 210	064				Rece	ption Date :	2024-02-28	;
	Eurofins	Client Sample	A	Desult	11-1-14-1	Exceeded Criteria			
Sample No	Identification	Analyte	Result	Units	Α	В	С	1	
	Nitrate (Water,	Colorimetry)							
ſ	7543456	BH1	Nitrate (as Nitrogen)	15.6	mg/L	10			1



146 Colonnade Rd, Unit 8, Ottawa, ON K2E 7Y1 (613) 727-5692

### **OFFICIAL CERTIFICATE OF ANALYSIS - RESULTS**

Client : Kollaard Associates Inc. Project : 210064

				Eurofins S	Sample No :	7543456	7543457	7543458	7543459	7543460
			Matrix :				Ground Water	Ground Water	Ground Water	Ground Water
				Sam	pling Date :	2024-02-27	2024-02-28	2024-02-27	2024-02-28	2024-02-28
			Client	Sample Ide	entification :	BH1	BH5	BH7	BH8	BH9
Nutrients				Criteria						
	RL	Unit	A	В	С					
Ammonia, Total (Water, Colorimetry)										
Ammonia (Total, as Nitrogen)	0.02	mg/L				<0.020	<0.020	<0.020	0.037	0.087
Nitrate (Water, Colorimetry)										
Nitrate (as Nitrogen)	0.1	mg/L	10			15.6	0.34	<0.10	<0.10	0.22
Nitrite (Water, Colorimetry)										
Nitrite (as Nitrogen)	0.1	mg/L	1			0.12	<0.10	<0.10	<0.10	<0.10
Total Kjeldahl Nitrogen (Water, Colorimetry)										
Total Kjeldahl Nitrogen	0.1	mg/L				0.500	0.310	0.676	0.229	0.524
				Eurofins S	Sample No :	7543461	7543462			
					Matrix :	Ground Water	Ground Water			
				Sam	pling Date :	2024-02-28	2024-02-28			
			Client	Sample Ide	entification :	BH10	BH11			
Nutrients				Criteria						
	RL	Unit	Α	в	С					
Ammonia, Total (Water, Colorimetry)										
Ammonia (Total, as Nitrogen)	0.02	mg/L				0.224	0.155			
Nitrate (Water, Colorimetry)										
Nitrate (as Nitrogen)	0.1	mg/L	10			<0.10	<0.10			
Nitrite (Water, Colorimetry)										
Nitrite (as Nitrogen)	0.1	mg/L	1			<0.10	<0.10			
Total Kieldahl Nitrogen (Water, Colorimetry)										
Total Kjeldahl Nitrogen	0.1	mg/L				0.806	0.442			

Approved by :

Emma-Dawn Ferguson, Enviromental Chemist

3834193-V1

Reception Date: 2024-02-28

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### **OFFICIAL CERTIFICATE OF ANALYSIS - QUALITY CONTROL**

_				Q	2	Matrix S	Spike	Dupli	icate
Parameter	Unit	RL	Blank	Recovery %	Range %	Recovery %	Range %	RPD %	Range %
Ammonia, Total (Water, Colorimetry)									
	Method : Ammonia (V	Vater, Colori	imetry). Interna	l method: OTT-	I-NUT-WI46	201.			
Ammonia (Total, as Nitrogen)	mg/L	0.02	<0.020	103	80-120	99	80-120	1	0-20
Associated Sar	nples : 7543456, 7543457	, 7543458, 7	7543459, 75434	60, 7543461, 7	543462		Α	Prep Date: Analysis Date:	2024-02-29 2024-02-29
Nitrate (Water, Colorimetry)									
	Method : Nitrates/Nitrate	s (Water, Co	olorimetry). Inte	rnal method: O	TT-I-NUT-W	46199.			
Nitrate (as Nitrogen)	mg/L	0.1	<0.10	100	80-120			1	0-20
Associated Sar	mples : 7543456, 7543457	, 7543458, 7	7543459, 75434	60, 7543461, 7	543462		A	Prep Date: Analysis Date:	2024-03-0 <sup>2</sup> 2024-03-0 <sup>2</sup>
Nitrite (Water, Colorimetry)									
	Method : Nitrates/Nitrate	s (Water, Co	olorimetry). Inte	rnal method: O	TT-I-NUT-W	46199.			
Nitrite (as Nitrogen)	mg/L	0.1	<0.10	101	80-120	104	80-120	-	0-20
Associated Sar	mples : 7543456, 7543457	, 7543458, 7	7543459, 75434	60, 7543461, 7	543462		A	Prep Date: Analysis Date:	2024-03-0 <sup>2</sup> 2024-03-0 <sup>2</sup>
Total Kjeldahl Nitrogen (Water, Colorir	netry)								
	Method : TKN (Wa	ter, colorime	etry). Internal m	ethod: OTT-I-N	UT-WI46201				
Total Kjeldahl Nitrogen	mg/L	0.1	<0.100	124	70-130	109	70-130	-	0-20

Where RPD % is reported as "-" the calculation is not available because one or both of the duplicates is within 5 times the RL.

### **Certificate of Analysis**

# **Environment Testing**

		-			
Client:	Kollaard Associates Inc.		Report Number:	1993661	
	210 Prescott St., Box 189		Date Submitted:	2023-02-10	
	Kemptville, ON		Date Reported:	2023-02-14	
	K0G 1J0		Project:	210064	
Attention:	Ms. Colleen Vermeersch		COC #:	905438	
PO#:					
Invoice to:	Kollaard Associates Inc.	Page 1 of 3			
PO#:		Page 1 of 3			

### Dear Colleen Vermeersch:

Please find attached the analytical results for your samples. If you have any questions regarding this report, please do not hesitate to call (613-727-5692).

**Report Comments:** 

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APPROVAL:

Raheleh Zafari, Environmental Chemist

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Client:	Kollaard Associates Inc.	Report Number:	1993661
	210 Prescott St., Box 189	Date Submitted:	2023-02-10
	Kemptville, ON	Date Reported:	2023-02-14
	K0G 1J0	Project:	210064
Attention:	Ms. Colleen Vermeersch	COC #:	905438
PO#:			
Invoice to:	Kollaard Associates Inc.		

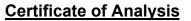
				Lab I.D. Sample Matrix Sample Type Sampling Date Sample I.D.	1674214 Water 2023-02-09 BH1
Group	Analyte	MRL	Units	Guideline	
Nutrients	N-NH3	0.020	mg/L		<0.020
	Total Kjeldahl Nitrogen	0.100	mg/L		0.572
Others	N-NO2	0.10	mg/L		0.14
	N-NO3	0.10	mg/L		19.3

Guideline =

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\* = Guideline Exceedence

Results relate only to the parameters tested on the samples submitted. Methods references and/or additional QA/QC information available on request.



Client:	Kollaard Associates Inc.
	210 Prescott St., Box 189
	Kemptville, ON
	K0G 1J0
Attention:	Ms. Colleen Vermeersch
PO#:	
Invoice to:	Kollaard Associates Inc.

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1993661
2023-02-10
2023-02-14
210064
905438

### QC Summary

A	nalyte	Blank	QC % Rec	QC Limits
Run No 437473 Method EPA 350.1	Analysis/Extraction Date 20	23-02-13 An	alyst SKH	
N-NH3		<0.020 mg/L	92	80-120
Run No 437476 Method C SM4500-No	Analysis/Extraction Date 20 03-F	23-02-13 An	alyst SKH	
N-NO2		<0.10 mg/L	100	80-120
N-NO3		<0.10 mg/L	101	80-120
Run No 437487 Method EPA 351.2	Analysis/Extraction Date 20	123-02-13 <b>An</b>	alyst SKH	
Total Kjeldahl Nit	rogen	<0.100 mg/L	116	70-130

Guideline =

\* = Guideline Exceedence

Results relate only to the parameters tested on the samples submitted. Methods references and/or additional QA/QC information available on request. MRL = Method Reporting Limit, AO = Aesthetic Objective, OG = Operational Guideline, MAC = Maximum Acceptable Concentration, IMAC = Interim Maximum Acceptable Concentration, STD = Standard, PWQO = Provincial Water Quality Guideline, IPWQO = Interim Provincial Water Quality Objective, TDR = Typical Desired Range

### **Certificate of Analysis**

# **Environment Testing**

(	Client:	Kollaard Associates Inc.		Report Number:	1947810
		210 Prescott St., Box 189		Date Submitted:	2021-02-12
		Kemptville, ON		Date Reported:	2021-02-18
		KOG 1J0		Project:	210064
	Attention:	Ms. Colleen Vermeersch		COC #:	211512
I	PO#:				
I	nvoice to:	Kollaard Associates Inc.	Page 1 of 3		

### Dear Colleen Vermeersch:

Please find attached the analytical results for your samples. If you have any questions regarding this report, please do not hesitate to call (613-727-5692).

Report Comments:

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Addrine Thomas 2021.02.18 14:41:20 -05'00'

APPROVAL:

Addrine Thomas, Inorganics Supervisor

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### Certificate of Analysis

# **Environment Testing**

Client:	Kollaard Associates Inc.	Report Number:	1947810	
	210 Prescott St., Box 189	Date Submitted:	2021-02-12	
	Kemptville, ON	Date Reported:	2021-02-18	
	K0G 1J0	Project:	210064	
Attention:	Ms. Colleen Vermeersch	COC #:	211512	
PO#:				
Invoice to:	Kollaard Associates Inc.			

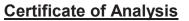
Group	Analyte	MRL	Units	Lab I.D. Sample Matrix Sample Type Sampling Date Sample I.D. <b>Guideline</b>	1542143 GW 2021-02-12 <del>MW2</del> MW1	1542144 GW 2021-02-12 <del>MW4</del> MW3	1542145 GW 2021-02-12 <del>MW6</del> MW5
Nutrients	N-NH3	0.010	mg/L		<0.010	<0.010	0.031
	Total Kjeldahl Nitrogen	0.100	mg/L		0.393	0.331	0.245
Others	N-NO2	0.10	mg/L		0.17	<0.10	<0.10
	N-NO3	0.10	mg/L		5.80	<0.10	<0.10

Guideline =

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\* = Guideline Exceedence

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Client:	Kollaard Associates Inc.
	210 Prescott St., Box 189
	Kemptville, ON
	K0G 1J0
Attention:	Ms. Colleen Vermeersch
PO#:	
Invoice to:	Kollaard Associates Inc.

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1947810
2021-02-12
2021-02-18
210064
211512

### QC Summary

A	nalyte	Blank	QC % Rec	QC Limits
Run No 396258 Method C SM4500-NG	Analysis/Extraction Date 20 D3-F	)21-02-16 <b>Ana</b>	llyst SKH	
N-NO2		<0.10 mg/L	96	
N-NO3		<0.10 mg/L	103	
Run No 396301 Method EPA 350.1	Analysis/Extraction Date 20	)21-02-17 <b>A</b> na	ilyst SKH	
N-NH3		<0.010 mg/L	100	80-120
Run No 396312 Method EPA 351.2	Analysis/Extraction Date 20	)21-02-17 <b>Ana</b>	ilyst SKH	
Total Kjeldahl Nit	rogen	<0.100 mg/L	112	70-130

Guideline =

\* = Guideline Exceedence

Results relate only to the parameters tested on the samples submitted. Methods references and/or additional QA/QC information available on request.

### **Certificate of Analysis**

# **Environment Testing**

Clie	ent:	Kollaard Associates Inc.		Report Number:	1979883	
		210 Prescott St., Box 189		Date Submitted:	2022-06-22	
		Kemptville, ON		Date Reported:	2022-06-28	
		K0G 1J0		Project:	210064	
Atte	ention:	Ms. Colleen Vermeersch		COC #:	892186	
PO#	#:					
	pice to:	Kollaard Associates Inc.	Page 1 of 3			

### Dear Colleen Vermeersch:

Please find attached the analytical results for your samples. If you have any questions regarding this report, please do not hesitate to call (613-727-5692).

**Report Comments:** 

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APPROVAL:

Emma-Dawn Ferguson, Chemist

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# **Environment Testing**

Client:	Kollaard Associates Inc.	Report Number:	1979883
	210 Prescott St., Box 189	Date Submitted:	2022-06-22
	Kemptville, ON	Date Reported:	2022-06-28
	K0G 1J0	Project:	210064
Attention:	Ms. Colleen Vermeersch	COC #:	892186
PO#:			
Invoice to:	Kollaard Associates Inc.		

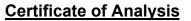
				Lab I.D. Sample Matrix Sample Type Sampling Date Sample I.D.	1632864 Water 2022-06-17 MW1
Group	Analyte	MRL	Units	Guideline	
Nutrients	N-NH3	0.010	mg/L		0.020
	Total Kjeldahl Nitrogen	0.100	mg/L		0.292
Others	N-NO2	0.10	mg/L		<0.10
	N-NO3	0.10	mg/L		8.11

Guideline =

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\* = Guideline Exceedence

Results relate only to the parameters tested on the samples submitted. Methods references and/or additional QA/QC information available on request.



Client:	Kollaard Associates Inc.		
	210 Prescott St., Box 189		
	Kemptville, ON		
	K0G 1J0		
Attention:	Ms. Colleen Vermeersch		
PO#:			
Invoice to:	Kollaard Associates Inc.		

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Report Number:	1979883
Date Submitted:	2022-06-22
Date Reported:	2022-06-28
Project:	210064
COC #:	892186

### QC Summary

Analyte	Blank	QC % Rec	QC Limits		
Run No     424404     Analysis/Extraction Date     2       Method     EPA 350.1	022-06-23 <b>An</b> a	ilyst ML			
N-NH3	<0.010 mg/L	99	80-120		
Run No       424476       Analysis/Extraction Date       2022-06-24       Analyst       SKH         Method       C SM4500-NO3-F       SKH       SKH       SKH       SKH					
N-NO2	<0.10 mg/L	102	80-120		
N-NO3	<0.10 mg/L	103	80-120		
Run No424502Analysis/Extraction Date2MethodEPA 351.2	022-06-24 <b>Ana</b>	ilyst SKH			
Total Kjeldahl Nitrogen	<0.100 mg/L	105	70-130		

Guideline =

\* = Guideline Exceedence

Results relate only to the parameters tested on the samples submitted. Methods references and/or additional QA/QC information available on request. MRL = Method Reporting Limit, AO = Aesthetic Objective, OG = Operational Guideline, MAC = Maximum Acceptable Concentration, IMAC = Interim Maximum Acceptable Concentration, STD = Standard, PWQO = Provincial Water Quality Guideline, IPWQO = Interim Provincial Water Quality Objective, TDR = Typical Desired Range

## **Environment Testing**

Client:	Kollaard Associates Inc.		Report Number:	1973212
	210 Prescott St., Box 189		Date Submitted:	2022-03-11
	Kemptville, ON		Date Reported:	2022-03-18
	K0G 1J0		Project:	210064
Attention:	Ms. Colleen Vermeersch		COC #:	887286
PO#:				
Invoice to:	Kollaard Associates Inc.	Page 1 of 4		

### Dear Colleen Vermeersch:

Please find attached the analytical results for your samples. If you have any questions regarding this report, please do not hesitate to call (613-727-5692).

**Report Comments:** 

🛟 eurofins

APPROVAL:

Addrine Thomas, Inorganics Supervisor

All analysis is completed at Eurofins Environment Testing Canada Inc. (Ottawa, Ontario) unless otherwise indicated.

Eurofins Environment Testing Canada Inc. (Ottawa, Ontario) is accredited by CALA, Canadian Association for Laboratory Accreditation to ISO/IEC 17025 for tests which appear on the scope of accreditation. The scope is available at: <u>http://www.cala.ca/scopes/2602.pdf</u>.

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Eurofins Environment Testing Canada Inc. (Ottawa, Ontario) is accredited by the Ontario Ministry of Agriculture, Food, and Rural Affairs for specific tests in agricultural soils.



Client:	Kollaard Associates Inc.	Report Number:	1973212
	210 Prescott St., Box 189	Date Submitted:	2022-03-11
	Kemptville, ON	Date Reported:	2022-03-18
	K0G 1J0	Project:	210064
Attention:	Ms. Colleen Vermeersch	COC #:	887286
PO#:			
Invoice to:	Kollaard Associates Inc.		

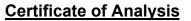
				Lab I.D. Sample Matrix Sample Type Sampling Date Sample I.D.	1614181 Water 2022-03-10 BH3
Group	Analyte	MRL	Units	Guideline	
Nutrients	N-NH3	0.010	mg/L		0.028
	Total Kjeldahl Nitrogen	0.100	mg/L		0.397
Others	N-NO2	0.10	mg/L		<0.10
	N-NO3	0.10	mg/L		<0.10

Guideline =

🛟 eurofins

\* = Guideline Exceedence

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Client:	Kollaard Associates Inc.
	210 Prescott St., Box 189
	Kemptville, ON
	K0G 1J0
Attention:	Ms. Colleen Vermeersch
PO#:	
Invoice to:	Kollaard Associates Inc.

🛟 eurofins

1973212
2022-03-11
2022-03-18
210064
887286

### QC Summary

Analyte		Blank	QC % Rec	QC Limits
Run No 418445 Method EPA 350.1	Analysis/Extraction Date 20	022-03-14 <b>An</b>	alyst SKH	
N-NH3		<0.010 mg/L	101	80-120
Run No 418494 Method EPA 351.2	Analysis/Extraction Date 20	022-03-14 <b>An</b>	alyst SKH	
Total Kjeldahl Nit	rogen	<0.100 mg/L	99	70-130
Run No 418535 Method C SM4500-NG	Analysis/Extraction Date 20 D3-F	)22-03-15 <b>An</b>	alyst SKH	
N-NO2		<0.10 mg/L	98	80-120
N-NO3		<0.10 mg/L	98	80-120

Guideline =

\* = Guideline Exceedence

Results relate only to the parameters tested on the samples submitted. Methods references and/or additional QA/QC information available on request.



## **Environment Testing**

Client: Kollaard Associates Inc. 210 Prescott St., Box 189 Kemptville, ON K0G 1J0 Attention: Ms. Colleen Vermeersch PO#: Invoice to: Kollaard Associates Inc.

 Report Number:
 1973212

 Date Submitted:
 2022-03-11

 Date Reported:
 2022-03-18

 Project:
 210064

 COC #:
 887286

### Sample Comment Summary

Sample ID: 1614181 BH3 Sediment not included in TKN analysis.

Guideline =

\* = Guideline Exceedence

Results relate only to the parameters tested on the samples submitted. Methods references and/or additional QA/QC information available on request.

## **Environment Testing**

Client:	Kollaard Associates Inc.		Report Number:	1972761	
	210 Prescott St., Box 189		Date Submitted:	2022-03-04	
	Kemptville, ON		Date Reported:	2022-03-09	
	K0G 1J0		Project:	210064	
Attention:	Ms. Colleen Vermeersch		COC #:	886841	
PO#:					
Invoice to:	Kollaard Associates Inc.	Page 1 of 4			

#### Dear Colleen Vermeersch:

Please find attached the analytical results for your samples. If you have any questions regarding this report, please do not hesitate to call (613-727-5692).

**Report Comments:** 

🛟 eurofins

APPROVAL:

Addrine Thomas, Inorganics Supervisor

All analysis is completed at Eurofins Environment Testing Canada Inc. (Ottawa, Ontario) unless otherwise indicated.

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Eurofins Environment Testing Canada Inc. (Ottawa, Ontario) is accredited by the Ontario Ministry of Agriculture, Food, and Rural Affairs for specific tests in agricultural soils.



Client:	Kollaard Associates Inc.	Report Number:	1972761
	210 Prescott St., Box 189	Date Submitted:	2022-03-04
	Kemptville, ON	Date Reported:	2022-03-09
	K0G 1J0	Project:	210064
Attention:	Ms. Colleen Vermeersch	COC #:	886841
PO#:			
Invoice to:	Kollaard Associates Inc.		

				Lab I.D. Sample Matrix Sample Type Sampling Date Sample I.D.	1613058 Water 2022-03-03 BH1	1613059 Water 2022-03-04 BH5
Group	Analyte	MRL	Units	Guideline		
Nutrients	N-NH3	0.010	mg/L		<0.010	<0.010
	Total Kjeldahl Nitrogen	0.100	mg/L		0.737	0.309
Others	N-NO2	0.10	mg/L		0.16	<0.10
	N-NO3	0.10	mg/L		19.7	0.72

Guideline =

🛟 eurofins

\* = Guideline Exceedence

Results relate only to the parameters tested on the samples submitted. Methods references and/or additional QA/QC information available on request.



Client: Kollaard Associates Inc. 210 Prescott St., Box 189 Kemptville, ON K0G 1J0 Attention: Ms. Colleen Vermeersch PO#: Invoice to: Kollaard Associates Inc.

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 Report Number:
 1972761

 Date Submitted:
 2022-03-04

 Date Reported:
 2022-03-09

 Project:
 210064

 COC #:
 886841

### QC Summary

Analyte		-		QC % Rec	QC Limits
Run No 418148	Analysis/Extraction Date 20	022-03-07 A	nalyst	I SKH	
Method EPA 351.2					
Total Kjeldahl Nit	rogen	<0.100 mg/L		101	70-130
Run No 418208	Analysis/Extraction Date 20	)22-03-08 A	nalyst	SKH	
Method C SM4500-NG	03-F				
N-NO2		<0.10 mg/L		88	80-120
N-NO3		<0.10 mg/L		99	80-120
Run No 418237	)22-03-09 <b>A</b>	nalyst	SKH		
Method EPA 350.1					
N-NH3		0.013 mg/L		118	80-120

Guideline =

\* = Guideline Exceedence

Results relate only to the parameters tested on the samples submitted. Methods references and/or additional QA/QC information available on request.



## **Environment Testing**

Client: Kollaard Associates Inc. 210 Prescott St., Box 189 Kemptville, ON K0G 1J0 Attention: Ms. Colleen Vermeersch PO#: Invoice to: Kollaard Associates Inc.

 Report Number:
 1972761

 Date Submitted:
 2022-03-04

 Date Reported:
 2022-03-09

 Project:
 210064

 COC #:
 886841

### Sample Comment Summary

Sample ID: 1613058 BH1 Sediment not included in TKN analysis for this report.

Guideline =

\* = Guideline Exceedence

Results relate only to the parameters tested on the samples submitted. Methods references and/or additional QA/QC information available on request.

## **Environment Testing**

Client:	Kollaard Associates Inc.		Report Number:	1977214
	210 Prescott St., Box 189		Date Submitted:	2022-05-12
	Kemptville, ON		Date Reported:	2022-05-19
	K0G 1J0		Project:	210064
Attention:	Ms. Colleen Vermeersch		COC #:	890555
PO#:				
Invoice to:	Kollaard Associates Inc.	Page 1 of 4		

### Dear Colleen Vermeersch:

Please find attached the analytical results for your samples. If you have any questions regarding this report, please do not hesitate to call (613-727-5692).

**Report Comments:** 

🛟 eurofins

APPROVAL:

Emma-Dawn Ferguson, Chemist

All analysis is completed at Eurofins Environment Testing Canada Inc. (Ottawa, Ontario) unless otherwise indicated.

Eurofins Environment Testing Canada Inc. (Ottawa, Ontario) is accredited by CALA, Canadian Association for Laboratory Accreditation to ISO/IEC 17025 for tests which appear on the scope of accreditation. The scope is available at: <u>http://www.cala.ca/scopes/2602.pdf</u>.

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Eurofins Environment Testing Canada Inc. (Ottawa, Ontario) is accredited by the Ontario Ministry of Agriculture, Food, and Rural Affairs for specific tests in agricultural soils.



## **Environment Testing**

Client:	Kollaard Associates Inc.		
	210 Prescott St., Box 189		
	Kemptville, ON		
	K0G 1J0		
Attention:	Ms. Colleen Vermeersch		
PO#:			
Invoice to:	Kollaard Associates Inc.		

Report Number:	1977214
Date Submitted:	2022-05-12
Date Reported:	2022-05-19
Project:	210064
COC #:	890555

				Lab I.D. Sample Matrix Sample Type Sampling Date Sample I.D.	1625779 Water 2022-05-06 5503 Osgoode Main	1625780 Water 2022-05-06 3216 Reids Lane	1625781 Water 2022-05-06 5535 Osgoode Main	1625782 Water 2022-05-06 5519 Osgoode Main
Group	Analyte	MRL	Units	Guideline				
Anions	N-NO2	0.10	mg/L	MAC 1.0	<0.10	0.72	<0.10	<0.10
	N-NO3	0.10	mg/L	MAC 10.0	<0.10	30.8*	12.3*	22.3*
Nutrients	N-NH3	0.010	mg/L		0.249	0.182	0.060	0.095
	Total Kjeldahl Nitrogen	0.100	mg/L		0.145	0.740	0.298	0.533

Guideline = ODWSOG

\* = Guideline Exceedence

Results relate only to the parameters tested on the samples submitted. Methods references and/or additional QA/QC information available on request.



Client:	Kollaard Associates Inc.
	210 Prescott St., Box 189
	Kemptville, ON
	K0G 1J0
Attention:	Ms. Colleen Vermeersch
PO#:	
Invoice to:	Kollaard Associates Inc.

🛟 eurofins

1977214
2022-05-12
2022-05-19
210064
890555

### QC Summary

Ai	nalyte	Blank	QC % Rec	QC Limits
Run No 421994 Method SM 4110	Analysis/Extraction Date 20	022-05-17 <b>An</b> a	alyst AaN	
N-NO2		<0.10 mg/L	97	90-110
N-NO3		<0.10 mg/L	102	90-110
Run No 422119 Method SM 4110	Analysis/Extraction Date 20	)22-05-18 <b>An</b> a	alyst SKH	
N-NO3		<1.0 mg/L	111	90-110
Run No 422273 Method EPA 351.2	Analysis/Extraction Date 20	)22-05-18 <b>An</b> a	alyst SKH	
Total Kjeldahl Nit	rogen	<0.100 mg/L	114	70-130
Run No 422331 Method EPA 350.1	Analysis/Extraction Date 20	022-05-19 <b>An</b> a	alyst SKH	
N-NH3		<0.010 mg/L	89	80-120

Guideline = ODWSOG

\* = Guideline Exceedence

Results relate only to the parameters tested on the samples submitted. Methods references and/or additional QA/QC information available on request.



## **Environment Testing**

Client:	Kollaard Associates Inc.				
	210 Prescott St., Box 189				
	Kemptville, ON				
	K0G 1J0				
Attention:	Ms. Colleen Vermeersch				
PO#:					
Invoice to:	Kollaard Associates Inc.				

 Report Number:
 1977214

 Date Submitted:
 2022-05-12

 Date Reported:
 2022-05-19

 Project:
 210064

 COC #:
 890555

### Sample Comment Summary

Sample ID: 1625779 5503 Osgoode Main For workorder: Holding time for N-NO2 & N-NO3 analysis was exceeded.	
Sample ID: 1625780 3216 Reids Lane NO3 MRL elevated due to matrix interference (dilution was done).	
Sample ID: 1625781 5535 Osgoode Main NO3 MRL elevated due to matrix interference (dilution was done).	
Sample ID: 1625782 5519 Osgoode Main NO3 MRL elevated due to matrix interference (dilution was done).	

Guideline = ODWSOG

\* = Guideline Exceedence

Results relate only to the parameters tested on the samples submitted. Methods references and/or additional QA/QC information available on request.



## ATTACHMENT E

## SEPTIC EFFLUENT DILUTION CALCULATIONS

### SEPTIC EFFLUENT DILUTION CALCULATIONS

Number of Lots Gross Site Area Env. Can. Water Surplus (NPI)	7 35035 m <sup>2</sup> 379 mm					
Hard Surface Area (Post-Development)						
Roadway Dwellings (320 m2/house) Other impervious surfaces (pools, etc.) Driveways Total	1965 2240 700 <u>996</u> 5901 m <sup>2</sup>	Lot Based				
Net Infiltration Area = Gross Site Area - Hard S	urface Area (Post- 29134 m <sup>2</sup>	Development)				
Infiltration Reduction Factor:						
Topography (rolling) Soil (open sandy loam) <u>Cover (cultivated/orchard)</u> Total IRF	0.20 0.40 <u>0.10</u> 0.70					
Septic Dilution For	7 Septio	c Systems:				
Number of Lots x 365 m <sup>3</sup> Effluent Per Year x 40 mg/L NO <sub>3</sub> = $9.9$ mg/L NO <sub>3</sub> -N						

Number of Lots x 365 m<sup>3</sup> Effluent Per Year + (Net Infiltration Area x NPI x IRF)

Ottawa	Intl A		WATE	R BUDG	IET MEA	ANS FOR	R THE F	PERIOD	1939-2	021	DC20492
	45.32 G 75.67			DLDING					AT IND		
DATE	TEMP (C)	PCPN	RAIN	MELT	PE	AE	DEF	SURP	SNOW	SOIL	ACC P
31- 1	-10.6	62	12	14	0	0	0	25	83	74	294
28- 2	-9.0	56	10	16	1	1	0	26	111	74	350
31- 3	-2.8	65	31	77	6	6	0	103	68	75	416
30- 4	5.7	73	68	73	31	31	0	110	0	75	489
31- 5	13.1	75	75	0	80	80	0	14	0	56	565
30- 6	18.3	85	85	0	116	107	-9	5	0	29	650
31- 7	20.9	88	88	0	136	103	-33	3	0	11	737
31- 8	19.7	84	84	0	118	83	-35	1	0	11	822
30- 9	14.8	82	82	0	75	65	-10	4	0	24	904
31-10	8.3	78	78	0	37	36	-1	14	0	52	78
30-11	1.2	76	59	8	10	10	0	38	9	71	154
31-12	-6.9	79	27	14	1	1	0	36	47	74	233
AVE	6.0 TTL	903	699	202	611	523	-88	379			

Ottawa	Intl A		STAN	DARD D	EVIATI	ONS FO	OR THE	PERIOD	1939-	2021	DC20492
DATE	TEMP (C)	PCPN	RAIN	MELT	PE	AE	DEF	SURP	SNOW	SOIL	ACC P
31- 1	2.9	26	15	17	1	1	0	28	44	3	59
28- 2	2.6	26	14	25	1	1	0	34	59	3	63
31- 3	2.6	28	22	49	5	5	0	55	87	0	71
30- 4	1.8	32	33	88	9	9	0	89	2	2	80
31- 5	1.8	34	34	2	12	12	0	24	0	22	94
30- 6	1.2	38	38	0	8	17	18	16	0	29	105
31- 7	1.2	45	45	0	8	31	33	16	0	22	117
31- 8	1.3	37	37	0	9	29	31	4	0	21	126
30- 9	1.5	39	39	0	8	16	16	15	0	28	132
31-10	1.5	37	37	1	7	7	2	21	0	27	37
30-11	1.8	27	27	8	4	4	0	32	13	12	45
31-12	3.0	30	22	13	1	1	0	30	34	4	55



## ATTACHMENT F

## RESULTS OF LABORATORY TESTING OF TEST WELL WATER SAMPLES

## **Environment Testing**

Client:	Kollaard Associates Inc.		Report Number:	1953233
	210 Prescott St., Box 189		Date Submitted:	2021-05-13
	Kemptville, ON		Date Reported:	2021-05-20
	K0G 1J0		Project:	210064
Attention:	Ms. Colleen Vermeersch		COC #:	873626
PO#:				
Invoice to:	Kollaard Associates Inc.	Page 1 of 7		

### Dear Colleen Vermeersch:

Please find attached the analytical results for your samples. If you have any questions regarding this report, please do not hesitate to call (613-727-5692).

Report Comments:

🛟 eurofins



APPROVAL:

Addrine Thomas, Inorganics Supervisor

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## **Environment Testing**

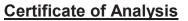
Client:	Kollaard Associates Inc.	Report Number:	1953233
	210 Prescott St., Box 189	Date Submitted:	2021-05-13
	Kemptville, ON	Date Reported:	2021-05-20
	K0G 1J0	Project:	210064
Attention:	Ms. Colleen Vermeersch	COC #:	873626
PO#:			
Invoice to:	Kollaard Associates Inc.		

Group	Analyte	MRL	Units	Lab I.D. Sample Matrix Sample Type Sampling Date Sample I.D. Guideline	1556912 Water 2021-05-12 TW#1-3 hr	1556913 Water 2021-05-12 TW#1-6 hr
Anions	Cl	1	mg/L	AO 250	178	180
	F	0.10	mg/L	MAC 1.5	0.83	0.85
	N-NO2	0.10	mg/L	MAC 1.0	<0.50	<0.50
	N-NO3	0.10	mg/L	MAC 10.0	<0.50	<0.50
	SO4	1	mg/L	AO 500	44	44
General Chemistry	Alkalinity as CaCO3	5	mg/L	OG 500	143	142
	Colour	2	TCU		<2	<2
	Conductivity	5	uS/cm		951	945
	DOC	0.5	mg/L	AO 5	1.8	2.0
	pН	1.00	-	6.5-8.5	8.19	8.20
	S2-	0.01	mg/L	AO 0.05	1.10*	1.10*
	TDS (COND - CALC)	1	mg/L	AO 500	618*	614*
	Turbidity	0.1	NTU	AO 5.0	2.2	1.1
Hardness	Hardness as CaCO3	1	mg/L	OG 100	229*	229*
Indices/Calc	Ion Balance	0.01			1.03	1.03
Metals	Al	0.01	mg/L	OG 0.1	<0.01	<0.01
	As	0.001	mg/L	IMAC 0.01	<0.001	<0.001
	В	0.01	mg/L	IMAC 5.0	0.53	0.54
	Ва	0.01	mg/L	MAC 1.0	0.08	0.07
	Са	1	mg/L		44	44
	Cd	0.0001	mg/L	MAC 0.005	<0.0001	<0.0001
	Со	0.0002	mg/L		<0.0002	<0.0002
	Cr	0.001	mg/L	MAC 0.05	<0.001	<0.001
	Cu	0.001	mg/L	AO 1.0	<0.001	<0.001
	Fe	0.03	mg/L	AO 0.3	0.16	0.11

#### Guideline = ODWSOG

#### \* = Guideline Exceedence

Results relate only to the parameters tested on the samples submitted. Methods references and/or additional QA/QC information available on request.



Client:	Kollaard Associates Inc.	Report Number:	1953233	
	210 Prescott St., Box 189	Date Submitted:	2021-05-13	
	Kemptville, ON	Date Reported:	2021-05-20	
	K0G 1J0	Project:	210064	
Attention:	Ms. Colleen Vermeersch	COC #:	873626	
PO#:				
Invoice to:	Kollaard Associates Inc.			

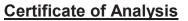
-				Lab I.D. Sample Matrix Sample Type Sampling Date Sample I.D.	1556912 Water 2021-05-12 TW#1-3 hr	1556913 Water 2021-05-12 TW#1-6 hr
Group	Analyte	MRL	Units	Guideline	-0.0001	10.0001
Metals	Hg	0.0001	mg/L	MAC 0.001	< 0.0001	<0.0001
	K	1	mg/L		11	11
	Mg	1	mg/L		29	29
	Mn	0.01	mg/L	AO 0.05	0.01	0.01
	Na	2	mg/L	AO 200	98	98
	Pb	0.001	mg/L	MAC 0.010	<0.001	<0.001
	Sb	0.0005	mg/L	IMAC 0.006	<0.0005	<0.0005
	Se	0.001	mg/L	MAC 0.05	<0.001	<0.001
	Sr	0.001	mg/L		3.92	3.87
	U	0.001	mg/L	MAC 0.02	<0.001	<0.001
	V	0.001	mg/L		<0.001	<0.001
	Zn	0.01	mg/L	AO 5.0	<0.01	<0.01
Nutrients	N-NH3	0.010	mg/L		0.307	0.303
	Total Kjeldahl Nitrogen	0.100	mg/L		0.391	0.504
Subcontract	Phenols	0.001	mg/L		<0.0010	<0.0010
	Tannin & Lignin	0.1	mg/L		0.1	0.1

Guideline = ODWSOG

🛟 eurofins

\* = Guideline Exceedence

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Client:	Kollaard Associates Inc.
	210 Prescott St., Box 189
	Kemptville, ON
	K0G 1J0
Attention:	Ms. Colleen Vermeersch
PO#:	
Invoice to:	Kollaard Associates Inc.

🛟 eurofins

Report Number:	1953233
Date Submitted:	2021-05-13
Date Reported:	2021-05-20
Project:	210064
COC #:	873626

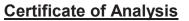
### QC Summary

Analyte	Blank		QC % Rec	QC Limits
Run No         400541         Analysis/Extraction           Method         C SM2130B	Date 2021-05-13	Ana	lyst KB	
Turbidity	0.6 NTU		101	70-130
Run No400603Analysis/ExtractionMethodC SM2120C	Date 2021-05-14	Ana	lyst SKH	
Colour	<2 TCU		102	90-110
Run No400654Analysis/ExtractionMethodEPA 200.8	Date 2021-05-14	Ana	lyst SKH	
Aluminum	<0.01 mg/L		106	80-120
Arsenic	<0.001 mg/L		100	80-120
Boron (total)	<0.01 mg/L		106	80-120
Barium	<0.01 mg/L		95	80-120
Cadmium	<0.0001 mg/l	-	100	80-120
Cobalt	<0.0002 mg/l	-	104	80-120
Chromium Total	<0.001 mg/L		105	80-120
Copper	<0.001 mg/L		105	80-120
Iron	<0.03 mg/L		99	80-120
Mercury	<0.0001 mg/l	-	90	80-120

#### Guideline = ODWSOG

#### \* = Guideline Exceedence

Results relate only to the parameters tested on the samples submitted. Methods references and/or additional QA/QC information available on request.



Client:	Kollaard Associates Inc.
	210 Prescott St., Box 189
	Kemptville, ON
	K0G 1J0
Attention:	Ms. Colleen Vermeersch
PO#:	
Invoice to:	Kollaard Associates Inc.

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Report Number:	1953233
Date Submitted:	2021-05-13
Date Reported:	2021-05-20
Project:	210064
COC #:	873626

### QC Summary

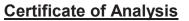
Ar	nalyte	Blank	QC % Rec	QC Limits
Manganese		<0.01 mg/L	100	80-120
Lead		<0.001 mg/L	106	80-120
Antimony		<0.0005 mg/L	96	80-120
Selenium		<0.001 mg/L	94	80-120
Strontium		<0.001 mg/L	94	80-120
Uranium		<0.001 mg/L	107	80-120
Vanadium		<0.001 mg/L	104	80-120
Zinc		<0.01 mg/L	104	80-120
Run No 400665 Method SM2320,2510	Analysis/Extraction Date 20 0,4500H/F	21-05-15 <b>Ana</b>	l <b>yst</b> SWS	
F		<0.10 mg/L	100	90-110
рН			100	90-110
Run No 400666 Method SM 5310B	Analysis/Extraction Date 20	121-05-14 <b>Ana</b>	llyst SWS	
DOC		<0.5 mg/L	89	80-120
Run No 400717 Method EPA 350.1	Analysis/Extraction Date 20	21-05-17 <b>Ana</b>	l <b>yst</b> SKH	
N-NH3		<0.010 mg/L	99	80-120

#### Guideline = ODWSOG

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Maximum Acceptable Concentration, IMAC = Interim Maximum Acceptable Concentration, STD =



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	K0G 1J0
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1953233
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873626

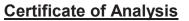
### QC Summary

Analyte Blank			QC % Rec	QC Limits
Run No         400719         Analysis/Extraction Date         20           Method         EPA 351.2	)21-05-17 <b>An</b>	alyst	SKH	
Total Kjeldahl Nitrogen	<0.100 mg/L		102	70-130
Run No400737Analysis/Extraction Date2021-05-18MethodM SM3120B-3500C		alyst	ZS	
Calcium	<1 mg/L		100	90-110
Potassium	<1 mg/L		102	87-113
Magnesium	<1 mg/L		98	76-124
Sodium	<2 mg/L		105	82-118
Run No400792Analysis/Extraction Date20MethodSM2320,2510,4500H/F	)21-05-17 <b>An</b>	alyst	SWS	
Alkalinity (CaCO3)	<5 mg/L		97	90-110
Conductivity	<5 uS/cm		97	90-110
Run No         400797         Analysis/Extraction Date         20           Method         SM 4110	021-05-19 <b>An</b>	alyst	AET	
Chloride	<5 mg/L			90-110
N-NO2	<0.50 mg/L		98	90-110
N-NO3	<0.50 mg/L		105	90-110
SO4	<5 mg/L		100	90-110

#### Guideline = ODWSOG

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1953233
2021-05-13
2021-05-20
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873626

### QC Summary

Analyte	Blank	QC % Rec	QC Limits
Run No         400811         Analysis/Extraction Date         20           Method         C SM2340B	)21-05-19 <b>Ana</b>	llyst AET	
Hardness as CaCO3			
Ion Balance			
TDS (COND - CALC)			
Run No         400865         Analysis/Extraction Date         20           Method         SUBCONTRACT-A	)21-05-14 <b>Ana</b>	llyst AET	
Phenols	<0.0010 mg/L	98	
Tannin & Lignin	<0.10 mg/L	103	
Run No         400982         Analysis/Extraction Date         20           Method         C SM4500-S2-D	)21-05-20 <b>Ana</b>	llyst AET	
S2-	<0.01 mg/L	104	80-120

Guideline = ODWSOG

\* = Guideline Exceedence

Results relate only to the parameters tested on the samples submitted. Methods references and/or additional QA/QC information available on request.

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### **Certificate of Analysis**

## **Environment Testing**

Client: Attention: PO#:	Kollaard Associates Inc. 210 Prescott St., Box 189 Kemptville, ON K0G 1J0 Ms. Colleen Vermeersch		Report Number: Date Submitted: Date Reported: Project: COC #:	1953218 2021-05-13 2021-05-16 210064 873626	
Invoice to:	Kollaard Associates Inc.	Page 1 of 2			

### **Dear Colleen Vermeersch:**

Please find attached the analytical results for your samples. If you have any questions regarding this report, please do not hesitate to call (613-727-5692).

Report Comments:

	Dragana
Magara Modetore	Dzeletovic
poparor monore	2021.05.16
	08:33:26 -04'00'

APPROVAL:

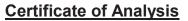
Dragana Dzeletovic-Andric, Microbiology Team Lead

All analysis is completed at Eurofins Environment Testing Canada Inc. (Ottawa, Ontario) unless otherwise indicated.

Eurofins Environment Testing Canada Inc. (Ottawa, Ontario) is accredited by CALA, Canadian Association for Laboratory Accreditation to ISO/IEC 17025 for tests which appear on the scope of accreditation. The scope is available at: http://www.cala.ca/scopes/2602.pdf.

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Eurofins Environment Testing Canada Inc. (Ottawa, Ontario) is accredited by the Ontario Ministry of Agriculture, Food, and Rural Affairs for specific tests in agricultural soils.



Client:	Kollaard Associates Inc. 210 Prescott St., Box 189 Kemptville, ON K0G 1J0	Report Number: Date Submitted: Date Reported: Project:	1953218 2021-05-13 2021-05-16 210064
Attention: PO#:	Ms. Colleen Vermeersch	COC #:	873626
Invoice to:	Kollaard Associates Inc.		

				Lab I.D. Sample Matrix Sample Type Sampling Date Sample I.D.	1556873 Water 2021-05-12 TW#1-3 hr	1556874 Water 2021-05-12 TW#1-6 hr
Group	Analyte	MRL	Units	Guideline		
Microbiology	Escherichia Coli	0	ct/100mL	MAC 0	0	0
	Faecal Coliforms	0	ct/100mL		0	0
	Heterotrophic Plate Count	0	ct/1mL		0	0
	Total Coliforms	0	ct/100mL	MAC 0	0	0

Guideline = ODWSOG

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Results relate only to the parameters tested on the samples submitted. **Analytical Method: AMBCOLM1** additional QA/QC information available on request.

## **Environment Testing**

Client:	Kollaard Associates Inc.		Report Number:	1952974
	210 Prescott St., Box 189		Date Submitted:	2021-05-11
	Kemptville, ON		Date Reported:	2021-05-19
	KOG 1J0		Project:	210064
Attention:	Ms. Colleen Vermeersch		COC #:	873496
PO#:				
Invoice to:	Kollaard Associates Inc.	Page 1 of 7		

#### Dear Colleen Vermeersch:

Please find attached the analytical results for your samples. If you have any questions regarding this report, please do not hesitate to call (613-727-5692).

Report Comments:

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	Addrine
	Thomas
	(Tham) 2021.05.19
	16:06:04
VAL:	0.410.01
	-04 00 Addrine Thomas, Inorganics Supervisor

APPROVAL:

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## **Environment Testing**

Client:	Kollaard Associates Inc.
	210 Prescott St., Box 189
	Kemptville, ON
	K0G 1J0
Attention: PO#:	Ms. Colleen Vermeersch
Invoice to:	Kollaard Associates Inc.

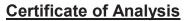
Report Number:	1952974
Date Submitted:	2021-05-11
Date Reported:	2021-05-19
Project:	210064
COC #:	873496

Group	Analyte	MRL	Units	Lab I.D. Sample Matrix Sample Type Sampling Date Sample I.D. <b>Guideline</b>	1556262 Water 2021-05-10 TW2-3 hrs	1556263 Water 2021-05-10 TW2-6 hrs
Anions	Cl	1	mg/L	AO 250	155	165
	F	0.10	mg/L	MAC 1.5	0.94	0.89
	N-NO2	0.10	mg/L	MAC 1.0	<0.10	<0.10
	N-NO3	0.10	mg/L	MAC 10.0	<0.10	<0.10
	SO4	1	mg/L	AO 500	47	41
General Chemistry	Alkalinity as CaCO3	5	mg/L	OG 500	139	140
	Colour	2	TCU		<2	<2
	Conductivity	5	uS/cm		829	879
	DOC	0.5	mg/L	AO 5	1.8	2.1
	рН	1.00		6.5-8.5	8.05	8.01
	S2-	0.01	mg/L	AO 0.05	0.27*	0.24*
	TDS (COND - CALC)	1	mg/L	AO 500	539*	571*
	Turbidity	0.1	NTU	AO 5.0	5.7*	1.2
Hardness	Hardness as CaCO3	1	mg/L	OG 100	211*	233*
Indices/Calc	Ion Balance	0.01			0.97	1.01
Metals	Al	0.01	mg/L	OG 0.1	<0.01	<0.01
	As	0.001	mg/L	IMAC 0.01	<0.001	<0.001
	В	0.01	mg/L	IMAC 5.0	0.57	0.58
	Ва	0.01	mg/L	MAC 1.0	0.26	0.20
	Са	1	mg/L		40	44
	Cd	0.0001	mg/L	MAC 0.005	<0.0001	<0.0001
	Со	0.0002	mg/L		<0.0002	<0.0002
	Cr	0.001	mg/L	MAC 0.05	<0.001	<0.001
	Cu	0.001	mg/L	AO 1.0	<0.001	<0.001
	Fe	0.03	mg/L	AO 0.3	0.46*	0.14

#### Guideline = ODWSOG

#### \* = Guideline Exceedence

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Client:	Kollaard Associates Inc.	Report Number:	1952974	
	210 Prescott St., Box 189	Date Submitted:	2021-05-11	
	Kemptville, ON	Date Reported:	2021-05-19	
	KOG 1J0	Project:	210064	
Attention:	Ms. Colleen Vermeersch	COC #:	873496	
PO#:				
Invoice to:	Kollaard Associates Inc.			

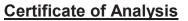
				Lab I.D. Sample Matrix Sample Type Sampling Date Sample I.D.	1556262 Water 2021-05-10 TW2-3 hrs	1556263 Water 2021-05-10 TW2-6 hrs
Group	Analyte	MRL	Units	Guideline		
Metals	Hg	0.0001	mg/L	MAC 0.001	<0.0001	<0.0001
	К	1	mg/L		11	11
	Mg	1	mg/L		27	30
	Mn	0.01	mg/L	AO 0.05	0.02	0.01
	Na	2	mg/L	AO 200	78	80
	Pb	0.001	mg/L	MAC 0.010	<0.001	<0.001
	Sb	0.0005	mg/L	IMAC 0.006	<0.0005	<0.0005
	Se	0.001	mg/L	MAC 0.05	<0.001	<0.001
	Sr	0.001	mg/L		3.28	3.64
	U	0.001	mg/L	MAC 0.02	<0.001	<0.001
	V	0.001	mg/L		<0.001	<0.001
	Zn	0.01	mg/L	AO 5.0	<0.01	<0.01
Nutrients	N-NH3	0.010	mg/L		0.290	0.307
	Total Kjeldahl Nitrogen	0.100	mg/L		0.272	0.323
Subcontract	Phenols	0.001	mg/L		<0.0010	<0.0010
	Tannin & Lignin	0.1	mg/L		0.1	0.2

Guideline = ODWSOG

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Client:	Kollaard Associates Inc.		
	210 Prescott St., Box 189		
	Kemptville, ON		
	K0G 1J0		
Attention:	Ms. Colleen Vermeersch		
PO#:			
Invoice to:	Kollaard Associates Inc.		

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2021-05-11
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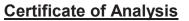
### QC Summary

Analyte	Blank	QC % Rec	QC Limits	
Run No         400409         Analysis/Extract           Method         C SM2130B	tion Date 202	21-05-12 <b>Ana</b>	llyst KB	
Turbidity		<0.1 NTU	101	70-130
Run No     400492     Analysis/Extraction Date     202       Method     C SM2120C		21-05-13 <b>Ana</b>	llyst KB	
Colour		<2 TCU	87	90-110
Run No400510Analysis/ExtractMethodEPA 200.8	tion Date 202	21-05-13 <b>Ana</b>	l <b>yst</b> SKH	
Aluminum		<0.01 mg/L	100	80-120
Arsenic		<0.001 mg/L	102	80-120
Boron (total)		<0.01 mg/L	108	80-120
Barium		<0.01 mg/L	89	80-120
Cadmium		<0.0001 mg/L	97	80-120
Cobalt		<0.0002 mg/L	114	80-120
Chromium Total		<0.001 mg/L	109	80-120
Copper		<0.001 mg/L	116	80-120
Iron		<0.03 mg/L	103	80-120
Mercury		<0.0001 mg/L	96	80-120

#### Guideline = ODWSOG

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Client:	Kollaard Associates Inc.		
	210 Prescott St., Box 189		
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	K0G 1J0		
Attention:	Ms. Colleen Vermeersch		
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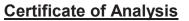
### QC Summary

Ar	nalyte	Blank	QC % Rec	QC Limits
Manganese		<0.01 mg/L	99	80-120
Lead		<0.001 mg/L	111	80-120
Antimony		<0.0005 mg/L	90	80-120
Selenium		<0.001 mg/L	87	80-120
Strontium		<0.001 mg/L	86	80-120
Uranium		<0.001 mg/L	110	80-120
Vanadium		<0.001 mg/L	108	80-120
Zinc		<0.01 mg/L	108	80-120
Run No 400520 Method SM 5310B	Analysis/Extraction Date 20	21-05-12 <b>Ana</b>	alyst SWS	
DOC		<0.5 mg/L	92	80-120
Run No400525Analysis/Extraction DMethodSM 4110		21-05-14 <b>Ana</b>	alyst AET	
N-NO2		<0.10 mg/L	101	90-110
N-NO3		<0.10 mg/L	105	90-110
SO4		<1 mg/L	100	90-110
Run No400564Analysis/Extraction Date202MethodEPA 350.1		21-05-13 <b>Ana</b>	alyst SKH	
N-NH3		<0.010 mg/L	106	80-120

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Client:	Kollaard Associates Inc.		
	210 Prescott St., Box 189		
	Kemptville, ON		
	K0G 1J0		
Attention:	Ms. Colleen Vermeersch		
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2021-05-11
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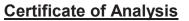
### QC Summary

Analyte	Blank	QC % Rec	QC Limits
Run No         400568         Analysis/Extraction Date         20           Method         EPA 351.2	)21-05-13 <b>Ana</b>	lyst SKH	
Total Kjeldahl Nitrogen	<0.100 mg/L	95	70-130
Run No400570Analysis/Extraction Date20MethodSM2320,2510,4500H/F	)21-05-13 <b>Ana</b>	lyst SWS	
Alkalinity (CaCO3)	<5 mg/L	98	90-110
Conductivity	<5 uS/cm	100	90-110
F	<0.10 mg/L	101	90-110
рН		100	90-110
Run No400624Analysis/Extraction Date20MethodM SM3120B-3500C	)21-05-14 <b>Ana</b>	lyst ZS	
Calcium	<1 mg/L	99	90-110
Potassium	<1 mg/L	102	87-113
Magnesium	<1 mg/L	98	76-124
Sodium	<2 mg/L	102	82-118
Run No400722Analysis/Extraction Date20MethodSM 4110	)21-05-18 <b>Ana</b>	lyst AET	
Chloride	<5 mg/L		90-110

#### Guideline = ODWSOG

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Client:	Kollaard Associates Inc.		
	210 Prescott St., Box 189		
	Kemptville, ON		
	K0G 1J0		
Attention:	Ms. Colleen Vermeersch		
PO#:			
Invoice to:	Kollaard Associates Inc.		

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Report Number:	1952974
Date Submitted:	2021-05-11
Date Reported:	2021-05-19
Project:	210064
COC #:	873496

### QC Summary

Analyte	Blank	QC % Rec	QC Limits
Run No         400734         Analysis/Extraction Date         20           Method         C SM2340B	)21-05-18 <b>Ana</b>	lyst AET	
Hardness as CaCO3			
Ion Balance			
TDS (COND - CALC)			
Run No         400761         Analysis/Extraction Date         20           Method         C SM4500-S2-D	)21-05-18 <b>Ana</b>	lyst AET	
S2-	<0.01 mg/L	92	80-120
Run No     400865     Analysis/Extraction Date     2021-05-18     Analyst     AET       Method     SUBCONTRACT-A     August     AET			
Phenols	<0.0010 mg/L	103	
Tannin & Lignin	<0.10 mg/L	100	

Guideline = ODWSOG

\* = Guideline Exceedence

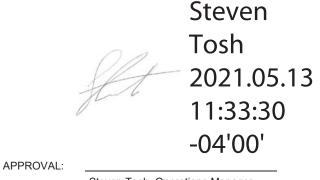
Results relate only to the parameters tested on the samples submitted. Methods references and/or additional QA/QC information available on request.

🔅 euro	ofins	Environment Testing         Associates Inc.         scott St., Box 189         Ile, ON         Date Submitted:       2021-05-11         Date Reported:       2021-05-13         Project:       210064			
	Environment Testing				
Client: Attention: PO#:	Kollaard Associates Inc. 210 Prescott St., Box 189 Kemptville, ON K0G 1J0 Ms. Colleen Vermeersch		Date Submitted: Date Reported: Project:	2021-05-11 2021-05-13 210064	
Invoice to:	Kollaard Associates Inc.	Page 1 of 2			

### Dear Colleen Vermeersch:

Please find attached the analytical results for your samples. If you have any questions regarding this report, please do not hesitate to call (613-727-5692).

**Report Comments:** 



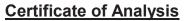
Steven Tosh, Operations Manager

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Client:	Kollaard Associates Inc. 210 Prescott St., Box 189 Kemptville, ON K0G 1J0	Report Number: Date Submitted: Date Reported: Project:	1952957 2021-05-11 2021-05-13 210064	
Attention: PO#: Invoice to:	Ms. Colleen Vermeersch Kollaard Associates Inc.	COC #:	873496	

				Lab I.D. Sample Matrix Sample Type Sampling Date Sample I.D.	1556225 Water 2021-05-10 TW2-3 hrs	1556226 Water 2021-05-10 TW2-6 hrs
Group	Analyte	MRL	Units	Guideline		
Microbiology	Escherichia Coli	0	ct/100mL	MAC 0	0	0
	Faecal Coliforms	0	ct/100mL		0	0
	Heterotrophic Plate Count	0	ct/1mL		3	5
	Total Coliforms	0	ct/100mL	MAC 0	0	0

Guideline = ODWSOG

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\* = Guideline Exceedence

Results relate only to the parameters tested on the samples submitted. **Analytical Method: AMBCOLM1** additional QA/QC information available on request.

## **Environment Testing**

CI	lient:	Kollaard Associates Inc.		Report Number:	1952723	
		210 Prescott St., Box 189		Date Submitted:	2021-05-06	
		Kemptville, ON		Date Reported:	2021-05-13	
		K0G 1J0		Project:	210064	
At	tention:	Ms. Colleen Vermeersch		COC #:	873355	
P	O#:					
In	voice to:	Kollaard Associates Inc.	Page 1 of 8			

### Dear Colleen Vermeersch:

Please find attached the analytical results for your samples. If you have any questions regarding this report, please do not hesitate to call (613-727-5692).

Report Comments:

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Addrine Thomas 2021.05.13 15:56:08 -04'00'

APPROVAL:

Addrine Thomas, Inorganics Supervisor

All analysis is completed at Eurofins Environment Testing Canada Inc. (Ottawa, Ontario) unless otherwise indicated.

Eurofins Environment Testing Canada Inc. (Ottawa, Ontario) is accredited by CALA, Canadian Association for Laboratory Accreditation to ISO/IEC 17025 for tests which appear on the scope of accreditation. The scope is available at: <u>http://www.cala.ca/scopes/2602.pdf</u>.

Eurofins Environment Testing Canada Inc. (Ottawa, Ontario) is licensed by the Ontario Ministry of the Environment, Conservation, and Parks (MECP) for specific tests in drinking water (license #2318). A copy of the license is available upon request.

Eurofins Environment Testing Canada Inc. (Ottawa, Ontario) is accredited by the Ontario Ministry of Agriculture, Food, and Rural Affairs for specific tests in agricultural soils.



## **Environment Testing**

Client:	Kollaard Associates Inc.
	210 Prescott St., Box 189
	Kemptville, ON
	K0G 1J0
Attention:	Ms. Colleen Vermeersch
PO#:	
Invoice to	Kollaard Associates Inc.

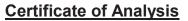
Report Number:	1952723
Date Submitted:	2021-05-06
Date Reported:	2021-05-13
Project:	210064
COC #:	873355

				Lab I.D. Sample Matrix Sample Type Sampling Date Sample I.D.	1555611 Water 2021-05-05 TW#3-3 hr	1555612 Water 2021-05-05 TW#3-6 hr
Group	Analyte	MRL	Units	Guideline		
Anions	Cl	1	mg/L	AO 250	167	173
	F	0.10	mg/L	MAC 1.5	0.17	0.16
	N-NO2	0.10	mg/L	MAC 1.0	<0.10	<0.10
	N-NO3	0.10	mg/L	MAC 10.0	<0.10	<0.10
	SO4	1	mg/L	AO 500	49	50
General Chemistry	Alkalinity as CaCO3	5	mg/L	OG 500	154	157
	Colour	2	TCU		<2	2
	Conductivity	5	uS/cm		879	916
	DOC	0.5	mg/L	AO 5	1.9	1.9
	рН	1.00		6.5-8.5	8.01	8.08
	S2-	0.01	mg/L	AO 0.05	<0.01	<0.01
	TDS (COND - CALC)	1	mg/L	AO 500	571*	595*
	Turbidity	0.1	NTU	AO 5.0	3.2	1.5
Hardness	Hardness as CaCO3	1	mg/L	OG 100	298*	310*
Indices/Calc	Ion Balance	0.01			1.00	1.02
Metals	Al	0.01	mg/L	OG 0.1	<0.01	<0.01
	As	0.001	mg/L	IMAC 0.01	<0.001	<0.001
	В	0.01	mg/L	IMAC 5.0	0.06	0.06
	Ва	0.01	mg/L	MAC 1.0	0.32	0.33
	Са	1	mg/L		65	68
	Cd	0.0001	mg/L	MAC 0.005	<0.0001	<0.0001
	Со	0.0002	mg/L		<0.0002	<0.0002
	Cr	0.001	mg/L	MAC 0.05	<0.001	<0.001
	Cu	0.001	mg/L	AO 1.0	<0.001	<0.001
	Fe	0.03	mg/L	AO 0.3	0.54*	0.21

#### Guideline = ODWSOG

#### \* = Guideline Exceedence

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Client:	Kollaard Associates Inc.	Report Number:	1952723	
	210 Prescott St., Box 189	Date Submitted:	2021-05-06	
	Kemptville, ON	Date Reported:	2021-05-13	
	K0G 1J0	Project	210064	
Attention:	Ms. Colleen Vermeersch	COC #:	873355	
PO#:				
Invoice to:	Kollaard Associates Inc.			

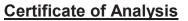
Group	Angluta	MRL	Units	Lab I.D. Sample Matrix Sample Type Sampling Date Sample I.D. Guideline	1555611 Water 2021-05-05 TW#3-3 hr	1555612 Water 2021-05-05 TW#3-6 hr
Group Metals	Analyte	0.0001			<0.0001	<0.0001
ivietais	Hg		mg/L	MAC 0.001		
	K	1	mg/L		4	4
	Mg	1	mg/L		33	34
	Mn	0.01	mg/L	AO 0.05	0.01	0.01
	Na	2	mg/L	AO 200	64	67
	Pb	0.001	mg/L	MAC 0.010	<0.001	<0.001
	Sb	0.0005	mg/L	IMAC 0.006	<0.0005	<0.0005
	Se	0.001	mg/L	MAC 0.05	<0.001	<0.001
	Sr	0.001	mg/L		0.662	0.677
	U	0.001	mg/L	MAC 0.02	<0.001	<0.001
	V	0.001	mg/L		<0.001	<0.001
	Zn	0.01	mg/L	AO 5.0	<0.01	<0.01
Nutrients	N-NH3	0.010	mg/L		0.171	0.168
	Total Kjeldahl Nitrogen	0.100	mg/L		0.184	0.337
Subcontract	Phenols	0.001	mg/L		<0.0010	<0.0010
	Tannin & Lignin	0.1	mg/L		0.7	0.6

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	K0G 1J0		
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Report Number:	1952723
Date Submitted:	2021-05-06
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Project:	210064
COC #:	873355

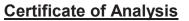
#### QC Summary

Ar	nalyte	Blank	QC % Rec	QC Limits
Run No 400186 Method C SM2130B	Analysis/Extraction Date 20	)21-05-07 <b>An</b> a	alyst KB	
Turbidity		<0.1 NTU	101	70-130
Run No 400216 Method C SM4500-S2	Analysis/Extraction Date 20 2-D	021-05-07 <b>An</b> a	alyst AET	
S2-		<0.01 mg/L	82	80-120
Run No 400254 Method EPA 351.2	Analysis/Extraction Date 20	)21-05-07 <b>An</b> a	alyst SKH	
Total Kjeldahl Niti	rogen	<0.100 mg/L	101	70-130
Run No 400261 Method SM 5310B	Analysis/Extraction Date 20	)21-05-07 <b>An</b> a	alyst SWS	
DOC		<0.5 mg/L	89	80-120
Run No 400292 Method M SM3120B-3	Analysis/Extraction Date 20 3500C	)21-05-10 <b>An</b> a	alyst ZS	
Calcium		<1 mg/L	105	90-110
Potassium		<1 mg/L	106	87-113
Magnesium		<1 mg/L	103	76-124
Sodium		<2 mg/L	106	82-118

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Date Submitted:	2021-05-06
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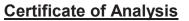
#### QC Summary

Analyte		Blank	Blank QC % Rec	
Run No         400294           Method         EPA 200.8	Analysis/Extraction Date 20	21-05-10 <b>Ana</b>	ll <b>yst</b> SKH	
Aluminum		<0.01 mg/L	100	80-120
Arsenic		<0.001 mg/L	97	80-120
Boron (total)		<0.01 mg/L	103	80-120
Cobalt		<0.0002 mg/L	100	80-120
Chromium Total		<0.001 mg/L	99	80-120
Copper		<0.001 mg/L	100	80-120
Iron		<0.03 mg/L	96	80-120
Manganese		<0.01 mg/L	98	80-120
Selenium		<0.001 mg/L	92	80-120
Vanadium		<0.001 mg/L	100	80-120
Zinc		<0.01 mg/L	99	80-120
Run No 400341 Method EPA 350.1	Analysis/Extraction Date 20	21-05-10 <b>Ana</b>	il <b>yst</b> SKH	
N-NH3		<0.010 mg/L	108	80-120
Run No         400382           Method         C SM2120C	Analysis/Extraction Date 20	21-05-11 <b>Ana</b>	ilyst KB	
Colour		<2 TCU	82	90-110

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Client:	Kollaard Associates Inc.		
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PO#:			
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Report Number:	1952723
Date Submitted:	2021-05-06
Date Reported:	2021-05-13
Project:	210064
COC #:	873355

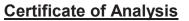
#### QC Summary

Analyte	Blank	QC % Rec	QC Limits
Run No         400384         Analysis/Extraction Date         2           Method         EPA 200.8	2021-05-11 <b>Ana</b>	ilyst SKH	
Barium	<0.01 mg/L	94	80-120
Cadmium	<0.0001 mg/L	99	80-120
Mercury	<0.0001 mg/L	91	80-120
Lead	<0.001 mg/L	105	80-120
Antimony	<0.0005 mg/L	100	80-120
Strontium	<0.001 mg/L	93	80-120
Uranium	<0.001 mg/L	105	80-120
Run No400405Analysis/Extraction DateMethodEPA 351.2	2021-05-11 Ana	l <b>lyst</b> SKH	
Total Kjeldahl Nitrogen	<0.100 mg/L	130	70-130
Run No400415Analysis/Extraction DateMethodSM 4110	2021-05-12 <b>Ana</b>	ilyst AET	
N-NO2	<0.10 mg/L	99	90-110
N-NO3	<0.10 mg/L	101	90-110
SO4	<1 mg/L	95	90-110
Run No     400418     Analysis/Extraction Date       Method     C SM4500-FC	2021-05-11 Ana	llyst SWS	

#### Guideline = ODWSOG

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Client:	Kollaard Associates Inc.		
	210 Prescott St., Box 189		
	Kemptville, ON		
	K0G 1J0		
Attention:	Ms. Colleen Vermeersch		
PO#:			
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1952723
2021-05-06
2021-05-13
210064
873355

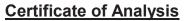
#### QC Summary

Analyte	Blank	QC % Rec	QC Limits
F	<0.10 mg/L	94	90-110
Run No         400423         Analysis/Extraction Date         20           Method         SUBCONTRACT-A	021-05-10 <b>Ana</b>	ilyst AET	
Phenols	<0.0010 mg/L	101	
Tannin & Lignin	<0.10 mg/L	100	
Run No         400441         Analysis/Extraction Date         20           Method         C SM2510B	021-05-11 <b>Ana</b>	ilyst SWS	
Conductivity	<5 uS/cm	99	95-105
Run No         400442         Analysis/Extraction Date         24           Method         SM2320,2510,4500H/F	021-05-11 <b>Ana</b>	ilyst SWS	
рН	5.85	100	90-110
Run No         400451         Analysis/Extraction Date         20           Method         SM 2320B         SM 2320B <t< th=""><th>021-05-11 <b>Ana</b></th><th>ilyst SWS</th><th></th></t<>	021-05-11 <b>Ana</b>	ilyst SWS	
Alkalinity (CaCO3)	<5 mg/L	100	95-105
Run No         400525         Analysis/Extraction Date         20           Method         SM 4110	021-05-13 <b>Ana</b>	ilyst AET	
Chloride	<1 mg/L	100	90-110
Run No         400544         Analysis/Extraction Date         24           Method         C SM2340B	021-05-13 <b>Ana</b>	ilyst AET	

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Client:	Kollaard Associates Inc.
	210 Prescott St., Box 189
	Kemptville, ON
	K0G 1J0
Attention:	Ms. Colleen Vermeersch
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Report Number:	1952723
Date Submitted:	2021-05-06
Date Reported:	2021-05-13
Project:	210064
COC #:	873355

#### QC Summary

Analyte	Blank	QC % Rec	QC Limits
Hardness as CaCO3			
lon Balance			
TDS (COND - CALC)			

Guideline = ODWSOG

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# eurofins

#### **Certificate of Analysis**

# Environment Testing

Client: Attention: PO#:	Kollaard Associates Inc. 210 Prescott St., Box 189 Kemptville, ON K0G 1J0 Ms. Colleen Vermeersch		Report Number: Date Submitted: Date Reported: Project: COC #:	1952724 2021-05-06 2021-05-09 210064 873355	
Invoice to:	Kollaard Associates Inc.	Page 1 of 2			

#### Dear Colleen Vermeersch:

Please find attached the analytical results for your samples. If you have any questions regarding this report, please do not hesitate to call (613-727-5692).

Report Comments:

	Dragana
Magaia Addtorre	Dzeletovic
magaier manual	2021.05.09
	10:54:46 -04'00'

APPROVAL:

Dragana Dzeletovic-Andric, Microbiology Team Lead

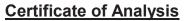
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Eurofins Environment Testing Canada Inc. (Ottawa, Ontario) is accredited by the Ontario Ministry of Agriculture, Food, and Rural Affairs for specific tests in agricultural soils.

Please note: Field data, where presented on the report, has been provided by the client and is presented for informational purposes only. Guideline values listed on this report are provided for ease of use (informational purposes) only. Eurofins recommends consulting the official provincial or federal guideline as required. Unless otherwise stated, measurement uncertainty is not taken into account when determining guideline or regulatory exceedances.



Client:	Kollaard Associates Inc.	Report Number:	1952724
	210 Prescott St., Box 189	Date Submitted:	2021-05-06
	Kemptville, ON	Date Reported:	2021-05-09
	KOG 1J0	Project:	210064
Attention:	Ms. Colleen Vermeersch	COC #:	873355
PO#:			
Invoice to:	Kollaard Associates Inc.		

				Lab I.D. Sample Matrix Sample Type Sampling Date Sample I.D.	1555613 Water 2021-05-05 TW#3-3 hr	1555614 Water 2021-05-05 TW#3-6 hr
Group	Analyte	MRL	Units	Guideline		
Microbiology	Escherichia Coli	0	ct/100mL	MAC 0	0	0
	Faecal Coliforms	0	ct/100mL		0	0
	Heterotrophic Plate Count	0	ct/1mL		0	1
	Total Coliforms	0	ct/100mL	MAC 0	0	0

Guideline = ODWSOG

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Results relate only to the parameters tested on the samples submitted. **Analytical Method: AMBCOLM1** additional QA/QC information available on request.



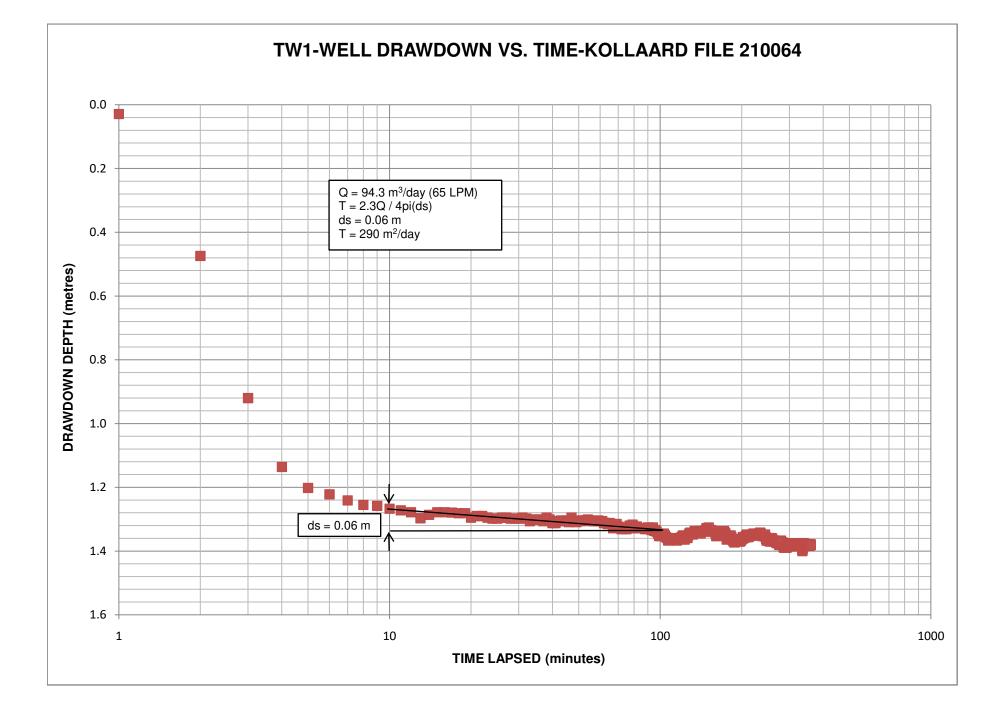
## ATTACHMENT G

# RESULTS OF LABORATORY TESTING OF EXISTING NEIGHBOURING WELL WATER SAMPLES



## ATTACHMENT H

#### PUMPING TEST DATA FOR TW1



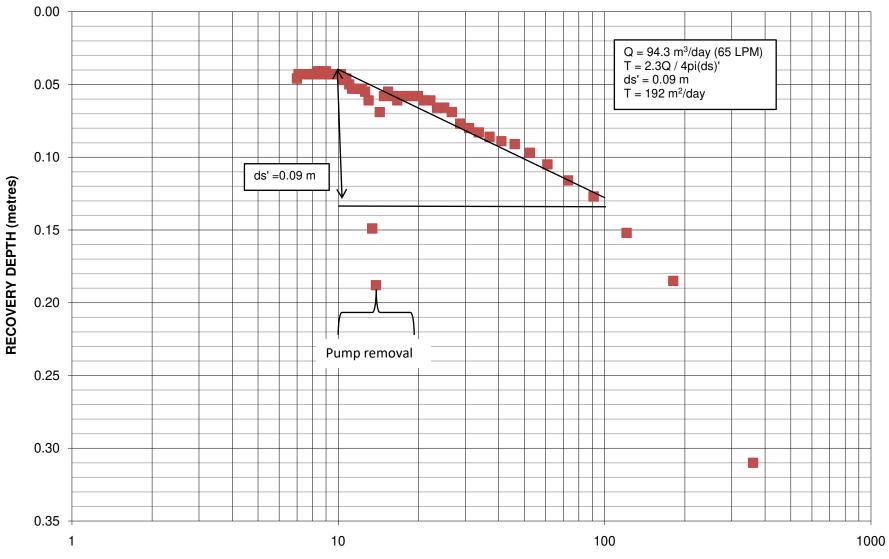
Kollaard File 210064	Pump Rate	65.5	litres/minute
DRAWDOWN DATA TW	V1		

Time Lapsed	Abs Pres	Temp	Water Level	Drawdown
(minutes)	(kPa)	(°C)	(m)	(m)
0 1	388.094 387.814	8.382 8.282	-6.86 -6.889	0.00 0.03
2	383.442	8.282	-7.334	0.03
3	379.072	8.282	-7.78	0.92
4	376.956	8.282	-7.996	1.14
5	376.305 376.115	8.282 8.282	-8.062 -8.082	1.20 1.22
7	375.925	8.282	-8.101	1.24
8	375.789	8.282	-8.115	1.26
9	375.754	8.182	-8.118	1.26
10 11	375.672 375.618	8.182 8.182	-8.127 -8.132	1.27 1.27
12	375.564	8.182	-8.132	1.27
13	375.374	8.182	-8.157	1.30
14	375.483	8.182	-8.146	1.29
15 16	375.564 375.564	8.182 8.182	-8.138 -8.138	1.28 1.28
17	375.555	8.082	-8.139	1.28
18	375.528	8.082	-8.141	1.28
19	375.528	8.082	-8.141	1.28
20 21	375.393 375.447	8.082 8.082	-8.155 -8.15	1.30 1.29
22	375.447	8.082	-8.15	1.29
23	375.393	8.082	-8.155	1.30
24	375.366	8.082	-8.158	1.30
25 26	375.366 375.393	8.082 8.082	-8.158 -8.155	1.30 1.30
26	375.393 375.393	8.082	-8.155 -8.155	1.30
28	375.366	8.082	-8.158	1.30
29	375.366	8.082	-8.158	1.30
30 31	375.366	8.082 8.082	-8.158	1.30
31	375.393 375.366	8.082	-8.155 -8.158	1.30 1.30
33	375.284	8.082	-8.166	1.31
34	375.338	8.082	-8.161	1.30
35	375.338 375.338	8.082 8.082	-8.161 -8.161	1.30 1.30
36 37	375.284	8.082	-8.161	1.30
38	375.393	8.082	-8.155	1.30
39	375.338	8.082	-8.161	1.30
40 41	375.23 375.23	8.082 8.082	-8.172 -8.172	1.31 1.31
41 42	375.284	8.082	-8.172	1.31
43	375.311	8.082	-8.164	1.30
44	375.284	8.082	-8.166	1.31
45 46	375.311	8.082	-8.164	1.30
40	375.257 375.393	8.082 8.082	-8.169 -8.155	1.31 1.30
48	375.284	8.082	-8.166	1.31
49	375.257	8.082	-8.169	1.31
50	375.311 375.284	8.082	-8.164	1.30
51 52	375.284	8.082 8.082	-8.166 -8.164	1.31 1.30
53	375.311	8.082	-8.164	1.30
54	375.338	8.082	-8.161	1.30
55	375.311	8.082	-8.164	1.30
56 57	375.284 375.284	8.082 8.082	-8.166 -8.166	1.31 1.31
58	375.284	8.082	-8.166	1.31
59	375.311	8.082	-8.164	1.30
60 61	375.284	8.082	-8.166	1.31
61 62	375.284 375.23	8.082 8.082	-8.166 -8.172	1.31 1.31
63	375.23	8.082	-8.172	1.31
64	375.203	8.082	-8.175	1.32
65	375.23	8.082	-8.172	1.31
66 67	375.203 375.067	8.082 8.082	-8.175 -8.188	1.32 1.33
68	375.176	8.082	-8.177	1.33
69	375.203	8.082	-8.175	1.32
70	375.121	8.082	-8.183	1.32
71 72	375.067 375.04	8.082 8.082	-8.188 -8.191	1.33 1.33
72	375.094	8.082	-8.131	1.33
74	375.094	8.082	-8.186	1.33
75	375.04	8.082	-8.191	1.33
76 77	375.067 375.149	8.082 8.082	-8.188 -8.18	1.33 1.32
78	375.149	8.082	-8.18	1.32
79	375.176	8.082	-8.177	1.32
80	375.121	8.082	-8.183	1.32
81	375.067 375.121	8.082 8.082	-8.188	1.33
82 83	375.067	8.082	-8.183 -8.188	1.32 1.33
84	375.067	8.082	-8.188	1.33
85	375.067	8.082	-8.188	1.33
86	375.067	8.082	-8.188	1.33

87	375.067	8.082	-8.188	1.33
88	375.04	8.082	-8.191	1.33
89	375.067	8.082	-8.188	1.33
90	375.094	8.082	-8.186	1.33
91				
	375.094	8.082	-8.186	1.33
92	375.04	8.082	-8.191	1.33
93	375.013	8.082	-8.194	1.33
94	375.094	8.082	-8.186	1.33
95	374.986	8.082	-8.197	1.34
96	375.013	8.082	-8.194	1.33
97	374.959	8.082	-8.199	1.34
98	374.904	8.082	-8.205	1.35
99	374.823	8.082	-8.213	1.35
100	374.85	8.082	-8.211	1.35
101	374.823	8.082	-8.213	1.35
102	374.85	8.082	-8.211	1.35
103	374.904	8.082	-8.205	1.35
104	374.85	8.082	-8.211	1.35
105	374.796	8.082	-8.216	1.36
106	374.769	8.082	-8.219	1.36
107	374.688	8.082	-8.227	1.37
108	374.742	8.082	-8.222	1.36
	374.715	8.082	-8.224	1.36
109				
110	374.715	8.082	-8.224	1.36
111	374.715	8.082	-8.224	1.36
112	374.715	8.082	-8.224	1.36
113	374.742	8.082	-8.222	1.36
114	374.769	8.082	-8.219	1.36
115	374.688	8.082	-8.227	1.37
116	374,715	8.082	-8.224	1.36
117	374.742	8.082	-8.222	1.36
118	374.769	8.082	-8.219	1.36
119	374.769	8.082	-8.219	1.36
120	374.796	8.082	-8.216	1.36
121	374.85	8.082	-8.211	1.35
122	374.85	8.082	-8.211	1.35
123	374.715	8.082	-8.224	1.36
124	374.769	8.082	-8.219	1.36
125	374.796	8.082	-8.216	1.36
126	374.769	8.082	-8.219	1.36
127	374.85	8.082	-8.211	1.35
128	374.904	8.082	-8.205	1.35
129	374.932	8.082	-8.202	1.34
130	374.904	8.082	-8.205	1.35
131	374.904	8.082	-8.205	1.35
132	374.877	8.082	-8.208	1.35
133	374.932	8.082	-8.202	1.34
134	374.986	8.082	-8.197	1.34
	374.959	8.082	-8.199	1.34
135				
136	374.932	8.082	-8.202	1.34
137	374.932	8.082	-8.202	1.34
138	374.932	8.082	-8.202	1.34
139	374.932	8.082	-8.202	1.34
140	374.986	8.082	-8.197	1.34
141	374.904	8.082	-8.205	1.35
142	374.986	8.082	-8.197	1.34
143				
	374.959	8.082	-8.199	1.34
144	374.959	8.082	-8.199	1.34
145	374.986	8.082	-8.197	1.34
146	374.986	8.082	-8.197	1.34
147	375.013	8.082	-8.194	1.33
148	375.067	8.082	-8.188	1.33
149	374.986	8.082	-8.197	1.34
150	375.04	8.082	-8.191	1.33
151	375.094	8.082	-8.186	1.33
152	374.986	8.082	-8.197	1.34
153	374.959	8.082	-8.199	1.34
154	375.013	8.082	-8.194	1.33
155	374.986	8.082	-8.197	1.34
156	374.959	8.082	-8.199	1.34
157	374.959	8.082	-8.199	1.34
158	374.986	8.082	-8.197	1.34
159	374.986	8.082	-8.197	1.34
160	374.904	8.082	-8.205	1.35
161	374.823	8.082	-8.213	1.35
162	374.823	8.082	-8.213	1.35
163	374.904	8.082	-8.205	1.35
164	374.85	8.082	-8.211	1.35
165	374.877	8.082	-8.208	1.35
166	374.877	8.082	-8.208	1.35
167	374.877	8.082	-8.208	1.35
168	374.904	8.082	-8.205	1.35
169	374.932	8.082	-8.202	1.34
170	374.877	8.082	-8.208	1.35
170	374.959	8.082	-8.199	1.34
172	374.986	8.082	-8.197	1.34
173	374.932	8.082	-8.202	1.34
174	374.904	8.082	-8.205	1.35
175	374.85	8.082	-8.211	1.35
176	374.715	8.082	-8.224	1.36
177	374.769	8.082	-8.219	1.36
178	374.796	8.082	-8.216	1.36
179	374.796	8.082	-8.216	1.36
		5.002	0.210	1.50

180	374.85	8.082	-8.211	1.25
				1.35
181	374.823	8.082	-8.213	1.35
182	374.85	8.082	-8.211	1.35
183	374.796	8.082	-8.216	1.36
184	374.715	8.082	-8.224	1.36
185	374.742	8.082	-8.222	1.36
186	374.688	8.082	-8.227	
			-	1.37
187	374.66	8.082	-8.23	1.37
188	374.633	8.082	-8.233	1.37
189	374.66	8.082	-8.23	1.37
190	374.715	8.082	-8.224	1.36
191	374.688	8.082	-8.227	1.37
192	374.688	8.082	-8.227	1.37
193	374.715	8.082	-8.224	1.36
194	374.66	8.082	-8.23	1.37
195	374.742	8.082	-8.222	1.36
196	374.66	8.082	-8.23	1.37
197	374.66	8.082	-8.23	1.37
198	374.688	8.082	-8.227	1.37
199	374.688	8.082	-8.227	1.37
200	374.742	8.082	-8.222	1.36
201	374.742	8.082	-8.222	1.36
202	374.796	8.082	-8.216	1.36
203	374.769	8.082	-8.219	1.36
204	374.769	8.082	-8.219	1.36
205	374.796	8.082	-8.216	1.36
206	374.796	8.082	-8.216	1.36
207	374.823	8.082	-8.213	1.35
208	374.85	8.082	-8.211	1.35
209	374.877	8.082	-8.208	1.35
210	374.796	8.082	-8.216	1.36
211	374.796	8.082	-8.216	1.36
212	374.796	8.082	-8.216	1.36
213	374.85	8.082	-8.211	1.35
214	374.823	8.082	-8.213	1.35
215	374.85	8.082	-8.211	1.35
216	374.85	8.082	-8.211	1.35
217	374.85	8.082	-8.211	1.35
	374.877	8.082		
218			-8.208	1.35
219	374.85	8.082	-8.211	1.35
220	374.85	8.082	-8.211	1.35
221	374.904	8.082	-8.205	1.35
222	374.904	8.082	-8.205	1.35
223	374.85	8.082	-8.211	1.35
224	374.877	8.082	-8.208	1.35
225	374.877	8.082	-8.208	1.35
226	374.877	8.082	-8.208	1.35
227	374.877	8.082	-8.208	1.35
228	374.877	8.082	-8.208	1.35
229	374.904	8.082	-8.205	1.35
230	374.877	8.082	-8.208	1.35
231	374.85	8.082	-8.211	1.35
232	374.877	8.082	-8.208	1.35
233	374.85	8.082	-8.211	1.35
234	374.932	8.082	-8.202	1.34
235	374.904	8.082	-8.205	1.35
236	374.877	8.082	-8.208	1.35
237	374.85	8.082	-8.211	1.35
238	374.823	8.082	-8.213	1.35
239	374.85	8.082	-8.211	1.35
240	374.823	8.082	-8.213	1.35
241	374.85	8.082	-8.211	1.35
242	374.85	8.082	-8.211	1.35
243	374.85	8.082	-8.211	1.35
244	374.877	8.082	-8.208	1.35
245	374.796	8.082	-8.216	1.36
246	374.742	8.082	-8.222	1.36
247	374.688	8.082	-8.227	1.37
248	374.742	8.082	-8.222	1.36
249	374.688	8.082	-8.227	1.37
250	374.688	8.082	-8.227	1.37
251	374.688	8.082	-8.227	1.37
252	374.742	8.082	-8.222	1.36
253	374.742	8.082	-8.222	1.36
254	374.66	8.082	-8.23	1.37
255	374,715	8.082	-8.224	1.36
256	374.66	8.082	-8.23	1.37
257	374.715	8.082	-8.224	1.36
258	374.769	8.082	-8.219	1.36
259	374.742	8.082	-8.222	1.36
260	374.715	8.082	-8.224	1.36
261	374.688	8.082	-8.227	1.37
262	374.66	8.082	-8.23	1.37
263	374.66	8.082	-8.23	1.37
264	374.66	8.082	-8.23	1.37
265	374.66	8.082	-8.23	1.37
266	374.688	8.082	-8.227	1.37
267	374.688	8.082	-8.227	1.37
268	374.633	8.082	-8.233	1.37
269	374.66	8.082	-8.23	1.37
270	374.606	8.082	-8.235	1.38
271	374.606	8.082	-8.235	1.38
272	374.633	8.082	-8.233	1.37
-				

273	374.606	8.082	-8.235	1.38
274	374.633	8.082	-8.233	1.37
275	374.552	8.082	-8.241	1.38
276	374.606	8.082	-8.235	1.38
277	374.688	8.082	-8.227	1.37
278	374.66	8.082	-8.23	1.37
279	374.688	8.082	-8.227	1.37
280	374.66	8.082	-8.23	1.37
281	374.633	8.082	-8.233	1.37
282	374.606	8.082	-8.235	1.38
283	374.606	8.082	-8.235	1.38
284	374.633	8.082	-8.233	1.37
285	374.498	8.082	-8.246	1.39
286	374.471	8.082	-8.249	1.39
287	374.471	8.082	-8.249	1.39
288	374.498	8.082	-8.246	1.39
289	374.498	8.082	-8.246	1.39
290	374.498	8.082	-8.246	1.39
291	374.471	8.082	-8.249	1.39
292	374.471	8.082	-8.249	1.39
293	374.471	8.082	-8.249	1.39
294	374.498	8.082	-8.246	1.39
295	374.525	8.082	-8.244	1.38
296	374.552	8.082	-8.241	1.38
297	374.552	8.082	-8.241	1.38
298	374.552	8.082	-8.241	1.38
299	374.552	8.082	-8.241	1.38
300	374.606	8.082	-8.235	1.38
301	374.552	8.082	-8.241	1.38
302	374.552	8.082	-8.241	1.38
303	374.579	8.082	-8.238	1.38
304	374.552	8.082	-8.241	1.38
305	374.498	8.082	-8.246	1.39
306	374.552	8.082	-8.241	1.38
307	374.552	8.082	-8.241	1.38
308	374.579	8.082	-8.238	1.38
309	374.552	8.082	-8.241	1.38
310	374.525	8.082	-8.244	1.38
			-8.244	1.38
311	374.525	8.082		
312	374.552	8.082	-8.241	1.38
313	374.579	8.082	-8.238	1.38
314	374.552	8.082	-8.241	1.38
315	374.579	8.082	-8.238	1.38
316	374.606	8.082	-8.235	1.38
317	374.525		-8.244	1.38
		8.082		
318	374.579	8.082	-8.238	1.38
319	374.525	8.082	-8.244	1.38
320	374.552	8.082	-8.241	1.38
321	374.552	8.082	-8.241	1.38
322	374.579	8.082	-8.238	1.38
323	374.552	8.082	-8.241	1.38
324	374.579	8.082	-8.238	1.38
325	374.579	8.082	-8.238	1.38
326	374.525	8.082	-8.244	1.38
327	374.606	8.082	-8.235	1.38
328	374.552	8.082	-8.241	1.38
329	374.579	8.082	-8.238	1.38
330	374.525	8.082	-8.244	1.38
331	374.579	8.082	-8.238	1.38
332	374.579	8.082	-8.238	1.38
333	374.579	8.082	-8.238	1.56
555	57 11552	0.002	0.2.12	1.50
334	374.416	8.082	-8.255	1.40
335	374.362	8.082	-8.26	1.40
336	374.416	8.082	-8,255	1.40
337	374.471	8.082	-8.249	1.39
338	374.498	8.082	-8.246	1.39
339	374.606	8.082	-8.235	1.38
340	374.579	8.082	-8.238	1.38
341	374.579	8.082	-8.238	1.38
342	374.552	8.082	-8.241	1.38
343	374.579	8.082	-8.238	1.38
344	374.552	8.082	-8.241	1.38
345	374.525	8.082	-8.244	1.38
346	374.525	8.082	-8.244	1.38
347	374.552	8.082	-8.241	1.38
348	374.579	8.082	-8.238	1.38
349	374.579	8.082	-8.238	1.38
350	374.579	8.082	-8.238	1.38
351	374.579	8.082	-8.238	1.38
352	374.579	8.082	-8.238	1.38
353	374.579	8.082	-8.238	1.38
354	374.579	8.082	-8.238	1.38
355	374.552	8.082	-8.241	1.38
356	374.525	8.082	-8.244	1.38
357	374.579	8.082	-8.238	1.38
358	374.552	8.082	-8.241	1.38
359	374.579	8.082	-8.238	1.38
360	374.552	8.082	-8.241	1.38



## TW1- WELL RECOVERY VS. TIME - KOLLAARD FILE 210064

t/t' (ratio)

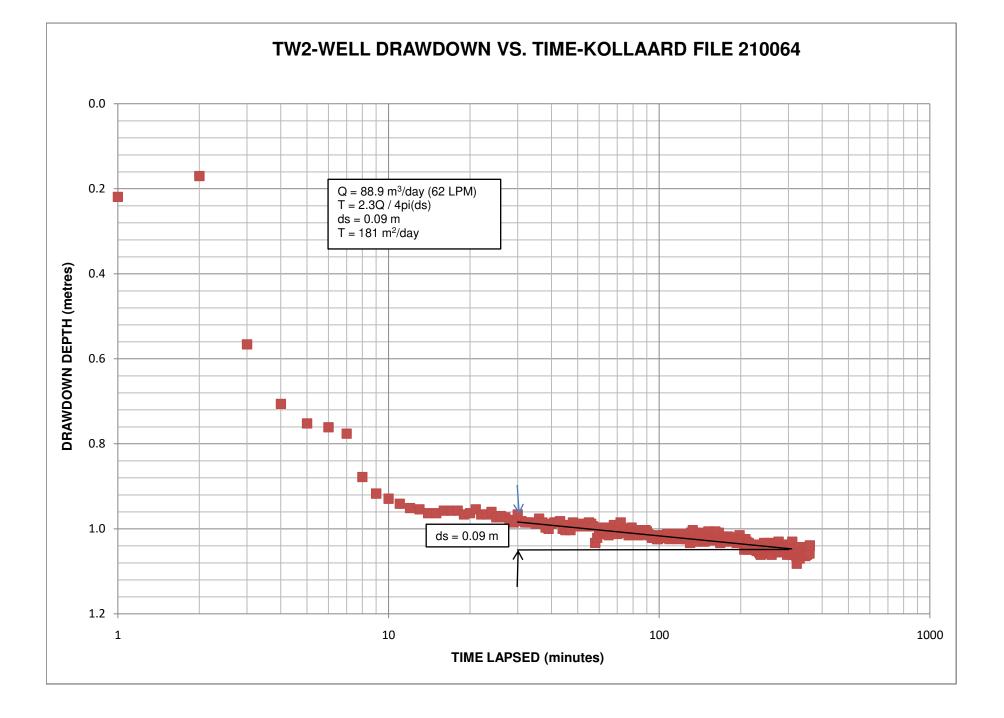
#### Kollaard File 210064 RECOVERY DATA TW-1

ť	t / t'	Abs Pres	Temp	Water Level	Drawdown	Recovery
		(kPa)	(°C)	(m)	(m)	(%)
1	361	385.053	8.082	-7.17	0.31	78%
2	181.0	386.275	8.082	-7.045	0.19	87%
3	121.0	386.601	8.082	-7.012	0.15	89%
4	91.0	386.846	8.082	-6.987	0.13	91%
5	73.0	386.954	8.082	-6.976	0.12	92%
6	61.0	387.063	8.082	-6.965	0.11	92%
7	52.4	387.144	8.082	-6.957	0.10	93%
8	46.0	387.199	8.082	-6.951	0.09	93%
9	41.0	387.226	8.082	-6.949	0.09	94%
10	37.0	387.253	8.082	-6.946	0.09	94%
11	33.7	387.28	8.082	-6.943	0.08	94%
12	31.0	387.307	8.082	-6.94	0.08	94%
13	28.7	387.335	8.082	-6.937	0.08	94%
14	26.7	387.416	8.082	-6.929	0.07	95%
15	25.0	387.443	8.082	-6.926	0.07	95%
16	23.5	387.443	8.082	-6.926	0.07	95%
17	22.2	387.498	8.082	-6.921	0.06	96%
18	21.0	387.498	8.082	-6.921	0.06	96%
19	19.9	387.525	8.082	-6.918	0.06	96%
20	19.0	387.525	8.082	-6.918	0.06	96%
20	18.1	387.525	8.082	-6.918	0.06	96%
22	17.4	387.525	8.082	-6.918	0.06	96%
23	16.7	387.498	8.082	-6.921	0.06	96%
23	16.0	387.525	8.082	-6.918	0.06	96%
25	15.4	387.552	8.082	-6.915	0.05	96%
26	14.8	387.525	8.082	-6.918	0.06	96%
20	14.3	387.416	8.082	-6.929	0.07	95%
28	13.9	386.248	8.082	-7.048	0.19	86%
29	13.4	386.628	8.082	-7.009	0.15	89%
30	13.4	387.498	8.082	-6.921	0.06	96%
31	12.6	387.552	8.082	-6.915	0.05	96%
32	12.3	387.579	8.082	-6.913	0.05	96%
33	11.9	387.579	8.082	-6.913	0.05	96%
34	11.6	387.579	8.082	-6.913	0.05	96%
35	11.0	387.579	8.082	-6.913	0.05	96%
36	11.0	387.606	8.082	-6.91	0.05	96%
30	10.7	387.642	8.182	-6.906	0.05	97%
38	10.7	387.633	8.082	-6.907	0.05	97%
39	10.5	387.669	8.182	-6.903	0.03	97%
40	10.2	387.669	8.182	-6.903	0.04	97%
	9.8		8.182	-6.903	0.04	97%
41 42	9.8 9.6	387.669 387.669	8.182	-6.903	0.04	97%
42	9.6	387.669	8.182	-6.903	0.04	97% 97%
43 44	9.4 9.2	387.669	8.182	-6.903	0.04	97% 97%
44 45	9.2	387.696	8.182	-6.901	0.04	97%
45 46	9.0 8.8	387.696	8.182	-6.901	0.04	97%
46 47	8.8 8.7	387.669	8.182	-6.901	0.04	97% 97%
47 48	8.7 8.5	387.696	8.182	-6.903	0.04	97% 97%
49	8.3	387.696	8.182	-6.901	0.04	97%
50	8.2	387.669	8.182	-6.903	0.04	97% 07%
51 52	8.1	387.669	8.182	-6.903	0.04	97% 07%
52	7.9	387.669	8.182	-6.903	0.04	97% 07%
53	7.8	387.669	8.182	-6.903	0.04	97%
54	7.7	387.669	8.182	-6.903	0.04	97%
55	7.5	387.669	8.182	-6.903	0.04	97%
56	7.4	387.669	8.182	-6.903	0.04	97%
57	7.3	387.669	8.182	-6.903	0.04	97%
58	7.2	387.669	8.182	-6.903	0.04	97%
59	7.1	387.669	8.182	-6.903	0.04	97%
60	7.0	387.642	8.182	-6.906	0.05	97%



ATTACHMENT I

#### PUMPING TEST DATA FOR TW2



Kollaard File 210064	Pump Rate	61.7	litres/minute
DRAWDOWN DATA TV	V2		

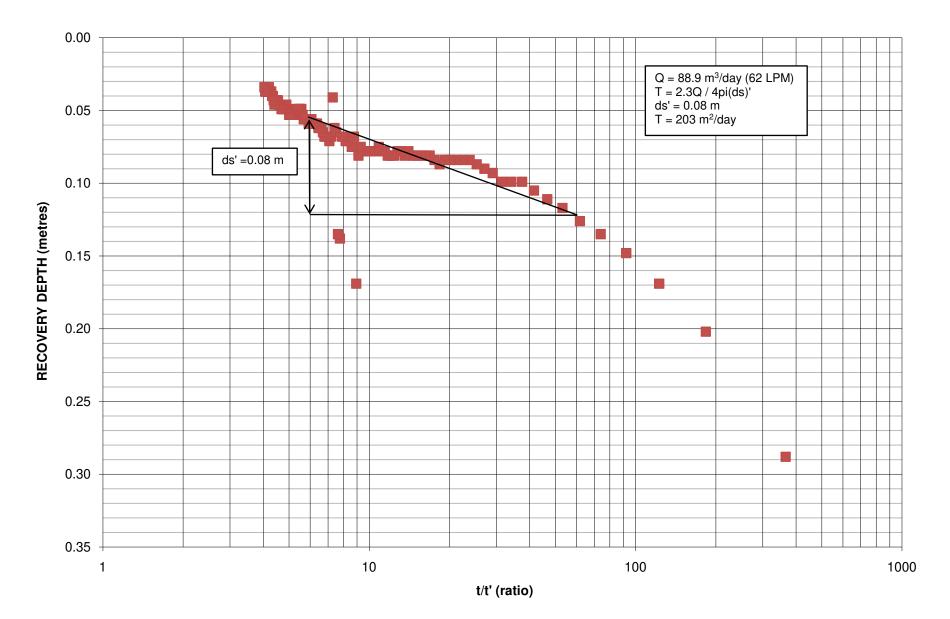
Time Lenged	Aha Duas	Temm	Water Level	Ducund
Time Lapsed (minutes)	Abs Pres (kPa)	Temp (°C)	Water Level (m)	Drawdown (m)
0	392.344	8.182	-6.68	0.00
1	390.194	8.182	-6.899	0.22
2	390.672	8.182	-6.85	0.17
3	386.79	8.182	-7.246	0.57
4 5	385.417 384.969	8.182 8.182	-7.386 -7.432	0.71 0.75
6	384.88	8.182	-7.441	0.76
7	384.73	8.182	-7.456	0.78
8	383.738	8.082	-7.558	0.88
9	383.35	8.082	-7.597	0.92
10 11	383.231 383.112	8.082 8.082	-7.609 -7.621	0.93 0.94
11	383.022	8.082	-7.621	0.94
13	382.992	8.082	-7.634	0.95
14	382.903	8.082	-7.643	0.96
15	382.903	8.082	-7.643	0.96
16	382.962	8.082	-7.637	0.96
17 18	382.955 382.955	7.983 7.983	-7.637 -7.637	0.96 0.96
19	382.866	7.983	-7.646	0.97
20	382.896	7.983	-7.643	0.96
21	382.985	7.983	-7.634	0.95
22	382.866	7.983	-7.646	0.97
23	382.866	7.983	-7.646	0.97
24 25	382.926 382.806	7.983 7.983	-7.64 -7.653	0.96 0.97
25	382.836	7.983	-7.65	0.97
27	382.806	7.983	-7.653	0.97
28	382.746	7.983	-7.659	0.98
29	382.687	7.983	-7.665	0.99
30 31	382.866 382.717	7.983 7.983	-7.646 -7.662	0.97 0.98
32	382.687	7.983	-7.665	0.98
33	382.687	7.983	-7.665	0.99
34	382.687	7.983	-7.665	0.99
35	382.657	7.983	-7.668	0.99
36	382.776	7.983	-7.656	0.98
37	382.687	7.983	-7.665	0.99
38 39	382.567 382.538	7.983 7.983	-7.677 -7.68	1.00 1.00
40	382.657	7.983	-7.668	0.99
41	382.687	7.983	-7.665	0.99
42	382.687	7.983	-7.665	0.99
43	382.717	7.983	-7.662	0.98
44 45	382.538	7.983	-7.68	1.00
45	382.508 382.627	7.983 7.983	-7.683 -7.671	1.00 0.99
40	382.508	7.983	-7.683	1.00
48	382.687	7.983	-7.665	0.99
49	382.597	7.983	-7.674	0.99
50	382.597	7.983	-7.674	0.99
51 52	382.657 382.597	7.983 7.983	-7.668 -7.674	0.99 0.99
53	382.597	7.983	-7.674	0.99
54	382.597	7.983	-7.674	0.99
55	382.687	7.983	-7.665	0.99
56	382.657	7.983	-7.668	0.99
57	382.597	7.983	-7.674	0.99 1.03
58 59	382.209 382.329	7.983 7.983	-7.713 -7.701	1.03 1.02
60	382.418	7.983	-7.692	1.02
61	382.567	7.983	-7.677	1.00
62	382.478	7.983	-7.686	1.01
63	382.508	7.983	-7.683	1.00
64 65	382.567 382.388	7.983 7.983	-7.677 -7.695	1.00 1.02
66	382.388	7.983	-7.695	1.02
67	382.538	7.983	-7.68	1.00
68	382.627	7.983	-7.671	0.99
69	382.508	7.983	-7.683	1.00
70	382.418	7.983	-7.692	1.01
71 72	382.508 382.687	7.983 7.983	-7.683 -7.665	1.00 0.99
73	382.448	7.983	-7.689	1.01
74	382.448	7.983	-7.689	1.01
75	382.508	7.983	-7.683	1.00
76	382.538	7.983	-7.68	1.00
77 78	382.388 382.538	7.983 7.983	-7.695 -7.68	1.02 1.00
78 79	382.538 382.567	7.983	-7.68	1.00
80	382.448	7.983	-7.689	1.01
81	382.478	7.983	-7.686	1.01
82	382.448	7.983	-7.689	1.01
83	382.418	7.983	-7.692	1.01
84 85	382.388 382.508	7.983 7.983	-7.695 -7.683	1.02 1.00
86	382.448	7.983	-7.689	1.01
	-	-	-	

87	382.448	7.983	-7.689	1.01
88	382.418	7.983	-7.692	1.01
89	382.508	7.983	-7.683	1.00
90	382.478	7.983	-7.686	1.01
91				-
	382.418	7.983	-7.692	1.01
92	382.388	7.983	-7.695	1.02
93	382.388	7.983	-7.695	1.02
94	382.329	7.983	-7.701	1.02
			-	
95	382.358	7.983	-7.698	1.02
96	382.329	7.983	-7.701	1.02
97	382.388	7.983	-7.695	1.02
98	382.299	7.983	-7.704	1.02
99	382.299	7.983	-7.704	1.02
100	382.358	7.983	-7.698	1.02
101	382.329	7.983	-7.701	1.02
102	382.358	7.983	-7.698	1.02
103	382.388	7.983	-7.695	1.02
		7.983		1.02
104	382.358		-7.698	
105	382.388	7.983	-7.695	1.02
106	382.388	7.983	-7.695	1.02
107	382.418	7.983	-7.692	1.01
108	382.418	7.983	-7.692	1.01
109	382.299	7.983	-7.704	1.02
110	382.358	7.983	-7.698	1.02
111	382.388	7.983	-7.695	1.02
112	382.418	7.983	-7.692	1.01
113	382.329	7.983	-7.701	1.02
114	382.388	7.983	-7.695	1.02
115	382.388	7.983	-7.695	1.02
116	382.329	7.983	-7.701	1.02
117	382.299	7.983	-7.704	1.02
118	382.329	7.983	-7.701	1.02
119	382.329	7.983	-7.701	1.02
120	382.418	7.983	-7.692	1.01
121	382.388	7.983	-7.695	1.02
122	382.388	7.983	-7.695	1.02
123	382.388	7.983	-7.695	1.02
124	382.388	7.983	-7.695	1.02
125	382.329	7.983	-7.701	1.02
126	382.299	7.983	-7.704	1.02
127	382.299	7.983	-7.704	1.02
128	382.358	7.983	-7.698	1.02
129	382.329	7.983	-7.701	1.02
130	382.209	7.983	-7.713	1.03
131	382.448	7.983	-7.689	1.01
132	382.358	7.983	-7.698	1.02
133	382.508	7.983	-7.683	1.00
134	382.329	7.983	-7.701	1.02
135	382.448	7.983	-7.689	1.01
136	382.358	7.983	-7.698	1.02
137	382.239	7.983	-7.71	1.03
138	382.329	7.983	-7.701	1.02
139	382.358	7.983	-7.698	1.02
140	382.388	7.983	-7.695	1.02
141	382.358	7.983	-7.698	1.02
142	382.418	7.983	-7.692	1.01
143	382.448	7.983		1.01
			-7.689	
144	382.388	7.983	-7.695	1.02
145	382.388	7.983	-7.695	1.02
146	382.329	7.983	-7.701	1.02
			7.74	
147	382.239	7.983	-7.71	1.03
148	382.418	7.983	-7.692	1.01
149	382.269	7.983	-7.707	1.03
150	382.358	7.983	-7.698	1.02
		7.983		
151	382.299		-7.704	1.02
152	382.478	7.983	-7.686	1.01
153	382.448	7.983	-7.689	1.01
154	382.269	7.983	-7.707	1.03
155	382.269	7.983	-7.707	1.03
156	382.358	7.983	-7.698	1.02
157	382.448	7.983	-7.689	1.01
158	382.299	7.983	-7.704	1.02
		7.983		
159	382.388		-7.695	1.02
160	382.299	7.983	-7.704	1.02
161	382.478	7.983	-7.686	1.01
162	382.358	7.983	-7.698	1.02
				-
163	382.388	7.983	-7.695	1.02
164	382.329	7.983	-7.701	1.02
165	382.299	7.983	-7.704	1.02
166	382.448	7.983	-7.689	1.01
167	382.269	7.983	-7.707	1.03
168	382.209	7.983	-7.713	1.03
169	382.269	7.983	-7.707	1.03
170	382.329	7.983	-7.701	1.02
171	382.329	7.983	-7.701	1.02
172	382.358	7.983	-7.698	1.02
173	382.299	7.983	-7.704	1.02
174	382.299	7.983	-7.704	1.02
175	382.299	7.983	-7.704	1.02
176	382.329	7.983	-7.701	1.02
177	382.239	7.983	-7.71	1.03
178	382.329	7.983	-7.701	1.02
179	382.358	7.983	-7.698	1.02
				1.02

100	382.358	7.983	-7.698	1.02
180				
181	382.299	7.983	-7.704	1.02
182	382.329	7.983	-7.701	1.02
183	382.329	7.983	-7.701	1.02
184	382.329	7.983	-7.701	1.02
185	382.299	7.983	-7.704	1.02
	382.269	7.983	-7.707	1.03
186				
187	382.299	7.983	-7.704	1.02
188	382.299	7.983	-7.704	1.02
				-
189	382.269	7.983	-7.707	1.03
190	382.329	7.983	-7.701	1.02
191	382.269	7.983	-7.707	1.03
	382.269			
192		7.983	-7.707	1.03
193	382.209	7.983	-7.713	1.03
194	382.299	7.983	-7.704	1.02
195		7,983		
	382.239		-7.71	1.03
196	382.239	7.983	-7.71	1.03
197	382.239	7.983	-7.71	1.03
198	382.388	7.983	-7.695	1.02
199	382.239	7.983	-7.71	1.03
200	382.299	7.983	-7.704	1.02
201	382.209	7.983	-7.713	1.03
202	382.269	7.983	-7.707	1.03
203	382.239	7.983	-7.71	1.03
204	382.209	7.983	-7.713	1.03
205	382.269	7.983	-7.707	1.03
206	382.06	7.983	-7.729	1.05
			-	
207	382.09	7.983	-7.726	1.05
208	382.299	7.983	-7.704	1.02
209	382.179	7.983	-7.717	1.04
210	382.239	7.983	-7.71	1.03
211	382.179	7.983	-7.717	1.04
212	382,209	7,983	-7.713	1.03
213	382.06	7.983	-7.729	1.05
214	382.209	7.983	-7.713	1.03
215	382.12	7.983	-7.723	1.04
			-	-
216	382.12	7.983	-7.723	1.04
217	382.12	7.983	-7.723	1.04
218	382.179	7.983	-7.717	1.04
219	382.179	7.983	-7.717	1.04
220	382.15	7.983	-7.719	1.04
221	382.15	7.983	-7.719	1.04
222	382.09	7.983	-7.726	1.05
223	382.09	7.983	-7.726	1.05
224	382.09	7.983	-7.726	1.05
225	382.06	7.983	-7.729	1.05
226	382.15	7.983	-7.719	1.04
227	382.06	7.983	-7.729	1.05
	382.09	7.983	-7.726	1.05
228				
229	382.03	7.983	-7.732	1.05
230	382.06	7.983	-7.729	1.05
231	382.03	7.983	-7.732	1.05
232	382.09	7.983	-7.726	1.05
233	382.09	7.983	-7.726	1.05
234	382	7.983	-7.735	1.06
235	382.06	7.983	-7.729	1.05
236	381.971	7.983	-7.738	1.06
237	381.941	7.983	-7.741	1.06
238	382	7.983	-7.735	1.06
239	382.179	7.983	-7.717	1.04
240	382.03	7.983	-7.732	1.05
			-	
241	382.06	7.983	-7.729	1.05
242	382.15	7.983	-7.719	1.04
243	382.09	7.983	-7.726	1.05
243	382.209	7.983	-7.713	1.03
245	382.12	7.983	-7.723	1.04
246	382.12	7.983	-7.723	1.04
247	382.09	7.983	-7.726	1.05
248	382.03	7.983	-7.732	1.05
249	382.03	7.983	-7.732	1.05
250	381.971	7.983	-7.738	1.06
251	382.03	7.983	-7.732	1.05
252	382	7.983	-7.735	1.06
253	381.971	7.983	-7.738	1.06
254	382.03	7.983	-7.732	1.05
255	382.209	7.983	-7.713	1.03
256	382	7.983	-7.735	1.06
257	382.09	7.983	-7.726	1.05
258	382.03	7.983	-7.732	1.05
259	382.03	7.983	-7.732	1.05
260	381.941	7.983	-7.741	1.06
261	382.06	7.983	-7.729	1.05
262	382.06	7.983	-7.729	1.05
263	382.06	7.983	-7.729	1.05
264	382.12	7.983	-7.723	1.04
265	382.06	7.983	-7.729	1.05
266	382.179	7.983	-7.717	1.04
267	382.06	7.983	-7.729	1.05
268	382.03	7.983	-7.732	1.05
269	382.09	7.983	-7.726	1.05
270	382.09	7.983	-7.726	1.05
271	382.179	7.983	-7.717	1.04
272	382.09	7.983	-7.726	1.05
				1.00

273	382.12	7,983	-7.723	1.04
274				
	382.12	7.983	-7.723	1.04
275	382.12	7.983	-7.723	1.04
276	382.239	7.983	-7.71	1.03
	382			
277		7.983	-7.735	1.06
278	382.12	7.983	-7.723	1.04
279	382.15	7.983	-7.719	1.04
280	382	7,983	-7.735	1.06
281	382.12	7.983	-7.723	1.04
282	382.09	7.983	-7.726	1.05
283	382.15	7.983	-7.719	1.04
284	382.09	7.983	-7.726	1.05
285	382	7.983	-7.735	1.06
286	382.06	7.983	-7.729	1.05
287	382.03	7.983	-7.732	1.05
288	382	7.983	-7.735	1.06
289	382.179	7.983	-7.717	1.04
290	382.15	7.983	-7.719	1.04
291	382.12	7.983	-7.723	1.04
292	382.09	7.983	-7.726	1.05
293	382.09	7.983	-7.726	1.05
294	382.09	7.983	-7.726	1.05
295	382	7.983	-7.735	1.06
296	382.09	7.983	-7.726	1.05
297	381.941	7.983	-7.741	1.06
298	382.03	7.983	-7.732	1.05
299	382.12	7.983	-7.723	1.04
300	382.09	7.983	-7.726	1.05
	382.06		-7.729	
301		7.983		1.05
302	382.03	7.983	-7.732	1.05
303	382.06	7.983	-7.729	1.05
304	382	7.983	-7.735	1.06
305	382.03	7.983	-7.732	1.05
306	382.03	7.983	-7.732	1.05
307	382.06	7.983	-7.729	1.05
			-	
308	382.03	7.983	-7.732	1.05
309	382	7.983	-7.735	1.06
310	382.239	7.983	-7.71	1.03
	381.941		-7.741	
311		7.983		1.06
312	382.03	7.983	-7.732	1.05
313	381.971	7.983	-7.738	1.06
314	382.06	7.983	-7.729	1.05
315	382	7.983	-7.735	1.06
316	382.09	7.983	-7.726	1.05
317	381.941	7.983	-7.741	1.06
	382.06			
318		7.983	-7.729	1.05
319	381.971	7.983	-7.738	1.06
320	382.06	7.983	-7.729	1.05
321	381.911	7.983	-7.744	1.06
322	381.732	7.983	-7.762	1.08
323	381.881	7.983	-7.747	1.07
324	381.911	7.983	-7.744	1.06
325	381.971	7.983	-7.738	1.06
326	382.03	7.983	-7.732	1.05
327	382	7.983	-7.735	1.06
328	381.941	7.983	-7.741	
				1.06
329	382.12	7.983	-7.723	1.04
330	381.851	7.983	-7.75	1.07
331	381.971	7.983	-7.738	1.06
332	381.941	7.983	-7.741	1.06
333	381.971	7.983	-7.738	1.06
334	381.941	7.983	-7.741	1.06
335	381.941	7.983	-7.741	1.06
336	381.971	7.983	-7.738	1.06
337	382	7.983	-7.735	1.06
338	381.941	7.983	-7.741	1.06
339	382	7.983	-7.735	1.06
340	382	7.983	-7.735	1.06
341	382	7.983	-7.735	1.06
342	381.941	7.983	-7.741	1.06
343	382.12	7.983	-7.723	1.04
344	381.971	7.983	-7.738	1.06
345	382	7.983	-7.735	1.06
346	381.911	7.983	-7.744	1.06
347	381.971	7.983	-7.738	1.06
348	382.06	7.983	-7.729	1.05
349	382	7.983	-7.735	1.06
350	382	7.983	-7.735	1.06
351	381.941	7.983	-7.741	1.06
352	381.971	7.983	-7.738	1.06
353	381.971	7.983	-7.738	1.06
354	382.06	7.983	-7.729	1.05
355	381.971	7.983	-7.738	1.06
356	382.09	7.983	-7.726	1.05
357	381.971	7.983	-7.738	1.06
358	382.09	7.983	-7.726	1.05
359	381.971	7.983	-7.738	1.06
360	382.15	7.983	-7.719	1.04
361	382.06	7.983	-7.729	1.05
362	382	7.983	-7.735	1.06
363	381.941	7.983	-7.741	1.06
364	382.06	7.983	-7.729	1.05
365	382.179	7.983	-7.717	1.04

## TW2- WELL RECOVERY VS. TIME - KOLLAARD FILE 210064



#### Kollaard File 210064 RECOVERY DATA TW-2

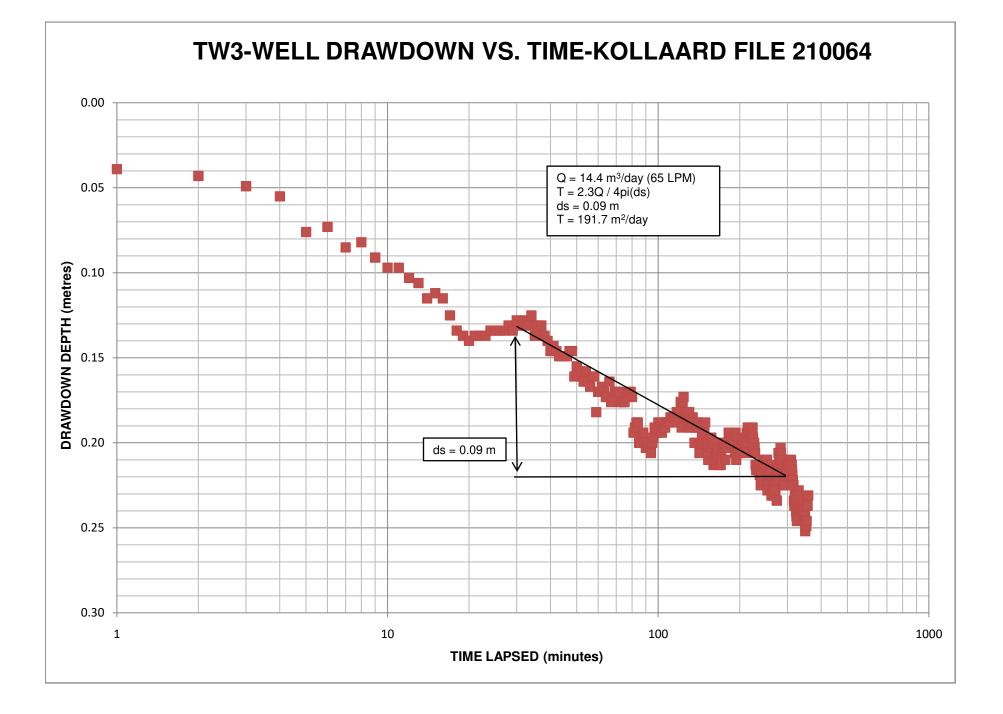
ť	t / t'	Abs Pres	Temp	Water Level	Drawdown	Recovery
		(kPa)	(°C)	(m)	(m)	(%)
1	366.0	389.523	7.983	-6.968	0.29	73%
2	183.5	390.359	7.983	-6.882	0.20	81%
3	122.7	390.687	7.983	-6.849	0.17	84%
4	92.3	390.896	7.983	-6.828	0.15	86%
5	74.0	391.016	7.983	-6.815	0.14	87%
6	61.8	391.105	7.983	-6.806	0.13	88%
7	53.1	391.195	7.983	-6.797	0.12	89%
8	46.6	391.255	7.983	-6.791	0.11	90%
9	41.6	391.314	7.983	-6.785	0.11	90%
10	37.5	391.374	7.983	-6.779	0.10	91%
11	34.2	391.374	7.983	-6.779	0.10	91%
12	31.4	391.374	7.983	-6.779	0.10	91%
13	29.1	391.434	7.983	-6.773	0.09	91%
14	27.1	391.464	7.983	-6.77	0.09	91%
15	25.3	391.494	7.983	-6.767	0.09	92%
16	23.8	391.523	7.983	-6.764	0.08	92%
10	22.5	391.523	7.983	-6.764	0.08	92%
18	22.5	391.523	7.983	-6.764	0.08	92%
18 19	21.3	391.523	7.983	-6.764	0.08	92%
19 20	19.3	391.523	7.983	-6.764	0.08	92%
20 21	19.3 18.4	391.523				92% 92%
21 22	18.4 17.6	391.494	7.983 7.983	-6.767 -6.764	0.09 0.08	92% 92%
22	16.9		7.983	-6.761		92%
23 24	16.9	391.553 391.553	7.983	-6.761	0.08 0.08	92%
24 25	15.6	391.553	7.983		0.08	92%
				-6.761		
26	15.0	391.553	7.983	-6.761	0.08	92%
27	14.5	391.553	7.983	-6.761	0.08	92%
28	14.0	391.583	7.983	-6.758	0.08	93%
29	13.6	391.553	7.983	-6.761	0.08	92%
30	13.2	391.583	7.983	-6.758	0.08	93%
31	12.8	391.583	7.983	-6.758	0.08	93%
32	12.4	391.553	7.983	-6.761	0.08	92%
33	12.1	391.553	7.983	-6.761	0.08	92%
34	11.7	391.553	7.983	-6.761	0.08	92%
35	11.4	391.583	7.983	-6.758	0.08	93%
36	11.1	391.583	7.983	-6.758	0.08	93%
37	10.9	391.613	7.983	-6.755	0.08	93%
38	10.6	391.583	7.983	-6.758	0.08	93%
39	10.4	391.583	7.983	-6.758	0.08	93%
40	10.1	391.583	7.983	-6.758	0.08	93%
41	9.9	391.583	7.983	-6.758	0.08	93%
42	9.7	391.583	7.983	-6.758	0.08	93%
43	9.5	391.583	7.983	-6.758	0.08	93%
44	9.3	391.613	7.983	-6.755	0.08	93%
45	9.1	391.553	7.983	-6.761	0.08	92%
46	8.9	390.687	7.983	-6.849	0.17	84%
47	8.8	391.673	7.983	-6.748	0.07	94%
48	8.6	391.613	7.983	-6.755	0.08	93%
49	8.4	391.673	7.983	-6.748	0.07	94%
50	8.3	391.643	7.983	-6.751	0.07	93%
51	8.2	391.643	7.983	-6.751	0.07	93%
52	8.0	391.673	7.983	-6.748	0.07	94%
53	7.9	391.673	7.983	-6.748	0.07	94%
54	7.8	390.986	7.983	-6.818	0.14	87%
55	7.6	391.016	7.983	-6.815	0.14	87%
56	7.5	391.703	7.983	-6.745	0.07	94%
57	7.4	391.733	7.983	-6.742	0.06	94%
		001.700	7.983	-6.721	0.04	96%

59	7.2	391.673	7.983	-6.748	0.07	94%
60	7.1	391.643	7.983	-6.751	0.07	93%
61	7.0	391.673	7.983	-6.748	0.07	94%
62	6.9	391.673	7.983	-6.748	0.07	94%
63	6.8	391.673	7.983	-6.748	0.07	94%
64	6.7	391.703	7.983	-6.745	0.07	94%
65	6.6	391.74	8.082	-6.742	0.06	94%
66	6.5	391.74	8.082	-6.742	0.06	94%
	6.4	391.74		-6.742		94% 94%
67 68	6.4	391.74	8.082	-6.739	0.06	94% 94%
68 60			8.082		0.06	
69 70	6.3	391.77	8.082	-6.739	0.06	94%
70	6.2	391.77	8.082	-6.739	0.06	94%
71	6.1	391.77	8.082	-6.739	0.06	94%
72	6.1	391.799	8.082	-6.736	0.06	95%
73	6.0	391.77	8.082	-6.739	0.06	94%
74	5.9	391.77	8.082	-6.739	0.06	94%
75	5.9	391.799	8.082	-6.736	0.06	95%
76	5.8	391.799	8.082	-6.736	0.06	95%
77	5.7	391.799	8.082	-6.736	0.06	95%
78	5.7	391.799	8.082	-6.736	0.06	95%
79	5.6	391.829	8.082	-6.733	0.05	95%
80	5.6	391.859	8.082	-6.729	0.05	95%
81	5.5	391.859	8.082	-6.729	0.05	95%
82	5.5	391.859	8.082	-6.729	0.05	95%
83	5.4	391.859	8.082	-6.729	0.05	95%
84	5.3	391.829	8.082	-6.733	0.05	95%
85	5.3	391.829	8.082	-6.733	0.05	95%
86	5.2	391.829	8.082	-6.733	0.05	95%
87	5.2	391.829	8.082	-6.733	0.05	95%
88	5.1	391.829	8.082	-6.733	0.05	95%
89	5.1	391.829	8.082	-6.733	0.05	95%
90	5.1	391.829	8.082	-6.733	0.05	95%
91	5.0	391.829	8.082	-6.733	0.05	95%
92	5.0	391.859	8.082	-6.729	0.05	95%
93	4.9	391.859	8.082	-6.729	0.05	95%
94	4.9	391.889	8.082	-6.726	0.05	96%
95	4.8	391.859	8.082	-6.729	0.05	95%
96	4.8	391.859	8.082	-6.729	0.05	95%
97	4.8	391.859	8.082	-6.729	0.05	95%
98	4.7	391.859	8.082	-6.729	0.05	95%
99	4.7	391.859	8.082	-6.729	0.05	95%
100	4.7	391.889	8.082	-6.726	0.05	96%
101	4.6	391.889	8.082	-6.726	0.05	96%
102	4.6	391.889	8.082	-6.726	0.05	96%
103	4.5	391.919	8.082	-6.723	0.04	96%
104	4.5	391.919	8.082	-6.723	0.04	96%
105	4.5	391.919	8.082	-6.723	0.04	96%
106	4.4	391.919	8.082	-6.723	0.04	96%
107	4.4	391.889	8.082	-6.726	0.05	96%
108	4.4	391.919	8.082	-6.723	0.04	96%
109	4.3	391.949	8.082	-6.72	0.04	96%
110	4.3	391.949	8.082	-6.72	0.04	96%
111	4.3	391.979	8.082	-6.717	0.04	97%
112	4.3	391.979	8.082	-6.717	0.04	97%
113	4.2	391.979	8.082	-6.717	0.04	97%
114	4.2	392.008	8.082	-6.714	0.03	97%
115	4.2	391.979	8.082	-6.717	0.04	97%
116	4.1	391.979	8.082	-6.717	0.04	97%
110	4.1	391.979	8.082	-6.717	0.04	97%
118	4.1	391.979	8.082	-6.717	0.04	97%
119	4.1	391.979	8.082	-6.717	0.04	97%
120	4.0	392.008	8.082	-6.714	0.03	97%
-20		332.000	0.002	0.7 17	0.00	2770



## ATTACHMENT J

#### PUMPING TEST DATA FOR TW3



Kollaard File 210064	Pump Rate	65.5	litres/minute
DRAWDOWN DATA T	N3		

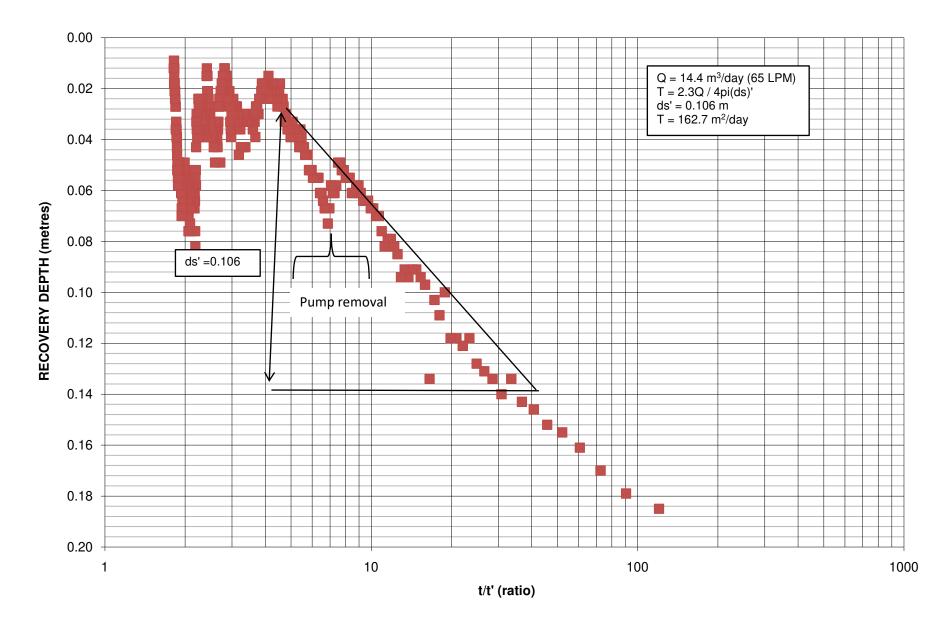
Time Lapsed	Abs Pres	Temp	Water Level	Drawdown
(minutes)	(kPa)	(°C)	(m)	(m)
0	359.25	7.983	-4.53	0.00
1 2	358.863 358.833	7.983 7.983	-4.569 -4.573	0.04 0.04
3	358.774	7.983	-4.579	0.04
4	358.714	7.983	-4.585	0.05
5	358.506	7.983	-4.606	0.08
6 7	358.535 358.416	7.983 7.983	-4.603 -4.615	0.07
8	358.446	7.983	-4.612	0.05
9	358.357	7.983	-4.621	0.09
10	358.297	7.983	-4.627	0.10
11 12	358.297 358.238	7.983 7.983	-4.627 -4.633	0.10 0.10
13	358.208	7.983	-4.636	0.10
14	358.118	7.983	-4.645	0.11
15	358.148	7.983	-4.642	0.11
16 17	358.118 358.029	7.983 7.983	-4.645 -4.655	0.11 0.13
18	357.94	7.983	-4.664	0.13
19	357.91	7.983	-4.667	0.14
20	357.88	7.983	-4.67	0.14
21 22	357.91 357.91	7.983 7.983	-4.667 -4.667	0.14 0.14
22	357.91	7.983	-4.667	0.14
24	357.94	7.983	-4.664	0.13
25	357.94	7.983	-4.664	0.13
26	357.94	7.983	-4.664	0.13
27 28	357.94 357.969	7.983 7.983	-4.664 -4.661	0.13 0.13
28	357.94	7.983	-4.664	0.13
30	357.999	7.983	-4.658	0.13
31	357.969	7.983	-4.661	0.13
32 33	357.999 357.969	7.983 7.983	-4.658 -4.661	0.13
33	358.029	7.983	-4.655	0.13
35	357.91	7.983	-4.667	0.14
36	357.969	7.983	-4.661	0.13
37 38	357.969 357.91	7.983 7.983	-4.661 -4.667	0.13 0.14
39	357.88	7.983	-4.67	0.14
40	357.82	7.983	-4.676	0.15
41	357.85	7.983	-4.673	0.14
42 43	357.82	7.983	-4.676	0.15
43	357.791 357.791	7.983 7.983	-4.679 -4.679	0.15
45	357.791	7.983	-4.679	0.15
46	357.791	7.983	-4.679	0.15
47 48	357.82	7.983	-4.676	0.15
48	357.82 357.672	7.983 7.983	-4.676 -4.691	0.15 0.16
50	357.731	7.983	-4.685	0.15
51	357.701	7.983	-4.688	0.16
52	357.672	7.983	-4.691	0.16
53 54	357.642 357.701	7.983 7.983	-4.694 -4.688	0.16
55	357.642	7.983	-4.694	0.16
56	357.612	7.983	-4.697	0.17
57	357.672	7.983	-4.691	0.16
58 59	357.672 357.463	7.983 7.983	-4.691 -4.712	0.16 0.18
60	357.582	7.983	-4.7	0.13
61	357.582	7.983	-4.7	0.17
62	357.612	7.983	-4.697	0.17
63 64	357.582 357.552	7.983 7.983	-4.7 -4.703	0.17 0.17
65	357.552	7.983	-4.703	0.17
66	357.642	7.983	-4.694	0.16
67	357.523	7.983	-4.706	0.18
68 69	357.552 357.582	7.983 7.983	-4.703 -4.7	0.17 0.17
70	357.582	7.983	-4.7	0.17
71	357.582	7.983	-4.7	0.17
72	357.582	7.983	-4.7	0.17
73 74	357.523 357.523	7.983 7.983	-4.706 -4.706	0.18
74	357.523	7.983	-4.706	0.18
76	357.552	7.983	-4.703	0.17
77	357.552	7.983	-4.703	0.17
78 79	357.582 357.582	7.983 7.983	-4.7 -4.7	0.17 0.17
79 80	357.582	7.983	-4.7	0.17
81	357.344	7.983	-4.724	0.19
82	357.374	7.983	-4.721	0.19
83 84	357.403 357.403	7.983 7.983	-4.718 -4.718	0.19 0.19
84 85	357.403	7.983	-4.718 -4.73	0.19
• ••				• • • • • •

86	357.284	7.983	-4.73	0.20
87	357.314	7.983	-4.727	0.20
88	357.344	7.983	-4.724	0.19
89	357.284	7.983	-4.73	0.20
90	357.255	7.983	-4.733	0.20
91	357.284	7.983	-4.73	0.20
92	357.255	7.983	-4.733	0.20
93	357.255	7.983	-4.733	0.20
94	357.225	7.983	-4.736	0.21
95	357.284	7.983	-4.73	0.20
96	357.314	7.983	-4.727	0.20
97	357.374	7.983	-4.721	0.19
98	357.344	7.983	-4.724	0.19
99	357.344	7.983	-4.724	0.19
100	357,403	7.983	-4.718	0.19
101	357.374	7.983	-4.721	0.19
102	357.403	7.983	-4.718	0.19
103	357.344	7.983	-4.724	0.19
104	357.374	7.983	-4.721	0.19
105	357.374	7.983	-4.721	0.19
106	357.374	7.983	-4.721	0.19
107	357.403	7.983	-4.718	0.19
108	357.403	7.983	-4.718	0.19
109	357.403	7.983		
			-4.718	0.19
110	357.403	7.983	-4.718	0.19
111	357.433	7.983	-4.715	0.19
			-4.718	
112	357.403	7.983		0.19
113	357.433	7.983	-4.715	0.19
114	357.433	7.983	-4.715	0.19
115	357.433	7.983	-4.715	0.19
116	357.433	7.983	-4.715	0.19
117	357.463	7.983	-4.712	0.18
118	357.433	7.983	-4.715	0.19
119	357.403	7.983	-4.718	0.19
120	357.463	7.983	-4.712	0.18
121	357.523	7.983	-4.706	0.18
122	357.374	7.983	-4.721	0.19
	357.523			
123	357.523	7.983	-4.706	0.18
124	357.552	7.983	-4.703	0.17
125	357.433	7.983	-4.715	0.19
126	357.463	7.983	-4.712	0.18
127	357.433	7.983	-4.715	0.19
128	357.433	7.983	-4.715	0.19
129	357.374	7.983	-4.721	0.19
130	357.463	7.983	-4.712	0.18
131	357.403	7.983	-4.718	0.19
132	357.403	7.983	-4.718	0.19
133	357.374	7.983	-4.721	0.19
134	357.433	7.983	-4.715	0.19
135	357.403	7.983	-4.718	0.19
136	357.284	7.983	-4.73	0.20
137	357.403	7.983	-4.718	0.19
138	357.374	7.983	-4.721	0.19
139	357.374	7.983	-4.721	0.19
140	357.403	7.983	-4.718	0.19
141	357.374	7.983	-4.721	0.19
142	357.225	7.983	-4.736	0.21
143	357.284	7.983	-4.73	0.20
144	357.284	7.983	-4.73	0.20
145	357.344	7.983	-4.724	0.19
146	357.284	7.983	-4.73	0.20
147	357.314	7.983	-4.727	0.20
148	357.344	7.983	-4.724	0.19
149	357.403	7.983	-4.718	0.19
150	357.284	7.983	-4.73	0.20
151	357.284	7.983	-4.73	0.20
	357.284		-4.73	
152		7.983		0.20
153	357.195	7.983	-4.74	0.21
154	357.255	7.983	-4.733	0.20
155	357.225	7.983	-4.736	0.21
156	357.314	7.983	-4.727	0.20
157	357.314	7.983	-4.727	0.20
158	357.255	7.983	-4.733	0.20
159	357.284	7.983	-4.73	0.20
160	357.165	7.983	-4.743	0.21
161	357.195	7.983	-4.74	0.21
162	357.284	7.983	-4.73	0.20
163	357.225	7.983	-4.736	0.21
164	357.195	7.983	-4.74	0.21
165	357.225	7.983	-4.736	0.21
166	357.255	7.983	-4.733	0.20
167	357.195	7.983	-4.74	0.21
168	357.165	7.983	-4.743	0.21
	357.165	7.983	-4.743	0.21
169				
170	357.165	7.983	-4.743	0.21
171	357.225	7.983	-4.736	0.21
172	357.195	7.983	-4.74	0.21
173	357.255	7.983	-4.733	0.20
174	357.255	7.983	-4.733	0.20
175	357.284	7.983	-4.73	0.20
176	357.255	7.983	-4.733	0.20
	•		-	-

177	357.195	7.983	-4.74	0.21
178	357.255	7.983	-4.733	0.20
179	357.255	7.983	-4.733	0.20
180	357.284	7.983	-4.73	0.20
181	357.255	7.983	-4.733	0.20
182	357.344	7.983	-4.724	0.19
183	357.344	7.983	-4.724	0.19
	357.344	7.983	-4.724	0.19
184				
185	357.284	7.983	-4.73	0.20
186	357.314	7.983	-4.727	0.20
187	357.284	7.983	-4.73	0.20
188	357.314	7.983	-4.727	0.20
189	357.314	7.983	-4.727	0.20
190	357.284	7.983	-4.73	0.20
191	357.284	7.983	-4.73	0.20
192	357.225	7.983	-4.736	0.21
193	357.344	7.983	-4.724	0.19
194	357.195	7.983	-4.74	0.21
195	357.314	7.983	-4.727	0.20
196	357.255	7.983	-4.733	0.20
197	357.284	7.983	-4.73	0.20
198	357.284	7.983	-4.73	0.20
199	357.225	7.983	-4.736	0.21
200	357.225	7.983	-4.736	0.21
201	357.255	7.983	-4.733	0.20
202	357.255	7.983	-4.733	0.20
203	357.284	7.983	-4.73	0.20
204	357.255	7.983	-4.733	0.20
205	357.314	7.983	-4.727	0.20
206	357.255	7.983	-4.733	0.20
	357.235			
207		7.983	-4.736	0.21
208	357.284	7.983	-4.73	0.20
209	357.314	7.983	-4.727	0.20
210	357.314	7.983	-4.727	0.20
211	357.284	7.983	-4.73	0.20
212	357.344	7.983	-4.724	0.19
213	357.344	7.983	-4.724	0.19
214	357.374	7.983	-4.721	0.19
215	357.374	7.983	-4.721	0.19
216	357.314	7.983	-4.727	0.20
	357.344	7.983	-4.724	0.19
217				
218	357.344	7.983	-4.724	0.19
219	357.314	7.983	-4.727	0.20
220	357.284	7.983	-4.73	0.20
221	357.374	7.983	-4.721	0.19
222	357.314	7.983	-4.727	0.20
223	357.374	7.983	-4.721	0.19
224				
	357.314	7.983	-4.727	0.20
225	357.225	7.983	-4.736	0.21
226	357.284	7.983	-4.73	0.20
227	357.255	7.983	-4.733	0.20
228	357.225	7.983	-4.736	0.21
229	357.165	7.983	-4.743	0.21
230	357.135	7.983	-4.746	0.22
231	357.165	7.983	-4.743	0.21
232	357.135	7.983	-4.746	0.22
233	357.135	7.983	-4.746	0.22
234	357.165	7.983	-4.743	0.21
235	357.165	7.983	-4.743	0.21
236	357.135	7.983	-4.746	0.22
237	357.106	7.983	-4.749	0.22
238	357.165	7.983	-4.743	0.21
239	357.046	7.983	-4.755	0.23
240	357.135	7.983	-4.746	0.22
241	357.106	7.983	-4.749	0.22
242	357.076	7.983	-4.752	0.22
		7.983		
243	357.195		-4.74	0.21
244	357.165	7.983	-4.743	0.21
245	357.165	7.983	-4.743	0.21
246	357.165	7.983	-4.743	0.21
247	357.165	7.983	-4.743	0.21
248	357.195	7.983	-4.74	0.21
249	357.135	7.983	-4.746	0.22
				0.21
250	357.165	7.983	-4.743	
251	357.195	7.983	-4.74	0.21
252	357.195	7.983	-4.74	0.21
253	357.016	7.983	-4.758	0.23
254	357.076	7.983	-4.752	0.22
255	357.106	7.983	-4.749	0.22
256	357.106	7.983	-4.749	0.22
257	357.165	7.983	-4.743	0.21
258	357.135	7.983	-4.746	0.22
259	357.106	7.983	-4.749	0.22
260	357.106	7.983	-4.749	0.22
			-4.746	
261	357.135	7.983		0.22
262	356.986	7.983	-4.761	0.23
263	357.016	7.983	-4.758	0.23
264	357.076	7.983	-4.752	0.22
265	356.986	7.983	-4.761	0.23
266	357.046	7.983	-4.755	0.23
267	357.016	7.983	-4.758	0.23
	•			

268	356.986	7.983	-4.761	0.23
269	357.046	7.983	-4.755	0.23
270	357.076	7.983	-4.752	0.22
			-4.758	
271	357.016	7.983		0.23
272	357.076	7.983	-4.752	0.22
273	357.106	7.983	-4.749	0.22
274	356.957		-4.764	0.23
		7.983		
275	357.135	7.983	-4.746	0.22
276	357.076	7.983	-4.752	0.22
277	357.165	7.983	-4.743	0.21
278	357.225	7.983	-4.736	0.21
279	357.165	7.983	-4.743	0.21
280	357.195	7.983	-4.74	0.21
281	357.225	7.983	-4.736	0.21
282	357.195	7.983	-4.74	0.21
283	357.255	7.983	-4.733	0.20
284	357.225	7.983	-4.736	0.21
285	357.195	7.983	-4.74	0.21
	357.135		-4.746	0.22
286		7.983		
287	357.135	7.983	-4.746	0.22
288	357.195	7.983	-4.74	0.21
289	357.046	7.983	-4.755	0.23
290	357.046	7.983	-4.755	0.23
291	357.106	7.983	-4.749	0.22
292	357.106	7.983	-4.749	0.22
293	357.106	7.983	-4.749	0.22
294	357.135	7.983	-4.746	0.22
295	357.165	7.983	-4.743	0.21
296	357.135	7.983	-4.746	0.22
297	357.135	7.983	-4.746	0.22
298	357.135	7.983	-4.746	0.22
299	357.165	7.983	-4.743	0.21
300	357.195	7.983	-4.74	0.21
301	357.165	7.983	-4.743	0.21
				-
302	357.165	7.983	-4.743	0.21
303	357.165	7.983	-4.743	0.21
304	357.195	7.983	-4.74	0.21
305	357.165	7.983	-4.743	0.21
306	357.135	7.983	-4.746	0.22
307	357.135	7.983	-4.746	0.22
308	357.135	7.983	-4.746	0.22
309	357.195	7.983	-4.74	0.21
310	357.165	7.983	-4.743	0.21
311	357.165	7.983	-4.743	0.21
312	357.135	7.983	-4.746	0.22
313	357.106	7.983	-4.749	0.22
314	357.076	7.983	-4.752	0.22
315	357.046	7.983	-4.755	0.23
316	357.046	7.983	-4.755	0.23
317	356.957	7.983	-4.764	0.23
318	356.927	7.983	-4.767	0.24
319	356.927	7.983	-4.767	0.24
320	356,986	7.983	-4.761	0.23
321	356.957	7.983	-4.764	0.23
322	356.927	7.983	-4.767	0.24
323	356.897	7.983	-4.77	0.24
324	356.867	7.983	-4.773	0.24
325	356.838	7.983	-4.776	0.25
326	356.897	7.983	-4.77	0.24
	356 927			-
327	550.527	7.983	-4.767	0.24
328	356.897	7.983	-4.77	0.24
329	356.927	7.983	-4.767	0.24
330	357.016	7.983	-4.758	0.23
331	356.986	7.983	-4.761	0.23
332	356.897	7.983	-4.77	0.24
333	356.897	7.983	-4.77	0.24
334	356.897	7.983	-4.77	0.24
335	356.897	7.983	-4.77	0.24
336	356.927	7.983	-4.767	0.24
337	356.897	7.983	-4.77	0.24
338	356.957	7.983	-4.764	0.23
339	356.897	7.983	-4.77	0.24
340	356.897	7.983	-4.77	0.24
			-4.773	
341	356.867	7.983		0.24
342	356.897	7.983	-4.77	0.24
343	356.927	7.983	-4.767	0.24
344	356.957	7.983	-4.764	0.23
345	356.897	7.983	-4.77	0.24
346	356.838	7.983	-4.776	0.25
347	356.867	7.983	-4.773	0.24
348	356.867	7.983	-4.773	0.24
349	356.778	7.983	-4.782	0.25
350	356.808	7.983	-4.779	0.25
351	356.838	7.983	-4.776	0.25
352	356.808	7.983	-4.779	0.25
353	356.838	7.983	-4.776	0.25
354	356.927	7.983	-4.767	0.24
355	356.927	7.983	-4.767	0.24
356	356.927	7.983	-4.767	0.24
357	356.986	7.983	-4.761	0.23
358	356.986	7.983	-4.761	0.23

## TW3- WELL RECOVERY VS. TIME - KOLLAARD FILE 210064



#### Kollaard File 210064 RECOVERY DATA TW-3

ť	t / t'	Abs Pres	Temp	Water Level	Drawdown	Recovery
		(kPa)	(°C)	(m)	(m)	(%)
1	359.0	357.195	7.983	-4.74	95.24	
2	180.0	357.344	7.983	-4.724	95.22	
3	120.3	357.433	7.983	-4.715	0.19	12%
4	90.5	357.493	7.983	-4.709	0.18	15%
5	72.6	357.582	7.983	-4.7	0.17	19%
6	60.7	357.672	7.983	-4.691	0.16	23%
7	52.1	357.731	7.983	-4.685	0.15	26%
8	45.8	357.761	7.983	-4.682	0.15	28%
9	40.8	357.82	7.983	-4.676	0.15	30%
10	36.8	357.85	7.983	-4.673	0.14	32%
11	33.5	357.94	7.983	-4.664	0.13	36%
12	30.8	357.88	7.983	-4.67	0.14	33%
13	28.5	357.94	7.983	-4.664	0.13	36%
14	26.6	357.969	7.983	-4.661	0.13	38%
15	24.9	357.999	7.983	-4.658	0.13	39%
16	23.4	358.089	7.983	-4.648	0.12	44%
10	22.1	358.059	7.983	-4.651	0.12	42%
18	20.9	358.089	7.983	-4.648	0.12	44%
19	19.8	358.089	7.983	-4.648	0.12	44%
20	15.8	358.267	7.983	-4.63	0.10	52%
20	18.9	358.207	7.983	-4.639	0.10	48%
22	17.3	358.238	7.983	-4.633	0.10	48% 51%
22	17.5	357.94	7.983	-4.664	0.10	36%
23 24	15.9	358.297	7.983	-4.627	0.13	30% 54%
25 26	15.3 14.8	358.327 358.357	7.983 7.983	-4.624 -4.621	0.09 0.09	55%
20 27	14.8	358.357	7.983	-4.621	0.09	57%
27 28	14.3	358.327	7.983	-4.621	0.09	57% 55%
29 20	13.3	358.357	7.983	-4.621	0.09	57%
30	12.9	358.327	7.983	-4.624	0.09	55%
31	12.5	358.416	7.983	-4.615	0.09	60%
32	12.2	358.446	7.983	-4.612	0.08	61%
33	11.8	358.476	7.983	-4.609	0.08	62%
34 25	11.5	358.476	7.983	-4.609	0.08	62%
35	11.2	358.446	7.983	-4.612	0.08	61%
36	10.9	358.506	7.983	-4.606	0.08	64%
37	10.7	358.565	7.983	-4.6	0.07	67%
38	10.4	358.565	7.983	-4.6	0.07	67%
39	10.2	358.595	7.983	-4.597	0.07	68%
40	10.0	358.595	7.983	-4.597	0.07	68%
41	9.7	358.625	7.983	-4.594	0.06	70%
42	9.5	358.625	7.983	-4.594	0.06	70%
43	9.3	358.625	7.983	-4.594	0.06	70%
44	9.1	358.655	7.983	-4.591	0.06	71%
45	9.0	358.684	7.983	-4.588	0.06	72%
46	8.8	358.684	7.983	-4.588	0.06	72%

47	8.6	358.655	7.983	-4.591	0.06	71%
48	8.5	358.655	7.983	-4.591	0.06	71%
49	8.3	358.714	7.983	-4.585	0.05	74%
50	8.2	358.714	7.983	-4.585	0.05	74%
51	8.0	358.714	7.983	-4.585	0.05	74%
52	7.9	358.744	7.983	-4.582	0.05	75%
53	7.8	358.744	7.983	-4.582	0.05	75%
54	7.6	358.774	7.983	-4.579	0.05	77%
55	7.5	358.774	7.983	-4.579	0.05	77%
56	7.4	358.684	7.983	-4.588	0.06	72%
57	7.3	358.655	7.983	-4.591	0.06	71%
58	7.2	358.655	7.983	-4.591	0.06	71%
59	7.1	358.684	7.983	-4.588	0.06	72%
60	7.0	358.595	7.983	-4.597	0.07	68%
61	6.9	358.535	7.983	-4.603	0.07	65%
62	6.8	358.595	7.983	-4.597	0.07	68%
63	6.7	358.595	7.983	-4.597	0.07	68%
64	6.6	358.625	7.983	-4.594	0.06	70%
65	6.5	358.655	7.983	-4.591	0.06	71%
66	6.4	358.655	7.983	-4.591	0.06	71%
67	6.3	358.714	7.983	-4.585	0.05	74%
68	6.3	358.714	7.983	-4.585	0.05	74%
69	6.2	358.714	7.983	-4.585	0.05	74%
70	6.1	358.714	7.983	-4.585	0.05	74%
71	6.0	358.714	7.983	-4.585	0.05	74%
72	6.0	358.744	7.983	-4.582	0.05	75%
73	5.9	358.744	7.983	-4.582	0.05	75%
74	5.8	358.744	7.983	-4.582	0.05	75%
75	5.8	358.803	7.983	-4.576	0.05	78%
76	5.7	358.803	7.983	-4.576	0.05	78%
77	5.6	358.803	7.983	-4.576	0.05	78%
78	5.6	358.833	7.983	-4.573	0.04	80%
79	5.5	358.833	7.983	-4.573	0.04	80%
80	5.5	358.863	7.983	-4.569	0.04	81%
81	5.4	358.893	7.983	-4.566	0.04	83%
82	5.4	358.833	7.983	-4.573	0.04	80%
83	5.3	358.863	7.983	-4.569	0.04	81%
84	5.3	358.893	7.983	-4.566	0.04	83%
85	5.2	358.893	7.983	-4.566	0.04	83%
86	5.2	358.893	7.983	-4.566	0.04	83%
87	5.1	358.893	7.983	-4.566	0.04	83%
88	5.1	358.923	7.983	-4.563	0.03	84%
89	5.0	358.863	7.983	-4.569	0.04	81%
90	5.0	358.863	7.983	-4.569	0.04	81%
91	4.9	358.893	7.983	-4.566	0.04	83%
92	4.9	358.923	7.983	-4.563	0.03	84%
93	4.8	358.893	7.983	-4.566	0.04	83%
94	4.8	358.923	7.983	-4.563	0.03	84%
95	4.8	358.952	7.983	-4.56	0.03	86%
96	4.7	358.923	7.983	-4.563	0.03	84%
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97	4.7	358.982	7.983	-4.557	0.03	87%
98	4.7	359.012	7.983	-4.554	0.02	89%
99	4.6	358.982	7.983	-4.557	0.03	87%
100	4.6	359.012	7.983	-4.554	0.02	89%
101	4.5	359.072	7.983	-4.548	0.02	91%
102	4.5	359.042	7.983	-4.551	0.02	90%
103	4.5	359.042	7.983	-4.551	0.02	90%
104	4.4	358.982	7.983	-4.557	0.03	87%
105	4.4	359.012	7.983	-4.554	0.02	89%
106	4.4	359.042	7.983	-4.551	0.02	90%
107	4.3	359.042	7.983	-4.551	0.02	90%
108	4.3	359.012	7.983	-4.554	0.02	89%
109	4.3	359.072	7.983	-4.548	0.02	91%
110	4.3	359.072	7.983	-4.548	0.02	91%
111	4.2	359.042	7.983	-4.551	0.02	90%
112	4.2	359.012	7.983	-4.554	0.02	89%
113	4.2	359.042	7.983	-4.551	0.02	90%
114	4.1	359.072	7.983	-4.548	0.02	91%
115	4.1	359.101	7.983	-4.545	0.01	93%
116	4.1	359.042	7.983	-4.551	0.02	90%
117	4.1	359.072	7.983	-4.548	0.02	91%
118	4.0	359.072	7.983	-4.548	0.02	91%
119	4.0	359.072	7.983	-4.548	0.02	91%
120	4.0	359.072	7.983	-4.548	0.02	91%
121	4.0	359.042	7.983	-4.551	0.02	90%
122	3.9	359.072	7.983	-4.548	0.02	91%
123	3.9	359.072	7.983	-4.548	0.02	91%
124	3.9	359.072	7.983	-4.548	0.02	91%
125	3.9	359.042	7.983	-4.551	0.02	90%
126	3.8	359.012	7.983	-4.554	0.02	89%
127	3.8	359.012	7.983	-4.554	0.02	89%
128	3.8	359.012	7.983	-4.554	0.02	89%
129	3.8	358.952	7.983	-4.56	0.03	86%
130	3.8	358.952	7.983	-4.56	0.03	86%
131	3.7	358.982	7.983	-4.557	0.03	87%
132	3.7	358.952	7.983	-4.56	0.03	86%
133	3.7	358.982	7.983	-4.557	0.03	87%
134	3.7	358.863	7.983	-4.569	0.04	81%
135	3.7	358.923	7.983	-4.563	0.03	84%
136	3.6	358.952	7.983	-4.56	0.03	86%
137	3.6	358.952	7.983	-4.56	0.03	86%
138	3.6	358.893	7.983	-4.566	0.04	83%
139	3.6	358.923	7.983	-4.563	0.03	84%
140	3.6	358.923	7.983	-4.563	0.03	84%
141	3.5	358.923	7.983	-4.563	0.03	84%
142	3.5	358.923	7.983	-4.563	0.03	84%
143	3.5	358.923	7.983	-4.563	0.03	84%
144	3.5	358.923	7.983	-4.563	0.03	84%
145	3.5	358.923	7.983	-4.563	0.03	84%
146	3.5	358.923	7.983	-4.563	0.03	84%
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147	3.4	358.923	7.983	-4.563	0.03	84%
148	3.4	358.923	7.983	-4.563	0.03	84%
149	3.4	358.952	7.983	-4.56	0.03	86%
150	3.4	358.923	7.983	-4.563	0.03	84%
151	3.4	358.833	7.983	-4.573	0.04	80%
152	3.4	358.952	7.983	-4.56	0.03	86%
153	3.3	358.952	7.983	-4.56	0.03	86%
154	3.3	358.952	7.983	-4.56	0.03	86%
155	3.3	358.833	7.983	-4.573	0.04	80%
156	3.3	358.923	7.983	-4.563	0.03	84%
157	3.3	358.923	7.983	-4.563	0.03	84%
158	3.3	358.923	7.983	-4.563	0.03	84%
159	3.3	358.833	7.983	-4.573	0.04	80%
160	3.2	358.833	7.983	-4.573	0.04	80%
161	3.2	358.893	7.983	-4.566	0.04	83%
162	3.2	358.923	7.983	-4.563	0.03	84%
163	3.2	358.952	7.983	-4.56	0.03	86%
164	3.2	358.803	7.983	-4.576	0.05	78%
165	3.2	358.923	7.983	-4.563	0.03	84%
166	3.2	358.952	7.983	-4.56	0.03	86%
167	3.1	358.923	7.983	-4.563	0.03	84%
168	3.1	358.982	7.983	-4.557	0.03	87%
169	3.1	358.893	7.983	-4.566	0.04	83%
170	3.1	358.982	7.983	-4.557	0.03	87%
171	3.1	358.982	7.983	-4.557	0.03	87%
172	3.1	358.982	7.983	-4.557	0.03	87%
173	3.1	358.923	7.983	-4.563	0.03	84%
174	3.1	358.952	7.983	-4.56	0.03	86%
175	3.0	358.982	7.983	-4.557	0.03	87%
176	3.0	359.012	7.983	-4.554	0.02	89%
177	3.0	358.982	7.983	-4.557	0.03	87%
178	3.0	358.982	7.983	-4.557	0.03	87%
179	3.0	358.982	7.983	-4.557	0.03	87%
180	3.0	358.952	7.983	-4.56	0.03	86%
181	3.0	358.863	7.983	-4.569	0.04	81%
182	3.0	358.893	7.983	-4.566	0.04	83%
183	3.0	358.923	7.983	-4.563	0.03	84%
184	2.9	358.982	7.983	-4.557	0.03	87%
185	2.9	359.042	7.983	-4.551	0.02	90%
186	2.9	359.042	7.983	-4.551	0.02	90%
187	2.9	359.042	7.983	-4.551	0.02	90%
188	2.9	359.042	7.983	-4.551	0.02	90%
189	2.9	359.042	7.983	-4.551	0.02	90%
190	2.9	359.012	7.983	-4.554	0.02	89%
191	2.9	359.072	7.983	-4.548	0.02	91%
192	2.9	359.101	7.983	-4.545	0.01	93%
193	2.9	359.072	7.983	-4.548	0.02	91%
194	2.8	359.072	7.983	-4.548	0.02	91%
195	2.8	359.101	7.983	-4.545	0.01	93%
196	2.8	359.101	7.983	-4.545	0.01	93%

197	2.8	359.131	7.983	-4.542	0.01	94%
198	2.8	359.131	7.983	-4.542	0.01	94%
199	2.8	359.042	7.983	-4.551	0.02	90%
200	2.8	359.042	7.983	-4.551	0.02	90%
201	2.8	359.042	7.983	-4.551	0.02	90%
202	2.8	359.101	7.983	-4.545	0.01	93%
203	2.8	359.072	7.983	-4.548	0.02	91%
204	2.8	359.072	7.983	-4.548	0.02	91%
205	2.7	359.072	7.983	-4.548	0.02	91%
206	2.7	359.042	7.983	-4.551	0.02	90%
207	2.7	359.042	7.983	-4.551	0.02	90%
208	2.7	359.042	7.983	-4.551	0.02	90%
209	2.7	358.774	7.983	-4.579	0.05	77%
210	2.7	358.982	7.983	-4.557	0.03	87%
211	2.7	359.012	7.983	-4.554	0.02	89%
212	2.7	359.012	7.983	-4.554	0.02	89%
213	2.7	358.982	7.983	-4.557	0.03	87%
214	2.7	358.982	7.983	-4.557	0.03	87%
215	2.7	358.923	7.983	-4.563	0.03	84%
216	2.7	358.893	7.983	-4.566	0.04	83%
217	2.6	358.833	7.983	-4.573	0.04	80%
218	2.6	358.863	7.983	-4.569	0.04	81%
219	2.6	358.893	7.983	-4.566	0.04	83%
220	2.6	358.893	7.983	-4.566	0.04	83%
221	2.6	358.893	7.983	-4.566	0.04	83%
222	2.6	358.923	7.983	-4.563	0.03	84%
223	2.6	358.893	7.983	-4.566	0.04	83%
224	2.6	358.893	7.983	-4.566	0.04	83%
225	2.6	358.774	7.983	-4.579	0.05	77%
226	2.6	358.893	7.983	-4.566	0.04	83%
227	2.6	358.893	7.983	-4.566	0.04	83%
228	2.6	358.863	7.983	-4.569	0.04	81%
229	2.6	358.833	7.983	-4.573	0.04	80%
230	2.6	358.863	7.983	-4.569	0.04	81%
231	2.5	358.863	7.983	-4.569	0.04	81%
232	2.5	358.893	7.983	-4.566	0.04	83%
233	2.5	358.863	7.983	-4.569	0.04	81%
234	2.5	358.863	7.983	-4.569	0.04	81%
235	2.5	358.863	7.983	-4.569	0.04	81%
236	2.5	358.893	7.983	-4.566	0.04	83%
237	2.5	358.863	7.983	-4.569	0.04	81%
238	2.5	358.863	7.983	-4.569	0.04	81%
239	2.5	358.893	7.983	-4.566	0.04	83%
240	2.5	358.923	7.983	-4.563	0.03	84%
241	2.5	358.952	7.983	-4.56	0.03	86%
242	2.5	358.923	7.983	-4.563	0.03	84%
243	2.5	358.952	7.983	-4.56	0.03	86%
244	2.5	358.982	7.983	-4.557	0.03	87%
245	2.5	358.982	7.983	-4.557	0.03	87%
246	2.5	358.952	7.983	-4.56	0.03	86%

247	2.4	359.012	7.983	-4.554	0.02	89%
248	2.4	359.012	7.983	-4.554	0.02	89%
249	2.4	359.042	7.983	-4.551	0.02	90%
250	2.4	359.042	7.983	-4.551	0.02	90%
251	2.4	359.101	7.983	-4.545	0.01	93%
252	2.4	359.042	7.983	-4.551	0.02	90%
253	2.4	359.131	7.983	-4.542	0.01	94%
254	2.4	359.101	7.983	-4.545	0.01	93%
255	2.4	358.863	7.983	-4.569	0.04	81%
256	2.4	358.982	7.983	-4.557	0.03	87%
257	2.4	358.952	7.983	-4.56	0.03	86%
258	2.4	358.952	7.983	-4.56	0.03	86%
259	2.4	358.923	7.983	-4.563	0.03	84%
260	2.4	358.923	7.983	-4.563	0.03	84%
261	2.4	358.893	7.983	-4.566	0.04	83%
262	2.4	358.952	7.983	-4.56	0.03	86%
263	2.4	358.923	7.983	-4.563	0.03	84%
264	2.4	358.893	7.983	-4.566	0.04	83%
265	2.4	358.923	7.983	-4.563	0.03	84%
266	2.3	358.923	7.983	-4.563	0.03	84%
267	2.3	358.952	7.983	-4.56	0.03	86%
268	2.3	358.923	7.983	-4.563	0.03	84%
269	2.3	358.923	7.983	-4.563	0.03	84%
270	2.3	358.982	7.983	-4.557	0.03	87%
271	2.3	359.012	7.983	-4.554	0.02	89%
272	2.3	358.863	7.983	-4.569	0.04	81%
273	2.3	358.923	7.983	-4.563	0.03	84%
274	2.3	358.952	7.983	-4.56	0.03	86%
275	2.3	358.952	7.983	-4.56	0.03	86%
276	2.3	358.952	7.983	-4.56	0.03	86%
277	2.3	358.893	7.983	-4.566	0.04	83%
278	2.3	358.982	7.983	-4.557	0.03	87%
279	2.3	359.012	7.983	-4.554	0.02	89%
280	2.3	358.982	7.983	-4.557	0.03	87%
281	2.3	358.982	7.983	-4.557	0.03	87%
282	2.3	358.893	7.983	-4.566	0.04	83%
283	2.3	358.863	7.983	-4.569	0.04	81%
284	2.3	358.982	7.983	-4.557	0.03	87%
285	2.3	358.982	7.983	-4.557	0.03	87%
286	2.3	358.982	7.983	-4.557	0.03	87%
287	2.2	359.012	7.983	-4.554	0.02	89%
288	2.2	359.012	7.983	-4.554	0.02	89%
289	2.2	358.952	7.983	-4.56	0.03	86%
290	2.2	358.952	7.983	-4.56	0.03	86%
291	2.2	358.952	7.983	-4.56	0.03	86%
292	2.2	358.863	7.983	-4.569	0.04	81%
293	2.2	358.863	7.983	-4.569	0.04	81%
294	2.2	358.893	7.983	-4.566	0.04	83%
295	2.2	358.893	7.983	-4.566	0.04	83%
296	2.2	358.952	7.983	-4.56	0.03	86%
	•				1	

297	2.2	358.923	7.983	-4.563	0.03	84%
298	2.2	358.833	7.983	-4.573	0.04	80%
299	2.2	358.684	7.983	-4.588	0.06	72%
300	2.2	358.744	7.983	-4.582	0.05	75%
301	2.2	358.714	7.983	-4.585	0.05	74%
302	2.2	358.446	7.983	-4.612	0.08	61%
303	2.2	358.506	7.983	-4.606	0.08	64%
304	2.2	358.625	7.983	-4.594	0.06	70%
305	2.2	358.655	7.983	-4.591	0.06	71%
306	2.2	358.595	7.983	-4.597	0.07	68%
307	2.2	358.595	7.983	-4.597	0.07	68%
308	2.2	358.595	7.983	-4.597	0.07	68%
309	2.2	358.625	7.983	-4.594	0.06	70%
310	2.2	358.625	7.983	-4.594	0.06	70%
311	2.2	358.655	7.983	-4.591	0.06	71%
312	2.1	358.655	7.983	-4.591	0.06	71%
313	2.1	358.684	7.983	-4.588	0.06	72%
314	2.1	358.655	7.983	-4.591	0.06	71%
315	2.1	358.684	7.983	-4.588	0.06	72%
316	2.1	358.684	7.983	-4.588	0.06	72%
317	2.1	358.714	7.983	-4.585	0.05	74%
318	2.1	358.714	7.983	-4.585	0.05	74%
319	2.1	358.595	7.983	-4.597	0.07	68%
320	2.1	358.506	7.983	-4.606	0.08	64%
321	2.1	358.595	7.983	-4.597	0.07	68%
322	2.1	358.595	7.983	-4.597	0.07	68%
323	2.1	358.595	7.983	-4.597	0.07	68%
324	2.1	358.595	7.983	-4.597	0.07	68%
325	2.1	358.625	7.983	-4.594	0.06	70%
326	2.1	358.655	7.983	-4.591	0.06	71%
327	2.1	358.655	7.983	-4.591	0.06	71%
328	2.1	358.655	7.983	-4.591	0.06	71%
329	2.1	358.535	7.983	-4.603	0.07	65%
330	2.1	358.625	7.983	-4.594	0.06	70%
331	2.1	358.684	7.983	-4.588	0.06	72%
332	2.1	358.655	7.983	-4.591	0.06	71%
333	2.1	358.714	7.983	-4.585	0.05	74%
334	2.1	358.684	7.983	-4.588	0.06	72%
335	2.1	358.625	7.983	-4.594	0.06	70%
336	2.1	358.506	7.983	-4.606	0.08	64%
337	2.1	358.565	7.983	-4.6	0.07	67%
338	2.1	358.506	7.983	-4.606	0.08	64%
339	2.1	358.565	7.983	-4.6	0.07	67%
340	2.1	358.565	7.983	-4.6	0.07	67%
341	2.0	358.625	7.983	-4.594	0.06	70%
342	2.0	358.684	7.983	-4.588	0.06	72%
343	2.0	358.714	7.983	-4.585	0.05	74%
344	2.0	358.684	7.983	-4.588	0.06	72%
345	2.0	358.714	7.983	-4.585	0.05	74%
346	2.0	358.744	7.983	-4.582	0.05	75%

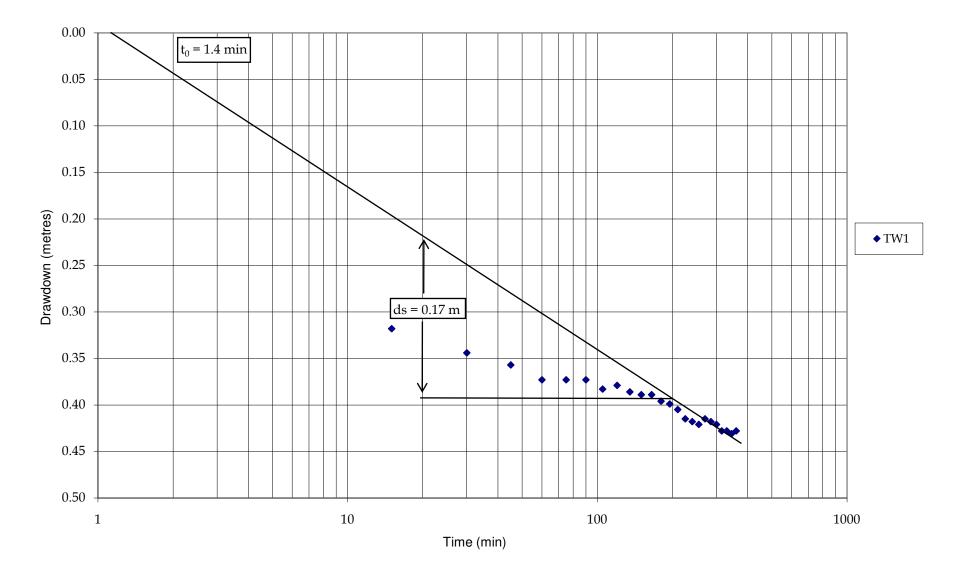
347	2.0	358.744	7.983	-4.582	0.05	75%
348	2.0	358.714	7.983	-4.585	0.05	74%
349	2.0	358.684	7.983	-4.588	0.06	72%
350	2.0	358.714	7.983	-4.585	0.05	74%
351	2.0	358.714	7.983	-4.585	0.05	74%
352	2.0	358.595	7.983	-4.597	0.07	68%
353	2.0	358.655	7.983	-4.591	0.06	71%
354	2.0	358.625	7.983	-4.594	0.06	70%
355	2.0	358.655	7.983	-4.591	0.06	71%
356	2.0	358.684	7.983	-4.588	0.06	72%
357	2.0	358.684	7.983	-4.588	0.06	72%
358	2.0	358.684	7.983	-4.588	0.06	72%
359	2.0	358.744	7.983	-4.582	0.05	75%
360	2.0	358.714	7.983	-4.585	0.05	74%
361	2.0	358.774	7.983	-4.579	0.05	77%
362	2.0	358.714	7.983	-4.585	0.05	74%
363	2.0	358.714	7.983	-4.585	0.05	74%
364	2.0	358.744	7.983	-4.582	0.05	75%
365	2.0	358.744	7.983	-4.582	0.05	75%
366	2.0	358.714	7.983	-4.585	0.05	74%
367	2.0	358.714	7.983	-4.585	0.05	74%
368	2.0	358.744	7.983	-4.582	0.05	75%
369	2.0	358.655	7.983	-4.591	0.06	71%
370	2.0	358.655	7.983	-4.591	0.06	71%
371	2.0	358.595	7.983	-4.597	0.07	68%
372	2.0	358.625	7.983	-4.594	0.06	70%
373	2.0	358.684	7.983	-4.588	0.06	72%
374	2.0	358.684	7.983	-4.588	0.06	72%
375	2.0	358.625	7.983	-4.594	0.06	70%
376	2.0	358.655	7.983	-4.591	0.06	71%
377	1.9	358.565	7.983	-4.6	0.07	67%
378	1.9	358.595	7.983	-4.597	0.07	68%
379	1.9	358.595	7.983	-4.597	0.07	68%
380	1.9	358.565	7.983	-4.6	0.07	67%
381	1.9	358.684	7.983	-4.588	0.06	72%
382	1.9	358.655	7.983	-4.591	0.06	71%
383	1.9	358.714	7.983	-4.585	0.05	74%
384	1.9	358.655	7.983	-4.591	0.06	71%
385	1.9	358.714	7.983	-4.585	0.05	74%
386	1.9	358.684	7.983	-4.588	0.06	72%
387	1.9	358.714	7.983	-4.585	0.05	74%
388	1.9	358.684	7.983	-4.588	0.06	72%
389	1.9	358.714	7.983	-4.585	0.05	74%
390	1.9	358.714	7.983	-4.585	0.05	74%
391	1.9	358.744	7.983	-4.582	0.05	75%
392	1.9	358.744	7.983	-4.582	0.05	75%
393	1.9	358.774	7.983	-4.579	0.05	77%
394	1.9	358.744	7.983	-4.582	0.05	75%
395	1.9	358.774	7.983	-4.579	0.05	77%
396	1.9	358.774	7.983	-4.579	0.05	77%

207	1.0	250 744	7.002	4 502	0.05	750/
397	1.9	358.744	7.983	-4.582	0.05	75%
398	1.9	358.774	7.983	-4.579	0.05	77%
399	1.9	358.774	7.983	-4.579	0.05	77%
400	1.9	358.774	7.983	-4.579	0.05	77%
401	1.9	358.684	7.983	-4.588	0.06	72%
402	1.9	358.744	7.983	-4.582	0.05	75%
403	1.9	358.774	7.983	-4.579	0.05	77%
404	1.9	358.774	7.983	-4.579	0.05	77%
405	1.9	358.774	7.983	-4.579	0.05	77%
406	1.9	358.684	7.983	-4.588	0.06	72%
407	1.9	358.714	7.983	-4.585	0.05	74%
408	1.9	358.744	7.983	-4.582	0.05	75%
409	1.9	358.774	7.983	-4.579	0.05	77%
410	1.9	358.744	7.983	-4.582	0.05	75%
411	1.9	358.774	7.983	-4.579	0.05	77%
412	1.9	358.744	7.983	-4.582	0.05	75%
413	1.9	358.803	7.983	-4.576	0.05	78%
414	1.9	358.833	7.983	-4.573	0.04	80%
415	1.9	358.863	7.983	-4.569	0.04	81%
416	1.9	358.863	7.983	-4.569	0.04	81%
417	1.9	358.893	7.983	-4.566	0.04	83%
418	1.9	358.863	7.983	-4.569	0.04	81%
419	1.9	358.893	7.983	-4.566	0.04	83%
420	1.9	358.923	7.983	-4.563	0.03	84%
421	1.9	358.893	7.983	-4.566	0.04	83%
422	1.8	358.893	7.983	-4.566	0.04	83%
423	1.8	358.893	7.983	-4.566	0.04	83%
424	1.8	358.982	7.983	-4.557	0.03	87%
425	1.8	358.982	7.983	-4.557	0.03	87%
426	1.8	358.982	7.983	-4.557	0.03	87%
427	1.8	359.012	7.983	-4.554	0.02	89%
428	1.8	359.012	7.983	-4.554	0.02	89%
429	1.8	359.042	7.983	-4.551	0.02	90%
430	1.8	359.012	7.983	-4.554	0.02	89%
431	1.8	359.042	7.983	-4.551	0.02	90%
432	1.8	359.072	7.983	-4.548	0.02	91%
433	1.8	359.042	7.983	-4.551	0.02	90%
434	1.8	359.072	7.983	-4.548	0.02	91%
435	1.8	359.131	7.983	-4.542	0.01	94%
436	1.8	359.101	7.983	-4.545	0.01	93%
437	1.8	359.072	7.983	-4.548	0.02	91%
438	1.8	359.161	7.983	-4.539	0.01	96%
439	1.8	359.131	7.983	-4.542	0.01	94%
440	1.8	359.131	7.983	-4.542	0.01	94%
440 441	1.8	359.161	7.983	-4.539	0.01	94 <i>%</i> 96%
441	1.8	359.101	7.983	-4.539	0.01	90% 97%
442	1.8	359.191	7.983	-4.536	0.01	97% 97%
443	1.8	359.191	7.983	-4.536	0.01	97% 97%
444 445	1.8	359.25	7.983	-4.53	0.01	97% 100%
440	1.0	339.23	1.305	-4.33	0.00	100%

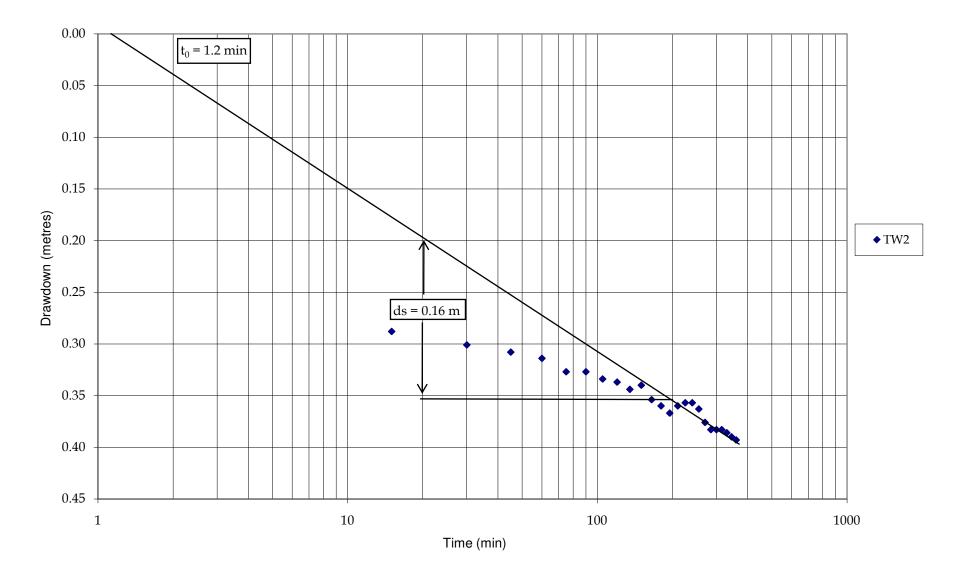


## ATTACHMENT K

#### OBSERVATION WELL DATA USING PRESSURE TRANSDUCER LOGGERS



## Drawdown vs. Time in Observation Well During Pumping Test for TW2



## Drawdown vs. Time in Observation Well During Pumping Test for TW1

#### Attachment L

Groundwater Velocity and Lateral and Vertical Gradients

$$\frac{Q}{A} = K \frac{dh}{dL}$$

where Q/A = darcy flux, d

K, saturated hydraulic conductivity, in m/s dh, change in head between two standpipes dL, lateral distance between two standpipes

Linear velocity, V = d/n where n is the porosity of the soil

K 2.6E-04 m/s n 0.3

Travel time = dL / V

Start Point	End Point	Distance (dL)	Change in head (dh)		Darcy, flux, Q/A	Groundwater velocity, v	Estimated Travel Time	Estimated Travel Time
		metres	metres * February 27, 2024		m3/m2/s	m/s	days	years
BH1	BH8	61		1.25	5.3E-06	1.8E-05	39.8	0.109
BH1	BH5	125		0.97	2.0E-06	6.7E-06	215.1	0.589
BH9	внз	56		0.92	4.3E-06	1.4E-05	45.5	0.125
BH1	внз	113	:	1.96	4.5E-06	1.5E-05	87.0	0.238
BH1	вн9	64	:	1.04	4.2E-06	1.4E-05	52.6	0.144
BH1	BH7	4.5		0.03	1.7E-06	5.8E-06	9.0	0.025

Average lateral gw velocity (m/day)

1.2 m/day