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REPORT ON

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

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Submitted to:

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TABLE OF CONTENTS

TABLE OF CONTENTS continued

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^2) and the other being the Reids Lane parcel (~1754.63 m^2). 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 were measured on February 12, 2021, and water samples were obtained from 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 topsoil. Underlying the surficial organic and/or fill layers, the engineering staff identified the 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_{15} (mm)	K (cm/s)
BH1-SS2	Fine to medium SAND	0.76 - 1.37m	0.0	96.5	3.5	0.26	2.4×10^{-2}
BH2-SS9	GLACIAL TILL (sandy silt, trace clay)	7.62 - 8.22m	17.7	32.1	45.2S 5.0C	NA	$\sim 1 \times 10^{-5}$
BH3-SS2	Fine to medium SAND	0.76 - 1.37m	0.0	94.9	5.1	0.27	2.5×10^{-2}
BH4-SS7	Fine to medium SAND	4.52 - 5.18m	0.0	85.9	10.1S 4.0C	0.08	2.2×10^{-3}
BH5-SS2	Fine to medium SAND	0.76 - 1.37m	0.0	96.7	3.3	0.29	2.9×10^{-2}

Based on the above noted information, the hydraulic conductivity of the fine to medium sand is expected to be $\sim 2.6 \times 10^{-2}$ cm/s. With depth (as in BH4), the percentage of fines increase and the deeper sand deposit has a hydraulic conductivity of 2×10^{-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 Elevations (masl)	Ground Surface Elevations (masl)	Groundwater Elevations (masl)	
			May 5, 2021	March 3, 2022
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:

- 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 (PHCs). The soil analytical results were compared against Ontario Ministry of the 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 Condition Standards in a Potable Ground 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.

- 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

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

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_3 up to 0.72 mg/L N-NO_3), with the exception of the monitoring well, BH1, which had levels of ~6 to 20 mg/L N-NO_3. 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^{-4}, 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_3 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^2.

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 consists of sand overlying till (variably described 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 and 41 metres. Well yields were generally tested at rates of greater than 22 L/minute up to 76 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 $CaC0_3$ 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.

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.

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 review. The indicated depths of the existing wells range from about 24 to 73 metres and 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

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 (masl)	Ground Surface Elevations (masl)	Groundwater Elevations (masl)	
			May 5, 2021	March 3, 2022
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 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 (in order of	Bedrock Description	Target Fracture	Target Well Depth	Well Yields	Comments

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.

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.

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^2, 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:

- <u>TARGET DEPTH 1:</u>
  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.

- <u>TARGET DEPTH 2:</u>
  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 <https://www.ontario.ca/document/water-supply-wells-requirements-and-best-practices>. Additional information and links on water conservation measures are offered at the *wellaware.ca* website.

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

Regards,

Kollaard Associates Inc.

Colleen Vermeersch, P. Eng.

Kollaard Associates
Engineers

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
DATUM: GEODETIC

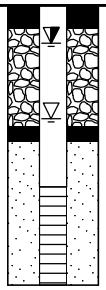
DEPTH SCALE (meters)	DESCRIPTION	DEPTH (m)	STRATA PLOT	ELEV. (m)	NUMBER	TYPE	BLOWS/0.3m
	Topsoil (FILL)	0.00		92.89	1	SS	WH
	Yellow brown sand and gravel (FILL)	0.15		92.74			
	TOPSOIL	0.30		92.59	2	SS	WH
		0.70		92.19			
2.0	Red brown fine to medium SAND, trace silt	1.37		91.52	3	SS	WH
	Grey fine to medium SAND				4	SS	WH
					5	SS	WH
4.0	Borehole continued as probehole	3.66		89.23			
6.0							
8.0							
10.0							
12.0							
14.0							
	Practical refusal on large boulder or bedrock	14.52		78.37			

UNDIST SHEAR STRENGTH x Cu. kPa x
REM SHEAR STRENGTH o Cu. kPa o
0 20 40 60 80 100

DYNAMIC CONE PENETRATION TEST blows/300 mm
0 20 40 60 80 100

MOISTURE CONTENT (%)

PIEZOMETER OR STANDPIPE INSTALLATION



Water observed in borehole at approximately 1.5 metres below the existing ground surface, February 4, 2021. Water measured in standpipe at approximately 0.5 metres below the existing ground surface, February 12, 2021.

DEPTH SCALE: 1 to 100
LOGGED: DT
BORING METHOD: Power Auger
AUGER TYPE: 200 mm Hollow Stem
CHECKED: SD

Kollaard Associates
Engineers

BOREHOLE BH02

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: 2021-02-04
SHEET: 1 of 1
DATUM: GEODETIC

DEPTH SCALE (meters)	SOIL PROFILE: DESCRIPTION	DEPTH (m)	STRATA PLOT	ELEV. (m)	SAMPLES: NUMBER	TYPE	BLOWS/0.3m	UNDIST SHEAR STRENGTH x Cu. kPa x / REM SHEAR STRENGTH o Cu. kPa o (0 20 40 60 80 100)	DYNAMIC CONE PENETRATION TEST blows/300 mm (0 20 40 60 80 100)	MOISTURE CONTENT (%)	PIEZOMETER OR STANDPIPE INSTALLATION
	TOPSOIL	0.00		91.16	1	SS	WH				
	Grey fine to medium SAND	0.40		90.76	2	SS	WH				
2.0	Grey SILTY CLAY, some sand	1.80		89.36	3	SS	WH				▽
	Grey fine to medium SAND, some silt, trace clay	2.60		88.56	4	SS	WH				
4.0	Grey SILTY CLAY	3.86		87.30	5	SS	WH				
					6	SS	WH	o ×			
6.0					7	SS	WH	o ×			
					8	SS	WH	o ×			
	Grey silty sand, trace to some gravel, cobbles and boulders, trace clay (GLACIAL TILL)	7.15		84.01							
8.0					9	SS	WH				
					10	SS	WH				
	End of borehole in GLACIAL TILL	8.99		82.17							

Water observed in borehole at approximately 1.8 metres below the existing ground surface, February 4, 2021.

DEPTH SCALE: 1 to 75
LOGGED: DT

BORING METHOD: Power Auger
AUGER TYPE: 200 mm Hollow Stem
CHECKED: SD

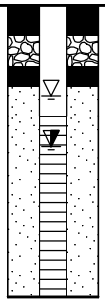
Kollaard Associates
Engineers

BOREHOLE BH03

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: 2021-02-04
SHEET: 1 of 1
DATUM: GEODETIC

DEPTH SCALE (meters)	SOIL PROFILE: DESCRIPTION	DEPTH (m)	STRATA PLOT	ELEV. (m)	SAMPLES: NUMBER	TYPE	BLOWS/0.3m	UNDIST SHEAR STRENGTH x Cu. kPa x / REM SHEAR STRENGTH o Cu. kPa o (0 20 40 60 80 100)	DYNAMIC CONE PENETRATION TEST blows/300 mm (0 20 40 60 80 100)	MOISTURE CONTENT (%)	PIEZOMETER OR STANDPIPE INSTALLATION
	TOPSOIL	0.00		90.39	1	SS	WH				
	Grey fine to medium SAND	0.40		89.99							
	Grey SILTY CLAY, some sand	1.10		89.29	2	SS	WH				
2.0					3	SS	WH				
	Grey fine to medium SAND, some silt, trace clay	2.33		88.06	4	SS	WH				
	End of borehole in SAND	2.89		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.

DEPTH SCALE: 1 to 75
LOGGED: DT

BORING METHOD: Power Auger
AUGER TYPE: 200 mm Hollow Stem
CHECKED: SD

Kollaard Associates
Engineers

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)	DESCRIPTION	DEPTH (m)	STRATA PLOT	ELEV. (m)	NUMBER	TYPE	BLOWS/0.3m	UNDIST SHEAR STRENGTH x Cu. kPa x / REM SHEAR STRENGTH o Cu. kPa o (0 20 40 60 80 100)	DYNAMIC CONE PENETRATION TEST blows/300 mm (0 20 40 60 80 100)	MOISTURE CONTENT (%)	PIEZOMETER OR STANDPIPE INSTALLATION
	Topsoil (FILL)	0.00		92.54							
	Yellow brown sand and gravel (FILL)	0.15		92.39	1	SS	WH				
	TOPSOIL	1.15		91.39	2	SS	WH				
	Red brown fine to medium SAND, trace silt	1.30		91.24							
2.0	Grey fine to medium SAND	1.80		90.74	3	SS	WH				
					4	SS	WH				
					5	SS	WH				
	Grey SILTY CLAY, some sand	3.60		88.94							
4.0					6	SS	WH				
	Grey fine to medium SAND, some silt, trace clay	4.72		87.82	7	SS	WH				
					8	SS	WH				
6.0											
	Grey SILTY CLAY	6.09		86.45	9	SS	WH	o o x x			
8.0					10	SS	WH				
								o o x x			
					11	SS	WH				
	End of borehole in SILTY CLAY	9.75		82.79							

▽

Water observed in borehole at approximately 1.5 metres below the existing ground surface, February 4, 2021.

DEPTH SCALE: 1 to 75
LOGGED: DT

BORING METHOD: Power Auger
AUGER TYPE: 200 mm Hollow Stem
CHECKED: SD

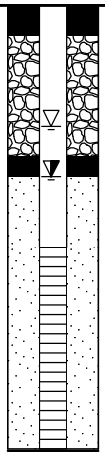
Kollaard Associates
Engineers

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

DEPTH SCALE (meters)	SOIL PROFILE: DESCRIPTION	DEPTH (m)	STRATA PLOT	ELEV. (m)	SAMPLES: NUMBER	TYPE	BLOWS/0.3m	UNDIST SHEAR STRENGTH x Cu. kPa x / REM SHEAR STRENGTH o Cu. kPa o (0 20 40 60 80 100)	DYNAMIC CONE PENETRATION TEST blows/300 mm (0 20 40 60 80 100)	MOISTURE CONTENT (%)	PIEZOMETER OR STANDPIPE INSTALLATION
	TOPSOIL	0.00		91.37	1	SS	8				
	Red brown fine to medium SAND	0.45		90.92	2	SS	12				
	Grey fine to medium SAND	1.20		90.17	3	SS	4				
2.0					4	SS	3				
	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 existing ground surface, February 12, 2021

DEPTH SCALE: 1 to 75
LOGGED: DT

BORING METHOD: Power Auger
AUGER TYPE: 200 mm Hollow Stem
CHECKED: SD

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

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

DEPTH SCALE (meters)	SOIL PROFILE: DESCRIPTION	DEPTH (m)	STRATA PLOT	ELEV. (m)	SAMPLES: NUMBER	TYPE	BLOWS/0.3m	UNDIST SHEAR STRENGTH x Cu. kPa x / REM SHEAR STRENGTH o Cu. kPa o (0 20 40 60 80 100)	DYNAMIC CONE PENETRATION TEST blows/300 mm (0 20 40 60 80 100)	MOISTURE CONTENT (%)	PIEZOMETER OR STANDPIPE INSTALLATION
	TOPSOIL	0.00		90.32	1	SS	2				▽
	Red brown fine to medium SAND, trace silt	0.35		89.97							
	Grey fine to medium SAND	0.90		89.42	2	SS	4				
2.0					3	SS	5				
	Grey SILTY CLAY, some sand	1.90		88.42							
	Grey fine to medium SAND, some silt, trace clay	2.29		88.03	4	SS	20				
	Grey SILTY CLAY	3.00		87.32	5	SS	2				
4.0								o × o ×			Water observed in borehole at approximately 0.9 metres below the existing ground surface, February 4, 2021.
					6	SS	WH				
6.0	Grey silty sand, some gravel, cobbles and boulders, trace clay (GLACIAL TILL)	5.64		84.68				o ×			
					7	SS	2				
	End of borehole in GLACIAL TILL	6.70		83.62							

DEPTH SCALE: 1 to 75
LOGGED: DT

BORING METHOD: Power Auger
AUGER TYPE: 200 mm Hollow Stem
CHECKED: SD

Kollaard Associates
Engineers

BOREHOLE BH07

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: 2023-10-17
SHEET: 1 of 1
DATUM: GEODETIC

DEPTH SCALE (meters)	DESCRIPTION	DEPTH (m)	STRATA PLOT	ELEV. (m)	NUMBER	TYPE	BLOWS/0.3m	UNDIST SHEAR STRENGTH x Cu. kPa x / REM SHEAR STRENGTH o Cu. kPa o (0 20 40 60 80 100)	DYNAMIC CONE PENETRATION TEST blows/300 mm (0 20 40 60 80 100)	MOISTURE CONTENT (%)	PIEZOMETER OR STANDPIPE INSTALLATION
	Augered through sand materials	0.00		92.92							
1.0											
2.0											
3.0											
	Grey fine to medium SAND	3.05		89.87	1	SS	5				
4.0					2	SS	5				
5.0					3	SS	16				
6.0					4	SS	6				
	Grey SILTY CLAY	6.10		86.82	5	SS	1				
7.0					6	SS	1				
8.0											
	End of borehole in SILTY CLAY	8.23		84.69							

Groundwater measured in standpipe at about 1.7 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

Kollaard Associates
Engineers

BOREHOLE BH08

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: 2023-10-17
SHEET: 1 of 1
DATUM: GEODETIC

DEPTH SCALE (meters)	SOIL PROFILE: DESCRIPTION	DEPTH (m)	STRATA PLOT	ELEV. (m)	SAMPLES: NUMBER	TYPE	BLOWS/0.3m	UNDIST SHEAR STRENGTH x Cu. kPa x / REM SHEAR STRENGTH o Cu. kPa o (0 20 40 60 80 100)	DYNAMIC CONE PENETRATION TEST blows/300 mm (0 20 40 60 80 100)	MOISTURE CONTENT (%)	PIEZOMETER OR STANDPIPE INSTALLATION
	Augered through sand materials	0.00		90.87							
1.0											
2.0											
3.0											
	Grey fine to medium SAND	3.05		87.82	1	SS	13				
4.0					2	SS	18				
	Grey SILTY CLAY	4.57		86.30	3	SS	WH				
5.0											
	End of borehole in SILTY CLAY	5.18		85.69							

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

Kollaard Associates
Engineers

BOREHOLE BH09

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: 2023-10-17
SHEET: 1 of 1
DATUM: GEODETIC

DEPTH SCALE (meters)	SOIL PROFILE: DESCRIPTION	DEPTH (m)	STRATA PLOT	ELEV. (m)	SAMPLES: NUMBER	TYPE	BLOWS/0.3m	UNDIST SHEAR STRENGTH x Cu. kPa x / REM SHEAR STRENGTH o Cu. kPa o (0 20 40 60 80 100)	DYNAMIC CONE PENETRATION TEST blows/300 mm (0 20 40 60 80 100)	MOISTURE CONTENT (%)	PIEZOMETER OR STANDPIPE INSTALLATION
1.0	Augered through sand materials	0.00		91.91							
2.0											
3.0											
	Grey fine to medium SAND, some silt	3.05		88.86	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							

Groundwater measured in standpipe at about 0.2 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

Kollaard Associates
Engineers

BOREHOLE BH10

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: 2023-10-17
SHEET: 1 of 1
DATUM: GEODETIC

DEPTH SCALE (meters)	SOIL PROFILE: DESCRIPTION	DEPTH (m)	STRATA PLOT	ELEV. (m)	SAMPLES: NUMBER	TYPE	BLOWS/0.3m	UNDIST SHEAR STRENGTH x Cu. kPa x / REM SHEAR STRENGTH o Cu. kPa o (0 20 40 60 80 100)	DYNAMIC CONE PENETRATION TEST blows/300 mm (0 20 40 60 80 100)	MOISTURE CONTENT (%)	PIEZOMETER OR STANDPIPE INSTALLATION
	Augered through sand materials	0.00		91.71							
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	WH				
	End of borehole in SILTY CLAY	5.94		85.77							

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

Kollaard Associates
Engineers

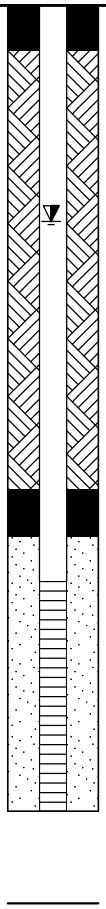
BOREHOLE BH11

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: 2023-10-17
SHEET: 1 of 1
DATUM: GEODETIC

DEPTH SCALE (meters)	SOIL PROFILE: DESCRIPTION	DEPTH (m)	ELEV. (m)	SAMPLES: NUMBER	TYPE	BLOWS/0.3m	UNDIST SHEAR STRENGTH x Cu. kPa x / REM SHEAR STRENGTH o Cu. kPa o (0 20 40 60 80 100)	DYNAMIC CONE PENETRATION TEST blows/300 mm (0 20 40 60 80 100)	MOISTURE CONTENT (%)
	Augered through sand materials	0.00	91.83						
1.0									
2.0									
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	WH			
	End of borehole in SILTY CLAY	5.94	85.89						

PIEZOMETER OR STANDPIPE INSTALLATION



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

TABLE I

FIELD WATER QUALITY MEASUREMENTS
FOR TEST WELLS

	Hours Since Pumping Test Started	Temp. (^{0}C)	pH	Conductivity (μs)	TDS (ppm)	Turbidity (NTU)	Free Chlorine (mg/l)
TW 1	1	9.3	7.7	980	497	1.9	0.0
	2	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	-
	5	9.4	7.8	960	480	0.4	-
	6	9.4	7.7	955	385	0.6	0.0
TW 2	1	9.5	8.3	666	337	1.6	0.0
	2	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
TW 3	1	9.4	7.5	832	400	8.1	0.0
	2	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

TABLE II

SUMMARY OF SUBDIVISION WATER CHEMISTRY FOR TEST AND SAMPLED WELLS

Parameter	Guideline	TW1		TW2		TW3		5529 Osgoode Main	5560 Lombardy	5566 Lombardy
		3hr	6hr	3hr	6hr	3hr	6hr			
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
pH		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**
TKN [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
Iron [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	TW1		TW2		TW3	
		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	Tp (m^2/day)	Tr (m^2/day)	Tav (m^2/day)	Q (m^3/day)	SC (m^3/day/m)	ho m	hf m	Td m	TD m	CS m	AD 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^2/day

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

Note:
- Tp: Transmissivity as calculated from pumping data (m^2/day)
- Tr: Transmissivity as calculated from recovery data (m^2/day)
- Tav: Average transmissivity (average of pumping and recovery) (m^2/day)
- Q: Test pumping rate (m^3/day)
- SC: Specific Capacity (m^3/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)

TABLE V
MUTUAL WELL INTERFERENCE AT CENTRAL LOT

Storativity	2.4.E-04		based on storativity estimate using drawdown in observation wells (cooper-jacob straight-line)
Transmissivity	203	m^2/day	average calculated value using cooper-jacob
T	2.E-03	m^2/s	
Q	1100	L/day	
Q	1.27E-05	m^3/s	
Duration	30	years	
Duration	946080000	s	
2.3Q/(4piT)	0.0010		

Lot	Distance [m]	30 Year Drawdown [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 well [metres]		0.038

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: 117.2 metres
PUMPING RATE, Q: 94.3 m3/day

Time Lapsed (minutes)	Depth (metres)	h-ho (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

TABLE VII (continued)

DATE 5-May-21
PUMPED WELL: TW3
OBSERVATION WELL: TW2
DISTANCE BETWEEN PUMPED WELL AND OBSERVATION WELL, r: 117.6 metres
PUMPING RATE, Q: 94.3 m3/day

Time Lapsed (minutes)	Depth (metres)	h-ho (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

TABLE VII (continued)

DATE 10-May-21
PUMPED WELL: TW2
OBSERVATION WELL: TW1
DISTANCE BETWEEN PUMPED WELL AND OBSERVATION WELL, r: 45 metres
PUMPING RATE, Q: 88.9 m3/day

Time Lapsed (minutes)	Depth (metres)	h-ho (metres)
0	-7.07	0
15	-7.39	0.32
30	-7.41	0.34
45	-7.43	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
135	-7.46	0.39
150	-7.46	0.39
165	-7.46	0.39
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
465	-7.14	0.07
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
585	-7.13	0.06
600	-7.13	0.05
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
705	-7.09	0.02
720	-7.09	0.02
735	-7.08	0.01
750	-7.08	0.01

TABLE VII (continued)

DATE 10-May-21
PUMPED WELL: TW2
OBSERVATION WELL: TW3
DISTANCE BETWEEN PUMPED WELL AND OBSERVATION WELL, r: 117.6 metres
PUMPING RATE, Q: 88.9 m3/day

Time Lapsed (minutes)	Depth (metres)	h-ho (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

TABLE VII (continued)

DATE 12-May-21
PUMPED WELL: TW1
OBSERVATION WELL: TW2
DISTANCE BETWEEN PUMPED WELL AND OBSERVATION WELL, r: 44.6 metres
PUMPING RATE, Q: 94.3 m3/day

Time Lapsed (minutes)	Depth (metres)	h-ho (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

TABLE VII (continued)

DATE 12-May-21
PUMPED WELL: TW1
OBSERVATION WELL: TW3
DISTANCE BETWEEN PUMPED WELL AND OBSERVATION WELL, r: 117.2 metres
PUMPING RATE, Q: 94.3 m3/day

Time Lapsed (minutes)	Depth (metres)	h-ho (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 Well	r (m)	Q (m^3/day)	t_o (min)	T (m^2/day)	S
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

TABLE VI
WELL INTERFERENCE AT PROPERTY BOUNDARY

Storativity	2.4.E-04		based on storativity estimate using drawdown in observation wells (cooper-jacob straight-line)
Transmissivity	203	m^2/day	average calculated value using cooper-jacob
T	2.E-03	m^2/s	
Q	1100	L/day	
Q	1.27E-05	m^3/s	
Duration	30	years	
Duration	946080000	s	
2.3Q/(4piT)	0.0010		

Lot	Distance [m]	30 Year Drawdown [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 aquifer drawdown at north property corner [m]		0.044

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	MW7		MW8		MW9		MW10		MW11	
DATE		20-Nov-23	28-Feb-24	20-Nov-23	28-Feb-24	20-Nov-23	28-Feb-24	20-Nov-23	28-Feb-24	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

TABLE X GROUNDWATER ELEVATIONS-RECEIVING AQUIFER AND WATER SUPPLY AQUIFER

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

FIGURE 2

TW1
Approximate Water Well Location

Approximate Borehole (Monitoring Well) Location
BH1 (MW1)

Approximate Receiving Aquifer Flow Direction

Approximate Water Supply Aquifer Flow Direction

NOTE: 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
K0G 1J0 FAX (613) 258-0475
http://www.kollaard.ca
(613) 860-0923
info@kollaard.ca

CLIENT: MILES YANG

PROJECT: PROPOSED RESIDENTIAL SUBDIVISION

LOCATION: 3200 REIDS LANE OSGOODE, ONTARIO

DRAWING: SITE PLAN

DESIGNED BY:	DATE:
—	AUGUST 2021
DRAWN BY:	SCALE:
CV	1:1000

KOLLAARD FILE NUMBER: 210064

FIGURE 3

TW1
Approximate Water Well Location

NOTE: 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
K0G 1J0 FAX (613) 258-0475
http://www.kollaard.ca

(613) 860-0923
info@kollaard.ca

CLIENT: MILES YANG

PROJECT: PROPOSED RESIDENTIAL SUBDIVISION

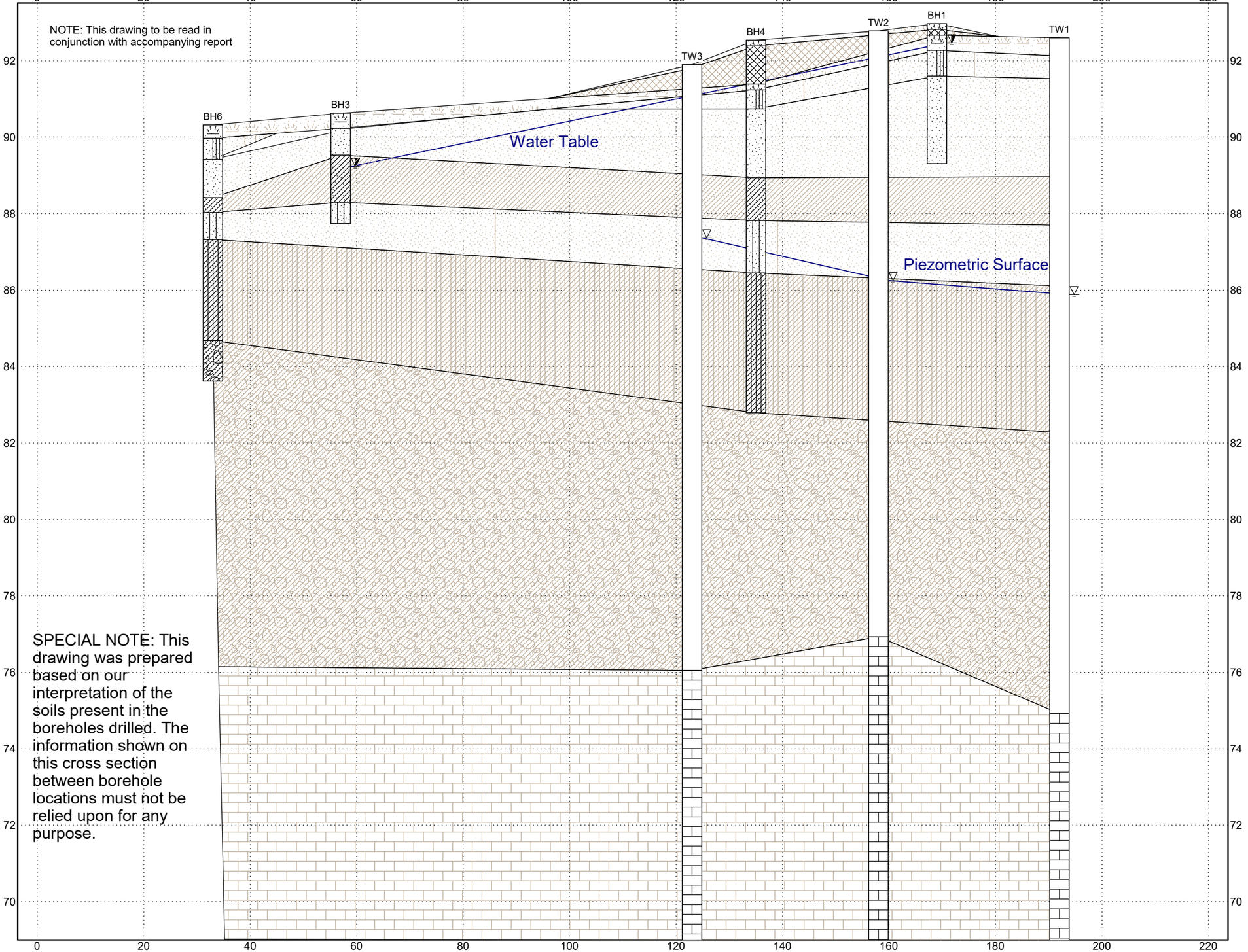
LOCATION: 3200 REIDS LANE OSGOODE, ONTARIO

DRAWING: AREA AND SAMPLED WELL LOCATIONS

DESIGNED BY:	DATE:
_	AUGUST 2021
DRAWN BY:	SCALE:
CV	1:2000

KOLLAARD FILE NUMBER: 210064

NOTE: This drawing to be read in conjunction with accompanying report



SPECIAL NOTE: This drawing was prepared based on our interpretation of the soils present in the boreholes drilled. The information shown on this cross section between borehole locations must not be relied upon for any purpose.

CROSS-SECTION KOLLAARD 210064-CROSSSECTION.GPJ GINT STD CANADA.GDT 21-8-19

FIGURE 4

- TOPSOIL
- Yellow brown sand and gravel (FILL)
- Red brown fine to medium SAND, trace silt
- Grey fine to medium SAND
- Grey sandy CLAY, trace silt
- Grey SILTY SAND
- Grey SILTY CLAY
- Grey silty sand, trace to some gravel, cobbles and boulders, trace clay (GLACIAL TILL)
- LIMESTONE BEDROCK

Kollaard Associates
Engineers

210 Prescott Street, Unit 1
P.O. Box 189
Kemptville, Ontario
K0G 1J0

613-860-0923
info@kollaard.ca
Fax: 613-258-0475

CLIENT:
Miles Yang

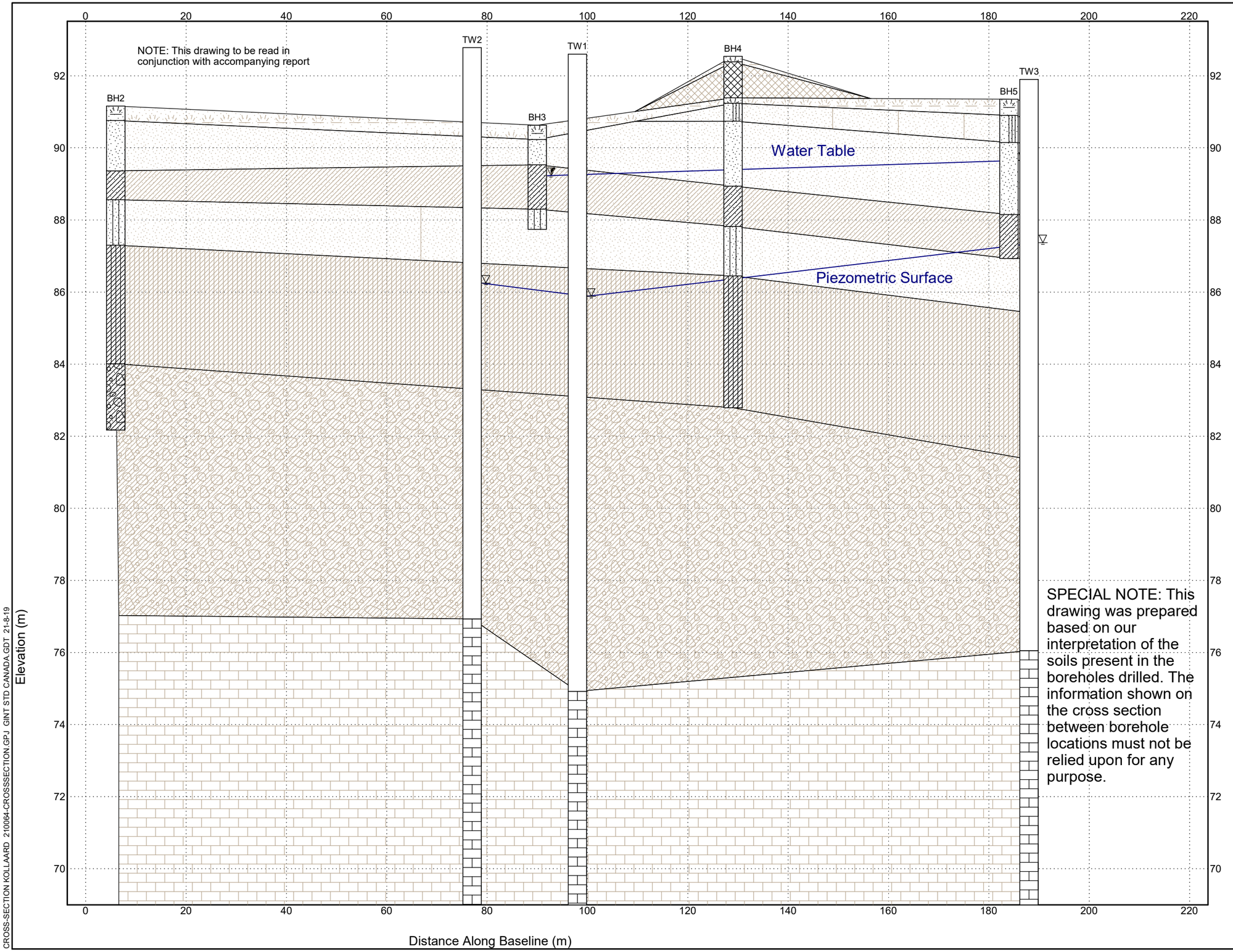
PROJECT:
Proposed Residential Subdivision

LOCATION:
3200 Reids Lane.
Osgoode. Ottawa. Ontario

DRAWING:
East-West Cross Section

DESIGNED BY:	*DATE:*
CV	July 2021
DRAWN BY:	*SCALE:*
CI	1:100

PROJECT NUMBER:
210064



CROSS-SECTION KOLLAARD 210064-CROSSSECTION.GPJ GINT STD CANADA.GDT 21-8-19

FIGURE 5

- TOPSOIL
- Yellow brown sand and gravel (FILL)
- Red brown fine to medium SAND, trace silt
- Grey fine to medium SAND
- Grey sandy CLAY, trace silt
- Grey SILTY SAND
- Grey SILTY CLAY
- Grey silty sand, trace to some gravel, cobbles and boulders, trace clay (GLACIAL TILL)
- LIMESTONE BEDROCK

Kollaard Associates
Engineers

210 Prescott Street, Unit 1
P.O. Box 189
Kemptville, Ontario
K0G 1J0

613-860-0923
info@kollaard.ca
Fax: 613-258-0475

CLIENT:
Miles Yang

PROJECT:
Proposed Residential Subdivision

LOCATION:
3200 Reids Lane.
Osgoode. Ottawa. Ontario

DRAWING:
North-South Cross Section

DESIGNED BY:	*DATE:*
CV	July 2021
DRAWN BY:	*SCALE:*
CI	1:100

PROJECT NUMBER:
210064

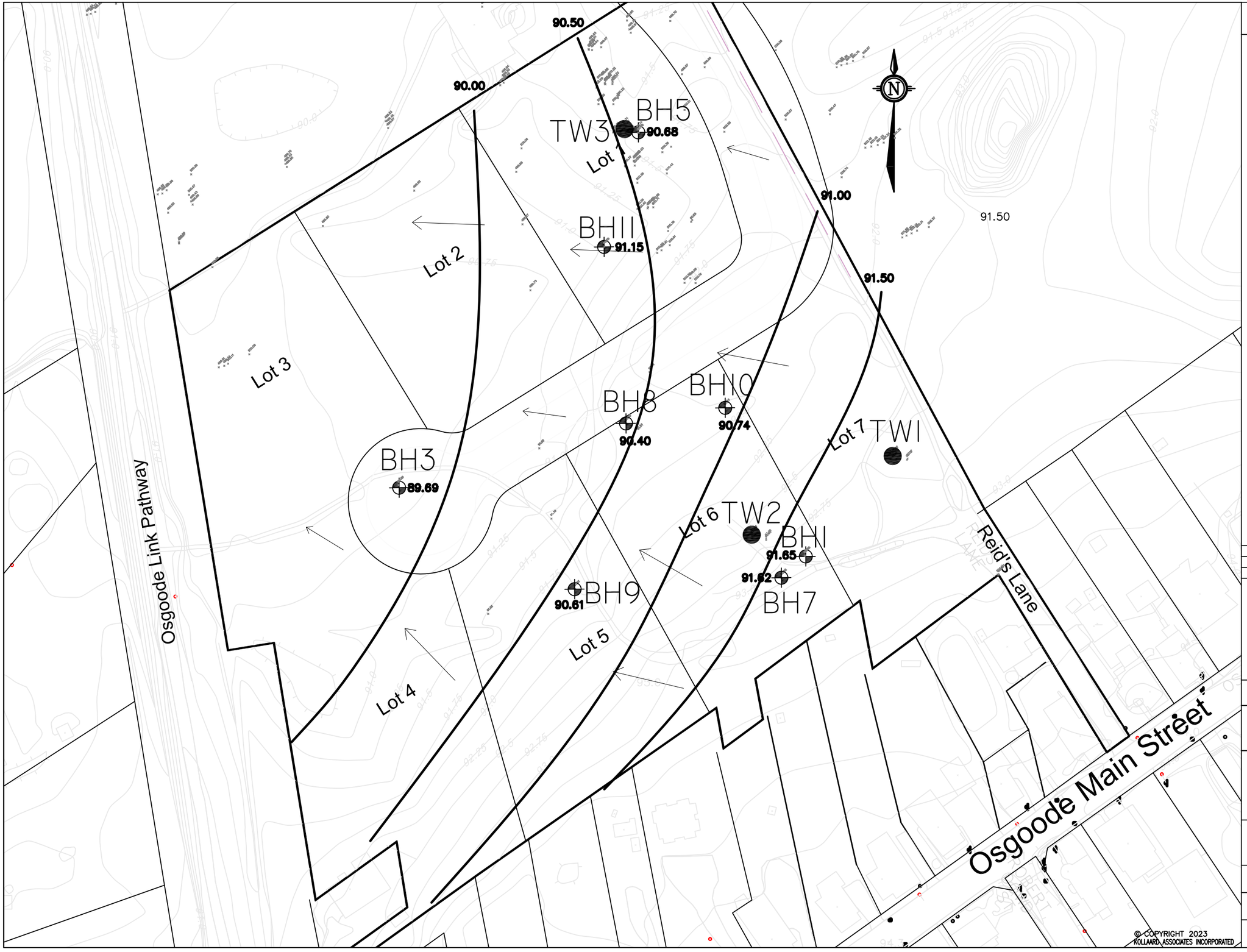


FIGURE 6A

TW1 — Existing Water Well Location

BH1 — Approximate Borehole (Monitoring Well) Location

91.30 — GW ELEVATION

Approximate Receiving Aquifer Flow Direction

NOTE: 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
K0G 1J0 FAX (613) 258-0475
http://www.kollaard.ca

(613) 860-0923
info@kollaard.ca

CLIENT: MILES YANG

PROJECT: PROPOSED RESIDENTIAL SUBDIVISION

LOCATION: 3200 REIDS LANE OSGOODE, ONTARIO

DRAWING: INTERPRETED GROUNDWATER FLOW RECEIVING AQUIFER

DESIGNED BY:	DATE:
–	APRIL 2024
DRAWN BY:	SCALE:
CV	1:1000

KOLLAARD FILE NUMBER: 210064

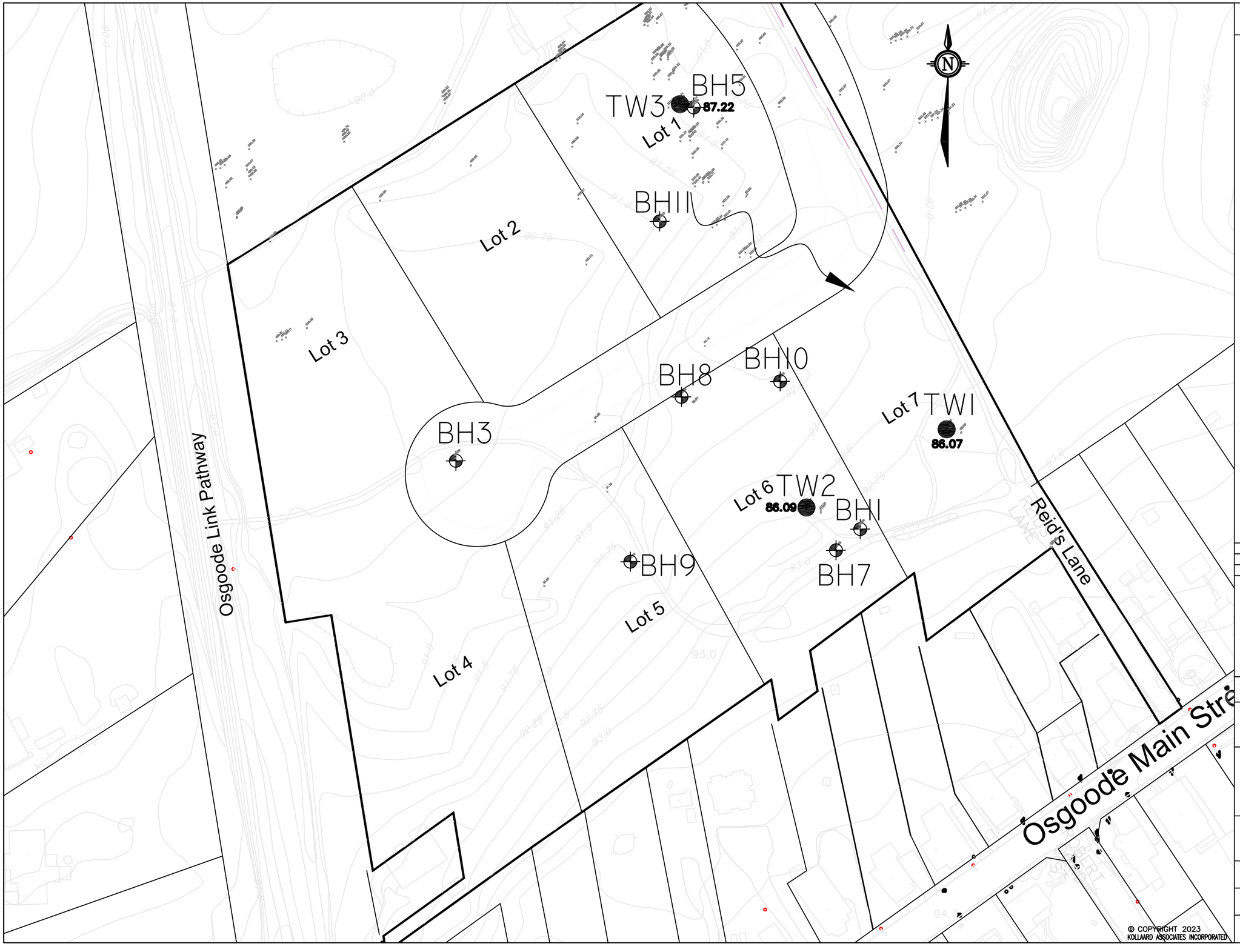


FIGURE 6B

TW1 ● Existing Water Well Location

BH1 (MW1) Approximate Borehole (Monitoring Well) Location

91.30 GW ELEVATION

Approximate Water Supply Aquifer Flow Direction

NOTE: 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
K0G 1J0 FAX (613) 258-0475
http://www.kollaard.ca

(613) 860-0923
info@kollaard.ca

CLIENT: MILES YANG

PROJECT: PROPOSED RESIDENTIAL SUBDIVISION

LOCATION: 3200 REIDS LANE OSGOODE, ONTARIO

DRAWING: INTERPRETED GROUNDWATER FLOW WATER SUPPLY AQUIFER

DESIGNED BY:	DATE:
–	AUGUST 2021
DRAWN BY:	SCALE:
CV	1:1000

KOLLAARD FILE NUMBER: 210064

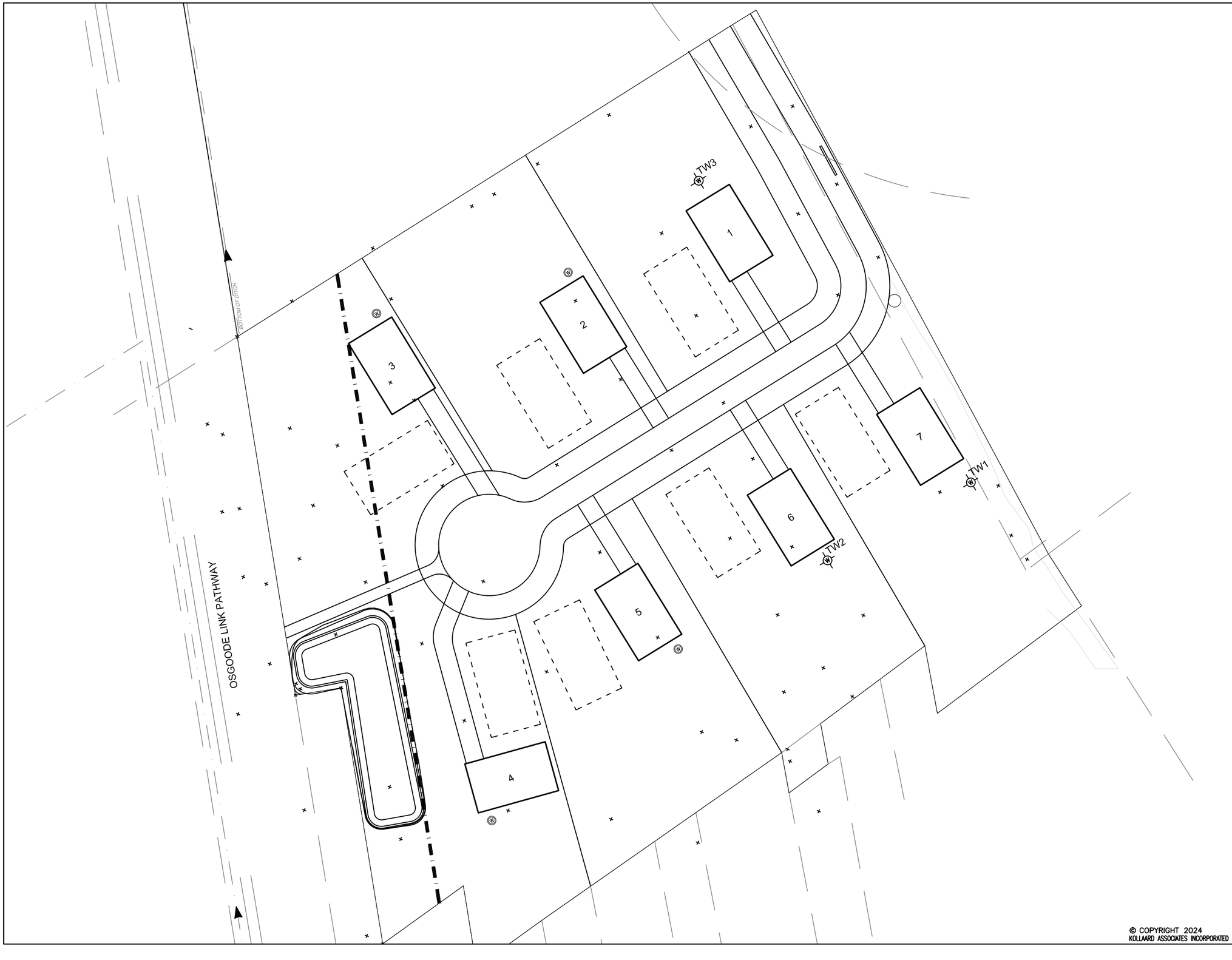


FIGURE 7

TW1
Approximate Water Well Location

Proposed Water Well Location

Proposed sewage system

Proposed house

NOTE: This drawing to be read in conjunction with accompanying report.

REV.	NAME	DATE	DESCRIPTION
2	CV	07/24	revised per Novatech
1	CV	02/23	setback distances

Kollaard Associates
Engineers

PO, BOX 189, 210 PRESCOTT ST
KEMPTVILLE ONTARIO
K0G 1J0 FAX (613) 258-0475
http://www.kollaard.ca

(613) 860-0923
info@kollaard.ca

CLIENT:
MILES YANG

PROJECT:
PROPOSED RESIDENTIAL SUBDIVISION

LOCATION:
3200 REIDS LANE
OSGOODE, ONTARIO

DRAWING:
LOT DEVELOPMENT PLAN

DESIGNED BY:	DATE:
–	AUGUST 2021
DRAWN BY:	SCALE:
CV	1:1000

KOLLAARD FILE NUMBER:
210064

ATTACHMENT A

SURFICIAL AND BEDROCK GEOLOGY MAPS

BEDROCK GEOLOGY MAP

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

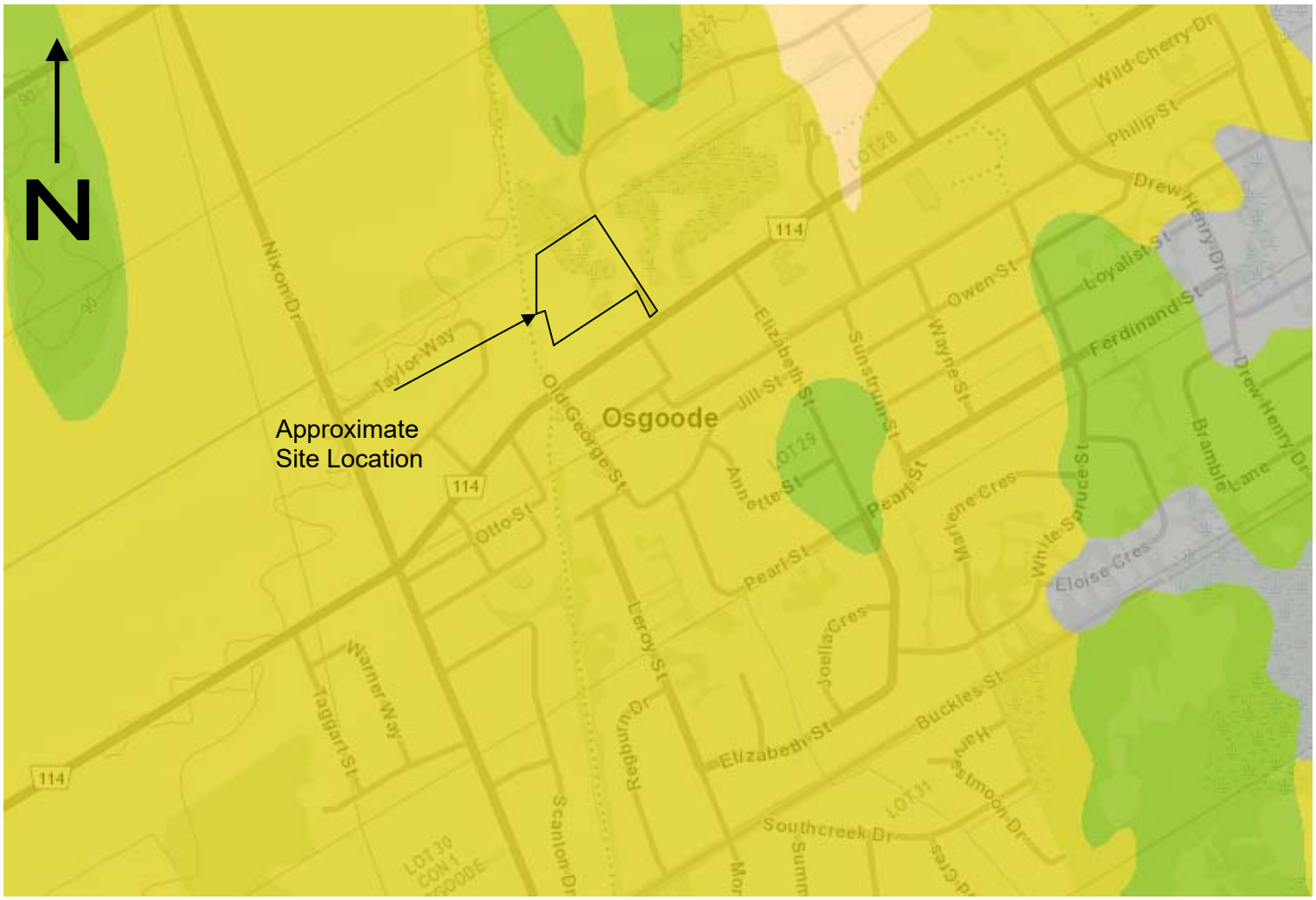
Oxford Formation (Beekmantown Group):
Primary Lithology: dolostone
brown-grey to green-grey, thin- to thick-bedded, very fine- to medium-grained dolostone; with local thin glauconitic shale beds, and interbeds of quartz sandstone and shaly dolostone

Kollaard Associates
Engineers

Project No. 210064

Date June 2024

SURFICIAL GEOLOGY MAP



Coarse-textured glaciomarine deposits: sand, gravel, minor silt and clay	**Glaciofluvial Deposits:** river deposits and delta topset facies
Till: Silty sand to sand-textured till on Precambrian terrain	**Organic Deposits:** Peat, muck, marl

Ontario Geological Survey of Ontario, Bedrock Geology Map MRD 128-REV, issued 2010

Kollaard Associates
Engineers

Project No. 210064

Date June 2024

ATTACHMENT B

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

TW1

Ontario — Ministry of the Environment, Conservation and Parks

Well Tag#: A318366 (Below) A318366

Well Record

Regulation 903 Ontario Water Resources Act

Measurements recorded in: ☐ Metric ☒ Imperial

Page ____ of ____

Well Owner's Information

First Name	Last Name/Organization	E-mail Address	☐ Well Constructed by Well Owner
	Crestview Innovation Inc.		

Mailing Address (Street Number/Name)	Municipality	Province	Postal Code	Telephone No. (inc. area code)
12 Escade Drive	Ottawa	ON	K2G 6R9	

Well Location

Address of Well Location (Street Number/Name)	Township	Lot	Concession
3200 Reids Lane	Osgode	P/L 27+28	1

County/District/Municipality	City/Town/Village	Province	Postal Code
Ottawa Carleton	Osgoode	Ontario	

UTM Coordinates	Zone	Easting	Northing	Municipal Plan and Sublot Number	Other
NAD 83	18	452113	4999346	4R-20040 (Parts 4+5)	TW# 1

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

General Colour	Most Common Material	Other Materials	General Description	Depth (m/ft) From	Depth (m/ft) To
	Sand	& Cobble		0	25
	Clay			25	38
	Gravel		(Packed)	38	56
Grey	Limestone			56	160
Grey	Limestone	w/ Grey Sandstone Mix		160	244
Grey	Limestone	w/ Grey Sandstone Mix		244	250
	* Test Well # 1 of 3 *				

Annular Space

Depth Set at (m/ft) From	To	Type of Sealant Used (Material and Type)	Volume Placed (m³)
66	56	Neat cement	9.36
56	0	Bentonite slurry	21

Method of Construction

☐ Cable Tool ☐ Diamond ☐ Public ☐ Commercial ☐ Not used
☐ Rotary (Conventional) ☐ Jetting ☒ Domestic ☐ Municipal ☐ Dewatering
☐ Rotary (Reverse) ☐ Driving ☐ Livestock ☐ Test Hole ☐ Monitoring
☐ Boring ☐ Digging ☐ Irrigation ☐ Cooling & Air Conditioning
☐ Air percussion ☐ Industrial
☐ Other, specify ☐ Other, specify

Construction Record - Casing

Inside Diameter (cm/in)	Open Hole OR Material (Galvanized, Fibreglass, Concrete, Plastic, Steel)	Wall Thickness (cm/in)	Depth (m/ft) From	Depth (m/ft) To
6 1/4"	Steel	.188"	+2	66
6"	Open Hole		66	250

Construction Record - Screen

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

Status of Well

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

Water Details

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

Hole Diameter

Depth (m/ft) From	To	Diameter (cm/in)
0	66	9 3/4"
66	250	6"

Results of Well Yield Testing

After test of well yield, water was:
☐ Clear and sand free
☐ Other, specify Not tested

If pumping discontinued, give reason: X

Pump intake set at (m/ft): 240

Pumping rate (l/min / GPM): 20

Duration of pumping: 1 hrs + 0 min

Final water level end of pumping (m/ft): 30.2"

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

Recommended pump depth (m/ft): 140'

Recommended pump rate (l/min/GPM): 20

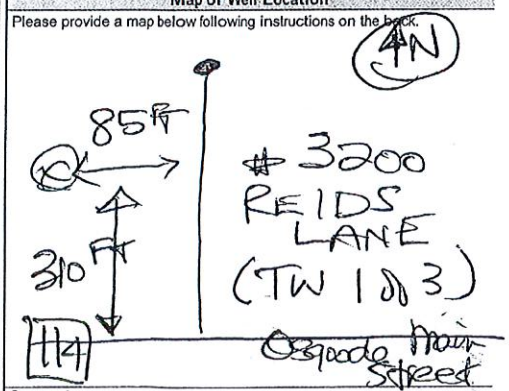
Well production (l/min/GPM): 20

Disinfected? ☒ Yes ☐ No

	Draw Down Time (min)	Draw Down Water Level (m/ft)	Recovery Time (min)	Recovery Water Level (m/ft)
Static Level	226"			30.2"
1	27.9	1	25.0	
2	28.9	2	23.3	
3	29.2	3	22.9	
4	29.4	4	22.9"	
5	29.5	5		
10	29.8	10		
15	29.9	15		
20	30.0	20		
25	30.0	25		
30	30.1	30		
40	30.1	40		
50	30.2	50		
60	30.2"	60		

Map of Well Location

Please provide a map below following instructions on the back.



Comments: 1/2HP - 10 GPM Set @ 140 FT

Well Contractor and Well Technician Information

Business Name of Well Contractor	Well Contractor's Licence No.
Air Rock Drilling Co. Ltd.	7681

Business Address (Street Number/Name)	Municipality
6659 Franktown Road	Richmond

Province	Postal Code	Business E-mail Address
ON	K0A 2Z0	air-rock@sympatico.ca

Bus. Telephone No. (inc. area code)	Name of Well Technician (Last Name, First Name)
8138382170	Hanna, Jeremy

Well Technician's Licence No.	Signature of Technician and/or Contractor	Date Submitted
T3632		2021 05 31

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

Date Package Delivered: 2021 04 27

Date Work Completed: 2021 04 26

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Audit No. Z355079

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CERTIFICATE OF WELL COMPLIANCE

Ottawa

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: ~~24~~ Part 27 **CON:** 1 **PLAN #** 4R-20040 ~~STR#~~ Part 4 & 5

Ottawa-Carleton / Geographical Township of Osgoode

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.

Signed this 26TH Day of APRIL, 2021

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 11th day of May, 2021

TAG A318366
TW# 1 of 3
2021241

(Engineer)

Shaping our future together
Ensemble, formons notre avenir

City of
Client S
8743 Vi

Kollaard Associates
Engineers
P.O. Box 189
210 Prescott Street, Unit 1
Kemptville, Ontario K0G 1J0

2001
International Year of Volunteers
Année internationale

TW2

Ontario — Ministry of the Environment, Conservation and Parks

Tag#: A318392 (Print Below)

A318392

Well Record

Regulation 903 Ontario Water Resources Act

Measurements recorded in: ☐ Metric ☒ Imperial

Page ____ of ____

Well Owner's Information

First Name	Last Name/Organization	E-mail Address	☐ Well Constructed by Well Owner
	Crestview Innovation Inc.		

Mailing Address (Street Number/Name)	Municipality	Province	Postal Code	Telephone No. (inc. area code)
12 Escade Drive	Ottawa	ON	K2G 6R9	

Well Location

Address of Well Location (Street Number/Name)	Township	Lot	Concession
3200 Reids Lane	Osgoode	P/L 27 & 28	1

County/District/Municipality	City/Town/Village	Province	Postal Code
Ottawa Carleton	Osgoode	Ontario	

UTM Coordinates	Zone	Easting	Northing	Municipal Plan and Sublot Number	Other
NAD 83	18	452078	4999307	4R-20040 (Parts 4 & 5)	TW#2

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

General Colour	Most Common Material	Other Materials	General Description	Depth (m/ft) From	To
	Sand	& Boulders & Clay, Gravel		0'	52'
Grey & Black	Limestone			52'	180'
Grey & Black	Limestone		w/ Grey & White Sandstone Mix	180'	238'
Grey & Black	Limestone		w/ Grey & White Sandstone Mix.	238'	244'

* Test Well # 2 of 3 *

Annular Space

Depth Set at (m/ft) From	To	Type of Sealant Used (Material and Type)	Volume Placed (m³/ft³)
62'	52'	Neat cement	10.9
52'	0'	Bentonite slurry	21

Method of Construction

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

SURGED

Well Use

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

Construction Record - Casing

Inside Diameter (cm/in)	Open Hole OR Material (Galvanized, Fibreglass, Concrete, Plastic, Steel)	Wall Thickness (cm/in)	Depth (m/ft) From	To
6 1/4"	Steel	.188"	+2'	62'
6"	Open Hole		62'	244'

Construction Record - Screen

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

Status of Well

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

Water Details

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

Hole Diameter

Depth (m/ft) From	To	Diameter (cm/in)
0'	62'	9 3/4"
62'	244'	6"

Results of Well Yield Testing

After test of well yield, water was:
☐ Clear and sand free
☐ Other, specify: Not tested

If pumping discontinued, give reason:

Pump intake set at (m/ft): 220

Pumping rate (l/min / GPM): 20

Duration of pumping: 1 hrs + 0 min

Final water level end of pumping (m/ft): 27.8'

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

Recommended pump depth (m/ft): 140'

Recommended pump rate (l/min/GPM): 20

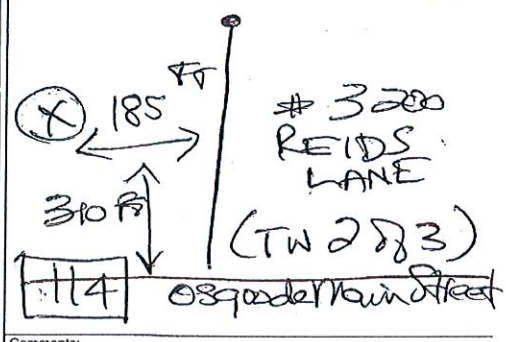
Well production (l/min/GPM): 20

Disinfected? ☒ Yes ☐ No

Draw Down Time (min)	Water Level (m/ft)	Recovery Time (min)	Water Level (m/ft)
Static Level	22.5'		27.8'
1	26.7	1	22.5
2	27.2	2	22.5'
3	27.5	3	
4	27.6	4	
5	27.7	5	
10	27.7	10	
15	27.7	15	
20	27.8	20	
25	27.8	25	
30	27.8	30	
40	27.8	40	
50	27.8	50	
60	27.8"	60	

Map of Well Location

Please provide a map below following instructions on the back.



Comments: 1/2HR 10 GPM Set @ 140 FT

Well Contractor and Well Technician Information

Business Name of Well Contractor	Well Contractor's Licence No.
Air Rock Drilling Co. Ltd.	7681

Business Address (Street Number/Name)	Municipality
6698 Frankltown Road	Richmond

Province	Postal Code	Business E-mail Address
ON	K0A 2Z0	air-rock@sympatico.ca

Bus. Telephone No. (inc. area code)	Name of Well Technician (Last Name, First Name)
6138382170	Hanna, Jeremy

Well Technician's Licence No.	Signature of Technician and/or Contractor	Date Submitted (Y Y Y Y M M D D)
13632		2021 05 31

Well owner's Information package delivered	Date Package Delivered (Y Y Y Y M M D D)	Date Work Completed (Y Y Y Y M M D D)
☒ Yes ☐ No	2021 04 29	2021 04 27

Ministry Use Only

Audit No. Z355078

Received

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Ministry's Copy

CERTIFICATE OF WELL COMPLIANCE

Ottawa

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: Part 27 & 28 CON: 1 PLAN # 4R-20040 ~~STL#~~ Part 4 & 5

Ottawa-Carleton / Geographical Township of Osgoode

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.

Signed this 27 TH Day of APRIL, 2021

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 11th day of May, 2021, TAG A318392
TW#2 of 3
2021242

(Engineer)

Shaping our future together
Ensemble, formons notre avenir

City of Ottawa
Client Service Centre
8763 Victoria Street

Kollaard Associates
Engineers
P.O. Box 189
210 Prescott Street, Unit 1
Kemptville, Ontario K0G 1J0

2001 International Year of Volunteers Année internationale

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: Part 27 & 28 **CON:** 1 **PLAN #** 4R-20040 ~~STL~~ # Part 4 & 5

Ottawa-Carleton / Geographical Township of Osgoode

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.

Signed this 26TH Day of APRIL, 2021

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 11th day of May, 2021, TAG A318365
TW# 2 OF 3
2021240.

(Engineer)

Shaping our future together
Ensemble, formons notre avenir

City of Ott
Client Servi
8763 Victoria

Kollaard Associates
Engineers
P.O. Box 189
210 Prescott Street, Unit 1
Kemptville, Ontario K0G 1J0

2001 International Year of Volunteers Année internationale

TW3

Ontario Ministry of the Environment, Conservation and Parks

Tag#: A318365 (Print Below) A318365

Well Record

Regulation 903 Ontario Water Resources Act

Measurements recorded in: ☐ Metric ☒ Imperial

Page ____ of ____

Well Owner's Information

First Name	Last Name/Organization	E-mail Address	☐ Well Constructed by Well Owner
	Crestview Innovation Inc.		

Mailing Address (Street Number/Name)	Municipality	Province	Postal Code	Telephone No. (inc. area code)
12 Escade Drive	Ottawa	ON	K2G 6R9	

Well Location

Address of Well Location (Street Number/Name)	Township	Lot	Concession
3200 Reids Lane	Osgoode	P/L 27 & 28	1

County/District/Municipality	City/Town/Village	Province	Postal Code
Ottawa Carleton	Osgoode	Ontario	

UTM Coordinates	Zone	Easting	Northing	Municipal Plan and Sublot Number	Other
NAD 83	18	452036	4999431	4R-20040 (Parts 4+5)	TW#3

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

General Colour	Most Common Material	Other Materials	General Description	Depth (m/ft) From	To
	Sand	& Stones		0	11
	Clay			11	37
	Boulders	& Gravel		37	52
Grey	Limestone			52	70
Grey	Limestone			70	93
Grey	Limestone			93	100

Test Well #3 of 3

Annular Space

Depth Set at (m/ft) From	To	Type of Sealant Used (Material and Type)	Volume Placed (m³/kg)
62	52	Neat cement	9.36
52	0	Bentonite slurry	25.2

Method of Construction

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

Well Use

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

Construction Record - Casing

Inside Diameter (cm/in)	Open Hole OR Material (Galvanized, Fibreglass, Concrete, Plastic, Steel)	Wall Thickness (cm/in)	Depth (m/ft) From	To
6 1/4"	Steel	.188"	+2'	62'
6"	Open Hole		62'	100'

Status of Well

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

Construction Record - Screen

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

Results of Well Yield Testing

After test of well yield, water was: ☐ Clear and sand free ☐ Other, specify **Not tested**

If pumping discontinued, give reason: X

Pump intake set at (m/ft): 80

Pumping rate (l/min / GPM): 20

Duration of pumping: 1 hrs + 0 min

Final water level end of pumping (m/ft): 16.2'

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

Recommended pump depth (m/ft): 80'

Recommended pump rate (l/min/GPM): 20

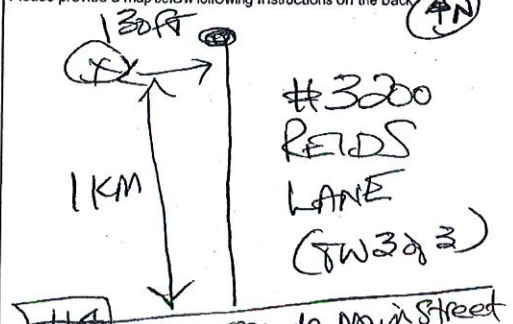
Well production (l/min/GPM): 20

Disinfected? ☒ Yes ☐ No

Draw Down Time (min)	Water Level (m/ft)	Recovery Time (min)	Water Level (m/ft)
Static Level	15.3'		16.2"
1	15.5	1	15.3
2	15.5	2	15.3"
3	15.6	3	
4	15.6	4	
5	15.6	5	
10	15.7	10	
15	15.8	15	
20	15.9	20	
25	15.9	25	
30	16.0	30	
40	16.1	40	
50	16.2	50	
60	16.2"	60	

Map of Well Location

Please provide a map below following instructions on the back. (4N)



Water Details

Water found at Depth (m/ft)	Kind of Water	Other, specify
70	☐ Fresh ☒ Untested	☐ Gas ☐ Other, specify
93	☐ Fresh ☒ Untested	☐ Gas ☐ Other, specify
	☐ Fresh ☐ Untested	☐ Gas ☐ Other, specify

Hole Diameter

Depth (m/ft) From	To	Diameter (cm/in)
0'	62'	9 3/4"
62'	100'	6"

Comments: 1/2 hr 10 GPM Sat @ 80 FT

Well Contractor and Well Technician Information

Business Name of Well Contractor	Well Contractor's Licence No.
Air Rock Drilling Co. Ltd.	7681

Business Address (Street Number/Name)	Municipality	Province	Postal Code	Business E-mail Address
6659 Franktown Road	Richmond	ON	K0A 2Z0	air-rock@sympatico.ca

Bus. Telephone No. (inc. area code)	Name of Well Technician (Last Name, First Name)	Well Technician's Licence No.	Signature of Technician and/or Contractor	Date Submitted (Y Y Y Y M M D D)
6138382170	Hanna, Jeremy	T3632		2021 05 31

Well owner's information package delivered	Date Package Delivered (Y Y Y Y M M D D)	Ministry Use Only
☒ Yes ☐ No	2021 04 27	Audit No. Z355080
	Date Work Completed (Y Y Y Y M M D D)	Received
	2021 04 26	

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Ministry's Copy

Ontario Ministry of the Environment

The Ontario Water Resources Act
WATER WELL RECORD

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

OTTAWA-CARLETON

11 1533843 Municipality 15009 Con. CON 01

County or District: Carleton
Township/Borough/City/Town/Village: OSGOODE (Ottawa)
Con block tract survey, etc.: 1 Plan 393
Lot: Part 46 & 47
Address: 5503 OSGOODE Main St.
Date completed: 9 day 01 month 03 year
Northing RC Elevation RC Basin Code

LOG OF OVERBURDEN AND BEDROCK MATERIALS (see instructions)

General colour	Most common material	Other materials	General description	Depth - feet From	Depth - feet To
BRown	Sand		Packed	0	14
GRey	Clay		thick	14	30
GRey	Clay & Stones		HARD Pan	30	50
GRey	Limestone		MED HARD	50	80
	54' OF 6"		casing		
	1		DRIVE Shoe		
	1		WELL CaP		
	2		Bags of Bentonite Quick Grout		

41 WATER RECORD

Water found at - feet	Kind of water
68	1 ☐ Fresh 2 ☐ Salty 3 ☒ Sulphur 4 ☒ Minerals 5 ☐ Gas 6
	1 ☐ Fresh 2 ☐ Salty 3 ☐ Sulphur 4 ☐ Minerals 5 ☐ Gas 6
	1 ☐ Fresh 2 ☐ Salty 3 ☐ Sulphur 4 ☐ Minerals 5 ☐ Gas 6
	1 ☐ Fresh 2 ☐ Salty 3 ☐ Sulphur 4 ☐ Minerals 5 ☐ Gas 6
	1 ☐ Fresh 2 ☐ Salty 3 ☐ Sulphur 4 ☐ Minerals 5 ☐ Gas 6

51 CASING & OPEN HOLE RECORD

Inside diam inches	Material	Wall thickness inches	Depth - feet From	Depth - feet To
6¼	1 ☒ Steel 2 ☐ Galvanized 3 ☐ Concrete 4 ☒ Open hole 5 ☐ Plastic	.188	0	53
6"			53	80
	1 ☐ Steel 2 ☐ Galvanized 3 ☐ Concrete 4 ☐ Open hole 5 ☐ Plastic			
	1 ☐ Steel 2 ☐ Galvanized 3 ☐ Concrete 4 ☐ Open hole 5 ☐ Plastic			

SCREEN

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

Material and type: Depth at top of screen feet

61 PLUGGING & SEALING RECORD

☒ Annular space ☐ Abandonment

Depth set at - feet From	Depth set at - feet To	Material and type (Cement grout, bentonite, etc.)
0	53	Bentonite Quick GROUT

71 PUMPING TEST

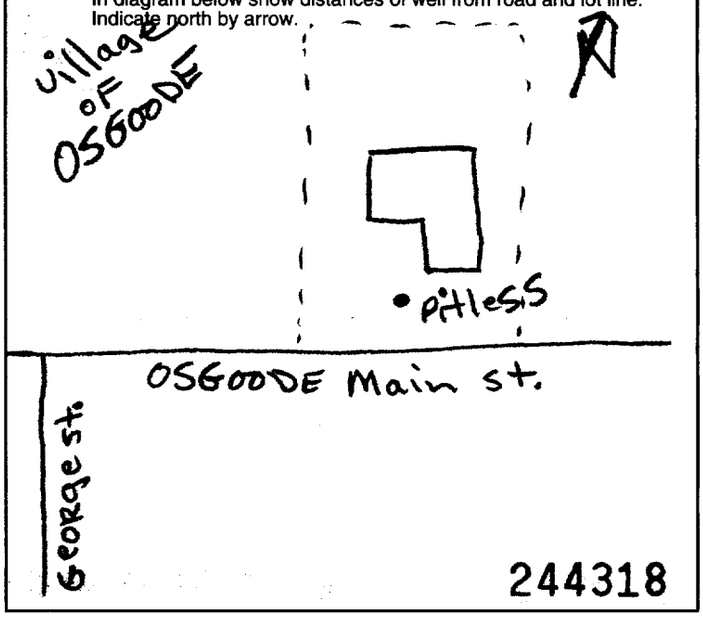
Pumping test method: 1 ☐ Pump 2 ☒ Bailer
Pumping rate: 12 GPM
Duration of pumping: 1 Hours Mins

Static level	Water level end of pumping	Water levels during ☒ Pumping ☐ Recovery			
26 feet	60 feet	15 minutes: 40 feet	30 minutes: 60 feet	45 minutes: 60 feet	60 minutes: 60 feet

If flowing give rate: GPM
Pump intake set at: feet
Water at end of test: ☒ Clear ☐ Cloudy
Recommended pump type: ☐ Shallow ☒ Deep
Recommended pump setting: 70 feet
Recommended pump rate: 10 GPM

LOCATION OF WELL

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



244318

FINAL STATUS OF WELL

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

WATER USE

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

METHOD OF CONSTRUCTION

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

Name of Well Contractor	Well Contractor's Licence No.
B. MOORE WELL DRILLING	6455
Address: Box 436 OSGOODE ON. K0A 2W0	
Name of Well Technician: Bob MOORE	Well Technician's Licence No.: T-0319
Signature of Technician/Contractor: Bob Moore	Submission date: day 9 mo 01 yr 03

MINISTRY USE ONLY

Data source | Contractor: 6455 | Date received: JUN 10 2003
Date of inspection | Inspector
Remarks: CSS.ES3

2 - MINISTRY OF THE ENVIRONMENT COPY

0506 (07/00) Front Form 9

Ontario — Ministry of the Environment

Measurements recorded in: ☐ Metric ☒ Imperial

Well Tag No. *(Place Sticker and/or Print Below)* **Tag#: A152369**

Well Record

Regulation 903 Ontario Water Resources Act

Page ____ of ____

Well Owner's Information

First Name	Last Name / Organization	E-mail Address	☐ Well Constructed by Well Owner
	Baresite Construction		

Mailing Address (Street Number/Name)	Municipality	Province	Postal Code	Telephone No. *(inc. area code)*
2354 Summerside Drive	Manotick	ON	K4M1B4	613 [illegible]

Well Location

37 15171

Address of Well Location (Street Number/Name)	Township	Lot	Concession
5572 Lombardy Drive	Osgoode	pt lt 21+22	

County/District/Municipality	City/Town/Village	Province	Postal Code
Ottawa	Osgoode	Ontario	

UTM Coordinates	Zone	Easting	Northing	Municipal Plan and Sublot Number	Other
NAD 8 3	18	452172	4999621	RP4R-14828 pt lot #32+33 on Plan 4m-830	

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

General Colour	Most Common Material	Other Materials	General Description	Depth (m/ft) From	Depth (m/ft) To
Brown	Fill		Soft	0	2'
Black	Topsoil		Soft	2'	3'
Grey	Sand, Stones		Packed	3'	54'6"
Grey	Limestone		Hard	54'6"	101'

Annular Space

Depth Set at (m/ft) From	Depth Set at (m/ft) To	Type of Sealant Used (Material and Type)	Volume Placed (m^3/ft^3)
59'6"	49'6"	Cement Pressure Grouted	13.54
49'6"	0	Bentonite Pressure Grouted	20.31

Method of Construction

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

Well Use

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

Construction Record - Casing

Inside Diameter (cm/in)	Open Hole OR Material (Galvanized, Fibreglass, Concrete, Plastic, Steel)	Wall Thickness (cm/in)	Depth (m/ft) From	Depth (m/ft) To
9 7/8"	Mud		0	59'6"
6 1/4"	Steel	.188	0	59'6"
6 1/8"	Open Hole		59'6"	101'

Construction Record - Screen

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

Status of Well

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

Water Details

Water found at Depth (m/ft)	Gas	Kind of Water	Other, specify
75'	☐	☐ Fresh ☒ Untested	
93'	☐	☐ Fresh ☒ Untested	
	☐	☐ Fresh ☐ Untested	

Hole Diameter

Depth (m/ft) From	Depth (m/ft) To	Diameter (cm/in)
0	59'6"	9 7/8"
59'6"	101'	6 1/8"

Results of Well Yield Testing

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

If pumping discontinued, give reason:

Pump intake set at (m/ft): 90'

Pumping rate (l/min / GPM): 19 gpm

Duration of pumping: 1 hrs + 0 min

Final water level end of pumping (m/ft): 16.3

If flowing give rate (l/min / GPM)

Recommended pump depth (m/ft): 80'

Recommended pump rate (l/min / GPM): 10 gpm

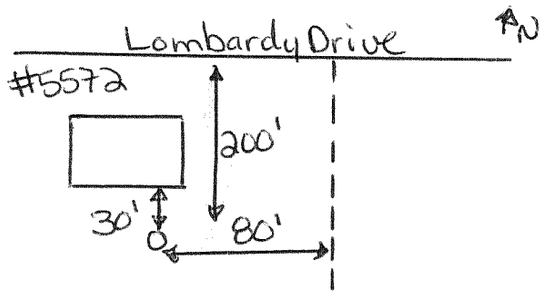
Well production (l/min / GPM)

Disinfected? ☒ Yes ☐ No 165

Draw Down Time (min)	Draw Down Water Level (m/ft)	Recovery Time (min)	Recovery Water Level (m/ft)
Static Level	15.6		16.3
1	15.7	1	15.9
2	15.7	2	15.9
3	15.8	3	15.9
4	15.8	4	15.8
5	15.9	5	15.8
10	15.9	10	15.7
15	16.0	15	15.7
20	16.1	20	15.7
25	16.2	25	15.6
30	16.2	30	↓
40	16.1	40	
50	16.1	50	
60	16.3	60	

Map of Well Location

Please provide a map below following instructions on the back.



Well Contractor and Well Technician Information

Business Name of Well Contractor	Well Contractor's Licence No.
1425486 Ontario Ltd o/a Splash Well Drilling	4877

Business Address (Street Number/Name)	Municipality
PO BOX 1083	Prescott

Province	Postal Code	Business E-mail Address
ON	K0E 1T0	

Bus. Telephone No. *(inc. area code)*	Name of Well Technician (Last Name, First Name)
6139254885	Ferguson, Todd

Well Technician's Licence No.	Signature of Technician and/or Contractor	Date Submitted
T478	Todd	2014/05/30

Comments:
165 Chlorine after Drilling
0 Chlorine after Yield Test

Well owner's information package delivered	Date Package Delivered	Date Work Completed
☒ Yes ☐ No	20140518	20140508

Ministry Use Only

Audit No. Z 176050

Received JUN 19 2014

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Ontario

Ministry of the Environment and Climate Change

Measurements recorded in: ☐ Metric ☒ Imperial

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

Tag#: A193395

Well Record

Regulation 903 Ontario Water Resources Act

Page _____ of _____

Well Owner's Information

First Name	Last Name / Organization	E-mail Address	☐ Well Constructed by Well Owner
Baresite	Construction		

Mailing Address (Street Number/Name)	Municipality	Province	Postal Code	Telephone No. *(inc. area code)*
2354 Summerside Drive	Manotick	ON	K4M1B4	613 837 1515

Well Location

Address of Well Location (Street Number/Name)	Township	Lot	Concession
5566 Lombardy Drive	Osgoode	pt lt 19+20	Con #1

County/District/Municipality	City/Town/Village	Province	Postal Code
Ottawa	Osgoode	Ontario	K0A2W0

UTM Coordinates	Zone	Easting	Northing	Municipal Plan and Sublot Number	Other
NAD 83	18	452134	4991961	RP 4R-14828 pt lot #32 plan 4M-830	

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

General Colour	Most Common Material	Other Materials	General Description	Depth (m/ft) From	Depth (m/ft) To
Brown	Sand		Fill	0	3'
Brown	Sand		Soft	3'	15'
Grey	Sand	Gravel	Packed	15'	55'6"
Grey	Limestone		Hard	55'6"	241'

Annular Space

Depth Set at (m/ft) From	To	Type of Sealant Used *(Material and Type)*	Volume Placed *(m³/ft³)*
60'6"	40'	Cement Pressure Grouted	6.77
40'	0	Bentonite Pressure Grouted	13.54

Method of Construction

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

Well Use

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

Construction Record - Casing

Inside Diameter *(cm/in)*	Open Hole OR Material (Galvanized, Fibreglass, Concrete, Plastic, Steel)	Wall Thickness *(cm/in)*	Depth (m/ft) From	Depth (m/ft) To
9 7/8"	(Open Hole)		0	60'6"
6 1/4"	Steel	.188	0	60'6"
6 1/8"	Open Hole		60'6"	241'

Construction Record - Screen

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

Status of Well

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

Water Details

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

Hole Diameter

Depth (m/ft) From	Depth (m/ft) To	Diameter *(cm/in)*
0	60'6"	9 7/8"
60'6"	241'	6 1/8"

Results of Well Yield Testing

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

If pumping discontinued, give reason:

Pump intake set at *(m/ft)*: 230'

Pumping rate *(l/min / GPM)*: 20 gpm

Duration of pumping: 1 hrs + 0 min

Final water level end of pumping *(m/ft)*: 150.8

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

Recommended pump depth *(m/ft)*: 200'

Recommended pump rate *(l/min / GPM)*: 10 gpm

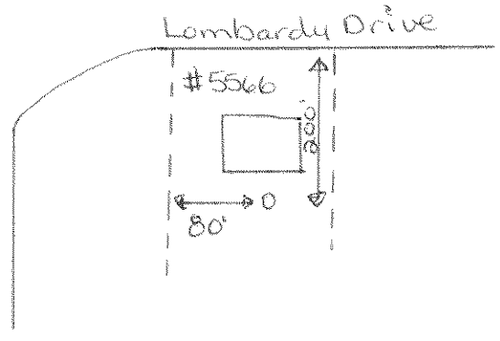
Well production *(l/min / GPM)*

Disinfected? ☒ Yes ☐ No 140

Draw Down Time *(min)*	Draw Down Water Level *(m/ft)*	Recovery Time *(min)*	Recovery Water Level *(m/ft)*
Static Level	20.5		150.8
1	32.4	1	137.4
2	39.5	2	127.5
3	46.7	3	117.9
4	53.5	4	109.5
5	59.8	5	101.7
10	85.7	10	68.2
15	104.25	15	45.2
20	117.9	20	31.2
25	127.8	25	24.1
30	134.7	30	21.2
40	143.4	40	20.7
50	148.35	50	20.55
60	150.8	60	20.45

Map of Well Location

Please provide a map below following instructions on the back.



Comments:
140 Chlorine after Drilling
0 Chlorine after Yield Test

Well Contractor and Well Technician Information

Business Name of Well Contractor	Well Contractor's Licence No.
1425486 Ontario Ltd o/a Solon Well Drilling	4717

Business Address (Street Number/Name)	Municipality
PO Box 1083	Prescott

Province	Postal Code	Business E-mail Address
ON	K0E1T0	

Bus. Telephone No. *(inc. area code)*	Name of Well Technician (Last Name, First Name)
613 925 4885	Ferguson, Johnathon

Well Technician's Licence No.	Signature of Technician and/or Contractor	Date Submitted
2859		Nov 16 2016

Well owner's information package delivered ☒ Yes ☐ No

Date Package Delivered: Nov 16 2016

Date Work Completed: Nov 16 2016

Ministry Use Only

Audit No. Z242999

NOV 18 2016 Received

Ministry's Copy

Ontario

Ministry of the Environment and Climate Change

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

Tag# A193411

Well Record

Regulation 903 Ontario Water Resources Act

Measurements recorded in: ☐ Metric ☑ Imperial

Page _____ of _____

Well Owner's Information

First Name	Last Name / Organization	E-mail Address	☐ Well Constructed by Well Owner
Bansite	Construction		

Mailing Address (Street Number/Name)	Municipality	Province	Postal Code	Telephone No. *(inc. area code)*
2354 Summerside Drive	Manotick	ON	K4M1B4	613 731 7171

Well Location

Address of Well Location (Street Number/Name)	Township	Lot	Concession
5560 Lombardy Drive	Osgoode	pt lot 3	3 Plan 4M-830

County/District/Municipality	City/Town/Village	Province	Postal Code
Ottawa	Osgoode	Ontario	K0A2W0

UTM Coordinates	Zone	Easting	Northing	Municipal Plan and Sublot Number	Other
NAD 8 3	18	415210	4991515	Parts 17 & 18 RP 4R-14828	

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

General Colour	Most Common Material	Other Materials	General Description	Depth (m/ft) From	Depth (m/ft) To
Brown	Sandy Clay		Packed	0	10'
Brown	Sand		Packed	10'	25'
Grey	Sand	Gravel	Packed	25'	55'
Grey	Limestone		Hard	55'	161'

Annular Space

Depth Set at (m/ft) From	To	Type of Sealant Used *(Material and Type)*	Volume Placed (m^3/ft^3)
60'	40'	Cement Pressure Grouted	6.77
40'	0	Bentonite Pressure Grouted	13.54

Method of Construction

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

Well Use

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

Construction Record - Casing

Inside Diameter *(cm/in)*	Open Hole OR Material (Galvanized, Fibreglass, Concrete, Plastic, Steel)	Wall Thickness *(cm/in)*	Depth (m/ft) From	Depth (m/ft) To
9 7/8"	Mud (Open Hole)		0	60'
6 1/4"	Steel	.188	0	60'
6 1/8"	Open Hole		60'	161'

Construction Record - Screen

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

Status of Well

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

Water Details

Water found at Depth (m/ft)	Gas	Kind of Water	Other, specify
135'	☐	☐ Fresh ☒ Untested	
	☐	☐ Fresh ☐ Untested	
	☐	☐ Fresh ☐ Untested	

Hole Diameter

Depth (m/ft) From	To	Diameter *(cm/in)*
0	60'	9 7/8"
60'	161'	6 1/8"

Results of Well Yield Testing

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

If pumping discontinued, give reason:

Pump intake set at *(m/ft)*: 150'

Pumping rate *(l/min / GPM)*: 7 gpm

Duration of pumping: 1 hrs + 0 min

Final water level end of pumping *(m/ft)*: 137.3

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

Recommended pump depth *(m/ft)*: 150'

Recommended pump rate *(l/min / GPM)*: 7 gpm

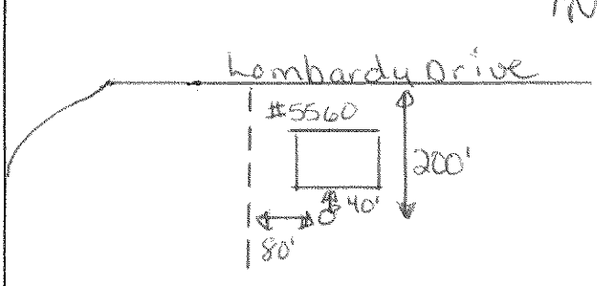
Well production *(l/min / GPM)*

Disinfected? ☒ Yes ☐ No 145

Draw Down Time *(min)*	Draw Down Water Level *(m/ft)*	Recovery Time *(min)*	Recovery Water Level *(m/ft)*
Static Level	20.6		137.3
1	25.9	1	131.5
2	30.2	2	126.9
3	34.05	3	123.4
4	37.7	4	120
5	41	5	116.75
10	55.2	10	101.5
15	66.85	15	87.55
20	77.3	20	75.55
25	86.75	25	64.8
30	95.3	30	55.7
40	111.2	40	41.2
50	125.1	50	31.3
60	137.3	60	25.1

Map of Well Location

Please provide a map below following instructions on the back.



Comments: 145 Chlorine after Drilling & Chlorine after Yield Test

Well Contractor and Well Technician Information

Business Name of Well Contractor	Well Contractor's Licence No.
1423486 Ontario Ltd o/a Splash Well Drilling	4187

Business Address (Street Number/Name)	Municipality
PO Box 1083	Prescott

Province	Postal Code	Business E-mail Address
ON	K0E1T0	

Bus. Telephone No. *(inc. area code)*	Name of Well Technician (Last Name, First Name)
613 925 4885	Fergusson, Johnathan

Well Technician's Licence No.	Signature of Technician and/or Contractor	Date Submitted
21519		2016/11/30

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

Date Package Delivered: 2016/11/17

Date Work Completed: 2016/11/04

Ministry Use Only

Audit No. Z243019

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0506E (2014/11)

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Ontario — Ministry of the Environment and Climate Change

Measurements recorded in: ☐ Metric ☒ Imperial

Well Tag No. *(Place Sticker and/or Print Below)*: Tag# A193412

Well Record

Regulation 903 Ontario Water Resources Act

Page ____ of ____

Well Owner's Information

First Name	Last Name / Organization	E-mail Address	☐ Well Constructed by Well Owner
Baresite Construction			

Mailing Address (Street Number/Name)	Municipality	Province	Postal Code	Telephone No. *(inc. area code)*
2354 Summerside Drive	Manotick	ON	K4M1B4	6133715171

Well Location

Address of Well Location (Street Number/Name)	Township	Lot	Concession
5554 Lombardy Drive	Osgoode	pt lot 31	Plan 4m-830

County/District/Municipality	City/Town/Village	Province	Postal Code
Ottawa	Osgoode	Ontario	K0A2W0

UTM Coordinates	Zone	Easting	Northing	Municipal Plan and Sublot Number	Other
NAD 83	18	452066	4999583	Parts 5&6 RP4R-14828	

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

General Colour	Most Common Material	Other Materials	General Description	Depth (m/ft) From	To
Brown	Clay		Packed	∅	8'
Brown	Sand		Packed	8'	15'
Grey	Sand	Gravel	Packed	15'	51'6"
Grey	Limestone		Hard	51'6"	121'

Annular Space

Depth Set at (m/ft) From	To	Type of Sealant Used (Material and Type)	Volume Placed (m³/ft³)
56'6"	46'6"	Cement Pressure Grouted	6.77
46'6"	∅	Bentonite Pressure Grouted	13.54

Method of Construction

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

Well Use

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

Construction Record - Casing

Inside Diameter (cm/in)	Open Hole OR Material (Galvanized, Fibreglass, Concrete, Plastic, Steel)	Wall Thickness (cm/in)	Depth (m/ft) From	To
9 7/8"	(Mud Open Hole)		∅	56'6"
6 1/4"	Steel	.188	∅	56'6"
6 1/8"	Open Hole		56'6"	121'

Status of Well

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

Construction Record - Screen

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

Results of Well Yield Testing

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

If pumping discontinued, give reason:

Pump intake set at (m/ft): 110'

Pumping rate (l/min / GPM): 7gpm

Duration of pumping: 1 hrs + 0 min

Final water level end of pumping (m/ft): 56.4

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

Recommended pump depth (m/ft): 110'

Recommended pump rate (l/min / GPM): 7gpm

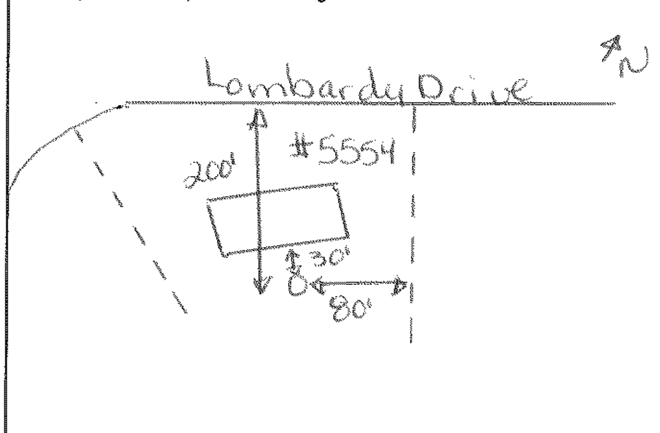
Well production (l/min / GPM):

Disinfected? ☒ Yes ☐ No 140

Draw Down Time (min)	Water Level (m/ft)	Recovery Time (min)	Water Level (m/ft)
Static Level	16.9		56.4
1	21.05	1	50.85
2	23.15	2	45.7
3	25.2	3	42.4
4	27	4	39.3
5	28.65	5	36
10	35	10	23.4
15	39.5	15	18.3
20	43	20	17.6
25	45.8	25	17.05
30	47.5	30	17.025
40	52.8	40	17
50	54.85	50	17
60	56.4	60	16.975

Map of Well Location

Please provide a map below following instructions on the back.



Water Details

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

Hole Diameter

Depth (m/ft) From	To	Diameter (cm/in)
∅	56'6"	9 7/8"
56'6"	121'	6 1/8"

Well Contractor and Well Technician Information

Business Name of Well Contractor	Well Contractor's Licence No.
1425486 Ontario Ltd o/a Splash Well Drilling	41877

Business Address (Street Number/Name)	Municipality
PO Box 1083	Prescott

Province	Postal Code	Business E-mail Address
ON	K0E1T0	

Bus. Telephone No. (inc. area code)	Name of Well Technician (Last Name, First Name)
6139254885	Ferguson, Johnathon

Well Technician's Licence No.	Signature of Technician and/or Contractor	Date Submitted
21859	[signature]	20161130

Comments:
140 Chlorine after Drilling
∅ Chlorine after Yield Test

Well owner's information package delivered	Date Package Delivered	Date Work Completed
☒ Yes ☐ No	20161130	20161110

Ministry Use Only

Audit No. Z243020

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316/4h

UTM 1/18 Z 4/5/2/1/9/0 E

Con 5 R 4/9/9/9/0/8/0 N

Elev. 4 R 2/3/1/0

Basin 2/5 Lot I

The Ontario Water Resources Commission Act

WATER WELL RECORD

County or District: Carl — Township, Village, Town or City: Osgoode

Con.: I — P.I. — Lot: 28 — Date completed: 2 (day) Feb (month) 63 (year)

Owner (print in block letters): Coady Constr Co — Address: 220 Ellendale Cres Ottawa

Casing and Screen Record

Inside diameter of casing	5"
Total length of casing	62'
Type of screen	
Length of screen	
Depth to top of screen	
Diameter of finished hole	5"

Pumping Test

Static level	31
Test-pumping rate	8 G.P.M.
Pumping level	60
Duration of test pumping	1 hr
Water clear or cloudy at end of test	cloudy
Recommended pumping rate	8 G.P.M.
with pump setting of	75 feet below ground surface

Well Log / Water Record

Overburden and Bedrock Record	From ft.	To ft.	Depth(s) at which water(s) found	Kind of water (fresh, salty, sulphur)
sand	0	20'	100	fresh
clay	20	36'	120	fresh
hardpan	36	59	131	"
blue limestone	59	133		

For what purpose(s) is the water to be used? Post office

Is well on upland, in valley, or on hillside? upland

Drilling or Boring Firm: Capital Water Supply

Address: 1243 Heron Rd

Licence Number: 482 976

Name of Driller or Borer: S Huff

Address:

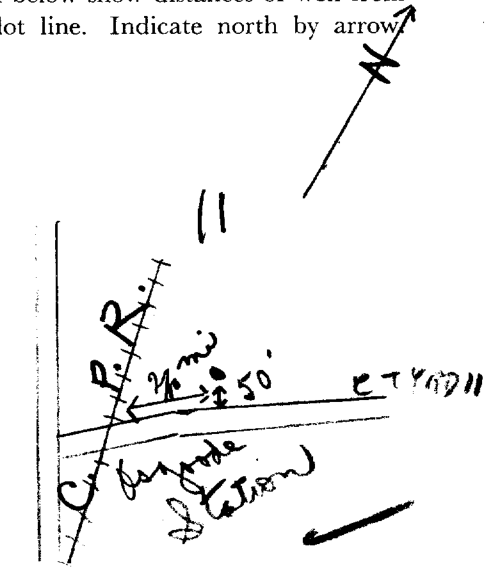
Date: 4 Feb 1963

Walter Kavanagh
(Signature of Licensed Drilling or Boring Contractor)

Location of Well

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

BF



Form 7 10M-62-1152

OWRC COPY

CSS.S8

316/4h

UTM 1/18 Z 4/5/2/1/9/0 E

Con 5 R 4/9/9/9/0/8/0 N

Elev. 4 R 2/3/1/0

Basin 2/5 | Carl

The Ontario Water Resources Commission Act

WATER WELL RECORD

County or District: Carl — Township, Village, Town or City: Osgoode

Con.: I P.1 Lot: 28 — Date completed: 2 (day) Feb (month) 63 (year)

Owner: Coady Constr Co (print in block letters) — Address: 220 Ellendale Cres Ottawa

Casing and Screen Record

Inside diameter of casing: 5"

Total length of casing: 62'

Type of screen:

Length of screen:

Depth to top of screen:

Diameter of finished hole: 5"

Pumping Test

Static level: 31

Test-pumping rate: 8 G.P.M.

Pumping level: 60

Duration of test pumping: 1 hr

Water clear or cloudy at end of test: cloudy

Recommended pumping rate: 8 G.P.M.

with pump setting of 75 feet below ground surface

Well Log / Water Record

Overburden and Bedrock Record	From ft.	To ft.	Depth(s) at which water(s) found	Kind of water (fresh, salty, sulphur)
sand	0	20'	100	fresh
clay	20	36'	120	fresh
hardpan	36	59	131	"
blue limestone	59	133		

For what purpose(s) is the water to be used? Post office

Is well on upland, in valley, or on hillside? upland

Drilling or Boring Firm: Capital Water Supply

Address: 1243 Heron Rd

Licence Number: 482 976

Name of Driller or Borer: S Huff

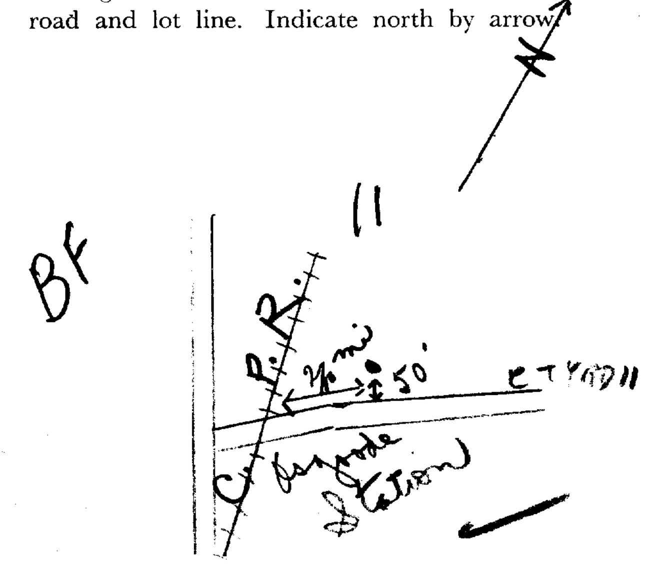
Address:

Date: 4 Feb 1963

Walter Kavanagh
(Signature of Licensed Drilling or Boring Contractor)

Location of Well

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



Form 7 10M-62-1152

OWRC COPY

CSS.S8

Ontario Ministry of the Environment

The Ontario Water Resources Act
WATER WELL RECORD

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

OTTAWA-CARLETON

11 1533843 Municipality 15009 Con. CON 01

County or District: Carleton
Township/Borough/City/Town/Village: OSGOODE (Ottawa)
Con block tract survey, etc.: 1 Plan 393
Lot: Part 46 & 47
Address: 5503 OSGOODE Main St.
Date completed: 9 day 01 month 03 year
Northing RC Elevation RC Basin Code

LOG OF OVERBURDEN AND BEDROCK MATERIALS (see instructions)

General colour	Most common material	Other materials	General description	Depth - feet From	Depth - feet To
BRown	Sand		Packed	0	14
GRey	Clay		thick	14	30
GRey	Clay & Stones		HARD Pan	30	50
GRey	Limestone		MED HARD	50	80
	54' OF 6"		casing		
	1		DRIVE Shoe		
	1		WELL CaP		
	2		Bags of Bentonite Quick Grout		

41 WATER RECORD

Water found at - feet	Kind of water
68	1 ☐ Fresh 2 ☐ Salty 3 ☒ Sulphur 4 ☒ Minerals 5 ☐ Gas 6
	1 ☐ Fresh 2 ☐ Salty 3 ☐ Sulphur 4 ☐ Minerals 5 ☐ Gas 6
	1 ☐ Fresh 2 ☐ Salty 3 ☐ Sulphur 4 ☐ Minerals 5 ☐ Gas 6
	1 ☐ Fresh 2 ☐ Salty 3 ☐ Sulphur 4 ☐ Minerals 5 ☐ Gas 6
	1 ☐ Fresh 2 ☐ Salty 3 ☐ Sulphur 4 ☐ Minerals 5 ☐ Gas 6

51 CASING & OPEN HOLE RECORD

Inside diam inches	Material	Wall thickness inches	Depth - feet From	Depth - feet To
6¼	1 ☒ Steel 2 ☐ Galvanized 3 ☐ Concrete 4 ☒ Open hole 5 ☐ Plastic	.188	0	53
6"			53	80
	1 ☐ Steel 2 ☐ Galvanized 3 ☐ Concrete 4 ☐ Open hole 5 ☐ Plastic			
	1 ☐ Steel 2 ☐ Galvanized 3 ☐ Concrete 4 ☐ Open hole 5 ☐ Plastic			

SCREEN

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

Material and type: Depth at top of screen feet

61 PLUGGING & SEALING RECORD

☒ Annular space ☐ Abandonment

Depth set at - feet From	Depth set at - feet To	Material and type (Cement grout, bentonite, etc.)
0	53	Bentonite Quick GROUT

71 PUMPING TEST

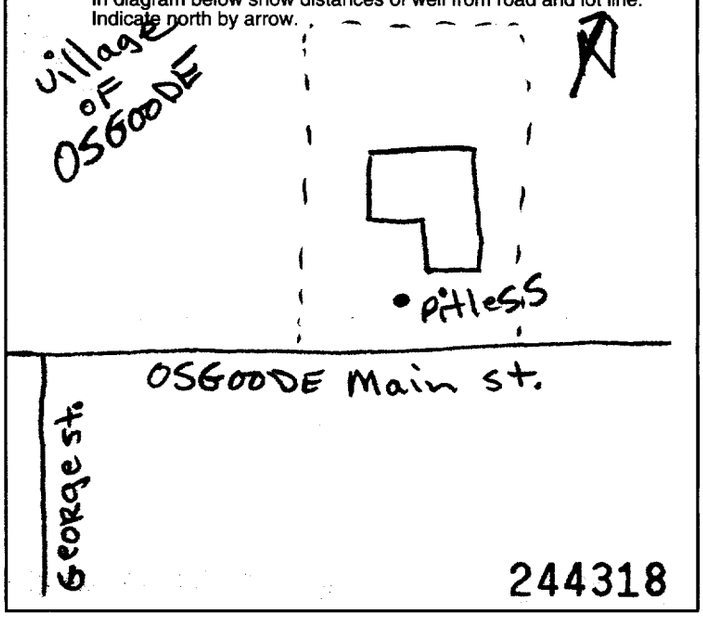
Pumping test method: 1 ☐ Pump 2 ☒ Bailer
Pumping rate: 12 GPM
Duration of pumping: 1 Hours Mins

Static level	Water level end of pumping	Water levels during ☒ Pumping ☐ Recovery			
26 feet	60 feet	15 minutes: 40 feet	30 minutes: 60 feet	45 minutes: 60 feet	60 minutes: 60 feet

If flowing give rate: GPM
Pump intake set at: feet
Water at end of test: ☒ Clear ☐ Cloudy
Recommended pump type: ☐ Shallow ☒ Deep
Recommended pump setting: 70 feet
Recommended pump rate: 10 GPM

LOCATION OF WELL

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



244318

FINAL STATUS OF WELL

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

WATER USE

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

METHOD OF CONSTRUCTION

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

Name of Well Contractor	Well Contractor's Licence No.
B. MOORE WELL DRILLING	6455
Address: Box 436 OSGOODE ON. K0A 2W0	
Name of Well Technician: Bob MOORE	Well Technician's Licence No.: T-0319
Signature of Technician/Contractor: Bob Moore	Submission date: day 9 mo 01 yr 03

MINISTRY USE ONLY

Data source | Contractor: 6455 | Date received: JUN 10 2003
Date of inspection | Inspector
Remarks: CSS.ES3

2 - MINISTRY OF THE ENVIRONMENT COPY

0506 (07/00) Front Form 9

Ontario — Ministry of the Environment

Measurements recorded in: [x] Metric [ ] Imperial

Well (Print Below): A 071208 / A071208

Well Record

Regulation 903 Ontario Water Resources Act

Page ____ of ____

Well Owner's Information

[redacted]

5502 Osgoode Main — County/District/Municipality: Ottawa

Osgoode — City/Town/Village: Osgoode

23 — 1

Province: Ontario — Postal Code: K0A 2W0

UTM Coordinates: NAD 83 | Zone 18 | Easting 452037 | Northing 4991220

Municipal Plan and Sublot Number:

Other:

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

General Colour	Most Common Material	Other Materials	General Description	Depth (m/ft) From	Depth (m/ft) To
Brown	Sand		Hard	0	2.5
Yellow	Course Sand		Soft	2.5	9.7
Grey	clay		Soft	9.7	13.5
Grey	gravel/		packed	13.5	14.9
Grey	limestone		layered	14.9	24.3

Annular Space

Depth Set at (m/ft) From	To	Type of Sealant Used (Material and Type)	Volume Placed (m³/ft³)
0	6	Ciment grout	4 Bag

Method of Construction

[ ] Cable Tool [ ] Diamond
[ ] Rotary (Conventional) [ ] Jetting
[ ] Rotary (Reverse) [ ] Driving
[ ] Boring [ ] Digging
[ ] Air percussion
[ ] Other, specify

Well Use

[ ] Public [ ] Commercial [ ] Not used
[x] Domestic [ ] Municipal [ ] Dewatering
[ ] Livestock [ ] Test Hole [ ] Monitoring
[ ] Irrigation [ ] Cooling & Air Conditioning
[ ] Industrial
[ ] Other, specify

Construction Record - Casing

Inside Diameter (cm/in)	Open Hole OR Material (Galvanized, Fibreglass, Concrete, Plastic, Steel)	Wall Thickness (cm/in)	Depth (m/ft) From	Depth (m/ft) To
1555	Steel	.48	+.60	14.9
1555	Open Hole		14.9	24.3

Construction Record - Screen

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

Status of Well

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

Water Details

Water found at Depth (m/ft)	Kind of Water	Gas	Other, specify
20	[x] Fresh [ ] Untested	[ ]	
	[ ] Fresh [ ] Untested	[ ]	
	[ ] Fresh [ ] Untested	[ ]	

Hole Diameter

Depth (m/ft) From	To	Diameter (cm/in)
0	6	21.23
6	24.3	15.55

Results of Well Yield Testing

After test of well yield, water was:
[x] Clear and sand free
[ ] Other, specify

If pumping discontinued, give reason:

Pump intake set at (m/ft): 19

Pumping rate (l/min / GPM): 56

Duration of pumping: 1 hrs + ____ min

Final water level end of pumping (m/ft): 8.51

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

Recommended pump depth (m/ft): 19

Recommended pump rate (l/min / GPM): 56

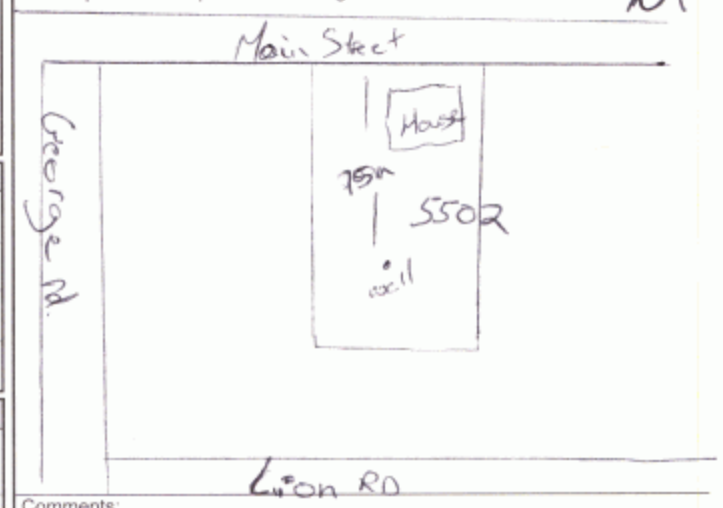
Well production (l/min / GPM): 80

Disinfected? [x] Yes [ ] No

Draw Down Time (min)	Draw Down Water Level (m/ft)	Recovery Time (min)	Recovery Water Level (m/ft)
Static Level	7.80		8.51
1	8.m	1	8.08
2	8.07	2	7.94
3	8.19	3	7.83
4	8.25	4	7.81
5	8.30	5	7.80
10	8.41	10	
15	8.47	15	
20	8.47	20	
25	8.47	25	
30	8.48	30	
40	8.48	40	
50	8.50	50	
60	8.51	60	

Map of Well Location

Please provide a map below following instructions on the back. NA



Comments:

Well Contractor and Well Technician Information

Business Name of Well Contractor: Bourgeois well Drilling

Well Contractor's Licence No.:

Business Address (Street Number/Name): 1178 Route 900 East

Municipality: Nation

Province: Ontario — Postal Code: K0A3C0 — Business E-mail Address: NA

Bus. Telephone No. (inc. area code): 6139875291

Name of Well Technician (Last Name, First Name): Michael Genier

Well Technician's Licence No.: 3493

Signature of Technician and/or Contractor:

Date Submitted: 2009 02 20

Well owner's information package delivered: [ ] Yes [x] No

Date Package Delivered: ____

Date Work Completed: 2009 02 17

Ministry Use Only

Audit No. Z 90541

Received MAY 6 2009

0506E (12/2007)

Ministry's Copy

Table III: Summary of Well Record Information from Area Wells

Well No	Soil Depth m	Soil Desc.	Bedrock desc.	Casing Depth m	Total Depth m	Available Drawdown m	Water Desc.	Yield Test			
								Test rate L/min	Static Level m	Specific Capacity L/min*m	Spec. Cap. m^2/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	phur & 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	-	-	-		-	-	-	-	-

316/46

UTM 18 Z 415216 E
5 R 4919910 N

Elev. 4 R 0310

Basin 215

Con I
lot 28

ONTARIO

The Water-well Drillers Act, 1954
Department of Mines

RECEIVED
DEC - 8 1955
GEOLOGICAL BRANCH
DEPARTMENT of MINES

15 No 7117

Water-Well Record

County or Territorial District Carleton Township, Village, Town or City Osgoode twp.

[redacted] Village, Town or City)

[redacted] ddress Osgoode

Date completed ..... (day) ..... (month) ..... (year)

Pipe and Casing Record

Casing diameter(s) 5"
Length(s) 58'
Type of screen
Length of screen

Pumping Test

Static level 18 ft
Pumping rate 360 gal. per hr.
Pumping level 75 ft
Duration of test 4 hours

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			
limestone rock	58	154	154	136	fresh

For what purpose(s) is the water to be used?
house
Is water clear or cloudy? clear
Is well on upland, in valley, or on hillside? upland

Drilling firm J. Singer & Sons
Address Maxville

Name of Driller Gerald Singer
Address Maxville

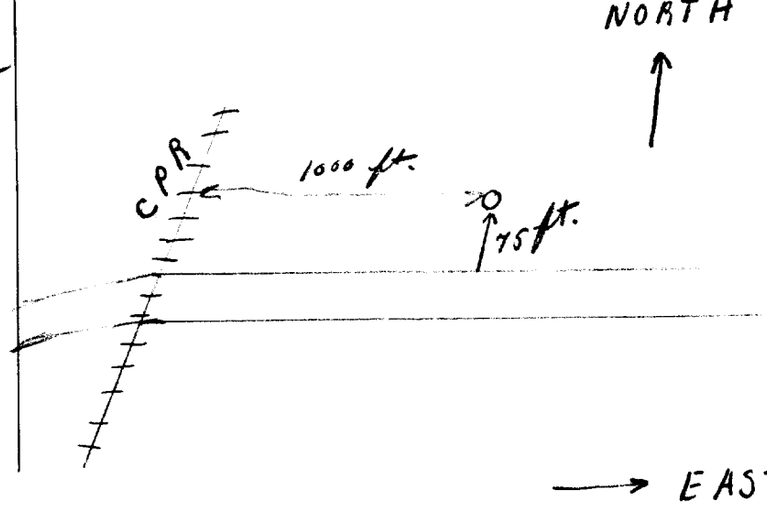
Licence Number 312

I certify that the foregoing statements of fact are true.

Date Oct 20 Gerald Singer
Signature of Licensee

Location of Well

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



CSS.88

Form 5

316/4h

UTM 1/18 Z 4/5/2/1/9/0 E

Con 5 R 4/9/9/9/0/8/0 N

Elev. 4 R 2/3/1/0

Basin 2/5

The Ontario Water Resources Commission Act

WATER WELL RECORD

County or District: Carl   Township, Village, Town or City: Osgoode

Con. I   P.1   Lot 28   Date completed 2 (day) Feb (month) 63 (year)

Owner: Coady Constr Co (print in block letters)   Address 220 Ellendale Cres Ottawa

Casing and Screen Record

Inside diameter of casing	5"
Total length of casing	62'
Type of screen	
Length of screen	
Depth to top of screen	
Diameter of finished hole	5"

Pumping Test

Static level	31
Test-pumping rate	8 G.P.M.
Pumping level	60
Duration of test pumping	1 hr
Water clear or cloudy at end of test	cloudy
Recommended pumping rate	8 G.P.M.
with pump setting of	75 feet below ground surface

Well Log / Water Record

Overburden and Bedrock Record	From ft.	To ft.	Depth(s) at which water(s) found	Kind of water (fresh, salty, sulphur)
sand	0	20'	100	fresh
clay	20	36'	120	fresh
hardpan	36	59	131	"
blue limestone	59	133		

For what purpose(s) is the water to be used? Post office

Is well on upland, in valley, or on hillside? upland

Drilling or Boring Firm: Capital Water Supply

Address: 1243 Heron Rd

Licence Number: 482 976

Name of Driller or Borer: S Huff

Address

Date: 4 Feb 1963

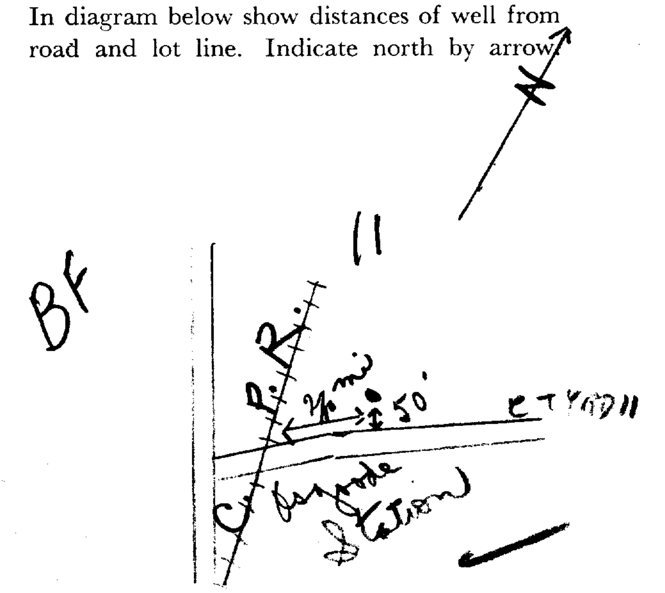
Walter Kavanagh
(Signature of Licensed Drilling or Boring Contractor)

Form 7 10M-62-1152

OWRC COPY

Location of Well

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



CSS.S8

CO

UTM 1 8 Z 4 5 2 0 5 0 E

Co 15 R 4 9 9 8 9 2 0 N

Elev. 15 R 0 3 2 0

Basin 25

The Ontario Water Resources Commission Act

WATER WELL RECORD

WATER RESOURCES DIVISION No 15 7132
MAY 17 1965
ONTARIO WATER RESOURCES COMMISSION

County or District Carleton Township, Village, Town or City Osgoode

Con. 1 Lot 29 Date completed April 14th, 1965 (day month year)

Owner Canadian Legion (print in block letters) Address Osgoode Ont.

Casing and Screen Record		Pumping Test	
Inside diameter of casing	2"	Static level	20'
Total length of casing	9'	Test-pumping rate	360 G.P.H. ~~G.P.M.~~
Type of screen	-	Pumping level	13' 31?
Length of screen	-	Duration of test pumping	1hour
Depth to top of screen	-	Water clear or cloudy at end of test	clear
Diameter of finished hole	2"	Recommended pumping rate	300 G.P.H. ~~G.P.M.~~
		with pump setting of	75 feet below ground surface

Well Log: Overburden and Bedrock Record	From ft.	To ft.	Water Record: Depth(s) at which water(s) found	Kind of water (fresh, salty, sulphur)
Gravel	0	5		FRESH
Bolders	5	34		
Rocks	34	38'		
Limestone	38	80'	80'	

For what purpose(s) is the water to be used? Legion Hall

Is well on upland, in valley, or on hillside? ---

Drilling or Boring Firm
J.B. Dufresne & Co. Ltd.

Address 1014 Maitland Ave.
Ottawa, Ontario.

Licence Number 1307

Name of Driller or Borer F. Laramee

Address 21A Garneau, Hull Que.

Date April 19th, 1965

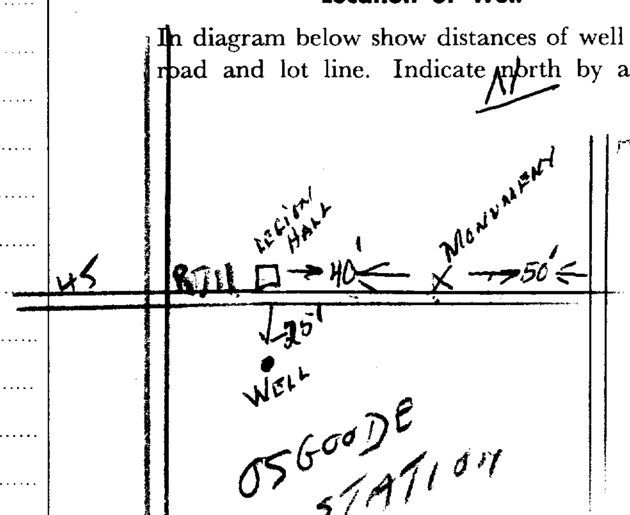
for J.B. Dufresne & Co. Ltd.
(Signature of Licensed Drilling or Boring Contractor)

Form 7 15M-60-4138

OWRC COPY

Location of Well

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



18 | 45 2 2 0 1 0
4 R 4 9 9 9 0 2 1 0
5 R 0 1 3 1 5
2 5

3/6/4/2

1510042
3 9

The Ontario Water Resources Commission Act

WATER WELL RECORD

DIVISION OF WATER RESOURCES
JUN 2 1969
ONTARIO WATER RESOURCES COMMISSION

County or District Carlton ~~Osgoode~~ Township, Village, Town or City Osgoode

Con. ~~Broken Front~~ I Lot 28 Date completed Jan 28, 1969 (day month year)

[redacted] Address Osgoode

Casing and Screen Record

Inside diameter of casing 5"
Total length of casing 43'
Type of screen —
Length of screen —
Depth to top of screen —
Diameter of finished hole 5"

Pumping Test

Static level 20 ft
Test-pumping rate 10 G.P.M.
Pumping level 35 ft
Duration of test pumping 1 hr.
Water clear or cloudy at end of test Clear
Recommended pumping rate 5-10 G.P.M.
with pump setting of 56' feet below ground surface

Well Log / Water Record

Overburden and Bedrock Record	From ft.	To ft.	Depth(s) at which water(s) found	Kind of water (fresh, salty, sulphur)
Overburden	0	39'		
Limestone	39'	65'	61	Fresh

For what purpose(s) is the water to be used? House

Is well on upland, in valley, or on hillside? upland

Drilling or Boring Firm C.V. Morrison

Address Frankville

Licence Number 3104

Name of Driller or Borer P. Quinn

Address Frankville

Date Jan 28 1969

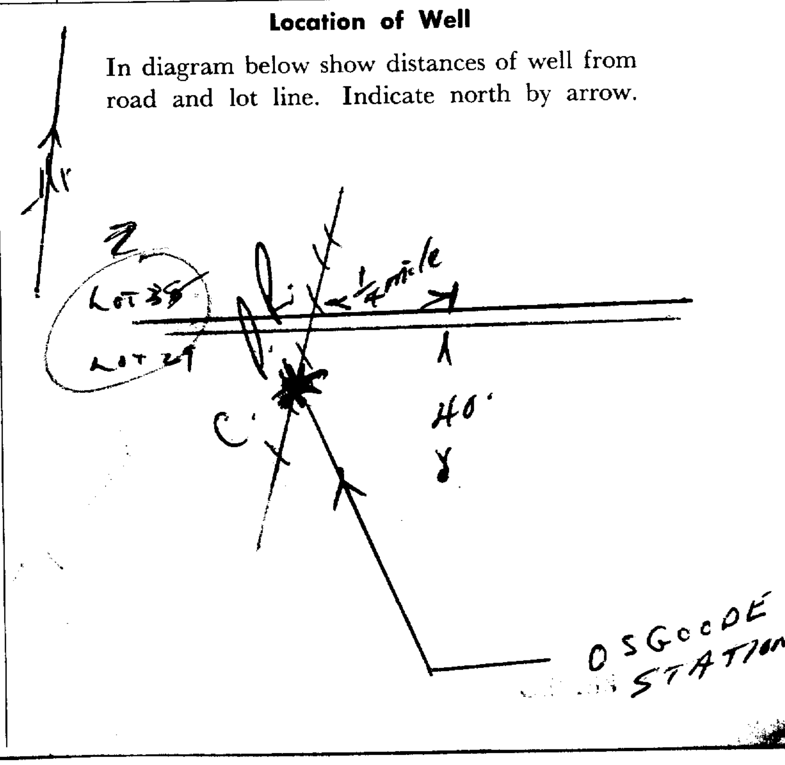
C.V. Morrison
(Signature of Licensed Drilling or Boring Contractor)

Form 7 15M-60-4138

OWRC COPY

Location of Well

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



ONTARIO

MINISTRY OF THE ENVIRONMENT

The Ontario Water Resources Act

WATER WELL RECORD

13 3.9/4L. 13

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

11 | 1512448 | MUNICIP. 15009 | CON. CON 01

COUNTY OR DISTRICT [redacted] | TOWNSHIP, BOROUGH, CITY, TOWN, VILLAGE Osgoode | CON., BLOCK, TRACT, SURVEY, ETC. 1 | LOT 29

[redacted] Main St Osgoode | DATE COMPLETED DAY 13 MO. 02 YR. 73

RC. ELEVATION RC. BASIN CODE

21 1512448 18 452153 4998995 4 313 4 26 MAR 17, 1975 247

LOG OF OVERBURDEN AND BEDROCK MATERIALS (SEE INSTRUCTIONS)

GENERAL COLOUR	MOST COMMON MATERIAL	OTHER MATERIALS	GENERAL DESCRIPTION	DEPTH - FEET FROM	TO
Brown	Top Soil			0	2
Brown	Sand	Cobbles	Loose	2	32
Grey	Sand	Gravel Boulders	Packed	32	45

31 | 0002602 | 0032628 | 0045228113

32

41 WATER RECORD

WATER FOUND AT - FEET	KIND OF WATER
0042	1 ☑ FRESH 3 ☐ SULPHUR 2 ☐ SALTY 4 ☐ MINERAL
~~0053~~	1 ☑ FRESH 3 ☐ SULPHUR 2 ☐ SALTY 4 ☐ MINERAL
	1 ☐ FRESH 3 ☐ SULPHUR 2 ☐ SALTY 4 ☐ MINERAL
	1 ☐ FRESH 3 ☐ SULPHUR 2 ☐ SALTY 4 ☐ MINERAL
	1 ☐ FRESH 3 ☐ SULPHUR 2 ☐ SALTY 4 ☐ MINERAL

51 CASING & OPEN HOLE RECORD

INSIDE DIAM INCHES	MATERIAL	WALL THICKNESS INCHES	DEPTH - FEET FROM	TO
06	1 ☑ STEEL 2 ☐ GALVANIZED 3 ☐ CONCRETE 4 ☐ OPEN HOLE	.288	0	47
~~6~~	~~6 OPEN HOLE~~		~~47~~	~~54~~
06	1 ☐ STEEL 2 ☐ GALVANIZED 3 ☐ CONCRETE 4 ☒ OPEN HOLE		47	0054
	1 ☐ STEEL 2 ☐ GALVANIZED 3 ☐ CONCRETE 4 ☐ OPEN HOLE			

SCREEN (crossed out)

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

61 PLUGGING & SEALING RECORD (crossed out)

DEPTH SET AT - FEET FROM	TO	MATERIAL AND TYPE (CEMENT GROUT LEAD PACKER, ETC.)

71 PUMPING TEST

PUMPING TEST METHOD	1 ☐ PUMP 2 ☐ BAILER
PUMPING RATE	0010 GPM
DURATION OF PUMPING	02 HOURS 00 MINS
STATIC LEVEL	006 FEET
WATER LEVEL END OF PUMPING	026 FEET
WATER LEVELS DURING	1 ☑ PUMPING 2 ☐ RECOVERY
15 MINUTES	026 FEET
30 MINUTES	026 FEET
45 MINUTES	026 FEET
60 MINUTES	026 FEET
IF FLOWING, GIVE RATE	GPM
PUMP INTAKE SET AT	FEET
WATER AT END OF TEST	1 ☑ CLEAR 2 ☐ CLOUDY
RECOMMENDED PUMP TYPE	☑ SHALLOW ☐ DEEP
RECOMMENDED PUMP SETTING	032 FEET
RECOMMENDED PUMPING RATE	0005 GPM
GPM./FT. SPECIFIC CAPACITY	000.5

FINAL STATUS OF WELL

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

WATER USE

01

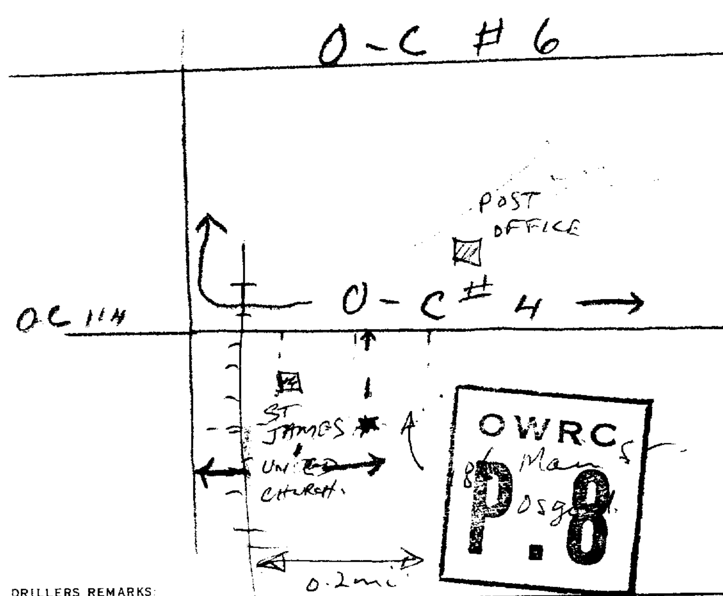
1 ☑ DOMESTIC 2 ☐ STOCK 3 ☐ IRRIGATION 4 ☐ INDUSTRIAL ☐ OTHER 5 ☐ COMMERCIAL 6 ☐ MUNICIPAL 7 ☐ PUBLIC SUPPLY 8 ☐ COOLING OR AIR CONDITIONING 9 ☐ NOT USED

METHOD OF DRILLING

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

LOCATION OF WELL

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



DRILLERS REMARKS

CONTRACTOR

NAME OF WELL CONTRACTOR: Maple Leaf Drilling | LICENCE NUMBER: 3658

ADDRESS: 409-465 Richmond Rd Ottawa

NAME OF DRILLER OR BORER: R Fraser | LICENCE NUMBER

SIGNATURE OF CONTRACTOR: Robert Bussin | SUBMISSION DATE DAY 13 MO. 2 YR. 73

OFFICE USE ONLY

DATA SOURCE 1 | CONTRACTOR 3658 | DATE RECEIVED 240473

DATE OF INSPECTION | INSPECTOR

REMARKS: | P R | WI

CSS.S8

MINISTRY OF THE ENVIRONMENT COPY

FORM 7 07-091

3/64h

Ministry of the Environment
Ontario

The Ontario Water Resources Act

WATER WELL RECORD

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

11   1517055   MUNICIP 15009   CON. CON   01

COUNTY OR DISTRICT	TOWNSHIP, BOROUGH, CITY, TOWN, VILLAGE	CON., BLOCK, TRACT, SURVEY, ETC.	LOT
Carleton	Osgoode	Conc. 1	028 ~~20~~

OWNER (SURNAME FIRST)	ADDRESS	DATE COMPLETED
Taldor Dev. [redacted]	R. R. # 1, Osgoode, Ontario K0A 2W0	DAY 21 MO 06 YR. 79

21 UTM ZONE 18 EASTING 451999 NORTHING 4999199 RC 4 ELEVATION 0310 RC 4 BASIN CODE 26

LOG OF OVERBURDEN AND BEDROCK MATERIALS (SEE INSTRUCTIONS)

GENERAL COLOUR	MOST COMMON MATERIAL	OTHER MATERIALS	GENERAL DESCRIPTION	DEPTH - FEET FROM	DEPTH - FEET TO
Brown	Sand			0	3
Gray	Sand		Wet	3	10
Gray	Clay & Sand			10	24
Gray	Sand		Boulders	24	29
Gray	Limestone		Broken	29	31

31   0003628   0010228   0024120528   0029228 13   0031 2 15 71

32

41 WATER RECORD

WATER FOUND AT - FEET	KIND OF WATER
0030	☒ FRESH ☐ SALTY ☐ SULPHUR ☐ MINERAL
	☐ FRESH ☐ SALTY ☐ SULPHUR ☐ MINERAL
	☐ FRESH ☐ SALTY ☐ SULPHUR ☐ MINERAL
	☐ FRESH ☐ SALTY ☐ SULPHUR ☐ MINERAL
	☐ FRESH ☐ SALTY ☐ SULPHUR ☐ MINERAL

51 CASING & OPEN HOLE RECORD

INSIDE DIAM INCHES	MATERIAL	WALL THICKNESS INCHES	DEPTH - FEET FROM	DEPTH - FEET TO
~~6¼~~ 06	☒ STEEL ☐ GALVANIZED ☐ CONCRETE ☐ OPEN HOLE	188	0	0029
06	☐ STEEL ☐ GALVANIZED ☐ CONCRETE ☒ OPEN HOLE		29	0031
	☐ STEEL ☐ GALVANIZED ☐ CONCRETE ☐ OPEN HOLE			

SCREEN

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

MATERIAL AND TYPE	DEPTH TO TOP OF SCREEN FEET

61 PLUGGING & SEALING RECORD

DEPTH SET AT - FEET FROM	TO	MATERIAL AND TYPE (CEMENT GROUT, LEAD PACKER, ETC.)

71 PUMPING TEST

PUMPING TEST METHOD: ☒ PUMP ☐ BAILER

PUMPING RATE: 0030 GPM

DURATION OF PUMPING: 01 HOURS 00 MINS

STATIC LEVEL	WATER LEVEL END OF PUMPING	15 MINUTES	30 MINUTES	45 MINUTES	60 MINUTES
008 FEET	015 FEET	015 FEET	015 FEET	015 FEET	015 FEET

WATER LEVELS DURING: ☒ PUMPING ☐ RECOVERY

IF FLOWING, GIVE RATE: GPM

PUMP INTAKE SET AT: FEET

WATER AT END OF TEST: ☒ CLEAR ☐ CLOUDY

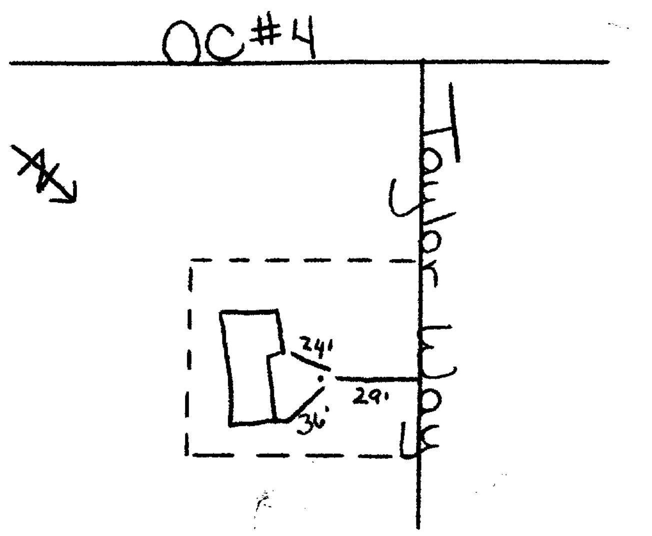
RECOMMENDED PUMP TYPE: ☒ SHALLOW ☐ DEEP

RECOMMENDED PUMP SETTING: 020 FEET

RECOMMENDED PUMPING RATE: 0005 GPM

LOCATION OF WELL

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



DRILLERS REMARKS

FINAL STATUS OF WELL 1

☒ WATER SUPPLY ☐ OBSERVATION WELL ☐ TEST HOLE ☐ RECHARGE WELL ☐ ABANDONED, INSUFFICIENT SUPPLY ☐ ABANDONED, POOR QUALITY ☐ UNFINISHED

WATER USE 01

☒ DOMESTIC ☐ STOCK ☐ IRRIGATION ☐ INDUSTRIAL ☐ OTHER ☐ COMMERCIAL ☐ MUNICIPAL ☐ PUBLIC SUPPLY ☐ COOLING OR AIR CONDITIONING ☐ NOT USED

METHOD OF DRILLING 5

☐ CABLE TOOL ☐ ROTARY (CONVENTIONAL) ☐ ROTARY (REVERSE) ☐ ROTARY (AIR) ☒ AIR PERCUSSION ☐ BORING ☐ DIAMOND ☐ JETTING ☐ DRIVING

CONTRACTOR

NAME OF WELL CONTRACTOR	LICENCE NUMBER
Capital Water Supply Ltd.	1558

ADDRESS: Box 490, Stittsville, Ontario K0A 3G0

NAME OF DRILLER OR BORER	LICENCE NUMBER
S. Miller	

SIGNATURE OF CONTRACTOR: W Kavanagh

SUBMISSION DATE: DAY 26 MO 06 YR 79

OFFICE USE ONLY

DATA SOURCE	CONTRACTOR	DATE RECEIVED
1	1558	130879

DATE OF INSPECTION: INSPECTOR: Km

REMARKS:

MINISTRY OF THE ENVIRONMENT COPY

FORM NO. 0506—4—77

3/64h

Ministry of the Environment
Ontario

The Ontario Water Resources Act

WATER WELL RECORD

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(11) 1517062 MUNICIP 15009 CON. CON 01

COUNTY OR DISTRICT	TOWNSHIP, BOROUGH, CITY, TOWN, VILLAGE	CON., BLOCK, TRACT, SURVEY, ETC.	
Carleton	Osgoode	I Conc. 1	028 ~~27~~

OWNER (SURNAME FIRST)	ADDRESS	DATE COMPLETED
Taldor Dev. c/o T. Princiotta	R. R. # 1, Osgoode, Ontario K0A 2W0	DAY 22 MO 06 YR 79

(21) UTM ZONE 18 EASTING 451999 NORTHING 4999199 RC ~~4~~ ELEVATION 0310 RC ~~4~~ BASIN CODE 26

LOG OF OVERBURDEN AND BEDROCK MATERIALS (SEE INSTRUCTIONS)

GENERAL COLOUR	MOST COMMON MATERIAL	OTHER MATERIALS	GENERAL DESCRIPTION	DEPTH - FEET FROM	DEPTH - FEET TO
Brown	Sand			0	5
Gray	Sand		Runny	5	14
Gray	Sand & Clay			14	29
Gray	Limestone			29	35

(31) 0005628 0014238 0029228 05 0035215

(32)

(41) WATER RECORD

WATER FOUND AT - FEET	KIND OF WATER
0034	1 ☒ FRESH 2 ☐ SALTY 3 ☐ SULPHUR 4 ☐ MINERAL
	1 ☐ FRESH 2 ☐ SALTY 3 ☐ SULPHUR 4 ☐ MINERAL
	1 ☐ FRESH 2 ☐ SALTY 3 ☐ SULPHUR 4 ☐ MINERAL
	1 ☐ FRESH 2 ☐ SALTY 3 ☐ SULPHUR 4 ☐ MINERAL
	1 ☐ FRESH 2 ☐ SALTY 3 ☐ SULPHUR 4 ☐ MINERAL

(51) CASING & OPEN HOLE RECORD

INSIDE DIAM INCHES	MATERIAL	WALL THICKNESS INCHES	DEPTH - FEET FROM	DEPTH - FEET TO
06 ~~61~~	1 ☒ STEEL 2 ☐ GALVANIZED 3 ☐ CONCRETE 4 ☐ OPEN HOLE	188	0	0029
06	1 ☐ STEEL 2 ☐ GALVANIZED 3 ☐ CONCRETE 4 ☒ OPEN HOLE		29	0035
	1 ☐ STEEL 2 ☐ GALVANIZED 3 ☐ CONCRETE 4 ☐ OPEN HOLE			

SCREEN

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

(61) PLUGGING & SEALING RECORD

DEPTH SET AT - FEET FROM	TO	MATERIAL AND TYPE (CEMENT GROUT, LEAD PACKER, ETC.)
10-13	14-17	
18-21	22-25	
26-29	30-33	

(71) PUMPING TEST

PUMPING TEST METHOD	PUMPING RATE GPM	DURATION OF PUMPING HOURS MINS
1 ☒ PUMP 2 ☐ BAILER	0050	01 HOURS 00 MINS

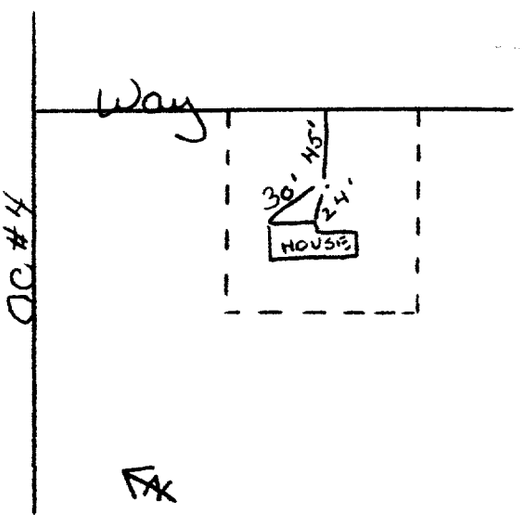
STATIC LEVEL	WATER LEVEL END OF PUMPING	WATER LEVELS DURING	15 MINUTES	30 MINUTES	45 MINUTES	60 MINUTES
006 FEET	015 FEET	1 ☒ PUMPING 2 ☐ RECOVERY	015 FEET	015 FEET	015 FEET	015 FEET

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

RECOMMENDED PUMP TYPE	RECOMMENDED PUMP SETTING FEET	RECOMMENDED PUMPING RATE GPM
☒ SHALLOW ☐ DEEP	025	0005

LOCATION OF WELL

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



DRILLERS REMARKS

FINAL STATUS OF WELL (54)	1 ☒ WATER SUPPLY 2 ☐ OBSERVATION WELL 3 ☐ TEST HOLE 4 ☐ RECHARGE WELL 5 ☐ ABANDONED, INSUFFICIENT SUPPLY 6 ☐ ABANDONED, POOR QUALITY 7 ☐ UNFINISHED
WATER USE (55-56) 01	1 ☒ DOMESTIC 2 ☐ STOCK 3 ☐ IRRIGATION 4 ☐ INDUSTRIAL ☐ OTHER 5 ☐ COMMERCIAL 6 ☐ MUNICIPAL 7 ☐ PUBLIC SUPPLY 8 ☐ COOLING OR AIR CONDITIONING 9 ☐ NOT USED
METHOD OF DRILLING (57) 5	1 ☐ CABLE TOOL 2 ☐ ROTARY (CONVENTIONAL) 3 ☐ ROTARY (REVERSE) 4 ☐ ROTARY (AIR) 5 ☒ AIR PERCUSSION 6 ☐ BORING 7 ☐ DIAMOND 8 ☐ JETTING 9 ☐ DRIVING

CONTRACTOR

NAME OF WELL CONTRACTOR	LICENCE NUMBER
Capital Water Supply Ltd.	1558

ADDRESS	
Box 490, Stittsville, Ontario K0A 3G0	

NAME OF DRILLER OR BORER	LICENCE NUMBER
S. Miller	

SIGNATURE OF CONTRACTOR	SUBMISSION DATE
W. Kawanagh	DAY 26 MO 06 YR 79

OFFICE USE ONLY

DATA SOURCE (58)	CONTRACTOR (59-62)	DATE RECEIVED (63-68) (80)
1	1558	130879

DATE OF INSPECTION	INSPECTOR

REMARKS

MINISTRY OF THE ENVIRONMENT COPY

FORM NO. 0506—4—77

3/64h

Ministry of the Environment
Ontario

The Ontario Water Resources Act

WATER WELL RECORD

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

11 1517063 MUNICIP 15009 CON. CON 01

COUNTY OR DISTRICT	TOWNSHIP, BOROUGH, CITY, TOWN, VILLAGE	CON., BLOCK, TRACT, SURVEY, ETC	
Carleton	Osgoode	Conc. 1 I	028 19

OWNER (SURNAME FIRST)	ADDRESS	DATE COMPLETED
Taldor Dev[redacted]	R. R. # 1, Osgoode, Ontario K0A 2W0	DAY 21 MO 06 YR 79

21 UTM ZONE 18 EASTING 451999 NORTHING 4999199 RC 4 ELEVATION 0310 RC 4 BASIN CODE 26

LOG OF OVERBURDEN AND BEDROCK MATERIALS (SEE INSTRUCTIONS)

GENERAL COLOUR	MOST COMMON MATERIAL	OTHER MATERIALS	GENERAL DESCRIPTION	DEPTH - FEET FROM	DEPTH - FEET TO
Brown	Sand			0	5
Gray	Sand & Clay			5	20
Gray	Clay			20	27
Gray	Limestone			27	40

31 0005628 0020228 05 0027205 0940215

32

41 WATER RECORD

WATER FOUND AT - FEET	KIND OF WATER
0040	1 ☒ FRESH 3 ☐ SULPHUR 2 ☐ SALTY 4 ☐ MINERAL
	1 ☐ FRESH 3 ☐ SULPHUR 2 ☐ SALTY 4 ☐ MINERAL
	1 ☐ FRESH 3 ☐ SULPHUR 2 ☐ SALTY 4 ☐ MINERAL
	1 ☐ FRESH 3 ☐ SULPHUR 2 ☐ SALTY 4 ☐ MINERAL
	1 ☐ FRESH 3 ☐ SULPHUR 2 ☐ SALTY 4 ☐ MINERAL

51 CASING & OPEN HOLE RECORD

INSIDE DIAM INCHES	MATERIAL	WALL THICKNESS INCHES	DEPTH - FEET FROM	DEPTH - FEET TO
06	1 ☒ STEEL 2 ☐ GALVANIZED 3 ☐ CONCRETE 4 ☐ OPEN HOLE	188	0	0029
06	1 ☐ STEEL 2 ☐ GALVANIZED 3 ☐ CONCRETE 4 ☒ OPEN HOLE		29	0040
	1 ☐ STEEL 2 ☐ GALVANIZED 3 ☐ CONCRETE 4 ☐ OPEN HOLE			

SCREEN

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

61 PLUGGING & SEALING RECORD

DEPTH SET AT - FEET FROM	TO	MATERIAL AND TYPE (CEMENT GROUT LEAD PACKER ETC.)

71 PUMPING TEST

METHOD	PUMPING RATE	DURATION OF PUMPING
1 ☒ PUMP 2 ☐ BAILER	0030 GPM	01 HOURS 00 MINS

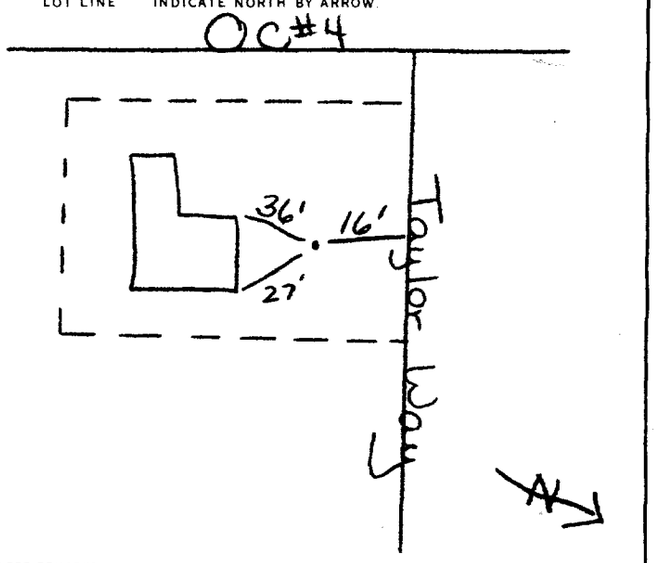
STATIC LEVEL	WATER LEVEL END OF PUMPING	WATER LEVELS DURING	15 MINUTES	30 MINUTES	45 MINUTES	60 MINUTES
008 FEET	015 FEET	1 ☒ PUMPING 2 ☐ RECOVERY	015 FEET	015 FEET	015 FEET	015 FEET

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

RECOMMENDED PUMP TYPE	RECOMMENDED PUMP SETTING	RECOMMENDED PUMPING RATE
☒ SHALLOW ☐ DEEP	020 FEET	0005 GPM

LOCATION OF WELL

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



DRILLERS REMARKS

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

WATER USE 01
1 ☒ DOMESTIC 2 ☐ STOCK 3 ☐ IRRIGATION 4 ☐ INDUSTRIAL ☐ OTHER 5 ☐ COMMERCIAL 6 ☐ MUNICIPAL 7 ☐ PUBLIC SUPPLY 8 ☐ COOLING OR AIR CONDITIONING 9 ☐ NOT USED

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

CONTRACTOR

NAME OF WELL CONTRACTOR	LICENCE NUMBER
Capital Water Supply Ltd.	1558
ADDRESS	
Box 490, Stittsville, Ontario K0A 3G0	
NAME OF DRILLER OR BORER	LICENCE NUMBER
S. Miller	
SIGNATURE OF CONTRACTOR	SUBMISSION DATE
W Kavanagh	DAY 26 MO 06 YR 79

OFFICE USE ONLY

DATA SOURCE	CONTRACTOR	DATE RECEIVED
1	1558	130879
DATE OF INSPECTION	INSPECTOR	
REMARKS		

MINISTRY OF THE ENVIRONMENT COPY

FORM NO. 0506—4—77

31G4h

Ministry of the Environment
Ontario

The Ontario Water Resources Act
WATER WELL RECORD

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

11 | 1517843 | MUNICIP 15009 | CON. CON | 01

COUNTY OR DISTRICT: [redacted] | TOWNSHIP, BOROUGH, CITY, TOWN, VILLAGE: Osgoode | CON., BLOCK, TRACT, SURVEY, ETC.: James St. | 98 88

[redacted] James St. Osgoode | DATE COMPLETED: DAY 19 MO 04 YR 82

[redacted] 98899 | RC 4 | ELEVATION 0310 | RC 4 | BASIN CODE 26

LOG OF OVERBURDEN AND BEDROCK MATERIALS (SEE INSTRUCTIONS)

GENERAL COLOUR	MOST COMMON MATERIAL	OTHER MATERIALS	GENERAL DESCRIPTION	DEPTH - FEET FROM	DEPTH - FEET TO
grey	sand			0	26
grey	gravel			26	31
grey	sand hardpan			31	44
grey	limestone			44	63

31 | 0026228 | 0031211 | 0044228 14 | 0063215

32

41 WATER RECORD

WATER FOUND AT - FEET	KIND OF WATER
0055	1 ☑ FRESH 2 ☐ SALTY 3 ☐ SULPHUR 4 ☐ MINERAL
0060	1 ☑ FRESH 2 ☐ SALTY 3 ☐ SULPHUR 4 ☐ MINERAL
	1 ☐ FRESH 2 ☐ SALTY 3 ☐ SULPHUR 4 ☐ MINERAL
	1 ☐ FRESH 2 ☐ SALTY 3 ☐ SULPHUR 4 ☐ MINERAL
	1 ☐ FRESH 2 ☐ SALTY 3 ☐ SULPHUR 4 ☐ MINERAL

51 CASING & OPEN HOLE RECORD

INSIDE DIAM INCHES	MATERIAL	WALL THICKNESS INCHES	DEPTH - FEET FROM	DEPTH - FEET TO
06	1 ☑ STEEL 2 ☐ GALVANIZED 3 ☐ CONCRETE 4 ☐ OPEN HOLE	.188	0	0046
	1 ☐ STEEL 2 ☐ GALVANIZED 3 ☐ CONCRETE 4 ☐ OPEN HOLE			
	1 ☐ STEEL 2 ☐ GALVANIZED 3 ☐ CONCRETE 4 ☐ OPEN HOLE			

SCREEN

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

MATERIAL AND TYPE | DEPTH TO TOP OF SCREEN FEET

61 PLUGGING & SEALING RECORD

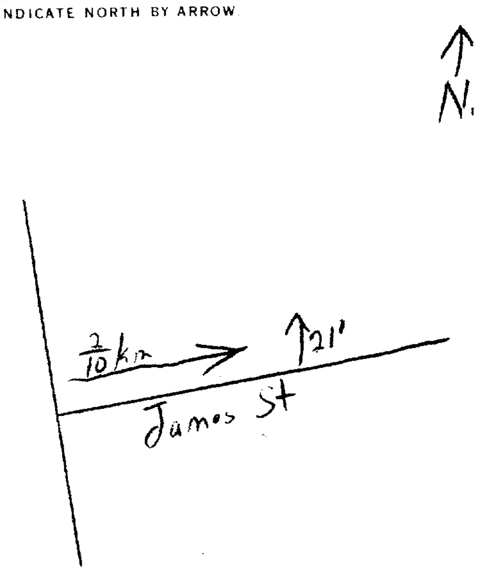
DEPTH SET AT - FEET FROM	TO	MATERIAL AND TYPE (CEMENT GROUT, LEAD PACKER, ETC.)

71 PUMPING TEST

PUMPING TEST METHOD	1 ☑ PUMP 2 ☐ BAILER
PUMPING RATE	0030 GPM
DURATION OF PUMPING	01 HOURS 00 MINS
STATIC LEVEL	015 FEET
WATER LEVEL END OF PUMPING	030 FEET
WATER LEVELS DURING	1 ☒ PUMPING 2 ☐ RECOVERY
15 MINUTES	030 FEET
30 MINUTES	030 FEET
45 MINUTES	030 FEET
60 MINUTES	030 FEET
IF FLOWING GIVE RATE	GPM
PUMP INTAKE SET AT	FEET
WATER AT END OF TEST	1 ☐ CLEAR 2 ☑ CLOUDY
RECOMMENDED PUMP TYPE	☑ SHALLOW ☐ DEEP
RECOMMENDED PUMP SETTING	030 FEET
RECOMMENDED PUMPING RATE	0010 GPM

LOCATION OF WELL

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



DRILLERS REMARKS

FINAL STATUS OF WELL: 1
1 ☑ WATER SUPPLY 2 ☐ OBSERVATION WELL 3 ☐ TEST HOLE 4 ☐ RECHARGE WELL 5 ☐ ABANDONED, INSUFFICIENT SUPPLY 6 ☐ ABANDONED, POOR QUALITY 7 ☐ UNFINISHED

WATER USE: 01
1 ☑ DOMESTIC 2 ☐ STOCK 3 ☐ IRRIGATION 4 ☐ INDUSTRIAL ☐ OTHER 5 ☐ COMMERCIAL 6 ☐ MUNICIPAL 7 ☐ PUBLIC SUPPLY 8 ☐ COOLING OR AIR CONDITIONING 9 ☐ NOT USED

METHOD OF DRILLING: 5
1 ☐ CABLE TOOL 2 ☐ ROTARY (CONVENTIONAL) 3 ☐ ROTARY (REVERSE) 4 ☐ ROTARY (AIR) 5 ☑ AIR PERCUSSION 6 ☐ BORING 7 ☐ DIAMOND 8 ☐ JETTING 9 ☐ DRIVING

CONTRACTOR

NAME OF WELL CONTRACTOR: Henry Mains Well Drilling | LICENCE NUMBER: 3644
ADDRESS: Box 326, Richmond Ont.
NAME OF DRILLER OR BORER: Henry Mains | LICENCE NUMBER:
SIGNATURE OF CONTRACTOR: Henry | SUBMISSION DATE: DAY 20 MO. 4 YR. 82

OFFICE USE ONLY

DATA SOURCE: 1 | CONTRACTOR: 3644 | DATE RECEIVED: 080782
DATE OF INSPECTION | INSPECTOR
REMARKS

MINISTRY OF THE ENVIRONMENT COPY

FORM NO. 0506—4—77 FORM 7

Ministry of the Environment
Ontario

The Ontario Water Resources Act 31G4h

WATER WELL RECORD

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

11 1518085 MUNICIP 15009 CON. C&N 01

COUNTY OR DISTRICT	TOWNSHIP, BOROUGH, CITY, TOWN, VILLAGE	CON., BLOCK, TRACT, SURVEY, ETC	LOT
[redacted]	Osgoode	Conc. 1	I 027

[redacted]501; Osgoode, Ontario. K0A 2W0 — DATE COMPLETED DAY 05 MO 11 YR 82

UTM 99299 RC 4 ELEVATION 0300 RC 4 BASIN CODE 26

LOG OF OVERBURDEN AND BEDROCK MATERIALS (SEE INSTRUCTIONS)

GENERAL COLOUR	MOST COMMON MATERIAL	OTHER MATERIALS	GENERAL DESCRIPTION	DEPTH - FEET FROM	DEPTH - FEET TO
Brown	Sand			0	4
Gray	Sand			4	10
Gray	Sand & Gravel			10	25
Gray	Hardpan			25	38
Gray	Limestone			38	75

31 00046028 00010228 00252811 00382114 00792115

32

41 WATER RECORD

WATER FOUND AT - FEET	KIND OF WATER
0070'	1 ☒ FRESH 2 ☐ SALTY 3 ☐ SULPHUR 4 ☐ MINERAL
	1 ☐ FRESH 2 ☐ SALTY 3 ☐ SULPHUR 4 ☐ MINERAL
	1 ☐ FRESH 2 ☐ SALTY 3 ☐ SULPHUR 4 ☐ MINERAL
	1 ☐ FRESH 2 ☐ SALTY 3 ☐ SULPHUR 4 ☐ MINERAL
	1 ☐ FRESH 2 ☐ SALTY 3 ☐ SULPHUR 4 ☐ MINERAL

51 CASING & OPEN HOLE RECORD

INSIDE DIAM. INCHES	MATERIAL	WALL THICKNESS INCHES	DEPTH - FEET FROM	DEPTH - FEET TO
06 4	1 ☒ STEEL 2 ☐ GALVANIZED 3 ☐ CONCRETE 4 ☐ OPEN HOLE	188	0	0039
06 13 15	1 ☐ STEEL 2 ☐ GALVANIZED 3 ☐ CONCRETE 4 ☒ OPEN HOLE		39	0075
	1 ☐ STEEL 2 ☐ GALVANIZED 3 ☐ CONCRETE 4 ☐ OPEN HOLE			

SCREEN

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

MATERIAL AND TYPE	DEPTH TO TOP OF SCREEN FEET

61 PLUGGING & SEALING RECORD

DEPTH SET AT - FEET FROM	DEPTH SET AT - FEET TO	MATERIAL AND TYPE (CEMENT GROUT, LEAD PACKER, ETC.)

71 PUMPING TEST

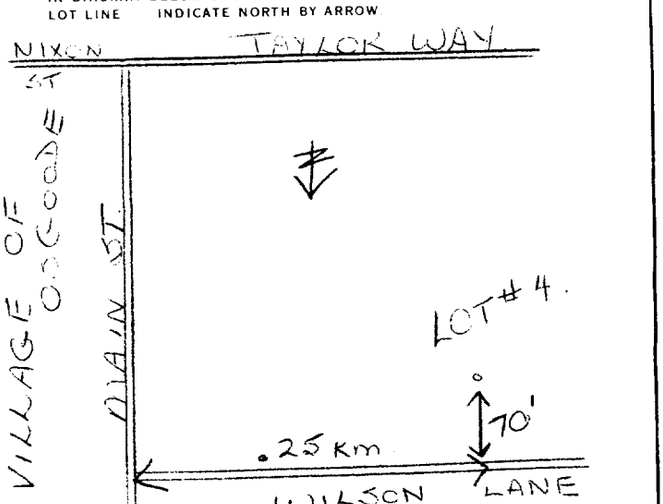
PUMPING TEST METHOD	PUMPING RATE	DURATION OF PUMPING
1 ☒ PUMP 2 ☐ BAILER	0010 GPM	01 HOURS 00 MINS

STATIC LEVEL	WATER LEVEL END OF PUMPING	WATER LEVELS DURING: 1 ☒ PUMPING 2 ☐ RECOVERY	15 MINUTES	30 MINUTES	45 MINUTES	60 MINUTES
010 FEET	025 FEET		025 FEET	025 FEET	025 FEET	025 FEET

IF FLOWING, GIVE RATE	PUMP INTAKE SET AT	WATER AT END OF TEST	RECOMMENDED PUMP TYPE	RECOMMENDED PUMP SETTING	RECOMMENDED PUMPING RATE
GPM	FEET	1 ☒ CLEAR 2 ☐ CLOUDY	☐ SHALLOW ☒ DEEP	040 FEET	0005 GPM

LOCATION OF WELL

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



DRILLERS REMARKS

FINAL STATUS OF WELL 1	1 ☒ WATER SUPPLY 2 ☐ OBSERVATION WELL 3 ☐ TEST HOLE 4 ☐ RECHARGE WELL 5 ☐ ABANDONED, INSUFFICIENT SUPPLY 6 ☐ ABANDONED, POOR QUALITY 7 ☐ UNFINISHED
WATER USE 01	1 ☑ DOMESTIC 2 ☐ STOCK 3 ☐ IRRIGATION 4 ☐ INDUSTRIAL ☐ OTHER 5 ☐ COMMERCIAL 6 ☐ MUNICIPAL 7 ☐ PUBLIC SUPPLY 8 ☐ COOLING OR AIR CONDITIONING 9 ☐ NOT USED
METHOD OF DRILLING 5	1 ☐ CABLE TOOL 2 ☐ ROTARY (CONVENTIONAL) 3 ☐ ROTARY (REVERSE) 4 ☐ ROTARY (AIR) 5 ☒ AIR PERCUSSION 6 ☐ BORING 7 ☐ DIAMOND 8 ☐ JETTING 9 ☐ DRIVING

CONTRACTOR

NAME OF WELL CONTRACTOR: Capital Water Supply Ltd. — LICENCE NUMBER: 1558

ADDRESS: Box 490; Stittsville, Ont. K0A 3G0

NAME OF DRILLER OR BORER: S. Miller — LICENCE NUMBER:

SIGNATURE OF CONTRACTOR: W Kavanagh — SUBMISSION DATE: DAY 05 MO 11 YR 82

OFFICE USE ONLY

DATA SOURCE 1 — CONTRACTOR 1558 — DATE RECEIVED 26 01 83

DATE OF INSPECTION — INSPECTOR

REMARKS

MINISTRY OF THE ENVIRONMENT COPY

FORM NO. 0506—4—77 FORM 7

Ministry of the Environment
Ontario

The Ontario Water Resources Act

WATER WELL RECORD

3164h

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

(11) 1518482 MUNICIP 15009 CON. CON 91

COUNTY OR DISTRICT: Carleton
TOWNSHIP, BOROUGH, CITY, TOWN, VILLAGE: Osgoode
CON, BLOCK, TRACT, SURVEY, ETC: I Con 1, Plan M258 Lot 28
LOT: 027

OWNER (SURNAME FIRST): Bicon Construction
ADDRESS: 41 Cleopatra Nepean K2G 0B6
DATE COMPLETED: DAY 16 MO 08 YR 83

(21) UTM ZONE: 18 EASTING: 431899 NORTHING: 4999199 RC: A ELEVATION: 0300 RC: A BASIN CODE: 26

LOG OF OVERBURDEN AND BEDROCK MATERIALS (SEE INSTRUCTIONS)

GENERAL COLOUR	MOST COMMON MATERIAL	OTHER MATERIALS	GENERAL DESCRIPTION	DEPTH - FEET FROM	DEPTH - FEET TO
grey	clay			0	11
grey	hardpan	stones		11	37
grey	limestone			27	40

MOE VF-18

(31) 0011205 0027214112 0040215
(32)

(41) WATER RECORD

WATER FOUND AT - FEET	KIND OF WATER
036	1 ☒ FRESH 2 ☐ SALTY 3 ☐ SULPHUR 4 ☐ MINERAL
	1 ☐ FRESH 2 ☐ SALTY 3 ☐ SULPHUR 4 ☐ MINERAL
	1 ☐ FRESH 2 ☐ SALTY 3 ☐ SULPHUR 4 ☐ MINERAL
	1 ☐ FRESH 2 ☐ SALTY 3 ☐ SULPHUR 4 ☐ MINERAL
	1 ☐ FRESH 2 ☐ SALTY 3 ☐ SULPHUR 4 ☐ MINERAL

(51) CASING & OPEN HOLE RECORD

INSIDE DIAM INCHES	MATERIAL	WALL THICKNESS INCHES	DEPTH - FEET FROM	DEPTH - FEET TO
06	1 ☒ STEEL 2 ☐ GALVANIZED 3 ☐ CONCRETE 4 ☐ OPEN HOLE	188	0	029
06	1 ☐ STEEL 2 ☐ GALVANIZED 3 ☐ CONCRETE 4 ☒ OPEN HOLE		29	40
	1 ☐ STEEL 2 ☐ GALVANIZED 3 ☐ CONCRETE 4 ☐ OPEN HOLE			

SCREEN

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

MATERIAL AND TYPE: | DEPTH TO TOP OF SCREEN FEET:

(61) PLUGGING & SEALING RECORD

DEPTH SET AT - FEET FROM	TO	MATERIAL AND TYPE (CEMENT GROUT LEAD PACKER, ETC.)

(71) PUMPING TEST

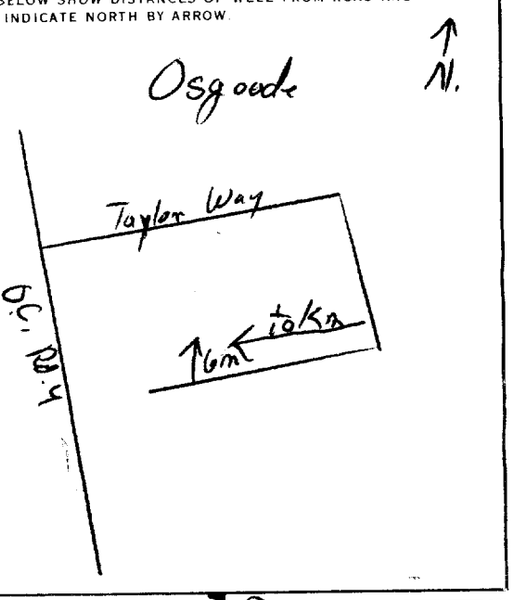
PUMPING TEST METHOD: 1 ☒ PUMP 2 ☐ BAILER
PUMPING RATE: 020 GPM
DURATION OF PUMPING: 01 HOURS 00 MINS

STATIC LEVEL	WATER LEVEL END OF PUMPING	WATER LEVELS DURING: 1 ☒ PUMPING 2 ☐ RECOVERY			
		15 MINUTES	30 MINUTES	45 MINUTES	60 MINUTES
012 FEET	030 FEET	030 FEET	030 FEET	030 FEET	030 FEET

IF FLOWING, GIVE RATE: GPM
PUMP INTAKE SET AT: FEET
WATER AT END OF TEST: 1 ☐ CLEAR 2 ☒ CLOUDY
RECOMMENDED PUMP TYPE: ☒ SHALLOW ☐ DEEP
RECOMMENDED PUMP SETTING: 030 FEET
RECOMMENDED PUMPING RATE: 0010 GPM

LOCATION OF WELL

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



DRILLERS REMARKS:

FINAL STATUS OF WELL (54): 1

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

WATER USE (55-56): 01

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

METHOD OF DRILLING (57): 5

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

CONTRACTOR

NAME OF WELL CONTRACTOR: Henry Mains Well Drilling — LICENCE NUMBER: 3644
ADDRESS: Box 326, Richmond Ont.
NAME OF DRILLER OR BORER: Henry Mains — LICENCE NUMBER:
SIGNATURE OF CONTRACTOR:
SUBMISSION DATE: DAY 27 MO 8 YR 83

OFFICE USE ONLY

DATA SOURCE (58): 1 — CONTRACTOR (59-62): 3644 — DATE RECEIVED (63-68): 12 09 83
DATE OF INSPECTION: — INSPECTOR:
REMARKS:

FORM NO. 0506—4—77 FORM 7

MINISTRY OF THE ENVIRONMENT COPY

3164

Ministry of the Environment
Ontario

The Ontario Water Resources Act

WATER WELL RECORD

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

11 — 1518483 — MUNICIP 15009 — CON. C&N — LOT 01

COUNTY OR DISTRICT: Carleton
TOWNSHIP, BOROUGH, CITY, TOWN, VILLAGE: Osgood
CON., BLOCK, TRACT, SURVEY, ETC.: I Con I Plan M2580
LOT: 27
OWNER (SURNAME FIRST): Bacon Construction et
ADDRESS: 41 Cleopatra Nepean K2G 0B6
DATE COMPLETED: DAY 16 MO 08 YR 83

21 — UTM ZONE 18 — EASTING 451899 — NORTHING 4999199 — RC 4 — ELEVATION 0300 — RC 4 — BASIN CODE 20

LOG OF OVERBURDEN AND BEDROCK MATERIALS (SEE INSTRUCTIONS)

GENERAL COLOUR	MOST COMMON MATERIAL	OTHER MATERIALS	GENERAL DESCRIPTION	DEPTH - FEET FROM	DEPTH - FEET TO
grey	sand			0	9
grey	hardpan	stones		9	29
grey	limestone			29	40

MOE VF-18

31 — 0009228 — 00221412 — 0040215

32

41 WATER RECORD

WATER FOUND AT - FEET	KIND OF WATER
037	1 ☑ FRESH 2 ☐ SALTY 3 ☐ SULPHUR 4 ☐ MINERAL
	1 ☐ FRESH 2 ☐ SALTY 3 ☐ SULPHUR 4 ☐ MINERAL
	1 ☐ FRESH 2 ☐ SALTY 3 ☐ SULPHUR 4 ☐ MINERAL
	1 ☐ FRESH 2 ☐ SALTY 3 ☐ SULPHUR 4 ☐ MINERAL
	1 ☐ FRESH 2 ☐ SALTY 3 ☐ SULPHUR 4 ☐ MINERAL

51 CASING & OPEN HOLE RECORD

OUTSIDE DIAM INCHES	MATERIAL	WALL THICKNESS INCHES	DEPTH - FEET FROM	DEPTH - FEET TO
06	1 ☑ STEEL 2 ☐ GALVANIZED 3 ☐ CONCRETE 4 ☐ OPEN HOLE	188	0	031
06	1 ☐ STEEL 2 ☐ GALVANIZED 3 ☐ CONCRETE 4 ☑ OPEN HOLE		31	040
	1 ☐ STEEL 2 ☐ GALVANIZED 3 ☐ CONCRETE 4 ☐ OPEN HOLE			

SCREEN

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

MATERIAL AND TYPE: — DEPTH TO TOP OF SCREEN FEET: —

61 PLUGGING & SEALING RECORD

DEPTH SET AT - FEET FROM	TO	MATERIAL AND TYPE (CEMENT GROUT, LEAD PACKER, ETC.)

71 PUMPING TEST

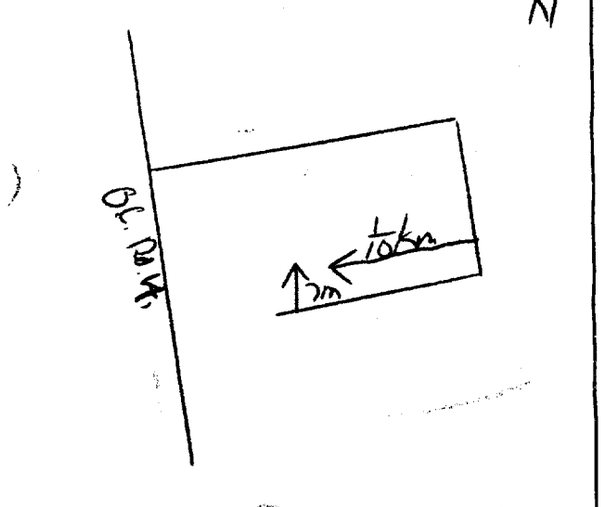
PUMPING TEST METHOD: 1 ☑ PUMP 2 ☐ BAILER
PUMPING RATE: 030 GPM
DURATION OF PUMPING: 01 HOURS 00 MINS

STATIC LEVEL	WATER LEVEL END OF PUMPING	WATER LEVELS DURING: 1 ☒ PUMPING 2 ☐ RECOVERY	15 MINUTES	30 MINUTES	45 MINUTES	60 MINUTES
010 FEET	030 FEET		030 FEET	030 FEET	030 FEET	030 FEET

IF FLOWING, GIVE RATE: — GPM
PUMP INTAKE SET AT: — FEET
WATER AT END OF TEST: 1 ☐ CLEAR 2 ☑ CLOUDY
RECOMMENDED PUMP TYPE: ☑ SHALLOW ☐ DEEP
RECOMMENDED PUMP SETTING: 030 FEET
RECOMMENDED PUMPING RATE: 010 GPM

LOCATION OF WELL

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



DRILLERS REMARKS:

FINAL STATUS OF WELL 1
1 ☑ WATER SUPPLY 2 ☐ OBSERVATION WELL 3 ☐ TEST HOLE 4 ☐ RECHARGE WELL 5 ☐ ABANDONED, INSUFFICIENT SUPPLY 6 ☐ ABANDONED, POOR QUALITY 7 ☐ UNFINISHED

WATER USE 01
1 ☑ DOMESTIC 2 ☐ STOCK 3 ☐ IRRIGATION 4 ☐ INDUSTRIAL ☐ OTHER 5 ☐ COMMERCIAL 6 ☐ MUNICIPAL 7 ☐ PUBLIC SUPPLY 8 ☐ COOLING OR AIR CONDITIONING 9 ☐ NOT USED

METHOD OF DRILLING 5
1 ☐ CABLE TOOL 2 ☐ ROTARY (CONVENTIONAL) 3 ☐ ROTARY (REVERSE) 4 ☐ ROTARY (AIR) 5 ☑ AIR PERCUSSION 6 ☐ BORING 7 ☐ DIAMOND 8 ☐ JETTING 9 ☐ DRIVING

CONTRACTOR

NAME OF WELL CONTRACTOR: Henry Mains Well Drilling — LICENCE NUMBER: 3644
ADDRESS: Box 326, Richmond Ont
NAME OF DRILLER OR BOREMAN: Henry Mains — LICENCE NUMBER:
SIGNATURE OF CONTRACTOR: Henry Mains
SUBMISSION DATE: DAY 27 MO. 8 YR. 83

OFFICE USE ONLY

DATA SOURCE 1 — CONTRACTOR 3644 — DATE RECEIVED 12 09 83
DATE OF INSPECTION — INSPECTOR
REMARKS

FORM NO. 0506—4—77 FORM 7

MINISTRY OF THE ENVIRONMENT COPY

31G4h

Ministry of the Environment
Ontario

The Ontario Water Resources Act

WATER WELL RECORD

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

(11) 1519019 MUNICIP 15009 CON. CON 01

COUNTY OR DISTRICT: Carleton
TOWNSHIP, BOROUGH, CITY, TOWN, VILLAGE: Osgoode
CON. BLOCK, TRACT, SURVEY, ETC.: I Con 1, Lot 28
LOT: 28

OWNER (SURNAME FIRST): Bicer Construction
ADDRESS: 4 Cleopatra Nepean K2G 0B6
DATE COMPLETED: DA 09 MO 05 YR 84

(21) UTM ZONE: 18 EASTING: 452099 NORTHING: 4999299 RC: 4 ELEVATION: 0310 RC: 4 BASIN CODE: 26

LOG OF OVERBURDEN AND BEDROCK MATERIALS (SEE INSTRUCTIONS)

GENERAL COLOUR	MOST COMMON MATERIAL	OTHER MATERIALS	GENERAL DESCRIPTION	DEPTH - FEET FROM	DEPTH - FEET TO
grey	sand			0	5
grey	hardpan	stone		5	41
grey	limestone			41	50

MOE VF-18

(31) 0005 28 | 0041 24 12 | 0050 215

(32)

(41) WATER RECORD

WATER FOUND AT - FEET	KIND OF WATER
0045	1 ☑ FRESH 2 ☐ SALTY 3 ☐ SULPHUR 4 ☐ MINERAL
	1 ☐ FRESH 2 ☐ SALTY 3 ☐ SULPHUR 4 ☐ MINERAL
	1 ☐ FRESH 2 ☐ SALTY 3 ☐ SULPHUR 4 ☐ MINERAL
	1 ☐ FRESH 2 ☐ SALTY 3 ☐ SULPHUR 4 ☐ MINERAL
	1 ☐ FRESH 2 ☐ SALTY 3 ☐ SULPHUR 4 ☐ MINERAL

(51) CASING & OPEN HOLE RECORD

INSIDE DIAM INCHES	MATERIAL	WALL THICKNESS INCHES	DEPTH - FEET FROM	DEPTH - FEET TO
06	1 ☑ STEEL 2 ☐ GALVANIZED 3 ☐ CONCRETE 4 ☐ OPEN HOLE	.188	0	0043
06	1 ☐ STEEL 2 ☐ GALVANIZED 3 ☐ CONCRETE 4 ☑ OPEN HOLE		0043	0050
	1 ☐ STEEL 2 ☐ GALVANIZED 3 ☐ CONCRETE 4 ☐ OPEN HOLE			

SCREEN

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

MATERIAL AND TYPE: | DEPTH TO TOP OF SCREEN FEET:

(61) PLUGGING & SEALING RECORD

DEPTH SET AT - FEET FROM	DEPTH SET AT - FEET TO	MATERIAL AND TYPE (CEMENT GROUT, LEAD PACKER, ETC.)

(71) PUMPING TEST

PUMPING TEST METHOD: 1 ☐ PUMP 2 ☐ BAILER
PUMPING RATE: 0020 GPM
DURATION OF PUMPING: 01 HOURS 00 MINS

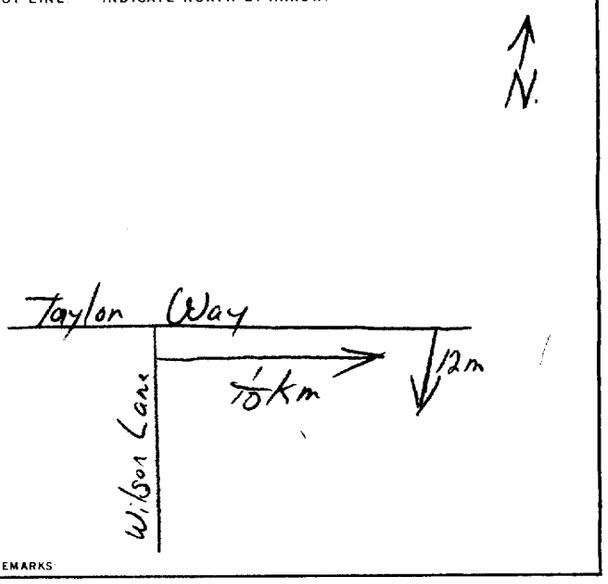
STATIC LEVEL	WATER LEVEL END OF PUMPING	WATER LEVELS DURING: 1 ☑ PUMPING 2 ☐ RECOVERY			
		15 MINUTES	30 MINUTES	45 MINUTES	60 MINUTES
010 FEET	030 FEET	030 FEET	030 FEET	030 FEET	030 FEET

IF FLOWING, GIVE RATE: GPM
PUMP INTAKE SET AT: FEET
WATER AT END OF TEST: 1 ☐ CLEAR 2 ☑ CLOUDY
RECOMMENDED PUMP TYPE: ☑ SHALLOW ☐ DEEP
RECOMMENDED PUMP SETTING: 030 FEET
RECOMMENDED PUMPING RATE: 0010 GPM

LOCATION OF WELL

1488

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



DRILLERS REMARKS:

FINAL STATUS OF WELL 1
1 ☑ WATER SUPPLY 2 ☐ OBSERVATION WELL 3 ☐ TEST HOLE 4 ☐ RECHARGE WELL 5 ☐ ABANDONED, INSUFFICIENT SUPPLY 6 ☐ ABANDONED, POOR QUALITY 7 ☐ UNFINISHED

WATER USE 01
1 ☑ DOMESTIC 2 ☐ STOCK 3 ☐ IRRIGATION 4 ☐ INDUSTRIAL ☐ OTHER 5 ☐ COMMERCIAL 6 ☐ MUNICIPAL 7 ☐ PUBLIC SUPPLY 8 ☐ COOLING OR AIR CONDITIONING 9 ☐ NOT USED

METHOD OF DRILLING 5
1 ☐ CABLE TOOL 2 ☐ ROTARY (CONVENTIONAL) 3 ☐ ROTARY (REVERSE) 4 ☐ ROTARY (AIR) 5 ☑ AIR PERCUSSION 6 ☐ BORING 7 ☐ DIAMOND 8 ☐ JETTING 9 ☐ DRIVING

CONTRACTOR

NAME OF WELL CONTRACTOR: Henry Maire Well Drilling | LICENCE NUMBER: 3644
ADDRESS: Box 326, Richmond Ont.
NAME OF DRILLER OR BORER: Henry Maire | LICENCE NUMBER:
SIGNATURE OF CONTRACTOR:
SUBMISSION DATE: DAY 12 MO 5 YR 84

OFFICE USE ONLY

DATA SOURCE: 1 | CONTRACTOR: 3644 | DATE RECEIVED: 030784
DATE OF INSPECTION: | INSPECTOR:
REMARKS:

MINISTRY OF THE ENVIRONMENT COPY

FORM NO. 0506—4—77 FORM 7

316-4h

Ministry of the Environment
Ontario

The Ontario Water Resources Act

WATER WELL RECORD

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

(11) 1519660 MUNICIP 15009 CON. CON 01

COUNTY OR DISTRICT	TOWNSHIP, BOROUGH, CITY, TOWN, VILLAGE	CON., BLOCK, TRACT, SURVEY, ETC	LOT	
Carleton	Osgoode	Conc. 1	I	027 27 & 28

OWNER (SURNAME FIRST)	ADDRESS	DATE COMPLETED
Taldor Enterprises	R. R. # 1, Osgoode, Ontario	DAY 31 MO 10 YR 79

(21) UTM ZONE 18 EASTING 451699 NORTHING 4999199 RC 4 ELEVATION 0300 RC 4 BASIN CODE 26

LOG OF OVERBURDEN AND BEDROCK MATERIALS (SEE INSTRUCTIONS)

GENERAL COLOUR	MOST COMMON MATERIAL	OTHER MATERIALS	GENERAL DESCRIPTION	DEPTH - FEET FROM	DEPTH - FEET TO
Brown	Sand			0	13
Gray	Sand		Wet	13	30
Gray	Sand & Gravel			30	32
Gray	Limestone			32	40

MOE VF-18

(31) 00/3628 0030228 0032228/11 0040215

(32)

(41) WATER RECORD

WATER FOUND AT - FEET	KIND OF WATER
0038'	1 ☒ FRESH 2 ☐ SALTY 3 ☐ SULPHUR 4 ☐ MINERAL
	1 ☐ FRESH 2 ☐ SALTY 3 ☐ SULPHUR 4 ☐ MINERAL
	1 ☐ FRESH 2 ☐ SALTY 3 ☐ SULPHUR 4 ☐ MINERAL
	1 ☐ FRESH 2 ☐ SALTY 3 ☐ SULPHUR 4 ☐ MINERAL
	1 ☐ FRESH 2 ☐ SALTY 3 ☐ SULPHUR 4 ☐ MINERAL

(51) CASING & OPEN HOLE RECORD

INSIDE DIAM INCHES	MATERIAL	WALL THICKNESS INCHES	DEPTH - FEET FROM	DEPTH - FEET TO
6 5/8	1 ☒ STEEL 2 ☐ GALVANIZED 3 ☐ CONCRETE 4 ☐ OPEN HOLE	188	0	0032
5 7/8	1 ☐ STEEL 2 ☐ GALVANIZED 3 ☐ CONCRETE 4 ☒ OPEN HOLE		32	0040
	1 ☐ STEEL 2 ☐ GALVANIZED 3 ☐ CONCRETE 4 ☐ OPEN HOLE			

SCREEN

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

61 PLUGGING & SEALING RECORD

DEPTH SET AT - FEET FROM	TO	MATERIAL AND TYPE (CEMENT GROUT LEAD PACKER, ETC.)

PUMPING TEST

(71) PUMPING TEST METHOD 1 ☒ PUMP 2 ☐ BAILER

PUMPING RATE 0060 GPM

DURATION OF PUMPING 01 HOURS 00 MINS

STATIC LEVEL	WATER LEVEL END OF PUMPING	WATER LEVELS DURING (1 ☒ PUMPING 2 ☐ RECOVERY)	15 MINUTES	30 MINUTES	45 MINUTES	60 MINUTES
007 FEET	010 FEET		010 FEET	010 FEET	010 FEET	010 FEET

IF FLOWING, GIVE RATE GPM

PUMP INTAKE SET AT 30 FEET

WATER AT END OF TEST 1 ☒ CLEAR 2 ☐ CLOUDY

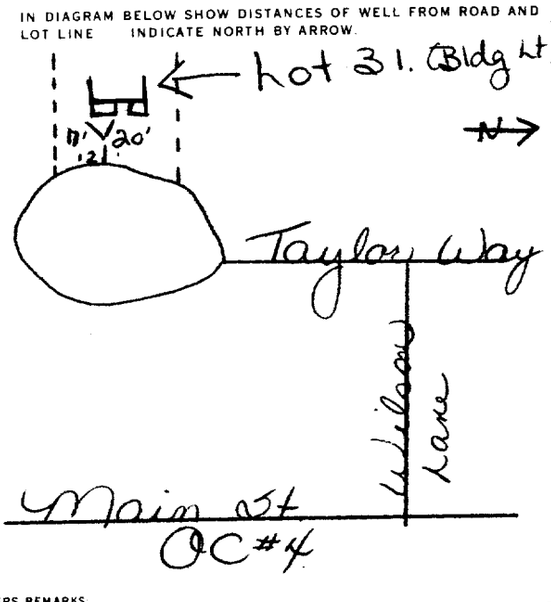
RECOMMENDED PUMP TYPE ☒ SHALLOW ☐ DEEP

RECOMMENDED PUMP SETTING 025 FEET

RECOMMENDED PUMPING RATE 0005 GPM

LOCATION OF WELL

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



DRILLERS REMARKS:

FINAL STATUS OF WELL	1 ☒ WATER SUPPLY 2 ☐ OBSERVATION WELL 3 ☐ TEST HOLE 4 ☐ RECHARGE WELL 5 ☐ ABANDONED, INSUFFICIENT SUPPLY 6 ☐ ABANDONED, POOR QUALITY 7 ☐ UNFINISHED
WATER USE 01	1 ☒ DOMESTIC 2 ☐ STOCK 3 ☐ IRRIGATION 4 ☐ INDUSTRIAL ☐ OTHER 5 ☐ COMMERCIAL 6 ☐ MUNICIPAL 7 ☐ PUBLIC SUPPLY 8 ☐ COOLING OR AIR CONDITIONING 9 ☐ NOT USED
METHOD OF DRILLING 5	1 ☐ CABLE TOOL 2 ☐ ROTARY (CONVENTIONAL) 3 ☐ ROTARY (REVERSE) 4 ☐ ROTARY (AIR) ☒ AIR PERCUSSION 6 ☐ BORING 7 ☐ DIAMOND 8 ☐ JETTING 9 ☐ DRIVING

CONTRACTOR

NAME OF WELL CONTRACTOR: Capital Water Supply Ltd. LICENCE NUMBER: 1558

ADDRESS: Box 490, Stittsville, Ontario K0A 3G0

NAME OF DRILLER OR BORER: S. Miller LICENCE NUMBER:

SIGNATURE OF CONTRACTOR: W Kavanagh SUBMISSION DATE: DAY 31 MO 10 YR 79

OFFICE USE ONLY

DATA SOURCE 1 | CONTRACTOR 1558 | DATE RECEIVED 210380

DATE OF INSPECTION | INSPECTOR K

REMARKS: changed from 1517260

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FORM NO. 0506—4—77

Ministry of the Environment
Ontario

The Ontario Water Resources Act

WATER WELL RECORD

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

11 1521685

MUNICIP

COUNTY OR DISTRICT: Carleton

TOWNSHIP, BOROUGH, CITY, TOWN, VILLAGE: Osgoode

CON., BLOCK, TRACT, SURVEY, ETC: Main St. CON 1

LOT: 5479

[redacted] Rr 123, Metcalfe Ont.

DATE COMPLETED: DAY 30 MO 4 YR 87

ELEVATION: KOA

BASIN CODE: 2P9

LOG OF OVERBURDEN AND BEDROCK MATERIALS (SEE INSTRUCTIONS)

GENERAL COLOUR	MOST COMMON MATERIAL	OTHER MATERIALS	GENERAL DESCRIPTION	DEPTH - FEET FROM	DEPTH - FEET TO
grey	fill			0	5
grey	sand			5	15
grey	hardpan	stones	~~stones~~ hard	15	46
grey	limestone			46	85

4 WATER RECORD

WATER FOUND AT - FEET	KIND OF WATER
60	1 ☒ FRESH 3 ☐ SULPHUR; 2 ☐ SALTY 4 ☐ MINERAL
80	1 ☒ FRESH 3 ☐ SULPHUR; 2 ☐ SALTY 4 ☐ MINERAL
	1 ☐ FRESH 3 ☐ SULPHUR; 2 ☐ SALTY 4 ☐ MINERAL
	1 ☐ FRESH 3 ☐ SULPHUR; 2 ☐ SALTY 4 ☐ MINERAL
	1 ☐ FRESH 3 ☐ SULPHUR; 2 ☐ SALTY 4 ☐ MINERAL

51 CASING & OPEN HOLE RECORD

INSIDE DIAM INCHES	MATERIAL	WALL THICKNESS INCHES	DEPTH - FEET FROM	DEPTH - FEET TO
6¼	1 ☒ STEEL; 2 ☐ GALVANIZED; 3 ☐ CONCRETE; 4 ☐ OPEN HOLE	.188	0	48
6	1 ☐ STEEL; 2 ☐ GALVANIZED; 3 ☐ CONCRETE; 4 ☒ OPEN HOLE		48	85
	1 ☐ STEEL; 2 ☐ GALVANIZED; 3 ☐ CONCRETE; 4 ☐ OPEN HOLE			

SCREEN

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

61 PLUGGING & SEALING RECORD

DEPTH SET AT - FEET FROM	TO	MATERIAL AND TYPE (CEMENT GROUT, LEAD PACKER, ETC.)
10-13	14-17	pressure cement grout
18-21	22-25	
26-29	30-33	

PUMPING TEST

PUMPING TEST METHOD	PUMPING RATE	DURATION OF PUMPING
1 ☒ PUMP 2 ☐ BAILER	9 GPM	1 HOURS 0 MINS

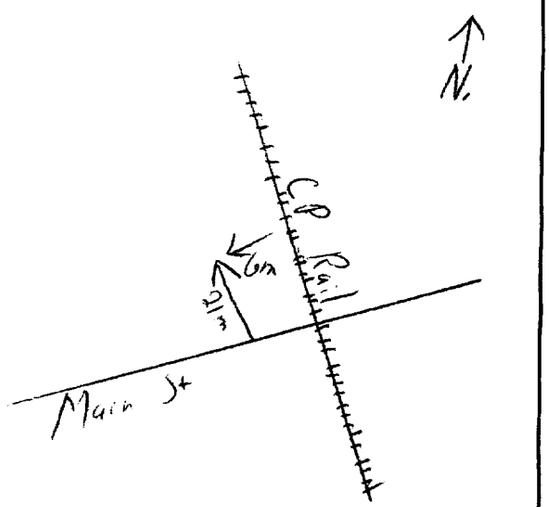
STATIC LEVEL	WATER LEVEL END OF PUMPING	WATER LEVELS DURING: 1 ☐ PUMPING 2 ☐ RECOVERY			
		15 MINUTES	30 MINUTES	45 MINUTES	60 MINUTES
15 FEET	80 FEET	80 FEET	80 FEET	80 FEET	80 FEET

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

RECOMMENDED PUMP TYPE	RECOMMENDED PUMP SETTING	RECOMMENDED PUMPING RATE
☐ SHALLOW ☒ DEEP	80 FEET	9 GPM

LOCATION OF WELL

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



07107

DRILLERS REMARKS:

FINAL STATUS OF WELL	1 ☒ WATER SUPPLY; 2 ☐ OBSERVATION WELL; 3 ☐ TEST HOLE; 4 ☐ RECHARGE WELL; 5 ☐ ABANDONED, INSUFFICIENT SUPPLY; 6 ☐ ABANDONED, POOR QUALITY; 7 ☐ UNFINISHED
WATER USE	1 ☐ DOMESTIC; 2 ☐ STOCK; 3 ☐ IRRIGATION; 4 ☐ INDUSTRIAL; 5 ☐ COMMERCIAL; 6 ☐ MUNICIPAL; 7 ☐ PUBLIC SUPPLY; 8 ☐ COOLING OR AIR CONDITIONING; ☐ OTHER Fire dept.; ☐ NOT USED
METHOD OF DRILLING	1 ☐ CABLE TOOL; 2 ☐ ROTARY (CONVENTIONAL); 3 ☐ ROTARY (REVERSE); 4 ☐ ROTARY (AIR); 5 ☒ AIR PERCUSSION; 6 ☐ BORING; 7 ☐ DIAMOND; 8 ☐ JETTING; 9 ☐ DRIVING 3644

CONTRACTOR

NAME OF WELL CONTRACTOR: D. Mains Well Drilling — LICENCE NUMBER: 3644

ADDRESS: Box 326, Richmond Ont.

NAME OF DRILLER OR BORER — LICENCE NUMBER

SIGNATURE OF CONTRACTOR — SUBMISSION DATE: DAY 30 MO 4 YR 87

OFFICE USE ONLY

DATE RECEIVED: AUG 14 1987

DATE OF INSPECTION — INSPECTOR

REMARKS

MINISTRY OF THE ENVIRONMENT COPY

FORM NO. 0506—4—77 FORM 7

Ministry of Environment and Energy
Ontario

The Ontario Water Resources Act
WATER WELL RECORD

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

11

1529556

Municipality 15009 Con. CON 01

[redacted]

Township/Borough/City/Town/Village: OSGOODE
Con block tract survey, etc.: 1 Part
Lot: 67
Address: 5515 Lion St. OSGOODE ON
Date completed: 23 day 7 month 97 year

Northing | RC | Elevation | RC | Basin Code

LOG OF OVERBURDEN AND BEDROCK MATERIALS (see instructions)

General colour	Most common material	Other materials	General description	Depth – feet From	Depth – feet To
BROWN	Sand		Packed	0	15
GREY	Sand		Packed	15	18
GREY	Clay		Runny	18	26
GREY	Clay & Stones		HARD PAN	26	52
GREY	Limestone		MED HARD	52	88
		55' of 6 1/4" casing			
		1 HEAVY DRIVE Shoe			
		1 WELL CAP			
		5 Bags of Cement			
		B.M.			

41 WATER RECORD

Water found at – feet	Kind of water
85	1 ☐ Fresh 2 ☐ Salty 3 ☐ Sulphur 4 ☒ Minerals 5 ☐ Gas
	1 ☐ Fresh 2 ☐ Salty 3 ☐ Sulphur 4 ☐ Minerals 5 ☐ Gas
	1 ☐ Fresh 2 ☐ Salty 3 ☐ Sulphur 4 ☐ Minerals 5 ☐ Gas
	1 ☐ Fresh 2 ☐ Salty 3 ☐ Sulphur 4 ☐ Minerals 5 ☐ Gas
	1 ☐ Fresh 2 ☐ Salty 3 ☐ Sulphur 4 ☐ Minerals 5 ☐ Gas

51 CASING & OPEN HOLE RECORD

Inside diam inches	Material	Wall thickness inches	Depth – feet From	Depth – feet To
6 1/4	1 ☒ Steel 2 ☐ Galvanized 3 ☐ Concrete 4 ☒ Open hole 5 ☐ Plastic	.188	0	53
6"			53	88
	1 ☐ Steel 2 ☐ Galvanized 3 ☐ Concrete 4 ☐ Open hole 5 ☐ Plastic			
	1 ☐ Steel 2 ☐ Galvanized 3 ☐ Concrete 4 ☐ Open hole 5 ☐ Plastic			

SCREEN

Sizes of opening (Slot No.)	Diameter inches	Length feet
Material and type	Depth at top of screen feet	

61 PLUGGING & SEALING RECORD

☐ Annular space ☐ Abandonment

Depth set at – feet From	Depth set at – feet To	Material and type (Cement grout, bentonite, etc.)
0	21	Cement Grout

71 PUMPING TEST

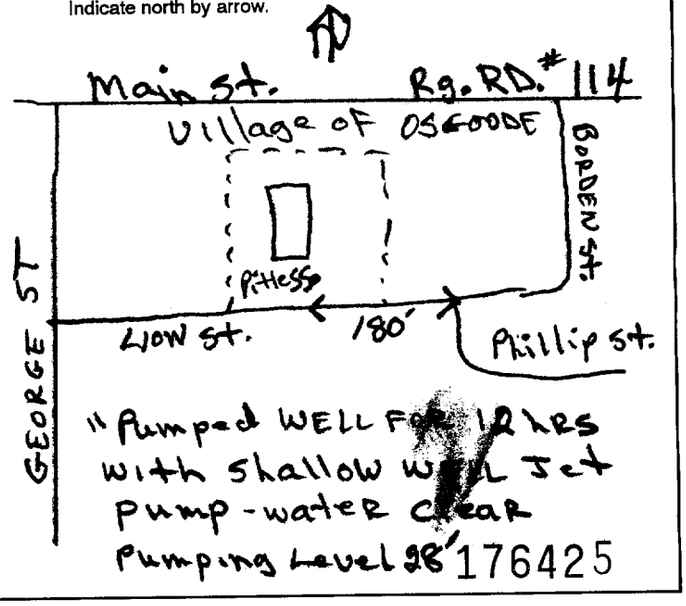
Pumping test method: 1 ☐ Pump 2 ☒ Bailer
Pumping rate: 12 GPM
Duration of pumping: 1 Hours ..... Mins

Static level	Water level end of pumping	Water levels during: 1 ☒ Pumping 2 ☐ Recovery			
		15 minutes	30 minutes	45 minutes	60 minutes
21 feet	40 feet	30 feet	40 feet	40 feet	40 feet

If flowing give rate: GPM
Pump intake set at: feet
Water at end of test: ☐ Clear ☒ Cloudy
Recommended pump type: ☒ Shallow ☐ Deep
Recommended pump setting: 35 feet
Recommended pump rate: 6 GPM

LOCATION OF WELL

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



1" Pumped well for 12 hrs with shallow well Jet pump - water clear
Pumping Level 28'

176425

FINAL STATUS OF WELL

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

WATER USE

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

METHOD OF CONSTRUCTION

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

Name of Well Contractor: B. MOORE WELL DRILLING
Well Contractor's Licence No.: 6455
Address: Main St. Box 436 OSGOODE ON
Name of Well Technician: Bob MOORE
Well Technician's Licence No.: T-0319
Signature of Technician/Contractor: Bob Moore
Submission date: day 24 mo 7 yr 97

MINISTRY USE ONLY

Data source
Contractor: 6455
Date received: AUG 11 1997
Date of inspection
Inspector
Remarks

0506 (07/94) Front Form 9

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Ontario Ministry of the Environment

The Ontario Water Resources Act
WATER WELL RECORD

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

OTTAWA-CARLETON

11 1533843 Municipality 15009 Con. CON 01

County or District: Carleton
Township/Borough/City/Town/Village: OSGOODE (Ottawa)
Con block tract survey, etc.: 1 Plan 393
Lot: Part 46 & 47
Address: 5503 OSGOODE Main St.
Date completed: 9 day 01 month 03 year
Northing RC Elevation RC Basin Code

LOG OF OVERBURDEN AND BEDROCK MATERIALS (see instructions)

General colour	Most common material	Other materials	General description	Depth - feet From	Depth - feet To
BRown	Sand		Packed	0	14
GRey	Clay		thick	14	30
GRey	Clay & Stones		HARD Pan	30	50
GRey	Limestone		MED HARD	50	80
	54' OF 6"		casing		
	1		DRIVE Shoe		
	1		WELL CaP		
	2		Bags of Bentonite Quick Grout		

41 WATER RECORD

Water found at - feet	Kind of water
68	1 ☐ Fresh 2 ☐ Salty 3 ☒ Sulphur 4 ☒ Minerals 5 ☐ Gas 6
	1 ☐ Fresh 2 ☐ Salty 3 ☐ Sulphur 4 ☐ Minerals 5 ☐ Gas 6
	1 ☐ Fresh 2 ☐ Salty 3 ☐ Sulphur 4 ☐ Minerals 5 ☐ Gas 6
	1 ☐ Fresh 2 ☐ Salty 3 ☐ Sulphur 4 ☐ Minerals 5 ☐ Gas 6
	1 ☐ Fresh 2 ☐ Salty 3 ☐ Sulphur 4 ☐ Minerals 5 ☐ Gas 6

51 CASING & OPEN HOLE RECORD

Inside diam inches	Material	Wall thickness inches	Depth - feet From	Depth - feet To
6¼	1 ☒ Steel 2 ☐ Galvanized 3 ☐ Concrete 4 ☒ Open hole 5 ☐ Plastic	.188	0	53
6"			53	80
	1 ☐ Steel 2 ☐ Galvanized 3 ☐ Concrete 4 ☐ Open hole 5 ☐ Plastic			
	1 ☐ Steel 2 ☐ Galvanized 3 ☐ Concrete 4 ☐ Open hole 5 ☐ Plastic			

SCREEN

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

Material and type: Depth at top of screen feet

61 PLUGGING & SEALING RECORD

☒ Annular space ☐ Abandonment

Depth set at - feet From	Depth set at - feet To	Material and type (Cement grout, bentonite, etc.)
0	53	Bentonite Quick GROUT

71 PUMPING TEST

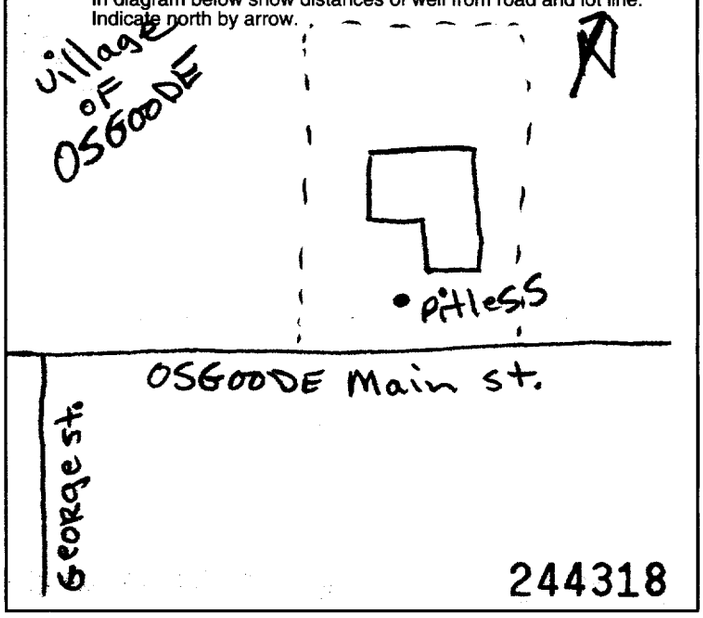
Pumping test method: 1 ☐ Pump 2 ☒ Bailer
Pumping rate: 12 GPM
Duration of pumping: 1 Hours Mins

Static level	Water level end of pumping	Water levels during ☒ Pumping ☐ Recovery			
26 feet	60 feet	15 minutes: 40 feet	30 minutes: 60 feet	45 minutes: 60 feet	60 minutes: 60 feet

If flowing give rate: GPM
Pump intake set at: feet
Water at end of test: ☒ Clear ☐ Cloudy
Recommended pump type: ☐ Shallow ☒ Deep
Recommended pump setting: 70 feet
Recommended pump rate: 10 GPM

LOCATION OF WELL

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



244318

FINAL STATUS OF WELL

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

WATER USE

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

METHOD OF CONSTRUCTION

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

Name of Well Contractor	Well Contractor's Licence No.
B. MOORE WELL DRILLING	6455
Address: Box 436 OSGOODE ON. K0A 2W0	
Name of Well Technician: Bob MOORE	Well Technician's Licence No.: T-0319
Signature of Technician/Contractor: Bob Moore	Submission date: day 9 mo 01 yr 03

MINISTRY USE ONLY

Data source | Contractor: 6455 | Date received: JUN 10 2003
Date of inspection | Inspector
Remarks: CSS.ES3

2 - MINISTRY OF THE ENVIRONMENT COPY

0506 (07/00) Front Form 9

Ontario | Ministry of the Environment

Well Tag A 030765 (…er below)

A030765

Well Record

Regulation 903 Ontario Water Resources Act

page ___ of ___

Instructions for Completing Form

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

Ministry Use Only

MUN	CON	LOT

Well Owner's Information and Location of Well Information

Field	Entry
First Name	Osgoode Youth
Last Name	Centre (City of Ottawa)
Mailing Address (Street Number/Name, RR, Lot, Concession)	5479 Osgoode Main Street
County/District/Municipality	City of Ottawa
Township/City/Town/Village	Osgoode
Province	Ontario
Postal Code	K0A2W0
Telephone Number (include area code)	6135802424 Ext 43229
Address of Well Location (County/District/Municipality)	City of Ottawa
Township	Osgoode
Lot	Plan 393 E Pt Lot 14
Concession	
RR#/Street Number/Name	5479 Osgoode Main Street
City/Town/Village	Osgoode
Site/Compartment/Block/Tract etc.	
GPS Reading NAD	83
Zone	18
Easting	451931
Northing	4999099
Unit Make/Model	Garmin
Mode of Operation	☐ Undifferentiated ☒ Averaged ☐ Differentiated, specify

Log of Overburden and Bedrock Materials (see instructions)

General Colour	Most common material	Other Materials	General Description	Depth Metres From	Depth Metres To
~~Black~~	~~Asphalt~~				
Black	Ashphalt		Hard	0	.15
Brown	Sand		Soft	.15	2.13
Grey	Sand	Gravel Stone	Soft Packed	2.13	14.93
Grey	Limestone	Dolostone	Hard	14.93	64.31
Grey	Sandstone	Dolostone	Hard	64.31	73.46

Hole Diameter

Depth Metres From	Depth Metres To	Diameter Centimetres
0	16.46	25.08
16.46	73.46	15.23

Water Record

Water found at Metres	Kind of Water
65 m	☐ Fresh ☐ Sulphur ☐ Gas ☐ Salty ☐ Minerals ☐ Other:
71 m	☐ Fresh ☐ Sulphur ☐ Gas ☐ Salty ☐ Minerals ☐ Other:
m	☐ Fresh ☐ Sulphur ☐ Gas ☐ Salty ☐ Minerals ☐ Other:

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

Chlorinated ☒ Yes ☐ No

Construction Record

Inside diam centimetres	Material	Wall thickness centimetres	Depth Metres From	Depth Metres To
Casing				
15.88	☒ Steel ☐ Fibreglass ☐ Plastic ☐ Concrete ☐ Galvanized	.48	0	16.46
	☐ Steel ☐ Fibreglass ☐ Plastic ☐ Concrete ☐ Galvanized			
	☐ Steel ☐ Fibreglass ☐ Plastic ☐ Concrete ☐ Galvanized			
Screen (Outside diam)	☐ Steel ☐ Fibreglass ☐ Plastic ☐ Concrete ☐ Galvanized	Slot No.		
No Casing or Screen	☒ Open hole		16.46	73.46

Test of Well Yield

Item	Entry
Pumping test method	Submersible
Pump intake set at - (metres)	45.7
Pumping rate - (litres/min)	91
Duration of pumping	1 hrs + 0 min
Final water level end of pumping	8.03 metres
Recommended pump type	☐ Shallow ☒ Deep
Recommended pump depth	45 metres
Recommended pump rate (litres/min)	91
If flowing give rate - (litres/min)	
If pumping discontinued, give reason	

Draw Down Time min	Draw Down Water Level Metres	Recovery Time min	Recovery Water Level Metres
Static Level	7.48		8.03
1	7.78	1	7.74
2	7.84	2	7.65
3	7.88	3	7.70
4	7.9	4	7.59
5	7.92	5	7.57
10	7.96	10	7.53
15		15	7.50
20	7.98	20	7.48
25	8.00	25	
30	8.01	30	
40	8.01	40	
50	8.02	50	
60	8.03	60	

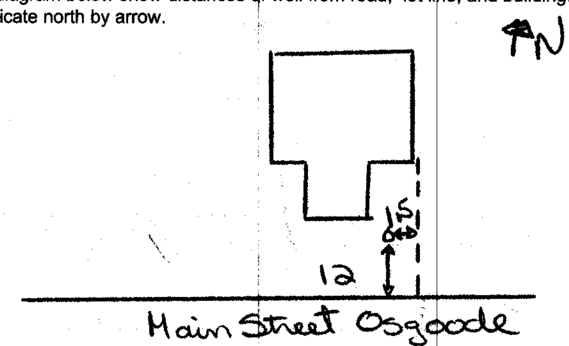
Plugging and Sealing Record

☒ Annular space ☐ Abandonment

Depth set at - Metres From	To	Material and type (bentonite slurry, neat cement slurry) etc.	Volume Placed (cubic metres)
16.46	0	Bentonite Pressure Grouted	1.30

Location of Well

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



Method of Construction

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

Water Use

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

Final Status of Well

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

Audit No. Z 33210

Date Well Completed (YYYY MM DD): 2005 11 29

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

Date Delivered (YYYY MM DD): 2005 12 15

Well Contractor/Technician Information

Field	Entry
Name of Well Contractor	Splash Well Drilling
Well Contractor's Licence No.	4877
Business Address (street name, number, city etc.)	P.O. BOX 1083, Prescott
Name of Well Technician (last name, first name)	Ferguson, Todd
Well Technician's Licence No.	T478
Signature of Technician/Contractor	x [signature]
Date Submitted (YYYY MM DD)	2005 12 20

Ministry Use Only

Field	Entry
Data Source	
Contractor	4877
Date Received	MAR 15 2006
Date of Inspection	
Remarks	
Well Record Number	

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

Ontario — Ministry of the Environment

Measurements recorded in: [x] Metric [ ] Imperial

Well (Print Below): A 071208 / A071208

Well Record

Regulation 903 Ontario Water Resources Act

Page ____ of ____

Well Owner's Information

[redacted]

5502 Osgoode Main — County/District/Municipality: Ottawa

Osgoode — City/Town/Village: Osgoode

23 — 1

Province: Ontario — Postal Code: K0A 2W0

UTM Coordinates: NAD 83 | Zone 18 | Easting 452037 | Northing 4991220

Municipal Plan and Sublot Number:

Other:

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

General Colour	Most Common Material	Other Materials	General Description	Depth (m/ft) From	Depth (m/ft) To
Brown	Sand		Hard	0	2.5
Yellow	Course Sand		Soft	2.5	9.7
Grey	clay		Soft	9.7	13.5
Grey	gravel/		packed	13.5	14.9
Grey	limestone		layered	14.9	24.3

Annular Space

Depth Set at (m/ft) From	To	Type of Sealant Used (Material and Type)	Volume Placed (m³/ft³)
0	6	Ciment grout	4 Bag

Method of Construction

[ ] Cable Tool [ ] Diamond
[ ] Rotary (Conventional) [ ] Jetting
[ ] Rotary (Reverse) [ ] Driving
[ ] Boring [ ] Digging
[ ] Air percussion
[ ] Other, specify

Well Use

[ ] Public [ ] Commercial [ ] Not used
[x] Domestic [ ] Municipal [ ] Dewatering
[ ] Livestock [ ] Test Hole [ ] Monitoring
[ ] Irrigation [ ] Cooling & Air Conditioning
[ ] Industrial
[ ] Other, specify

Construction Record - Casing

Inside Diameter (cm/in)	Open Hole OR Material (Galvanized, Fibreglass, Concrete, Plastic, Steel)	Wall Thickness (cm/in)	Depth (m/ft) From	Depth (m/ft) To
1555	Steel	.48	+.60	14.9
1555	Open Hole		14.9	24.3

Construction Record - Screen

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

Status of Well

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

Water Details

Water found at Depth (m/ft)	Kind of Water	Gas	Other, specify
20	[x] Fresh [ ] Untested	[ ]	
	[ ] Fresh [ ] Untested	[ ]	
	[ ] Fresh [ ] Untested	[ ]	

Hole Diameter

Depth (m/ft) From	To	Diameter (cm/in)
0	6	21.23
6	24.3	15.55

Results of Well Yield Testing

After test of well yield, water was:
[x] Clear and sand free
[ ] Other, specify

If pumping discontinued, give reason:

Pump intake set at (m/ft): 19

Pumping rate (l/min / GPM): 56

Duration of pumping: 1 hrs + ____ min

Final water level end of pumping (m/ft): 8.51

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

Recommended pump depth (m/ft): 19

Recommended pump rate (l/min / GPM): 56

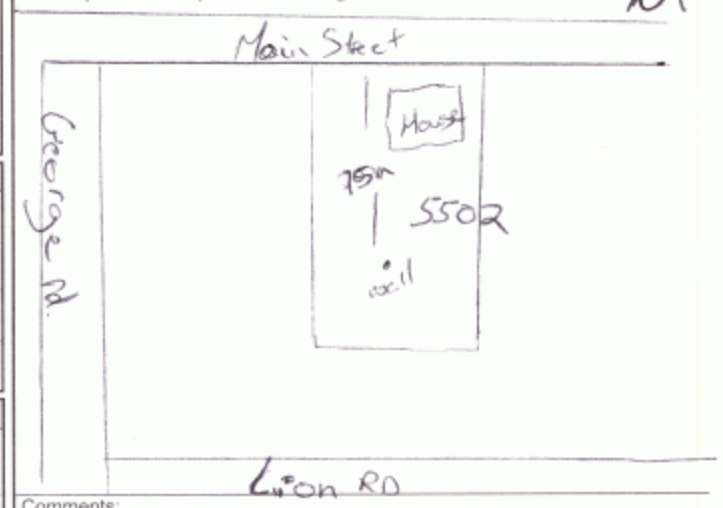
Well production (l/min / GPM): 80

Disinfected? [x] Yes [ ] No

Draw Down Time (min)	Draw Down Water Level (m/ft)	Recovery Time (min)	Recovery Water Level (m/ft)
Static Level	7.80		8.51
1	8.m	1	8.08
2	8.07	2	7.94
3	8.19	3	7.83
4	8.25	4	7.81
5	8.30	5	7.80
10	8.41	10	
15	8.47	15	
20	8.47	20	
25	8.47	25	
30	8.48	30	
40	8.48	40	
50	8.50	50	
60	8.51	60	

Map of Well Location

Please provide a map below following instructions on the back. NA



Comments:

Well Contractor and Well Technician Information

Business Name of Well Contractor: Bourgeois well Drilling

Well Contractor's Licence No.:

Business Address (Street Number/Name): 1178 Route 900 East

Municipality: Nation

Province: Ontario — Postal Code: K0A3C0 — Business E-mail Address: NA

Bus. Telephone No. (inc. area code): 6139875291

Name of Well Technician (Last Name, First Name): Michael Genier

Well Technician's Licence No.: 3493

Signature of Technician and/or Contractor:

Date Submitted: 2009 02 20

Well owner's information package delivered: [ ] Yes [x] No

Date Package Delivered: ____

Date Work Completed: 2009 02 17

Ministry Use Only

Audit No. Z 90541

Received MAY 6 2009

0506E (12/2007)

Ministry's Copy

Ontario — Ministry of the Environment

1

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

A 093967 A093967

Master Well Record for Cluster Well Construction

Regulation 903 Ontario Water Resources Act

2010 Page 1 of 3

[redacted]

Address of Well Location (Street Number/Name, RR): 5473 main st

Township:

Lot:

Concession:

County/District/Municipality:

City/Town/Village: Osgoode

Province: Ontario

Postal Code:

UTM Coordinates: NAD 83 | Zone 18 | Easting 451891 | Northing 4999099

GPS Unit Make: Garmin

Model: Etrex

Mode of Operation: ☐ Undifferentiated ☑ Averaged ☐ Differentiated, specify

Overburden and Bedrock Materials *(see instructions on the back of this form)*

General Colour	Most Common Material	Other Materials	General Description	Depth (Metres) From	To
Blk	Top Soil		soft, dry	0	.31
Brn	medium Sand		soft, dry	.31	1.5
Brn	medium Sand		soft, Saturated	1.5	2.9

Hole Details

Depth (Metres) From	To	Diameter (Centimetres)
0	2.9	8.25

Water Use

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

Method of Construction

☐ Cable Tool ☐ Air Percussion ☐ Digging
☐ Rotary (Conventional) ☐ Diamond ☐ Boring
☐ Rotary (Reverse) ☐ Jetting ☑ Other, specify
☐ Rotary (Air) ☐ Driving Direct Push

Status of Well

☑ Test Hole ☐ Abandoned, Insufficient Supply
☐ Replacement Well ☐ Abandoned, Poor Water Quality
☐ Dewatering Well ☑ Other, specify monitoring
☐ Alteration (Construction) ☐ Abandoned, other, specify

Construction Details

Inside Diameter (Centimetres)	Material (steel, plastic, fibreglass, concrete, galvanized)	Wall Thickness	Depth (Metres) From	To
4.03	PVC Riser	.368	0	1.35
	PVC Screen		1.35	2.9

No Casing and Screen Used

Open Hole ☐ Yes ☐ No

Static Water Level Test

[ ][ ] Metres

Screen

☐ Galvanized ☐ Steel ☐ Fibreglass ☐ Concrete ☑ Plastic

Outside Diameter (Centimetres): 4.82

Slot No.: 10

Annular Space/Abandonment Sealing Record

Depth Set at (Metres) From	To	Type of Sealant Used (Material and Type)	Volume Used (Cubic Metres)
0	1.22	Bensal	
1.22	2.9	Sand	

Water Details

Water found at Depth		Kind of Water
[ ][ ] Metres	☐ Gas	☐ Fresh ☐ Salty ☐ Sulphur ☐ Minerals
[ ][ ] Metres	☐ Gas	☐ Fresh ☐ Salty ☐ Sulphur ☐ Minerals
[ ][ ] Metres	☐ Gas	☐ Fresh ☐ Salty ☐ Sulphur ☐ Minerals

Disinfected ☐ Yes ☐ No If no, provide reason:

Date Master Well Completed (yyyy/mm/dd): 2009/12/18

Cluster Information *(Please also fill out the additional Cluster Well Information for Well Construction for each parcel of land and cluster.)*

Total Wells in Cluster: 4

Please indicate Number of Cluster Well Information Log Sheets Submitted: 1

Total Wells on this Property: 4

Location of Well Cluster

Detailed Map must be provided as an attachment no larger than legal size (8.5" x 14"). Sketches are not allowed.

☑ Check box to confirm detailed map is provided as per Section 11.1 (3)

Consent to release additional information concerning the cluster to the Director upon request

[redacted]

Well Contractor and Well Technician Information

Business Name of Well Contractor: Strata Soil Sampling

Well Contractor's Licence No.: 7241

Business Address (Street No./Name, number, RR): #2-147 West Beaver Creek

Municipality: Richmond Hill

Province: ON

Postal Code: L4B 1C6

Business E-mail Address: wtrecords@stratasoil.com

Business Telephone No. (inc. area code): (905) 764-9300

Name of Well Technician (Last Name, First Name): Muir, Mike

Well Technician's Licence No.: 3443

Signature of Technician:

Date Submitted (yyyy/mm/dd): 2009/12/31

Ministry Use Only

Audit No.: M 05276

Well Contractor No.:

Date Received (yyyy/mm/dd): JAN 21 2010

Date of Inspection (yyyy/mm/dd):

Remarks:

1992 (11/2006)

BB. 1792

Ministry's Copy

Ontario Ministry of the Environment

A 093967 (Print Well Tag No.) A093967

Cluster Well Information for Cluster Well Construction

Regulation 903 Ontario Water Resources Act

7014

[redacted]

Address of Well Location (Street Number/Name, RR): 5473 main st

Lot | Concession | Township | County/District/Municipality

City/Town/Village: Osgoode | Province: Ontario | Postal Code | GPS Unit Make: Garmin | Model: Etrex

Unit Mode of Operation: ☐ Undifferentiated ☑ Averaged ☐ Differentiated, specify:

Signature of Technician/Contractor | Date (yyyy/mm/dd)

Well # on Sketch	UTM Coordinates Zone	Easting	Northing	Full Depth of Hole (metres)	Hole Diameter (cm)	Method of Construction	Casing Material	Casing Length (metres)	Screen Interval (metres) From	To	Annular Space Sealant Used	Static Water Level (metres)	Abandonment Sealant Used	Comments	Date of Completion (yyyy/mm/dd)
2	18	451891	4999094	2.9	8.25	Direct push	PVC	1.35	1.35	2.9	Bensea1				2009/12/18
3	18	451888	4999090	2.9	8.25	"	"	1.35	1.35	2.9	"				"
4	18	451890	4999083	2.9	8.25	"	"	1.35	1.35	2.9	"				"

Well Contractor and Well Technician Information

Business Name of Well Contractor: Strata Soil Sampling | Business Address (Street Number/Name, RR): #2-141 West Beaver Creek | Municipality: Richmond Hill | Province: ON

Postal Code: L4B 1C6 | Business Telephone No. (inc. area code): (905) 764-9304 | Well Contractor's Licence No.: 7241 | Business E-mail Address: wrecords@stratasoil.com

Name of Well Technician (First Name, Last Name): Muir, Mike | Well Technician's Licence No.: 3448 | Date Submitted (yyyy/mm/dd): 2009/12/31 | Signature of Technician

BB, 1794

Date 1st Well in Cluster Constructed (yyyy/mm/dd): 2009/12/18 | Date Last Well in Cluster Constructed (yyyy/mm/dd): 2009/12/18

Ministry Use Only

Date Received (yyyy/mm/dd): JAN 21 2010 | Date Inspected (yyyy/mm/dd)

Audit No.: C06498 | Remarks: MOE 276

1991 (11/2006)

Ministry's Copy

pg 3 of 3

7014

T:\Autocad\Drawings\Project Drawings\2009\1056585 (122110243)\1056585-2.dwg PRINTED: Dec 02, 2009

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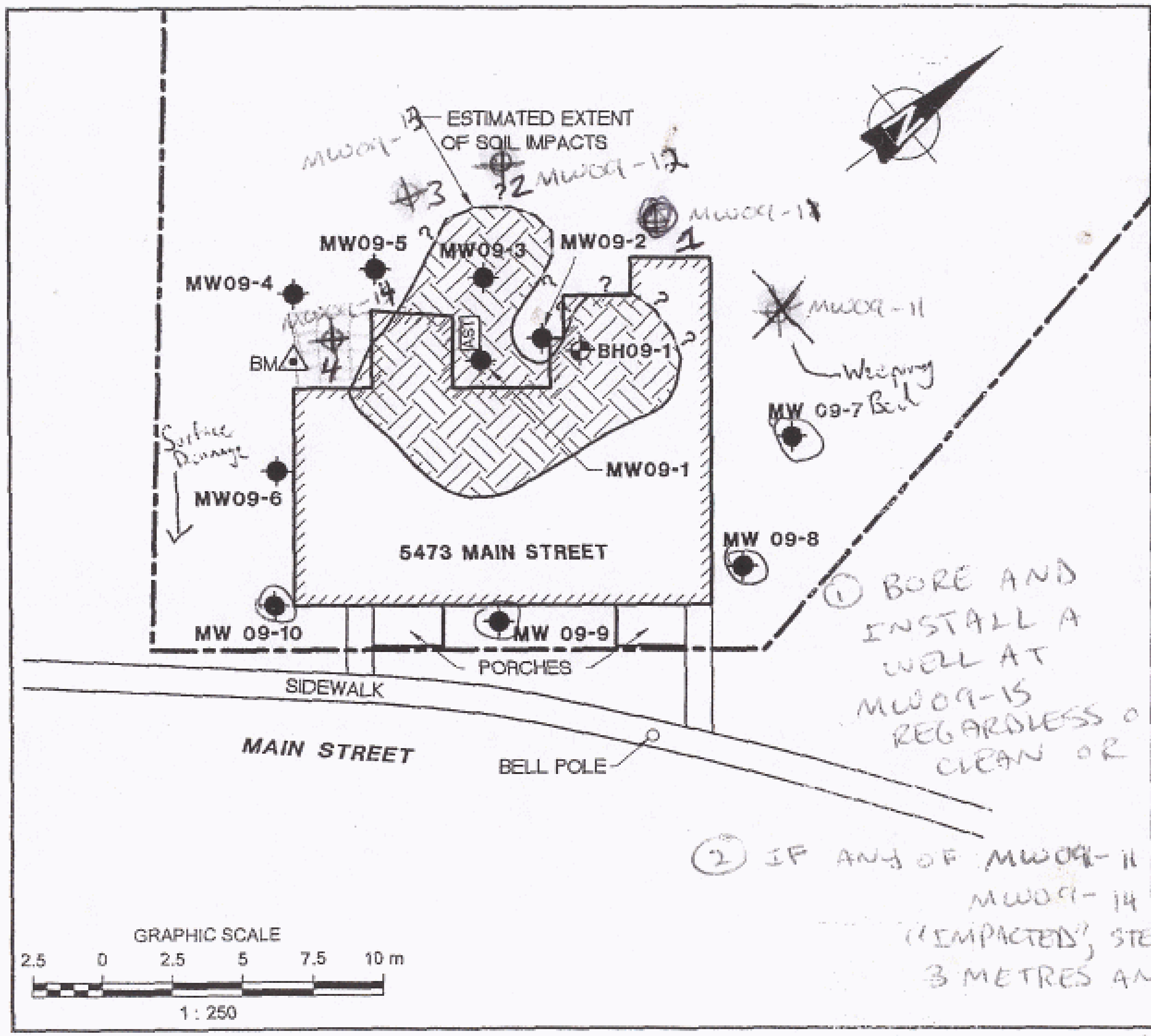
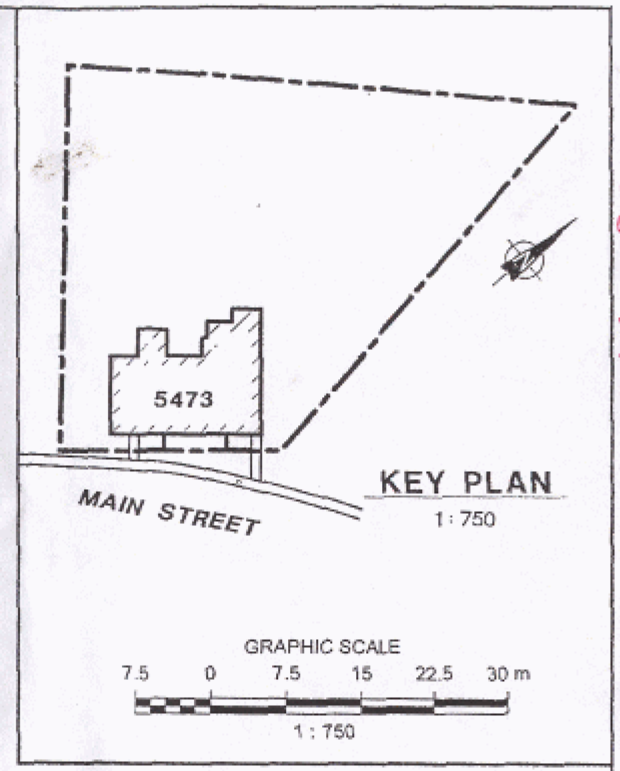


① BORE AND INSTALL A WELL AT MW09-15 REGARDLESS OF CLEAN OR DIRTY CONDITIONS

② IF ANY OF MW09-11 TO MW09-14 SEEM "IMPACTED", STEP OUT 3 METRES AND RE-BORE.

ONLY INSTALL WELL IN "CLEAN" BOREHOLES



C-7241 MOS276 C06498

JAN 21 2010

LEGEND:

- PROPERTY BOUNDARY
- MONITORING WELL
- BOREHOLE
- BM BENCHMARK (TOP OF RESIDENTIAL WELL) ASSUMED EL.= 100m
- AST ABOVEGROUND STORAGE TANK

NOTE: THIS DRAWING ILLUSTRATES SUPPORTING INFORMATION SPECIFIC TO A STANTEC CONSULTING LTD. REPORT AND MUST NOT BE USED FOR OTHER PURPOSES.

ESTIMATED EXTENT OF SOIL IMPACTS (NOV. 19, 2009)

PHASE II ENVIRONMENTAL SITE ASSESSMENT
5473 MAIN STREET, OSGOODE, ONTARIO

Client: CHERRIE GRIFFITH

Job No.:	1056585
Scale:	AS SHOWN
Date:	09/12/02
Dwn. By:	MT/GBB
App'd By:	SKR
Dwg. No.:	5

Stantec

Ontario — Ministry of the Environment

Well Tag No. *(Place Sticker and/or Print Below)* Abandonment A064328

Well Record

Regulation 903 Ontario Water Resources Act

Measurements recorded in: ☑ Metric ☐ Imperial

Page 1 of 1

[redacted]

Well Location

Address of Well Location (Street Number/Name)	Township	Lot	Concession
5502 Main Street	National Capital Region		

County/District/Municipality	City/Town/Village	Province	Postal Code
Ottawa Carleton	Osgoode	Ontario	

UTM Coordinates	Zone	Easting	Northing	Municipal Plan and Sublot Number	Other
NAD 83	18	452034	4999149		

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

General Colour	Most Common Material	Other Materials	General Description	Depth (m/ft) From	Depth (m/ft) To
brown			Sand	0	3.4
		well tag is enlosed			
			A total of 7 wells were decommissioned		

Annular Space

Depth Set at (m/ft) From	To	Type of Sealant Used (Material and Type)	Volume Placed (m³/ft³)
0	0.05	topsoil	
0.05	0.15	hole plug	
0.15	3.40	bentonite, cement, grout	15 litres

Method of Construction

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

Well Use

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

Construction Record - Casing

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

Construction Record - Screen

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

Status of Well

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

Water Details

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

Hole Diameter

Depth (m/ft) From	To	Diameter (cm/in)
0	3.4	5.7

Results of Well Yield Testing

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

If pumping discontinued, give reason:

Pump intake set at (m/ft)

Pumping rate (l/min / GPM)

Duration of pumping ____ hrs + ____ min

Final water level end of pumping (m/ft)

If flowing give rate (l/min / GPM)

Recommended pump depth (m/ft)

Recommended pump rate (l/min / GPM)

Well production (l/min / GPM)

Disinfected? ☐ Yes ☐ No

	Draw Down Time (min)	Draw Down Water Level (m/ft)	Recovery Time (min)	Recovery Water Level (m/ft)
Static Level				
1			1	
2			2	
3			3	
4			4	
5			5	
10			10	
15			15	
20			20	
25			25	
30			30	
40			40	
50			50	
60			60	

Map of Well Location

Please provide a map below following instructions on the back.

Site plan and area map are enclosed.

Comments:

Well Contractor and Well Technician Information

Business Name of Well Contractor	Well Contractor's Licence No.
OGS INC	6964

Business Address (Street Number/Name)	Municipality
5518 Appleton Side Road	Almonte

Province	Postal Code	Business E-mail Address
Ontario	K0A 1A0	ogsinc@bellnet.ca

Bus. Telephone No. (inc. area code)	Name of Well Technician (Last Name, First Name)
6132567666	Echlin, Chad

Well Technician's Licence No.	Signature of Technician and/or Contractor	Date Submitted
3299		2010 12 16

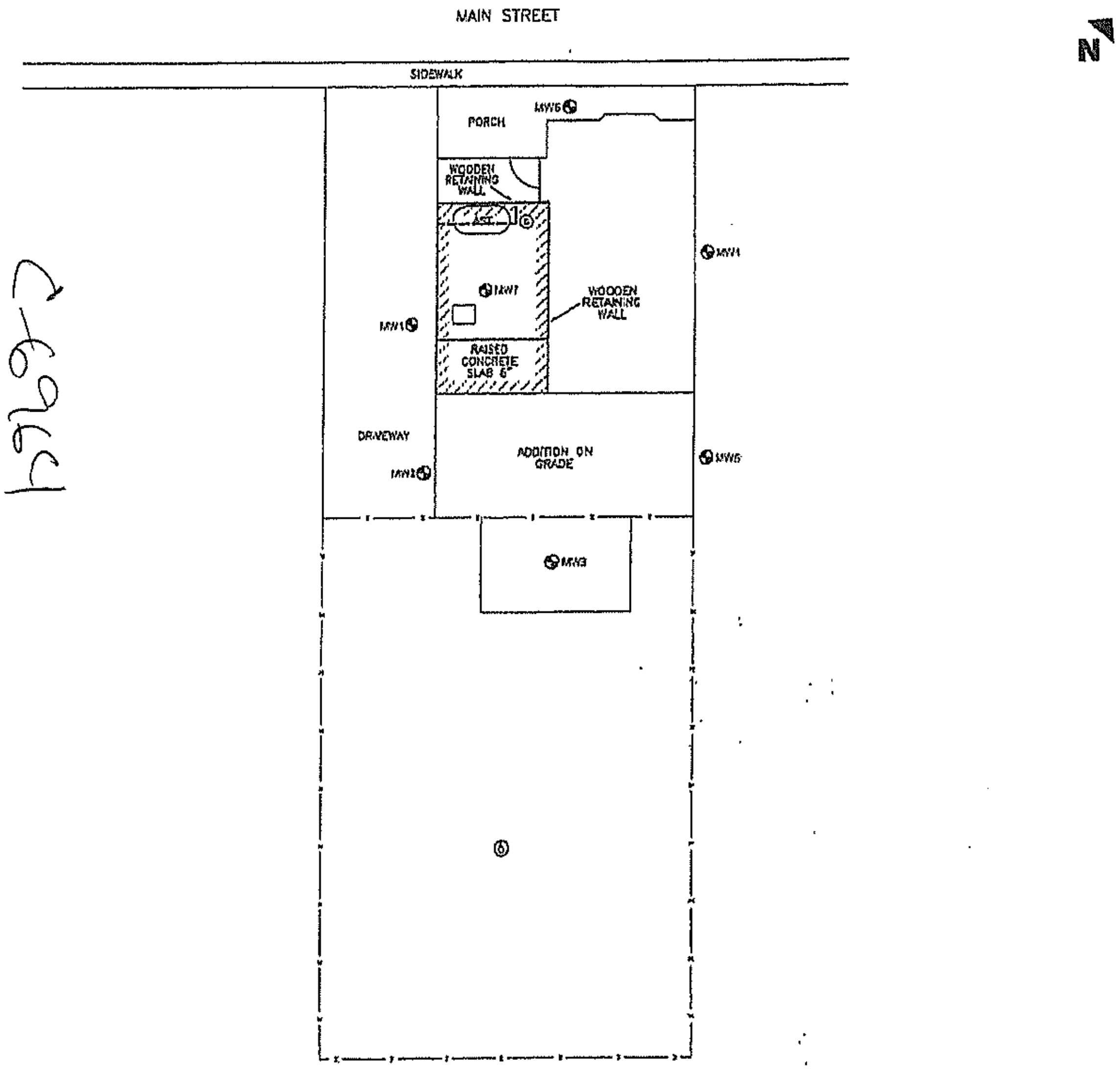
Well owner's information package delivered	Date Package Delivered	Date Work Completed
☐ Yes ☐ No		2010 12 10

Ministry Use Only

Audit No. Z 107037

JAN 05 2011

5502 Main St. Osgoode



C-6964
Z107037

JAN 05 2011

THIS DRAWING IS FOR CONCEPTUAL PURPOSES ONLY. ACTUAL LOCATIONS MAY VARY AND NOT ALL STRUCTURES ARE SHOWN.

NOTES
DRAWING COMPILED FROM SITE RECONNAISSANCE INFORMATION.

LEGEND
- BOREHOLE LOCATION COMPLETED AS A MONITORING WELL
- DRINKING WATER WELL
- BASEMENT
- SUMP PIT

ECONOMICAL INSURANCE
5502 MAIN STREET
OSGOODE, ON

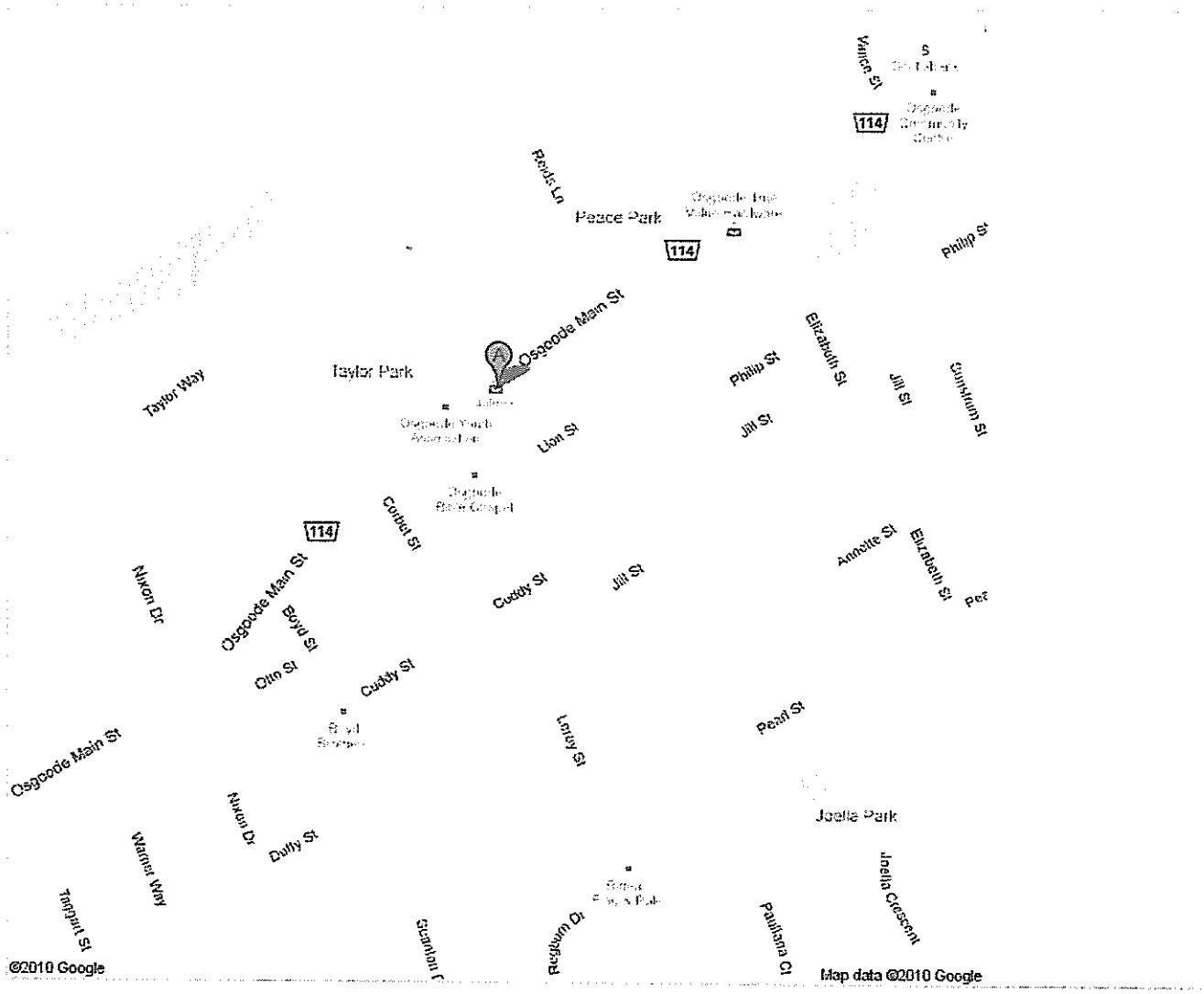
Report: OIL SPILL INVESTIGATION AND REMEDIATION

Drawing: SITE PLAN

Date	May 11, 2010	Scale	NTS	Drawing No. 2
File Name	9_116-10049-00-A1-2	Project No.	116.10049.00000	

SLR

Google maps Address 5502 Osgoode Main St
Ottawa, ON K0A



C-6964
2107037

JAN 0 5 2011

Ontario Ministry of the Environment

Measurements recorded in: ☒ Metric ☐ Imperial

Well Tag No. (Place Sticker and/or Print Below): **A117467**

Well Record

Regulation 903 Ontario Water Resources Act

[redacted]

Address of Well Location (Street Number/Name)	Township	Lot	Concession
5531 LOMBARDY DRIVE	OSGOODE	27	1

County/District/Municipality	City/Town/Village	Province	Postal Code
OTTAWA	OSGOODE	Ontario	K0A2W0

UTM Coordinates	Zone	Easting	Northing	Municipal Plan and Sublot Number	Other
NAD 83	18	451980	4999463	PLAN 4M-830 Sublot RP-4R-14828	

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

General Colour	Most Common Material	Other Materials	General Description	Depth (m/ft) From	To
GREY	SAND/SILT	FILL		0.00	1.83
GREY	CLAY			1.83	6.41
GREY	TILL	SAND/GRAVEL/BOULDERS		6.41	14.85
GREY	LIMESTONE	SHALE		14.85	21.96 (72')

Annular Space

Depth Set at (m/ft) From	To	Type of Sealant Used (Material and Type)	Volume Placed (m³/ft³)
0.00	16.47	Bentonite grout.	0.44

Method of Construction

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

Well Use

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

Construction Record - Casing

Inside Diameter (cm/in)	Open Hole OR Material (Galvanized, Fibreglass, Concrete, Plastic, Steel)	Wall Thickness (cm/in)	Depth (m/ft) From	To
15.88	Steel A589	0.48	+0.61	16.47

Construction Record - Screen

N/A.

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

Status of Well

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

Water Details

Water found at Depth: 19.5 (m/ft) ☐ Gas — Kind of Water: ☐ Fresh ☒ Untested ☐ Other, specify

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

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

Hole Diameter

Depth (m/ft) From	To	Diameter (cm/in)
16.47	21.96	15.24

Results of Well Yield Testing

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

If pumping discontinued, give reason: N/A.

Pump intake set at (m/ft): 12.2m (40')

Pumping rate (l/min / GPM): 45lpm (10gpm)

Duration of pumping: 1 hrs + 0 min

Final water level end of pumping (m/ft): 5.77m (18.9')

If flowing give rate (l/min / GPM): N/A.

Recommended pump depth (m/ft): 12.2m (40')

Recommended pump rate (l/min / GPM): 45lpm (10gpm)

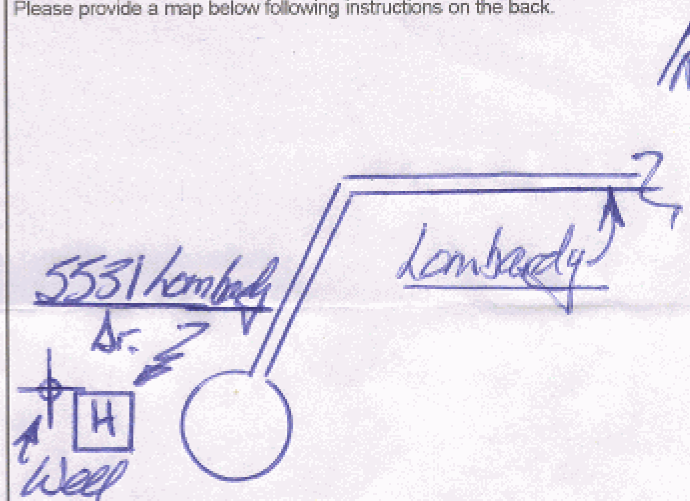
Well production (l/min / GPM): 7 130lpm (>30gpm)

Disinfected? ☒ Yes ☐ No

Draw Down Time (min)	Water Level (m/ft)	Recovery Time (min)	Water Level (m/ft)
Static Level	4.18		
1	4.90	1	4.77
2	5.03	2	4.71
3	5.07	3	4.68
4	5.11	4	4.64
5	5.13	5	4.62
10	5.27	10	4.54
15	5.35	15	4.47
20	5.43	20	4.39
25	5.51	25	4.31
30	5.57	30	4.30
40	5.65	40	4.28
50	5.74	50	4.27
60	5.77	60	4.26

Map of Well Location

Please provide a map below following instructions on the back.



Comments:

Well Contractor and Well Technician Information

Business Name of Well Contractor	Well Contractor's Licence No.
STANTON DRILLING INC	4875

Business Address (Street Number/Name)	Municipality
BOX 219, 157 FINE ARCHES DR	PAKENHAM

Province	Postal Code	Business E-mail Address
ON	K0A 2X0	stanton.drilling@bell.net

Bus. Telephone No. (inc. area code)	Name of Well Technician (Last Name, First Name)
(613)624-5622	STANTON, PETER

Well Technician's Licence No.	Signature of Technician and/or Contractor	Date Submitted
0086	[signature]	2011 09 28

Well owner's information package delivered	Date Package Delivered	Date Work Completed
☒ Yes ☐ No	2011 09 21	2011 09 21

Ministry Use Only

Audit No. Z133002

Received OCT 04 2011

Ministry's Copy

Ontario — Ministry of the Environment

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

Well Record

...n 903 Ontario Water Resources Act

[redacted]

Well Location

Address of Well Location (Street Number/Name)	Township	Lot	Concession
3243 Robert Dowd Road	Osgoode	29	1

County/District/Municipality	City/Town/Village	Province	Postal Code
Ottawa Carleton	Osgoode	Ontario	

UTM Coordinates	Zone	Easting	Northing	Municipal Plan and Sublot Number	Other
NAD 83	18	452190	4999169		

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

General Colour	Most Common Material	Other Materials	General Description	Depth (m/ft) From	Depth (m/ft) To
Brown	Sand			0	1.21
Red	Sand			1.21	3.65
Grey	Sand			3.65	7.61
Grey	Clay	Stones		7.61	16.15
Grey	Limestone			16.15	57.90
Grey & White	Sandstone			57.90	83.20

Annular Space

Depth Set at (m/ft) From	To	Type of Sealant Used (Material and Type)	Volume Placed (m^3/ft^3)
17.67	0	Grouted Bentonite Slurry	.46m^3

Method of Construction

- ☐ Cable Tool
- ☒ Rotary (Conventional) Mud
- ☐ Rotary (Reverse)
- ☐ Boring
- ☒ Air percussion
- ☐ Other, *specify*
- ☐ Diamond
- ☐ Jetting
- ☐ Driving
- ☐ Digging

Well Use

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

Construction Record - Casing

Inside Diameter (cm/in)	Open Hole OR Material (Galvanized, Fibreglass, Concrete, Plastic, Steel)	Wall Thickness (cm/in)	Depth (m/ft) From	Depth (m/ft) To
15.86	Steel	.48	+.45	17.67

Construction Record - Screen

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

Status of Well

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

Water Details

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

Hole Diameter

Depth (m/ft) From	To	Diameter (cm/in)
0	17.67	15.86
17.67	83.20	15.23

Results of Well Yield Testing

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

If pumping discontinued, give reason:

Pump intake set at (m/ft): 60.95

Pumping rate (l/min / GPM): 22.75

Duration of pumping: 1 hrs + ____ min

Final water level end of pumping (m/ft): 37.06

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

Recommended pump depth (m/ft): 45.71

Recommended pump rate (l/min / GPM): 22.75

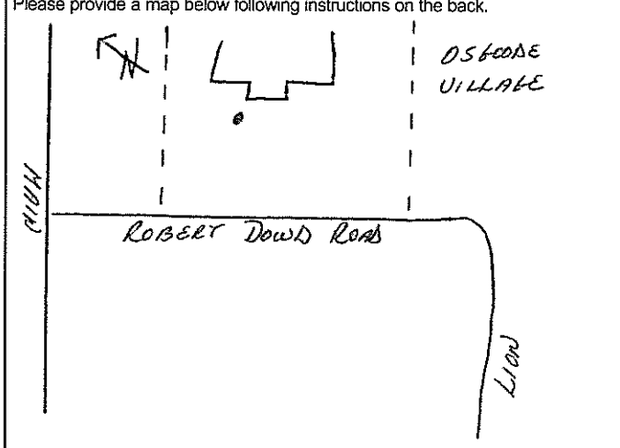
Well production (l/min / GPM):

Disinfected? ☒ Yes ☐ No

	Draw Down Time (min)	Draw Down Water Level (m/ft)	Recovery Time (min)	Recovery Water Level (m/ft)
Static Level		8.45		
1	1	8.86	1	35.31
2	2	9.95	2	34.54
3	3	11.15	3	33.70
4	4	11.96	4	32.95
5	5	12.82	5	32.10
10	10	16.17	10	28.67
15	15	19.40	15	
20	20	22.15	20	
25	25	24.70	25	
30	30	26.95	30	
40	40	31.50	40	
50	50	35.05	50	
60	60	37.06	60	

Map of Well Location

Please provide a map below following instructions on the back.



Comments:

Well Contractor and Well Technician Information

Business Name of Well Contractor	Well Contractor's Licence No.
Capital Water Supply Ltd.	1558

Business Address (Street Number/Name)	Municipality
Box 490	Stittsville

Province	Postal Code	Business E-mail Address
Ontario	K2S1A6	office@capitalwater.ca

Bus. Telephone No. (inc. area code)	Name of Well Technician (Last Name, First Name)
6138361766	Miller, Stephen

Well Technician's Licence No.	Signature of Technician and/or Contractor	Date Submitted
0097	[signature]	2011/10/28

Well owner's information package delivered	Date Package Delivered	Date Work Completed
☒ Yes ☐ No	2011/10/27	2011/10/26

Ministry Use Only

Audit No. Z139714

Received FEB 09 2012

  Ministry Copy

Ontario — Ministry of the Environment

Measurements recorded in: [X] Metric [ ] Imperial

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

A165032

Tag #: A165032

Well Record

Regulation 903 Ontario Water Resources Act

Page _____ of _____

[redacted]

Address of Well Location (Street Number/Name)	Township	Lot	Concession
5537 Lombardy Street	Osgoode		

County/District/Municipality	City/Town/Village	Province	Postal Code
Ottawa Carleton	Osgoode	Ontario	

UTM Coordinates	Zone	Easting	Northing	Municipal Plan and Sublot Number	Other
NAD 83	18	451992	4999614		

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

General Colour	Most Common Material	Other Materials	General Description	Depth (m/ft) From	Depth (m/ft) To
Brown	Soil	Stones		0	3.35
Grey	Sandy Soil	Boulders	Loose	3.35	7.61
Grey	Till	Large Boulders	Packed	7.61	14.32
Grey	Limestone		Medium	14.32	54.86
Grey & White	Sandstone		Hard	54.86	75.58

Annular Space

Depth Set at (m/ft) From	To	Type of Sealant Used (Material and Type)	Volume Placed (m^3/ft^3)
15.84	0	Grouted Bentonite Slurry	.504m3

Method of Construction

[ ] Cable Tool
[X] Rotary (Conventional) Mud
[ ] Rotary (Reverse)
[ ] Boring
[X] Air percussion
[ ] Other, *specify*
[ ] Diamond
[ ] Jetting
[ ] Driving
[ ] Digging

Well Use

[ ] Public
[X] Domestic
[ ] Livestock
[ ] Irrigation
[ ] Industrial
[ ] Other, *specify*
[ ] Commercial
[ ] Municipal
[ ] Test Hole
[ ] Cooling & Air Conditioning
[ ] Not used
[ ] Dewatering
[ ] Monitoring

Construction Record - Casing

Inside Diameter (cm/in)	Open Hole OR Material (Galvanized, Fibreglass, Concrete, Plastic, Steel)	Wall Thickness (cm/in)	Depth (m/ft) From	Depth (m/ft) To
27.13	Open		0	15.84
15.86	Steel	.48	+.45	15.84

Construction Record - Screen

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

Status of Well

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

Results of Well Yield Testing

After test of well yield, water was:
[X] Clear and sand free
[ ] Other, *specify*

If pumping discontinued, give reason:

Pump intake set at (m/ft): 30.47

Pumping rate (l/min / GPM): 54.5

Duration of pumping: 1 hrs + _____ min

Final water level end of pumping (m/ft): 8.19

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

Recommended pump depth (m/ft): 22.85

Recommended pump rate (l/min / GPM): 45.5

Well production (l/min / GPM):

Disinfected? [X] Yes [ ] No

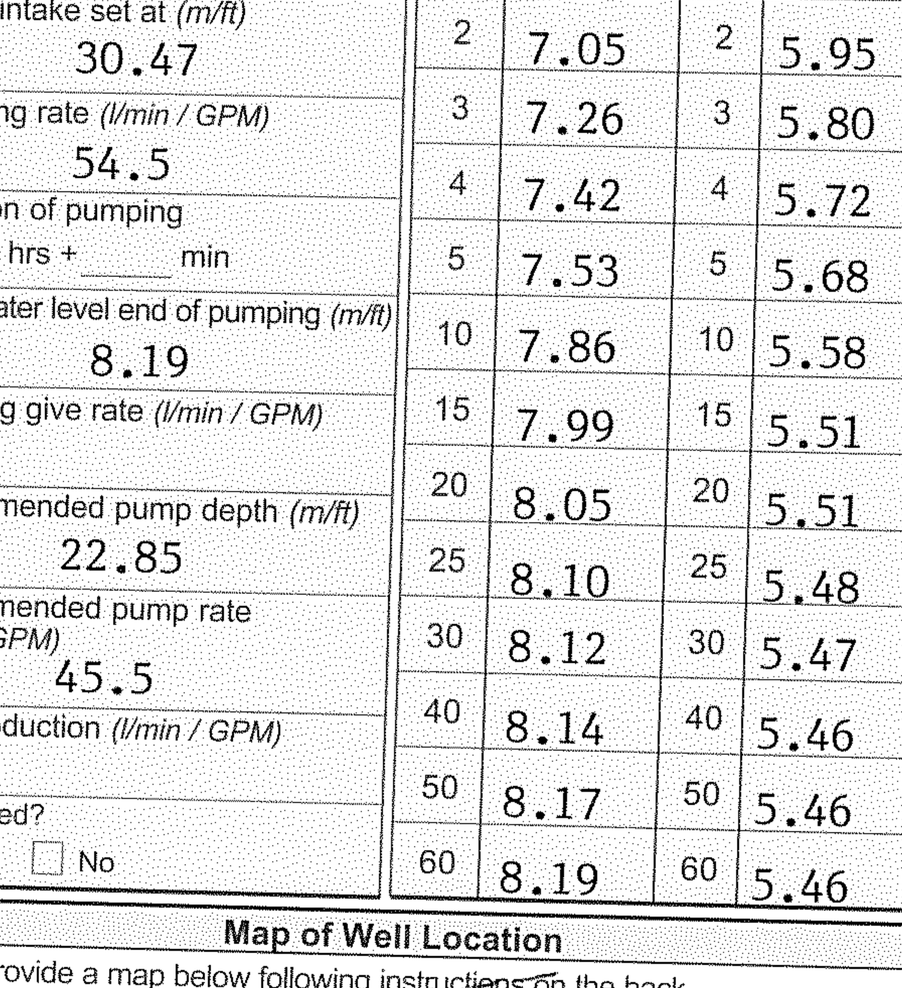
Draw Down Time (min)	Draw Down Water Level (m/ft)	Recovery Time (min)	Recovery Water Level (m/ft)
Static Level	5.46		
1	6.52	1	6.49
2	7.05	2	5.95
3	7.26	3	5.80
4	7.42	4	5.72
5	7.53	5	5.68
10	7.86	10	5.58
15	7.99	15	5.51
20	8.05	20	5.51
25	8.10	25	5.48
30	8.12	30	5.47
40	8.14	40	5.46
50	8.17	50	5.46
60	8.19	60	5.46

Water Details

Water found at Depth	Kind of Water	Hole Diameter Depth (m/ft) From	Depth (m/ft) To	Diameter (cm/in)
71.62 (m/ft) [ ] Gas	[ ] Fresh [X] Untested [ ] Other, *specify*	0	15.84	15.86
(m/ft) [ ] Gas	Kind of Water: [ ] Fresh [ ] Untested [ ] Other, *specify*	15.84	75.58	14.91
(m/ft) [ ] Gas	Kind of Water: [ ] Fresh [ ] Untested [ ] Other, *specify*			

Map of Well Location

Please provide a map below following instructions on the back.



Comments:

Well Contractor and Well Technician Information

Business Name of Well Contractor	Well Contractor's Licence No.
Capital Water Supply Ltd.	1558

Business Address (Street Number/Name)	Municipality
Box 490	Stittsville

Province	Postal Code	Business E-mail Address
Ontario	K2S1A6	office@capitalwater.ca

Bus. Telephone No. (inc. area code)	Name of Well Technician (Last Name, First Name)
6138361766	Miller, Stephen

Well Technician's Licence No.	Signature of Technician and/or Contractor	Date Submitted
0097		20160322

Well owner's information package delivered	Date Package Delivered	Date Work Completed
[X] Yes [ ] No	20160310	20160309

Ministry Use Only

Audit No. Z188416

AUG 29 2016 Received

0506E (2007/12)

Ministry's Copy

Ontario — Ministry of the Environment

Measurements recorded in: ☐ Metric ☒ Imperial

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

Tag #: A169050

Well Record

Regulation 903 Ontario Water Resources Act

Page ____ of ____

Well Owner's Information

First Name	Last Name / Organization	E-mail Address	☐ Well Constructed by Well Owner
	Baresite Construction		

Mailing Address (Street Number/Name)	Municipality	Province	Postal Code	Telephone No. (inc. area code)
2354 Summerside Drive	Manotick	ON	K4M1B4	6133715171

Well Location

Address of Well Location (Street Number/Name)	Township	Lot	Concession
5538 Lombardy Drive	Osgoode	27	1

County/District/Municipality	City/Town/Village	Province	Postal Code
Ottawa	Osgoode	Ontario	

UTM Coordinates	Zone	Easting	Northing	Municipal Plan and Sublot Number	Other
NAD 83	18	452042	4999557	4M830 Sublot#30	

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

General Colour	Most Common Material	Other Materials	General Description	Depth (m/ft) From	To
Brown	Sand		Fill	Ø	4'
Brown	Sand		Packed	4'	11'
Grey	Sand/Gravel	Stones	Packed	11'	45'
Grey	Clay	Gravel	Packed	45'	52'
Grey	Limestone		Hard	52'	101'

Annular Space

Depth Set at (m/ft) From	To	Type of Sealant Used (Material and Type)	Volume Placed (m³/ft³)
57'6"	47'6"	Cement Pressure Tremie Grouted	6.77
47'6"	Ø	Bentonite Pressure Tremie Grouted	20.31

Results of Well Yield Testing

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

If pumping discontinued, give reason:

Pump intake set at (m/ft): 90'

Pumping rate (l/min / GPM): 20gpm

Duration of pumping: 1 hrs + 0 min

Final water level end of pumping (m/ft): 16.8

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

Recommended pump depth (m/ft): 80'

Recommended pump rate (l/min / GPM): 10gpm

Well production (l/min / GPM):

Disinfected? ☒ Yes ☐ No 160

Draw Down Time (min)	Water Level (m/ft)	Recovery Time (min)	Water Level (m/ft)
Static Level	15.9		16.8
1	16.2	1	16.5
2	16.25	2	16.45
3	16.3	3	16.4
4	16.3	4	16.4
5	16.3	5	16.35
10	16.45	10	16.25
15	16.6	15	16.25
20	16.65	20	16.25
25	16.7	25	16.2
30	16.7	30	16.1
40	16.8	40	16.1
50	16.85	50	16.1
60	16.8	60	16

Method of Construction

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

Well Use

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

Construction Record - Casing

Inside Diameter (cm/in)	Open Hole OR Material (Galvanized, Fibreglass, Concrete, Plastic, Steel)	Wall Thickness (cm/in)	Depth (m/ft) From	To
9 7/8"	Open Mud		Ø	57'6"
6 1/4"	Steel	.188	Ø	57'6"
6"	Open Hole		57'6"	101'

Status of Well

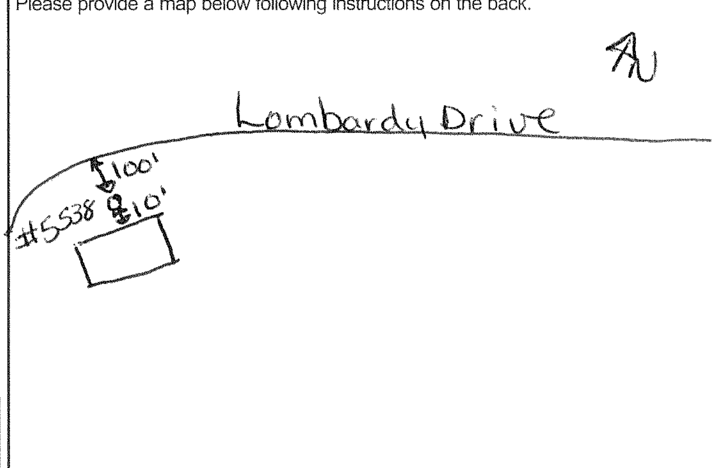
☒ Water Supply
☐ Replacement Well
☐ Test Hole
☐ Recharge Well
☐ Dewatering Well
☐ Observation and/or Monitoring Hole
☐ Alteration (Construction)
☐ Abandoned, Insufficient Supply
☐ Abandoned, Poor Water Quality
☐ Abandoned, other, specify
☐ Other, specify

Construction Record - Screen

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

Map of Well Location

Please provide a map below following instructions on the back.



Water Details

Water found at Depth	Kind of Water
79' (m/ft) ☐ Gas	☐ Fresh ☒ Untested ☐ Other, specify
87' (m/ft) ☐ Gas	☐ Fresh ☒ Untested ☐ Other, specify
(m/ft) ☐ Gas	☐ Fresh ☐ Untested ☐ Other, specify

Hole Diameter

Depth (m/ft) From	To	Diameter (cm/in)
Ø	57'6"	9 7/8"
57'6"	101'	6"

Well Contractor and Well Technician Information

Business Name of Well Contractor	Well Contractor's Licence No.
1425486 Ontario Ltd o/a Splashwell Drilling	4877

Business Address (Street Number/Name)	Municipality
PO BOX 1083	Prescott

Province	Postal Code	Business E-mail Address
ON	K0E1T0	

Bus. Telephone No. (inc. area code)	Name of Well Technician (Last Name, First Name)
6139254885	Ferguson, Todd

Well Technician's Licence No.	Signature of Technician and/or Contractor	Date Submitted
T478	Todd [signature]	20141219

Comments:
160 Chlorine after Drilling
Ø Chlorine after Yield Test

Well owner's information package delivered	Date Package Delivered	Ministry Use Only
☒ Yes ☐ No	20141206	Audit No. Z197240
	Date Work Completed: 20141125	Received

Ontario Ministry of the Environment and Climate Change

Well Tag No. *(Place Sticker and/or Print Below)* A182515 **Tag#: A182515**

Well Record

Regulation 903 Ontario Water Resources Act

S-211166 Page ______ of ______

Measurements recorded in: ☑ Metric ☐ Imperial

Well Owner's Information

First Name	Last Name / Organization	E-mail Address	☐ Well Constructed by Well Owner
	CITY OF OTTAWA		

Mailing Address (Street Number/Name)	Municipality	Province	Postal Code	Telephone No. *(inc. area code)*
110 Laurier Avenue West 5th Floor	Ottawa	ON	K1P 1J1	

Well Location

Address of Well Location (Street Number/Name)	Township	Lot	Concession
3200 Reids Lane			

County/District/Municipality	City/Town/Village	Province	Postal Code
	Osgoode	Ontario	

UTM Coordinates	Zone	Easting	Northing	Municipal Plan and Sublot Number	Other
NAD 83	18	453204	9499305		

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

General Colour	Most Common Material	Other Materials	General Description	Depth (m/ft) From	To
BRN	top soil		soft	0	.31
BRN	sand	silt	soft	.31	3.96
GRY	silt	clay	soft	3.96	4.57

Annular Space

Depth Set at (m/ft) From	To	Type of Sealant Used (Material and Type)	Volume Placed (m³/ft³)
0	.31	concrete/monument	
.31	1.22	bentonite	
1.22	4.57	filter sand	

Results of Well Yield Testing

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

If pumping discontinued, give reason:

Pump intake set at *(m/ft)*

Pumping rate *(l/min / GPM)*

Duration of pumping ____ hrs + ____ min

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

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

Recommended pump depth *(m/ft)*

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

Well production *(l/min / GPM)*

Disinfected? ☐ Yes ☐ No

Draw Down Time (min)	Water Level (m/ft)	Recovery Time (min)	Water Level (m/ft)
Static Level			
1		1	
2		2	
3		3	
4		4	
5		5	
10		10	
15		15	
20		20	
25		25	
30		30	
40		40	
50		50	
60		60	

Method of Construction

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

Well Use

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

Construction Record - Casing

Inside Diameter (cm/in)	Open Hole OR Material (Galvanized, Fibreglass, Concrete, Plastic, Steel)	Wall Thickness (cm/in)	Depth (m/ft) From	To
4.03	PVC	.368	0	1.52

Status of Well

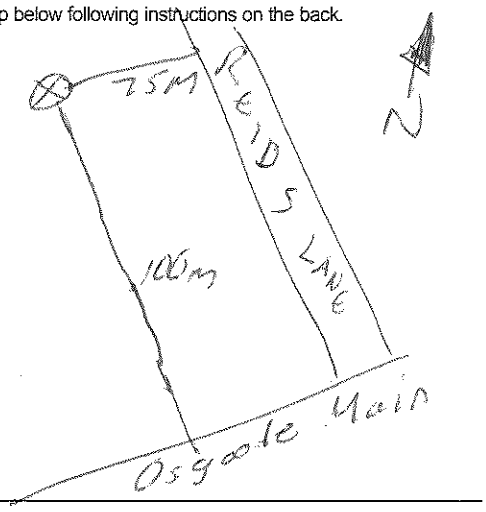
☐ Water Supply ☐ Replacement Well ☑ Test Hole ☐ Recharge Well ☐ Dewatering Well ☑ Observation and/or Monitoring Hole ☐ Alteration (Construction) ☐ Abandoned, Insufficient Supply ☐ Abandoned, Poor Water Quality ☐ Abandoned, other, *specify* ☐ Other, *specify*

Construction Record - Screen

Outside Diameter (cm/in)	Material (Plastic, Galvanized, Steel)	Slot No.	Depth (m/ft) From	To
4.82	PVC	10	1.52	4.57

Map of Well Location

Please provide a map below following instructions on the back.



Comments:

Water Details

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*

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

Hole Diameter

Depth (m/ft) From	To	Diameter (cm/in)
0	4.57	8.25

Well Contractor and Well Technician Information

Business Name of Well Contractor	Well Contractor's Licence No.
Strata Drilling Group	7241

Business Address (Street Number/Name)	Municipality
165 Shields Court	Markham

Province	Postal Code	Business E-mail Address
ON	L3R 8M2	wrecords@stratasoil.com

Bus.Telephone No. *(inc. area code)*	Name of Well Technician (Last Name, First Name)
9059407919	Millar, James

Well Technician's Licence No.	Signature of Technician and/or Contractor	Date Submitted
3656		20171220

Well owner's information package delivered ☐ Yes ☐ No

Date Package Delivered Y Y Y Y M M D D

Date Work Completed 20171130

Ministry Use Only

Audit No. Z212340

DEC 22 2017 Received

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Ontario Ministry of the Environment and Climate Change

Measurements recorded in: ☑ Metric ☐ Imperial

Well Tag No. (Place Sticker and/or Print Below) A182517 Tag#: A182517

Well Record

Regulation 903 Ontario Water Resources Act

S-21166 Page ____ of ____

Well Owner's Information

First Name	Last Name / Organization	E-mail Address	☐ Well Constructed by Well Owner
	CITY OF OTTAWA		

Mailing Address (Street Number/Name)	Municipality	Province	Postal Code	Telephone No. (inc. area code)
110 Laurier Avenue West, 5th Floor	Ottawa	ON	K1P1J1	

Well Location

Address of Well Location (Street Number/Name)	Township	Lot	Concession
3200 Reids Lane			

County/District/Municipality	City/Town/Village	Province	Postal Code
	Ottawa	Ontario	

UTM Coordinates	Zone	Easting	Northing	Municipal Plan and Sublot Number	Other
NAD 83	18	452011	4999437		

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

General Colour	Most Common Material	Other Materials	General Description	Depth (m/ft) From	Depth (m/ft) To
BRN	topsoil		soft	0	.31
BRN	sand	silt	soft	.31	3.35
GRY	silt	clay	soft	3.35	3.96

Annular Space

Depth Set at (m/ft) From	To	Type of Sealant Used (Material and Type)	Volume Placed (m³/ft³)
0	.31	concrete/monument	
.31	.76	bentonite	
.76	3.96	filter sand	

Results of Well Yield Testing

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

If pumping discontinued, give reason:

Pump intake set at (m/ft)

Pumping rate (l/min / GPM)

Duration of pumping ____ hrs + ____ min

Final water level end of pumping (m/ft)

If flowing give rate (l/min / GPM)

Recommended pump depth (m/ft)

Recommended pump rate (l/min / GPM)

Well production (l/min / GPM)

Disinfected? ☐ Yes ☐ No

Draw Down Time (min)	Water Level (m/ft)	Recovery Time (min)	Water Level (m/ft)
Static Level			
1		1	
2		2	
3		3	
4		4	
5		5	
10		10	
15		15	
20		20	
25		25	
30		30	
40		40	
50		50	
60		60	

Method of Construction

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

Well Use

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

Construction Record - Casing

Inside Diameter (cm/in)	Open Hole OR Material (Galvanized, Fibreglass, Concrete, Plastic, Steel)	Wall Thickness (cm/in)	Depth (m/ft) From	To
4.03	PVC	.368	0	.91

Status of Well

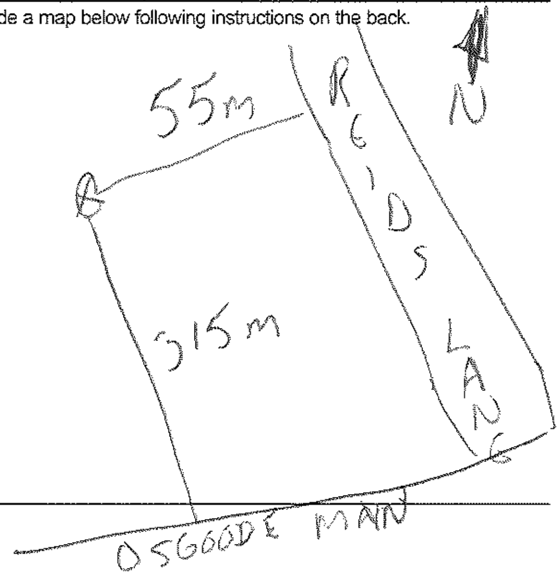
☐ Water Supply ☐ Replacement Well ☑ Test Hole ☐ Recharge Well ☐ Dewatering Well ☑ Observation and/or Monitoring Hole ☐ Alteration (Construction) ☐ Abandoned, Insufficient Supply ☐ Abandoned, Poor Water Quality ☐ Abandoned, other, specify ☐ Other, specify

Construction Record - Screen

Outside Diameter (cm/in)	Material (Plastic, Galvanized, Steel)	Slot No.	Depth (m/ft) From	To
4.82	PVC	10	.91	3.96

Map of Well Location

Please provide a map below following instructions on the back.



Comments:

Water Details

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

Hole Diameter

Depth (m/ft) From	To	Diameter (cm/in)
0	3.96	8.25

Well Contractor and Well Technician Information

Business Name of Well Contractor	Well Contractor's Licence No.
Strata Drilling Group	7241

Business Address (Street Number/Name)	Municipality
165 Shields Court	Markham

Province	Postal Code	Business E-mail Address
ON	L3R8V2	wrecords@stratasoil.com

Bus. Telephone No. (inc. area code)	Name of Well Technician (Last Name, First Name)
9059401999	McCoy, JAMES

Well Technician's Licence No.	Signature of Technician and/or Contractor	Date Submitted
3656		20171208

Well owner's information package delivered ☐ Yes ☐ No

Date Package Delivered: YYYY MM DD

Date Work Completed: 20171130

Ministry Use Only

Audit No. Z212339

DEC 22 2017

Received

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Ontario

Ministry of the Environment and Climate Change

Measurements recorded in: ☑ Metric ☐ Imperial

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

A182518 **Tag#: A182518**

Well Record

Regulation 903 Ontario Water Resources Act

S-21166 Page _____ of _____

Well Owner's Information

First Name	Last Name / Organization	E-mail Address	☐ Well Constructed by Well Owner
	City of Ottawa		

Mailing Address (Street Number/Name)	Municipality	Province	Postal Code	Telephone No. *(inc. area code)*
110 Laurier Avenue West, 5th Floor	Ottawa	ON	K1P1J1	

Well Location

Address of Well Location (Street Number/Name)	Township	Lot	Concession
320 Reids Lane			

County/District/Municipality	City/Town/Village	Province	Postal Code
	Osgoode	Ontario	

UTM Coordinates	Zone	Easting	Northing	Municipal Plan and Sublot Number	Other
NAD 83	18	452078	4999407		

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

General Colour	Most Common Material	Other Materials	General Description	Depth (m/ft) From	Depth (m/ft) To
BRN	top soil		soft	0	.31
BRN	sandy	silt	soft	.31	3.96
GRY	silt	clay	soft	3.96	4.57

Annular Space

Depth Set at (m/ft) From	To	Type of Sealant Used (Material and Type)	Volume Placed (m³/ft³)
0	.31	concrete/monument	
.31	1.22	bentonite	
1.22	4.57	filter sand	

Method of Construction

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

Well Use

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

Construction Record - Casing

Inside Diameter (cm/in)	Open Hole OR Material (Galvanized, Fibreglass, Concrete, Plastic, Steel)	Wall Thickness (cm/in)	Depth (m/ft) From	Depth (m/ft) To
4.03	PVC	.368	0	1.52

Construction Record - Screen

Outside Diameter (cm/in)	Material (Plastic, Galvanized, Steel)	Slot No.	Depth (m/ft) From	Depth (m/ft) To
4.82	PVC	10	1.52	4.57

Status of Well

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

Water Details

Water found at Depth (m/ft)	Kind of Water	Hole Diameter Depth From (m/ft)	Depth To (m/ft)	Diameter (cm/in)
☐ Gas ☐ Other, *specify*	☐ Fresh ☐ Untested	0	4.57	8.25
☐ Gas ☐ Other, *specify*	☐ Fresh ☐ Untested			
☐ Gas ☐ Other, *specify*	☐ Fresh ☐ Untested			

Well Contractor and Well Technician Information

Business Name of Well Contractor	Well Contractor's Licence No.
Strata Drilling Group	7214

Business Address (Street Number/Name)	Municipality
165 Shields Court	Markham

Province	Postal Code	Business E-mail Address
ON	L3R8V2	inrecords@stratasoil.com

Bus. Telephone No. *(inc. area code)*	Name of Well Technician (Last Name, First Name)
9054940791	McCay, James

Well Technician's Licence No.	Signature of Technician and/or Contractor	Date Submitted
3165		2017/12/20

Results of Well Yield Testing

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

If pumping discontinued, give reason:

Pump intake set at *(m/ft)*

Pumping rate *(l/min / GPM)*

Duration of pumping _____ hrs + _____ min

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

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

Recommended pump depth *(m/ft)*

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

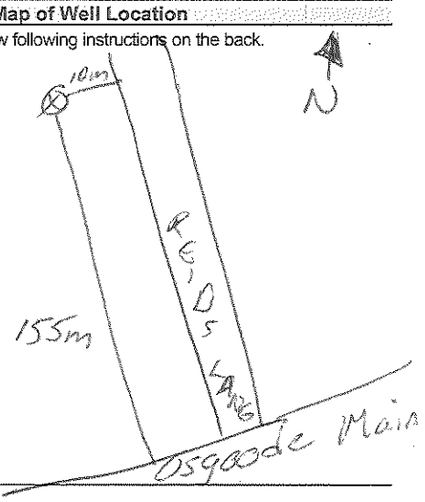
Well production *(l/min / GPM)*

Disinfected? ☐ Yes ☐ No

	Draw Down Time (min)	Draw Down Water Level (m/ft)	Recovery Time (min)	Recovery Water Level (m/ft)
Static Level				
1			1	
2			2	
3			3	
4			4	
5			5	
10			10	
15			15	
20			20	
25			25	
30			30	
40			40	
50			50	
60			60	

Map of Well Location

Please provide a map below following instructions on the back.



Comments:

Well owner's information package delivered ☐ Yes ☐ No

Date Package Delivered: _____

Date Work Completed: 2017/11/13

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Audit No. Z 212338

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0506E (2014/11)

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Ontario

Ministry of the Environment and Climate Change

Measurements recorded in: ☐ Metric ☒ Imperial

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

Tag#: A193395

Well Record

Regulation 903 Ontario Water Resources Act

Page _____ of _____

Well Owner's Information

First Name	Last Name / Organization	E-mail Address	☐ Well Constructed by Well Owner
Baresite	Construction		

Mailing Address (Street Number/Name)	Municipality	Province	Postal Code	Telephone No. *(inc. area code)*
2354 Summerside Drive	Manotick	ON	K4M1B4	613 837 1515

Well Location

Address of Well Location (Street Number/Name)	Township	Lot	Concession
5566 Lombardy Drive	Osgoode	pt lt 19+20	Con #1

County/District/Municipality	City/Town/Village	Province	Postal Code
Ottawa	Osgoode	Ontario	K0A2W0

UTM Coordinates	Zone	Easting	Northing	Municipal Plan and Sublot Number	Other
NAD 83	18	452134	4991961	RP 4R-14828 pt lot #32 plan 4M-830	

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

General Colour	Most Common Material	Other Materials	General Description	Depth (m/ft) From	Depth (m/ft) To
Brown	Sand		Fill	0	3'
Brown	Sand		Soft	3'	15'
Grey	Sand	Gravel	Packed	15'	55'6"
Grey	Limestone		Hard	55'6"	241'

Annular Space

Depth Set at (m/ft) From	To	Type of Sealant Used *(Material and Type)*	Volume Placed *(m³/ft³)*
60'6"	40'	Cement Pressure Grouted	6.77
40'	0	Bentonite Pressure Grouted	13.54

Method of Construction

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

Well Use

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

Construction Record - Casing

Inside Diameter *(cm/in)*	Open Hole OR Material (Galvanized, Fibreglass, Concrete, Plastic, Steel)	Wall Thickness *(cm/in)*	Depth (m/ft) From	Depth (m/ft) To
9 7/8"	(Open Hole)		0	60'6"
6 1/4"	Steel	.188	0	60'6"
6 1/8"	Open Hole		60'6"	241'

Construction Record - Screen

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

Status of Well

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

Water Details

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

Hole Diameter

Depth (m/ft) From	Depth (m/ft) To	Diameter *(cm/in)*
0	60'6"	9 7/8"
60'6"	241'	6 1/8"

Results of Well Yield Testing

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

If pumping discontinued, give reason:

Pump intake set at *(m/ft)*: 230'

Pumping rate *(l/min / GPM)*: 20 gpm

Duration of pumping: 1 hrs + 0 min

Final water level end of pumping *(m/ft)*: 150.8

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

Recommended pump depth *(m/ft)*: 200'

Recommended pump rate *(l/min / GPM)*: 10 gpm

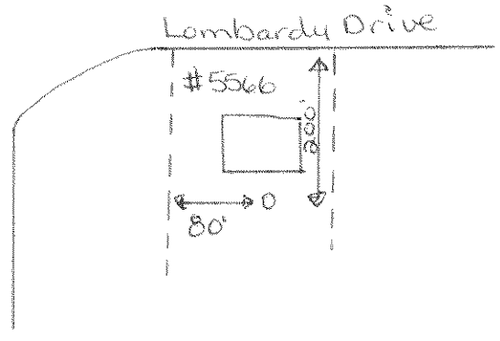
Well production *(l/min / GPM)*

Disinfected? ☒ Yes ☐ No 140

Draw Down Time *(min)*	Draw Down Water Level *(m/ft)*	Recovery Time *(min)*	Recovery Water Level *(m/ft)*
Static Level	20.5		150.8
1	32.4	1	137.4
2	39.5	2	127.5
3	46.7	3	117.9
4	53.5	4	109.5
5	59.8	5	101.7
10	85.7	10	68.2
15	104.25	15	45.2
20	117.9	20	31.2
25	127.8	25	24.1
30	134.7	30	21.2
40	143.4	40	20.7
50	148.35	50	20.55
60	150.8	60	20.45

Map of Well Location

Please provide a map below following instructions on the back.



Comments:
140 Chlorine after Drilling
0 Chlorine after Yield Test

Well Contractor and Well Technician Information

Business Name of Well Contractor	Well Contractor's Licence No.
1425486 Ontario Ltd o/a Solon Well Drilling	4717

Business Address (Street Number/Name)	Municipality
PO Box 1083	Prescott

Province	Postal Code	Business E-mail Address
ON	K0E1T0	

Bus. Telephone No. *(inc. area code)*	Name of Well Technician (Last Name, First Name)
613 925 4885	Ferguson, Johnathon

Well Technician's Licence No.	Signature of Technician and/or Contractor	Date Submitted
2859		Nov 16 2016

Well owner's information package delivered ☒ Yes ☐ No

Date Package Delivered: Nov 16 2016

Date Work Completed: Nov 16 2016

Ministry Use Only

Audit No. Z242999

NOV 18 2016 Received

Ministry's Copy

Ontario

Ministry of the Environment and Climate Change

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

Tag# A193411

Well Record

Regulation 903 Ontario Water Resources Act

Measurements recorded in: ☐ Metric ☑ Imperial

Page _____ of _____

Well Owner's Information

First Name	Last Name / Organization	E-mail Address	☐ Well Constructed by Well Owner
Bansite	Construction		

Mailing Address (Street Number/Name)	Municipality	Province	Postal Code	Telephone No. *(inc. area code)*
2354 Summerside Drive	Manotick	ON	K4M1B4	613 731 7171

Well Location

Address of Well Location (Street Number/Name)	Township	Lot	Concession
5560 Lombardy Drive	Osgoode	pt lot 3	3 Plan 4M-830

County/District/Municipality	City/Town/Village	Province	Postal Code
Ottawa	Osgoode	Ontario	K0A2W0

UTM Coordinates	Zone	Easting	Northing	Municipal Plan and Sublot Number	Other
NAD 8 3	18	415210	4991515	Parts 17 & 18 RP 4R-14828	

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

General Colour	Most Common Material	Other Materials	General Description	Depth (m/ft) From	Depth (m/ft) To
Brown	Sandy Clay		Packed	0	10'
Brown	Sand		Packed	10'	25'
Grey	Sand	Gravel	Packed	25'	55'
Grey	Limestone		Hard	55'	161'

Annular Space

Depth Set at (m/ft) From	To	Type of Sealant Used *(Material and Type)*	Volume Placed (m^3/ft^3)
60'	40'	Cement Pressure Grouted	6.77
40'	0	Bentonite Pressure Grouted	13.54

Method of Construction

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

Well Use

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

Construction Record - Casing

Inside Diameter *(cm/in)*	Open Hole OR Material (Galvanized, Fibreglass, Concrete, Plastic, Steel)	Wall Thickness *(cm/in)*	Depth (m/ft) From	Depth (m/ft) To
9 7/8"	Mud (Open Hole)		0	60'
6 1/4"	Steel	.188	0	60'
6 1/8"	Open Hole		60'	161'

Construction Record - Screen

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

Status of Well

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

Water Details

Water found at Depth (m/ft)	Gas	Kind of Water	Other, specify
135'	☐	☐ Fresh ☒ Untested	
	☐	☐ Fresh ☐ Untested	
	☐	☐ Fresh ☐ Untested	

Hole Diameter

Depth (m/ft) From	To	Diameter *(cm/in)*
0	60'	9 7/8"
60'	161'	6 1/8"

Results of Well Yield Testing

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

If pumping discontinued, give reason:

Pump intake set at *(m/ft)*: 150'

Pumping rate *(l/min / GPM)*: 7 gpm

Duration of pumping: 1 hrs + 0 min

Final water level end of pumping *(m/ft)*: 137.3

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

Recommended pump depth *(m/ft)*: 150'

Recommended pump rate *(l/min / GPM)*: 7 gpm

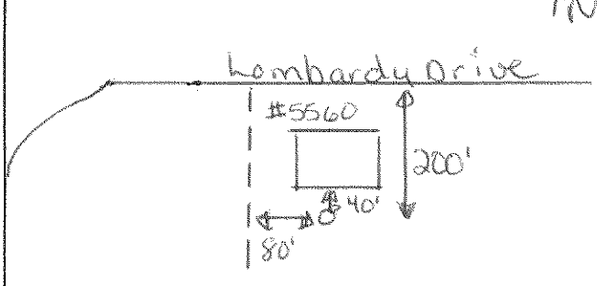
Well production *(l/min / GPM)*

Disinfected? ☒ Yes ☐ No 145

Draw Down Time *(min)*	Draw Down Water Level *(m/ft)*	Recovery Time *(min)*	Recovery Water Level *(m/ft)*
Static Level	20.6		137.3
1	25.9	1	131.5
2	30.2	2	126.9
3	34.05	3	123.4
4	37.7	4	120
5	41	5	116.75
10	55.2	10	101.5
15	66.85	15	87.55
20	77.3	20	75.55
25	86.75	25	64.8
30	95.3	30	55.7
40	111.2	40	41.2
50	125.1	50	31.3
60	137.3	60	25.1

Map of Well Location

Please provide a map below following instructions on the back.



Comments: 145 Chlorine after Drilling & Chlorine after Yield Test

Well Contractor and Well Technician Information

Business Name of Well Contractor	Well Contractor's Licence No.
1423486 Ontario Ltd o/a Splash Well Drilling	4187

Business Address (Street Number/Name)	Municipality
PO Box 1083	Prescott

Province	Postal Code	Business E-mail Address
ON	K0E1T0	

Bus. Telephone No. *(inc. area code)*	Name of Well Technician (Last Name, First Name)
613 925 4885	Fergusson, Johnathan

Well Technician's Licence No.	Signature of Technician and/or Contractor	Date Submitted
21519		2016/11/30

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

Date Package Delivered: 2016/11/17

Date Work Completed: 2016/11/04

Ministry Use Only

Audit No. Z243019

Received DEC 1 1 2016

0506E (2014/11)

Ministry's Copy

Ontario Ministry of the Environment and Climate Change

Measurements recorded in: ☐ Metric ☒ Imperial

Well Tag No. *(Place Sticker and/or Print Below)* Tag# A193412

Well Record

Regulation 903 Ontario Water Resources Act

Page ____ of ____

Well Owner's Information

First Name	Last Name / Organization	E-mail Address	☐ Well Constructed by Well Owner
Baresite Construction			

Mailing Address (Street Number/Name)	Municipality	Province	Postal Code	Telephone No. *(inc. area code)*
2354 Summerside Drive	Manotick	ON	K4M1B4	6133715171

Well Location

Address of Well Location (Street Number/Name)	Township	Lot	Concession
5554 Lombardy Drive	Osgoode	pt lot 31	Plan 4m-830

County/District/Municipality	City/Town/Village	Province	Postal Code
Ottawa	Osgoode	Ontario	K0A2W0

UTM Coordinates	Zone	Easting	Northing	Municipal Plan and Sublot Number	Other
NAD 8 3	18	452066	4999583	Parts 5,6 RP4R-14828	

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

General Colour	Most Common Material	Other Materials	General Description	Depth (m/ft) From	To
Brown	Clay		Packed	Ø	8'
Brown	Sand		Packed	8'	15'
Grey	Sand	Gravel	Packed	15'	51'6"
Grey	Limestone		Hard	51'6"	121'

Annular Space

Depth Set at (m/ft) From	To	Type of Sealant Used (Material and Type)	Volume Placed (m³/ft³)
56'6"	46'6"	Cement Pressure Grouted	6.77
46'6"	Ø	Bentonite Pressure Grouted	13.54

Results of Well Yield Testing

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

If pumping discontinued, give reason:

Pump intake set at (m/ft): 110'

Pumping rate (l/min / GPM): 7gpm

Duration of pumping: 1 hrs + 0 min

Final water level end of pumping (m/ft): 56.4

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

Recommended pump depth (m/ft): 110'

Recommended pump rate (l/min / GPM): 7gpm

Well production (l/min / GPM):

Disinfected? ☒ Yes ☐ No 140

Draw Down Time (min)	Water Level (m/ft)	Recovery Time (min)	Water Level (m/ft)
Static Level	16.9		56.4
1	21.05	1	50.85
2	23.15	2	45.7
3	25.2	3	42.4
4	27	4	39.3
5	28.65	5	36
10	35	10	23.4
15	39.5	15	18.3
20	43	20	17.6
25	45.8	25	17.05
30	47.5	30	17.025
40	52.8	40	17
50	54.85	50	17
60	56.4	60	16.975

Method of Construction

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

Well Use

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

Construction Record - Casing

Inside Diameter (cm/in)	Open Hole OR Material (Galvanized, Fibreglass, Concrete, Plastic, Steel)	Wall Thickness (cm/in)	Depth (m/ft) From	To
9 7/8"	(Mud Open Hole)		Ø	56'6"
6 1/4"	Steel	.188	Ø	56'6"
6 1/8"	Open Hole		56'6"	121'

Status of Well

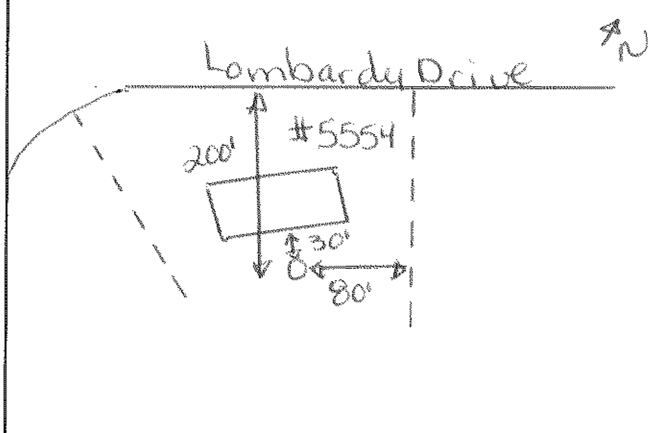
☒ Water Supply ☐ Replacement Well ☐ Test Hole ☐ Recharge Well ☐ Dewatering Well ☐ Observation and/or Monitoring Hole ☐ Alteration (Construction) ☐ Abandoned, Insufficient Supply ☐ Abandoned, Poor Water Quality ☐ Abandoned, other, *specify* ☐ Other, *specify*

Construction Record - Screen

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

Map of Well Location

Please provide a map below following instructions on the back.



Water Details

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

Hole Diameter

Depth (m/ft) From	To	Diameter (cm/in)
Ø	56'6"	9 7/8"
56'6"	121'	6 1/8"

Well Contractor and Well Technician Information

Business Name of Well Contractor: 1425486 Ontario Ltd o/a Splash Well Drilling

Well Contractor's Licence No.: 41817

Business Address (Street Number/Name): PO Box 1083

Municipality: Prescott

Province: ON

Postal Code: K0E1T0

Business E-mail Address:

Bus.Telephone No. *(inc. area code)*: 6139254885

Name of Well Technician (Last Name, First Name): Ferguson, Johnathon

Well Technician's Licence No.: 2 1 8 5 1 9

Signature of Technician and/or Contractor: [signature]

Date Submitted: 2016 11 30

Comments: 140 Chlorine after Drilling; Ø Chlorine after Yield Test

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

Date Package Delivered: 2016 11 22

Date Work Completed: 2016 11 10

Ministry Use Only

Audit No. Z243020

Received DEC 1 9 2016

0506E (2014/11)

Ministry's Copy

Ontario — Ministry of the Environment and Climate Change

Measurements recorded in: ☐ Metric ☒ Imperial

Tag#: A 207699 *(nt Below)*

A207699

Well Record

Regulation 903 Ontario Water Resources Act

Page _____ of _____

[redacted]

Address of Well Location (Street Number/Name)	Township	Lot	Concession
5549 Lombardy Drive	Osgoode	27	1

County/District/Municipality	City/Town/Village	Province	Postal Code
Ottawa Carleton	Osgoode	Ontario	K0A 2

UTM Coordinates	Zone	Easting	Northing	Municipal Plan and Sublot Number	Other
NAD 8 3	18	462000	4999637	4M830	S/L 29

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

General Colour	Most Common Material	Other Materials	General Description	Depth (m/ft) From	Depth (m/ft) To
	Sand + Gravel & Boulders + Clay			0'	43'
Grey	Limestone			43'	138'
Grey	Limestone			138'	233'
Grey	Limestone			233'	240'

Annular Space

Depth Set at (m/ft) From	To	Type of Sealant Used (Material and Type)	Volume Placed (m³/ft³)
43'	39'	Neat cement	10.9
39'	0'	Bentonite slurry	60.4

Method of Construction

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

Well Use

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

Construction Record - Casing

Inside Diameter (cm/in)	Open Hole OR Material (Galvanized, Fibreglass, Concrete, Plastic, Steel)	Wall Thickness (cm/in)	Depth (m/ft) From	To
6 1/4"	Steel	.188"	+2'	49'
6"	Open Hole		49'	240'

Construction Record - Screen

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

Status of Well

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

Water Details

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

Hole Diameter

Depth (m/ft) From	To	Diameter (cm/in)
0'	49'	9 3/4"
49'	240'	6"

Results of Well Yield Testing

After test of well yield, water was:
☐ Clear and sand free
☐ Other, *specify* Not tested

If pumping discontinued, give reason: X

Pump intake set at (m/ft): 220

Pumping rate (l/min / GPM): 20

Duration of pumping: 1 hrs + 0 min

Final water level end of pumping (m/ft): 21.7"

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

Recommended pump depth (m/ft): 140'

Recommended pump rate (l/min / GPM): 20

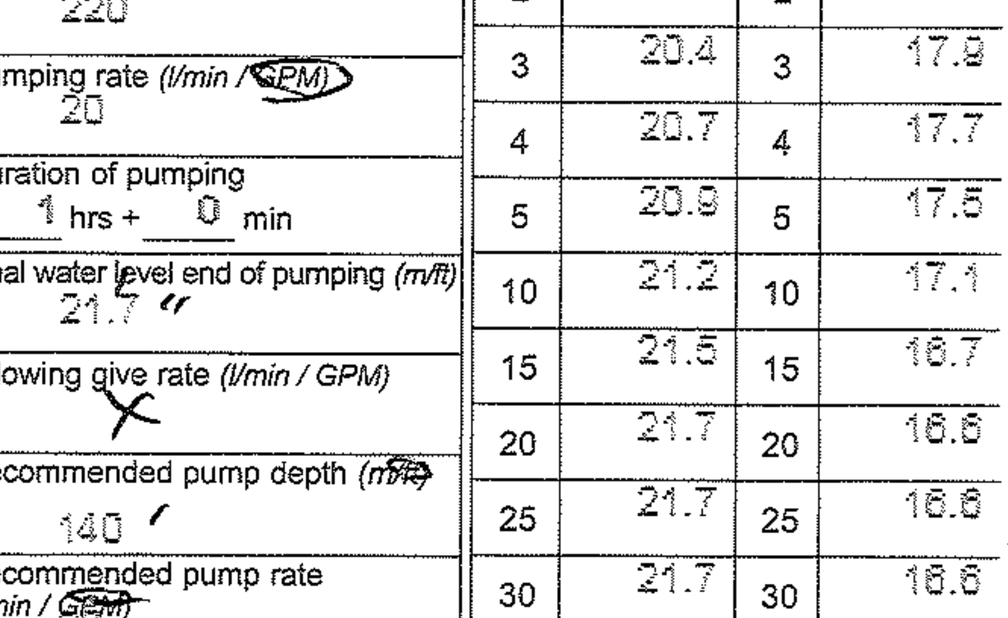
Well production (l/min / GPM): 20

Disinfected? ☒ Yes ☐ No

Draw Down Time (min)	Draw Down Water Level (m/ft)	Recovery Time (min)	Recovery Water Level (m/ft)
Static Level	16'6"		21.7"
1	19.9	1	19.7
2	20.1	2	18.2
3	20.4	3	17.9
4	20.7	4	17.7
5	20.9	5	17.5
10	21.2	10	17.1
15	21.5	15	16.7
20	21.7	20	16.6
25	21.7	25	16.6
30	21.7	30	16.6
40	21.7	40	16.6
50	21.7	50	16.6
60	21.7"	60	16.6"

Map of Well Location

Please provide a map below following instructions on the back.



Comments:
10Hp 10GPM - Set at 140 Feet

Well Contractor and Well Technician Information

Business Name of Well Contractor	Well Contractor's Licence No.
Air Rock Drilling Co. Ltd.	1119

Business Address (Street Number/Name)	Municipality
6659 Frankford Rd, RR#1	Richmond

Province	Postal Code	Business E-mail Address
ON	K0A 2Z0	air-rock@sympatico.ca

Bus. Telephone No. (inc. area code)	Name of Well Technician (Last Name, First Name)
6138882170	Hogan, Dan

Well Technician's Licence No.	Signature of Technician and/or Contractor	Date Submitted
13056		2016 10 31

Well owner's information package delivered	Date Package Delivered	Date Work Completed
☒ Yes ☐ No	2016 09 30	2016 09 28

Ministry Use Only

Audit No. Z237037

Received NOV 28 2016

0506E (2014/11)

Ministry's Copy

Ontario — Ministry of the Environment and Climate Change

Measurements recorded in: ☐ Metric ☐ Imperial

Tag#: A 229142 *Print Below)*

A229142

Well Record

Regulation 903 Ontario Water Resources Act

Page ____ of ____

[redacted]

Address of Well Location (Street Number/Name)	Township	Lot	Concession
5495 Osgoode Main	Osgoode	X	X

County/District/Municipality	City/Town/Village	Province	Postal Code
Ottawa Carleton	Osgoode	Ontario	

UTM Coordinates	Zone	Easting	Northing	Municipal Plan and Sublot Number	Other
NAD 8 3	18	451988	4999137	Plan 393	S/L 44

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

General Colour	Most Common Material	Other Materials	General Description	Depth (m/ft) From	Depth (m/ft) To
	Sand			0 '	27 '
	Gravel	& Boulders		27 '	44 '
Grey	Limestone			44 '	207 '
Grey	Sandstone			207 '	234 '
Grey	Sandstone			234 '	240 '

Annular Space

Depth Set at (m/ft) From	To	Type of Sealant Used (Material and Type)	Volume Placed (m³/cm)
54 '	44 '	Neat cement	10.93
44 '	0 '	Bentonite slurry	10.8

Method of Construction

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

Well Use

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

Construction Record - Casing

Inside Diameter (cm/in)	Open Hole OR Material (Galvanized, Fibreglass, Concrete, Plastic, Steel)	Wall Thickness (cm/in)	Depth (m/ft) From	Depth (m/ft) To
6 1/4"	Steel	.188"	+2 '	54 '
6 1/4"	Open Hole		54 '	240 '

Construction Record - Screen

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

Status of Well

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

Results of Well Yield Testing

After test of well yield, water was:
☐ Clear and sand free
☐ Other, *specify* Not tested

If pumping discontinued, give reason: X

Pump intake set at (m/ft): 200

Pumping rate (l/min / GPM): 20

Duration of pumping: 1 hrs + 0 min

Final water level end of pumping (m/ft): 28.1 ''

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

Recommended pump depth (m/ft): 140 '

Recommended pump rate (l/min / GPM): 20 — 20 GPM

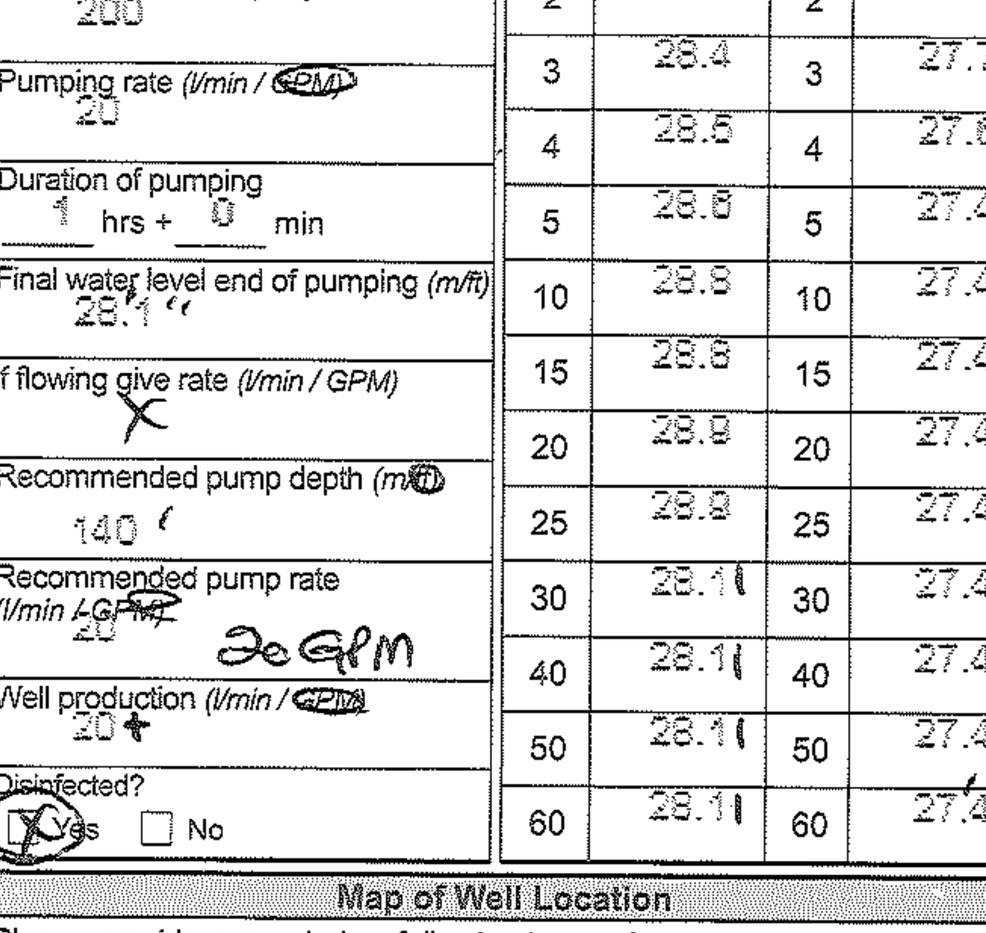
Well production (l/min / GPM): 20 +

Disinfected? ☒ Yes ☐ No

Draw Down Time (min)	Draw Down Water Level (m/ft)	Recovery Time (min)	Recovery Water Level (m/ft)
Static Level	27'4"		28.11''
1	28.2	1	27.8
2	28.3	2	27.8
3	28.4	3	27.7
4	28.5	4	27.6
5	28.6	5	27.4
10	28.8	10	27.4
15	28.8	15	27.4
20	28.8	20	27.4
25	28.8	25	27.4
30	28.11	30	27.4
40	28.11	40	27.4
50	28.11	50	27.4
60	28.11	60	27.4 ''

Map of Well Location

Please provide a map below following instructions on the back.



Comments:
1/2 HP 10 GPM SET AT 140 FEET

Water Details

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

Hole Diameter

Depth (m/ft) From	Depth (m/ft) To	Diameter (cm/in)
0 '	54 '	9 3/4"
54 '	240 '	6 1/4"

Well Contractor and Well Technician Information

Business Name of Well Contractor	Well Contractor's Licence No.
Air Rock Drilling Co. Ltd.	1119

Business Address (Street Number/Name)	Municipality
[redacted]	[redacted]

Province	Postal Code	Business E-mail Address
ON	K0A 2Z0	air-rock@sympatico.ca

Business Telephone No. (inc. area code)	Name of Well Technician (Last Name, First Name)
6135832170	Hanna, Jeremy

Well Technician's Licence No.	Signature of Technician and/or Contractor	Date Submitted
19032		2018 07 31

Well owner's information package delivered	Date Package Delivered	Date Work Completed
☒ Yes ☐ No	2018 07 13	2018 07 10

Ministry Use Only

Audit No. Z276999

Received SEP 10 2018

Ontario — Ministry of the Environment and Climate Change

Measurements recorded in: ☐ Metric ☒ Imperial

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

Tag#: A 236933

Well Record

Regulation 903 Ontario Water Resources Act

Page ____ of ____

[redacted]

Address of Well Location (Street Number/Name)	Township	Lot	Concession
5533 Lombardy Drive	Osgoode	pt lot #27	Con # 1

County/District/Municipality	City/Town/Village	Province	Postal Code
Ottawa-Carleton	Ottawa	Ontario	K0A2W0

UTM Coordinates	Zone	Easting	Northing	Municipal Plan and Sublot Number	Other
NAD 83	18	451978	4999488	Plan 4M-830 Pt Blk 46 52	

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

General Colour	Most Common Material	Other Materials	General Description	Depth (m/ft) From	Depth (m/ft) To
Brown	Sand	Stones	Packed	0	15'
Grey	Sand	Stones	Packed	15'	42'
Grey	Clay (Till)	Stones + Boulders	Packed	42'	51'6"
Grey	Limestone		Layered	51'6"	121'

Annular Space

Depth Set at (m/ft) From	Depth Set at (m/ft) To	Type of Sealant Used (Material and Type)	Volume Placed (m^3/ft^3)
56'6"	46'6"	Cement Pressure Grouted	6.77
46'6"	0	Bentonite Pressure Grouted	13.54

Method of Construction

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

Well Use

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

Construction Record - Casing

Inside Diameter (cm/in)	Open Hole OR Material (Galvanized, Fibreglass, Concrete, Plastic, Steel)	Wall Thickness (cm/in)	Depth (m/ft) From	Depth (m/ft) To
6 1/4"	Steel	.188	+2'	56'6"
6 1/16"	Open Hole		56'5"	121'

Construction Record - Screen

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

Status of Well

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

Water Details

Water found at Depth	Kind of Water	
65' (m/ft) ☐ Gas	☐ Fresh ☒ Untested	☐ Other, *specify*
108' (m/ft) ☐ Gas	☐ Fresh ☒ Untested	☐ Other, *specify*
(m/ft) ☐ Gas	☐ Fresh ☐ Untested	☐ Other, *specify*

Hole Diameter

Depth (m/ft) From	Depth (m/ft) To	Diameter (cm/in)
0	56'6"	9 7/8"
56'6"	121'	6 1/16"

Results of Well Yield Testing

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

If pumping discontinued, give reason:

Pump intake set at (m/ft): 110'

Pumping rate (l/min / GPM): 20gpm

Duration of pumping: 1 hrs + 0 min

Final water level end of pumping (m/ft): 15.85

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

Recommended pump depth (m/ft): 100'

Recommended pump rate (l/min / GPM): 10gpm

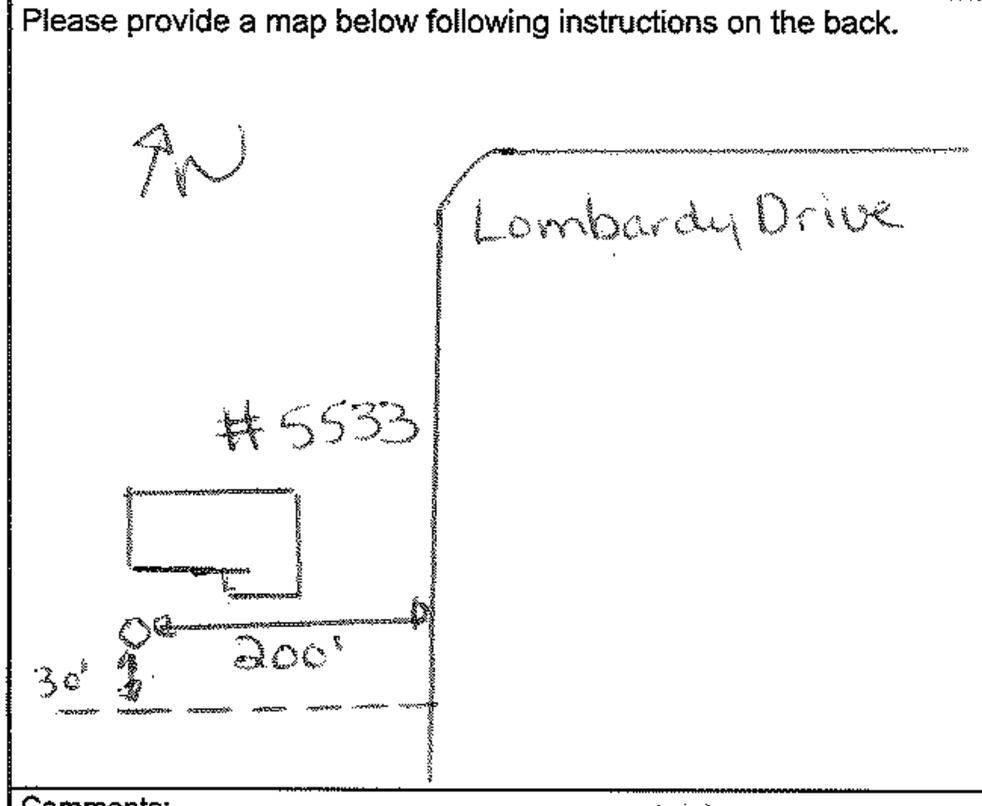
Well production (l/min / GPM):

Disinfected? ☒ Yes ☐ No 140

Draw Down Time (min)	Draw Down Water Level (m/ft)	Recovery Time (min)	Recovery Water Level (m/ft)
Static Level	14		15.85
1	15.2	1	14.65
2	15.3	2	14.6
3	15.4	3	14.55
4	15.4	4	14.5
5	15.45	5	14.5
10	15.5	10	14.4
15	15.65	15	14.35
20	15.7	20	14.3
25	15.75	25	14.3
30	15.8	30	14.25
40	15.8	40	14.2
50	15.8	50	14.2
60	15.85	60	14.2

Map of Well Location

Please provide a map below following instructions on the back.



Comments:
140 Chlorine after Drilling
0 Chlorine after Yield Test

Well Contractor and Well Technician Information

Business Name of Well Contractor	Well Contractor's Licence No.
1405486 Ontario Ltd o/a Splawinski Drilling	4817

Business Address (Street Number/Name)	Municipality
PO Box 1083	Prescott

Province	Postal Code	Business E-mail Address
ON	K0E1T0	

Bus. Telephone No. (inc. area code)	Name of Well Technician (Last Name, First Name)
6138485885	Ferguson, Johnathon

Well Technician's Licence No.	Signature of Technician and/or Contractor	Date Submitted
4042		2019/04/30

Well owner's information package delivered	Date Package Delivered	Date Work Completed
☒ Yes ☐ No	2019/04/30	2019/04/30

Ministry Use Only

Audit No. Z292468

MAY 01 2019

Received

0506E (2014/11)

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Tag#:A304984

A304984

Well Record

Regulation 903 Ontario Water Resources Act

Measurements recorded in: ☐ Metric ☒ Imperial

Page ____ of ____

Well Owner's Information

First Name	Last Name/Organization	E-mail Address	☐ Well Constructed by Well Owner
	Vibration Studios Inc.		

Mailing Address (Street Number/Name)	Municipality	Province	Postal Code	Telephone No. (inc. area code)
5488 Osgoode Main Street	Osgoode	ON	K0A 2W0	

Well Location

Address of Well Location (Street Number/Name)	Township	Lot	Concession
5488 Osgoode Main Street	Osgoode	28&29	1

County/District/Municipality	City/Town/Village	Province	Postal Code
Ottawa Carleton	Osgoode	Ontario	

UTM Coordinates	Zone	Easting	Northing	Municipal Plan and Sublot Number	Other
NAD 83	18	451963	4999097	# 393 (PLN 15+16)	

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

General Colour	Most Common Material	Other Materials	General Description	Depth (m/ft) From	Depth (m/ft) To
	Sand &	Clay & Gravel	& Boulders	0'	42'
Grey & Black	Limestone			42'	100'
Black	Limestone			100'	220'
Grey & Black	Limestone	W/ white Sandstone Mix		220'	334'
Grey & Black	Limestone	W/ white Sandstone Mix		334'	340'

Annular Space

Depth Set at (m/ft) From	To	Type of Sealant Used (Material and Type)	Volume Placed (m³/ft³)
52'	42'	Neat cement	10.9
42'	0'	Bentonite slurry	16.8

Method of Construction

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

Well Use

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

Construction Record - Casing

Inside Diameter (cm/in)	Open Hole OR Material (Galvanized, Fibreglass, Concrete, Plastic, Steel)	Wall Thickness (cm/in)	Depth (m/ft) From	Depth (m/ft) To
6 1/4"	Steel	.188"	+2'	52'
6 1/8"	Open Hole		52'	340'

Construction Record - Screen

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

Status of Well

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

Water Details

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

Hole Diameter

Depth (m/ft) From	To	Diameter (cm/in)
0'	52'	9 3/4"
52'	340'	6 1/8"

Results of Well Yield Testing

After test of well yield, water was: ☐ Clear and sand free ☐ Other, specify **Not tested**

If pumping discontinued, give reason: X

Pump intake set at (m/ft): 300

Pumping rate (l/min / GPM): 20

Duration of pumping: 1 hrs + 0 min

Final water level end of pumping (m/ft): 26.5''

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

Recommended pump depth (m/ft): 140 FT

Recommended pump rate (l/min/GPM): 20

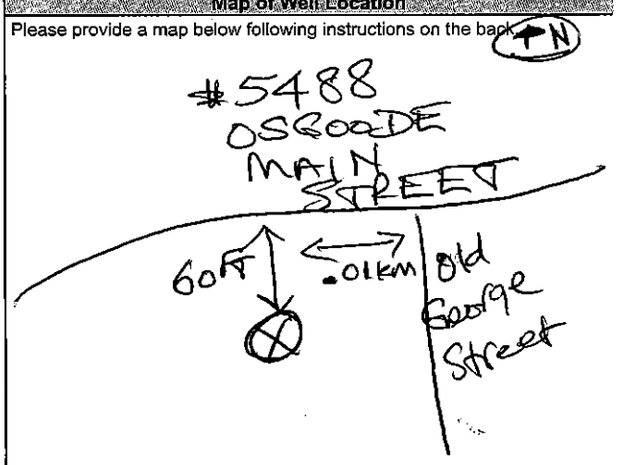
Well production (l/min/GPM): 20

Disinfected? ☒ Yes ☐ No

Draw Down Time (min)	Draw Down Water Level (m/ft)	Recovery Time (min)	Recovery Water Level (m/ft)
Static Level	24'4"		26.5"
1	24.8	1	24.4
2	24.8	2	24.4
3	24.9	3	24.4
4	24.9	4	24.4
5	24.9	5	24.4
10	25.2	10	24.4
15	25.4	15	24.4
20	25.6	20	24.4
25	25.8	25	24.4
30	25.9	30	24.4
40	26.2	40	24.4
50	26.4	50	24.4
60	26.5"	60	24.4"

Map of Well Location

Please provide a map below following instructions on the back.



Comments: 1/2HP - 10GPM Set @ 140 FT

Well Contractor and Well Technician Information

Business Name of Well Contractor	Well Contractor's Licence No.
Air Rock Drilling Co. Ltd.	7681

Business Address (Street Number/Name)	Municipality
6659 Franktown Road	Richmond

Province	Postal Code	Business E-mail Address
ON	K0A 2Z0	air-rock@sympatico.ca

Bus. Telephone No. (inc. area code)	Name of Well Technician (Last Name, First Name)
6138382170	Hanna, Jeremy

Well Technician's Licence No.	Signature of Technician and/or Contractor	Date Submitted Y Y Y Y M M D D
13632		2020 10 30

Well owner's information package delivered ☒ Yes ☐ No

Date Package Delivered: 2020 10 12

Date Work Completed: 2020 10 07

Ministry Use Only

Audit No. Z343944

Received NOV 09 2020

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Ministry's Copy

Ontario

Ministry of the Environment, Conservation and Parks

Measurements recorded in: ☐ Metric ☑ Imperial

Well Tag No. (Place Sticker and/or Print Below)
Tag#:A308544

Well Record

Regulation 903 Ontario Water Resources Act

Page 1 of 3

[redacted]

Address of Well Location (Street Number/Name)	Township	Lot	Concession
5550 OSgoode main ST	OSgoode		
County/District/Municipality	**City/Town/Village**	**Province**	**Postal Code**
Ottawa	OSgoode	Ontario	K0A2W0
UTM Coordinates Zone / Easting / Northing	**Municipal Plan and Sublot Number**	**Other**	
NAD 8 3 18 0452242 4999306			

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

General Colour	Most Common Material	Other Materials	General Description	Depth (m/ft) From	Depth (m/ft) To
	Raised well casing above grade in accordance with regulation 903		well was sanitized		

Annular Space

Depth Set at (m/ft) From	Depth Set at (m/ft) To	Type of Sealant Used (Material and Type)	Volume Placed (m^3/ft^3)
		N/A	

Method of Construction

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

N/A

Well Use

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

N/A

Construction Record - Casing

Inside Diameter (cm/in)	Open Hole OR Material (Galvanized, Fibreglass, Concrete, Plastic, Steel)	Wall Thickness (cm/in)	Depth (m/ft) From	Depth (m/ft) To
	N/A			

Construction Record - Screen

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

Status of Well

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

Water Details

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

Hole Diameter

Depth (m/ft) From	Depth (m/ft) To	Diameter (cm/in)
5'	5'	

Results of Well Yield Testing

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

If pumping discontinued, give reason:

Pump intake set at (m/ft)

Pumping rate (l/min / GPM)

Duration of pumping _____ hrs + _____ min

Final water level end of pumping (m/ft)

If flowing give rate (l/min / GPM)

Recommended pump depth (m/ft)

Recommended pump rate (l/min / GPM)

Well production (l/min / GPM)

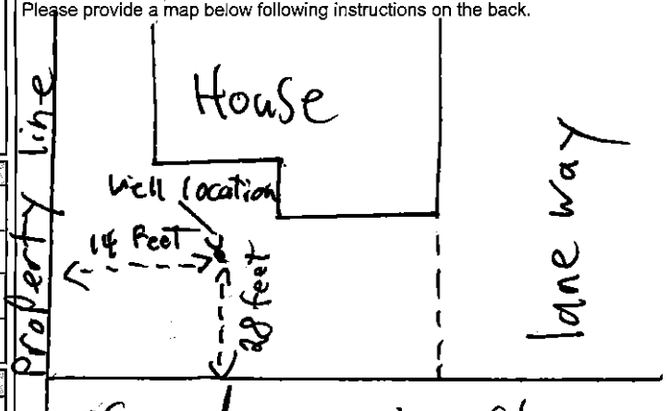
Disinfected? ☐ Yes ☐ No

N/A

	Draw Down Time (min)	Draw Down Water Level (m/ft)	Recovery Time (min)	Recovery Water Level (m/ft)
Static Level				
1			1	
2			2	
3			3	
4			4	
5			5	
10			10	
15			15	
20			20	
25			25	
30			30	
40			40	
50			50	
60			60	

Map of Well Location

Please provide a map below following instructions on the back.



Comments:

Well Contractor and Well Technician Information

Business Name of Well Contractor	Well Contractor's Licence No.
C&N electrical & Plumbing	6364
Business Address (Street Number/Name)	**Municipality**
5640 Manotick main St	ottawa
Province	**Postal Code**	**Business E-mail Address**
ONT	K4M1B3	Plumbing@cn-electric.ca
Bus. Telephone No. (inc. area code)	**Name of Well Technician (Last Name, First Name)**
6136923284	Sadler Johnston
Well Technician's Licence No.	**Signature of Technician and/or Contractor**	**Date Submitted**
5689		2021 08 06

Well owner's information package delivered	Date Package Delivered	Date Work Completed
☑ Yes ☐ No	2021 08 06	2021 08 06

Ministry Use Only

Audit No. Z319370

AUG 26 2021

Received

0506E (2018/12) **Ministry's Copy**

7334769

Ontario — 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

S-23150 Page ___ of ___

CITY OF OTTAWA

Ext. 12567

Address of Well Location (Street Number/Name)	Township	Lot	Concession
3200 Reids Lane			

County/District/Municipality	City/Town/Village	Province	Postal Code
	Osgoode Ottawa	Ontario	

UTM Coordinates	Zone	Easting	Northing	Municipal Plan and Sublot Number	Other
NAD	18	451952	4999254		

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

General Colour	Most Common Material	Other Materials	General Description	Depth (m/ft) From	Depth (m/ft) To

Annular Space

Depth Set at (m/ft) From	To	Type of Sealant Used (Material and Type)	Volume Placed (m³/ft³)
0	2	Hole plug	
2	13	Bentonite slurry	

Method of Construction

☐ Cable Tool ☐ Diamond
☐ Rotary (Conventional) ☐ Jetting
☐ Rotary (Reverse) ☐ Driving
☐ Boring ☐ Digging
☐ Air percussion
☒ Other, specify: hand pull

Well Use

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

Construction Record - Casing

Inside Diameter (cm/in)	Open Hole OR Material (Galvanized, Fibreglass, Concrete, Plastic, Steel)	Wall Thickness (cm/in)	Depth (m/ft) From	Depth (m/ft) To
2.047	PVC	.154	+2	3

Construction Record - Screen

Outside Diameter (cm/in)	Material (Plastic, Galvanized, Steel)	Slot No.	Depth (m/ft) From	Depth (m/ft) To
2.375	PVC	10	3	13

Status of Well

☐ Water Supply
☐ Replacement Well
☐ Test Hole
☐ Recharge Well
☐ Dewatering Well
☐ Observation and/or Monitoring Hole
☐ Alteration (Construction)
☐ Abandoned, Insufficient Supply
☐ Abandoned, Poor Water Quality
☒ Abandoned, other, specify: not needed
☐ Other, specify

Water Details

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

Hole Diameter

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

Well Contractor and Well Technician Information

Business Name of Well Contractor	Well Contractor's Licence No.
Strata Drilling Group	7241

Business Address (Street Number/Name)	Municipality
165 Shields Court	Markham

Province	Postal Code	Business E-mail Address
ON	L3R8V2	wrecords@stratasoil.com

Bus. Telephone No. (inc. area code)	Name of Well Technician (Last Name, First Name)
9059400797	Beatty, Brian

Well Technician's Licence No.	Signature of Technician and/or Contractor	Date Submitted
3616		Y Y Y Y M M D D

Results of Well Yield Testing

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

If pumping discontinued, give reason:

Pump intake set at (m/ft)

Pumping rate (l/min / GPM)

Duration of pumping ___ hrs + ___ min

Final water level end of pumping (m/ft)

If flowing give rate (l/min / GPM)

Recommended pump depth (m/ft)

Recommended pump rate (l/min / GPM)

Well production (l/min / GPM)

Disinfected? ☐ Yes ☐ No

	Draw Down Time (min)	Draw Down Water Level (m/ft)	Recovery Time (min)	Recovery Water Level (m/ft)
Static Level				
1			1	
2			2	
3			3	
4			4	
5			5	
10			10	
15			15	
20			20	
25			25	
30			30	
40			40	
50			50	
60			60	

Map of Well Location

Please provide a map below following instructions on the back.

MW03-01 ON MAP

Comments: Dillon General Contractors

Well owner's information package delivered	Date Package Delivered	Date Work Completed
☐ Yes ☐ No	Y Y Y Y M M D D	2018 04 09

Ministry Use Only

Audit No. Z302833

Received MAR 08 2019

0506E (2014/11)

Ministry's Copy

7334770

Ontario — 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

5-23158 Page ____ of ____

CITY OF OTTAWA

Well Location

Address of Well Location (Street Number/Name)	Township	Lot	Concession
3200 Reids Lane			

County/District/Municipality	City/Town/Village	Province	Postal Code
	Osgoode, Ottawa	Ontario	

UTM Coordinates	Zone	Easting	Northing	Municipal Plan and Sublot Number	Other
NAD 83	18	451945	4992771		

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

General Colour	Most Common Material	Other Materials	General Description	Depth (m/ft) From	Depth (m/ft) To

Annular Space

Depth Set at (m/ft) From	To	Type of Sealant Used (Material and Type)	Volume Placed (m³/ft³)
0	2	Hole Plug	
2	15	Bentonite Slurry	

Method of Construction

☐ Cable Tool ☐ Diamond
☐ Rotary (Conventional) ☐ Jetting
☐ Rotary (Reverse) ☐ Driving
☐ Boring ☐ Digging
☐ Air percussion
☒ Other, *specify* hand pull

Well Use

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

Construction Record - Casing

Inside Diameter (cm/in)	Open Hole OR Material (Galvanized, Fibreglass, Concrete, Plastic, Steel)	Wall Thickness (cm/in)	Depth (m/ft) From	Depth (m/ft) To
2.047	PVC	.154	+2	5

Construction Record - Screen

Outside Diameter (cm/in)	Material (Plastic, Galvanized, Steel)	Slot No.	Depth (m/ft) From	Depth (m/ft) To
2.375	PVC	10	5	15

Status of Well

☐ Water Supply
☐ Replacement Well
☐ Test Hole
☐ Recharge Well
☐ Dewatering Well
☐ Observation and/or Monitoring Hole
☐ Alteration (Construction)
☐ Abandoned, Insufficient Supply
☐ Abandoned, Poor Water Quality
☒ Abandoned, other, *specify* not needed
☐ Other, *specify*

Water Details

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

Hole Diameter

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

Results of Well Yield Testing

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

If pumping discontinued, give reason:

Pump intake set at (m/ft)

Pumping rate (l/min / GPM)

Duration of pumping ____ hrs + ____ min

Final water level end of pumping (m/ft)

If flowing give rate (l/min / GPM)

Recommended pump depth (m/ft)

Recommended pump rate (l/min / GPM)

Well production (l/min / GPM)

Disinfected? ☐ Yes ☐ No

	Draw Down Time (min)	Draw Down Water Level (m/ft)	Recovery Time (min)	Recovery Water Level (m/ft)
Static Level				
1			1	
2			2	
3			3	
4			4	
5			5	
10			10	
15			15	
20			20	
25			25	
30			30	
40			40	
50			50	
60			60	

Map of Well Location

Please provide a map below following instructions on the back.

MW03-02 ON MAP

Well Contractor and Well Technician Information

Business Name of Well Contractor	Well Contractor's Licence No.
Strata Drilling Group	7124

Business Address (Street Number/Name)	Municipality
165 Shields Court	Markham

Province	Postal Code	Business E-mail Address
ON	L3R8V2	wrecords@stratasgi.com

Bus. Telephone No. (inc. area code)	Name of Well Technician (Last Name, First Name)
9059407919	Beatty, Brian

Well Technician's Licence No.	Signature of Technician and/or Contractor	Date Submitted
7616		Y Y Y Y M M D D

Comments: Dillon General Contractors

Well owner's information package delivered ☐ Yes ☐ No

Date Package Delivered: Y Y Y Y M M D D

Date Work Completed: 2019 09 09

Ministry Use Only

Audit No. Z302886

MAR 08 2019 Received

MAR 08 2019

C-1241 Z302886

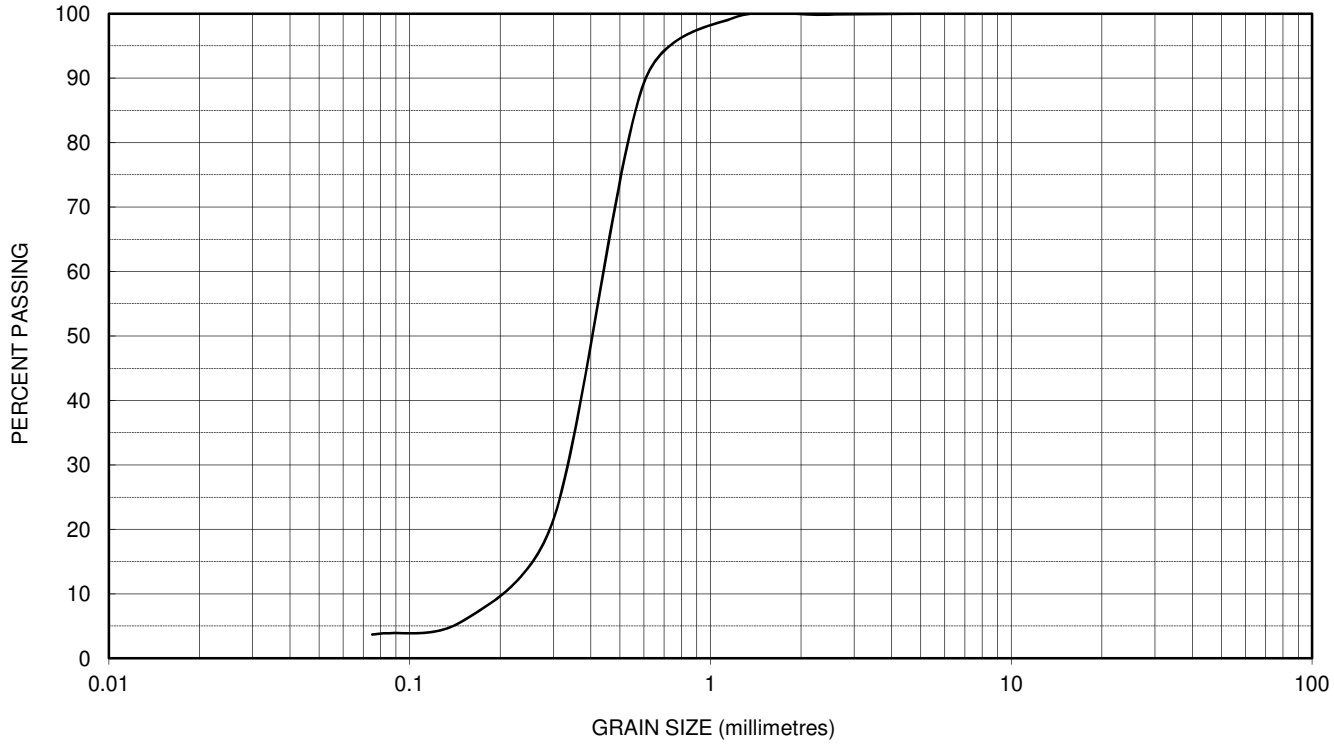
ATTACHMENT C

GRAIN SIZE ANALYSES OF REPRESENTATIVE SOIL SAMPLES

Grain Size Distribution Analysis

Kollaard Associates
Engineers

SAND



SIEVE SIZE (mm)	76.2	53	26.5	19.0	16	13..2	9.5	4.75	2.36	1.180	0.600	0.300	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
Box 189, 210 Prescott Street
Kemptville, Ontario K0G 1J0
(613) 860-0923, FAX: (613) 258-0475

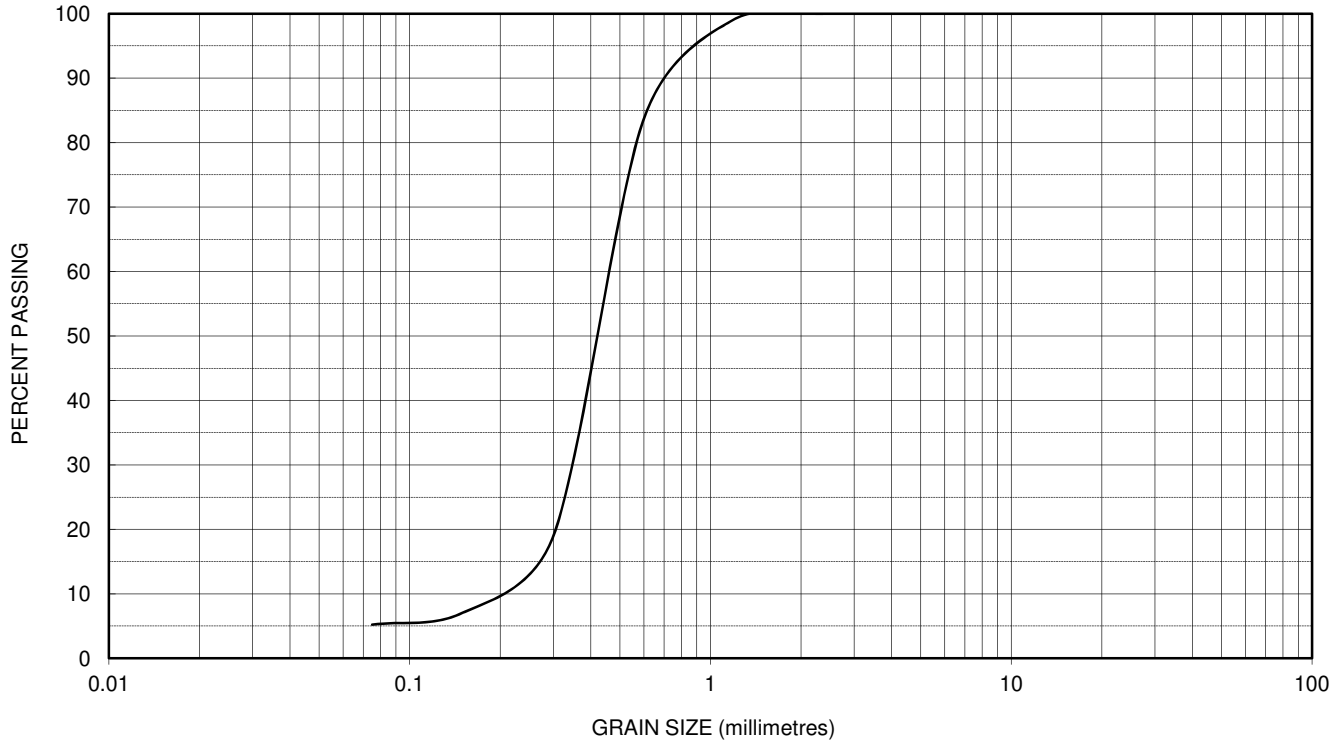
Issued by: Dean Tataryn, B.E.S., EP

Date: February 12, 2021

Grain Size Distribution Analysis

Kollaard Associates
Engineers

SAND



SIEVE SIZE (mm)	76.2	53	26.5	19.0	16	13..2	9.5	4.75	2.36	1.180	0.600	0.300	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
Box 189, 210 Prescott Street
Kemptville, Ontario K0G 1J0
(613) 860-0923, FAX: (613) 258-0475

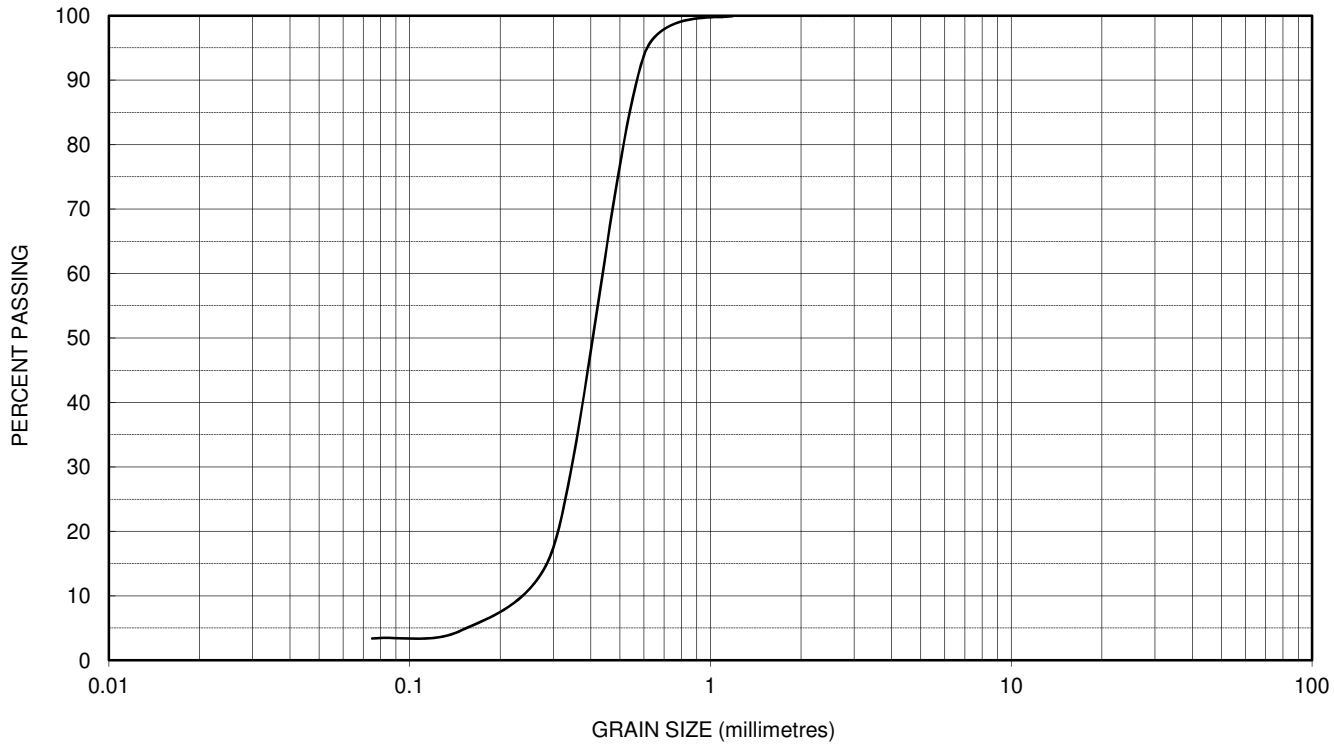
Issued by: Dean Tartaryn, B.E.S. EP

Date: February 12, 2021

Grain Size Distribution Analysis

Kollaard Associates
Engineers

SAND



SIEVE SIZE (mm)	76.2	53	26.5	19.0	16	13..2	9.5	4.75	2.36	1.180	0.600	0.300	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

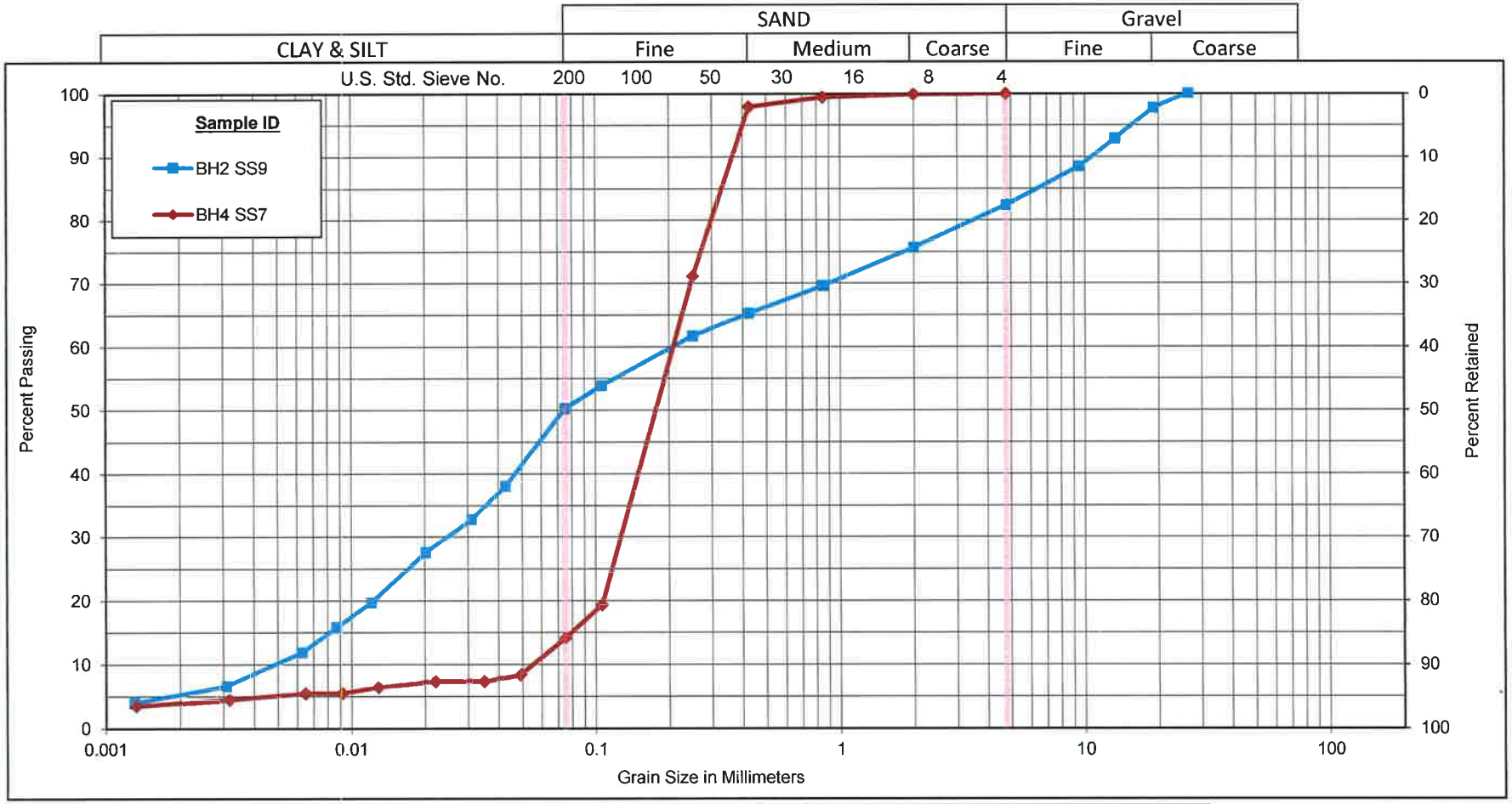
REMARKS:

Kollaard Associates
Engineers
Box 189, 210 Prescott Street
Kemptville, Ontario K0G 1J0
(613) 860-0923, FAX: (613) 258-0475

Issued by: Dean Tataryn, B.E.S. EP

Date: February 12, 2021

Unified Soil Classification System



Sample ID	Depth	% Gravel	% Sand	% Silt	% Clay
BH2 SS9	7.62-8.22 m	17.7	32.1	45.2	5.0
BH4 SS7	4.52-5.18 m	0.0	85.9	10.1	4.0

Stantec

GRAIN SIZE DISTRIBUTION

Kollaard Associates Inc. File # 210064

3200 Reid Lane, Osgoode

Figure No.

Project No. 122410003

Stantec

Particle-Size Analysis of Soils

LS702

AASHTO T88

PROJECT DETAILS			
Client:	Kollaard Associates Inc. File # 210064	Project No.:	122410003
Project:	3200 Reid Lane, Osgoode	Test Method:	LS702
Material Type:	Soil	Sampled By:	Kollaard Associates Inc.
Source:	BH2	Date Sampled:	February 4, 2021
Sample No.:	SS9	Tested By:	Denis Rodriguez
Sample Depth	7.62-8.22 m	Date Tested:	February 15, 2021

WASH TEST DATA	
Oven Dry Mass In Hydrometer Analysis (g)	56.48
Sample Weight after Hydrometer and Wash (g)	20.26
Percent Passing No. 200 Sieve (%)	64.1
Percent Passing Corrected (%)	48.50

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

SOIL INFORMATION		
Liquid Limit (LL)		
Plasticity Index (PI)		
Soil Classification		
Specific Gravity (G_s)	2.750	
Sg. Correction Factor (α)	0.978	
Mass of Dispersing Agent/Litre	40	g

CALCULATION OF DRY SOIL MASS	
Oven Dried Mass (W_o), (g)	101.04
Air Dried Mass (W_a), (g)	101.21
Hygroscopic Corr. Factor ($F=W_o/W_a$)	0.9983
Air Dried Mass in Analysis (M_a), (g)	56.58
Oven Dried Mass in Analysis (M_o), (g)	56.48
Percent Passing 2.0 mm Sieve (P_{10}), (%)	75.62
Sample Represented (W), (g)	74.69

SIEVE ANALYSIS		
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)[1]	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
PAN	20.26	

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

HYDROMETER DETAILS	
Volume of Bulb (V_B), (cm^3)	63.0
Length of Bulb (L_2), (cm)	14.47
Length from '0' Reading to Top of Bulb (L_1), (cm)	10.29
Scale Dimension (h_s), (cm/Div)	0.155
Cross-Sectional Area of Cylinder (A), (cm^2)	27.25
Meniscus Correction (H_m), (g/L)	1.0

START TIME 9:33 AM

HYDROMETER ANALYSIS

Date	Time	Elapsed Time T Mins	H_s Divisions g/L	H_c Divisions g/L	Temperature T_c °C	Corrected Reading $R = H_s - H_c$ g/L	Percent Passing P %	L cm	η Poise	K	Diameter D mm
15-Feb-21	9:34 AM	1	36.0	7.0	21.0	29.0	37.99	10.63404	9.84835	0.013126	0.04280
15-Feb-21	9:35 AM	2	32.0	7.0	21.0	25.0	32.75	11.25404	9.84835	0.013126	0.03114
15-Feb-21	9:38 AM	5	28.0	7.0	21.0	21.0	27.51	11.87404	9.84835	0.013126	0.02023
15-Feb-21	9:48 AM	15	22.0	7.0	21.0	15.0	19.65	12.80404	9.84835	0.013126	0.01213
15-Feb-21	10:03 AM	30	19.0	7.0	21.0	12.0	15.72	13.26904	9.84835	0.013126	0.00873
15-Feb-21	10:33 AM	60	16.0	7.0	21.0	9.0	11.79	13.73404	9.84835	0.013126	0.00628
15-Feb-21	1:43 PM	250	12.0	7.0	22.0	5.0	6.5492	14.35404	9.61570	0.012970	0.00311
16-Feb-21	9:33 AM	1440	10.0	7.0	22.0	3.0	3.9295	14.66404	9.61570	0.012970	0.00131

Remarks:

Reviewed By: Brian Prevost

Date: February 23/2021

Stantec

Particle-Size Analysis of Soils

LS702

AASHTO T88

PROJECT DETAILS			
Client:	Kollaard Associates Inc. File # 210064	Project No.:	122410003
Project:	3200 Reid Lane, Osgoode	Test Method:	LS702
Material Type:	Soil	Sampled By:	Kollaard Associates Inc.
Source:	BH4	Date Sampled:	February 3, 2021
Sample No.:	SS7	Tested By:	Denis Rodriguez
Sample Depth	4.52-5.18 m	Date Tested:	February 15, 2021

WASH TEST DATA	
Oven Dry Mass In Hydrometer Analysis (g)	99.19
Sample Weight after Hydrometer and Wash (g)	87.02
Percent Passing No. 200 Sieve (%)	12.3
Percent Passing Corrected (%)	12.25

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

SOIL INFORMATION		
Liquid Limit (LL)		
Plasticity Index (PI)		
Soil Classification		
Specific Gravity (G_s)	2.750	
Sg. Correction Factor (α)	0.978	
Mass of Dispersing Agent/Litre	24	g

CALCULATION OF DRY SOIL MASS	
Oven Dried Mass (W_o), (g)	80.13
Air Dried Mass (W_a), (g)	80.22
Hygroscopic Corr. Factor ($F=W_o/W_a$)	0.9989
Air Dried Mass in Analysis (M_a), (g)	99.30
Oven Dried Mass in Analysis (M_o), (g)	99.19
Percent Passing 2.0 mm Sieve (P_{10}), (%)	99.89
Sample Represented (W), (g)	99.30

SIEVE ANALYSIS		
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		100.0
19.0		100.0
13.2		100.0
9.5		100.0
4.75	0.0	100.0
2.00	0.7	99.9
Total (C + F)[1]	623.40	
0.850	0.44	99.44
0.425	1.99	97.88
0.250	28.60	71.09
0.106	80.00	19.32
0.075	85.18	14.11
PAN	86.94	

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

HYDROMETER DETAILS	
Volume of Bulb (V_B), (cm^3)	63.0
Length of Bulb (L_2), (cm)	14.47
Length from '0' Reading to Top of Bulb (L_1), (cm)	10.29
Scale Dimension (h_s), (cm/Div)	0.155
Cross-Sectional Area of Cylinder (A), (cm^2)	27.25
Meniscus Correction (H_m), (g/L)	1.0

START TIME 9:40 AM

HYDROMETER ANALYSIS

Date	Time	Elapsed Time T Mins	H_s Divisions g/L	H_c Divisions g/L	Temperature T_c °C	Corrected Reading $R = H_s - H_c$ g/L	Percent Passing P %	L cm	η Poise	K	Diameter D mm
15-Feb-21	9:41 AM	1	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	5	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	60	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 Prevost

Date: February 23/2021

ATTACHMENT D

RESULTS OF LABORATORY NITROGEN TESTING OF RECEIVING AQUIFER SAMPLES

Certificate of Analysis

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: 1947810
Date Submitted: 2021-02-12
Date Reported: 2021-02-18
Project: 210064
COC #: 211512

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:

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: http://www.cala.ca/scopes/2602.pdf.

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.

Certificate of Analysis

eurofins | 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: 1947810
Date Submitted: 2021-02-12
Date Reported: 2021-02-18
Project: 210064
COC #: 211512

				Lab I.D.	1542143	1542144	1542145
				Sample Matrix	GW	GW	GW
				Sample Type			
				Sampling Date	2021-02-12	2021-02-12	2021-02-12
				Sample I.D.	MW2	MW4	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
	N-NO3	0.10	mg/L		5.80	<0.10	<0.10

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

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Certificate of Analysis

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: 1947810
Date Submitted: 2021-02-12
Date Reported: 2021-02-18
Project: 210064
COC #: 211512

QC Summary

Analyte	Blank	QC % Rec	QC Limits
Run No 396258 **Analysis/Extraction Date** 2021-02-16 **Analyst** SKH **Method** C SM4500-NO3-F			
N-NO2	<0.10 mg/L	96	
N-NO3	<0.10 mg/L	103	
Run No 396301 **Analysis/Extraction Date** 2021-02-17 **Analyst** SKH **Method** EPA 350.1			
N-NH3	<0.010 mg/L	100	80-120
Run No 396312 **Analysis/Extraction Date** 2021-02-17 **Analyst** SKH **Method** EPA 351.2			
Total Kjeldahl Nitrogen	<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.

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

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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.
210 Prescott St., Box 189
Kemptville, ON
K0G 1J0
Attention : Colleen Vermeersch

Reception Date : 2023-11-20
Project : 210064
Sampler : NA
PO Number : Not Applicable
Temperature : 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
* : Analysis conducted by external subcontracting
^ : Analysis not accredited

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OFFICIAL CERTIFICATE OF ANALYSIS - EXCEEDENCE SUMMARY

Client : Kollaard Associates Inc.
Project : 210064

Reception Date : 2023-11-20

Eurofins Sample No	Client Sample Identification	Analyte	Result	Units	Exceeded Criteria		
					A	B	C
Nitrate (Water, Colorimetry)							
7379224	BH1	Nitrate (as Nitrogen)	18.8	mg/L	10		

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OFFICIAL CERTIFICATE OF ANALYSIS - RESULTS

Client : Kollaard Associates Inc.
Project : 210064

Reception Date: 2023-11-20

					Eurofins Sample No :	7379224	7379225	7379226	7379227	7379228
					Matrix :	Ground Water	Ground Water	Ground Water	Ground Water	Ground Water
					Sampling Date :	2023-11-20	2023-11-20	2023-11-20	2023-11-20	2023-11-20
					Client Sample Identification :	BH1	BH3	BH5	BH7	BH8
Nutrients	**RL**	**Unit**	**Criteria**							
			A	**B**	**C**					
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 Sample No :	7379229	7379230	7379231		
					Matrix :	Ground Water	Ground Water	Ground Water		
					Sampling Date :	2023-11-20	2023-11-20	2023-11-20		
					Client Sample Identification :	BH9	BH10	BH11		
Nutrients	**RL**	**Unit**	**Criteria**							
			A	**B**	**C**					
Ammonia, Total (Water, Colorimetry)										
Ammonia (Total, as Nitrogen)	0.02	mg/L				0.065	0.032	0.208		
Nitrate (Water, Colorimetry)										
Nitrate (as Nitrogen)	0.1	mg/L	10			<0.10	<0.10	<0.10		
Nitrite (Water, Colorimetry)										
Nitrite (as Nitrogen)	0.1	mg/L	1			<0.10	<0.10	<0.10		
Total Kjeldahl Nitrogen (Water, Colorimetry)										
Total Kjeldahl Nitrogen	0.1	mg/L				0.503	0.415	0.569		

Approved by : R. Zafari
Raheleh Zafari,
Ottawa, Environmental Chemist, PhD

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

OFFICIAL CERTIFICATE OF ANALYSIS - QUALITY CONTROL

Client : Kollaard Associates Inc.
Project : 210064

Reception Date: 2023-11-20

Parameter	Unit	RL	Blank	QC		Matrix Spike		Duplicate	
				Recovery %	Range %	Recovery %	Range %	RPD %	Range %
Ammonia, Total (Water, Colorimetry)									
Method : Ammonia (Water, Colorimetry). Internal method: OTT-I-NUT-WI46201.									
Ammonia (Total, as Nitrogen)	mg/L	0.02	<0.020	101	80-120	115	80-120	-	0-20
Associated Samples : 7379224, 7379225, 7379226, 7379227, 7379228, 7379229, 7379230, 7379231								Prep Date: 2023-11-24 Analysis Date: 2023-11-24	
Nitrate (Water, Colorimetry)									
Method : Nitrates/Nitrates (Water, Colorimetry). Internal method: OTT-I-NUT-WI46199.									
Nitrate (as Nitrogen)	mg/L	0.1	<0.10	106	80-120				
Associated Samples : 7379224, 7379225, 7379226, 7379227, 7379228, 7379229, 7379230, 7379231								Prep Date: 2023-11-22 Analysis Date: 2023-11-22	
Nitrite (Water, Colorimetry)									
Method : Nitrates/Nitrates (Water, Colorimetry). Internal method: OTT-I-NUT-WI46199.									
Nitrite (as Nitrogen)	mg/L	0.1	<0.10	93	80-120				
Associated Samples : 7379224, 7379225, 7379226, 7379227, 7379228, 7379229, 7379230, 7379231								Prep Date: 2023-11-22 Analysis Date: 2023-11-22	
Total Kjeldahl Nitrogen (Water, Colorimetry)									
Method : TKN (Water, colorimetry). Internal method: OTT-I-NUT-WI46201.									
Total Kjeldahl Nitrogen	mg/L	0.1	<0.100	104	70-130	102	70-130	11	0-20
Associated Samples : 7379224, 7379225, 7379226, 7379227, 7379228, 7379229, 7379230, 7379231								Prep Date: 2023-11-24 Analysis Date: 2023-11-27	

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

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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.
210 Prescott St., Box 189
Kemptville, ON
K0G 1J0
Attention : Colleen Vermeersch

Reception Date : 2024-02-28
Project : 210064
Sampler : NA
PO Number : Not Applicable
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	N/A : Not applicable	* : Analysis conducted by external subcontracting
QC : Reference material (QC)	1 : Results in annex	^ : Analysis not accredited

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

OFFICIAL CERTIFICATE OF ANALYSIS - EXCEEDENCE SUMMARY

Client : Kollaard Associates Inc.
Project : 210064

Reception Date : 2024-02-28

Eurofins Sample No	Client Sample Identification	Analyte	Result	Units	Exceeded Criteria		
					A	B	C
Nitrate (Water, Colorimetry)							
7543456	BH1	Nitrate (as Nitrogen)	15.6	mg/L	10		

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

OFFICIAL CERTIFICATE OF ANALYSIS - RESULTS

Client : Kollaard Associates Inc.
Project : 210064

Reception Date: 2024-02-28

					Eurofins Sample No :	7543456	7543457	7543458	7543459	7543460
					Matrix :	Ground Water	Ground Water	Ground Water	Ground Water	Ground Water
					Sampling Date :	2024-02-27	2024-02-28	2024-02-27	2024-02-28	2024-02-28
					Client Sample Identification :	BH1	BH5	BH7	BH8	BH9
Nutrients	**RL**	**Unit**	**Criteria**							
			A	**B**	**C**					
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 Sample No :	7543461	7543462			
					Matrix :	Ground Water	Ground Water			
					Sampling Date :	2024-02-28	2024-02-28			
					Client Sample Identification :	BH10	BH11			
Nutrients	**RL**	**Unit**	**Criteria**							
			A	**B**	**C**					
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 Kjeldahl Nitrogen (Water, Colorimetry)										
Total Kjeldahl Nitrogen	0.1	mg/L				0.806	0.442			

Approved by :

Emma-Dawn Ferguson,
Enviromental Chemist

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

OFFICIAL CERTIFICATE OF ANALYSIS - QUALITY CONTROL

Client : Kollaard Associates Inc.
Project : 210064

Reception Date: 2024-02-28

Parameter	Unit	RL	Blank	QC		Matrix Spike		Duplicate	
				Recovery %	Range %	Recovery %	Range %	RPD %	Range %
Ammonia, Total (Water, Colorimetry)									
Method : Ammonia (Water, Colorimetry). Internal method: OTT-I-NUT-WI46201.									
Ammonia (Total, as Nitrogen)	mg/L	0.02	<0.020	103	80-120	99	80-120	1	0-20
Associated Samples : 7543456, 7543457, 7543458, 7543459, 7543460, 7543461, 7543462								Prep Date: 2024-02-29 Analysis Date: 2024-02-29	
Nitrate (Water, Colorimetry)									
Method : Nitrates/Nitrates (Water, Colorimetry). Internal method: OTT-I-NUT-WI46199.									
Nitrate (as Nitrogen)	mg/L	0.1	<0.10	100	80-120			1	0-20
Associated Samples : 7543456, 7543457, 7543458, 7543459, 7543460, 7543461, 7543462								Prep Date: 2024-03-01 Analysis Date: 2024-03-01	
Nitrite (Water, Colorimetry)									
Method : Nitrates/Nitrates (Water, Colorimetry). Internal method: OTT-I-NUT-WI46199.									
Nitrite (as Nitrogen)	mg/L	0.1	<0.10	101	80-120	104	80-120	-	0-20
Associated Samples : 7543456, 7543457, 7543458, 7543459, 7543460, 7543461, 7543462								Prep Date: 2024-03-01 Analysis Date: 2024-03-01	
Total Kjeldahl Nitrogen (Water, Colorimetry)									
Method : TKN (Water, colorimetry). Internal method: OTT-I-NUT-WI46201.									
Total Kjeldahl Nitrogen	mg/L	0.1	<0.100	124	70-130	109	70-130	-	0-20
Associated Samples : 7543456, 7543457, 7543458, 7543459, 7543460, 7543461, 7543462								Prep Date: 2024-02-29 Analysis Date: 2024-03-01	

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

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:	1993661
Date Submitted:	2023-02-10
Date Reported:	2023-02-14
Project:	210064
COC #:	905438

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:

APPROVAL: _____
Raheleh Zafari, Environmental Chemist

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Certificate of Analysis

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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.

Report Number: 1993661
Date Submitted: 2023-02-10
Date Reported: 2023-02-14
Project: 210064
COC #: 905438

				Lab I.D.	1674214
				Sample Matrix	Water
				Sample Type	
				Sampling Date	2023-02-09
				Sample I.D.	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 = *** = Guideline Exceedence**

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Report Number: 1993661
Date Submitted: 2023-02-10
Date Reported: 2023-02-14
Project: 210064
COC #: 905438

QC Summary

Analyte	Blank	QC % Rec	QC Limits
Run No 437473 **Analysis/Extraction Date** 2023-02-13 **Analyst** SKH **Method** EPA 350.1			
N-NH3	<0.020 mg/L	92	80-120
Run No 437476 **Analysis/Extraction Date** 2023-02-13 **Analyst** SKH **Method** C SM4500-NO3-F			
N-NO2	<0.10 mg/L	100	80-120
N-NO3	<0.10 mg/L	101	80-120
Run No 437487 **Analysis/Extraction Date** 2023-02-13 **Analyst** SKH **Method** EPA 351.2			
Total Kjeldahl Nitrogen	<0.100 mg/L	116	70-130

Guideline = *** = Guideline Exceedence**

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Attention: Ms. Colleen Vermeersch
PO#:
Invoice to: Kollaard Associates Inc.

Report Number: 1947810
Date Submitted: 2021-02-12
Date Reported: 2021-02-18
Project: 210064
COC #: 211512

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:

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

Addrine Thomas, Inorganics Supervisor

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Attention: Ms. Colleen Vermeersch
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Invoice to: Kollaard Associates Inc.

Report Number: 1947810
Date Submitted: 2021-02-12
Date Reported: 2021-02-18
Project: 210064
COC #: 211512

Group	Analyte	MRL	Units	Guideline	Lab I.D. / Sample Matrix / Sample Type / Sampling Date / Sample I.D.		
					1542143 GW 2021-02-12 ~~MW2~~ MW1	1542144 GW 2021-02-12 ~~MW4~~ MW3	1542145 GW 2021-02-12 ~~MW6~~ 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 = *** = Guideline Exceedence**

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Report Number: 1947810
Date Submitted: 2021-02-12
Date Reported: 2021-02-18
Project: 210064
COC #: 211512

QC Summary

Analyte	Blank	QC % Rec	QC Limits
Run No 396258 **Analysis/Extraction Date** 2021-02-16 **Analyst** SKH **Method** C SM4500-NO3-F			
N-NO2	<0.10 mg/L	96	
N-NO3	<0.10 mg/L	103	
Run No 396301 **Analysis/Extraction Date** 2021-02-17 **Analyst** SKH **Method** EPA 350.1			
N-NH3	<0.010 mg/L	100	80-120
Run No 396312 **Analysis/Extraction Date** 2021-02-17 **Analyst** SKH **Method** EPA 351.2			
Total Kjeldahl Nitrogen	<0.100 mg/L	112	70-130

Guideline = *** = 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.

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

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:

APPROVAL: _____
Emma-Dawn Ferguson, Chemist

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Attention: Ms. Colleen Vermeersch
PO#:
Invoice to: Kollaard Associates Inc.

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

					Lab I.D.	1632864
					Sample Matrix	Water
					Sample Type	
					Sampling Date	2022-06-17
					Sample I.D.	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 = *** = Guideline Exceedence**

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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** 2022-06-23 **Analyst** ML **Method** EPA 350.1			
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			
N-NO2	<0.10 mg/L	102	80-120
N-NO3	<0.10 mg/L	103	80-120
Run No 424502 **Analysis/Extraction Date** 2022-06-24 **Analyst** SKH **Method** EPA 351.2			
Total Kjeldahl Nitrogen	<0.100 mg/L	105	70-130

Guideline = *** = Guideline Exceedence**

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Attention: Ms. Colleen Vermeersch
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Invoice to: Kollaard Associates Inc.

Report Number: 1973212
Date Submitted: 2022-03-11
Date Reported: 2022-03-18
Project: 210064
COC #: 887286

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:

APPROVAL: _____
Addrine Thomas, Inorganics Supervisor

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Report Number: 1973212
Date Submitted: 2022-03-11
Date Reported: 2022-03-18
Project: 210064
COC #: 887286

				Lab I.D.	1614181
				Sample Matrix	Water
				Sample Type	
				Sampling Date	2022-03-10
				Sample I.D.	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 = *** = Guideline Exceedence**

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Report Number: 1973212
Date Submitted: 2022-03-11
Date Reported: 2022-03-18
Project: 210064
COC #: 887286

QC Summary

Analyte	Blank	QC % Rec	QC Limits
Run No 418445 **Analysis/Extraction Date** 2022-03-14 **Analyst** SKH **Method** EPA 350.1			
N-NH3	<0.010 mg/L	101	80-120
Run No 418494 **Analysis/Extraction Date** 2022-03-14 **Analyst** SKH **Method** EPA 351.2			
Total Kjeldahl Nitrogen	<0.100 mg/L	99	70-130
Run No 418535 **Analysis/Extraction Date** 2022-03-15 **Analyst** SKH **Method** C SM4500-NO3-F			
N-NO2	<0.10 mg/L	98	80-120
N-NO3	<0.10 mg/L	98	80-120

Guideline = *** = Guideline Exceedence**

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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**

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Invoice to: Kollaard Associates Inc.

Report Number: 1972761
Date Submitted: 2022-03-04
Date Reported: 2022-03-09
Project: 210064
COC #: 886841

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:

APPROVAL: _____
Addrine Thomas, Inorganics Supervisor

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Report Number: 1972761
Date Submitted: 2022-03-04
Date Reported: 2022-03-09
Project: 210064
COC #: 886841

				Lab I.D.	1613058	1613059
				Sample Matrix	Water	Water
				Sample Type		
				Sampling Date	2022-03-03	2022-03-04
				Sample I.D.	BH1	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 = *** = Guideline Exceedence**

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Report Number: 1972761
Date Submitted: 2022-03-04
Date Reported: 2022-03-09
Project: 210064
COC #: 886841

QC Summary

Analyte	Blank	QC % Rec	QC Limits
Run No 418148 **Analysis/Extraction Date** 2022-03-07 **Analyst** SKH **Method** EPA 351.2			
Total Kjeldahl Nitrogen	<0.100 mg/L	101	70-130
Run No 418208 **Analysis/Extraction Date** 2022-03-08 **Analyst** SKH **Method** C SM4500-NO3-F			
N-NO2	<0.10 mg/L	88	80-120
N-NO3	<0.10 mg/L	99	80-120
Run No 418237 **Analysis/Extraction Date** 2022-03-09 **Analyst** SKH **Method** EPA 350.1			
N-NH3	0.013 mg/L	118	80-120

Guideline = *** = Guideline Exceedence**

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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**

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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

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:

APPROVAL: _____
Emma-Dawn Ferguson, Chemist

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Attention: Ms. Colleen Vermeersch
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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.	1625779	1625780	1625781	1625782
				Sample Matrix	Water	Water	Water	Water
				Sample Type				
				Sampling Date	2022-05-06	2022-05-06	2022-05-06	2022-05-06
				Sample I.D.	5503 Osgoode Main	3216 Reids Lane	5535 Osgoode Main	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**

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Attention: Ms. Colleen Vermeersch
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Invoice to: Kollaard Associates Inc.

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

QC Summary

Analyte	Blank	QC % Rec	QC Limits
Run No 421994 **Analysis/Extraction Date** 2022-05-17 **Analyst** AaN **Method** SM 4110			
N-NO2	<0.10 mg/L	97	90-110
N-NO3	<0.10 mg/L	102	90-110
Run No 422119 **Analysis/Extraction Date** 2022-05-18 **Analyst** SKH **Method** SM 4110			
N-NO3	<1.0 mg/L	111	90-110
Run No 422273 **Analysis/Extraction Date** 2022-05-18 **Analyst** SKH **Method** EPA 351.2			
Total Kjeldahl Nitrogen	<0.100 mg/L	114	70-130
Run No 422331 **Analysis/Extraction Date** 2022-05-19 **Analyst** SKH **Method** EPA 350.1			
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.

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

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.

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

ATTACHMENT E

SEPTIC EFFLUENT DILUTION CALCULATIONS

April 2024 210064

SEPTIC EFFLUENT DILUTION CALCULATIONS

Number of Lots	7	
Gross Site Area	35035	m^2
Env. Can. Water Surplus (NPI)	379	mm

Hard Surface Area (Post-Development)

Roadway	1965	Lot Based
Dwellings (320 m2/house)	2240	
Other impervious surfaces (pools, etc.)	700	
Driveways	996	
Total	5901	m^2

Net Infiltration Area = Gross Site Area - Hard Surface Area (Post-Development)

29134 m^2

Infiltration Reduction Factor:

Topography (rolling)	0.20
Soil (open sandy loam)	0.40
Cover (cultivated/orchard)	0.10
Total IRF	0.70

Septic Dilution For 7 Septic Systems:

$$\frac{\text{Number of Lots} \times 365\ m^3 \text{ Effluent Per Year} \times 40\ mg/L\ NO_3}{\text{Number of Lots} \times 365\ m^3 \text{ Effluent Per Year} + (\text{Net Infiltration Area} \times \text{NPI} \times \text{IRF})} = 9.9\ mg/L\ NO_3\text{-N}$$

Ottawa Intl A WATER BUDGET MEANS FOR THE PERIOD 1939-2021 DC20492

LAT.... 45.32 WATER HOLDING CAPACITY... 75 MM HEAT INDEX... 36.75
LONG... 75.67 LOWER ZONE..... 45 MM A..... 1.080

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 STANDARD DEVIATIONS FOR 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

Certificate of Analysis

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

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:

Addrine Thomas 2021.05.20 16:03:15 -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: http://www.cala.ca/scopes/2602.pdf.

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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.

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Certificate of Analysis

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

Group	Analyte	MRL	Units	Guideline	1556912 Water 2021-05-12 TW#1-3 hr	1556913 Water 2021-05-12 TW#1-6 hr
	Lab I.D.				1556912	1556913
	Sample Matrix				Water	Water
	Sample Type					
	Sampling Date				2021-05-12	2021-05-12
	Sample I.D.				TW#1-3 hr	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
	pH	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
	B	0.01	mg/L	IMAC 5.0	0.53	0.54
	Ba	0.01	mg/L	MAC 1.0	0.08	0.07
	Ca	1	mg/L		44	44
	Cd	0.0001	mg/L	MAC 0.005	<0.0001	<0.0001
	Co	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.

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

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Certificate of Analysis

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

Group	Analyte	MRL	Units	Guideline	1556912 Water 2021-05-12 TW#1-3 hr	1556913 Water 2021-05-12 TW#1-6 hr
	Lab I.D.				1556912	1556913
	Sample Matrix				Water	Water
	Sample Type					
	Sampling Date				2021-05-12	2021-05-12
	Sample I.D.				TW#1-3 hr	TW#1-6 hr
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 *** = Guideline Exceedence**

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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

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: 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 Date** 2021-05-13 **Analyst** K B **Method** C SM2130B			
Turbidity	0.6 NTU	101	70-130
Run No 400603 **Analysis/Extraction Date** 2021-05-14 **Analyst** SKH **Method** C SM2120C			
Colour	<2 TCU	102	90-110
Run No 400654 **Analysis/Extraction Date** 2021-05-14 **Analyst** SKH **Method** EPA 200.8			
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.
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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.

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
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 **Analysis/Extraction Date** 2021-05-15 **Analyst** SWS **Method** SM2320,2510,4500H/F			
F	<0.10 mg/L	100	90-110
pH		100	90-110
Run No 400666 **Analysis/Extraction Date** 2021-05-14 **Analyst** SWS **Method** SM 5310B			
DOC	<0.5 mg/L	89	80-120
Run No 400717 **Analysis/Extraction Date** 2021-05-17 **Analyst** SKH **Method** EPA 350.1			
N-NH3	<0.010 mg/L	99	80-120

Guideline = ODWSOG *** = Guideline Exceedence**

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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

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: 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 400719 **Analysis/Extraction Date** 2021-05-17 **Analyst** SKH **Method** EPA 351.2			
Total Kjeldahl Nitrogen	<0.100 mg/L	102	70-130
Run No 400737 **Analysis/Extraction Date** 2021-05-18 **Analyst** Z S **Method** M SM3120B-3500C			
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 No 400792 **Analysis/Extraction Date** 2021-05-17 **Analyst** SWS **Method** SM2320,2510,4500H/F			
Alkalinity (CaCO3)	<5 mg/L	97	90-110
Conductivity	<5 uS/cm	97	90-110
Run No 400797 **Analysis/Extraction Date** 2021-05-19 **Analyst** AET **Method** SM 4110			
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 *** = 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

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Certificate of Analysis

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: 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 400811 **Analysis/Extraction Date** 2021-05-19 **Analyst** AET **Method** C SM2340B			
Hardness as CaCO3			
Ion Balance			
TDS (COND - CALC)			
Run No 400865 **Analysis/Extraction Date** 2021-05-14 **Analyst** AET **Method** SUBCONTRACT-A			
Phenols	<0.0010 mg/L	98	
Tannin & Lignin	<0.10 mg/L	103	
Run No 400982 **Analysis/Extraction Date** 2021-05-20 **Analyst** AET **Method** C SM4500-S2-D			
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.

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

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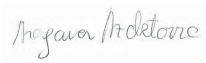
Client: Kollaard Associates Inc.
210 Prescott St., Box 189
Kemptville, ON
K0G 1J0
Attention: Ms. Colleen Vermeersch
PO#:
Invoice to: Kollaard Associates Inc.

Report Number: 1953218
Date Submitted: 2021-05-13
Date Reported: 2021-05-16
Project: 210064
COC #: 873626

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 Dzeletovic
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

Certificate of Analysis

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: 1953218
Date Submitted: 2021-05-13
Date Reported: 2021-05-16
Project: 210064
COC #: 873626

Group	Analyte	MRL	Units	Guideline	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
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 *** = Guideline Exceedence**

Results relate only to the parameters tested on the samples submitted.
Analytical Method: AMBCOLM1
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

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

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:

APPROVAL: Addrine Thomas 2021.05.19 16:06:04 -04'00'

Addrine Thomas, Inorganics Supervisor

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

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Certificate of Analysis

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

Group	Analyte	MRL	Units	Guideline	1556262 Water 2021-05-10 TW2-3 hrs	1556263 Water 2021-05-10 TW2-6 hrs
	Lab I.D.				1556262	1556263
	Sample Matrix				Water	Water
	Sample Type					
	Sampling Date				2021-05-10	2021-05-10
	Sample I.D.				TW2-3 hrs	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
	pH	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
	B	0.01	mg/L	IMAC 5.0	0.57	0.58
	Ba	0.01	mg/L	MAC 1.0	0.26	0.20
	Ca	1	mg/L		40	44
	Cd	0.0001	mg/L	MAC 0.005	<0.0001	<0.0001
	Co	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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Certificate of Analysis

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

Group	Analyte	MRL	Units	Guideline	1556262 Water 2021-05-10 TW2-3 hrs	1556263 Water 2021-05-10 TW2-6 hrs
	Lab I.D.				1556262	1556263
	Sample Matrix				Water	Water
	Sample Type					
	Sampling Date				2021-05-10	2021-05-10
	Sample I.D.				TW2-3 hrs	TW2-6 hrs
Metals	Hg	0.0001	mg/L	MAC 0.001	<0.0001	<0.0001
	K	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

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COC #: 873496

QC Summary

Analyte	Blank	QC % Rec	QC Limits
Run No 400409 **Analysis/Extraction Date** 2021-05-12 **Analyst** K B **Method** C SM2130B			
Turbidity	<0.1 NTU	101	70-130
Run No 400492 **Analysis/Extraction Date** 2021-05-13 **Analyst** K B **Method** C SM2120C			
Colour	<2 TCU	87	90-110
Run No 400510 **Analysis/Extraction Date** 2021-05-13 **Analyst** SKH **Method** EPA 200.8			
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 *** = Guideline Exceedence**

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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
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 **Analysis/Extraction Date** 2021-05-12 **Analyst** SWS **Method** SM 5310B			
DOC	<0.5 mg/L	92	80-120
Run No 400525 **Analysis/Extraction Date** 2021-05-14 **Analyst** AET **Method** SM 4110			
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 No 400564 **Analysis/Extraction Date** 2021-05-13 **Analyst** SKH **Method** EPA 350.1			
N-NH3	<0.010 mg/L	106	80-120

Guideline = ODWSOG *** = Guideline Exceedence**

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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 400568 **Analysis/Extraction Date** 2021-05-13 **Analyst** SKH **Method** EPA 351.2			
Total Kjeldahl Nitrogen	<0.100 mg/L	95	70-130
Run No 400570 **Analysis/Extraction Date** 2021-05-13 **Analyst** SWS **Method** SM2320,2510,4500H/F			
Alkalinity (CaCO3)	<5 mg/L	98	90-110
Conductivity	<5 uS/cm	100	90-110
F	<0.10 mg/L	101	90-110
pH		100	90-110
Run No 400624 **Analysis/Extraction Date** 2021-05-14 **Analyst** Z S **Method** M SM3120B-3500C			
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 No 400722 **Analysis/Extraction Date** 2021-05-18 **Analyst** AET **Method** SM 4110			
Chloride	<5 mg/L		90-110

Guideline = ODWSOG *** = Guideline Exceedence**

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Attention: Ms. Colleen Vermeersch
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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** 2021-05-18 **Analyst** AET **Method** C SM2340B			
Hardness as CaCO3			
Ion Balance			
TDS (COND - CALC)			
Run No 400761 **Analysis/Extraction Date** 2021-05-18 **Analyst** AET **Method** C SM4500-S2-D			
S2-	<0.01 mg/L	92	80-120
Run No 400865 **Analysis/Extraction Date** 2021-05-18 **Analyst** AET **Method** SUBCONTRACT-A			
Phenols	<0.0010 mg/L	103	
Tannin & Lignin	<0.10 mg/L	100	

Guideline = ODWSOG *** = Guideline Exceedence**

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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

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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.

Report Number: 1952957
Date Submitted: 2021-05-11
Date Reported: 2021-05-13
Project: 210064
COC #: 873496

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 2021.05.13 11:33:30 -04'00'

APPROVAL: _____

Steven Tosh, Operations Manager

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.

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.

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Certificate of Analysis

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: 1952957
Date Submitted: 2021-05-11
Date Reported: 2021-05-13
Project: 210064
COC #: 873496

Group	Analyte	MRL	Units	Guideline	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
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 *** = Guideline Exceedence**

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

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210 Prescott St., Box 189
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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

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:

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

APPROVAL: _____
Addrine Thomas, Inorganics Supervisor

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Certificate of Analysis

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

Group	Analyte	MRL	Units	Guideline	1555611 Water 2021-05-05 TW#3-3 hr	1555612 Water 2021-05-05 TW#3-6 hr
	Lab I.D. / Sample Matrix / Sample Type / Sampling Date / Sample I.D.					
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
	pH	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
	B	0.01	mg/L	IMAC 5.0	0.06	0.06
	Ba	0.01	mg/L	MAC 1.0	0.32	0.33
	Ca	1	mg/L		65	68
	Cd	0.0001	mg/L	MAC 0.005	<0.0001	<0.0001
	Co	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

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Group	Analyte	MRL	Units	Guideline	1555611 Water 2021-05-05 TW#3-3 hr	1555612 Water 2021-05-05 TW#3-6 hr
	Lab I.D.				1555611	1555612
	Sample Matrix				Water	Water
	Sample Type					
	Sampling Date				2021-05-05	2021-05-05
	Sample I.D.				TW#3-3 hr	TW#3-6 hr
Metals	Hg	0.0001	mg/L	MAC 0.001	<0.0001	<0.0001
	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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Date Submitted: 2021-05-06
Date Reported: 2021-05-13
Project: 210064
COC #: 873355

QC Summary

Analyte	Blank	QC % Rec	QC Limits
Run No 400186 **Analysis/Extraction Date** 2021-05-07 **Analyst** K B **Method** C SM2130B			
Turbidity	<0.1 NTU	101	70-130
Run No 400216 **Analysis/Extraction Date** 2021-05-07 **Analyst** AET **Method** C SM4500-S2-D			
S2-	<0.01 mg/L	82	80-120
Run No 400254 **Analysis/Extraction Date** 2021-05-07 **Analyst** SKH **Method** EPA 351.2			
Total Kjeldahl Nitrogen	<0.100 mg/L	101	70-130
Run No 400261 **Analysis/Extraction Date** 2021-05-07 **Analyst** SWS **Method** SM 5310B			
DOC	<0.5 mg/L	89	80-120
Run No 400292 **Analysis/Extraction Date** 2021-05-10 **Analyst** Z S **Method** M SM3120B-3500C			
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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COC #: 873355

QC Summary

Analyte	Blank	QC % Rec	QC Limits
Run No 400294 **Analysis/Extraction Date** 2021-05-10 **Analyst** SKH **Method** EPA 200.8			
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 **Analysis/Extraction Date** 2021-05-10 **Analyst** SKH **Method** EPA 350.1			
N-NH3	<0.010 mg/L	108	80-120
Run No 400382 **Analysis/Extraction Date** 2021-05-11 **Analyst** K B **Method** C SM2120C			
Colour	<2 TCU	82	90-110

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COC #: 873355

QC Summary

Analyte	Blank	QC % Rec	QC Limits
Run No 400384 **Analysis/Extraction Date** 2021-05-11 **Analyst** SKH **Method** EPA 200.8			
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 No 400405 **Analysis/Extraction Date** 2021-05-11 **Analyst** SKH **Method** EPA 351.2			
Total Kjeldahl Nitrogen	<0.100 mg/L	130	70-130
Run No 400415 **Analysis/Extraction Date** 2021-05-12 **Analyst** AET **Method** SM 4110			
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** 2021-05-11 **Analyst** SWS **Method** C SM4500-FC			

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.

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

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

QC Summary

Analyte	Blank	QC % Rec	QC Limits
F	<0.10 mg/L	94	90-110
Run No 400423 **Analysis/Extraction Date** 2021-05-10 **Analyst** AET **Method** SUBCONTRACT-A			
Phenols	<0.0010 mg/L	101	
Tannin & Lignin	<0.10 mg/L	100	
Run No 400441 **Analysis/Extraction Date** 2021-05-11 **Analyst** SWS **Method** C SM2510B			
Conductivity	<5 uS/cm	99	95-105
Run No 400442 **Analysis/Extraction Date** 2021-05-11 **Analyst** SWS **Method** SM2320,2510,4500H/F			
pH	5.85	100	90-110
Run No 400451 **Analysis/Extraction Date** 2021-05-11 **Analyst** SWS **Method** SM 2320B			
Alkalinity (CaCO3)	<5 mg/L	100	95-105
Run No 400525 **Analysis/Extraction Date** 2021-05-13 **Analyst** AET **Method** SM 4110			
Chloride	<1 mg/L	100	90-110
Run No 400544 **Analysis/Extraction Date** 2021-05-13 **Analyst** AET **Method** C SM2340B			

Guideline = ODWSOG *** = Guideline Exceedence**

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COC #: 873355

QC Summary

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

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.

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

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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.

Report Number: 1952724
Date Submitted: 2021-05-06
Date Reported: 2021-05-09
Project: 210064
COC #: 873355

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:

APPROVAL: Dragana Dzeletovic 2021.05.09 10:54:46 -04'00'

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.

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.

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Certificate of Analysis

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: 1952724
Date Submitted: 2021-05-06
Date Reported: 2021-05-09
Project: 210064
COC #: 873355

				Lab I.D.	1555613	1555614
				Sample Matrix	Water	Water
				Sample Type		
				Sampling Date	2021-05-05	2021-05-05
				Sample I.D.	TW#3-3 hr	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 *** = Guideline Exceedence**

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

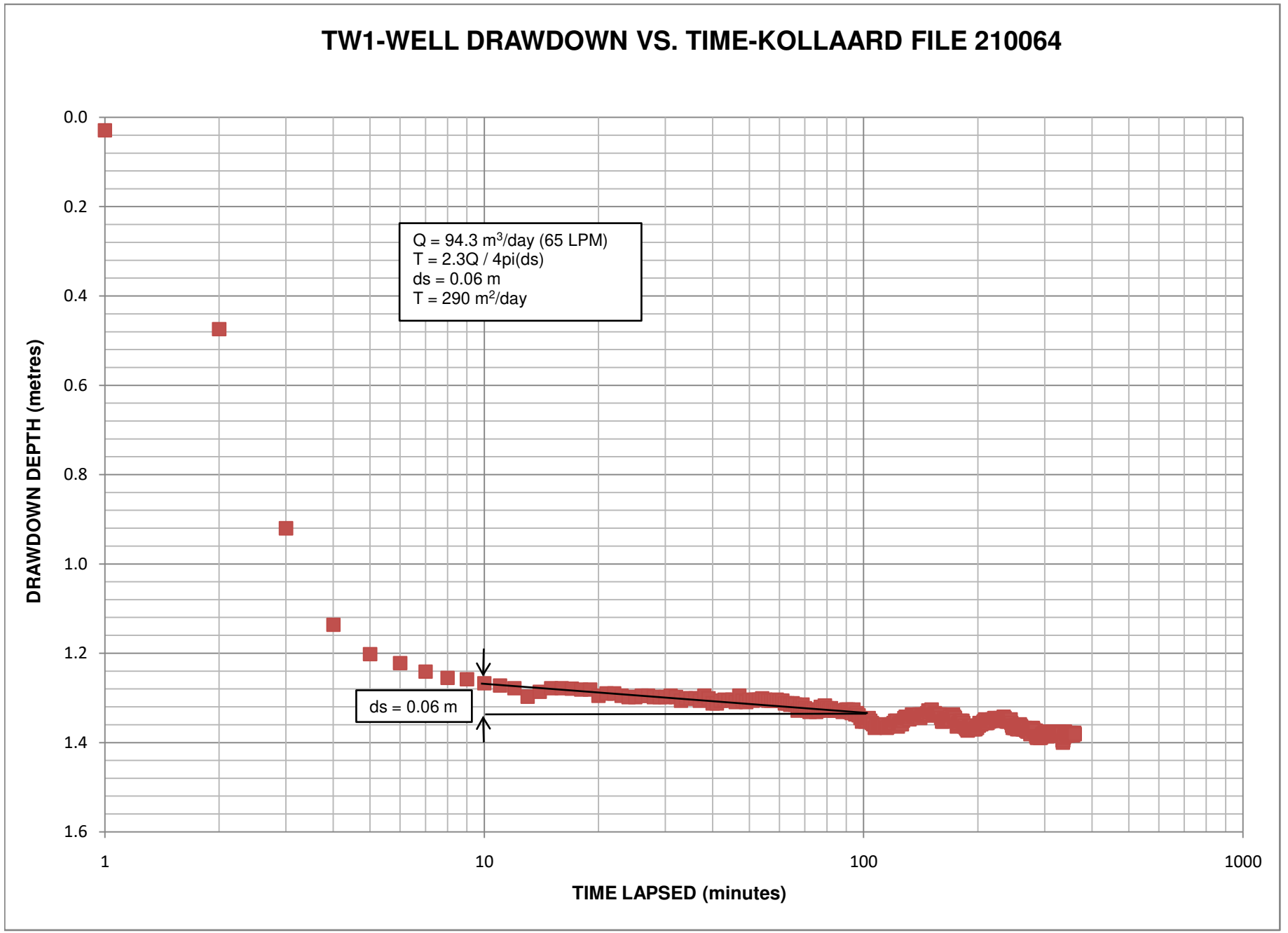
MRL = Method Reporting Limit, AO = Aesthetic Objective, OG = Operational Guideline, MAC = Maximum Acceptable Concentration, IMAC = Interim Maximum Acceptable Concentration, STD = Standard, PWQO = Provincial Water Quality Guideline, IPWQO = Interim Provincial Water Quality Objective, TDR = Typical Desired Range

ATTACHMENT G

RESULTS OF LABORATORY TESTING OF EXISTING NEIGHBOURING WELL WATER SAMPLES

ATTACHMENT H

PUMPING TEST DATA FOR TW1


TW1-WELL DRAWDOWN VS. TIME-KOLLAARD FILE 210064
DRAWDOWN DEPTH (metres)
0.0
0.2
0.4
0.6
0.8
1.0
1.2
1.4
1.6
1
10
100
1000
TIME LAPSED (minutes)
Q = 94.3 m3/day (65 LPM)
T = 2.3Q / 4pi(ds)
ds = 0.06 m
T = 290 m2/day
ds = 0.06 m

Kollaard File 210064 Pump Rate 65.5 litres/minute

DRAWDOWN DATA TW1

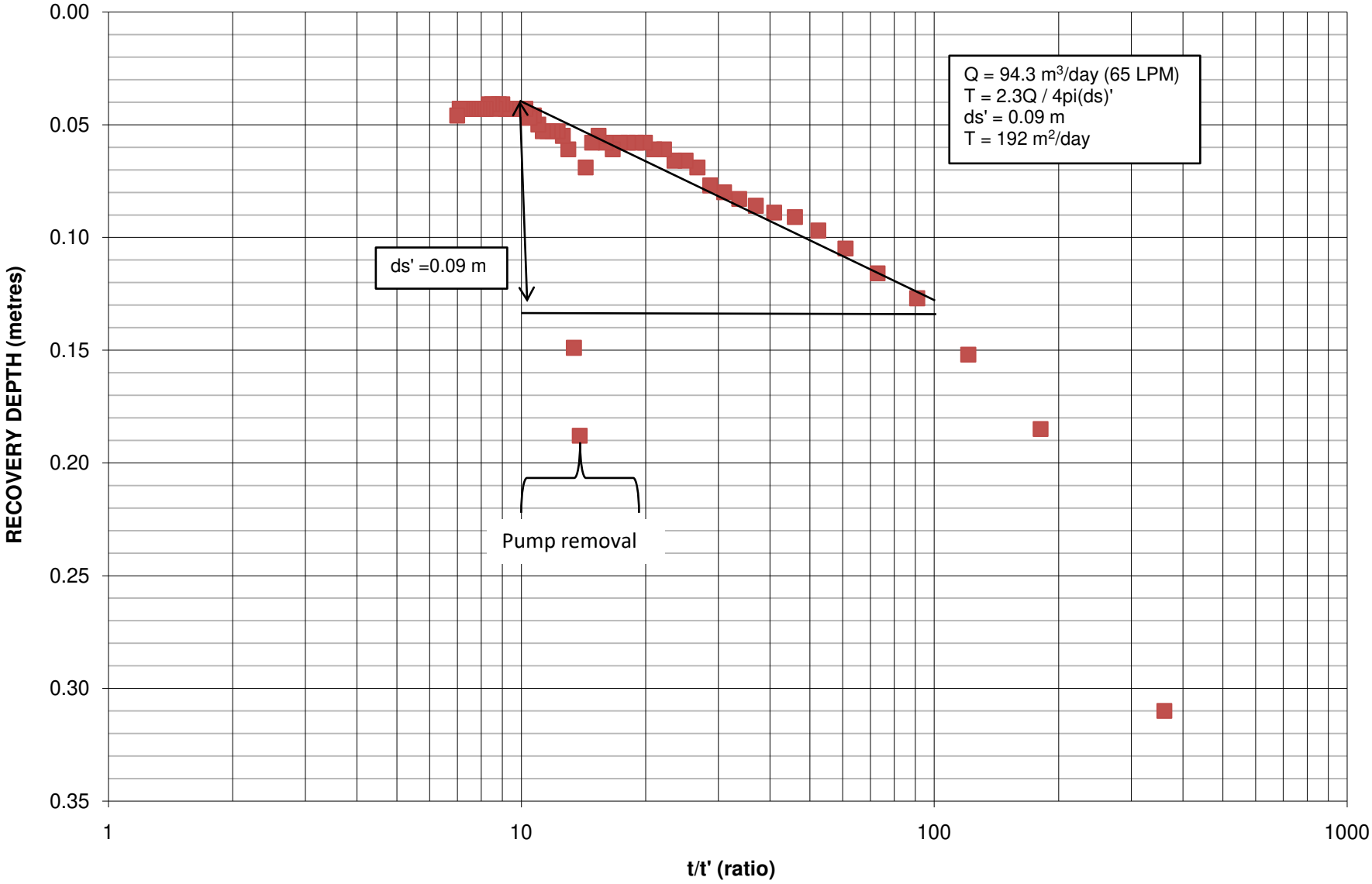
Time Lapsed (minutes)	Abs Pres (kPa)	Temp (°C)	Water Level (m)	Drawdown (m)
0	388.094	8.382	-6.86	0.00
1	387.814	8.282	-6.889	0.03
2	383.442	8.282	-7.334	0.47
3	379.072	8.282	-7.78	0.92
4	376.956	8.282	-7.996	1.14
5	376.305	8.282	-8.062	1.20
6	376.115	8.282	-8.082	1.22
7	375.925	8.282	-8.101	1.24
8	375.789	8.282	-8.115	1.26
9	375.754	8.182	-8.118	1.26
10	375.672	8.182	-8.127	1.27
11	375.618	8.182	-8.132	1.27
12	375.564	8.182	-8.138	1.28
13	375.374	8.182	-8.157	1.30
14	375.483	8.182	-8.146	1.29
15	375.564	8.182	-8.138	1.28
16	375.564	8.182	-8.138	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	375.393	8.082	-8.155	1.30
21	375.447	8.082	-8.15	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	375.366	8.082	-8.158	1.30
26	375.393	8.082	-8.155	1.30
27	375.393	8.082	-8.155	1.30
28	375.366	8.082	-8.158	1.30
29	375.366	8.082	-8.158	1.30
30	375.366	8.082	-8.158	1.30
31	375.393	8.082	-8.155	1.30
32	375.366	8.082	-8.158	1.30
33	375.284	8.082	-8.166	1.31
34	375.338	8.082	-8.161	1.30
35	375.338	8.082	-8.161	1.30
36	375.338	8.082	-8.161	1.30
37	375.284	8.082	-8.166	1.31
38	375.393	8.082	-8.155	1.30
39	375.338	8.082	-8.161	1.30
40	375.23	8.082	-8.172	1.31
41	375.23	8.082	-8.172	1.31
42	375.284	8.082	-8.166	1.31
43	375.311	8.082	-8.164	1.30
44	375.284	8.082	-8.166	1.31
45	375.311	8.082	-8.164	1.30
46	375.257	8.082	-8.169	1.31
47	375.393	8.082	-8.155	1.30
48	375.284	8.082	-8.166	1.31
49	375.257	8.082	-8.169	1.31
50	375.311	8.082	-8.164	1.30
51	375.284	8.082	-8.166	1.31
52	375.311	8.082	-8.164	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	375.284	8.082	-8.166	1.31
57	375.284	8.082	-8.166	1.31
58	375.284	8.082	-8.166	1.31
59	375.311	8.082	-8.164	1.30
60	375.284	8.082	-8.166	1.31
61	375.284	8.082	-8.166	1.31
62	375.23	8.082	-8.172	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	375.203	8.082	-8.175	1.32
67	375.067	8.082	-8.188	1.33
68	375.176	8.082	-8.177	1.32
69	375.203	8.082	-8.175	1.32
70	375.121	8.082	-8.183	1.32
71	375.067	8.082	-8.188	1.33
72	375.04	8.082	-8.191	1.33
73	375.094	8.082	-8.186	1.33
74	375.094	8.082	-8.186	1.33
75	375.04	8.082	-8.191	1.33
76	375.067	8.082	-8.188	1.33
77	375.149	8.082	-8.18	1.32
78	375.121	8.082	-8.183	1.32
79	375.176	8.082	-8.177	1.32
80	375.121	8.082	-8.183	1.32
81	375.067	8.082	-8.188	1.33
82	375.121	8.082	-8.183	1.32
83	375.067	8.082	-8.188	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
109	374.715	8.082	-8.224	1.36
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
135	374.959	8.082	-8.199	1.34
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
171	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

180	374.85	8.082	-8.211	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
218	374.877	8.082	-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
311	374.525	8.082	-8.244	1.38
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	8.082	-8.244	1.38
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	374.552	8.082	-8.241	1.38
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



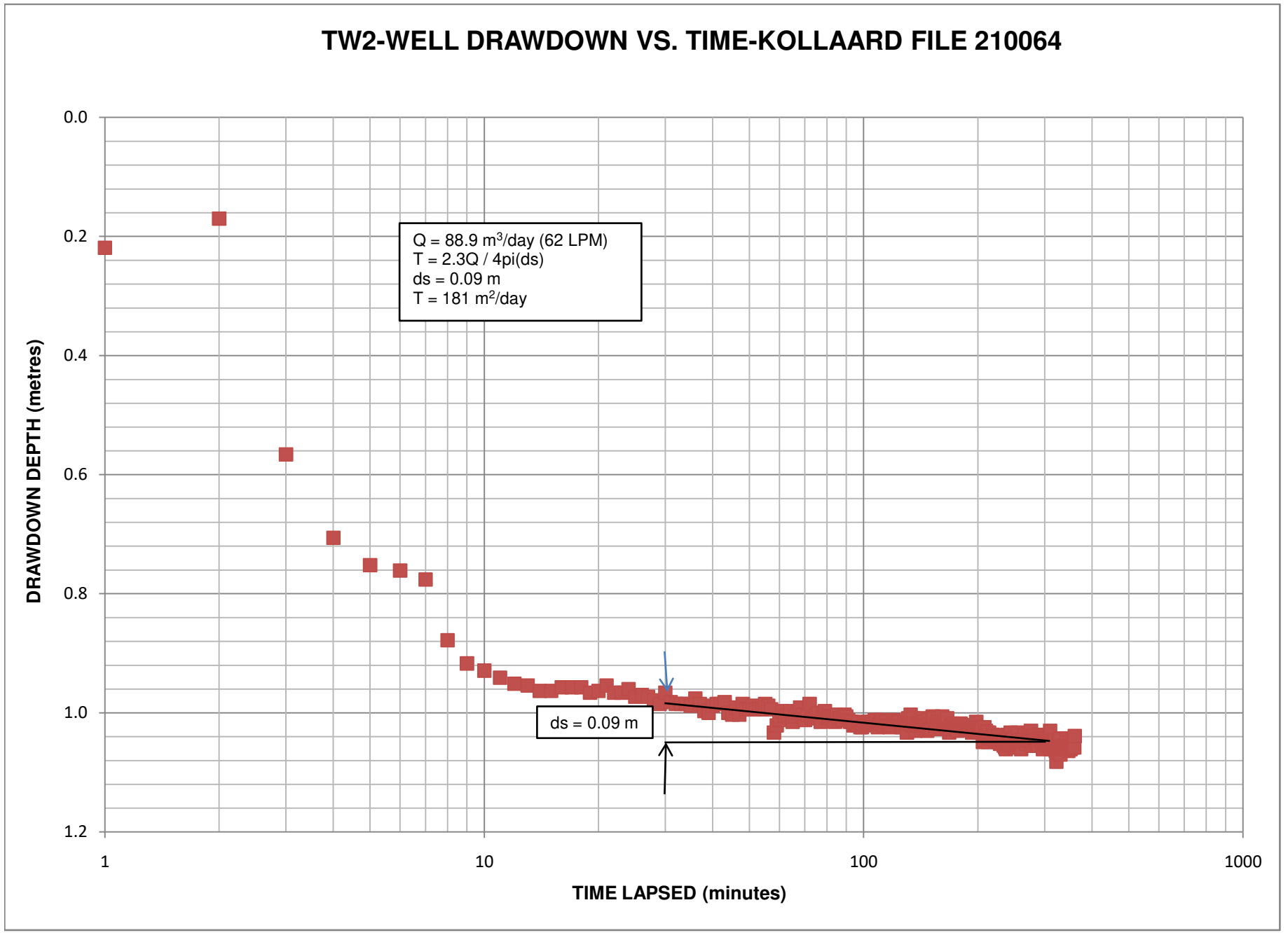
Kollaard File 210064

RECOVERY DATA TW-1

t'	t / t'	Abs Pres (kPa)	Temp (°C)	Water Level (m)	Drawdown (m)	Recovery (%)
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%
21	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%
24	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%
27	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	13.0	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	11.3	387.579	8.082	-6.913	0.05	96%
36	11.0	387.606	8.082	-6.91	0.05	96%
37	10.7	387.642	8.182	-6.906	0.05	97%
38	10.5	387.633	8.082	-6.907	0.05	97%
39	10.2	387.669	8.182	-6.903	0.04	97%
40	10.0	387.669	8.182	-6.903	0.04	97%
41	9.8	387.669	8.182	-6.903	0.04	97%
42	9.6	387.669	8.182	-6.903	0.04	97%
43	9.4	387.669	8.182	-6.903	0.04	97%
44	9.2	387.669	8.182	-6.903	0.04	97%
45	9.0	387.696	8.182	-6.901	0.04	97%
46	8.8	387.696	8.182	-6.901	0.04	97%
47	8.7	387.669	8.182	-6.903	0.04	97%
48	8.5	387.696	8.182	-6.901	0.04	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%
51	8.1	387.669	8.182	-6.903	0.04	97%
52	7.9	387.669	8.182	-6.903	0.04	97%
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


TW2-WELL DRAWDOWN VS. TIME-KOLLAARD FILE 210064
Q = 88.9 m3/day (62 LPM)
T = 2.3Q / 4pi(ds)
ds = 0.09 m
T = 181 m2/day
ds = 0.09 m
DRAWDOWN DEPTH (metres)
0.0
0.2
0.4
0.6
0.8
1.0
1.2
1
10
100
1000
TIME LAPSED (minutes)

Kollaard File 210064 Pump Rate 61.7 litres/minute

DRAWDOWN DATA TW2

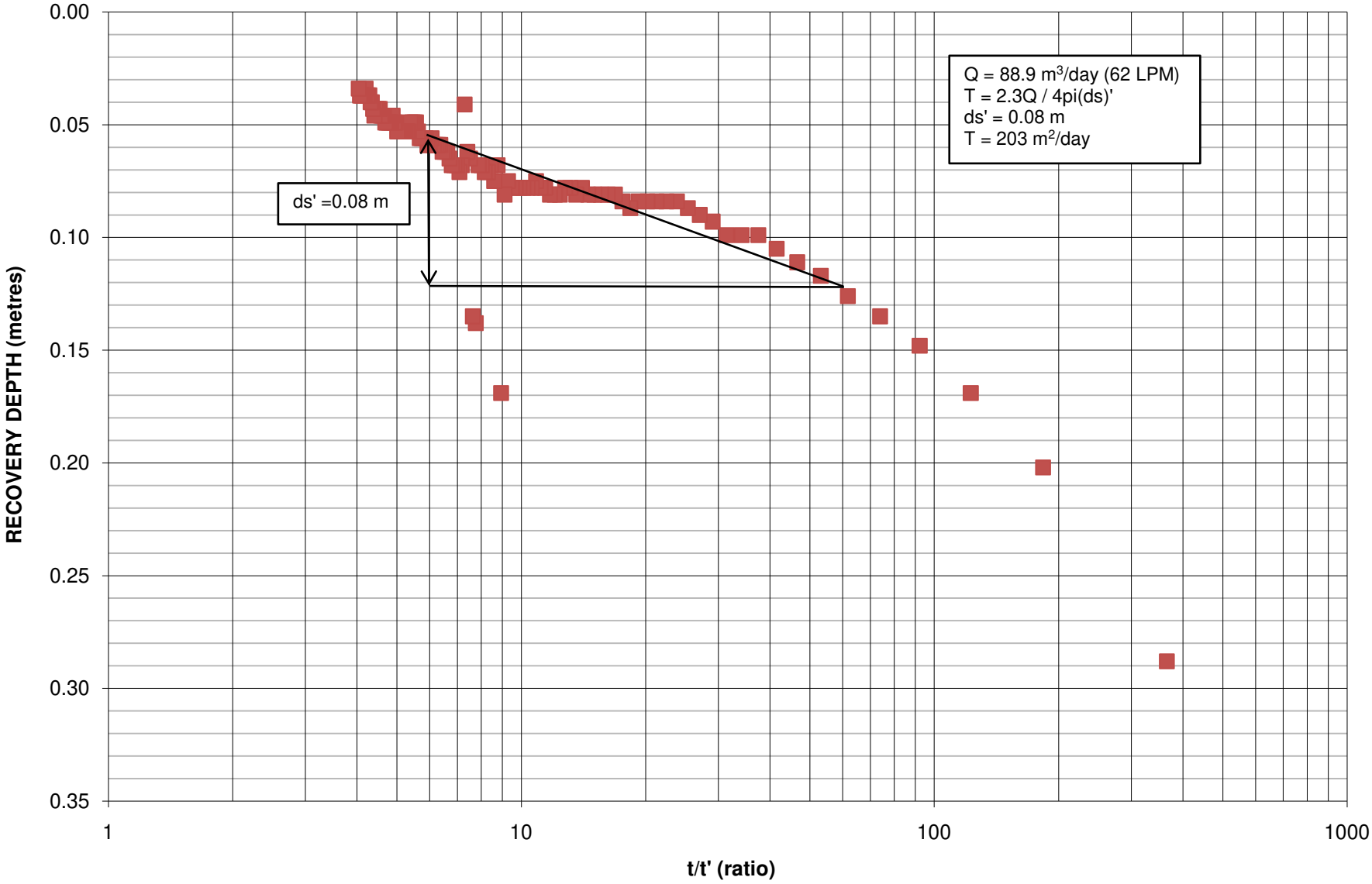
Time Lapsed (minutes)	Abs Pres (kPa)	Temp (°C)	Water Level (m)	Drawdown (m)
0	392.344	8.182	-6.68	0.00
1	390.194	8.182	-6.899	0.22
2	390.672	8.182	-6.85	0.17
3	386.79	8.182	-7.246	0.57
4	385.417	8.182	-7.386	0.71
5	384.969	8.182	-7.432	0.75
6	384.88	8.182	-7.441	0.76
7	384.73	8.182	-7.456	0.78
8	383.738	8.082	-7.558	0.88
9	383.35	8.082	-7.597	0.92
10	383.231	8.082	-7.609	0.93
11	383.112	8.082	-7.621	0.94
12	383.022	8.082	-7.631	0.95
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	382.955	7.983	-7.637	0.96
18	382.955	7.983	-7.637	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	382.926	7.983	-7.64	0.96
25	382.806	7.983	-7.653	0.97
26	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	382.866	7.983	-7.646	0.97
31	382.717	7.983	-7.662	0.98
32	382.687	7.983	-7.665	0.99
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	382.567	7.983	-7.677	1.00
39	382.538	7.983	-7.68	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	382.538	7.983	-7.68	1.00
45	382.508	7.983	-7.683	1.00
46	382.627	7.983	-7.671	0.99
47	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	382.657	7.983	-7.668	0.99
52	382.597	7.983	-7.674	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
58	382.209	7.983	-7.713	1.03
59	382.329	7.983	-7.701	1.02
60	382.418	7.983	-7.692	1.01
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	382.567	7.983	-7.677	1.00
65	382.388	7.983	-7.695	1.02
66	382.478	7.983	-7.686	1.01
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	382.508	7.983	-7.683	1.00
72	382.687	7.983	-7.665	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	382.388	7.983	-7.695	1.02
78	382.538	7.983	-7.68	1.00
79	382.567	7.983	-7.677	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	382.388	7.983	-7.695	1.02
85	382.508	7.983	-7.683	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
104	382.358	7.983	-7.698	1.02
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	-7.689	1.01
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
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
151	382.299	7.983	-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
159	382.388	7.983	-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

180	382.358	7.983	-7.698	1.02
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
186	382.269	7.983	-7.707	1.03
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
192	382.269	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	382.239	7.983	-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
228	382.09	7.983	-7.726	1.05
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
244	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

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
277	382	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
301	382.06	7.983	-7.729	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
311	381.941	7.983	-7.741	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
318	382.06	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

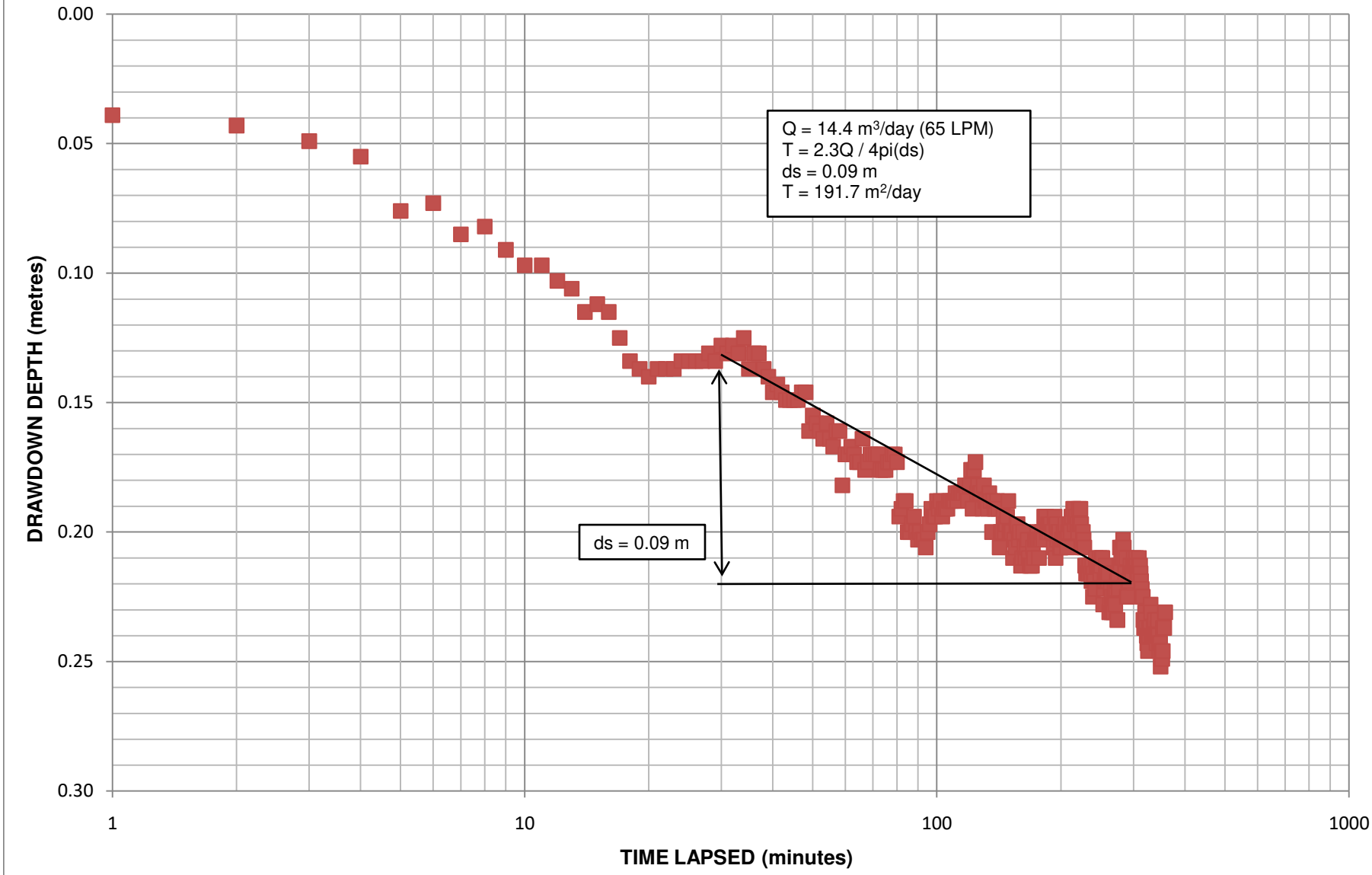
t'	t / t'	Abs Pres (kPa)	Temp (°C)	Water Level (m)	Drawdown (m)	Recovery (%)
1	366.0	389.523	7.983	-6.968	0.29	73%
2	183.5	390.359	7.983	-6.882	0.20	81%
3	122.7	390.687	7.983	-6.849	0.17	84%
4	92.3	390.896	7.983	-6.828	0.15	86%
5	74.0	391.016	7.983	-6.815	0.14	87%
6	61.8	391.105	7.983	-6.806	0.13	88%
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%
17	22.5	391.523	7.983	-6.764	0.08	92%
18	21.3	391.523	7.983	-6.764	0.08	92%
19	20.2	391.523	7.983	-6.764	0.08	92%
20	19.3	391.523	7.983	-6.764	0.08	92%
21	18.4	391.494	7.983	-6.767	0.09	92%
22	17.6	391.523	7.983	-6.764	0.08	92%
23	16.9	391.553	7.983	-6.761	0.08	92%
24	16.2	391.553	7.983	-6.761	0.08	92%
25	15.6	391.553	7.983	-6.761	0.08	92%
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%
58	7.3	391.942	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%
67	6.4	391.74	8.082	-6.742	0.06	94%
68	6.4	391.77	8.082	-6.739	0.06	94%
69	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%
117	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%

ATTACHMENT J

PUMPING TEST DATA FOR TW3

TW3-WELL DRAWDOWN VS. TIME-KOLLAARD FILE 210064



Kollaard File 210064 Pump Rate 65.5 litres/minute

DRAWDOWN DATA TW3

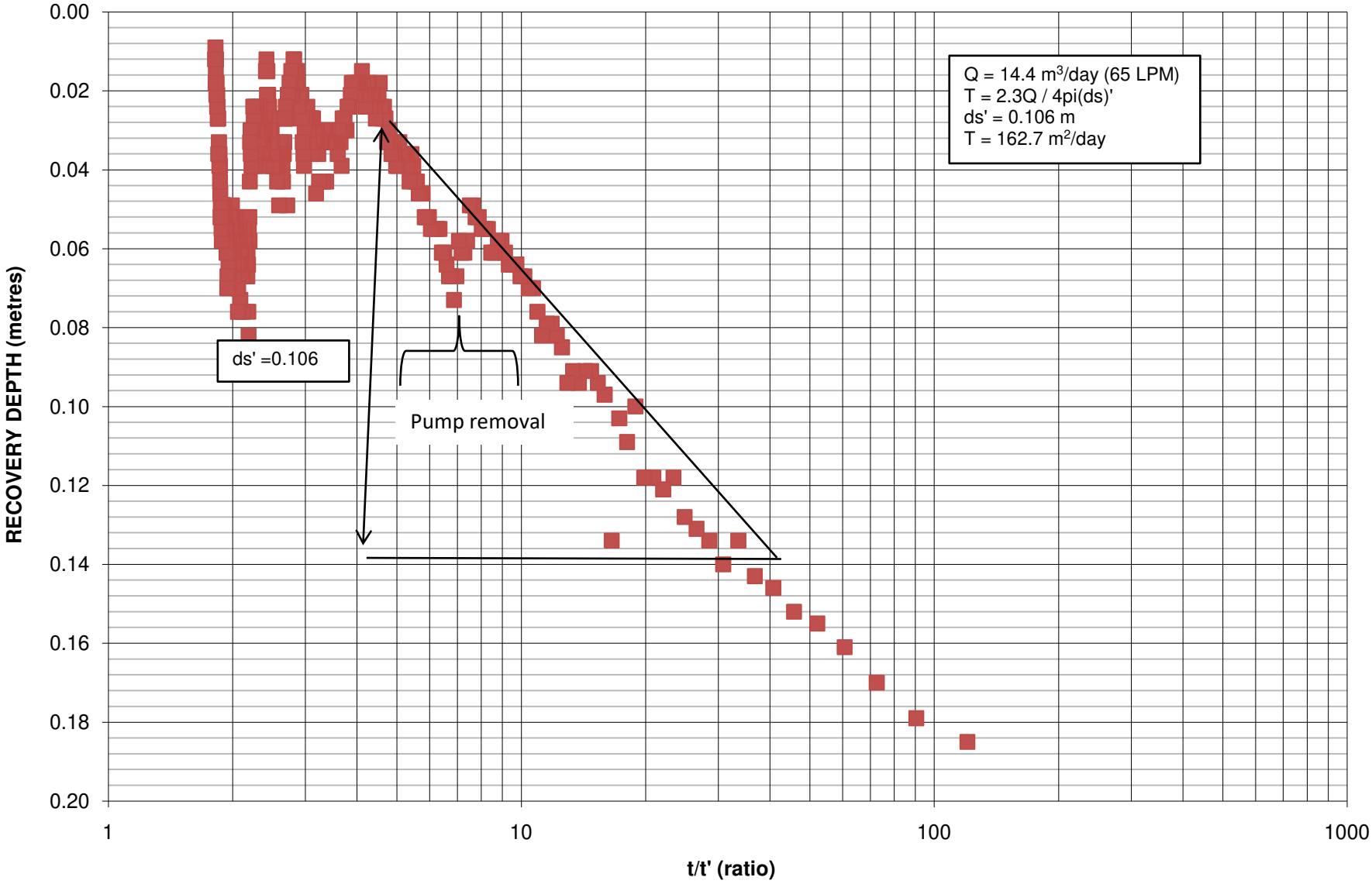
Time Lapsed (minutes)	Abs Pres (kPa)	Temp (°C)	Water Level (m)	Drawdown (m)
0	359.25	7.983	-4.53	0.00
1	358.863	7.983	-4.569	0.04
2	358.833	7.983	-4.573	0.04
3	358.774	7.983	-4.579	0.05
4	358.714	7.983	-4.585	0.05
5	358.506	7.983	-4.606	0.08
6	358.535	7.983	-4.603	0.07
7	358.416	7.983	-4.615	0.09
8	358.446	7.983	-4.612	0.08
9	358.357	7.983	-4.621	0.09
10	358.297	7.983	-4.627	0.10
11	358.297	7.983	-4.627	0.10
12	358.238	7.983	-4.633	0.10
13	358.208	7.983	-4.636	0.11
14	358.118	7.983	-4.645	0.11
15	358.148	7.983	-4.642	0.11
16	358.118	7.983	-4.645	0.11
17	358.029	7.983	-4.655	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	357.91	7.983	-4.667	0.14
22	357.91	7.983	-4.667	0.14
23	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	357.94	7.983	-4.664	0.13
28	357.969	7.983	-4.661	0.13
29	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	357.999	7.983	-4.658	0.13
33	357.969	7.983	-4.661	0.13
34	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	357.969	7.983	-4.661	0.13
38	357.91	7.983	-4.667	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	357.82	7.983	-4.676	0.15
43	357.791	7.983	-4.679	0.15
44	357.791	7.983	-4.679	0.15
45	357.791	7.983	-4.679	0.15
46	357.791	7.983	-4.679	0.15
47	357.82	7.983	-4.676	0.15
48	357.82	7.983	-4.676	0.15
49	357.672	7.983	-4.691	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	357.642	7.983	-4.694	0.16
54	357.701	7.983	-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	357.672	7.983	-4.691	0.16
59	357.463	7.983	-4.712	0.18
60	357.582	7.983	-4.7	0.17
61	357.582	7.983	-4.7	0.17
62	357.612	7.983	-4.697	0.17
63	357.582	7.983	-4.7	0.17
64	357.552	7.983	-4.703	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	357.552	7.983	-4.703	0.17
69	357.582	7.983	-4.7	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	357.523	7.983	-4.706	0.18
74	357.523	7.983	-4.706	0.18
75	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	357.582	7.983	-4.7	0.17
79	357.582	7.983	-4.7	0.17
80	357.552	7.983	-4.703	0.17
81	357.344	7.983	-4.724	0.19
82	357.374	7.983	-4.721	0.19
83	357.403	7.983	-4.718	0.19
84	357.403	7.983	-4.718	0.19
85	357.284	7.983	-4.73	0.20

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
112	357.403	7.983	-4.718	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
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
152	357.284	7.983	-4.73	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
169	357.165	7.983	-4.743	0.21
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
184	357.344	7.983	-4.724	0.19
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
207	357.225	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
217	357.344	7.983	-4.724	0.19
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
243	357.195	7.983	-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
250	357.165	7.983	-4.743	0.21
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
261	357.135	7.983	-4.746	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
271	357.016	7.983	-4.758	0.23
272	357.076	7.983	-4.752	0.22
273	357.106	7.983	-4.749	0.22
274	356.957	7.983	-4.764	0.23
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
286	357.135	7.983	-4.746	0.22
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
327	356.927	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
341	356.867	7.983	-4.773	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

t'	t / t'	Abs Pres (kPa)	Temp (°C)	Water Level (m)	Drawdown (m)	Recovery (%)
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%
17	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	18.9	358.267	7.983	-4.63	0.10	52%
21	18.0	358.178	7.983	-4.639	0.11	48%
22	17.3	358.238	7.983	-4.633	0.10	51%
23	16.6	357.94	7.983	-4.664	0.13	36%
24	15.9	358.297	7.983	-4.627	0.10	54%
25	15.3	358.327	7.983	-4.624	0.09	55%
26	14.8	358.357	7.983	-4.621	0.09	57%
27	14.3	358.357	7.983	-4.621	0.09	57%
28	13.8	358.327	7.983	-4.624	0.09	55%
29	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	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%

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%

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%

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%

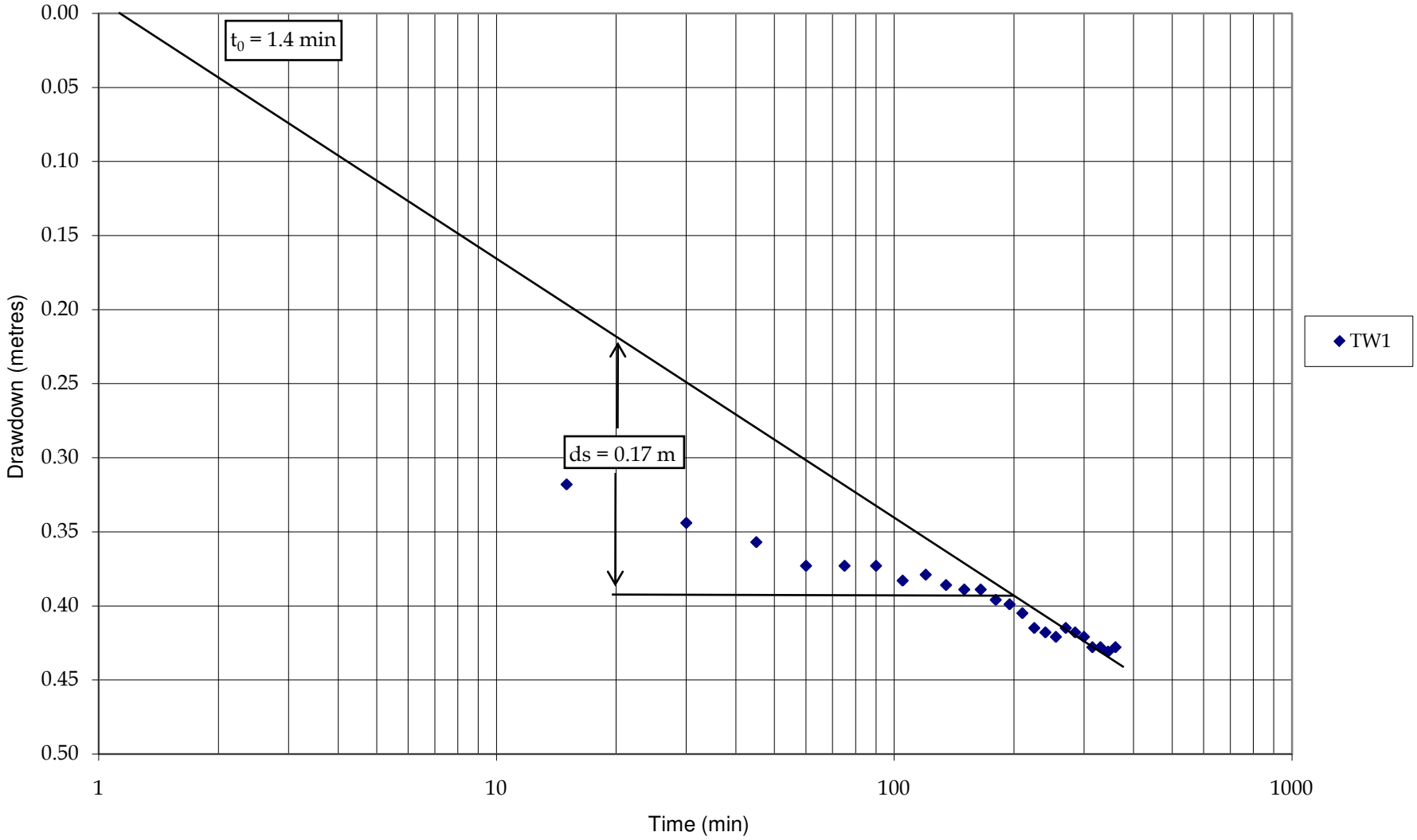
347	2.0	358.744	7.983	-4.582	0.05	75%
348	2.0	358.714	7.983	-4.585	0.05	74%
349	2.0	358.684	7.983	-4.588	0.06	72%
350	2.0	358.714	7.983	-4.585	0.05	74%
351	2.0	358.714	7.983	-4.585	0.05	74%
352	2.0	358.595	7.983	-4.597	0.07	68%
353	2.0	358.655	7.983	-4.591	0.06	71%
354	2.0	358.625	7.983	-4.594	0.06	70%
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%

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%
441	1.8	359.161	7.983	-4.539	0.01	96%
442	1.8	359.191	7.983	-4.536	0.01	97%
443	1.8	359.191	7.983	-4.536	0.01	97%
444	1.8	359.191	7.983	-4.536	0.01	97%
445	1.8	359.25	7.983	-4.53	0.00	100%

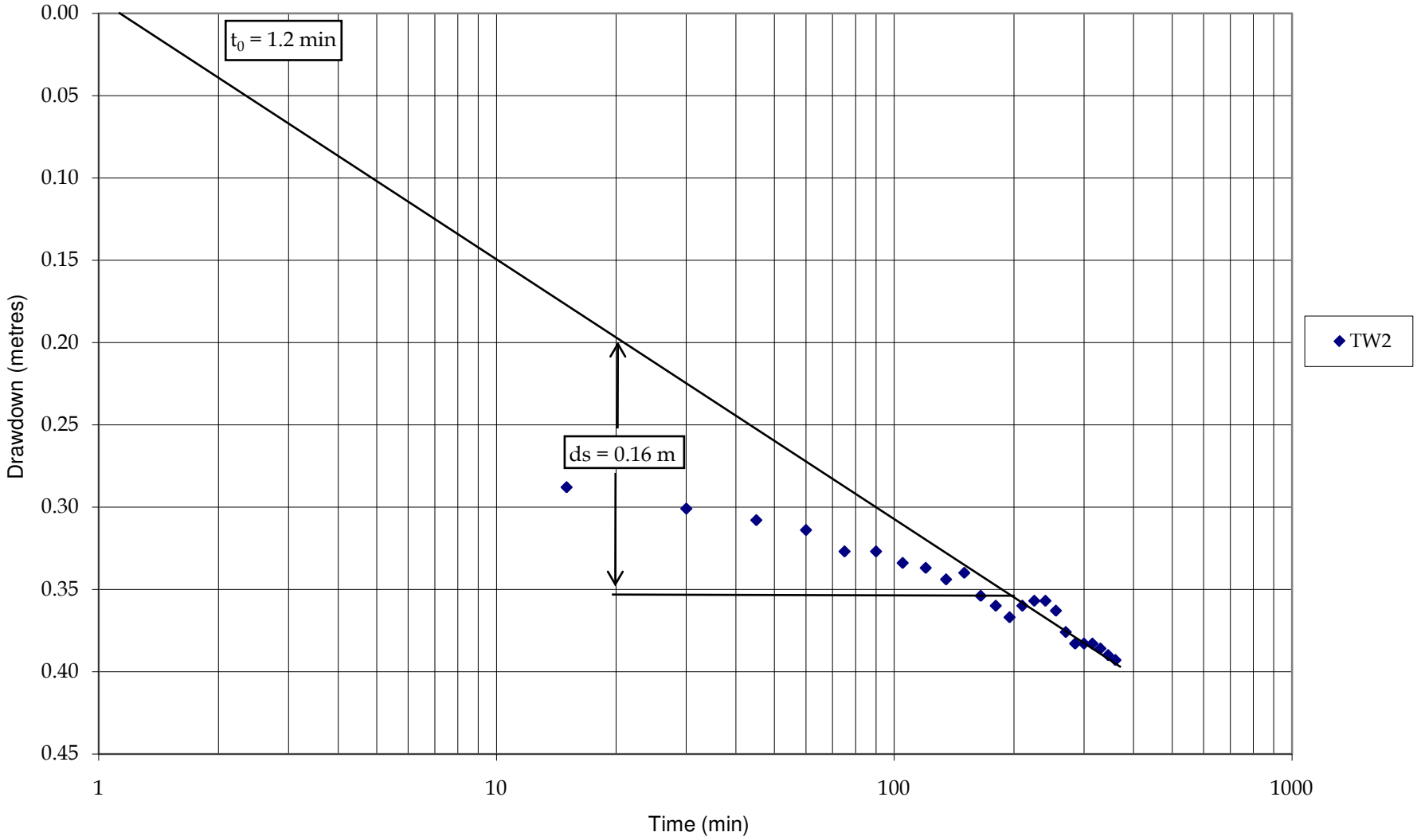
ATTACHMENT K

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) metres	Change in head (dh) metres * February 27, 2024	Darcy, flux, Q/A m3/m2/s	Groundwater velocity, v m/s	Estimated Travel Time days	Estimated Travel Time 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	BH3	56	0.92	4.3E-06	1.4E-05	45.5	0.125
BH1	BH3	113	1.96	4.5E-06	1.5E-05	87.0	0.238
BH1	BH9	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		