Prepared By:

Maximum Predicted Water Table And Hydrogeological Assessment Report
Proposed Class "A" Pit Above Water
JT Pit

382063 Concession 4, Bentinck
Municipality of West Grey
JT Excavating Ltd.

GMBP File: 220135

Revised November 2023

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382063 CONCESSION 4, BENTINCK

MAXIMUM PREDICTED WATER TABLE AND HYDROGEOLOGICAL ASSESSMENT REPORT

PROPOSED CLASS 'A' PIT ABOVE WATER

REVISED NOVEMBER 2023

GMBP FILE: 220135

1. INTRODUCTION

GM BluePlan Engineering Limited (GMBP) was retained by JT Excavating Ltd. to conduct a Hydrogeological Assessment to support the application for a proposed Category 3, Class "A" Pit above water. The proposed Aggregate Pit is situated on the north side of Concession Road 4, Bentick approximately 9.5 km northeast of the Town of Hanover. The property is located on Lot 22, Concession 5 in the former Township of Bentinck, Municipality of West Grey. The civic address of the subject property is 382063 Concession Road 4, Bentinck. The location of the Site is shown on Figure 1.

This Level 1 Hydrogeological Study is being prepared to characterize the geology, the potential groundwater occurrence, and the elevation of the water table within the proposed extraction area in order to support development and licensing under the Aggregate Resources Act (ARA). Additionally, this Study investigates the potential adverse impacts that the proposed pit may have on the local groundwater and surface water resources in the area. It is our understanding that the proposed pit operations will be conducted to a maximum depth of 1.5 metres above the "high" groundwater table elevation.

The subject property encompasses approximately 41.2 ha (102 acres) and is used primarily for agricultural purposes. The property consists of agricultural fields consisting of crops and naturalized treed and vegetated areas. The northern portion of the property contains an auxiliary building inferred to be used for agricultural purposes and/or storage. A low-lying vegetated area with seasonal saturation/ponding was observed to extend in an east-west direction across the central portion of the Site, which effectively separates the southern fields with the northern field. Additionally, the northernmost portion of the property is at a relatively low elevation compared to the majority of the Site and is currently undeveloped and vegetated. The Site boundaries and features are shown on Figure 2.

2. METHODOLOGY

2.1 Background Data Collection/Review

Available information from the following sources was reviewed to support the site-specific information gathered from field investigations to prepare the hydrogeological assessment:

- Ministry of the Environment Conservation and Parks (MECP) well records,
- MECP publications, geologic publications,
- Review of the Grey and Bruce Counties Groundwater Study (Waterloo Hydrogeologic, July 2003), and pertinent maps

- Review of the Municipal Water Supply Wellhead Protection Areas (WHPAs) established through the Grey and Bruce Counties Groundwater Study, completed in July 2003 and prepared by Waterloo Hydrogeologic Inc.

2.2 Field Investigations

2.2.1 Monitoring Well Installations and Water Level Monitoring

In order to provide more certainty regarding the on-site groundwater elevations and flow direction, a series of four (4) monitoring wells were installed between February 22 and 23, 2021. The monitoring wells were advanced by London Soil Test Limited (LST) with a track-mounted drill, under the direction of GMBP, to depths of between 4.6 and 8.7 mbgs. Borehole logs are provided in Appendix B.

These monitoring wells and piezometers are used to measure the groundwater elevations and determine the "high" water levels associated with the property. The water levels at each of the monitoring locations were measured by GMBP personnel during a total of four (4) site visits between February 23, 2021 and March 25, 2022.

During the site visits, a review of the site conditions, including the surface topography, natural features, surface water features, and the characteristics of the neighboring properties (i.e. surrounding land use) were noted. In addition, the potential for the presence of springs or groundwater seeps was investigated.

On March 22, 2021, the monitoring well elevations and various topographical elevations were surveyed by GMBP using a GPS and total station survey system in order to provide elevation and spatial data.

3. REVIEW OF BACKGROUND INFORMATION

3.1 Physiography and Geology

Based on our review, the site is located within the physiographic region of the Horseshoe Moraines. In general, the Horseshoe Moraines are characterized by drumlinized till plains, kame moraines, and outwash deposits (Chapman and Putnam, 1984).

The soils on and surrounding the subject site are identified as that of the Sargent series, which is defined as a series of two thin layers of grey and brown loam (i.e. ~0.10 metres each) overlying well-sorted gravelly outwash deposits (Soil Survey Report No. 17). The physiographic mapping (Map 2225) indicates that the subject property is located in an area of glacial spillway deposits. According to the Surficial Geology of Southern Ontario (Ontario Geologic Survey), the subject property contains coarse textured glaciofluvial deposits consisting of river deposits and delta topset facies.

The Site is reported to be situated on or near the spatial contact between dolostone of the Guelph formation to the northeast and Salina formation to the southwest. Based on the mapping provided by the Grey and Bruce Groundwater Study, an analysis of water well logs in the area, the depth to bedrock in the vicinity of the subject property is reported to be in the range of 13 to 26 meters below ground surface (mbgs).

The subject Site primarily consists of gently undulating hills gradually sloping toward the west and the Saugeen River west of the Site. As discussed, a low-lying vegetated area with seasonal ponding was observed to extend in an east-west direction across the central portion of the Site, which effectively separates the southern fields with the northern field. Additionally, the northernmost portion of the property is at a relatively low elevation compared to the majority of the Site and is currently undeveloped and vegetated.

Based in onsite observations during the four Site visits in 2021 and 2022, the low-lying areas in the southwest and central portions of the Site were only saturated during the early spring freshet, when the groundwater elevations are at their maximum.

3.2 Conservation Authority and Screening Areas

The site is situated within the boundary of the Saugeen Valley Conservation Authority (SVCA). From a review of the site with respect to regulated areas, the following is noted:

- An approximate 30 metre buffer associated with the seasonally saturated areas on the property is considered to be a screening area under Ontario Regulation 169/06.
- The lower-lying southwestern and western portions of the Site are currently designated as SVCA screening areas (under Ontario Regulation 169/06) associated with the flood plain and associated setbacks from the Saugeen River.

The SVCA mapping is presented in Appendix "D".

Additionally, the Grey County Official Plan identifies a slightly smaller area than the noted SVCA screening area as *Hazard Lands*, as per Schedule "A" of the official plan, and are subject to the associated developmental restrictions. It is noted that this designation identifies lands that *"can be impacted by flooding, erosion, and/or dynamic beach hazards or have poor drainage, or any other physical condition that is severe enough to pose a risk for the occupant, property damage, or social disruption if developed."*

The Grey County Official Plan mapping is presented in Appendix "E".

3.3 Hydrogeology

The Grey and Bruce Counties Groundwater Study (Waterloo Hydrogeologic, 2003), existing water well logs, and observations during on-site drilling provide an overview of the regional setting and more general information about the site and the surrounding area. The pertinent findings are summarized as follows:

- The depth to bedrock in the area is estimated to be between 13 and 26 mbgs;
- The overburden thickness was observed to be greater than 8.7 metres thick in the location of each monitoring well installed on the Site;
- The water table elevation in the overburden has been measured to be between approximately 292.0 metres above mean sea level (masl) in the northeastern portion of the Site and 288.0 masl in the southwestern portion of the Site based on the March 25, 2022 measurements;
- The soils across the site were observed to generally consist of coarse sand and gravel deposits overlain by between 0.2 to 0.5 metres of topsoil. The exception is the lower-lying soils on the north portion of the Site (i.e. MW-1 area), which consists of a thin layer (i.e. approximately 0.3 m) of clay with trace silt overlying the coarse textured soil, and a 1.5 metre thick layer of clay that was observed between approximately 1.5 and 3.0 mbgs in the location of MW-4.

- The seasonal ponding areas in the central portion of the Site are inferred to be associated with the shallow water table elevation due to the presence of coarse textured soils across the Site and the absence of a surface water inlet or outlet from these areas.

To confirm the site-specific geology, a review of the Ministry of the Environment (MECP) well records for the site and surrounding area was conducted. MECP records were utilized from the MECPs online database (last updated June 4, 2021). A copy of the pertinent MECP well records is enclosed in Appendix A and a summary of the results of the well search within a 500 m radius of the subject site is provided in Table 1.

Five (5) well records were found within the 500 m well search radius, including the onsite well. Each well location correlates with known residential/agricultural properties in the vicinity of the Site.

Shallow groundwater flow is expected to mimic topography and generally flows towards surface water features. Based on measured groundwater table elevations across the Site and the presence of the Saugeen River west of the property (flowing in a southerly direction), the water table is expected to decline in a southwesterly direction toward the Saugeen River. Consequently, the water table is expected to be lowest in the southwestern portion of the Site (i.e. approximately 288 masl).

The Saugeen River is expected to form a flow divide for shallow groundwater, such that flow from the west side of the river is expected to flow easterly, and flow from the east side of the river, to flow easterly.

The more regional, or bedrock flow patterns are expected to be generally in a west, to northwesterly direction, towards Lake Huron, and consistent with the trend of the overall catchment area.

4. FIELD INVESTIGATIONS

4.1 Monitoring Well and Piezometer Installations

As discussed, on February 22 and 23, 2021, a series of four (4) monitoring wells (MW-1 to MW-4) were installed across the subject property. Borehole logs, including monitoring well installation details, are provided in Appendix B.

The water levels at each of the monitoring locations were measured by GMBP personnel during a total of seven (7) site visits between February 23, 2021 and June 25, 2023. A summary of the water level elevations measured to date is provided in Table 2.

Based on the water level elevations measured, the localized groundwater flow direction across the site is observed to be in a southwesterly direction toward the Saugeen River. This is expected to be influenced by both the local topography and surface water features.

Based on field observations and groundwater elevation data collected, the occurrence of surface water on the Site (i.e. in the central saturated area) is expected to be consistent with the occurrence of the groundwater elevation. The highest measured elevation of the groundwater across the proposed extraction area of the Site is inferred to be between approximately 292.0 metres above mean sea level (masl) in the northeastern portion of the Site and 288.0 masl in the southwestern portion of the property based on the April 10, 2023 measurements.

5. ESTIMATED WATER TABLE ELEVATION

Based on the geologic mapping, MECP well records, and Grey and Bruce Counties Groundwater Study, the high water table elevation in the area is generally estimated to be in the range of 292.0 to 288.0 masl, which corresponds to a water table between 1.0 and 13 metres below the ground surface. This is consistent with the water level elevations measured from the monitoring wells and surface water elevations across the Site and the relative difference in ground surface elevation between the lower-lying western portions of the Site and the elevated eastern portion of the property.

Based on the water level elevations measured, the localized major groundwater flow direction across the Site is to the southwest, influenced by the Saugeen River, which is situated approximately 260 metres west of the subject property at its closest point and flows in a southerly direction.

Based on the groundwater conditions, timing of the freshet, and precipitation events, the water level measurements collected, the “high” groundwater table elevations are expected to be consistent with the water levels measured on April 10, 2023 It is noted that these measurements were made following a period of significant snow melt and precipitation.

It is recommended that the monitoring wells continue to be monitored during the Pit Application process in order to ensure the collection of data that is reflective of the “high” water table elevation.

As discussed, in the portion of the site where extraction is proposed, the high water table is considered to decline from approximately 292.0 metres above mean sea level (masl) in the northeastern portion of the Site to approximately 288.0 masl in the southwestern portion of the property based on the April 10, 2023 measurements, as shown in Figure 3. Therefore, to maintain the 1.5 m separation, based on the proposed limits of onsite extraction, the maximum depth of the pit would be approximately 293.5 masl the northeast portion of the area of extraction and sloping to approximately 290.5 masl in the expected southwestern-most portion of the proposed extraction area. The expected “high” water table and corresponding proposed maximum pit depths are shown on the Figure 4A and 4B.

6. IMPACT ASSESSMENT

6.1 Impacts to Local Groundwater and Groundwater Resources

With respect to impacts to groundwater resources from development activities, these can often be separated into: 1) quality, or 2) quantity.

With respect to quality, potential changes to groundwater are not typically caused by excavation works above the water table.

The moving and stockpiling of native/existing soils may cause disruption at surface, but not typically the release of compounds to the subsurface. With respect to the on-site equipment, a potential for environmental impact may be associated with petroleum hydrocarbons (fuel) used on-site. Standard best management practices and standards under the Aggregate Resources Act require the implementation of a spill prevention and contingencies measures plan, mitigating this risk.

With respect to quantity, the proposed bottom contours of the aggregate pit have been selected to prevent alteration to the groundwater flow regime. As discussed, the proposed bottom contours are a minimum of 1.5 metres above the estimated "high" water table elevation. Therefore, pit operations will not include dewatering or groundwater diversion. Thus, no impacts to groundwater are anticipated by mining aggregate above the water table. Groundwater will not be diverted or altered during the aggregate extraction process. The overall water budget, pre- to post-development, is expected to remain unchanged.

Regardless of the fact that impacts are not expected, a further investigation of potential receptors has been conducted as part of this assessment. A review of MECP well records for the site and surrounding area was conducted and indicated seven (7) wells within 500m of the subject property. Additionally, from a review of surrounding properties, it is expected that an additional six (6) properties would have domestic/livestock wells that are currently being used. Domestic/livestock wells not documented in the MECP water well database are expected to be located at the following addresses:

- 133873 Allan Park Road – Located approximately 390 metres northwest of the property boundary west and across the Saugeen River from the Site;
- 133859 Allan Park Road – Located approximate 370 metres west of the property boundary west and across the Saugeen River from the Site;
- 133776 Allan Park Road – Located approximately 470 metres southwest of the property boundary west and across the Saugeen River from the Site;
- 382007 Concession Road 4 – Located approximately 340 metres southwest of the property boundary west and across the Saugeen River from the Site;
- 382048 Concession Road 4 – Located approximately 230 metres south of the property boundary across the Concession Road 4 Right-Of-Way (ROW) and adjacent to the east bank of the Saugeen River;
- 382064 Concession Road 4 – Located approximately 380 metres south of the property boundary across the Concession Road 4 ROW.

Copies of the pertinent MECP well records are enclosed in Appendix A and a summary of the results of the well search within 500 m is provided as Table 1, which includes a summary of both the MECP well record locations as well as those properties inferred to have a domestic well.

Of the wells identified/inferred, only one of the domestic wells are located within 300 metres of the subject property:

- The inferred domestic well located at 382048 Concession Road 4 is in a hydraulically cross-gradient direction from the proposed area of extraction on the subject Site. The southernmost extraction activities are expected to be located in the range of 330 metres from the location of this this well due required setbacks from the Concession Road 4 ROW and the location of viable and accessible aggregate resources on the Site. Additionally, the significant majority of the extraction is expected to take place between 400 and 1,100 metres from this well. Therefore, the potential for adverse effects on the quality and quantity of groundwater within the well located at 382048 Concession Road 4 is expected to be insignificant.

The seven wells identified in the MECP database, and five of the six inferred domestic wells are reported/estimated to be situated between 320 and 500 metres from the subject property boundary.

It is noted that the lands west and hydraulically downgradient of the subject property are largely undeveloped and are designated as Environmental Hazard Lands in the Grey County Official Plan and SVCA screening areas under Ontario Regulation 169/06. These development limitations are associated with the inferred 100 year flood levels of the Saugeen River. As such, any developed properties west and hydraulically downgradient of the Site are across, and hydraulically separated by, the Saugeen River.

More specifically, of the fifteen wells identified/inferred within 500 metres of the property boundary, only four are not across the Saugeen River / hydraulically separated from the Site. Each of these four wells are located in areas that are either hydraulically upgradient or cross-gradient from the Site. Therefore, the potential for adverse effects on the quality and quantity of groundwater within the wells identified within 500 metres of the Site is expected to be insignificant.

In summary, MECP well records indicate that there seven well records within a 500 m radius of the property. Six additional wells have been inferred to exist based on the presence of developed properties. Based on the proposed extraction above the water table elevation and the fact that water quality is not expected to be altered due to proposed operations, it is reasonable to expect that the proposed aggregate extraction would not impact the groundwater supply resources in the area. Based on the separation distance of the expected limit of extraction from the domestic wells (i.e., greater than 330 m), the shallow groundwater flow towards the Saugeen River, and the hydraulic separation between the Site and the majority of the identified domestic supply wells within 500 metres of the Site via the Saugeen River, the potential for impacts to off-site domestic wells is further mitigated.

6.2 Municipal Wells

6.2.1 Municipal Wells - Regulatory Setting

The Clean Water Act (CWA) was established in 2006 to protect and to ensure the quality and sustainability of municipal supplies of drinking water sources within the province. A focus of the CWA is the preparation of locally developed source protection plans and vulnerability assessments which can then be used to identify *threats* to the municipal wells. Under the CWA, a drinking water threat is defined as *an activity or condition that adversely affects or has the potential to adversely affect the quality or quantity of any water that is or may be used as a source of drinking water, and includes an activity or condition that is prescribed by the regulations as a drinking water threat.*

Based on a review of mapping, the site is not located within a regulated area, such as well head protection zone or intake protection zone. The nearest areas regulated under the CWA are located greater than 10.0 km away and would have no bearing on this development.

6.3 Potential Interference with Surface Water Resources

6.3.1 Seasonally Saturated and Ponding Areas

As discussed, a seasonally saturated area is situated in the central portion of the property. Due to the coarse-textured nature of the soils onsite, this feature is expected to be consistent with the occurrence of water table elevation. More specifically, since this area was observed to be dry during the June 30, 2021 Site visit, it is expected that water is only present in this area during relatively high groundwater conditions or during surface run-off flooding events. The locations of these features are shown in Appendix "D" and "E".

Further, the western portion of the property is currently designated as Hazard Lands and an Ontario Regulation 169/06 screening area. These limitations on the Site development are associated with the floodplains of the Saugeen River, located approximately 160 metres west of the subject property at its closest point.

The proposed onsite pit operations are required to have a setback from the areas of the property designated as Hazard Lands as part of the Grey County Official Plan. It is noted that the SVCA regulated screening area extends 50 metres beyond the noted Hazard Land boundary. It is our understanding that development within the area designated as an SVCA screening area is not prohibited as long as suitable consultation with the SVCA has been conducted and written permissions or permits (if required) have been obtained.

It is of particular note that the proposed operations are to be above the water table. No dewatering or water diversion will take place onsite as part of aggregate extraction operations. Based on the occurrence of coarse-grained soils (i.e., the sand and gravel) below the groundwater table, the pre- to post-development groundwater flows are expected remain similar. Consequently, the groundwater flow to the onsite seasonal surface water feature and more largely to the west toward the Saugeen River, considering both the water budget and flow direction, is expected to remain unchanged from pre-extraction to post-extraction when appropriate setback distances are maintained. Thus, no impacts to these areas are anticipated.

6.3.2 Saugeen River and Flood Plain

The Saugeen River is situated approximately 160 metres west of the subject property at its closest point, which flows in a southerly direction. The western portion of the property is currently designated as *Hazard Lands* and an Ontario Regulation 169/06 screening area. These limitations on the Site development are associated with the floodplains of the Saugeen River.

During the April 7 and June 30, 2021 Site visits, the western portion of the property was observed to be generally dry, with no evidence of surface water with the exception of the seasonally saturated / ponding area in the central portion of the Site discussed in Section 6.3.1 above, which was found to contain some standing surface water during the April 7, 2021 Site visit. As such, although the western portion of the Site is reported to fall within the GCOP *Hazard Land* and the SVCA Screening Area, the western portion of the Site does not show evidence of recent seasonal saturation and is expected to only become saturated during record snowmelt or storm events, which would cause the Saugeen River to flood to the limits of the designated floodplain of the river (i.e. 100 year flood event). Further, agricultural activities have been ongoing up to the western property boundary that do not appear to be hindered by saturated soil conditions.

Considering the proposed area of extraction is located outside of the designated *Hazard Lands* and the required setbacks will be implemented, no impacts to the Saugeen River or its flood plain are anticipated.

6.3.3 Surface Water – Quality

As discussed, the area designated as seasonally ponding has been observed to only contain standing water during the period of high groundwater elevation (i.e. the spring freshet) and is noted the be dry during the remainder of the year. The Saugeen River is situated approximately 160 metres west of the property boundary at its closest point.

The proposed licensed area is expected to be located at least 30 metres from the lands designated as *Hazard Land* in the GCOP. As such, the SVCA screening area (effectively defined as a 30 metre buffer beyond the GCOP *Hazard* Lands) is not located within the proposed area of extraction.

Based on the required setback from both the boundary of the Saugeen River floodplain and the seasonally saturated pond area, as well as the implementation of best management practices for sediment and run-off control, no impacts to these surface water features are anticipated.

Based on the proposed pit activities, the primary quality concerns relate to the potential degradation of water quality through:

- Increased sediment/suspended solids loading, and
- Increased temperature.
  - With respect to increased sediment and/or turbidity, this is caused through mobilization of fine-grained silt and clay sized soil particles (fines). In this particular scenario the following mechanisms will act to prevent fines:
- Only a small content of fines was encountered across the Site. Therefore, it is expected that very little fines will be mobilized during operations.
- The distance and low topographic relief between the pit activities and the Saugeen River will act as a buffer.

Potential impacts to water temperature are not considered to be an issue between pre- and post-development since:

- No surface water ponding is proposed/expected to occur in the proposed areas of extraction,
- Equal infiltration to the subsurface will continue post-development.

Based on proposed extraction to the water table, no water ponding (nor diversion) would occur. During aggregate pit development, precipitation would continue to infiltrate. As such, there is no increased potential for warming of groundwater recharging to the shallow system in the vicinity of the aggregate pit.

The Pit operations will include a spills response plan, which includes training for the proper and safe use, handling, and storage of fuel or other potential contaminants. All spills or releases of contaminants are to be reported immediately to the MECP Spills Action Centre. Further, a spills response plan will be posted onsite at all times.

6.3.4 Surface Water– Quantity

The surface water quantity is expected to remain the same pre- and post-development since:

- the surface water features, including outlet elevations and controls, are not to be adjusted as part of the pit development,

To mitigate potential impacts to water quantity we recommend the following mitigative measure:

- To generally maintain surface water flows to the same low-lying locations, sloping of the restored grades to maintain similar catchment areas (pre- and post-development) shall be conducted.

7. SUMMARY OF FINDINGS

The purpose of this Maximum Predicted Water Table Elevation and Hydrogeological Assessment Report is to assess the hydrogeological information available in the vicinity of the subject property to characterize the geology, potential groundwater occurrence, and the inferred elevation of the water table within the proposed extraction area. Additionally, this study investigates the potential adverse Impacts the pit may have on the local groundwater and surface water resources in the area.

Based on the geologic mapping, MECP well records, Grey and Bruce Counties Groundwater Study, and on the site-specific investigations completed to date, it was observed that shallow groundwater flows in a generally west-southwest direction across the Site. More specifically, groundwater flows are influenced by topography and the Saugeen River. From these observations, based on the proposed pit above groundwater, the maximum elevation of the floor of the quarry would be controlled by the inferred high groundwater elevations.

Currently, the “high” water levels at the site have been estimated to be 292.0 masl the northeast portion of the property and sloping to approximately 288.0 masl in the expected southwestern-most portion of the property (i.e. MW-3). Therefore, to maintain the 1.5 m separation, and based on the proposed limits of onsite extraction, the maximum depth of the pit would be 293.5 masl the northeast portion of the property and sloping to 290.5 masl in the expected southwest portion of the proposed extraction area. As schedule permits, it is recommended that water levels continue to be measured during the application process so that direct measurement of the “high” water level can be confirmed, and the pit floor elevation be updated accordingly.

Based on the proposed extraction of aggregate to depths associated with the high water table elevation with no proposed dewatering or water diversion, and assuming that setback distances are maintained for the sensitive features of the property (as identified and recommended by the Natural Environment Technical Report), it is reasonable to expect that the proposed aggregate extraction would not impact the local water supply wells in the area, surface water features, or associated ecological receptors in the area.

Based on this review, the development standards developed under the ARA are considered to be sufficient to protect the local water resources.

8. QUALIFICATIONS OF ASSESSORS

The Hydrogeological Investigation was completed by Mr. Corbin Sweet, H.B.Sc., P.Geo., and Mr. Matthew Nelson, P.Geo., P.Eng., M.Sc. of GMBP in consultation with applicant.

Mr. Corbin Sweet, H.B.Sc., P.Geo. has an honours B.Sc. degree in Earth Sciences (Geology) from the University of Waterloo and a diploma in Earth Resources from Sir Sandford Fleming College. He has over seven years of experience conducting numerous hydrogeological investigations and relevant public and agency consultation in support of pit and quarry ARA applications resulting in successful licences issued to applicants. He is also a member of the Professional Geoscientists of Ontario (PGO).

Mr. Matthew Nelson, P.Geo., P.Eng., M.Sc. is an Environmental Engineer / Hydrogeologist with over sixteen years of experience with hydrogeological investigations in support of pit and quarry ARA applications and associated consultation, resulting in successful licences issued to applicants. He is also a member of the Professional Geoscientists of Ontario (PGO) and Professional Engineers of Ontario (PEO).

All of which is respectfully submitted,

GM BLUEPLAN ENGINEERING LIMITED

Per:

C.J. Sweet, H.B.Sc., P.Geo.

CJS/kd

Per:

Matthew Nelson, M.Sc. P. Eng. P. Geo.

FIGURES:

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SCALE = 1:50,000
MARCH 2022

SITE LOCATION MAP

Figure No. 1

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LEGEND

- MONITORING WELL
- PROPERTY BOUNDARY
- EXISTING GROUND SURFACE CONTOURS

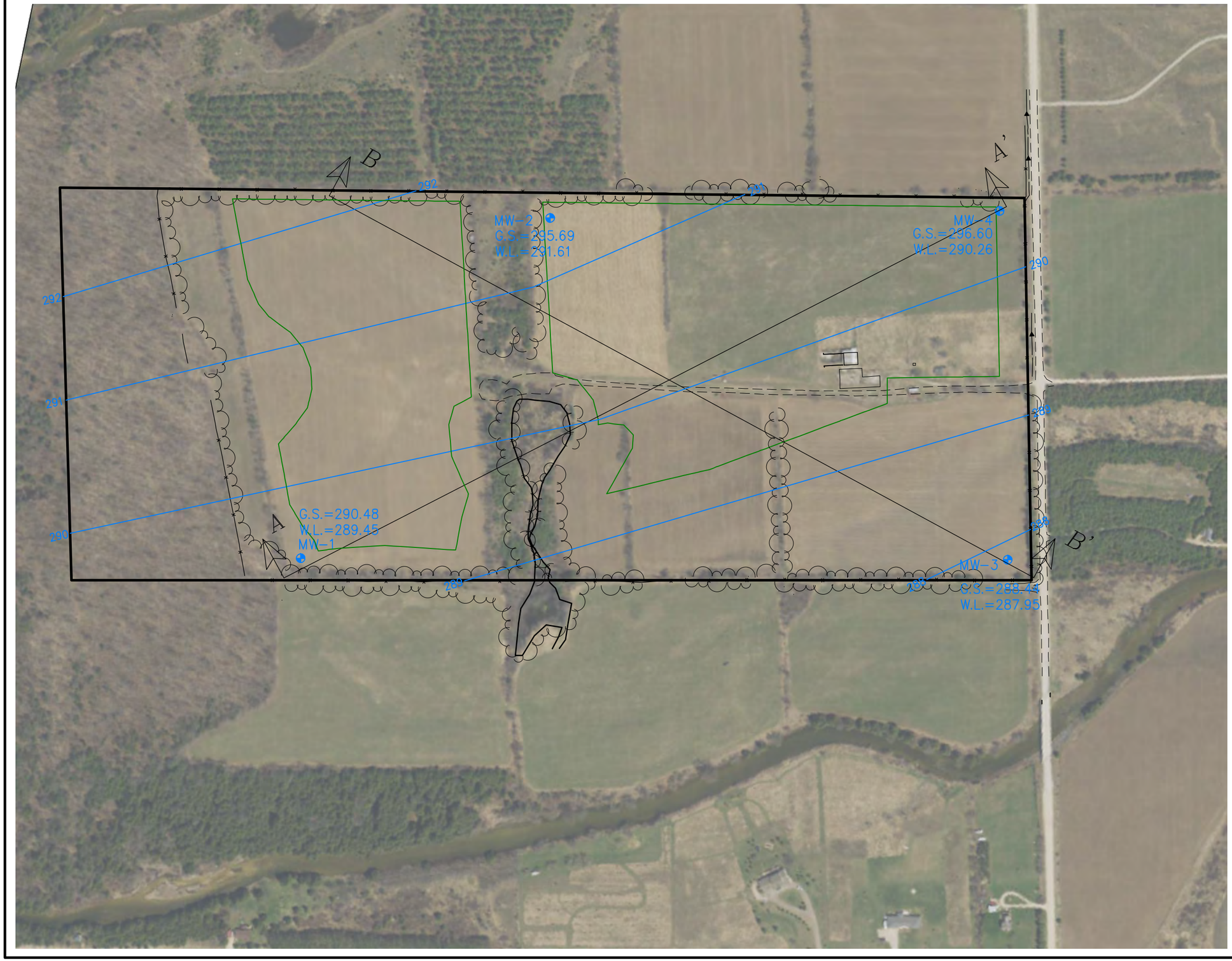
Scale = 1:4,000

MARCH 2022

MONITORING WELL LOCATIONS

Figure No. 2

BluePlan ENGINEERING



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LEGEND

- MONITORING WELL
- PROPERTY BOUNDARY
- 290——290 GROUNDWATER CONTOURS
- A A' CROSS SECTION
- G.S. GROUND SURFACE ELEVATION (masl)
- W.L. WATER LEVEL ELEVATION (masl)
- APPROXIMATE BOUNDARY OF PROPOSED EXTRACTION

Scale = 1:4,000

DECEMBER 2023

GROUNDWATER CONTOUR PLAN

Figure No. 3

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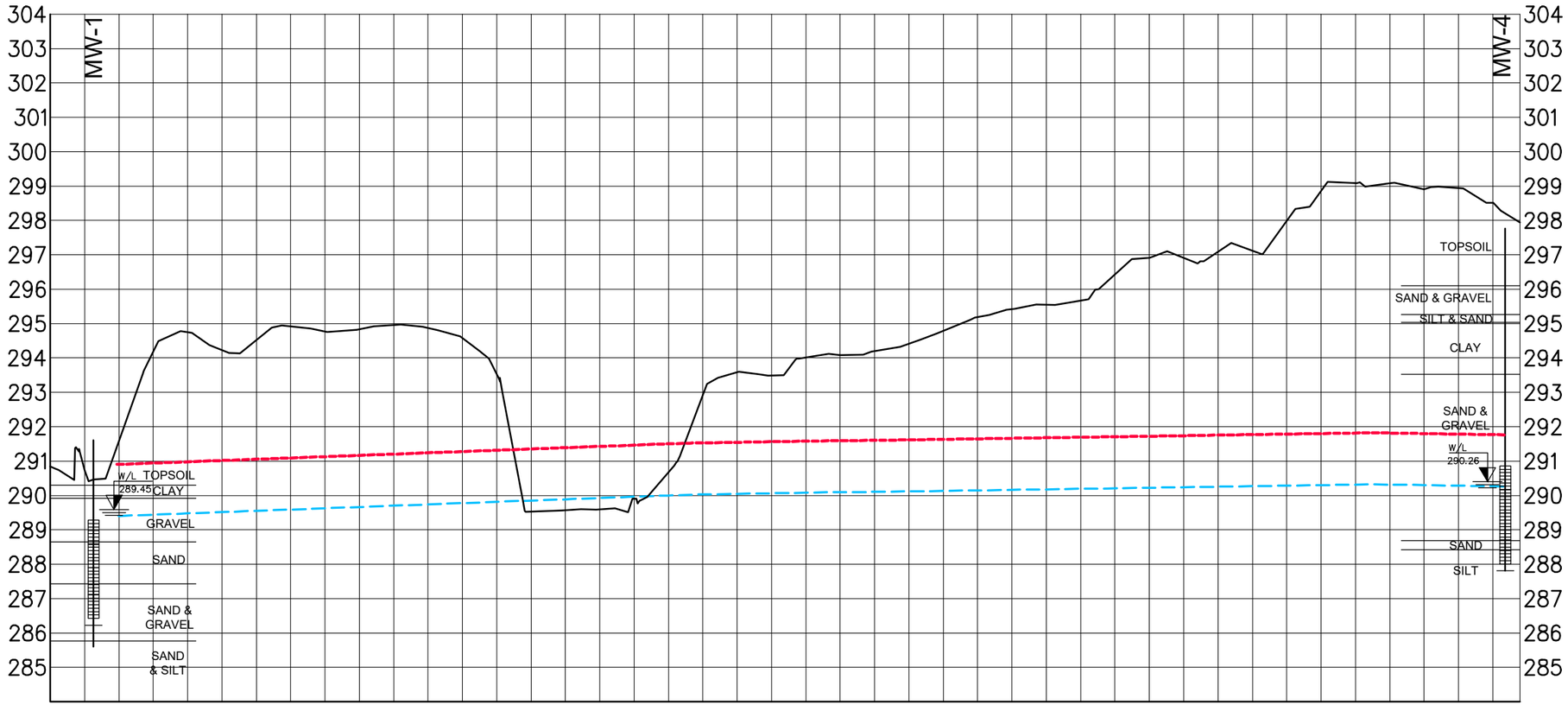

LEGEND:

- SCREENED INTERVAL
- GROUND SURFACE
- INFERRED GROUNDWATER LEVEL
- 1.5m SEPARATION FROM INFERRED HIGH GROUNDWATER ELEVATION (i.e. MAX. PROPOSED PIT DEPTH)

NOTE:
1. VERTICAL EXAGGERATION IS 10X
2. W.L.'S PRESENTED ARE CONSIDERED TO BE THE ANNUAL HIGH GROUNDWATER ELEVATION (APRIL 10, 2023)

Horizontal Scale = 1:3,000

DECEMBER 2023

CROSS-SECTION A-A'

Figure No. 4A

BluePlan ENGINEERING

FILE:W:\OwenSound\Owen Sound\220-2020\220135 ARA Pit Application - 382063 Conc. 4, Bentinck\Drawings\220135 - Hydrogeological Study - KC DEC2023.dwg LAYOUT:Cross-Section A-A'
LAST SAVED BY:Kcharpontier, 12/4/2023 9:48:04 AM PLOTTED BY:Kate Charpontier - GM BluePlan 12/4/2023 9:49:11 AM

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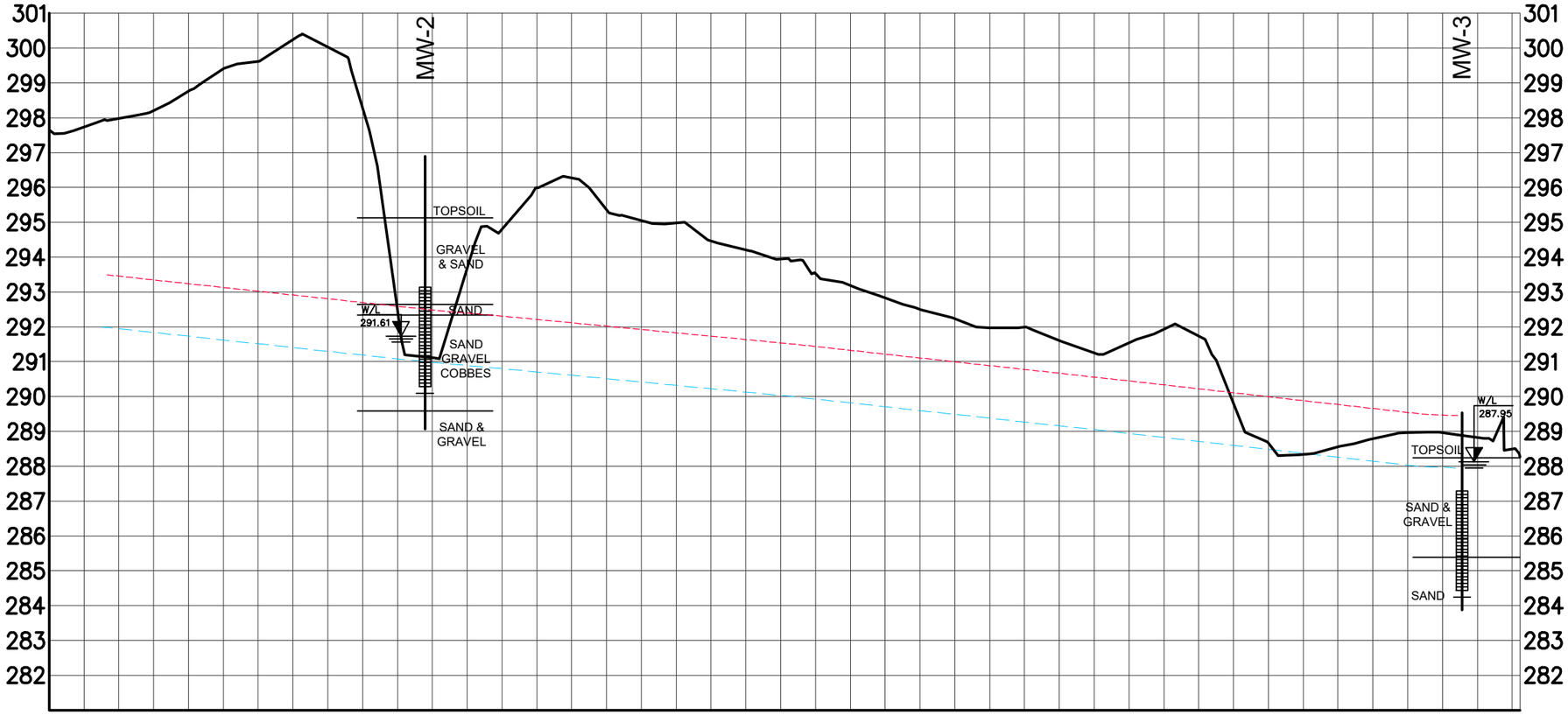


LEGEND:

- SCREENED INTERVAL
- GROUND SURFACE
- INFERRED GROUNDWATER LEVEL
- 1.5m SEPARATION FROM INFERRED HIGH GROUNDWATER ELEVATION (i.e. MAX. PROPOSED PIT DEPTH)

NOTE:
1. VERTICAL EXAGGERATION IS 10X
2. W.L.'S PRESENTED ARE CONSIDERED TO BE THE ANNUAL HIGH GROUNDWATER ELEVATION (MEASURED APRIL 10, 2023)

Horizontal Scale = 1:3,000

DECEMBER 2023

CROSS-SECTION B-B'

Figure No. 4B

BluePlan ENGINEERING

220135
Hydrogeological Study Report
382063 Concession 4 NDR
Municipality of West Grey

LEGEND

- MECP WELL RECORD
- PROPERTY BOUNDARY
- 500 m BUFFER

Scale = 1:15,000

MARCH 2022

MECP WELL LOCATION PLAN

Figure No. 5

BluePlan ENGINEERING

TABLES:

Table 1:
Summary of Nearby Domestic Water Supply Wells

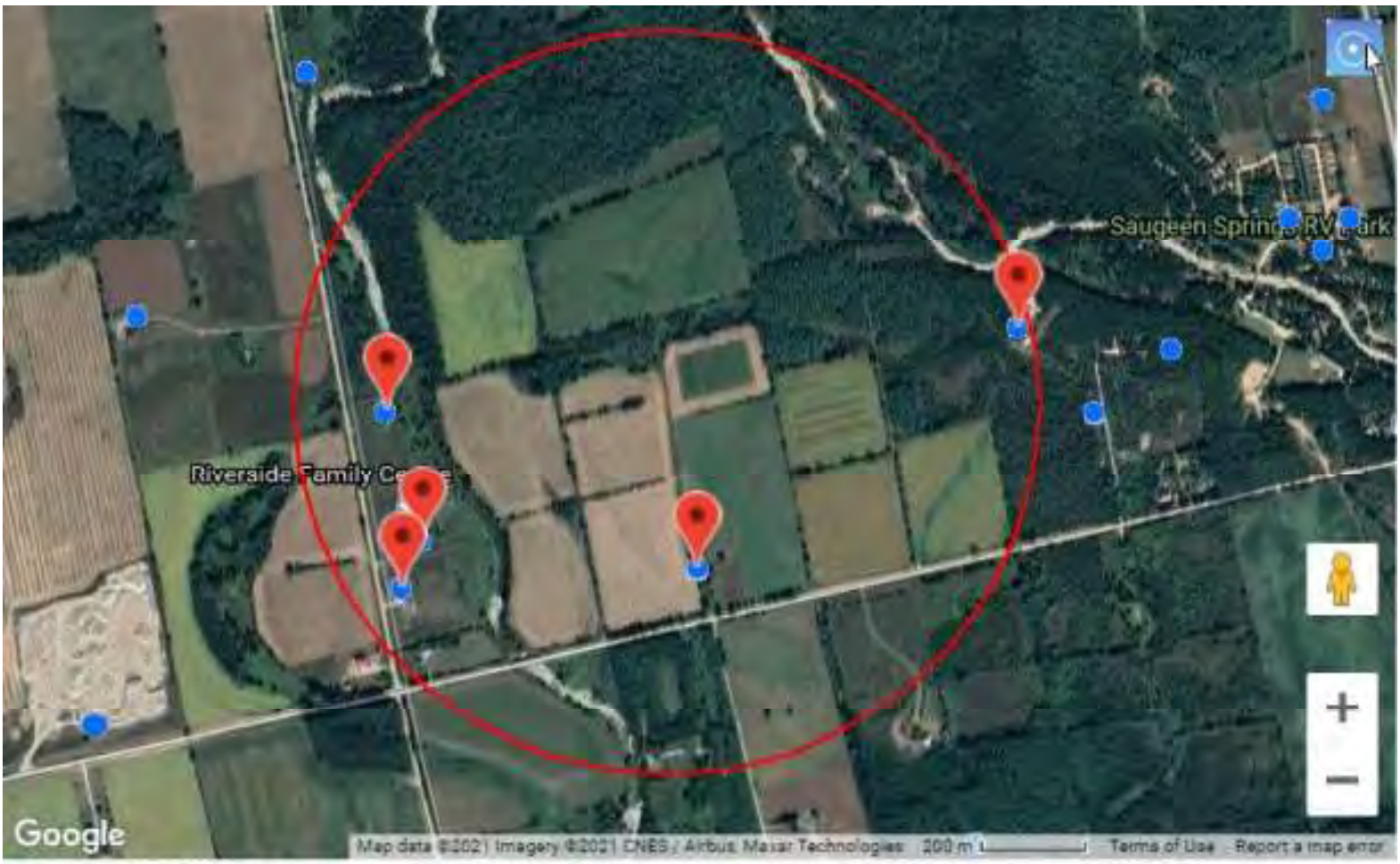
MECP Well ID	Address	Approximate Distance From Site (m)	Lot	Conc.	Easting	Northing	Township	County/ Municipality	Well Use	Bedrock/ Overburden	Depth to Bedrock (m)	Total Depth of Well (m)	Static Water Level (m)	Year Drilled
Onsite Domestic Well														
2506888	382063 Concession Road 4	-	22	5	505234	4894764	Bentinck	Grey / West Grey	Domestic / Livestock	Overburden	N/A	25.0	5.5	1980
Registered Wells on Neighbouring Properties														
2507455	422102 Concession Road 6	390	23	6	505310	4896060	Bentinck	Grey / West Grey	Public Supply	Bedrock	29.6	61.0	0.9	1981
2502709	133889 Allan Park Road	390	21	6	504450	4895670	Bentinck	Grey / West Grey	Domestic	Bedrock	19.2	24.4	4.6	1968
2516925	382145 Concession Road 4	500	24	5	505840	4895170	Bentinck	Grey / West Grey	Domestic	Bedrock	22.3	29.6	17.7	2006
2516461	133789 Allan Park Road	325	21	5	504680	4894720	Bentinck	Grey / West Grey	Domestic	Bedrock	19.5	29.9	4.6	2005
2516469	133805 Allan Park Road	320	21	5	504680	4894780	Bentinck	Grey / West Grey	Domestic	Bedrock	16.2	29.9	3.7	2005
2516963	133789 Allan Park Road	360	21	5	504650	4894680	Bentinck	Grey / West Grey	Domestic	Bedrock	19.8	41.5	4.0	2006
2512309	382094 Concession Road 4	320	23	4	505620	4894420	Bentinck	Grey / West Grey	Domestic	Bedrock	13.4	34.4	15.2	1993
Inferred Wells on Neighbouring Properties														
-	133873 Allan Park Road	390	21	6	504460	4895500	Bentinck	Grey / West Grey	Domestic	No Information				
-	133859 Allan Park Road	370	21	5	504500	4895340	Bentinck	Grey / West Grey	Domestic					
-	133776 Allan Park Road	470	20	5	504560	4894550	Bentinck	Grey / West Grey	Domestic					
-	382007 Concession Road 4	340	21	5	504690	4894560	Bentinck	Grey / West Grey	Domestic					
-	382048 Concession Road 4	230	22	4	505150	4894385	Bentinck	Grey / West Grey	Domestic					
-	382064 Concession Road 4	380	22	4	505410	4894280	Bentinck	Grey / West Grey	Domestic					

Table 2:
Onsite Groundwater Elevation Measurements

Well ID	MECP Well ID	Ground Surface Elevation	Top of Pipe [TOP] Elevation	Top of Casing [TOC] Elevation	23-Feb-21		7-Apr-21		30-Jun-21		24-Mar-22		27-Oct-23		10-Apr-23		15-Jun-23	
		(masl)	(masl)	(masl)	(mbTOP)	(masl)	(mbTOP)	(masl)	(mbTOP)	(masl)	(mbTOP)	(masl)	(mbTOP)	(masl)	(mbTOP)	(masl)	(mbTOP)	(masl)
BH-1 / MW-1	A316371	290.48	291.50	291.61	-	-	2.58	288.92	2.97	288.53	2.11	289.39	2.59	288.91	2.05	289.45	3.01	288.49
BH-2 / MW-2	A316370	295.69	296.76	296.89	-	-	5.65	291.11	6.24	290.52	5.51	291.26	5.35	291.41	5.15	291.61	6.12	290.64
BH-3 / MW-3	A316368	288.44	289.49	289.53	2.31	287.18	1.99	287.50	2.14	287.36	1.48	288.01	1.75	287.74	1.54	287.95	2.05	287.44
BH-4 / MW-4	A316369	296.6	297.67	297.76	8.21	289.46	7.57	290.10	8.08	289.59	7.49	290.18	7.85	289.82	7.41	290.26	7.91	289.76
Onsite Supply Well	2506888	-	-	295.94	-	-	-	-	6.23	289.71	-	-	-	-	-	-	-	-

Note: The groundwater elevations measured on April 10, 2023 are considered to be the annual maximum groundwater table elevation for the Site, measured following significant snow melt and precipitation.

APPENDIX A:
MECP WELL RECORDS



Latitude:44.20903, Longitude:-80.92240 (UTM Zone:17, Easting:506200, Northing:4895093)

Show 100 entries

Search:

Well ID	Well Record Information	Well Tag # (since 2003)	Audit #	Contractor Lic#	Well Depth (m)	Date of Completion (MM/DD/YYYY)
2506888	PDF | HTML	N/A	N/A	1804	25.0	06/04/1979
2516461	PDF | HTML	A025024	Z25412	2576	29.9	07/14/2005
2516469	PDF | HTML	A025018	Z25420	2576	29.9	08/05/2005
2516925	PDF | HTML	A043279	Z48391	6634	29.6	07/27/2006
2516963	PDF | HTML	A043695	Z25363	2576	41.5	07/04/2006

MINISTRY OF THE ENVIRONMENT
The Ontario Water Resources Act

WATER WELL RECORD

41A/24

Ontario

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

11 2506888 MUNICIP. 25002 CON. CON 05

COUNTY OR DISTRICT: GREY
TOWNSHIP, BOROUGH, CITY, TOWN, VILLAGE: BENTINCK
CON., BLOCK, TRACT, SURVEY, ETC.: 5
LOT: 022
[redacted] R.3 HANOVER
DATE COMPLETED: DAY 04 MO 06 YR 79
UTM NORTHING: 894500 RC: 5 ELEVATION: 0960 RC: 5 BASIN CODE: 22

LOG OF OVERBURDEN AND BEDROCK MATERIALS (SEE INSTRUCTIONS)

GENERAL COLOUR	MOST COMMON MATERIAL	OTHER MATERIALS	GENERAL DESCRIPTION	DEPTH - FEET FROM	DEPTH - FEET TO
BLACK	TOPSOIL			0	1
BROWN	GRAVEL & STONES			1	62
BROWN	SAND GRAVEL & STONES			62	82

31 000/802 00626/1/1/2 00826281/1/12
32

41 WATER RECORD

WATER FOUND AT - FEET	KIND OF WATER
0080	1 ☒ FRESH 2 ☐ SALTY 3 ☐ SULPHUR 4 ☐ MINERAL
0082	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
05"	1 ☒ STEEL 2 ☐ GALVANIZED 3 ☐ CONCRETE 4 ☐ OPEN HOLE	1/4"	0	0082
	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	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: 0012 GPM
DURATION OF PUMPING: 04 HOURS 40 MINS

STATIC LEVEL	WATER LEVEL END OF PUMPING	WATER LEVELS DURING: 1 ☐ PUMPING 2 ☒ RECOVERY			
		15 MINUTES	30 MINUTES	45 MINUTES	60 MINUTES
018 FEET	024 FEET	018 FEET	018 FEET	018 FEET	018 FEET

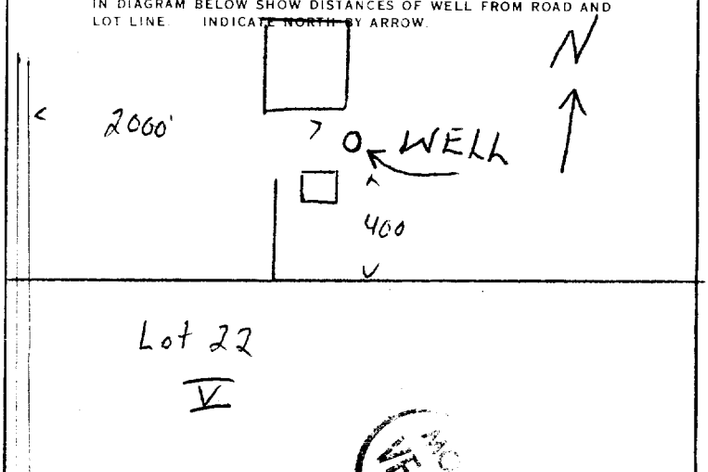
IF FLOWING, GIVE RATE: GPM
PUMP INTAKE SET AT: 60 FEET
WATER AT END OF TEST: 1 ☒ CLEAR 2 ☐ CLOUDY

RECOMMENDED PUMP TYPE: ☐ SHALLOW ☒ DEEP
RECOMMENDED PUMP SETTING: 60-70 FEET
RECOMMENDED PUMPING RATE: 0012 GPM

GPM/FT. SPECIFIC CAPACITY

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 /12: 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 /1: 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: Durham Drilling & Env. Ltd. | LICENCE NUMBER: 1804
ADDRESS: Steve Kusanyi
NAME OF DRILLER OR BORER: | LICENCE NUMBER: 1804
SIGNATURE OF CONTRACTOR: P C Johnston | SUBMISSION DATE: DAY ____ MO. ____ YR. ____

OFFICE USE ONLY

DATA SOURCE 58: 1 | CONTRACTOR 59-62: 1804 | DATE RECEIVED 63-68: 200879 | 80
DATE OF INSPECTION: 26/6/80 | INSPECTOR: 7
REMARKS: CSS.S8 | P H | WI H

MINISTRY OF THE ENVIRONMENT COPY

FORM 7 MOE 07-091

UTM 17 504450

5 4895450 CODED

Elev. 5 0970

Basin 22

2502709
3 9

41A2e

DEC 2 1968

The Ontario Water Resources Commission Act

WATER WELL RECORD

County or District GREY Township, Village, Town or City BENTINCK

Con. 6 Lot ~~20~~ 21 Date completed 7 (day) NOV month 68 year)

[redacted]ress ELMWOOD R.R1

Casing and Screen Record	
Inside diameter of casing	4"
Total length of casing	63
Type of screen	—
Length of screen	—
Depth to top of screen	—
Diameter of finished hole	4"

Pumping Test	
Static level	15'
Test-pumping rate	20 G.P.M.
Pumping level	25
Duration of test pumping	2 HRS
Water clear or cloudy at end of test	CLEAR
Recommended pumping rate	15 G.P.M.
with pump setting of	40 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)
BOULDERS	0	20	75	FRESH
GRAVEL + BOULDERS	20	40	70	
GRAVEL	40	55	80	
FINE SAND	55	63		
GREY ROCK	63	80		

For what purpose(s) is the water to be used? HOUSE HOLD USE

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

Drilling or Boring Firm DURHAM DRILLING & ENTERPRISES LTD

Address DURHAM ONT. BOX 299

Licence Number 2802

Name of Driller or Borer ED. HOTCHKISS

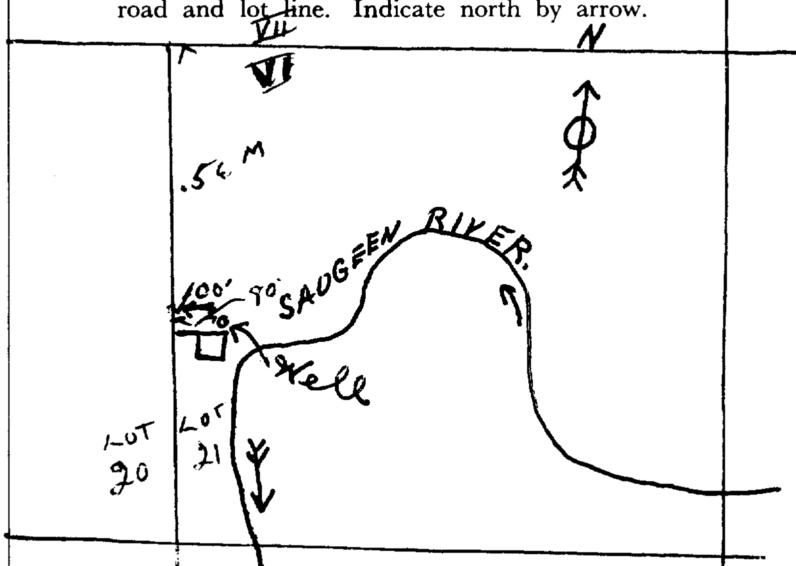
Address DURHAM ONT.

Date NOV. 7. — 68

(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 15M-60-4138

OWRC COPY

Ontario — Ministry of the Environment

Well Tag Number (Place sticker and print number below): A043695

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

[redacted]

Address of Well Location (County/District/Municipality): GREY COUNTY | Township: BENTINCK TWP | Lot: 21 | Concession: 5

RR#/Street Number/Name: # 133799 | City/Town/Village | Site/Compartment/Block/Tract etc.

GPS Reading: NAD 83 | Zone 17 | Easting 504647 | Northing 4894688 | Unit Make/Model | 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 From	Depth To
	TOP SOIL			0	1ft
BROWN	SAND	GRAVEL		1ft	20ft
BROWN	SAND			20ft	65ft
GREY	LIMESTONE	BROWN CLAY		65ft	70ft
GREY	LIMESTONE	BROWN LIMESTONE	LAYERS.	70ft	136ft

Hole Diameter

Depth From	Depth To	Diameter Centimetres
0	136ft	6"

Water Record

Water found at ___ Metres	Kind of Water
100 ft	☑ Fresh ☐ Salty ☐ Gas ☐ Sulphur ☐ Minerals ☐ Other: UNTESTED
125ft	☑ Fresh ☐ Salty ☐ Gas ☐ Sulphur ☐ Minerals ☐ Other: UNTESTED
___ m	☐ Fresh ☐ Salty ☐ Gas ☐ Sulphur ☐ Minerals ☐ Other:

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

Chlorinated ☑ Yes ☐ No

Construction Record

Inside diam centimetres	Material	Wall thickness centimetres	Depth From	Depth To
Casing				
6"	☑ Steel ☐ Fibreglass ☐ Plastic ☐ Concrete ☐ Galvanized	.188	+2ft	75ft
	☐ Steel ☐ Fibreglass ☐ Plastic ☐ Concrete ☐ Galvanized			
	☐ Steel ☐ Fibreglass ☐ Plastic ☐ Concrete ☐ Galvanized			
Screen				
Outside diam	☑ Steel ☐ Fibreglass ☐ Plastic ☐ Concrete ☐ Galvanized	Slot No.		
6"			75ft	136ft
No Casing or Screen				
	☐ Open hole			

Test of Well Yield

Pumping test method: Pump

Pump intake set at - (metres): 30ft

Pumping rate - (litres/min): 10 GPM

Duration of pumping: 1 hrs + ___ min

Final water level end of pumping: 13.2ft metres

Recommended pump type: ☑ Shallow ☑ Deep

Recommended pump depth: 400ft metres

Recommended pump rate: 10 GPM (litres/min)

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		13ft		
1		13.2ft	1	13ft
2		—	2	
3		—	3	
4		—	4	
5		—	5	
10		—	10	
15			15	
20			20	
25			25	
30			30	
40			40	
50			50	
60		13.2	60	

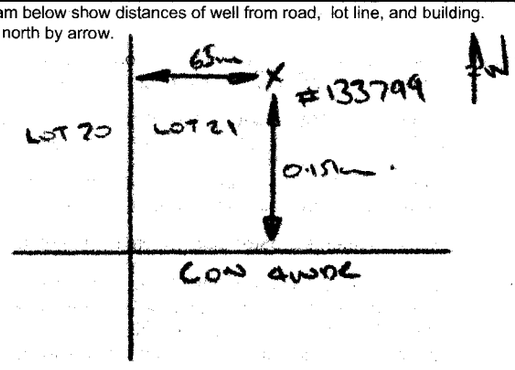
Plugging and Sealing Record

☑ Annular space ☐ Abandonment

Depth set at - Metres From	Depth set at - Metres To	Material and type (bentonite slurry, neat cement slurry) etc.	Volume Placed (cubic metres)
0	30ft	GROUT	

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

Water Use

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

Final Status of Well

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

Audit No. Z 25363

Date Well Completed: YYYY 2006 MM 07 DD 04

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

Date Delivered: YYYY 2006 MM 07 DD 04

Well Contractor/Technician Information

Name of Well Contractor: HIGHLAND WATER WELLS | Well Contractor's Licence No.: 7576

Business Address (street name, number, city etc.): BOX 141 OCHAWA, ONT. N0E 1R0

Name of Well Technician (last name, first name): POPPLETON, NIGEL | Well Technician's Licence No.: 12130

Signature of Technician/Contractor: X [signature] | Date Submitted: YYYY 2006 MM 07 DD 10

Ministry Use Only

Data Source | Contractor: 2576

Date Received: YYYY OCT 27 2006 MM DD | Date of Inspection: YYYY MM DD

Remarks: AVERAGED AT 300-400 GPM | 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

Well Tag A 043279 (or below)

A043279

Well Record

Regulation 903 Ontario Water Resources Act

page ___ of ___

Instructions for Completing Form

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- **All metre measurements shall be reported to 1/10th of a metre.**
- Please print clearly in blue or black ink only.

Ministry Use Only

MUN | CON | LOT

Well Owner's Information and Location of Well Information

[redacted]

WESTGREY — RR#/Street Number/Name

BENTINCK — City/Town/Village

24 — Site/Compartment/Block/Tract etc.

4

GPS Reading: NAD 83 | Zone 17 | Easting 505830 | Northing 4895188 | Unit Make/Model MAGELLAN | 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 From	Depth To (Metres)
		TOPSOIL		0	1 FT
		STONES & GRAVEL		1	65
		PEA GRAVEL		65	73
		LIMESTONE		73	97 FT.

Hole Diameter

Depth From	Metres To	Diameter Centimetres
0	20FT	10 INCH
20	73	9 INCH
73	97	6 INCH

Water Record

Water found at ~~Metres~~ / Kind of Water

97FT	☐ Fresh	☐ Sulphur	
☐ Gas	☐ Salty	☐ Minerals	
☐ Other:			
___ m	☐ Fresh	☐ Sulphur	
☐ Gas	☐ Salty	☐ Minerals	
☐ Other:			
___ m	☐ Fresh	☐ Sulphur	
☐ Gas	☐ Salty	☐ Minerals	
☐ Other:			

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

Chlorinated ☑ Yes ☐ No

Construction Record

Inside diam centimetres	Material	Wall thickness centimetres	Depth From	Depth To (Metres)
	Casing			
6 INCH	☑ Steel ☐ Fibreglass ☐ Plastic ☐ Concrete ☐ Galvanized	.188	0	75FT
	☐ 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		75	97FT

Test of Well Yield

Pumping test method: AIR-PUMP

	Draw Down Time min	Draw Down Water Level ~~Metres~~	Recovery Time min	Recovery Water Level ~~Metres~~
Pump intake set at - (metres) AIR 97	Static Level	58FT		70FT
Pumping rate - (~~litres~~/min) 6GAL	1	63	1	65
Duration of pumping 24 hrs + ___ min	2	68	2	60
Final water level end of pumping 59 FT ~~metres~~	3	70FT	3	58
Recommended pump type. ☐ Shallow ☑ ~~Deep~~	4		4	
Recommended pump depth. 70 FT ~~metres~~	5		5	
Recommended pump rate. 5GAL (~~litres~~/min)	10		10	
If flowing give rate - (litres/min)	15		15	
	20		20	
	25		25	
If pumping discontinued, give reason.	30		30	
	40		40	
	50		50	
	60		60	

Plugging and Sealing Record ☑ Annular space ☐ Abandonment

Depth set at - Metres From	To	Material and type (bentonite slurry, neat cement slurry) etc.	Volume Placed (cubic metres)
0	20FT	50 GAL GROUT SLURRY	
		150 LBS 3/8 HOLEPLUG	

Method of Construction

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

Water Use

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

Final Status of Well

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

Well Contractor/Technician Information

Name of Well Contractor: KAUFMAN INVESTMENTS LTD. — Well Contractor's Licence No.: 6634

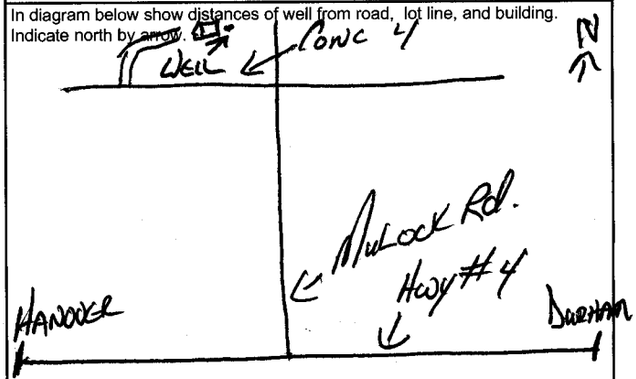
Business Address (street name, number, city etc.): RR#1 DURHAM ONTARIO

Name of Well Technician (last name, first name): KAUFMAN PAUL — Well Technician's Licence No.: T-1922

Signature of Technician/Contractor: X [signature] — Date Submitted: 2006 09 12

Location of Well

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



Audit No. Z 48391

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

Date Well Completed: 2006 07 27

Date Delivered: 2006 07 27

Ministry Use Only

Data Source | Contractor: 6634

Date Received: SEP 26 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

Well Tag Number (Place sticker and print number below): A025018

Well Record

Regulation 903 Ontario Water Resources Act

page ___ of ___

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- **All metre measurements shall be reported to 1/10th of a ~~metre~~ FOOT.**
- Please print clearly in blue or black ink only.

Ministry Use Only: MUN ____ CON ____ LOT ____

Well Owner's Information and Location of Well Information

[redacted]

GREY COUNTY | BENTINCK | 21 | CON 3

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

GPS Reading: NAD 83 | Zone 17 | Easting 504685 | Northing 4894777 | Unit Make/Model MERIDIAN | Mode of Operation: ☐ Undifferentiated ☑ Averaged ☐ Differentiated, specify

Log of Overburden and Bedrock Materials (see instructions)

FEET

General Colour	Most common material	Other Materials	General Description	Depth From	Depth ~~Metres~~ To
BROWN	SAND	BOULDERS		0	31
BROWN	SAND			31	53
GREY	LIMESTONE			53	98

Hole Diameter

Depth From	Depth ~~Metres~~ To	Diameter ~~Centimetres~~
0	98	6"

Water Record

Water found at ~~Metres~~	Kind of Water	
60 m	☑ Fresh ☐ Salty ☐ Gas ☐ Other: UNTESTED	☐ Sulphur ☐ Minerals
93 m	☑ Fresh ☐ Salty ☐ Gas ☐ Other: UNTESTED	☐ Sulphur ☐ Minerals
___ m	☐ Fresh ☐ Salty ☐ Gas ☐ Other:	☐ Sulphur ☐ Minerals

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

Chlorinated ☑ Yes ☐ No

Construction Record

Inside diam ~~centimetres~~	Material	Wall thickness centimetres	Depth From	Depth To
Casing				
6"	☑ Steel ☐ Fibreglass ☐ Plastic ☐ Concrete ☐ Galvanized	.188	2	55
	☐ 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		55	98

Test of Well Yield

Pumping test method: AIR	Draw Down Time min	Draw Down Water Level ~~Metres~~	Recovery Time min	Recovery Water Level Metres
Pump intake set at - (metres) 70	Static Level	12 FT		
Pumping rate - (litres/min) 30gpm	1		1	
Duration of pumping 1 hrs + 30 min	2		2	
Final water level end of pumping ___ metres	3		3	
Recommended pump type. ☐ Shallow ☑ Deep	4		4	
Recommended pump depth. 60 FT metres	5		5	
Recommended pump rate. 30gpm (litres/min)	10		10	
If flowing give rate - (litres/min)	15		15	
	20		20	
If pumping discontinued, give reason.	25		25	
	30		30	
	40		40	
	50		50	
	60		60	

Plugging and Sealing Record

☑ Annular space ☐ Abandonment

Depth set at - ~~Metres~~ From	To	Material and type (bentonite slurry, neat cement slurry) etc.	Volume Placed (cubic metres)
0	30	GROUT	

Method of Construction

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

Water Use

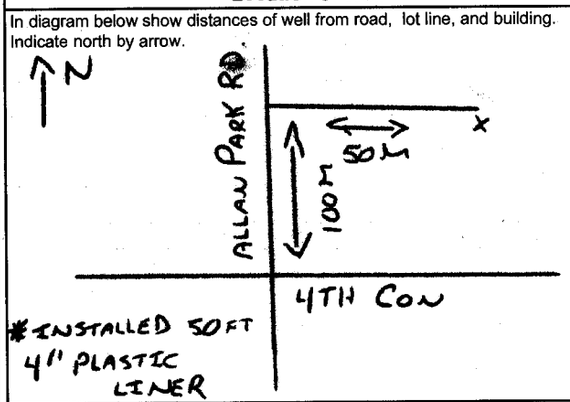
☑ Domestic ☐ Industrial ☐ Public Supply ☐ Other
☐ Stock ☐ Commercial ☐ Not used
☐ Irrigation ☐ Municipal ☐ Cooling & air conditioning

Final Status of Well

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

Location of Well

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



Audit No. Z 25420 | Date Well Completed 2005 08 05

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

Well Contractor/Technician Information

Name of Well Contractor: HIGHLAND WATER WELLS | Well Contractor's Licence No.: 2576

Business Address (street name, number, city etc.): BOX 141 DURHAM ONT N0G 1R0

Name of Well Technician (last name, first name): GRAHAM JEFF | Well Technician's Licence No.: T2909

Signature of Technician/Contractor: X [signature] | Date Submitted YYYY MM DD: 2005 08 08

Ministry Use Only

Data Source | Contractor: 2576

Date Received: SEP 08 2005 | Date of Inspection YYYY MM DD

Remarks: AIR LIFTED AT 200' G.P.M. | 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

Well Tag Number (Place sticker and print number below): A025024

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~~ FOOT.**
- Please print clearly in blue or black ink only.

Ministry Use Only

MUN ___ CON ___ LOT ___

[redacted]

Address of Well Location (County/District/Municipality): GREY COUNTY | Township: BENTINCK | Lot: 21 | Concession: CON 5

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

GPS Reading: NAD 83 | Zone 17 | Easting 504615 | Northing 4895026 | Unit Make/Model: MERIDIAN | Mode of Operation: ☐ Undifferentiated ☑ Averaged ☐ Differentiated, specify

Log of Overburden and Bedrock Materials (see instructions)

FEET

General Colour	Most common material	Other Materials	General Description	Depth From	Depth To
BROWN	SAND	BOULDERS		0	21
BROW	SAND		WET	21	58
GREY	GRAVEL	SAND		58	64
GREY	LIMESTONE			64	98

Hole Diameter

Depth From	Metres To	Diameter ~~Centimetres~~
0	98	6"

Water Record

Water found at Metres	Kind of Water			
85 m	☑ Fresh	☐ Sulphur	☐ Gas	☐ Salty
☐ Minerals	☐ Other: UNTESTED			
95 m	☑ Fresh	☐ Sulphur	☐ Gas	☐ Salty
☐ Minerals	☐ Other: a.f.			
___ m	☐ Fresh	☐ Sulphur	☐ Gas	☐ Salty
☐ Minerals	☐ Other:			

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

Chlorinated ☑ Yes ☐ No

Construction Record

Inside diam centimetres	Material	Wall thickness centimetres	Depth From	Metres To
Casing				
6"	☑ Steel ☐ Fibreglass ☐ Plastic ☐ Concrete ☐ Galvanized	.188	2	65
	☐ 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		65	98

Test of Well Yield

Pumping test method: AIR	Draw Down Time min	Draw Down Water Level Metres	Recovery Time min	Recovery Water Level Metres
Pump intake set at (~~metres~~) 60FT	Static Level	15FT		
Pumping rate - (litres/min) 25GPM	1		1	
Duration of pumping 1 hrs + 30 min	2		2	
Final water level end of pumping ___ metres	3		3	
Recommended pump type. ☐ Shallow ☑ Deep	4		4	
Recommended pump depth. 50' 66 metres	5		5	
Recommended pump rate. 15GPM (litres/min)	10		10	
If flowing give rate - (litres/min)	15		15	
If pumping discontinued, give reason.	20		20	
	25		25	
	30		30	
	40		40	
	50		50	
	60		60	

Plugging and Sealing Record

☑ Annular space ☐ Abandonment

Depth set at - Metres From	To	Material and type (bentonite slurry, neat cement slurry) etc.	Volume Placed (cubic metres)
0	30	GROUT	

Method of Construction

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

Water Use

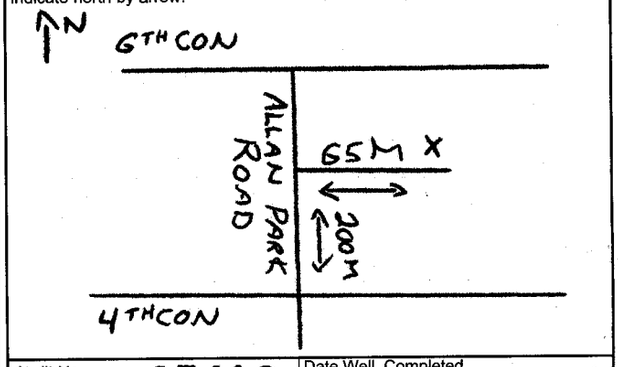
☑ Domestic ☐ Industrial ☐ Public Supply ☐ Other
☐ Stock ☐ Commercial ☐ Not used
☐ Irrigation ☐ Municipal ☐ Cooling & air conditioning

Final Status of Well

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

Location of Well

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



Audit No. Z 25412 | Date Well Completed 2005 07 15 (YYYY MM DD)

Was the well owner's information package delivered? ☐ Yes ☐ No | Date Delivered ___

Well Contractor/Technician Information

Name of Well Contractor: HIGHLAND WATER WELLS | Well Contractor's Licence No.: 2576

Business Address (street name, number, city etc.): Box 141 DURHAM ONT N0G 1R0

Name of Well Technician (last name, first name): GRAHAM JEFF | Well Technician's Licence No.:

Signature of Technician/Contractor: X [signature] | Date Submitted: 2005 07 15 (YYYY MM DD)

Ministry Use Only

Data Source: | Contractor: 2576

Date Received: SEP 08 2005 (YYYY MM DD) | Date of Inspection (YYYY MM DD)

Remarks: AIR LIFTED AT 200+G.P.M. | Well Record Number: Install SQ 10gpm

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

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 2512309 MUNICIP 25002 CON. CON 04

COUNTY OR DISTRICT [redacted] | TOWNSHIP, BOROUGH, CITY, TOWN, VILLAGE BENTINCK RR#3 HANOVER | CON. BLOCK, TRACT, SURVEY, ETC 4 | LOT 23 | DATE COMPLETED DAY 13 MO 09 YR 93

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
		GRAVEL		0	30
		CLAY & GRAVEL		30	44
	GREY	ROCK		44	80
	BROWN	ROCK		80	113

41 WATER RECORD

WATER FOUND AT - FEET	KIND OF WATER
80	1 ☒ FRESH 2 ☐ SALTY 3 ☐ SULPHUR 4 ☐ MINERALS 6 ☐ GAS
TO 113	1 ☐ FRESH 2 ☐ SALTY 3 ☐ SULPHUR 4 ☐ MINERALS 6 ☐ GAS
	1 ☐ FRESH 2 ☐ SALTY 3 ☐ SULPHUR 4 ☐ MINERALS 6 ☐ GAS
	1 ☐ FRESH 2 ☐ SALTY 3 ☐ SULPHUR 4 ☐ MINERALS 6 ☐ GAS
	1 ☐ FRESH 2 ☐ SALTY 3 ☐ SULPHUR 4 ☐ MINERALS 6 ☐ GAS

51 CASING & OPEN HOLE RECORD

INSIDE DIAM INCHES	MATERIAL	WALL THICKNESS INCHES	DEPTH - FEET FROM	DEPTH - FEET TO
5	1 ☒ STEEL 2 ☐ GALVANIZED 3 ☐ CONCRETE 4 ☐ OPEN HOLE 5 ☐ PLASTIC	1.88	0	46
	1 ☐ STEEL 2 ☐ GALVANIZED 3 ☐ CONCRETE 4 ☒ OPEN HOLE 5 ☐ PLASTIC		46	113
	1 ☐ STEEL 2 ☐ GALVANIZED 3 ☐ CONCRETE 4 ☐ OPEN HOLE 5 ☐ PLASTIC			

SCREEN

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

61 PLUGGING & SEALING RECORD

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

71 PUMPING TEST

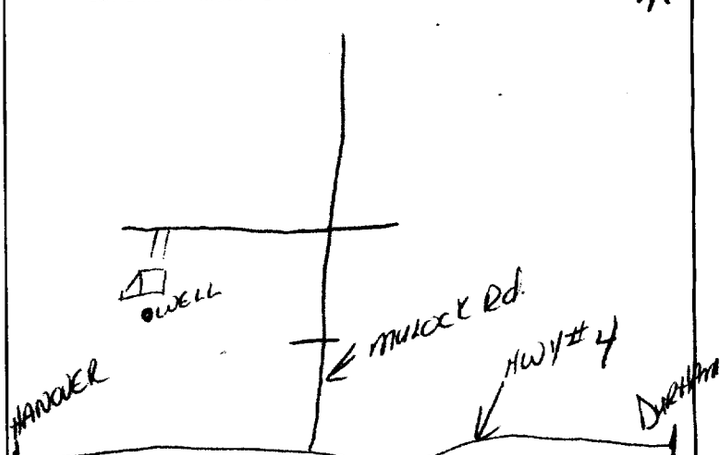
PUMPING TEST METHOD: 1 ☐ PUMP 2 ☐ BAILER — AIR
PUMPING RATE: 11 GPM
DURATION OF PUMPING: 1 HOURS 30 MINS

STATIC LEVEL	WATER LEVEL END OF PUMPING	WATER LEVELS DURING	15 MINUTES	30 MINUTES	45 MINUTES	60 MINUTES
50 FEET	68 FEET	1 ☐ PUMPING 2 ☒ RECOVERY	50 FEET	50 FEET	50 FEET	50 FEET

IF FLOWING, GIVE RATE: GPM
PUMP INTAKE SET AT: AIR 113 FEET
WATER AT END OF TEST: 1 ☐ CLEAR 2 ☐ CLOUDY
RECOMMENDED PUMP TYPE: ☐ SHALLOW ☒ DEEP
RECOMMENDED PUMP SETTING: 85 FEET
RECOMMENDED PUMPING RATE: 7 GPM

LOCATION OF WELL

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



DRILLERS REMARKS: 106592

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

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

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

CONTRACTOR

NAME OF WELL CONTRACTOR: KAUFMAN INVESTMENT LTD. | WELL CONTRACTOR'S LICENCE NUMBER: 6634
ADDRESS: RR#3 ELMWOOD N0G-1S0
NAME OF WELL TECHNICIAN: KAUFMAN & JACKSON | WELL TECHNICIAN'S LICENCE NUMBER: T-1920
SIGNATURE OF TECHNICIAN/CONTRACTOR: Paul Kaufman | SUBMISSION DATE: DAY 21 MO 09 YR 93

MINISTRY OF THE ENVIRONMENT COPY

OFFICE USE ONLY

DATA SOURCE | CONTRACTOR 6634 | DATE RECEIVED SEP 23 1993
DATE OF INSPECTION | INSPECTOR
REMARKS: CSS.ES

FORM NO. 0506 (11/86) FORM 9

Ministry of the Environment

Ontario

The Ontario Water Resources Act

WATER WELL RECORD

4/#/2W

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

(11) 2507455 MUNICIP 25002 CON. CON 06

COUNTY OR DISTRICT	TOWNSHIP, BOROUGH, CITY, TOWN, VILLAGE	CON., BLOCK, TRACT, SURVEY, ETC.	LOT
[redacted]	Bentrik	Con 6	023

[redacted] # Elmwood — DATE COMPLETED: DAY 15 MO. 07 YR. 80

[redacted] 95850 RC 5 ELEVATION 0975 RC 5 BASIN CODE 22

LOG OF OVERBURDEN AND BEDROCK MATERIALS (SEE INSTRUCTIONS)

GENERAL COLOUR	MOST COMMON MATERIAL	OTHER MATERIALS	GENERAL DESCRIPTION	DEPTH - FEET FROM	TO
Black	Topsoil			0	1
Brown	clay	gravel	Larg Bolders	1	97
Brown	Bedrock			97	200

(31) 0001802 | 0097605 11 13 | 0200626

32

(41) WATER RECORD

WATER FOUND AT - FEET	KIND OF WATER
~~0150~~ ~~200~~	1 ☒ FRESH 3 ☐ SULPHUR 2 ☐ SALTY 4 ☐ MINERAL
0200	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
05"	1 ☒ STEEL 2 ☐ GALVANIZED 3 ☐ CONCRETE 4 ☐ OPEN HOLE	188	0	0100
	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

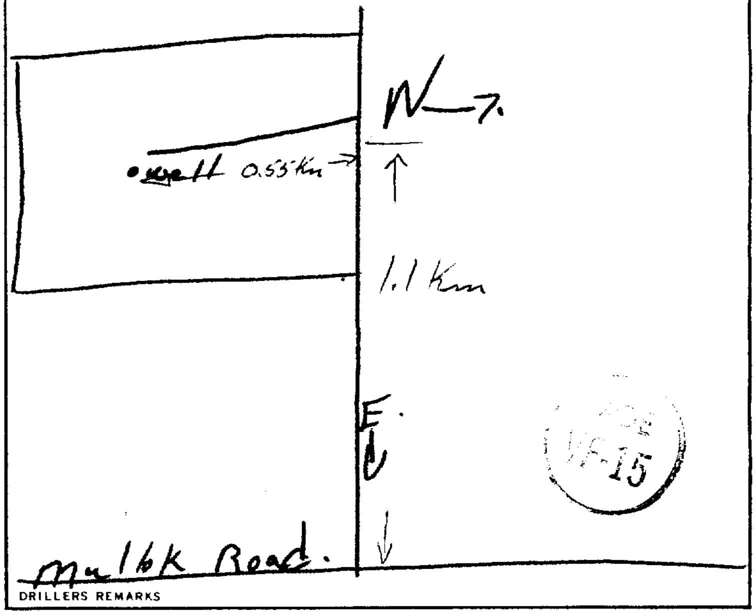
DEPTH SET AT - FEET FROM	TO	MATERIAL AND TYPE (CEMENT GROUT, LEAD PACKER, ETC.)

(71) PUMPING TEST

PUMPING TEST METHOD	1 ☐ PUMP 2 ☒ BAILER (AIR)
PUMPING RATE	0050 GPM
DURATION OF PUMPING	04 HOURS 30 MINS
STATIC LEVEL	003 FEET
WATER LEVEL END OF PUMPING	003 FEET
WATER LEVELS DURING	1 ☒ PUMPING 2 ☐ RECOVERY
15 MINUTES	Stem FEET
30 MINUTES	117 FEET
45 MINUTES	Hole FEET
60 MINUTES	003 FEET
IF FLOWING, GIVE RATE	GPM
PUMP INTAKE SET AT	180 FEET
WATER AT END OF TEST	1 ☒ CLEAR 2 ☐ CLOUDY
RECOMMENDED PUMP TYPE	☐ SHALLOW ☒ DEEP
RECOMMENDED PUMP SETTING	140 FEET
RECOMMENDED PUMPING RATE	0030 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: 07

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: 2

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: RIERS well Drilling — LICENCE NUMBER: 4544

ADDRESS: R# 3 Auther

NAME OF DRILLER OR BORER: L. Riev — LICENCE NUMBER: 4544

SIGNATURE OF CONTRACTOR: [signature] — SUBMISSION DATE: DAY 15 MO. 7 YR. 80

OFFICE USE ONLY

DATA SOURCE: 1 — CONTRACTOR: 4544 — DATE RECEIVED: 250681

DATE OF INSPECTION: 16/9/81 — INSPECTOR:

REMARKS: P/P

MINISTRY OF THE ENVIRONMENT COPY

FORM NO. 0506-4-77 FORM 7

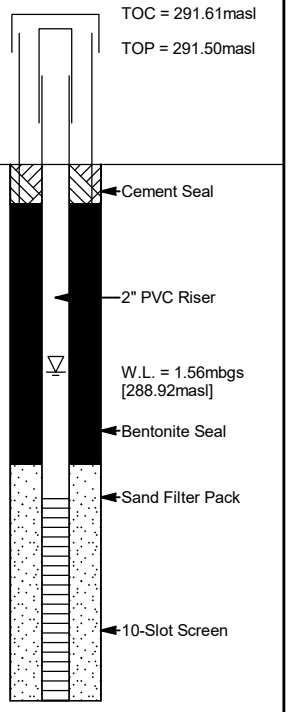
APPENDIX B:
BOREHOLE LOGS

Testhole ID: BH-1 / MW-1

CLIENT Candue Homes c/o Don Tremble
PROJECT NAME Hydrogeological Study
PROJECT NUMBER 220135
PROJECT LOCATION 382063 Conc. 4, Bentinck
DATE COMPLETED 21-Feb-2021
CONTRACTOR London Soil Test
LOGGED BY Corbin Sweet
METHOD Hollow Stem Auger / Split-Spoon Sampler
WELL CONSTRUCTION 2" Ø PVC Riser with 10' 10-slot screen
NOTES

DEPTH (m)	DEPTH (ft)	ELEVATION (m)	SAMPLE TYPE NUMBER	GRAPHIC LOG		MATERIAL DESCRIPTION	
	-4						
	-2						
0	0				0.00	Ground Surface	290.48
					0.18	TOPSOIL, Dark Brown, Loose, Moist	290.30
		290				CLAY with Trace SILT, Reddish Brown, Firm, Moist	
	2				0.56		289.92
					0.76	Coarse GRAVEL with SAND and SILT and trace CLAY, Brown, Loose-to-Compact, Moist-to-Dry	289.72
	4					Coarse GRAVEL and SAND with some SILT, Light Brown, Loose, Dry - Less Silt with Depth	
	6				1.83		288.65
2						Medium SAND, Brown, Loose, Wet	
	8	288					
	10				3.05		287.43
						Coarse-to-Medium SAND with GRAVEL and Trace SILT, Brown, Loose-to-Compact, Saturated	
	12						
4							
	14	286					
	16				4.72		285.76
						Fine SAND and SILT, Light Brown, Firm,. Saturated	

Borehole Terminated at 4.88 m.



Testhole ID: BH-2 / MW-2

CLIENT Candue Homes c/o Don Tremble
PROJECT NAME Hydrogeological Study
PROJECT NUMBER 220135
PROJECT LOCATION 382063 Conc. 4, Bentinck
DATE COMPLETED 21-Feb-2021
CONTRACTOR London Soil Test
LOGGED BY Corbin Sweet
METHOD Hollow Stem Auger / Split-Spoon Sampler
WELL CONSTRUCTION 2" Ø PVC Riser with 10' 10-slot screen
NOTES

DEPTH (m)	DEPTH (ft)	ELEVATION (m)	SAMPLE TYPE NUMBER	GRAPHIC LOG	MATERIAL DESCRIPTION		WELL DIAGRAM
	-4						TOC = 296.89masl
	-2	296					TOP = 296.76masl
0	0				0.00 Ground Surface	295.69	
					TOPSOIL with some GRAVEL, Dark Brown, Firm, Moist		Cement Seal
	2				0.56	295.13	
					0.76 Coarse GRAVEL with Fine SAND and SILT, Brown, Loose, Moist-to-Dry	294.93	
					Coarse GRAVEL and SAND with some COBBLES, Brown, Loose, Dry		2" PVC Riser
	4	294					Bentonite Seal
2	6						
	8						
					2.74	292.95	
	10				More SAND and Less COBBLES		
					3.05	292.64	
					Medium SAND with some Fine-to-Medium GRAVEL, Brown, Loose, Dry		
					3.35 - [Rock in Split Spoon Bit]	292.34	
	12	292			SAND and GRAVEL with COBBLES, Light Brown, Loose, Dry		Sand Filter Pack
4	14						W.L. = 4.58mbgs [291.11masl]
	16						10-Slot Screen
					5.33	290.36	
	18	290			Softer (Suspected to be saturated)		
6	20				6.10	289.59	
					Coarse SAND and GRAVEL, Light Brown, Loose, Saturated - Increasing gravel content with depth		
	22						
	24						

Borehole Terminated at 7.62 m.

Testhole ID: BH-3 / MW-3

CLIENT Candue Homes c/o Don Tremble
PROJECT NAME Hydrogeological Study
PROJECT NUMBER 220135
PROJECT LOCATION 382063 Conc. 4, Bentinck
DATE COMPLETED 22-Feb-2021
CONTRACTOR London Soil Test
LOGGED BY Kate Charpontier
METHOD Hollow Stem Auger / Split-Spoon Sampler
WELL CONSTRUCTION 2" Ø PVC Riser with 10' 10-slot screen
NOTES

DEPTH (m)	DEPTH (ft)	ELEVATION (m)	SAMPLE TYPE NUMBER	GRAPHIC LOG	MATERIAL DESCRIPTION		WELL DIAGRAM
	-2						TOC = 289.53masl TOP = 289.49masl
0	0				0.00 Ground Surface	288.44	
					0.20 TOPSOIL, Dark Brown, Moist	288.24	Cement Seal
		288			Coarse SAND and GRAVEL with some COBBLES, Brown, Dry-to-Wet, Compact -Finer sand and increasing moisture with depth		W.L. = 0.94mbgs [287.50masl]
	2						2" PVC Riser
	4						Bentonite Seal
2	6						
	8	286					
	10				3.05	285.39	Sand Filter Pack
					Coarse SAND, Brown, Saturated, Loose-to-Compact		10-Slot Screen
	12						
4	14						
		284					

Borehole Terminated at 4.57 m.

Testhole ID: BH-4 / MW-4

CLIENT Candue Homes c/o Don Tremble
PROJECT NAME Hydrogeological Study
PROJECT NUMBER 220135
PROJECT LOCATION 382063 Conc. 4, Bentinck
DATE COMPLETED 22-Feb-2021
CONTRACTOR London Soil Test
LOGGED BY Kate Charpontier
METHOD Hollow Stem Auger / Split-Spoon Sampler
WELL CONSTRUCTION 2" Ø PVC Riser with 10' 10-slot screen
NOTES

DEPTH (m)	DEPTH (ft)	ELEVATION (m)	SAMPLE TYPE NUMBER	GRAPHIC LOG	MATERIAL DESCRIPTION		WELL DIAGRAM
	-4						TOC = 297.76masl
	-2						TOP = 297.67masl
0	0				0.00 Ground Surface	296.60	
					TOPSOIL, Dark Brown, Moist		Cement Seal
					0.50	296.10	
	2	296			Coarse SAND and GRAVEL, Brown, Loose, Dry		
	4				1.34	295.26	
					1.57 SILT and SAND, Brown, Firm, Dry	295.03	
	6				CLAY, Brown, Firm-to-Dense, Dry-to-Moist		
2							2" PVC Riser
	8	294					
	10				3.07	293.53	Bentonite Seal
					Coarse SAND and GRAVEL with trace COBBLES, Brown, Loose, Dry-to-Moist - Increasting cobbles and lighter brown colour with depth		
	12						
4							
	14	292					
	16						
	18						
6							Sand Filter Pack
	20						
	22	290					W.L. = 6.50mbgs [290.10masl]
	24						10-Slot Screen
					7.50	289.10	
					- Saturated		
8	26				7.92	288.68	
					8.18 Fine SAND, Brown, Loose-to-Compact, Saturated	288.42	
	28	288			SILT, Light Brown, Firm, Saturated		

Testhole ID: BH-4 / MW-4

CLIENT Candue Homes c/o Don Tremble **PROJECT NAME** Hydrogeological Study

PROJECT NUMBER 220135 **PROJECT LOCATION** 382063 Conc. 4, Bentinck

DEPTH (m) (ft)	ELEVATION (m)	SAMPLE TYPE NUMBER	GRAPHIC LOG	MATERIAL DESCRIPTION	WELL DIAGRAM
				Borehole Terminated at 8.74 m.	

APPENDIX C:
SITE PHOTOGRAPHS

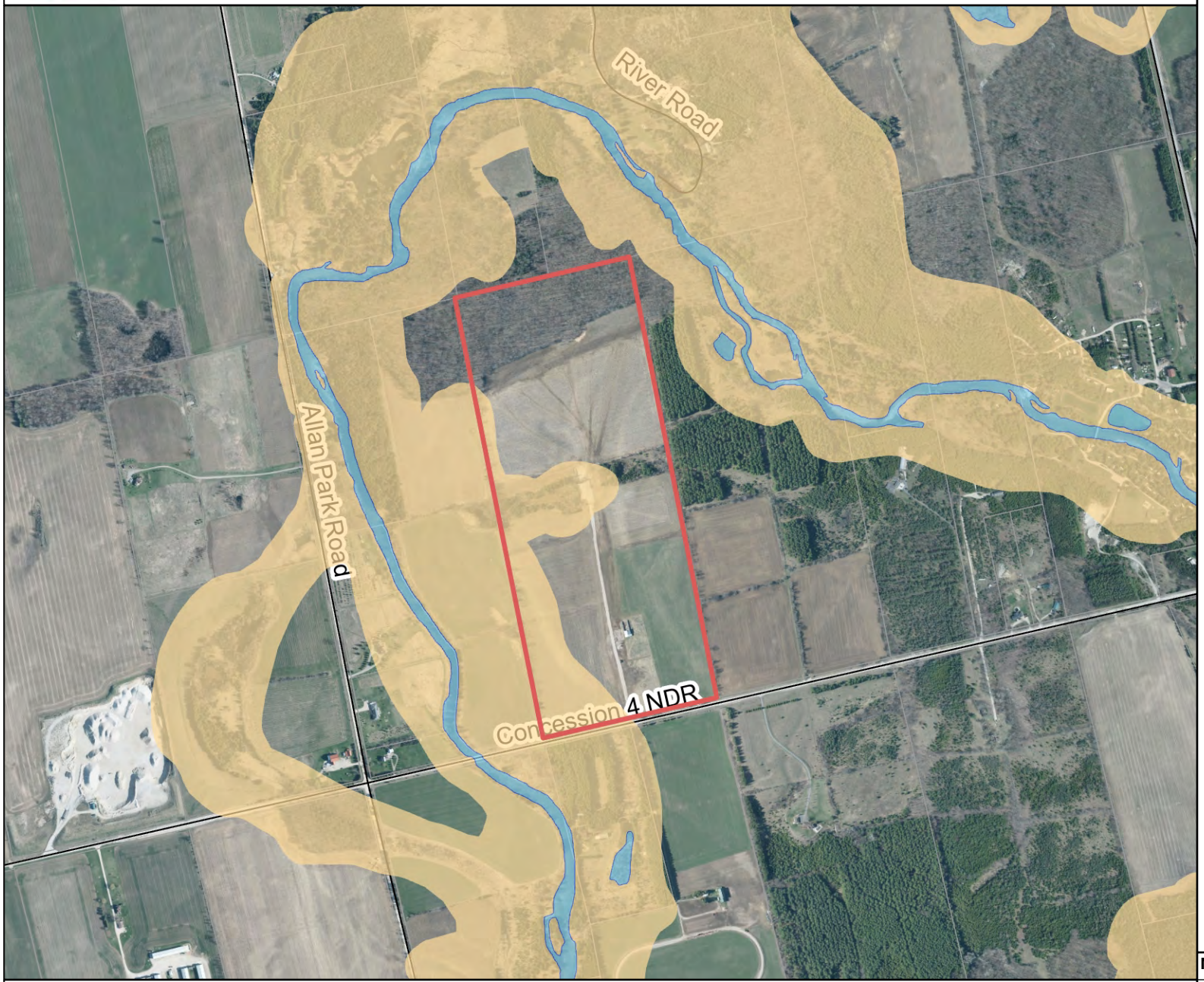
Photo 1 - View of southern Portion of the Site looking northeast from the southwest corner of the property. MW–3 in front. (March 25, 2022)

Photo 2 - Drilling of MW-4 (February 23, 2021)

Photo 3 - View of sand and gravel in the location of MW-2.

APPENDIX D:
SAUGEEN VALLEY CONSERVATION AUTHORITY MAPPING

SVCA Regulated Areas (O. Reg 169/06)



Legend

- Wet Areas - GSCA
- Water Features
- Watercourses
- Approximate Regulated and Screen SVCA
  - Approximate Regulated Area
  - Approximate Screening Area
- Large Scale Roads
  - Provincial Highway
  - County Road
  - Township Road
  - Seasonal Road
- Parcels - Current
- Grey County Boundary

Notes

888 0 444 888 Meters

WGS_1984_Web_Mercator_Auxiliary_Sphere

This map is a user generated static output from an Internet mapping site and is for reference only. Data layers that appear on this map may or may not be accurate, current, or otherwise reliable.

Printed March 28, 2022

THIS MAP IS NOT TO BE USED FOR NAVIGATION

SAUGEEN VALLEY CONSERVATION AUTHORITY

ONTARIO REGULATION 169/06
DEVELOPMENT, INTERFERENCE WITH WETLANDS AND ALTERATIONS TO SHORELINES AND WATERCOURSES

For the features and areas subject to Ontario Regulation 169/06 permission from the SVCA is required before any person may: *undertake development, straighten, change, divert or interfere in any way with a watercourse, or change or interfere in any way with a wetland*.

"Development" is defined as:

(a) the construction, reconstruction, erection or placing of a building or structure of any kind,
(b) any change to a building or structure that would have the effect of altering the use or potential use of the building or structure, increasing the size of the building or structure or increasing the number of dwelling units in the building or structure,
(c) site grading, or
(d) the temporary or permanent placing, dumping or removal of any material, originating on the site or elsewhere.

<u>The Following Areas and Features are Subject to the Regulation:</u>

- Hazardous lands – including flood plains (based on the Regional Storm Flood, also called the Hurricane Hazel Flood Event Standard), erosion prone lands, and unstable soils.
- Watercourses (including inland lakes).
- Wetlands and areas adjacent to wetlands.
- Valleys and steep slopes (and slope setbacks).
- Lake Huron shoreline (flooding, erosion and dynamic beach hazards).

<u>How to Determine Regulated Areas</u>

► For urban centres (such as Walkerton, Paisley, Kincardine, Durham) and near these areas, *SV*CA mapping is available at the Authority office showing the Regulations Limits. Contact the SVCA for information about specific properties.

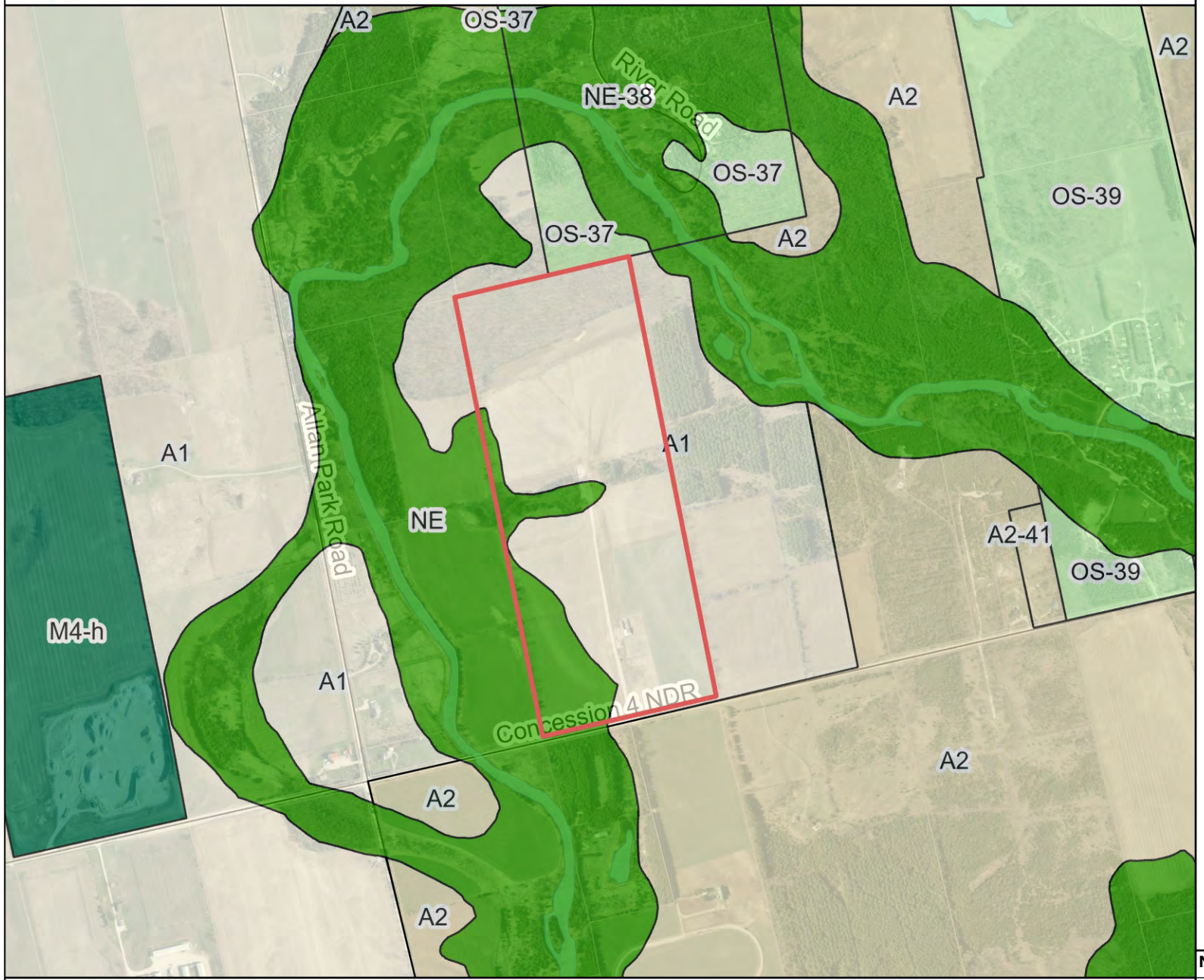
► *For all other areas* Regulation Mapping is not available; instead a *'screening' method* is used to determine potential Regulated Areas. In municipal comprehensive zoning by-laws the "Environmental Protection" (EP) zone (or similar zone such as EH, NE, etc.) generally identifies the features and areas where Regulation 169/06 could apply. **But, the EP zone boundary is <u>not</u> intended to be the Regulation Limit.** Therefore, the *'screening area' includes the EP zone plus a 50 metre distance beyond the zone boundary; and a 120 metre distance from Provincially Significant Wetlands* (Provincially Significant Wetlands are identified in the County Official Plan). For any proposal in the screening area, the SVCA should be contacted. SVCA staff will then determine whether a permit is required and inform the proponent accordingly.

► All watercourses (rivers, creeks, streams, etc.) and wetlands are subject to the Regulation.

Note: This handout is a summary only and for the full text of the Regulation and related information, reference should be made to Ontario Regulation 169/06 and the *Conservation Authorities Act*, R.S.O 1990, Chap. C.27, Section 28.

APPENDIX E:
GREY COUNTY OFFICIAL PLAN MAPPING AND INFORMATION

West Grey Zoning Map



888 0 444 888 Meters

WGS_1984_Web_Mercator_Auxiliary_Sphere

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Printed March 29, 2022

THIS MAP IS NOT TO BE USED FOR NAVIGATION

Legend

Zoning - West Grey

A1	Agricultural
A2	Rural
A3	Restricted Rural
C1	General Commercial
C2	Highway Commercial
C3	Neighbourhood Commercial
C4	Shopping Centre Commercial
C5	Hamlet Commercial
C6	Rural Commercial
FD	Future Development
FL	Flood Way
I	Institutional
M1	Industrial
M2	Restricted Industrial
M3	Rural Industrial
M4	Extractive Industrial
MH	Mobile Home Park
MU1	Mixed Use
ND	No Development
NE	Natural Environment
NE2	Natural Environment 2
OS	Open Space
ER	Estate Residential
R1A	Unserviced Residential
R1B	Low Density Residential
R2	Medium Density Residential
R3	High Density Residential

Wet Areas - GSCA

Water Features

Watercourses

Large Scale Roads

Provincial Highway

County Road

Township Road

Seasonal Road

Notes

within *Core Areas* or *Linkages*, provided no new residential *dwelling*s are permitted on the remnant parcel.

9) Where possible, transportation, utility, and service corridors should avoid the *Natural heritage system*, especially *Core Areas* where possible. Transportation, utility, and service corridors include sewage, water and stormwater management systems, electricity transmission and distribution systems (e.g. hydro corridors), communications / telecommunications, transportation corridors, trails, oil and gas pipelines and associated facilities. Such corridors may be subject to the Municipal Class Environmental Assessment process. Where not avoidable, crossing of *Core Areas* and *Linkages* should be minimized, consider the shortest route across the *Core Area* or *Linkage*, and include context *sensitive* design, such as a narrow footprint, eco-passages, and other best management practices.

10) *Compatible recreation* means recreational uses that will not negatively impact the natural features or function of the *Core Areas* or *Linkages* and would not be in contradiction of the prohibitions listed above.

7.2 *Hazard Lands*

Hazard Lands include *floodplain*s, steep or erosion prone slopes, organic or unstable soils, poorly drained areas, and lands along the Georgian Bay shoreline. These lands can be impacted by flooding, erosion, and/or dynamic beach hazards or have poor drainage, or any other physical condition that is severe enough to pose a risk for the occupant, property damage, or social disruption if developed. While these lands are intended to be regulated so as to avoid natural hazards, they also contribute to the natural environment within the *County*.

New *development* shall generally be directed away from *Hazard lands*. The policies of this section of the Plan work together with MNRF Natural Hazards Technical Guidelines, as well as *conservation authority* regulations, and policies.

1) The *Hazard lands land use type*s are shown on Schedule A. *Hazard lands* have not been mapped within the Niagara Escarpment Plan Area within Schedule A. *Hazard lands* may still exist within the Niagara Escarpment Plan Area and as such it is recommended that consultation occur with the *conservation authority* and the Niagara Escarpment Commission.

2) Permitted uses in the *Hazard Lands land use type* are forestry and uses connected with the conservation of water, soil, wildlife and other natural resources. Other uses also permitted are agriculture, passive public parks, public *utilities* and *resource based recreational uses*. The aforementioned uses will only be permitted where site conditions are suitable and where the relevant hazard impacts have been reviewed.

3) In the *Hazard Lands land use type* buildings and structures are generally not permitted. Minor extensions or enlargements of existing buildings and structures may be permitted subject to the policies of Section .7 Non-habitable buildings connected with public parks, such as picnic shelters, may be permitted.

4) *Development* and *site alteration* is not permitted within the *floodway* portion of the *floodplain* or defined portion of the dynamic beach. The *floodway* is the entire *floodplain*, unless the Two-Zone Concept is in use.

5) Implementation of the existing Two-Zone Concept or *Floodplain* Special Policy Area is subject to the following:
    a) The Two-Zone Concept shall continue to be used for the Saugeen River *floodplain* on Lot 56 to 59 inclusive, Concession 2 E.G.R., (Glenelg Township) Municipality of West Grey, with the *floodway* being the 100 Year *floodplain* and the flood fringe being the outer portions of the Regional Storm *floodplain*. Appropriate *development* may be permitted in the flood fringe provided suitable flood damage reduction measures are undertaken to protect against Regional Storm flooding. *Development* and *site alteration* within the *floodway*, flood fringe or Regulated Area requires the approval of the *conservation authority*, in addition to any other applicable approvals.
    b) Implementation of a new two-zone concept will be done through a municipal official plan amendment

6) Placing, removing, or re-grading fill material of any kind, whether originating on the site or elsewhere, is not permitted without written approval of the appropriate *conservation authority* in *Hazard Lands*.

7) Certain public or private works which, by their nature, must locate within *Hazard Lands* shall be permitted to do so. These works include flood and erosion control, drainage, water works, those directly required for the management or maintenance of the natural environment, and other necessary works of approved design.

8) Replacement of existing buildings or structures may be permitted if the hazard risk does not increase from the original condition, and the feasibility of re-locating the buildings or structures outside of the hazard areas has been assessed.

9) In the *Hazard Lands land use type development* and *site alteration*s will only be considered if all of the following can be satisfied:

a) The hazards can be safely addressed and new hazards are not created or existing ones aggravated;
b) No adverse environmental impacts will result. The *County*, in consultation with the *conservation authority*, may require an *environmental impact study* to be prepared at the proponent's expense, in accordance with this Plan;
c) Vehicles and people have a way of safely entering and exiting at all times;
d) The *development* does not include;
    i. Institutional uses including hospitals, nursing homes, pre-school, school nurseries, day care and schools, where there is a threat to the safe evacuation of the sick, the elderly, persons with disabilities or the young during an emergency as a result of flooding, failure of flood proofing measures or protection works, or erosion; or
    ii. Emergency services such as that provided by fire, police, and ambulance stations and electrical substations, which would be impaired during an emergency as a result of flooding, the failure of flood proofing measures and/or protection works, and/or erosion; or
    iii. Involve hazardous substances, and their disposal, manufacture, treatment or storage of.
e) The advice or approval where required, of the appropriate *conservation authority* shall be obtained. The *County* and the *conservation authority* will consider the mitigation of effects on vegetation, wildlife and fishery resources, and the natural features of the site.
f) There is no feasible location for the *development* outside of the *Hazard Lands land use type*.

10) Where new *development* is proposed on a site, part of which is *Hazard Lands*, then such lands may not be acceptable as part of the five per cent dedication for parkland. All lands dedicated to the municipality shall be conveyed in a condition satisfactory to local municipality.

11) Precise delineation of *Hazard Lands* will be shown in the local zoning by-laws. An amendment to the Official Plan will not be required to permit redefining of a Hazard Land boundary. Modifications to the *Hazard Lands* may occur through a zoning by-law amendment after consultation with the *conservation authority* and the approval authority.

7.3 *Wetlands*

The *County* generally encourages *development* be setback from *Wetlands* by at least 30 metres. In some cases this 30 metres distance can be reduced based on site-specific circumstances, or through the completion of an EIS.