Whitewater Hydrogeology Ltd.



COMBINED LEVEL 1 AND 2 HYDROGEOLOGICAL ASSESSMENT

PROPOSED BONNEFIELD AND PRINCE PITS

Prepared for: Strada Aggregates

Whitewater Hydrogeology Ltd Phone: 705.888.7064 Email: tecia@white-water.ca

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EXECUTIVE SUMMARY

Strada Aggregates Inc. (Strada) are filing an application with the Ministry of Natural Resources and Forestry (MNRF) for an Aggregate Resources Act (ARA) Category 3, Class A Pit Above Water license for development of the proposed Bonnefield Pit and Prince Pit. The proposed Bonnefield Pit is located on Part Lot 12, Concession 3 Township of Melancthon. This parcel of land is 20.25 ha and is situated between two of Strada's existing pit operations, referred to as Melancthon Pit #1 and Melancthon Pit #2. The proposed Prince Pit is located on Part Lot 14, Concession 3 Township of Melancthon. This parcel of land is 40.41 ha and is situated immediately north of Melancthon Pit #1.

Strada is intending to operate the proposed Bonnefield Pit and Prince Pit under the terms of a provincial license that covers both properties and would operate under the terms of an Operational Plan. Each property would be integrated with existing Strada operations at Melancthon Pits #1 and #2, such as through the use of an existing scale house to service both properties and haulage routes that would span each property.

The proposed Bonnefield and Prince Pits are located within a Primary Resource Aggregate Area, as identified by the Province of Ontario's Geological Survey. The results of the site-specific geological work program found that the material beneath the site is high quality Granular "A" aggregate, which is comparable to the material extracted from Strada's existing Melancthon Pit #1 and #2.

Whitewater has completed a Level 2 Hydrogeological Assessment, which has been prepared to accompany the ARA application to enable development of the proposed Bonnefield Pit and Prince Pit. The evaluation presented in this report is based on a comprehensive geological and hydrogeological work program, which provides the foundation to the conceptual understanding of the regional and local environmental conditions.

The results of the hydrogeological investigation indicate that the potential impacts associated with the extraction of the aggregate on the groundwater, surface water, and wetlands will be negligible. The above water extraction limits the potential for influence on the water table as well as the lower aquifer systems (bedrock aquifer). As a result, there will be no influence of the operations on the domestic water wells in the vicinity of the proposed operations.

This conclusion is supported by the long-term operation of the adjacent Melancthon Pit #1 and #2. Locally, the presence and influence of Strada's existing pits provides an invaluable physical model on the long-term effect(s) of such an operation on the surrounding environment and is considered the best source of information for the proposed Bonnefield Pit and Prince Pit assessment. This combined Level 1 and 2 Hydrogeological Assessment provides both regional and site-specific data to support that, similar to the existing Melancthon Pit #1 and #2, the proposed operation of the Bonnefield Pit and Prince Pit will result in no adverse impacts to the ground or surface water regimes.

It is Whitewater's professional opinion that the subject lands are geologically, hydrogeologically and hydrologically suited for the proposed aggregate operations.

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1.0 INTRODUCTION

Strada Aggregates Inc. (Strada) is filing applications with the Ministry of Natural Resources and Forestry (MNRF) for an Aggregate Resources Act (ARA) Category 3, Class A Pit Above Water license for development of the proposed Bonnefield Pit and Prince Pit. The proposed Bonnefield Pit is located on Part Lot 12, Concession 3 Township of Melancthon. This parcel of land is 20.25 ha and is situated between two of Strada's existing pit operations, referred to as Melancthon Pit #1 and Melancthon Pit #2. The proposed Prince Pit is located on Part Lot 14, Concession 3 Township of Melancthon. This parcel of land is 40.41 ha and is situated immediately north of Melancthon Pit #1 (Figure 1 and Figure 2).

Strada is intending to operate the proposed Bonnefield and Prince Pit under the terms of a provincial license that covers both properties and would operate under the terms of an Operational Plan. Aggregate facilities on each property would be integrated with existing Strada operations at Melancthon Pits #1 and #2, such as through the use of an existing scale house to service both properties and haulage routes that would span each property.

Strada has retained Whitewater Hydrogeology Ltd. (Whitewater) to complete a combined Level 1 and Level 2 Hydrogeological Assessment in support of the proposed aggregate operation.

1.1 Study Approach

Melancthon Pit #1 and Melancthon Pit #2 are licensed to extract sand and gravel from above the established water table. Locally, the presence and influence of these pits provides an invaluable physical model on the long-term effect(s) of such operations on the surrounding environment and is considered the best source of information for the assessment of the proposed operations. To develop this understanding, a comprehensive geological and hydrogeological work program, which provides the foundation to the conceptual understanding of the geology and hydrogeology beneath the proposed pits, has been completed. In addition to the local understanding obtained from the historical and on-going monitoring of the existing pits, a regional-scale understanding of the geology and hydrogeology was obtained through the use of published literature sources as summarized in the reference list at the end of this report.

The study approach for the geological and hydrogeological assessment for the proposed pits was developed to comply with the relevant legislation. The Provincial Standards, which support the ARA, outline the technical requirements for the various aggregate applications. For a Category 3, Class A Pit Above Water the only hydrogeological requirement is to "Determine the elevation of the established groundwater table within the site or demonstrate that the final depth of extraction is at least 1.5 m above the water table." The Provincial Policy Statement states that "The quality and quantity of groundwater and surface water and the function of sensitive ground water recharge/discharge areas, aquifers and headwaters will be protected or enhanced."

To comply with the abovementioned requirements, the hydrogeological work program was designed to characterize the regional and local geological, hydrogeological, and hydrological conditions. An impact assessment was completed to determine the potential impacts (if any) of above water aggregate extraction on this natural environment. The work program has also incorporated a cumulative effects assessment as there are four above water pits operating in close proximity. The proposed pits are located in proximity to the Duivenvoorden Pit, the Kasaks Pit, in addition to Melancthon Pit #1 and Melancthon Pit #2 (Figure 1 and Figure 2).

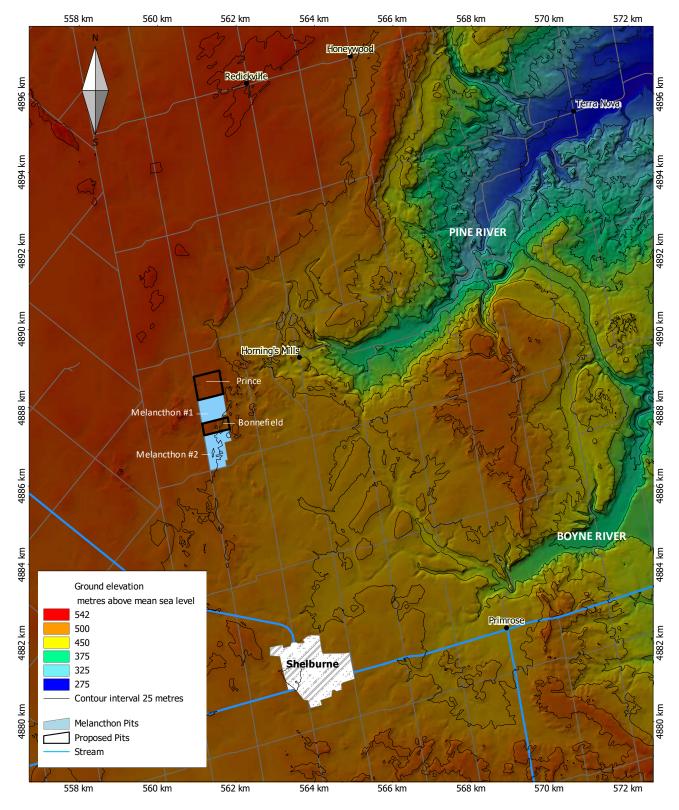


FIGURE 1: REGIONAL LOCATION MAP AND DIGITAL ELEVATION MODEL

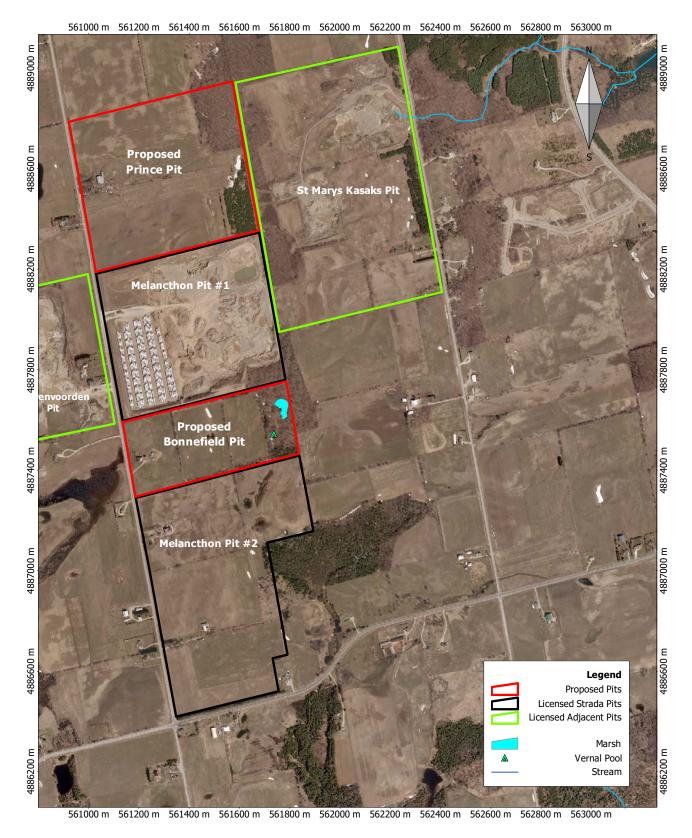


FIGURE 2: SITE LOCATION MAP

2.0 REGIONAL SETTING

2.1 Physiography

The subject property resides within the physiographic region referred to as the Horseshoe Moraines (Chapman and Putnam, 1984). From Singhampton south to Caledon Village, the moraines lie along the brow and slopes of the Niagara Escarpment. Associated with these moraines is a system of spillways with board gravel and sand terraces. The proposed pits will extract the sand and gravels from this spillway system referred to as the Orangeville Moraine.

A Digital Elevation Model (DEM) of the region is presented in Figure 1. DEM data files are digital representations of cartographic information in raster format. DEMs consist of a sampled array of elevations for a number of ground positions at regularly spaced intervals. The DEM model has been conditioned to be hydrologically correct which simply means, spurious sinks (depressions) within a DEM have been removed and the data has been topologically flow corrected.

The most dominant feature on the DEM in this region is the glacial re-entrant valley of the Pine River. This valley extends east of Horning Mills, terminating at Terra Nova. The Boyne River is also obvious on the DEM just north of Primrose. Both re-entrant valley systems cut deeply into the bedrock escarpment from the east.

Figure 3 shows the local topography (pre-extraction from existing aggregate operations) based on the 1 m DEM. The proposed pits are located on the plateau formed by the dolostone cap rock, west of the Niagara Escarpment face.

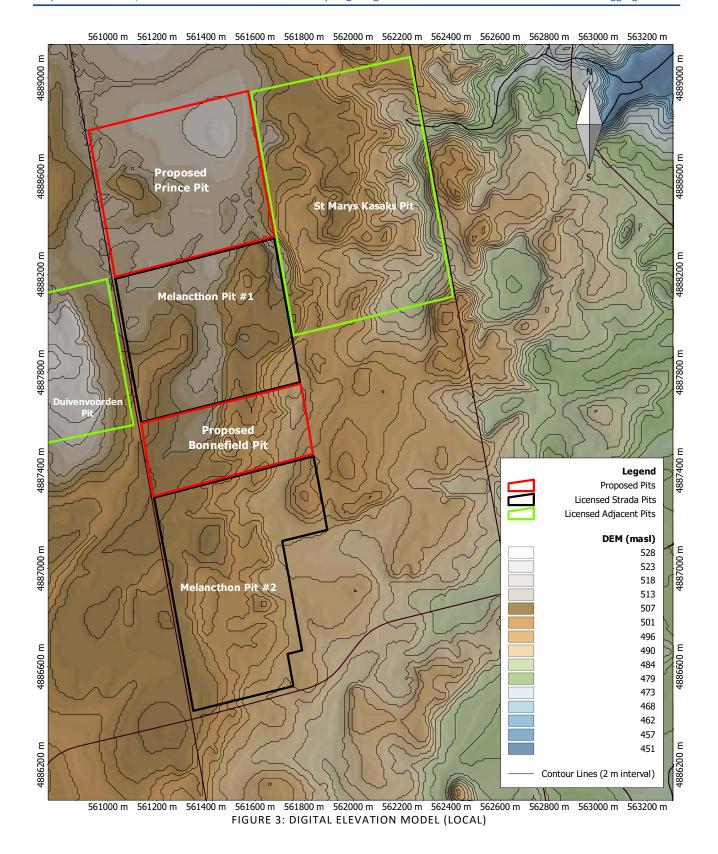
2.2 Hydrology

The subject lands are within the Nottawasaga watershed, which covers an area of 3,361 km². Smaller rivers and streams within the study area are outside of this system, draining to Nottawasaga Bay west of Wasaga Beach. The proposed pits located in proximity to the drainage divide between two headwaters systems of the Nottawasaga River (the Pine River and the Boyne River). These rivers rise west of the Niagara Escarpment and flow in an easterly direction (Figure 1).

The proposed Bonnefield and Prince Pits are located within the Boyne River sub-watershed, which arises from a series of wetlands southwest of Redickville. The Boyne River, a major tributary of the Nottawasaga River, has cut a broad, meandering valley system into the overburden creating a series of meander basins with remnants of the ancient river courses.

There are no streams or permanent watercourses on the proposed Bonnefield and Prince Pit properties (Figure 2). The MNRF has identified the presence of unevaluated wetland on the Bonnefield property within the woodlot, as shown in Figure 2. Field studies confirmed the absence of any wetland habitat within the Prince Property woodland (NRSI, 2017). A shallow perched wetland feature was identified within the Bonnefield Property woodland during site investigations, as was the presence of a small vernal pool. These ponds are "closed" systems (i.e., there are no surface water drainage courses into or out of these features).

Figure 3 shows the local topography based on the 2 m contours. Elevations at the proposed Prince Pit range



between a high of approximately 513 masl in the northeast corner of the property to a low of 504 masl along the western property boundary. Elevations at the proposed Bonnefield Pit range between a high of approximately 509 masl along the northern property boundary to a low of approximately 498 masl in the southeastern corner of the property. The hummocky topography that is characteristic of the Orangeville Moraine is evident.

There are no streams or permanent watercourses on the properties, which suggests that the soil conditions promote groundwater infiltration and limits surface water runoff. Groundwater recharge during rain events is likely to occur as dispersed infiltration, in comparison to spring melt where conditions are likely to result in runoff collecting and infiltrating in closed basins. Outside of these closed basins, surface water drainage is primarily towards the adjacent pits which capture runoff and allow for further infiltration.

2.3 Soils

The local soil types for Dufferin County are described in the Soil Survey Report No.: 38 (1963). Based on this work, the properties contain soils of the Caledon and Honeywood Series. These soils are well drained and have developed on gravelly materials. Across the properties, there may be variation in the soils characteristics.

2.4 Geology

The Quaternary deposits in the study area consist of ice-contact stratified deposits that are incised into the underlying fine-grained till (Figure 4). The ice-contact drift materials are described as mainly medium-grained sand with some gravel, pebbly sand and bouldery sand (Gwyn, 1972). The unconsolidated sand and gravel resource is underlain by a clay till deposit. This till unit may represent the regionally extensive Tavistock Till sheet, which is found at the surface in the vicinity of the subject property. Tavistock Till is a calcareous silty clay to silt till largely derived from glaciolacustrine sediments. This till sheet overlies the Paleozoic bedrock.

The Paleozoic geology of the study area is presented in Figure 5. The Paleozoic bedrock beneath the subject property is made up of a sedimentary rock sequence consisting primarily of layered dolostone, shale and sandstones units that were deposited in an ocean environment 400 to 500 million years ago. Conventionally, upper bedrock unit beneath the study area is referred to as the un-subdivided Amabel Formation, which is a thick reef mound and inter-reef crinoidal shoal lithofacies (Pratt and Miall, 1993, Bolton, 1957, and Liberty, *et al.*, 1971). The Lions Head Member is found at the base of the Amabel Formation and unconformably overlies the Fossil Hill Formation (Stott and von Bitter, 1999).

Brunton and Brintnell (2011) recognized that the un-subdivided Amabel Formation actually represents the Goat Island, Gasport, and Irondequoit Formation; and the Lions Head Member of the basal Amabel Formation is a carbonate equivalent of part of the Rochester Formation. These recent changes in the geological units and nomenclature have been adopted for this hydrogeological assessment to ensure consistency with provincial documentation.

The local geology logged from the on-site boreholes is provided in Figure 6. Section A-A' provides a cross-sectional view from north to south through the Prince and Bonnefield lands as well as the existing Strada Melancthon #1 and #2 Pits. Section B-B' provides a cross-sectional view from west to east through the Prince property. The top of the bedrock surface strongly influences the water level elevations in the area. The bedrock topography is presented in Figure 9. Based on the results of the on-site drilling program, there appears to a buried escarpment beneath the property. Along the western property boundary, the bedrock is reported at an elevation of approximately 490 masl. The bedrock surface drops significantly towards the east and southeast into what appears to be a bedrock valley system.

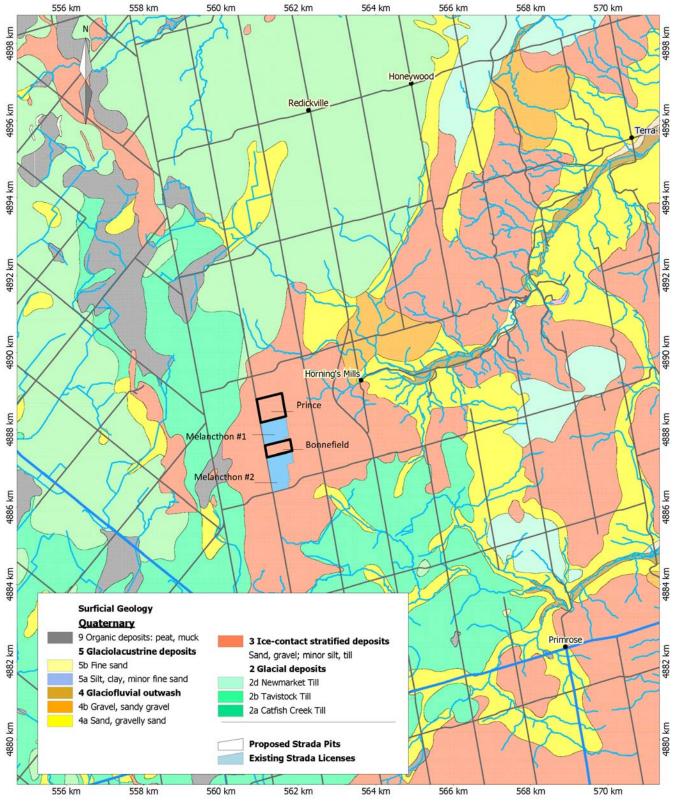
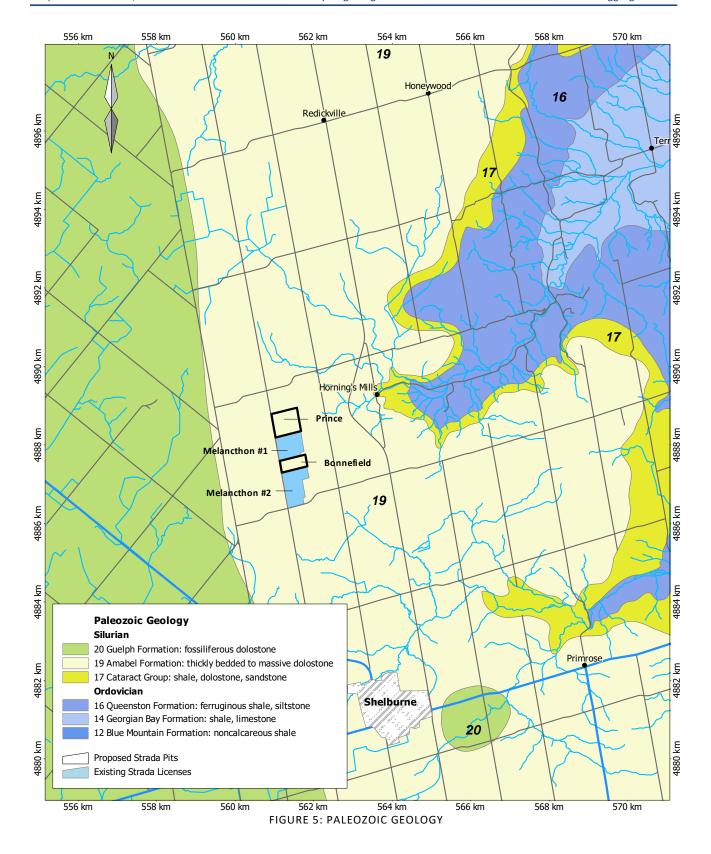


FIGURE 4: QUATERNARY GEOLOGY



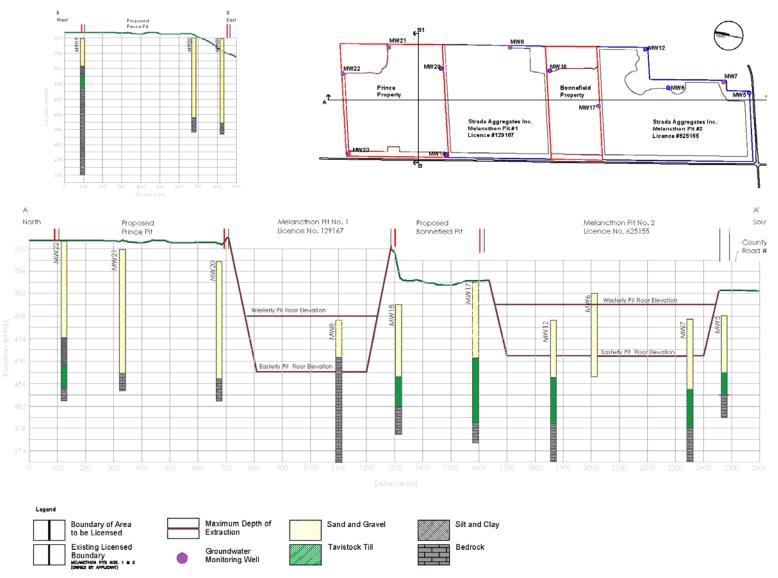


FIGURE 6: GEOLOGICAL CROSS-SECTION

2.5 Hydrogeology

Two principal aquifers were identified in the Town of Shelburne Ground Water Management Study (Burnside, 2001) being:

- 1. the overburden aquifer; and
- 2. the contact zone (upper fractured bedrock).

Production wells in the Town of Shelburne utilize the contact zone aquifer (i.e., bedrock aquifer). The following sections provide a description of the groundwater use (both municipal and private). The locations of the Town of Shelburne's municipal wells and wellhead protection areas (WHPA), as well as domestic water wells which are on record with the Ministry of the Environment and Climate Change (MOECC), are provided in Figure 7.

2.5.1 Town of Shelburne – Municipal Groundwater Wells

The Town of Shelburne is currently serviced by five production wells, all of which are constructed in the Goat Island/Gasport Formation. Four of the wells (PW1, PW3, PW5, and PW6) are located within the Nottawasaga Valley Source Protection Area of the South Georgian Bay Lake Simcoe Source Protection Region. The fifth well (referred to as PW7) was installed in 2010 and is found within the Grand River Source Protection Area, which is part of the Lake Erie Source Protection Region (Nottawasaga Valley Source Protection Area Un-Approved Assessment Report).

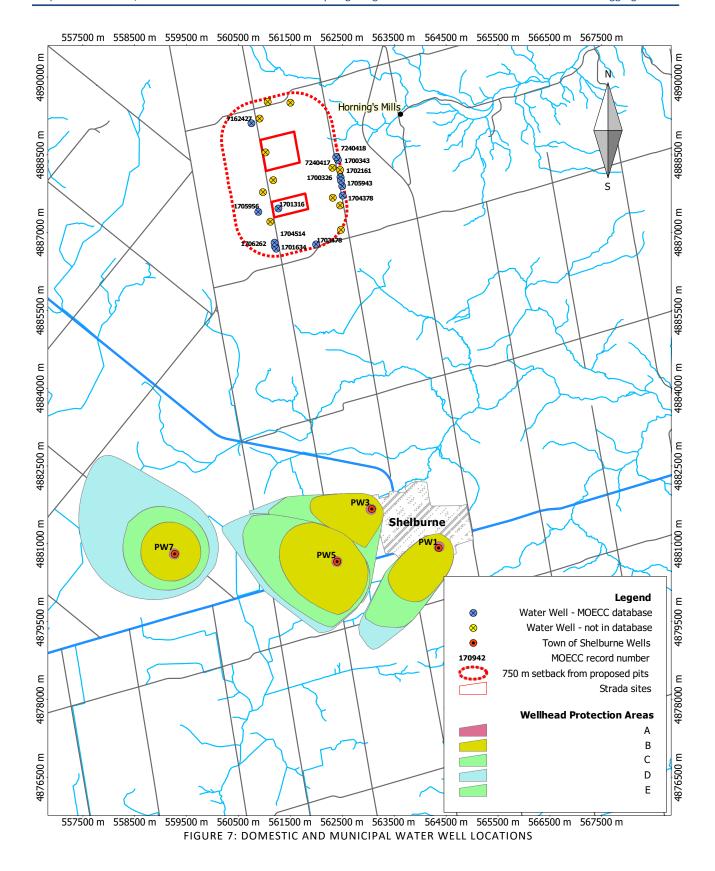
Burnside (2010) reported that the regional groundwater flow (bedrock) in the vicinity of the Town of Shelburne generally flows from southwest to northeast following the general patterns of the surface watercourses. Groundwater flow in the bedrock mimics the surface pattern with the well-defined northeasterly flow of the Boyne River system and a southeasterly component flowing towards the Nottawasaga River.

The groundwater flow direction greatly influences the wellhead capture zones. In 2015, Earthfx Inc. updated the wellhead protection areas for the Town of Shelburne which were originally completed by Burnside (2010). The resulting capture zones provide an indication of the area of influence of the municipal wells. The steady state extent of these capture areas is located in excess of 5.5km from the proposed Bonnefield and Prince Pits.

2.5.2 Township of Melancthon – Domestic Water Wells

Groundwater is the potable water supply in the vicinity of the proposed Bonnefield and Prince Pits. As a result, it can be assumed that each home is serviced by a private well. There are 25 known residences/wells within a 750 m radius of the proposed Bonnefield/Prince Pit. Of these, 14 water wells are on record with the MOECC. Domestic water well surveys completed on behalf of Strada have identified additional wells within the study area and are identified on Figure 7 (Whitewater, 2010).

All of the domestic wells identified obtain water from the bedrock aquifer, with the exception of MOECC Well No. 1701316, which services the current home on the Bonnefield property. This well will be decommissioned in compliance with O.Reg. 903, as amended upon licensing. Based on the water well records for the remaining wells, the first water-bearing zone that was able to sustain a yield that would meet the demands for most domestic needs was in the upper bedrock system (within the first few metres of dolostone). Copies of the water well records on file with the MOECC are provided in Appendix A.



3.0 SOURCE WATER PROTECTION

The Clean Water Act (CWA S.O. 2006, Chapter 22) is a law enacted by the Legislative Assembly of Ontario. The CWA is not designed to protect all of the province's water resources. The Act focuses on sources of water that have been designated by a municipality as being a current or future source of residential municipal drinking water for the community. The Ontario Water Resources Act and the Environmental Protection Act and other provincial and federal laws remain the main legislation for protecting the quality and quantity of Ontario's water resources.

The role of the proposed Bonnefield and Prince Pits in the context of Source Water Protection (SWP) has been undertaken. Specifically, the potential impacts associated with the extraction of aggregate on municipal and private water supplies in the study area. The closest municipal water supply is located in the Town of Shelburne, which obtains its groundwater supply from the bedrock aquifer. The proposed Bonnefield and Prince Pits are located 5.5 km from the delineated Town of Shelburne's WHPAs.

Although the proposed Bonnefield and Prince Pits are located outside of a municipal WHPA, the assessment has included a review of the groundwater/aquifer vulnerability in the area. This review has been applied to the domestic groundwater wells, which are the primary source of potable water for the local residents. Specifically, an assessment of the Significant Groundwater Recharge Areas (SGRAs) and Highly Vulnerable Aquifers (HVAs) has been completed.

3.1 Significant Groundwater Recharge Areas and Highly Vulnerable Aquifers

SGRAs are a type of vulnerable area identified in the Technical Rules (MOE, 2009b) under the CWA (2006). In the Nottawasaga Valley watershed, SGRAs are defined as an area that has an average annual recharge rate that is 15% greater than the average annual recharge rate for the Nottawasaga Valley watershed; and an area that has a hydrological connection to a surface water body or aquifer that is a source of drinking water for a drinking water system. The vulnerability of SGRAs is categorized as high, medium, or low based on their mapped intrinsic susceptibility. This susceptibility of the overburden soil layers are classified based on how readily each transmits water, and the thickness of each is considered. The estimated protective value of each layer is then added to calculate the total susceptibility at any point.

In general, all areas where infiltration occurs are defined as potential recharge areas. However, hydrogeologically, the recharge areas are identified by significant downward vertical gradients. Topographically elevated areas with permeable formations form the principal recharge areas. Based on the local surficial geology and physiography, a portion of the Township of Melancthon is covered by permeable sand and gravel formations. It is therefore not unexpected that areas classified as primary resource areas, such as the Strada properties, are delineated as a SGRA in the Approved Nottawasaga Valley Source Water Protection Assessment Report (2015).

Groundwater vulnerability is reported to be "low" at the Bonnefield and Prince Pits, with the exception of the limited area along the southern property boundary of the Bonnefield Pit, which is delineated as an area underlain by a Highly Vulnerable Aquifer (HVA) due to the thin unsaturated overburden thickness. The proposed change in land-use from agriculture to aggregate extraction may increase the vulnerability; therefore it is important to assess the threats (if any) associated with an aggregate operation (refer to Section 3.2).

3.2 Source Water Protection and the Aggregate Industry

In response to the CWA, regarding Source Water Protection, the Ontario Stone, Sand and Gravel Association (OSSGA) supported a literature review study by the MNRF to assess the role of the aggregate industry and associated lands in the context of source water programs. The MNRF study (Applied Research on Source Water Protection Issues in the Aggregate Industry; Blackport and Golder, 2006) did not find any documented scientific evidence linking the extraction and processing of stone, sand and gravel as a threat to drinking water sources.

The Province of Ontario has identified 21 prescribed drinking water threats under the CWA (2006). Nineteen of these relate to water quality and two to water quantity. The current land use at the proposed Bonnefield/Prince Pit is primarily agriculture, which results in at least 5 potential prescribed drinking water threats. These include:

- Agricultural source material application to land
- Agricultural source material storage
- Agricultural source material management
- Commercial fertilizer application
- Pesticide application

The proposed change in land use will temporarily reduce the number of prescribed drinking water threats. There is no proposed storage of fuel at the Bonnefield and Prince Pits. Aggregate extraction is an interim landuse. Although the proposed final rehabilitation plan for the site is to be returned to agricultural lands, improved best management practices for the use of pesticides and fertilizer may be available at that time and overall threats reduced.

4.0 HYDROLOGICAL / HYDROGEOLOGICAL EVALUATION

4.1 Groundwater Elevations

Compliance groundwater monitoring has been occurring at both Melancthon Pit #1 and #2 since 2001 and 2007, respectively. In addition, baseline groundwater monitoring commenced in 2017 at the Bonnefield and Prince properties. In total, there are currently 28 groundwater well nests that monitor 52 discrete aquifer intervals in the overburden and bedrock aquifers. The Melancthon Pit #1 and #2 groundwater monitoring programs were developed to characterize the local groundwater conditions at each individual property and were based on two operating pits (two scale houses, two fuel storage areas, and multiple crushing and processing operations). The proposed licensing of the Bonnefield and Prince properties provides an opportunity to not only streamline operations by eliminating the need to operate as individual pits but to develop a revised groundwater monitoring program. The revision would remove redundancies in the monitoring network and reporting allowing for an opportunity to complete an accumulative impact assessment from the Strada properties.

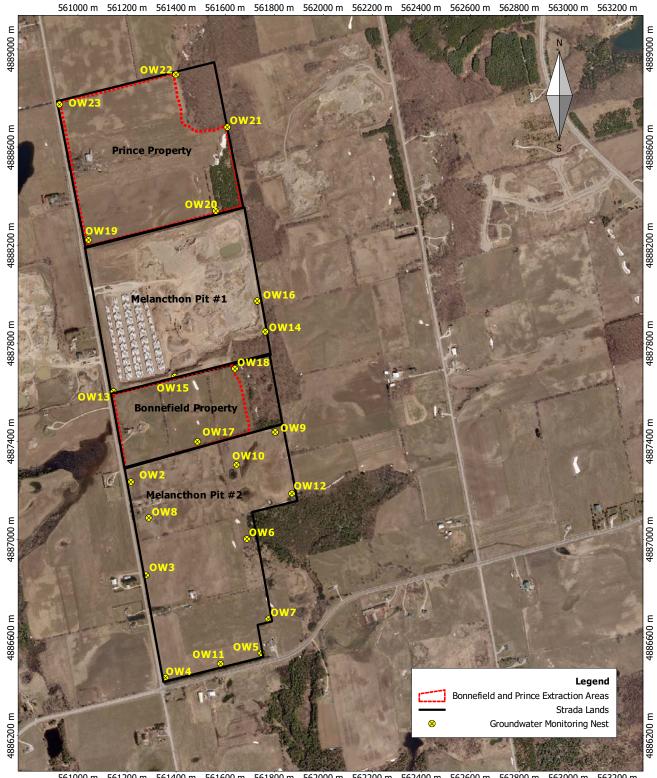
The revised groundwater monitoring program that was developed for this Level 1 and 2 Hydrogeological Assessment is provided in Table 1 and Figure 8. Groundwater wells that are identified as monitors "A" are constructed in the overburden aquifer. Revised groundwater monitoring well IDs are provided in Table 1. Monitors "A" are constructed above the geological contact between the sand and gravel unit and the Tavistock Till, if saturated. Otherwise, the screens are set above the geological contact between the Tavistock Till and the bedrock. Monitoring wells constructed in the upper bedrock aquifer system are identified as monitors "B". The revised program consists of 23 groundwater well nests that monitor 36 discrete aquifer intervals in the overburden and bedrock aquifers. Borehole records are provided in Appendix B.

Table 1: Groundwater Monitoring Well Details

Well Nest and Old Monitor ID		New Well	Top of	Ground	Top of	Bottom of	Loc	ation
		ID	Casing	Surface	Screen	Screen		
· · · · · · · · · · · · · · · · · · ·	erence only)			Metres Above	Sea Level (mas	51)	Easting	Northing
elancthon Pit #								
MW1	MW1-A	OW13-A	507.13	506.44	495.1	492.1	561,147	4,887,604
	MW1-B	OW13-B	507.13	506.44	490.5	487.5	561,147	4,887,604
MW2	MW2-B	OW14-B	497.36	496.46	479.8	476.8	561,761	4,887,840
MW5	MW5-A	OW15-A	511.48	510.85	491.9	488.9	561,432	4,887,667
	MW5-B	OW15-B	511.48	510.85	482.8	479.8	561,432	4,887,667
MW8	MW8-B	OW16-B	497.28	246.50	488.5	469.9	561,727	4,888,004
elancthon Pit #	2							
MW2	MW2-B	OW2-A	507.64	507.09	500.04	496.99	561,213	4,887,227
	MW2-C	OW2-B	507.64	507.09	484.54	481.49	561,213	4,887,227
MW3	MW3-B/C	OW3-B	504.61	504.11	494.36	491.31	561,272	4,886,849
MW4	MW4-B	OW4-A	506.54	505.84	500.97	497.92	561,355	4,886,426
	MW4-C	OW4-B	506.54	505.84	495.17	492.12	561,355	4,886,426
MW5	MW5-A	OW5-A	494.68	493.95	483.89	480.84	561,742	4,886,523
	MW5-C	OW5-B	494.54	493.94	486.32	483.27	561,743	4,886,525
MW6	MW6A	OW6-A	502.84	502.31	481.59	478.54	561,628	4,887,055
MW7	MW7-A	OW7-A	497.26	496.76	485.18	482.13	561,704	4,886,785
	MW7-C	OW7-B	497.26	496.76	478.56	466.26	561,704	4,886,785
MW13	MW13-A	OW8-A	505.99	504.89	500.39	492.89	561,282	4,887,057
MW9	MW9-A	OW9-A	496.77	496.20	492.85	489.80	561,806	4,887,468
MW10	MW10-B	OW10-A	495.79	495.19	479.04	475.99	561,628	4,887,239
MW11	MW11-A	OW11-A	495.90	495.20	493.7	487.70	561,571	4,886,477
	MW11-C	OW11-B	495.90	495.20	483.00	480.00	561,571	4,886,477
MW12	MW11-A	OW12-A	495.80	485.12	480.62	473.02	560,813	4,887,450
nnefield Pit								
-	-	OW17-A	503.60	502.10	481.67	478.63	561,472	4,887,382
-	-	OW17-B	503.60	502.10	477.69	474.67	561472	4,887,382
-	-	OW18-A	501.45	500.35	483.58	480.53	561,653	4,887,686
-	-	OW18-B	501.45	500.35	479.93	476.88	561,653	4,887,686
nce Pit					1			1
-	-	OW19-A	510.59	509.49	486.69	485.09	561,035	4,888,193
-	-	OW19-B	510.59	509.49	483.59	482.09	561,035	4,888,193
-	-	OW20-A	509.51	508.41	489.51	488.01	561,544	4,888,334
_	-	OW20-B	509.51	508.41	480.71	479.21	561,544	4,888,334
-	-	OW21-A	511.68	510.58	497.78	496.28	561,593	4,888,681
_	-	OW21-B	511.68	510.58	476.78	475.28	561,593	4,888,681
_	-	OW22-A	513.91	512.81	492.71	491.21	561,384	4,888,891
-	-	OW22-B	513.91	512.81	487.81	486.31	561,384	4,888,891
-	-	OW23-A	510.51	509.41	488.71	487.21	560,937	4,888,788
_	-	OW23-B	510.51	509.41	485.61	484.11	560,937	4,888,788

Notes:

1. New Well ID's have been assigned to avoid confusion with duplication in well names between the two existing aggregate licenses and differences in naming nomenclature for the aquifer monitored.



561000 m 561200 m 561400 m 561600 m 561800 m 562000 m 562200 m 562400 m 562600 m 562800 m 563000 m 563200 m FIGURE 8: GROUNDWATER MONITORING LOCATIONS

Table 2: 2016 and 2017 Water Level Elevations (Manual)

Well ID	2016								2017					
	27-Jan	17-Feb	26-Mar	2-Apr (WL High)	25-May	8-Jun	2-Jul	17-Aug	27-Sep	16-Oct	13-Nov	3-Dec	12-Feb	24-Feb
OW2-A	496.23	496.77	498.61	500.22	497.44	496.45	495.67	495.07	494.66	494.49	494.32	494.47	496.24	496.08
OW2-B	494.22	494.74	496.14	496.89	495.58	494.59	494.15	493.48	493.27	492.90	492.80	492.70	494.17	494.61
OW3-B	490.19	490.99	492.48	493.31	492.19	491.91	491.00	489.84	489.84	489.84	489.84	489.84	DRY	490.46
OW4-A	498.28	498.46	498.61	498.93	498.14	498.12	497.95	498.00	497.93	497.94	497.93	497.93	498.16	498.83
OW4-B	491.49	492.16	493.38	494.40	493.00	492.55	491.89	491.00	490.41	490.26	490.23	490.21	490.88	492.29
OW5-A	489.95	490.38	491.02	491.13	490.79	490.52	490.31	490.00	489.49	489.42	489.36	489.32	490.49	491.48
OW5-B	491.09	491.82	492.90	493.71	492.49	492.11	491.48	490.71	489.97	489.84	489.57	489.42	490.54	491.56
OW6-A	491.64	492.00	492.70	493.36	493.29	492.80	492.27	491.64	491.26	491.10	490.99	490.93	NA	492.02
OW7-A	490.05	490.44	491.14	491.30	491.30	490.98	490.61	490.00	489.73	489.62	489.36	489.25	NA	490.38
OW7-B	489.77	490.45	491.54	492.36	491.29	490.72	490.23	489.38	488.83	488.58	488.33	488.17	NA	490.27
OW8-A	497.31	497.21	497.39	497.57	497.35	497.37	497.33	497.29	497.24	497.22	497.15	497.14	497.25	497.30
OW9-A	491.74	492.05	492.90	493.59	493.58	493.27	492.91	492.37	491.76	491.76	491.55	491.44	491.35	491.62
OW10-A	488.39	488.95	490.09	490.97	490.19	489.56	489.00	488.23	487.60	487.28	487.05	486.98	487.93	488.60
OW11-A	491.10	491.82	493.10	493.90	492.56	492.2	491.70	490.68	490.04	489.82	489.59	489.37	490.65	491.71
OW11-B	491.11	491.83	493.01	493.35	492.64	492.21	491.70	490.71	490.07	489.84	489.62	489.36	490.67	491.77
OW12-A	492.06	492.32	492.70	492.73	492.81	492.70	492.62	492.26	491.92	491.76	491.61	491.66	491.88	492.17
OW13-A	494.37	497.08	499.73	500.31	497.6	494.01	493.37	492.84	492.49	DRY	DRY	DRY	494.64	495.95
OW13-B	493.53	495.39	496.86	497.52	495.48	493.31	492.64	492.14	491.81	491.75	491.8	491.78	493.61	493.97
OW14-B	481.5	482.32	483.13	483.75	483.40	482.73	482.48	482.35	482.16	481.81	481.74	481.48	480.54	481.90
OW15-A	488.69	489.37	489.87	490.73	491.37	489.87	489.49	489.00	488.75	488.59	488.48	488.42	488.55	488.65
OW15-B	488.59	489.29	489.8	489.88	489.9	489.78	489.26	488.92	488.69	488.49	488.42	488.13	488.40	488.55
OW16-B	477.61	480.06	481.46	482.82	481.27	480.08	479.37	479.17	478.58	478.39	478.27	477.73	477.38	479.86
OW17-A	-	-	-	-	-	-	-	-	-	-	-	-	486.12	486.64
OW17-B	-	-	-	-	-	-	-	-	-	-	-	-	486.12	486.64
OW18-A	-	-	-	-	-	-	-	-	-	-	-	-	487.56	487.60
OW18-B	-	-	-	-	-	-	-	-	-	-	-	-	485.34	485.56
OW19-A	-	-	-	-	-	-	-	-	-	-	-		DRY	DRY
OW19-B	-	-	-	-	-	-	-	-	-	-	-	-	488.11	483.64
OW20-A	-	-	-	-	-	-	-	-	-	-	-	-	DRY	DRY
OW20-B	-	-	-	-	-	-	-	-	-	-	-	-	484.48	484.96
OW21-A	-	-	-	-	-	-	-	-	-	-	-	-	DRY	DRY
OW21-B	-	-	-	-	-	-	-	-	-	-	-	-	487.6	487.56
OW22-A	-	-	-	-	-	-	-	-	-	-	-	-	NA	496.57
OW22-B	-	-	-	-	-	-	-	-	-	-	-	-	NA	496.57
OW23-A	-	-	-	-	-	-	-	-	-	-	-	-	NA	496.26
OW23-B	-	-	-	-	-	-	-	-	-	-	-	-	NA	496.26

4.1.1 Groundwater Flow

In an aquifer, groundwater flows from points of higher pressure to points of lower pressure, and the direction of groundwater flow typically has both a horizontal and a vertical component. The slope of the water table is known as the hydraulic gradient (horizontal component), which depends on the rate at which water is added to and removed from the aquifer and the permeability of the material. The slope of the water table reflects the surface relief due to the capillary effect in soils, sediments and other porous media.

The local groundwater flow pattern in the overburden is presented in Figure 9. The groundwater elevation contours are compared to the top of bedrock contours to show how the geological set influences the groundwater flow conditions. Recall from Section 2.0 and Figure 1 that the most dominant topographic feature in the region is the glacial re-entrant valley of the Pine River. Since the shallow groundwater pattern mimics the topographic surface, a north-easterly flow direction is likely dominant. However, the presence of a bedrock valley is evident in Figure 9 and has locally influenced the groundwater flow pattern.

Beneath portions of the Melancthon Pit #1 and the Prince property, the overburden is dry and the water table/potentiometric surface is found in the bedrock aquifer. In this area, the bedrock surface is relatively high in comparison to the lands to the south and is not confined by the Tavistock Till. Therefore, groundwater infiltration is not impeded by the materials of lower permeability.

In areas where the bedrock is confined by the Tavistock Till (north and south of the area discussed above), the water table is found in the unconfined overburden aquifer or at the confined geological contact between the Tavistock Till and bedrock units.

The true water table in the unconfined overburden aquifer can be measured at:

- OW2-A
- OW7-A
- OW12-A

- OW3-A
- OW8-A
- OW13-A

- OW4-AOW5-A
- OW9-A
- OW15-AOW18-A

- OW6-A
- OW11-A

OW10-A

The potentiometric surface in the confined overburden/bedrock aquifer can be measured at:

- OW17-A
- OW23-A
- OW22-A
- OW3-B

The groundwater contours and water levels plotted on Figure 9 represent the groundwater flow conditions in the unconfined overburden aquifer on April 2, 2016. Water levels for the confined overburden/bedrock aquifer are included in the figure, but have not been relied upon for the development of the groundwater flow map as they are more representative of the bedrock groundwater flow conditions. These water levels were taken on February 24, 2017.

The water table aquifer flows from a high of approximately 500 masl in the west towards the buried bedrock valley. A groundwater flow component from the east also flows towards the bedrock valley system. Here, groundwater flow divides into a north and south flow direction. This divide is likely the influence of the local bedrock valley on the more regional glacial re-entrant valley of the Pine River.

In summary, the local and regional bedrock topography has resulted in a complex groundwater flow system in the unconfined overburden aquifer. This complexity is increased when consideration for the confined overburden/bedrock contact aquifer, and bedrock aquifer is taken into account.

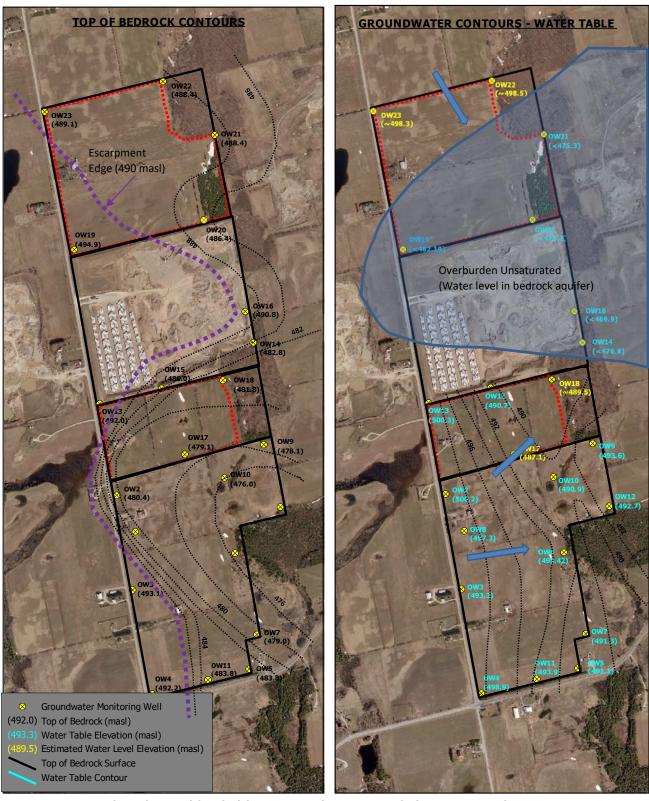


FIGURE 9: BEDROCK TOPOGRAPHY AND OVERBURDEN GROUNDWATER FLOW MAP

4.1.1 Overburden Groundwater Elevations

The groundwater elevations in the vicinity of the Strada properties are strongly influenced by the bedrock topography and the buried bedrock valley system reported in the southeast portion of the study area. This feature has created a primarily downward gradient drawing water levels from the shallow overburden aquifer to the bedrock flow system. As a result, the overburden is dry in the north and north-western portion of Melancthon Pit #1 as well as beneath the Prince property. Permanent unsaturated conditions in the overburden are reported at OW3, OW14, OW16, OW19, OW20, and OW21, where the first water-bearing zone is found beneath the bedrock contact (bedrock aguifer).

At OW22 and OW23, the first saturated zone is at the overburden / bedrock contact which is confined by a layer of silt and clay (potentially the Tavistock Till). The shallow well screens monitor the water level in the Tavistock Till immediately above the bedrock surface and may represent the water level in the bedrock aquifer (potentiometric surface).

Where saturated, the water levels in the overburden represent the water table. Generally, the water level trends are seasonal, with water levels peaking in the spring and decreasing over the warmer and drier summer months (Table 2 and Figure 10). Based on the continuous and manual water level measurements at the 11 overburden monitoring wells, the water table ranges between a high of 501 masl to a low of 491 masl during the spring season. Over the following months, the water levels drop approximately 2m, with the exception of OW2-A and OW10-A where water levels drop approximately 4 m.

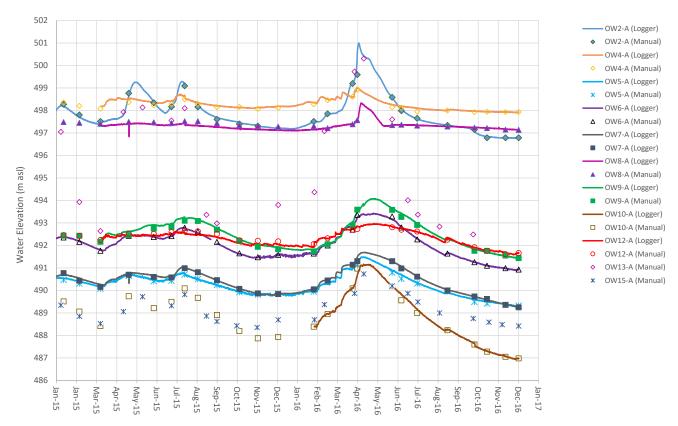


FIGURE 10: OVERBURDEN HYDROGRAPH

4.1.2 Bedrock Groundwater Elevations

Similar to the overburden water levels, the water levels in the bedrock aquifer show seasonal trends where water level highs are reached during the spring followed by a slow decrease during the summer, fall, and winter months. The groundwater elevation in the upper bedrock system ranges between 492 masl and 477 masl during the dry periods. This increases to between 497 masl and 483 masl during the wet periods of the year.

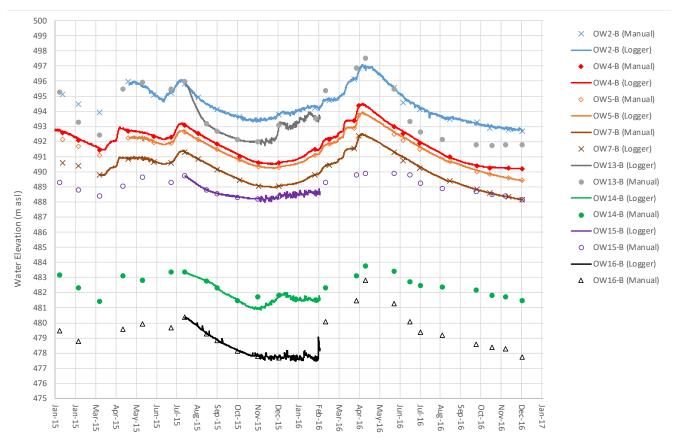


FIGURE 11: BEDROCK HYDROGRAPH

5.0 SITE OPERATIONS

5.1 Pit Floor Elevation

The proposed Bonnefield and Prince Pits will be a Class A Pit Above Water, which will restrict the extracting of aggregate material to no closer than 1.5 m above the established groundwater table. In order to provide the required hydrogeological information for the Site Plan, the floor elevation of the proposed pit must be defined and shows that the final depth of extraction complies with the above water requirements. The Provincial Standards defines the establishment of the groundwater table in unconsolidated surficial deposits as "The surface of an unconfined water-bearing zone at which the fluid pressure in the unconsolidated medium is atmospheric. Generally, the groundwater table is the top of the saturated zone." For confined aquifers, potentiometric surface is "The level that represents the fluid pressure in the water-bearing zone and is generally defined by the level to which water will rise in a well."

Based on the water table elevations from April 2016 the proposed pit floor elevations are presented in Figure 12. It should be noted that the new groundwater monitoring wells which monitoring the water levels in the overburden aquifer have not captured the seasonal high water levels to date. As a result, the historic water level trends from the overburden aquifer have been assessed and used to estimate the high water levels at these locations. A 2 m head has been added to the February 2017 measurements. On-going monitoring will provide an improved understanding of the seasonal high elevations at these locations. It is recommended that the spring 2017 data be assessed and compared to the estimated water level values to ensure the final pit floor elevation complies with Provincial Regulations. Final floor elevations may be modified to reflect extraction setbacks and bank sloping.

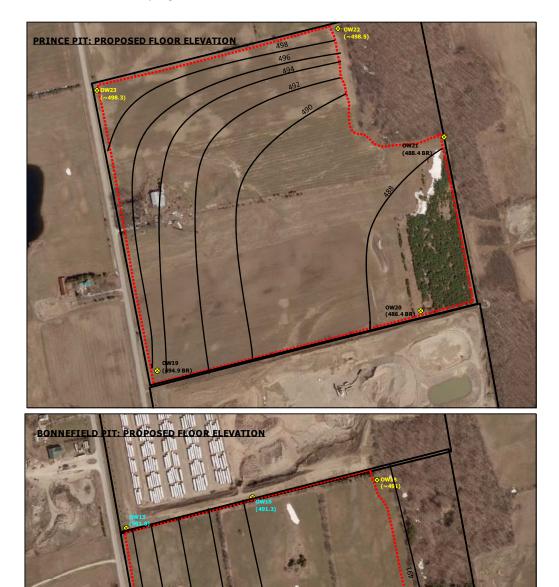


FIGURE 12: PROPOSED PIT FLOOR ELEVATIONS

1.5 m Above Water Table (masl)
1.5 m Above Estimated Water Level (masl)
Proposed Pit Floor Flevation (masl)

6.0 IMPACT ASSESSMENT

6.1 Water Balance

An impact assessment for the proposed Bonnefield and Prince Pits has been completed to ensure that the site operations will not have an adverse impact on the groundwater and surface water regimes. To determine the differences in the pre and post-extraction conditions, the changes in the water balance components have been assessed, with the specific focus on impacts to local groundwater recharge and surface water runoff conditions. Although water balance assessments are typically applied to land development proposals that involve increasing the impermeable surface area (i.e., parking lots, shopping centers, residential developments), or in aggregate applications that require dewatering and a resulting water management program, it is felt that the assessment is required to show the limited influence of an above water pit on the groundwater and surface water regimes.

A water balance is a quantitative expression that describes the relationship between inflows (into) and outflows (out of) a hydrogeology system over a specified time period. The basic concept is simply a conservation of mass. The parameters involved depend on the nature and scale of the system of interest. The Nottawasaga Valley Conservation Area (NVCA) has policies related to maintaining groundwater infiltration for properties that are proposing a change in land use. Furthermore, the maintenance of pre-extraction recharge is a general requirement of the Provincial Policy Statement that is often captured in municipal Official Plans. If there is a decrease infiltration, mitigation measures would be required to maintain or enhance groundwater recharge.

An annual water budget summary has been computed for the study area using the Thornthwaite monthly water-balance program, which was developed by the U.S. Geological Survey (McCabe, G.J., and Markstrom, S.L., 2007). Inputs to the model were monthly temperature and precipitation collected by Environment Canada at the Orangeville Climate Station (No.: 6155790) for the period of record from 1963 to 2005. Outputs include monthly potential and actual evapotranspiration (ET), soil moisture storage, snow storage, surplus, and runoff (Appendix C). The results indicate that the mean annual precipitation for the area is 890 mm, with a mean water surplus of 390 mm.

Infiltration factors (IF) are used to determine the fraction of water surplus that infiltrates into the ground and the fraction that runs off to nearby streams. Infiltration rates were estimated using the method from the MTO Stormwater Management Planning and Design Manual (March 2003). Due to the highly permeable nature of the sand and gravel surficial deposits, vegetation type, and the topographic relief, recharge is a dominant component of the water budget at this site. The estimated IF based on the existing site characteristics is 0.7, which relates to an average infiltration rate of 273 mm/year.

The average infiltration rate is applied to areas of the property that are not internally drained, where surface water will runoff site into roadside ditches and adjacent lands, before recharging off-site. Recharge within the internally drained basins will be equal to the mean water surplus (390 mm/year). The sub-catchment basins for the properties are presented in Figure 13, which show the areas with run-off and areas that are internally drained.

The infiltration rate of 273 mm/year has been applied to the areas that do not drain internally into Basins A or B. The infiltration rate of 390 mm/year (entire water surplus) has been applied to Basin A (represents 91% of the proposed extraction area for the Prince Pit) and Basin B (represents 80% of the proposed extraction area

for the Bonnefield Pit). The resulting total annual groundwater recharge across the sites is approximately 126,223 m³. A summary of the pre-extraction infiltration rates and the total volume of water recharging the groundwater regime is provided in Table 3.

TABLE 3: Pre-Extraction Infiltration Rates

	Development Scenario	Drainage Area (m²)	Infiltration Rate (m/year)	Volume of Groundwater Recharge (m³)						
Pr	Pre-Development Infiltration									
	Internally Drained Area (Basin A and B)	428,340	0.390	167,053						
	Remaining Area	57,660	0.273	15,741						
	Total	486,000		182,794						

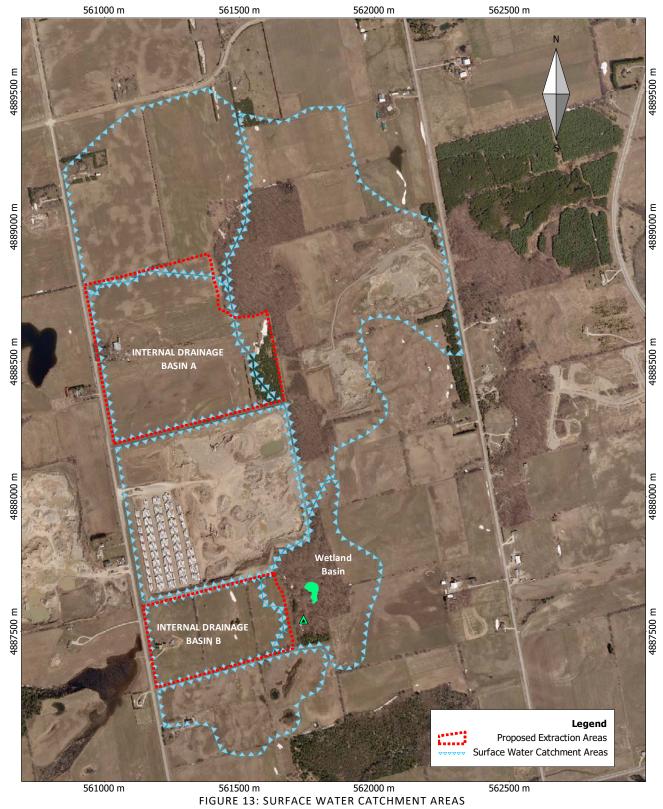
As aggregate is extracted, the flattening of the pit floor promotes infiltration as the average land slope lessens and the highly permeable materials are exposed (vegetation and topsoil removed). Furthermore, the pit itself creates an internally drained system. During post-extraction, groundwater infiltration within the extraction area will be equivalent to the water surplus value of 390 mm/year. Therefore, the total annual groundwater recharge across the site is approximately 182,794 m³. A summary of the post-extraction infiltration rates and the total volume of water recharging the groundwater regime is provided in Table 4.

TABLE 4: Post-Extraction Infiltration Rates

	Development Scenario	Drainage Area (m²)	Infiltration Rate (m/year)	Volume of Groundwater Recharge (m³)						
Post	Post-Development Infiltration									
	Internally Drained Area	486,000	0.390	189,540						
	Remaining Area	0	0	0						
	Total	486,000		189,540						

Based on this assessment, the proposed Bonnefield and Prince Pits will maintain or slightly enhance groundwater recharge across the pit floor by 4% (or 6,746 m³). The increase in groundwater recharge is a positive outcome of the water balance assessment. As noted above, the primary concern with certain development applications is the potential for a reduction in groundwater recharge and ensuring that there are mitigation measures in place to maintain or enhance groundwater infiltration.

The catchment area that provides surface water runoff to the wetland is approximately 17 ha. The proposed extraction on the Bonnefield property would reduce this area by approximately 1.3 ha. The change in dominant vegetation cover (increased forested area) increases the IF to 0.8 which results in a runoff value of approximately 0.078 m/year. The net change in the volume of water that enters the wetland area as run-off is 1,014 m³/year.



The low-lying area that contains the marsh is found at an elevation of approximately 494 masl and covers an area of approximately 0.9 ha. Assuming this elevation represents the extents of the wetland area, the equivalent water depth that collects in the low-lying area would decrease from approximately 1.47 m to 1.36 m (a difference of 11 cm).

Development Scenario Drainage Area Run-off (m/year) Volume of Run-off (m²)Entering Wetland (m3) Pre-Extraction 170,000 0.078 13,260 Post Extraction 157,000 0.078 12,246 13,000 **Difference** 1,014

Table 5: Wetland Water Balance

6.2 Potential Interference with Local Groundwater Regime

The proposed extraction of aggregate will occur at an elevation of at least 1.5 m above the established high water table elevation. As discussed in Section 6.1, the permeable materials on the pit floor will allow for groundwater to recharge at an enhanced rate of an average of 390 mm/year. Therefore, pit operations will not require a water management program to divert or control incidental waters entering the pit area. Furthermore, no pit dewatering will be required.

The change in land use will maintain or slightly enhance groundwater recharge across the pit floor by 4%. This small increase will likely result in no measurable change in water table elevations across the site and therefore will have no impact on off-site domestic water wells.

The comprehensive groundwater monitoring database for the existing Melancthon Pit #1 and #2 have shown that the extraction of aggregate from above the water table at these sites has had no measurable influence on the groundwater conditions on-site (Whitewater 2017a and 2017b).

6.3 Potential Interference with Surface Water Features

Local surface water features include a small wetland and vernal pool which are located within the forested area approximately 100 m from the proposed extraction boundary for the Bonnefield Pit. These features are perched approximately 4 m above the water table (Figure 9) and therefore isolated from the groundwater regime. The only potential impacts that could affect surface water levels are changes to the water balance.

The water balance analysis concluded that the majority of the water surplus from within the proposed extraction area will enter the groundwater system either as direct recharge (internally drained basins) or it will be infiltrated along the surface water runoff flow path. This is supported by the observation that there are no large surface water features on-site (streams, creeks, or springs). Furthermore, due to the highly permeable nature of the soils and the hummocky topography of the Bonnefield woodland feature, it is likely that the surface catchments surrounding the wetland and vernal pool are actually smaller than the outer catchment limit shown on Figure 12. Surface water infiltrated within the Bonnefield agricultural field will move vertically as shallow groundwater recharge, rather than horizontally as shallow soil interflow that re-expresses within the wetland

The wetland and vernal pool that are located within the forested area on the Bonnefield property will be preserved with a buffer, which maintains the majority of the natural and localized catchment area for these features. By maintaining 92% of this catchment area, potential impacts are limited.

7.0 MITIGATION MEASURES

Although there are no anticipated impacts associated with the proposed extraction of aggregate, which will occur at least 1.5 m above the established water table, there are preventative operational practices that are recommended to further protect groundwater quality:

- Refueling of machinery should not be conducted in areas of the excavation that are within 1.5 m of the water table (i.e., on the pit floor).
- Operator training should include understanding and ability to implement the preventative measures
 provided above, in addition to Strada's corporate Spill Contingency Plan (as per prescribed conditions
 on the Site Plans)

8.0 RECOMMENDED COMPLIANCE MONITORING PROGRAM

As discussed in Section 4.1, the existing compliance groundwater monitoring networks were developed to characterize the local groundwater conditions at each individual property in addition to allowing for the ongoing monitoring of potential adverse impacts from the two operating pits. These monitoring programs were modified slightly and incorporated 7 new monitoring nest for the purpose of the Level 1 and 2 Hydrogeological Assessment. A detailed review of the monitoring networks has been completed and a proposed streamlined program has been developed.

The proposed program focuses on the on-going monitoring of background conditions (up-gradient locations) in both the overburden and bedrock aquifers and the monitoring of potential influences from the aggregate operation on down-gradient locations. The proposed groundwater monitoring program is provided in Table 6. Selected up-gradient and down-gradient wells will be sampled for water quality. The water quality parameters for the semi-annual and annual sampling programs are provided in Table 7.

Table 6: Proposed Groundwater Monitoring Network

Well ID	Water Levels	Water Qu	ality
	Monthly Manual Water	Semi-Annual	Annual
OW2-A	X	Х	
OW2-B	X	Х	
OW3-B	X	Х	
OW4-A	X	Х	
OW4-B	Х	Х	
OW5-A	Х	Х	Х
OW5-B	Х	Х	
OW6-A	X	Х	Х
OW7-A	X	Х	Х
OW7-B	X	Х	
OW8-A	X	Х	Х
OW9-A	X	Х	Х
OW10-A	X	Х	Х
OW11-A	X	Х	Х
OW11-B	X	Х	
OW12-A	Х	Х	Х

Well ID	Water Levels	Water Quality				
	Monthly Manual Water	Semi-Annual	Annual			
OW13-A	Х	Х				
OW13-B	Х	Х				
OW14-B	Х	Х	Х			
OW15-B	X					
OW16-B	Х	Х	Х			
OW17-A	Х					
OW17-B	Х					
OW18-A	Х	Х	Х			
OW18-B	Х	Х				
OW19-A	Х					
OW19-B	Х	Х				
OW20-B	Х	Х	Х			
OW21-B	Х	Х	х			
OW22-B	Х	Х				
OW23-B	Х	Х				

Note: the collection of continuous water levels at selected groundwater monitoring locations is recommended.

Table 7: Proposed Water Quality Parameters

Semi-Annual Groundwater Quality Parameters	Annual Groundwater Quality Parameters				
General Water Quality Parameters: pH, Conductivity, Alkalinity,	Total Petroleum Hydrocarbons (F1-F4)				
Bicarbonate, Chloride, Calcium, Magnesium, Potassium,	BTEX, Total Oil and Grease				
Sodium, Sulphate, Nitrate, Nitrite, Phosphorous, and Metals					
(dissolved).					

It is recommended that a single annual groundwater monitoring report for the Melancthon Pits #1 and 2, as well as the proposed Bonnefield and Prince Pits be prepared and submitted to the MNRF prior to March 31st of each year and include the monitoring data for the 12-month period ending December 31st of the previous year. The report shall include, but not be limited to, the following:

- 1. Monitoring data collected as per Table 6 and
- 2. Table 7;
- 3. Data in tabulated and graphical formats;
- 4. Interpretation of the collected data including discussions of any observed trends in groundwater levels and groundwater quality (analytical) results;
- 5. Recommendations on and justification for the need for make changes to monitoring locations, monitoring frequency, type of monitoring, pumping patterns and/or the need for mitigation, and
- 6. Summary and documentation of any water well complaint(s) and their resolution(s).

9.0 CONCLUSIONS

- 1. The proposed Bonnefield and Prince properties were investigated to determine the feasibility of the extraction of aggregate from above the water table.
 - a. The maximum depth of extraction on the Prince property will be to within 1.5 m of the seasonal high water table, or to the top of the bedrock surface where no groundwater is encountered in the overburden.
 - b. The maximum depth of extraction on the Bonnefield property will be to within 1.5 m of the seasonal high water table.
- 2. There will be no water diversion or dewatering to maintain dry pit operating conditions on the subject lands.
- 3. Since the proposed aggregate operation will not be extracting from below the water table, it is anticipated that there will be no influence on the water table aquifer elevations. As a result, there will be no influence on the domestic water wells as a result of the proposed operation of the Bonnefield and Prince Pits.

It is Whitewater's professional opinion that the subject lands are geologically, hydrogeologically and hydrologically suited for the proposed aggregate operations.

Tecia White, M.Sc., P.Geo.

Senior Hydrogeologist / President Whitewater Hydrogeology Ltd.

10.0 REFERENCES

Bolton, T.E. 1957.

Silurian stratigraphy and paleontology of the Niagara Escarpment in Ontario; Geological Survey of Canada, Memoir 289, 145p.

Burnside and Waterloo Hydrogeologic, 2001.

Town of Shelburne: Groundwater Management Study.

Chapman, L.J., and Putman, D.F., 1984.

The Physiography of southern Ontario. 3rd Edition. Ontario Geological Survey, Special Volume 2.

Gwyn, Q.H.J., 1972

The Quaternary Geology of Dundalk area – Southern Ontario. Ont. Dept. Mines and Northern Affairs, P.727

Liberty, B.A. and Bolton, T.E. 1971.

Paleozoic geology of the Bruce Peninsula area, Ontario; Geological Survey of Canada, Memoir 360, 163p.

Nottawasaga Valley Source Protection Area, 2015

Un-Approved Assessment Report

Ontario Geological Survey, 1998.

Aggregate Resources Inventory: Melancthon and Mulmur Townships, Dufferin County. Sand and Gravel Resources ARIM 163-A and ARIP 163.

Pratt, B.R., and Miall, A.D., 1993.

Anatomy of a bioclastic grainstone megashoal (Middle Silurian, southern Ontario) revealed by ground-penetrating radar, Geology, 21, 223-236

Stott, C.A., and von Bitter, P.H., 1999.

Lithofacies and age variation in the Fossil Hill Formation (Lower Silurian), southern Georgian Bay region, Ontario. Canadian Journal of Earth Science, Vol. 36. pp 1743-1762.

Whitewater Hydrogeology Ltd., 2017a

Groundwater Monitoring Compliance Report: Melancthon Pit #1 (Shelburne North Pit)

Whitewater Hydrogeology Ltd., 2017b

Groundwater Monitoring Compliance Report: Melancthon Pit #2 (Shelburne South Pit)

APPENDIX A MOECC WATER WELL RECORDS

The Ontario Water Resources Act WATER WELL RECORD

0506 (07/94) Front Form 9

Print only in spaces provided. Municipality 1705240 Mark correct box with a checkmark, where applicable. Con block tract survey, etc. Township/Borough/City/Town/Village County or District **Address** Date First name Owner's surname completed Basin Code Elevation Northing LOG OF OVERBURDEN AND BEDROCK MATERIALS (see instructions) Depth - feet General description Other materials Most common material То From General colour quaye 31 32 14 15 39-40 34-38 Length Diameter CASING & OPEN HOLE RECORD Sizes of opening WATER RECORD 41 (Slot No.) SCREEN Wall Depth - feet Inside inches feet Water found Material thickness Kind of water diam To From at - feet inches inches Depth at top of screen Material and type ☐ Sulphur 13-16 Steel 4 | Minerals 2 [Galvanized ² Salty feet Gas Concrete ☐ Sulphur 19 ♣ ☐ Open hole 15-18 **PLUGGING & SEALING RECORD** 4 | Minerals 5 | Plastic 61 2 🗍 Salty ☐ Gas 20-23 ☐ Abandonment ☐ Steel ☐ Annular space ☐ Sulphur ²⁴ 2 Galvanized Depth set at - feet 4 🔲 Minerals Material and type (Cement grout, bentonite, etc.) ☐ Concrete ² ☐ Salty ₅ ☐ Gas То 4 🗌 Open hole From 14-17 10-13 5 | Plastic □ Sulphur 4 🔲 Minerals 27-30 2 🗌 Salty 22-25 18-21 ☐ Gas 2 [] Galvanized 3 Concrete 30-33 3 🗍 Sulphur ¹ Fresh 30-33 80 26-29 4 🗌 Open hole 4 🔲 Minerals ² Salty 5 Plastic 6 🗌 Gas Duration of pumping Pumping test method Pumping rate **LOCATION OF WELL** 17-18 Hours Mins **GPM** ☐ Pump ² ☐ Sailer In diagram below show distances of well from road and lot line. Water level 2 Recovery Indicate north by arrow. Water levels during Static level end of pumping 10th side No. 60 minutes 45 minutes 30 minutes 15 minutes 26-28 feet PUMPING Water at end of test 38-41 Pump intake set at If flowing give rate □ Clear feet **GPM** Recommended Recommended Recommended pump type pump rate pump setting ☐ Shallow **GPM** feet FINAL STATUS OF WELL Unfinished 5 Abandoned, insufficient supply 9 10 Replacement well 6 🗌 Abandoned, poor quality 2 🖫 Observation well 7 Abandoned (Other) 3 ☐ Test hole 8 Dewatering ♣ ☐ Recharge well— 55-56 WATER USE 5th Side St 9 Not used ☐ Commercial Domestic 10 Other ☐ Municipal 2 Stock Public supply 3 | Irrigation 8 Cooling & air conditioning 4 🔲 Industrial METHOD OF CONSTRUCTION 9 Driving ⁵ Air percussion 1 ☐ Cable tool 199520 10 🗌 Digging 2 Rotary (conventional) ⁶ Doring 3 ☐ Rotary (reverse) 7 🗌 Diamond 4 🗌 Rotary (air) 8 🗌 Jetting 63-68 80 59-62 Date received Contracctor Data Well Contractor's Licence No. Name of Well Contractor source Date of inspection Inspector Address SE Well Technician's Licence No. Remarks CSS. ES9 Submission date

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The Ontario Water Resources Act WATER WELL RECORD

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County or District DUFFERIN	·	1	Borough/City/	_		· · · · · · · · · · · · · · · · · · ·	Con block		, etc. Lot	19-13
Owner's surname 28-47	First name	Address			0	<u> </u>		Date	Floor 1	48-53
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41 WATER RECORD	51	CASING &	OPEN HOL	RECORD		Sizes of op	ening 31-3	65 3 Diameter	34-38 Lengt	75 80 h 39-40
Water found at – feet Kind of water	Inside diam	Material	Wall thickness	Depth -	feet	(Clas Na X			ches	feet
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2 Galty 6 Gas	24-23 1 2 2	Steel ²⁶ Galvanized		•	27-30	18-21	22-25	NUCE !		
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Static level end of pumping Wa	ater levels during 1 Pu	· · · · · · · · · · · · · · · · · · ·	☐ Recovery 60 minutes			orth by arrow.				
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Z GPW	feet nmended 43–45 Re	☐ Clear	☐ Cloudy 46-49							
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3 ☐ Test hole 7 ☐ Al	bandoned, poor quality bandoned (Other) ewatering	riopiace			9	4	400'		7	
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METHOD OF CONSTRUCTION	57		· · · · · · · · · · · · · · · · · · ·		Court	y Rd			<u> </u>	·
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Name of Well Contractor GERRUTSWELLDRI		Well Contractor	r's Licence No.	Data source		S Contracctor	06°	Bate recei		63-68 80
Address				Date o	of inspection	Ins	spector	<u> </u>		יייייי ו
RR#1 GRANCE Name of Well Technician	VALLEY		n's Licence No.	Sn Remai	rks					
TERRY THOMPSO		Tass	36	ISTR					CSS.	ES0
Signature of Technician/Contractor	unla.	Submission da day 25mo (
A CONTRACTOR OF THE PARTY OF TH	NVIRONMENT 8			1 1					0506 (07/94) F	ront Form 9

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0506 (07/00) Front Form 9

County or District Township/Borough/City/To				Con block tract survey	
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LOG OF OVERBURDEN AND BEDROCK MATERIALS (see instructions)					
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	14 15 21 51 51	CASING & OPEN HOLE REC		pening 31-33 Diameter	75 ii 34-38 Length 39-40
Water found at - feet	Kind of water Inside	Wall Material thickness	Dentificet Z (Slot No.)	ا بي	inches feet
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70 15-18 1 5	Fresh 3 Sulphur 19 Minerals	4 ☐ Open hole 5 ☐ Plastic		OLUCCINO A CEAL INC	PECOBD
	6 Gas 17-1	8 1 🗆 Steel		LUGGING & SEALING Annular space	Abandonment
1 1''	☐ Fresh 3 ☐ Sulphur 24 ☐ Minerals ☐ Salty 6 ☐ Gas	2 Galvanized 3 Concrete	3 77 Depth set at	- feet To Material and type (Ce	ement grout, bentonite, etc.)
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2 [☐ Salty 6 ☐ Gas	2 Galvanized	27-30	22-25	
	☐ Fresh ³ ☐ Sulphur ³⁴ 60 ☐ Minerals ☐ Salty 6 ☐ Gas	3 ☐ Concrete 4 ☐ Open hole	26-29	30-33 80	
	□ Salty 6 □ Gas	5 🗆 Plastic			
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	end of pumping water levels during	1 Pumping 2 Decovery 1 45 minutes 32-34 60 minutes 35-37	Indicate north by arrow		
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3 ☐ Irrigation 4 ☐ Industrial		ning			•
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Instructions for Completing Form	
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	er Record			Galvanized	oncrete				Duration of pumpinghrs + min	2		2
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Regulation 903 Ontario Water Resources Act

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Ins	tructions for Completing Form	# AU496U3	
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Address of W	ell Location (County	/District/Mu	ınicipality)	To	ownship	O TITLE O N	Lot 11		Conce	ssion	1
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Hole	Diameter	***************************************	Cons	struction Rec	ord		Tes	et of We	ell Yield		
Depth N	Metres Diameter To Centimetres	Inside	Material	Wall	Depth	Metres	Pumping test method		w Down Vater Level		Recovery Water Lev
	$43$ ft $6\frac{1}{4}$	diam centimetres	Waterial	thickness centimetres	From	То	Pump intake set at -	min	Metres	min	1
				Casing	·		(metres) Pumping rate -	Static Level	'		
		$1\frac{1}{4}$	Steel Fibreglass  Plastic Concrete	shc 40	0	29ft	(litres/min)	1		1	
Water found	er Record / Kind of Water		Galvanized Steel Fibreglass	5110 40		2916	Duration of pumpinghrs + min	2		2	
at Metres _	Fresh Sulphur		Plastic Concrete				Final water level end of pumping	3		3	
Gas Cother:	Salty Minerals		Galvanized				Recommended pump type.			4	
possessi possessi	Fresh Sulphur Salty Minerals		Steel Fibreglass Plastic Concrete				Shallow Deep			5	
Other:	<u> </u>		Galvanized				depthmetres				
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Other:After test of we	ell yield, water was	1 <del>1</del> 4	RIastic Concrete	.10	29ft	39ft	If flowing give rate - (litres/min)	20 25		20 25	
Clear and s	ediment free	1 4	Galvanized				If pumping discontinued, give reason.	30		30	
Other, spec			Open hole	asing or Sci	een			40 50		40 50	
Chlorinated		<u> </u>						60		60	
Depth set at - M			erd x Annula slurry, neat cement slurry	) etc Volur	bandonment ne Placed	In diagram belov	Location of which show distances of well from the control of the c		, lot line, ε	and bu	ilding.
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Irrigation	Municipa	al	Cooling & a	ir conditioning		Audit No.		e Well C	Completed	Υ .	
☐ Water Suppl			tus of Well  Unfinished	Aband	oned, (Other)	Was the well ow	vner's information Dat	te Deliver	007	/YY	5 ^{MM}   2 ^{DE}
Observation Test Hole	well Abandoned, i		upply Dewatering Replacemen	nt well		package delivere	d? Yes X No				
Name of Well Co		ractor/Tec	hnician Informatio	on ell Contractor's	icence No.	Data Source	Ministry Use	e Only	4 500	- 4	
KEITH	LANG WELL ss (street name, numbe	DRILI		7154		Date Received		<u> </u>	15	4	
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Ministry of the Environment

Well Tag Number	(Place	sticker and print number below	·)
	"M	049604	
# A O 4	496	04	

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 Help Desk (Toll Free) at 1-888-396-9355. All metre measurements shall be reported to 1/10th of a metre. Ministry Use Only Please print clearly in blue or black ink only. Address of Well Location (County/District/Municipality) Concession Lot 11 MELANCTHON DUFFERIN RR#/Street Number/Name City/Town/Village Site/Compartment/Block/Tract etc. **GPS Reading** NAD Mode of Operation: Undifferentiated 17, Easting 561,313 | Northing 4886400 Unit Make/Model MAGELEN X Averaged 8 3 Differentiated, specify Log of Overburden and Bedrock Materials (see instructions) Depth Metres General Colour Other Materials Most common material General Description From 30ft BROWN GRAVEL STONES 0 35ft BROWN SILT DAMP 30ft 43ft BROWN 35ft SAND & GRAVEI 56ft 43ft BROWN LIMESTONE **Hole Diameter Construction Record** Test of Well Yield Depth Metres Diameter Recovery Pumping test method Draw Down Wall Metres Inside Depth Material From To Centimetre Time Water Level Time Water Leve diam thickness centimetres From То min Metres min Metres entimetre 0 54£t 6 1/4 Pump intake set at -Statio Casing (metres) evel Pumping rate Steel Fibreglass 1 1 1 ½ 1 (litres/min) 0 44ft | Plastic | Concrete SHC 40 Duration of pumping Water Record 2 2 Galvanized Water found at Metres _hrs + Kind of Water Steel Fibreglass Final water level end 3 3 m Fresh Sulphu Plastic Concrete of pumping _metres Saltv Minerals Gas Galvanized Recommended pump Other 4 4 type. Shallow Deep Recommended pump Steel Fibreglass __ m Fresh Sulphur Plastic Concrete Gas Salty Minerals 5 5 depth. Galvanized Other: metres Recommended pump Fresh Screen l m 10 Sulphur 10 rate. Saltv Minerals rate. (litres/min) If flowing give rate Gas Outside 15 15 Steel Fibreglass Slot No. Other 44ft 54ft 20 20 X Plastic Concrete After test of well yield, water was (litres/min) 25 25 10 1 분 Galvanized If pumping discontinued, give reason. Clear and sediment free 30 30 Other, specify No Casing or Screen 40 40 50 50 Open hole Chlorinated 🗌 Yes 60 60 Abandonment X Annular space **Plugging and Sealing Record** Location of Well Depth set at - Metres Material and type (bentonite slurry, neat cement slurry) etc. Volume Placed In diagram below show distances of well from road, lot line, and building. Indicate north by arrow. 30ft BENTONITE 0200 **Method of Construction** Diamond Cable Tool X Rotary (air) Digging Air percussion Rotary (conventional) Jetting Othe ] Rotary (reverse) ___ Driving Boring Water Use Domestic ☐ Industrial ☐ Commercial Public Supply Other リフ世 SIDE RD Stock Not used Date Well Completed Irrigation Municipal Cooling & air conditioning Audit No. 58793 L Final Status of Well Date Delivered 7 YYYY ] Water Supply Recharge well Unfinished Abandoned, (Other) Was the well owner's information Yes X No Abandoned, insufficient supply Observation well Dewatering package delivered? Test Hole Abandoned, poor quality Replacement well Ministry Use Only Well Contractor/Technician Information Well Contractor's Licence No. Data Source Name of Well Contractor KEITH LANG WELL DRILLING INC <u>7154</u> Date Regelyed 1 47 2007 MM Date of Inspection ss Address (street name, number, city DD YYYY MM DD ELDON I Technician ST GODERICH ONT Well Technician's Licence No. Well Record Number KEITH LANG

Signature of Technician/Contra T446 YYYY MM DD



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Well Record

Page____ of ___

Regulation 903 Ontario Water Resources Act

Well Owner's Information					0.024	res. S						
First Name	Last Name	9			E-ma	il Address	s				Well Co	Owner
STRADA AGGREGATES Mailing Address (Street Number/Na			Municip	nality			Province	Postal Code	-	Telephone	,	
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Address of Well Location (Street No	mber/Name,	RR)		Township				Lot		Concessio 3	n	
County/District/Municipality				MELA City/Town				11	Provin	ce	Postal	Code
DUFFERIN				ony to an		-			Onta	ario		
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BROWN CLAY & S	STONES	GRAVEI	L LAY	YERS							35ft	-
BROWN LIMESTO	ONE										3311	36ft
		2in	PVC							1.75		
		10ft	scr	een b	otte	om 35	ft					
		10ft	scr	een b	otte	om 18	ft					
						King Si						
	41					Service :						
Annular Sp	ace/Abando	nment Seal	ling Rec	ord			<b>美国工作</b>	Results of W	ell Yiel	ld Testing	)	
Depth Set at (Metres)	Type of Sea	alant Used		V	olume F		Check box if after te water was:	st of well yield,	-	aw Down Water Lev	_	ecovery Water Level
From To	(Material ar	на гуреј		- 10	CODIC W	161/62)	Clear and sand		(Min)			(Metres)
0 7ft BENTO	VITE	- 12 12		-			Cannot develo	p to sand-free	Static		Static	
							If pumping discontin	ued, give reason:	1		1	
							Pumping test meth	od	2		2	
							Fumping test mean	od	3		3	
Method of Construction			Water	Use			Pump intake set at	(Metres)			1000	
Cable Tool Diamo	-		Comr			ot used	Pumping rate (Litre	o (min)	4		4	
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Rotary (Air) Digging	g   Im	igation	Cooli	ng & Air Co	nditionin	ng	Duration of pumpin	ng	10		10	
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net trigger of the second	Status	of Well					Final water level en (Metres)	a or pumping	20		20	
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	oned, Insuliide oned, Poor Wa			r, specify	aucaony		A STATE OF THE STA	Deep	25			
Recharge Well Aband	oned, other, sp						Recommended pur Metro		30		30	
Please provide a map below showing		n of Well					Recommended pu		40		40	9.16
<ul> <li>all property boundaries, and measure</li> <li>an arrow indicating the North direction</li> </ul>	ements sufficie	ent to locate th	he well in	relation to fi	ixed poir	nts,	S. Marine		50		50	
<ul> <li>detailed drawings can be provided a</li> </ul>	s attachments		n legal siz	e (8.5" by 1	4")	11	If flowing give rate (Litres/min)		60		60	
- vidigital pictures of inside of well can	also be provid	ied			X			Wate	r Deta	ile		
N.					necc		Water found at D	A STATE OF THE PARTY OF THE PAR	of Wate			
10					wece.		Metres				Sulphur	Minerals
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#13							Metres	Gas Fr	esh [	Salty	Sulphur	Minerals
#17	1/1	4 LI					Casing Used	Screen Use	Street or other Desirements	AND RESIDENCE OF THE PARTY OF T	and Wel	
-	47	K LI	Ne				Galvanized	Galvanized	Di	ameter of th	10000	enametres)
						+	Fibreglass	Fibreglass	D	epth of the H		98)
Date Well Completed Was the we (yyyy/mm/dd) package del	Il owner's infor			ell Record a			Plastic	x Plastic	10	all Thicknes	36f	THE RESERVE OF THE PARTY OF THE
2008/4/24	Yes	X No	Cilvered to	J VVOII OWITE	51 (yyyyn		Concrete	Concrete	491 1	all Trickries	s (Interres,	
Well Contra	ctor and We	II Technicia				(2)	No Casing a	nd Screen Use	In	side Diarnet	er of the C	asing (Metres)
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251 ELDON ST GODE								Ministr	The state of the s	The state of the s		
Province Postal Code		ss E-mail Ad	dress				Audit No. z 69	731	Well	Contractor N	lo.	
ONT N7A3R9  Bus.Telephone No. (inc. area code) N		echnician /I	ast Name	e. First Nan	ne)		Date Received (yyy)		Date	of Inspection	(yyyy/mn	vald)
519+524-8159		H LANG		-, i ii at i vali	,		JUN 0 5				arry	
Well Technician's Licence No. Signat				Date Subm	itted (yy	yy/mm/dd)						
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Regulation 903 Ontario		Record sources Act	
	П,	enstructed I Owner	

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Well Owner's	s Information												7 ( 5 ) (		
First Name	ACCRECATEC	Last Nar	ne			E-mail	Addres	SS							onstructed
	AGGREGATES (Street Number/Nam	o PP\												,	ell Owner
_	AL PARKWAY	e, RK)		Municip	N CORD			Provi			tal Code Ki 4 F		Telepho	ne No. (in	c. area code)
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	Location (Street Num			AAGII	Township					Lot			Conces	sion	
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County/District/I					City/Town					1		Provi	-	Post	al Code
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Gerieral Colour	Most Common N	naterial		Other Mai	terials				General	Descripti	on			From	To
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BROWN	SILTY CL	V 8	CDAVEL	TAVI	PPC									21ft	37ft
GRAY				- bal	EA-J								9 7	37ft	
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Method o	of Construction			Water	Use			Pump inta	ake set a	t (Metres)					
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Rotary (Air)	Digging		igation		g & Air Cond		toning	Duration	of numni	na ·	200 (100) 200 (200)	10		10	
Air percussion	Boring		dustrial					100	s +	min		10		10	
Other, specify_			ther, specify_			14/2/2		Final water	r level en	d of pumpi	ng	15		15	
☐ Water Supply	☐ Dewatering	Status	of Well	Oheon	ration and/or	Monitorina	a Hole	(Metres)				20		20	
Replacement W			ent Supply	Δ.	ion (Constru		g noie	Recomme				25		25	
Test Hole	Abandone	d, Poor Wa	ater Quality	Other,		,		Shall		Deep		25		25	
☐ Recharge Well	Abandone	d, other, sp	pecify					Recomme		imp depth		30		30	
Discounting		Location	n of Well					Recomme	Metr			40		40	
	nap below showing: daries, and measureme	ents sufficie	ent to locate th	ne well in re	elation to fixe	d points,	.	(Litres/min	)	imp rate		EO		EO	
<ul> <li>an arrow indicatir</li> </ul>	ng the North direction s can be provided as at							If flowing	give rate			50		50	
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Well Record

Regulation 903 Ontario Water Resources Act

							Page_		of
Well Owner's Information			(23%)	CONTRACTOR					
First Name Last STRADA AGGREGATES	Name	E-ma	ail Address					Well Cor by Well	nstructed Owner
Mailing Address (Street Number/Name, RR	R) Munic	cipality		Province	Postal Code	Т	elephone N	,	
30 floral parkwat	С	oncord		ont	14K 4F			ш	
Part A Construction and/or Major A									
Address of Well Location (Street Number/N	ame, RR)	Township MELANC	TON		Lot 11	C	Concession 3		
County/District/Municipality		City/Town/Village			11	Provinc		Postal	Code
DUFFERIN						Onta	rio	1.1	
UTM Coordinates Zone Easting #17 561213		GPS Unit Make GARMIN	Model	Mode of C		Undiffer	entiated	X Ave	eraged
NAD 8 3 #1 / SO 1213  Overburden and Bedrock Materials (see				Differer	ntiated, specify_			STATE STATE OF	
General Colour   Most Common Materia		THE RESERVE AND PARTY AND PERSONS ASSESSMENT AND PARTY A		General De	escription				(Metres)
BROWN SAND & GRAVI	FI		7404		Taraba.			From	To
21.0 11.1		ED C						0	33ft
	& GRAVEL LAY	ERS					- I.	33ft	1
GRAY CLAY & STONI	ES						200	5ft	84f
GRAY LIMESTONE							8	4ft	85f
2i	in PVC								1
10ft	screen bot	tom 84ft							
10ft	screen botte	om 33ft							
	andonment Sealing Rec	cord			Results of We	Il Yield	Testing	-	
	of Sealant Used rial and Type)	Volume P		Check box if after test water was:	of well yield,		w Down Water Level		ecovery Water Level
)0 22ft BENTONITE		, , , , , , , , , , , , , , , , , , , ,		Clear and sand f		(Min)	(Metres)	(Min)	(Metres)
,				Cannot develop state	to sand-free	Static		Static	
				If pumping discontinue	ed, give reason:	1		1	
				Pumping test method	d	2		2	
						3		3	
Method of Construction	Water	Use		Pump intake set at (/	Metres)				<u>Problema</u>
	Public Com Domestic Muni	and the second		Pumping rate (Litres/	min)	4		4	
Rotary (Reverse) Driving	Livestock Test	Hole	nitoring			5		5	
	Irrigation Cool	ing & Air Conditioning	9 1	Duration of pumping		10		10	
	Other, specify			hrs + r	min of pumping	15		15	
	tus of Well			(Metres)	, partyring	20		20	
Water Supply	A	ervation and/or Monitor ation (Construction)	nng Hole	Recommended pump	The state of the s	25		25	
☐ Test Hole ☐ Abandoned, Pool ☐ Recharge Well ☐ Abandoned, other	,	r, specify		Shallow D  Recommended pump					
	ation of Well			Metres	21,21,515,536,53	30		30	
Please provide a map below showing:			I	Recommended pump (Litres/min)	p rate	40		40	
<ul> <li>all property boundaries, and measurements su</li> <li>an arrow indicating the North direction</li> </ul>			ts,	If flowing give rate		50		50	
<ul> <li>detailed drawings can be provided as attachm</li> <li>vidigital pictures of inside of well can also be p</li> </ul>	ents no larger than legal siz rovided	re (8.5" by 14")		(Litres/min)		60		60	
A . I		,	li		Water	Details		859	F 1 F 1 F 1
1.10	14	OG CABIN .		Water found at Dep	and the state of the state of				
HIM XWELL		CABIN .		Water found at Dep	000		alty Su	lphur [	Minerals
#10						<	alty Su	lphur [	Minerals
				Water found at Dep	th Kind of				
-11.				Metres [	Gas Fres	sh S	alty Su	lphur [	Minerals
4+1	CINE			Casing Used	Screen Used	_	Casing an		
				Galvanized Steel	Galvanized	3.75	6in	ole (Cen	winewes)
				Fibreglass	Fibreglass	Dept	h of the Hole	(Metres)	)
Date Well Completed Was the well owner's (yyyy/mm/dd) Was the well owner's package delivered?	Delivered to	ell Record and Packa Well Owner (yyyy/m	age im/dd)	Plastic X	Plastic Concrete	Wall	85f Thickness (/		
2008/423	Yes XNo			No Casing and			Trillord is 35 (r	wow osy	
Well Contractor and Business Name of Well Contractor	Well Technician Inform	mation Well Contractor's Licen	oce No	Open Hole	Joi Sell Oseu	Inside	e Diameter o	f the Cas	sing (Metres)
KEITH LANG WELL DRILL		7154	. 11-	Disinfected?		Depti	h of the Casi	ng (Metri	95)
Business Address (Street No./Name, number	, RR) Munic			Yes No					
251 ELDON ST GODERIC				Audit Ma	Ministry				
Province Postal Code Bus ONT N7 A 3 R9	illess E-mail Address		l A	z 697	32	well Con	tractor No.		
Bus.Telephone No. (inc. area code) Name of We	ell Technician (Last Name	, First Name)	C	Date Received (1/1/1/2/m		Date of In	spection (yy	yy/mm/d	d)
519-525-8159 KI	EITH LANG	Data Orbania da			UUU				
Well Technician's Licence No. Signature of Technician's Licence No.	Tame I	Date Submitted (yyyy)	/mm/dd)   F	Remarks					
0506E (11/2006)		Ministry's	Copy				© Queen's I	Printer for	Ontario, 2006



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Well Record

Regulation 903 Ontario Water Resources Act

Wall O	unor	Infor	mation		SU2010 SSS										Page		of
Well Ov First Nam		intor	COLUMN THE SECOND	Last Nan	ne	Fait An		E-m	ail Addre	ess						Well C	onstructed
JAGGE	ER H	IMS	LIMITE	)					on Fraue							by We	II Owner
			Number/Name STREET ^S		301		unicipality NEWM	ARKET		F	Province ONT		stal Code	е	Telephon	e No. (inc	. area code)
The second second	A		and/or Majo			-	The second second second	KKEI	ACT ACT		ONI	r ₂	Y8X7	8425		E CONTRACTOR OF THE PARTY OF TH	
			n (Street Numb			9-11-0	Tow	nship		CONTRACTOR.		Lo			Concessi	on	
County/D	)istrict/l	Municip	alitv					LANCTO Town/Villag				1	3	Provi	4		al Code
		FER]	I N				Oity	TOWNS VISIAS	,c					_	ario	Posta	Code
UTM Coo		4 -	Easting: 5 605 23		orthing  488 7	51.7		Init Make	Model			of Opera		Undiffe	erentiated	x A	veraged
THE RESERVE AND ADDRESS OF THE PARTY OF THE	den an		rock Materials							F 2.32	Diffe	erentiate	d, specify				
General		1.01	st Common Ma				Materials				General	Descrip	otion	11275		Dept	h (Metres)
BROWN		SII	TY SAND	& S	TONE	S										0	16ft
BROWN		SA	ND & GR	AVEL	LAY	ERS										16ft	
GRAY		CI	AY & ST	ONES												37ft	63ft
BROWN		LI	MESTONE													63ft	90ft
GRAY		LI	MESTONE													90f	t 274f
GRAY		SH	IALE													274	ft288f
Donth Sat	at /Ma		nnular Space/				Record			21				-	ld Testin		
Depth Set From	at (Me			pe of Se laterial a	alant Use nd Type)	ed ·		Volume (Cubic N		water	k box if after t was:		Il yield,		aw Down Water Lev		Water Level
0	66	Et	BENTON	ITE	SLUR	RY					Clear and sar Cannot devel		nd-free	(Min) Static	(Metres,	(Min)	(Metres)
										S	state nping disconti			Level	17me	ters	
												and an gri		1		1	
										Pump	ping test met	hod		2		2	
Met	thod o	of Cons	struction			Wa	ter Use			Pump	o intake set a	at (Metre	s)	3		3	
Cable T			Diamond	□ Pu		_ c	ommercial		t used			272 (1.78) 1.61(1.51)		4		4	
Rotary Rotary	-		☐ Jetting ☐ Driving		mestic restock		lunicipal est Hole		watering	Pump	oing rate (Litr	es/min)		5		5	
☐ Rotary			☐ Digging ☐ Boring		gation fustrial	С	ooling & Ai	r Conditionin	g	Durat	tion of pumpi		1.55	10		10	
Other, s			The second second	Ot	her, spec	lfy				Final	hrs + water level en	min nd of pum	ping	15		15	
☐ Water S	Supply		☐ Dewatering	Status o	of Well	NT o	bservation :	and/or Monito	ring Hole	(Metre				20		20	7143
Replace	ement V	/ell	Abandoned,	Insufficie		□ A	Iteration (C	onstruction)	neig i lolo		mmended pu	Deep	1.4	25		25	
Recharg			☐ Abandoned, ☐ Abandoned,			y 🗆 o	ther, specii	fy			mmended pu		h	30		30	
22.35		4,32		ocation	of Well					Descr	Metr			40		40	
- all propert	ty bound	daries, a	w showing: nd measuremen	ts sufficie	nt to loca	te the well	l in relation	to fixed poin	its,	(Litres	mmended pu s/min)	ump rate	11.11	50		50	
<ul> <li>detailed d</li> </ul>	rawings	can be	orth direction provided as attac	chments i	no larger	than legal	size (8.5"	by 14")	1		ving give rate			60			
- vidigital pi	ctures o	of inside	of well can also b		_	0-		Li	N							60	
				0	AC	1.1				Wate	er found at D	epth	-	of Water		230	
								CON			A PROPERTY AND ADDRESS OF THE PARTY AND ADDRES	Ga	s Fre	sh 🗌	Salty []	Sulphur	Minerals
								454		Wate	er found at D Metres			of Water		Sulphur	Minerals
										Wate	er found at D		Kind o	of Water	r		
	1415	11									Metres	Ga					Minerals
7	-	_	50 m.			_	_				sing Used	-	en Used anized	Dia	Casing a	Hole (Ce	
		5	50 m.							Ste	el	Stee		8	.75in	1	
Date Well	Comple	eted W	as the well owner		nation	Date the	Well Reco	rd and Packa	age	-	reglass stic	Fibre	_	Det	66ft		s)
(yyyy/mm/d 2008/5		p	ackage delivered?			Delivered	to Well O	wner (yyyy/ir	nm/dd)	the same of the sa	ncrete	Con		Wa	II Thickness	(Metres)	
		Well	Contractor a	nd Well	Techni	cian Infe	ormation		200		o Casing ar	nd Scre	en Used	Insi		188 r of the Ca	sing (Metres)
Business N keith			ontractor vell dri	11:-	0 1-			tractor's Lice	nce No.	X Disinfe	Open Hole				61		
Business A			No./Name, num				715 nicipality	)4			res X No			1 1 1 1 1 1 1	oth of the Ca	ising (Met	res)
251	eld	on s	st goder	ich	ont							1252	Ministry	Use O	nly	2 ( - 3)	
Province		Post	al Code MANASR9	Business	E-mail A	Address				Audit N	z 69	750	)	Well Co	ntractor No		
Bus.Telepho		(inc. are	a code) Name of				me, First N	lame)		Date R	Received 0999			Date of I	Inspection (	yyyy/mm/c	dal)
519+ Well Technic			9 + Signature of ]	KEI	TH L	ANG	Date Sul	bmitted (yyyy	dmm/stat			ZUUB					
T446		140	die of	L	n	91	Jake Sul	orrandu (yyy)	rudd)	Remai	in/a						
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Ministry of the Environment

Well Tan No. (Diana Stinker and/or Print Below)

A 051672

A051672

Well Record

Regulation 903 Ontario Water Resources Act

Pa	nge	of	

62529	3 15 S	ideroa	đ	,		<b>XRRXXXX</b>	Mela	nc <b>hh</b> or	16			2	
County/Dist		ality			(	City/Town/Villag	е			Provin Onta		Postal	Code
Duffe UTM Coordin		Easting	, N	lorthing	ı	Municipal Plan	and Sublo	t Number		Other	1110		
NAD	8 3 17	56219		489000									
	-					ord (see Instruction	ons on the	back of this f		THE		Dec	oth (m/t)
General Co		Most Comm	non Materia			ner Materials			General Description			From 0	7.32
Brown		Sand			Grav	e1					7	.32	
Brown	I	imesto	ne								/	. 32	24.30
			Annula	r Space					Results of We	ell Yiel	d Testina		124001111111111111111111111111111111111
Depth Se	et at (m/ft)		Type of Se	ealant Used		Volume P			f well yield, water was:	Dr	aw Down		Recovery
From	6 1	Pon	(Material a			0.25	3)	Clear Other,	and sand free	Time (min)	Water Leve	Time (min)	Water Level
0	6.1	ben	CONIC	е		0.23			discontinued, give reason:	Static	5.44		6.51
										1	5.57	1	6.25
								Pump inta	ke set at (m/ft)	2	5.67	2	6.11
									5.24				
Meth	od of Con	struction			Well Us	se			ate (l/min / GPM)	3	5.77	3	6.0
Cable To		Diamond			Comme		ot used	45 . Duration o	5 f pumping	4	5.85	4	5.93
Rotary (F	Conventional) Reverse)	☐ Jetting ☐ Driving	2.6	omestic ivestock	Municip Test Ho		ewatering onitoring	_1_ hrs	s +0min	5	5.93	5	5.86
☐ Boring ☐ Air percu		Digging		rigation idustrial	Cooling	& Air Conditioni	ng	1	level end of pumping (m/ft)	10	6.16	10	5.57
Other, sp				ther, <i>specify</i> _				6.51	give rate (MMM) GPM)	15	6.32	15	5.41
	Con	struction R	ecord - Ca		^	Status of				20	6.39	20	
Inside Diameter (cnvin)	(Galvanized	OR Material d, Fibreglass, Plastic, Steel)	Wall Thiologess (cm/ln)		To	Water Sup Replacem Test Hole	ent Well		nded pump depth (m/ft)	25	6.44	25	
15.56			0.477	0.50	8.53			(Vmin / GP	nded pump rate M)	30	6.46	30	
	open	hole		8.53	24.38	Dewaterin  Observation	- 1	Well produ	uction (Vmin / GPM)	40	6.49	40	
	open	11010		0.00		Monitoring  Alteration	Hole			50	6.48	50	
				-		(Construct		Disinfected Yes		60	6.51	60	
	Co	onstruction R	acord Co	roop.	*******	Abandone Insufficien	t Supply	100	Map of W			3.95.661	
Outside Diameter (cm/in)	Ma	aterial vanized, Steel)	Slot No.		h (m/ft)	Abandone Water Qua Abandone specify	ality	Please pro	vide a map below following			oack.	
	on with	Water Det	tails	16311631320		Other, spe		J				/	1,
_16(m	ft) Gas	Kind of Wate Other, spe Kind of Wate	ecify	Α.	From	6.1	(cm/in)	t Lin	House				<b>V</b>
		Other, spe			6.1		16.0	3rd					
		Kind of Wate		Untested	8.53	_	15.55			3m			
(m		Other, spe		II Taabalala			10.00						
	ame of Well				W	ell Contractor's Li		=	15 S	DEC	<b>S</b>		
Business A		et Number/Na and Va:1			M	unicipality		Comments	rmation Pack	age	Mai1	ed	
Province		ostal Code		ss E-mail Add	dress								o Onto
-		LON 1G0 area code) Na		Technician (	Last Name	, First Name)		Well owne information package			Audit No.		4 F O C
			Gerr	its, S	Steve			delivered	2008 Y 08 M 2 Date Work Completed	18		8	4506
	ian's Licence	No. Signature			ontractor Da	ate Submitted	28	X Yes	2008 08 2	0		<b>IPR</b>	1 7 2009
2 9 0506E (12/200		1/11	( <i>l</i> .	v · · · · · · · · ·	HC.	Ministry's	101 (0) (0)		1 [1 ] 1 [1 [N] [N]	UU	© Queen	s Printer	for Ontario, 2007

Ministry of the Environment

Well Tag No. (Pla A 073355 Well Record Regulation 903 Ontario Water Resources Act Measurements recorded in: 

Metric | Imperial Well Owner's Information First Name Last Name / Organization E-mail Address ☐ Well Constructed THE HIGHLAND COMPANIES
Mailing Address (Street Number/Name) by Well Owner Municipality Province Postal Code Telephone No. (inc. area code) SHELBURNE 477476 THIRD LINE RR#2 ONT LON 1186 Well Location Address of Well Location (Street Number/Name) Concession Lot Township 13 4 MELANCTHON County/District/Municipality Province Postal Code City/Town/Village Ontario DUFFERIN UTM Coordinates Zone Municipal Plan and Sublot Number Other Northina Easting 560944 NAD | 8 | 3 1 7 4887656 Overburden and Bedrock Materials/Abandonment Sealing Record (see instructions on the back of this form) Depth (m/ft) Most Common Material Other Materials General Description From 15ft 0 silty sand and gravel brown Annular Space Results of Well Yield Testing After test of well yield, water was: Recovery Draw Down Depth Set at (m/ft) Type of Sealant Used Volume Placed (m3/ft3) Water Level Clear and sand free Water Level Time (Material and Type) From To (min)  $(m/\hbar)$ (m/lt)Other, specify 2ft BENTONITE Statio If pumping discontinued, give reason: 6ft Level 1 1 Pump intake set at (m/ft) 2 2 3 3 Pumping rate (I/min / GPM) Method of Construction Well Use 4 4 Commercial Cable Tool Diamond Public Not used Duration of pumping Municipal Dewatering Rotary (Conventional) Jetting Domestic 5 5 hrs + min Driving Test Hole Rotary (Reverse) Livestock X Monitoring Final water level end of pumping (m/ft) Cooling & Air Conditioning Boring Digging Irrigation 10 10 Air percussion Industrial Other, specify Other, specify 15 15 If flowing give rate (I/min / GPM) Construction Record - Casing Status of Well 20 20 Open Hole OR Material (Galvanized, Fibreglass, Concrete, Plastic, Steel) Depth (m/ft) Water Supply Inside Wall Recommended pump depth (m/ft) Diameter (cm/in) Thicknes (cm/in) Replacement Well 25 25 To From Test Hole Recommended pump rate (Vmin / GPM) 30 30 4 ∦ft Recharge Well 2in plastic shc40 0 Dewatering Well 40 40 Cobservation and/or Monitoring Hole Well production (Vmin / GPM) 50 50 Alteration Disinfected? (Construction) 60 Yes No Abandoned, Insufficient Supply Map of Well Location Construction Record - Screen Abandoned, Poor Please provide a map below following instructions on the back Outside Depth (m/ft) Water Quality Material (Plastic, Galvanized, Steel) Slot No. Abandoned, other, From То (cm/in) specify 2in plastic 14ft .10 Other, specify Water Details **Hole Diameter** Water found at Depth Kind of Water: Fresh Untested Depth (m/ft) From 14ft (m/ft) Gas Other, specify 15ft 6in Water found at Depth Kind of Water: Fresh Untested WELL SCALE House (m/ft) Gas Other, specify Water found at Depth Kind of Water. Fresh Untested (m/ft) Gas Other, specify Well Contractor and Well Technician Information Business Name of Well Contractor Well Contractor's Licence No. 14204+ KEITH LANG WELL DRILLING INC 7154 Comments: Business Address (Street Number/Name) 251 ELDON ST GODERICH ONT Business E-mail Address Postal Code Well owner's information Date Package Delivered Ministry Use Only N7A3R9 Bus.Telephone No. (inc. area code) Name of Well Technician (Last Name, First Name) package KEITH LANG delivered Date Work Completed

Well Technician's Licence No. Signature of Technician and/or Contractor Date Submitted

T446 0506E (12/2007) Yes

x No

2008 5 20

JUN 22

Ministry of Well Tag No. (Pla Well Record A 073353 the Environment Regulation 903 Ontario Water Resources Act 73353 Well Owner's Information Last Name / Organization First Name E-mail Address ☐ Well Constructed THE HIGHLAND COMPANIES by Well Owner Mailing Address (Street Number/Nar Municipality Province Postal Code Telephone No. (inc. area code) SHELBURNE ONT LON1S6 THIRD LINE RR#2 477476 Well Location Concession Address of Well Location (Street Number/Name) Township 13 MELANCTHON County/District/Municipality Postal Code City/Town/Village Province Ontario DUFFERIN VTM Coordinates Zone Easting NAD | 8 | 3 | 1 | 7 | 5 6 0 Municipal Plan and Sublot Number Northing Other 560871 4888025 Overburden and Bedrock Materials/Abandonment Sealing Record (see instructions on the back of this form) Depth (m/ft) General Colour Most Common Material General Description From SILTY CLAY & GRAVEL BROWN 0 20ft Results of Well Yield Testing Annular Space Recovery Depth Set at (m/ft) Type of Sealant Used Volume Placed After test of well vield, water was: Draw Down Clear and sand free ime Water Level Time Water Level From To (Material and Type)  $(m^3/ft^3)$ (m/ft) (m/ft) Other, specify (min) BENTONITE 7.ft Statio 20ft If pumping discontinued, give reason: Level 1 1 Pump intake set at (m/ft) 2 2 3 3 Pumping rate (I/min / GPM) Method of Construction Well Use 4 4 Commercial ☐ Not used Public Cable Tool Diamond Duration of pumping Dewatering Municipal Rotary (Conventional) Jetting Domestic 5 5 hrs + min Livestock Test Hole Rotary (Reverse) Driving X Monitoring Final water level end of pumping (m/lt) Boring Digging Irrigation Cooling & Air Conditioning 10 10 Industrial Air percussion Other, specify Other, specify 15 15 f flowing give rate (Vmin / GPM) Construction Record - Casing Status of Well 20 20 Open Hole OR Material (Galvanized, Fibreglass, Concrete, Plastic, Steel) Wall Thicknes Depth (m/ft) ☐ Water Supply Inside Recommended pump depth (m/ft) Diamete (cm/in) Replacement Well 25 25 To From (cm/in) Test Hole Recommended pump rate (Vmin / GPM) 30 30 Recharge Well **9**ft shc40 2 i n plastic 0 Dewatering Well 40 40 ■ Observation and/or Monitoring Hole Well production (I/min / GPM) 50 50 Alteration Disinfected? (Construction) Yes No 60 60 Abandoned, Insufficient Supply Map of Well Location Construction Record - Screen Abandoned, Poor Please provide a map below following instructions on the back.

1140 ft Depth (m/ft) Water Quality Outside Material (Plastic, Galvanized, Steel) Slot No Diamete Abandoned, other From To (cm/in) specify 19ft 9.ft plastic .10 2in Other, specify Water Details Hole Diameter Depth (m/ft) Water found at Depth Kind of Water: Fresh Untested Diamete (cm/ln) From (m/ft) Gas Other, specify 9 that found at Depth Kind of Water: Fresh Untested 0 20ft 6in (m/ft) Gas Other, specify Water found at Depth Kind of Water: Fresh Untested (m/ft) Gas Other, specify Well Contractor and Well Technician Information Business Name of Well Contractor Well Contractor's Licence No. KEITH LANG WELL DRILLING INC 7154 Municipality Comments Business Address (Street Number/Name) 251 ELDON ST GODERICH ONT Business E-mail Address Postal Code

Well owner's information Date Package Delivered package delivered Date Work Completed Yes 2008 5 21

X No

Ministry Use Only Audit No. 2 097132

JUN 2 2 2009

Province

0506E (12/2007)

N7A3R9

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

KEITH LANG

Ontario Ministry of the Environment  Measurements recorded in:  Metric Imperial	Well Ta	ng No. (Place Sticker at	nd/or Print Below)	Regulation	n 903 C			ecord
Well Owner's Information  First Name HIGHLAND COMPANIE  Mailing Address (Street Number/Name)  477476 THIRD LINE RR2	S	Municipality	E-mail Address Province	Postal Code		Telephone N	by We	Constructed III Owner area code)
Well Location		SHELBURNE	ONT					
Address of Well Location (Street Number/Name)		Township MELANCTHON	1	Lot 16		Concession 4		
County/District/Municipality DUFFERIN		City/Town/Village			Onta		Postal	Code
VTM Coordinates   Zone   Easting   NAD   8   3   17   560483     Northing   48994		Municipal Plan and Sublo	ot Number		Other			
Overburden and Bedrock Materials/Abandonment S General Colour Most Common Material		ord (see instructions on the her Materials		ral Description	mini			th ( <i>m/ft</i> )
	PLUG O	LD WELL					From	То
	0-6ft 5ft-33f	3ft tile						
	)[[-33]	t 4in well						
Annular Space			BERRING STREET	Results of We	ell Yield	d Testina	District Co.	TO SERVICE OF
Depth Set at (m/ft) Type of Sealant Used From To (Material and Type)	d	Volume Placed (m³/ft³)	After test of well yield,  Clear and sand f	water was:	Dra	w Down Water Level		ecovery Water Level
0 6ft sand gravel ben	ntonite		Other, specify  If pumping discontinue	ed. give reason:	(min) Static	(m/ft) 20ft	(min)	(m/ft)
6ft 33ft bentonite					Level 1		1	
			Pump intake set at (n	n/ft)	2		2	
Method of Construction	Well Us	80	Pumping rate (Vmin /	GPM)	3		3	
□ Cable Tool     □ Diamond     □ Public       □ Rotary (Conventional)     □ Jetting     □ Domestic	Comme		Duration of pumping		4		4	
□ Rotary (Reverse)     □ Driving     □ Livestock       □ Boring     □ Digging     □ Irrigation	☐ Test Ho	le Monitoring & Air Conditioning	hrs + n	nin of pumping (m/ft)	5		10	
Air percussion Industrial Other, specify Other, specify	y		If flowing give rate (Vn	nin / GPM)	15		15	
Inside Open Hole OR Material Wall De	pth (m/ft)	Status of Well  Water Supply	Recommended pump	denth (m/ff)	20		20	
Diameter (Galvanized, Fibreglass, Thickness (cm/in) Concrete, Plastic, Steel) (cm/in) From	То	Replacement Well Test Hole			25		25	
		Recharge Well Dewatering Well	Recommended pump (I/min / GPM)	rate	30		30	
		Observation and/or Monitoring Hole	Well production (I/min	/ GPM)	50		50	
		Alteration (Construction) Abandoned.	Disinfected?  X Yes No		60		60	
Construction Record - Screen	HIGHER	Insufficient Supply  Abandoned, Poor		Map of Wo				it in the same as
Outside Diameter (cm/in) Material Slot No. Prom	pth (m/ft) To	Water Quality  X Abandoned, other, specify  Other, specify	Please provide a map	below following	instructio	1,	ack. HL LIN	
Water Details Water found at Depth Kind of Water: Fresh Unteste	ed Dept	th (m/ft) Diameter						
(m/ft) ☐ Gas ☐ Other, specify	From	To (cm/in)	¥ -	,3Km				
(m/ft) Gas Other, specify Water found at Depth Kind of Water: Fresh Uniteste	ad		a-	,3Km		15		ERD
(m/ft) Gas Other, specify							מיני	ERD
Well Contractor and Well Technic Business Name of Well Contractor	A 1 2 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	tion ell Contractor's Licence No.						
KEITH LANG WELL DRILLING I Business Address (Street Number/Name)		7154 Inicipality	Comments:					
251 ELDON ST GODERICH ONT Province Postal Code Business E-mail Ad	ddress							
N7 A3 R9  Bus.Telephone No. (inc. area code) Name of Well Technician		First Name	information	ackage Delivered			ry Use	Only
Well Technician's Licence No. Signature of Technician and/or CT446	Contractor Dat		package   Y   Y   Date W	Y Y M M I	DO	Audit No. Z 1	L'	353 2010

Well Tag No A 084702 Well Record Ministry of Regulation 903 Ontario Water Resources Act the Environment Page Imperial Well Owner's Information E-mail Address ☐ Well Constructed Last Name / Organization HIGHLAND COMPANIES Telephone No. (inc. area code) Municipality Province Postal Code Mailing Address (Street Number/Name) LON1S6 ONT 477476 THIRD LINE SHELBURNE Well Location Lot 15 Concession Township Address of Well Location (Street Number/Name) MELANTHON Province City/Town/Village County/District/Municipality Ontario DUFFERIN Other Municipal Plan and Sublot Number Northing UTM Coordinates Zone Easting NAD | 8 | 3 | 17 | 5607 | 45 4889111 Overburden and Bedrock Materials/Abandonment Sealing Record (see instructions on the back of this form) Other Materials General Description Most Common Material General Colour clay 7 stones brown gravel grown clay % stones gray

19ft 41ft 51ft 41ft 51ft 89ft brown rock 89ft 122ft rock gray Results of Well Yield Testing Armular Space Volume Placed (m³/ft³) After test of well yield, water was: Draw Down Recovery Type of Sealant Used Depth Set at (m/ft) X Clear and sand free Water Level (Material and Type) (min) (m/ft) (m/ft) Other, specify 58ft BENTONITE SLURRY If pumping discontinued, give reason: 33ft Leve 1 1 Pump intake set at (m/ft) 2 2 60ft 3 3 Pumping rate (I/min / GPM) Method of Construction Well Use 10gpm 4 4 Commercial ☐ Not used Public Cable Tool Duration of pumping

1 hrs + -0 min X Domestic 35ft Jetting Municipal Dewatering 33ft X Rotary (Conventional) 5 Test Hole ■ Monitoring Rotary (Reverse) Driving Livestock Final water level end of pumping (m/ft) Cooling & Air Conditioning Boring Digging Irrigation 37ft 10 10 Industrial Air percussion 37ft Other, specify Other, specify 15 If flowing give rate (I/min / GPM) Status of Well Construction Record - Casing 20 20 Depth (m/ft) X Water Supply Recommended pump depth (m/ft) Open Hole OR Material VVall (Galvanized, Fibreglass, Concrete, Plastic, Steel) Replacement Well 25 25 60ft (cm/in) (cm/in) ☐ Test Hole ded pump rate 30 Recharge Well (I/min / GPM) 61 .188 58ft steel 0 10gpm Dewatering Well 40 40 122ft □ Observation and/or Well production (I/min / GPM) open hole 58ft Monitoring Hole 50 Alteration Disinfected? (Construction) 33ft 37ft Abandoned. Insufficient Supply Map of Well Location Construction Record - Screen Abandoned, Poor Please provide a map below following instructions on the back Depth (m/ft) Outside Water Quality Material (Plastic, Galvanized, Steel) Diamete (cm/in) Abandoned, other, From specify liott Other, specify House WELL Hole Diameter Water Details Depth (m/ft) Water found at Depth Kind of Water: XFresh Untested Diameter 350tt -> (cm/in) 116f t/m/ft) ☐ Gas ☐ Other, specify 0 58ft 8.75in Water found at Depth Kind of Water: Fresh Untested

6in Comments

> Well owner's information

package delivered

X Yes

Date Package Delivered YYY MM D Date Work Completed

2010 12 3

Ministry Use Only Audit No. Z]

by Well Owner

Postal Code

Depth (m/ft)

19ft

From

APR 2 9 2011

LANE

0506E (2007/12) © Queen's Printer for Ontario, 2007

T446

(m/ft) Gas Other, specify

(m/ft) Gas Other, specify

251 ELDON ST GODERICH ONT

Postal Code

N7A3R9

Business Address (Street Number/Name)

Province

Water found at Depth Kind of Water: Fresh Untested

KEITH LANG WELL DRILLING INC

Well Contractor and Well Technician Information

KEITH LANG

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

Business E-mail Address

Ministry's Copy

YYYYMMDD

58ft

122ft

7154

1	>
C.	Ontario

Ontario Ministry of the Environment	Well Ta	ag No. (Place Sticker a	nd/or Print Below)	Regulation	n 903 C			Record
Measurements recorded in:	al					Page		of
Well Owner's Information First Name   Last Name / Organ	action		E avail Address	-	(j. 18. A			
HIGHLAND COMPANIES	ization		E-mail Address	5			_	Constructed ell Owner
Mailing Address (Street Number/Name) 477476 THIRD LINE RR#3		Municipality SHELBURNE	Province ONT	Postal Code		Telephone	•	
Well Location							100	1 1
Address of Well Location (Street Number/Name)	LINE	Township MELANTHON		Lot 15		Concessio 4	п	
County/District/Municipality		City/Town/Village			Provin		Posta	Code
DUFFERIN    UTM Coordinates   Zone   Easting   Northing   17   560738     488	9031	Municipal Plan and Subl	ot Number		Onta	ario		
Overburden and Bedrock Materials/Abandonmer	nt Sealing Rec	ord (see instructions on the	back of this form)				An in	
General Colour Most Common Material		her Materials .	Ge	neral Description	·		From	oth ( <i>m/ft</i> )
·	PLUG O	LD WELL 4in						
				· , , , , , , , , , , , , , , , , , , ,				
		, , , , , , , , , , , , , , , , , , , ,						
						*		
Annular Spac	9			Results of We	II Vial	d Testing		
Depth Set at (m/ft) Type of Sealant U	sed	Volume Placed	After test of well yiel	d, water was:	Dra	aw Down		ecovery
O 50ft BENTONITE	3)	(m³/ft³)	☐ Clear and sand ☐ Other, <i>specify</i>		Time (min)	Water Leve (m/ft)	Time (min)	Water Level (m/ft)
	*****		If pumping discontin	ued, gíve reason:	Static Level			
					1		1	
			Pump intake set at	(m/ft)	2		2	
	800/800199891/AZIA ŽIVZNININI	See a delay in section of a second second second second second	Pumping rate (l/min	r/GPM)	3		3	
Method of Construction   Public     Cable Tool	Well U		l	ŕ	4		4	
Rotary (Conventional)	☐ Municip	pal Dewatering	Duration of pumpin hrs +	ıg min	5		5	
☐ Boring ☐ Digging ☐ Irrigation	***************************************	ole	Final water level end		10	. , ,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,	10	
☐ Air percussion ☐ Industrial ☐ Other, specify ☐ Other,	ecify		If flowing give rate	//i / CDIA)	15		15	
Construction Record - Casing		Status of Well	in nowing give rate	umin / Grivi)	20		20	
Diameter (Galvanized Fibreglass, Thickness	Depth ( <i>m/ft)</i>	☐ Water Supply ☐ Replacement Well	Recommended pur	mp depth <i>(m/ft)</i>	25		25	
(cm/in) Concrete, Plastic, Steel) (cm/in) Fro	m To	Test Hole	Recommended pur	mp rate				
		Recharge Well  Dewatering Well	(I/min / GPM)		30		30	
		Observation and/or Monitoring Hole	Well production (I/n	nin / GPM)	40	***************************************	40	
		Alteration (Construction)	Disinfected?		50		50	
200723300000000000000000000000000000000	5093308309330000000000000000000000000000	Abandoned, Insufficient Supply	X Yes No	Matanagan Persamana	60	Septimization to the second	60	PAN PROPER MANAGEMENT
	Depth ( <i>m/ft</i> )	Abandoned, Poor Water Quality	Please provide a ma	Map of We			oack.	
Diameter (crrvin) (Plastic, Galvanized, Steel) Slot No. Fro	1.	Abandoned, other, specify	15ths	UDE ROO	_		11	11
		***************************************	350	M				/V
		Other, specify		[4]				
Water Details		lole Diameter		40/13				<b>.</b>
Water found at Depth Kind of Water: ☐ Fresh ☐ Unter (m/ft) ☐ Gas ☐ Other, specify	ested Dep From	oth ( <i>m/ft)</i> Diameter To ( <i>cm/in</i> )		<del></del>			_	CON
Water found at Depth Kind of Water: Fresh Unite	ested		10/	1_1	ANE		+	4
(m/ft) Gas Other, specify			1 E	•	(,			
Water found at Depth Kind of Water: Fresh Unter	ested		国					
Well Contractor and Well Techi	nician Informa	tion	Yank K	/	<b>.</b>			
Business Name of Well Contractor  KEITH LANE WELL DRILLING	1	ell Contractor's Licence No. 7154	] 3 <	100	<u>m</u> _	<b>&gt;</b>		
Business Address (Street Number/Name)		unicipality	Comments:				<u> </u>	
251 ELDON ST GODERICH ONT								
Province Postal Code Business E-mai	ı Address			Package Delivere	d I	Minis	try Use	Only
Bus.Telephone No. (inc. area code) Name of Well Technic		First Name)	information package	Y Y M M M	l l	Audit No.		
Well Technician's Licence No.   Signature of Technician and/		te Submitted	Date Date	Work Completed		Z 1	ひU: 13 N 13	429 2012

Well Technician's

T446

0506E (2007/12)

audit No. z 130429 JAN 13 2012 

☐ Yes ※ No

# APPENDIX B BOREHOLE LOGS

# Whitewater Hydrogeology Ltd.

Project Name: Melancthon Pit #2

Well ID: OW2

Depth (m)	Elevation (masl)	Lithology	Lithology Description	Well Construction Diagram
-4 0	508		TOP SOIL	
4 =	504	0.00	SILTY SAND: Brown, occassional stone, loose, dry	
8 =	500	0.00	SAND AND GRAVEL: Brown, angular to subangular gravel, loose, dry to wet	
12 —	496	V	Subangular graver, loose, dry to wet	
16	492	D. O. S	TAVISTOCK TILL: Grey, clay with stones,	
20 =	488	0.4.4	dense to soft, damp	
24 =	484	Δ		
28 =	480			A A
32 =	476			
36 =	472			
40	468			
44 =	464			<u>ə</u>
48 =	460		AMABEL FORMATION: Dolostone, buff to white, fossiliferous	Open Hole
52 =	456			o
56 =	452			
60 =	448	/		
64 =	444			
68 =	440		CAROT LICAD CHALC. Cross and dames	
72 —	436		CABOT HEAD SHALE: Green, soft, damp	В
76 =	432			

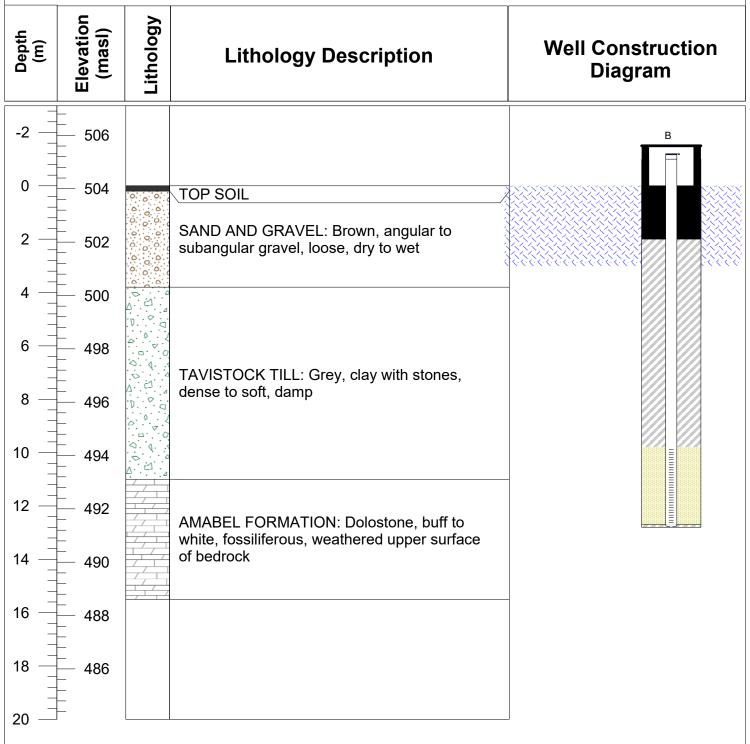
Drilling Date: March 2007 / April 2008 Drilling Company: Keith Lang Drilling Geologist: Ken Goff / Tecia White Location: Township of Melancthon

> Easting: 561,689 Northing: 4,887,097





Well ID: OW3



Drilling Date: March 2007 / April 2008
Drilling Company: Keith Lang Drilling
Geologist: Ken Goff / Tecia White
Location: Township of Melancthon

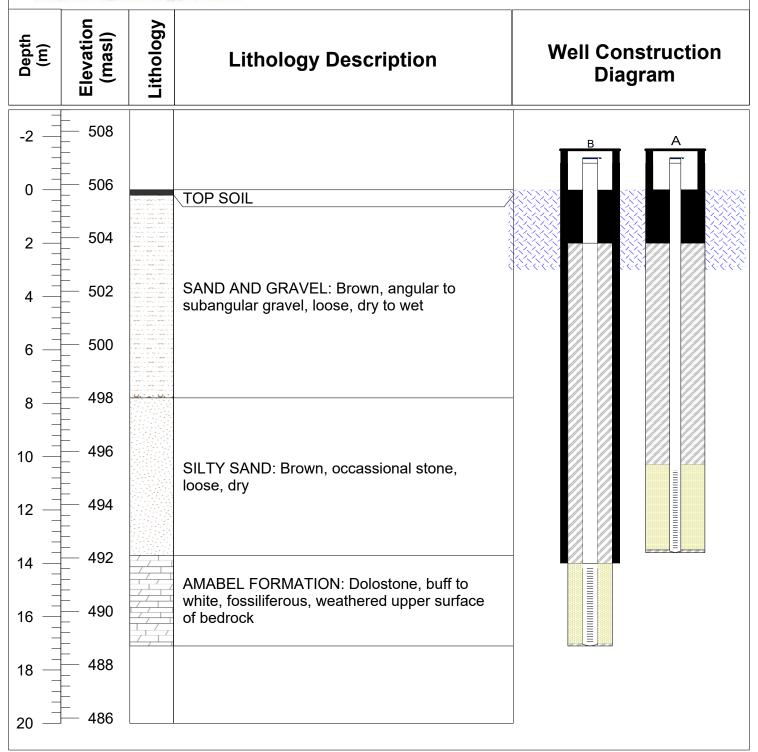
Easting: 561,272 Northing: 4,886,849



# Whitewater Hydrogeology Ltd.

Project Name: Melancthon Pit #2

Well ID: OW4



Drilling Date: March 2007 / April 2008
Drilling Company: Keith Lang Drilling
Geologist: Ken Goff / Tecia White
Location: Township of Melancthon

Easting: 561,313 Northing: 4,886,400



# Whitewater Hydrogeology Ltd.

Project Name: Melancthon Pit #2

Well ID: OW5

2.500	U		27 SC SECONS	
Depth (m)	Elevation (masl)	Lithology	Lithology Description	Well Construction Diagram
-4				
-2	 496 			B A
0	_ 494		TOD COIL	ZXXXXX
2 —			TOP SOIL  SAND AND GRAVEL: Brown, angular to	
4 -	 490 		subangular gravel, loose, dry to wet	
6	_ 488	2 - 4		-
8 —			TAVISTOCK TILL: Grey, clay with stones, dense to soft, damp	
10	484	V		
12 —	- - - - 482 -		AMABEL FORMATION: Dolostone, buff to white, fossiliferous, weathered upper surface of bedrock	
14	480 			
16				
18	 476			
20	474			

Drilling Date: March 2007 / April 2008 Drilling Company: Keith Lang Drilling Geologist: Ken Goff / Tecia White Location: Township of Melancthon

> Easting: 561,742 Northing: 4,886,523





Well ID: OW6

Depth (m)	Elevation (masl)	Lithology	Lithology Description	Well Construction Diagram
-2	497			A
-1	_ 496 			
0	495			
1 —	 494		SILTY SAND: Brown, occassional stone, loose, dry	
2 —	 493 			
3 —	 492			
4	- - - 491		SAND AND GRAVEL: Brown, angular to	
5 —	490 		subangular gravel, loose, dry to wet	
6	489 			
7	- - - - -			
8 -	 487 			
9 -	- - - - -			
10	- - - 485 -			
11 -	 484 			
12	483			

Drilling Date: Jun-15

Drilling Company: Keith Lang Drilling

Geologist: Tecia White

Location: Township of Melancthon

Easting: 561,660 Northing: 4,886,939





Well ID: OW7

Depth (m)	Elevation (masl)	Lithology	Lithology Description	V	Vell Construction	on
-2	498			1		
0 =	496					
2 =	494		SILTY SAND: Brown, occassional stone, loose, dry			
4 =	492	0 0 0				
6 -	490	0 0 0	SAND AND GRAVEL: Brown, angular to subangular gravel, loose, dry to wet			
8 —	488	0 0 0				
10 —	486	V			A	
12 —	484	· · · · · · · · · · · · · · · · · · ·	TAVISTOCK TILL: Grey, clay with stones,		7	
14 =	482	Ο Ο Ο	dense to soft, damp			
16	480	. D \ \				
18 —	478					
20 —	476					
22 —	474		AMABEL FORMATION: Dolostone, buff to		Φ	
24 —	472		white, fossiliferous, weathered upper surface of bedrock		Open Hole	
26	470				Ō	
28 —	468					
30 —	466					
32 =					С	

Drilling Date: Jun-15

Drilling Company: Keith Lang Drilling

Geologist: Tecia White

Location: Township of Melancthon

Easting:

Northing:





Well ID: OW8

Depth (m)	Elevation (masl)	Lithology	Lithology Description	Well Construction Diagram
-2				A
-1	497 			
0	496 			
1 —	 495 		SILTY SAND: Brown, occassional stone, loose, dry	
2 —	494 			
3	493 			
4	492 			
5	491 			
6	490 		SAND AND GRAVEL: Brown, angular to	
7	489 		subangular gravel, loose, dry to wet	
8 -	488 			
9 —	487 			
10	486 			
11	485 			
12	484 			
13	483 			
14	482			

Drilling Date: Jun-15

Drilling Company: Lantech Drilling Services

Geologist: Tecia White

Location: Township of Melancthon

Easting: 561,881 Northing: 4,887,192





Well ID: OW9

Depth (m)	Elevation (masl)	Lithology	Lithology Description	Well Construction Diagram
-2	 498			A
0	 496			
2 —	  494 		SAND AND GRAVEL: Brown, angular to	
4 -	492		subangular gravel, loose, dry to wet	
6	490			
8 —	 488 			
10	486	V. 77.		
12	 484 		TAVISTOCK TILL: Grey, clay with stones, dense to soft, damp	
14	_ 482 	A. Z		
16	 480	0 0		
18	 478 	. N	AMABEL FORMATION: Dolostone, buff to	
20	 476		white, fossiliferous, weathered upper surface of bedrock	
22				

Drilling Date: March 2007 / April 2008 Drilling Company: Keith Lang Drilling Geologist: Ken Goff / Tecia White Location: Township of Melancthon

> Easting: 561,806 Northing: 4,887,468





Well ID: OW10

Depth (m)	Elevation (masl)	Lithology	Lithology Description	Well Construction Diagram
-2				T = T
0	— 496 -	'6:-1:'6:-1		
2 —	 494 	0 0 0	SAND AND GRAVEL: Brown, angular to subangular gravel, loose, dry to wet	
	492	0.00		
6	- - - - 490		SILTY CLAY: Brown, compact, moist	
	_ _ 488			
8 —	_ _ _		SILTY SAND: Brown, occassional stone,	
10	486 		loose, dry	
=	_ 484	Δ. [] . Δ		
12		D. V. Z		
	482	0.0		
14			TAVISTOCK TILL: Grey, clay with stones,	
16	— 480 –	D 0	dense to soft, damp	
	 478	0.0.0		
18	_ _ _	. D S		
20	- 476 	79,10	AMABEL FORMATION: Dolostone, buff to white, fossiliferous, weathered upper surface of bedrock	
22	474 		OI DEGIOCK	

Drilling Date: March 2007 / April 2008
Drilling Company: Keith Lang Drilling
Geologist: Ken Goff / Tecia White
Location: Township of Melancthon

Easting: 561,628 Northing: 4,887,239





Well ID: OW11

Depth (m)	Elevation (masl)	Lithology	Lithology Description	V		onstruction agram
498 _	498				В	Α
496 _	496					
494 —	494		SILTY SAND: Brown, occassional stone, loose, dry			
492 —	492					
490 —	490		SAND AND GRAVEL: Brown, angular to subangular gravel, loose, dry to wet			
488 —	488	D 3				
486 —	486	V. D. V.	TAVISTOCK TILL: Grey, clay with stones, dense to soft, damp			
484 —	484	Δ. []				
482 —	482		AMABEL FORMATION: Dolostone, buff to white, fossiliferous, weathered upper surface of bedrock		Open Hole	
480 _	480					z
478 —	478					
476 —	476					
	<del></del>					

Drilling Date: Jun-15

Drilling Company: Keith Lang Drilling

Geologist: Tecia White

Location: Township of Melancthon

Easting: 561,571 Northing: 488,477





Well ID: OW12

Depth (m)	Elevation (masl)	Lithology	Lithology Description	Well Construction Diagram
-2				A
-1	507			
0	506			
1 -	505		SILTY SAND: Brown, occassional stone, loose, dry	
2	 504			
3	503 			
4	 502			
5	 501 			
6	500 		SAND AND CDAVEL: Proven angular to	
7	499 		SAND AND GRAVEL: Brown, angular to subangular gravel, loose, dry to wet	
8 -	498 			
9 =	497 			
10	496 			
11	495 			
12				
13	493			

Drilling Date: Jun-15

Drilling Company: Lantech Drilling Services

Geologist: Tecia White

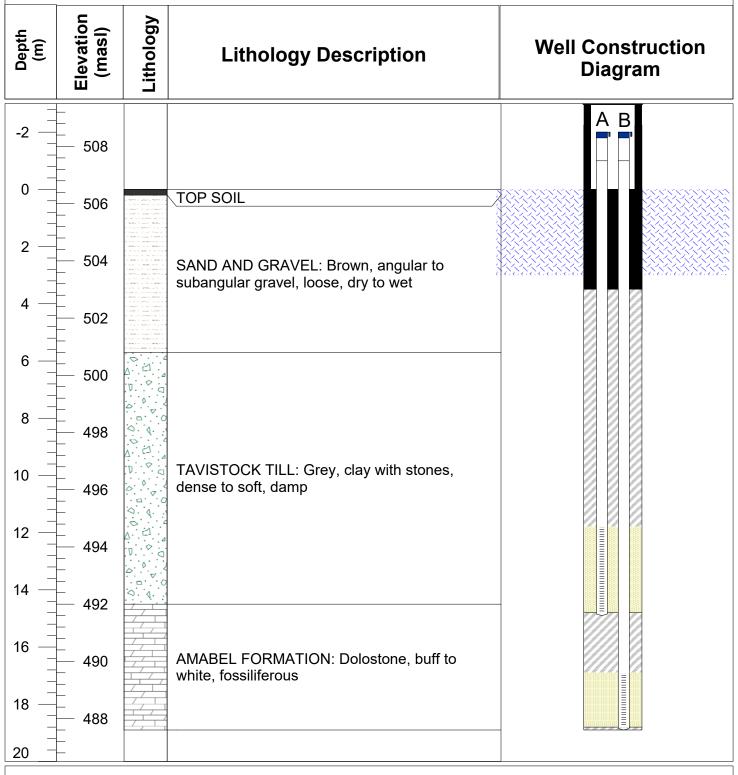
Location: Township of Melancthon

Easting: 561,282 Northing: 4,887,057





Well ID: OW13



Drilling Date: Dec-01

Drilling Company: Keith Lang Drilling

Geologist: Keith Lang

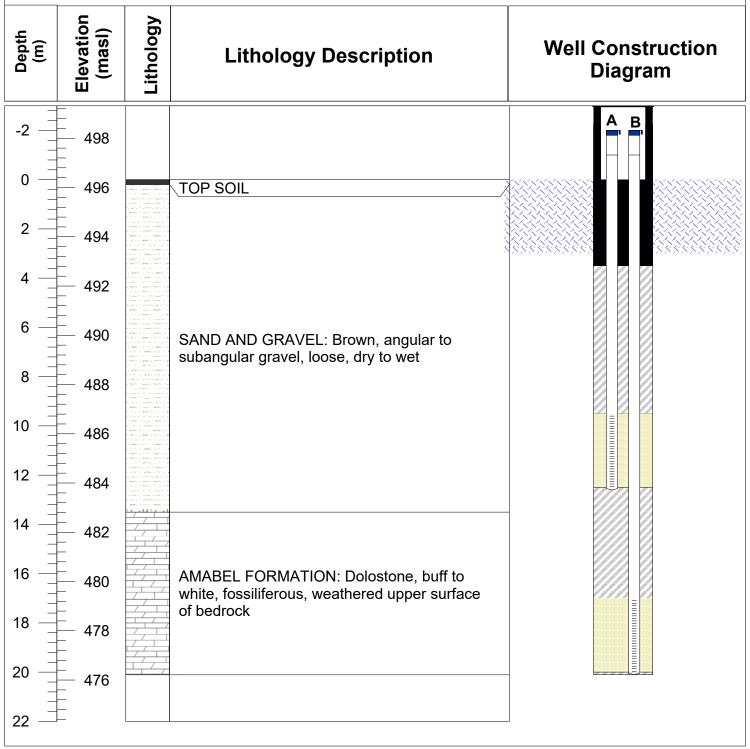
Location: Township of Melancthon

Easting: 561,145 Northing: 4,887,604





Well ID: OW14



Drilling Date: Aug-04

Drilling Company: Keith Lang Drilling

Geologist: Keith Lang

Location: Township of Melancthon

Easting: 561,769 Northing: 4,887,847





Well ID: OW15

Depth (m)	Elevation (masl)	Lithology	Lithology Description	Well Construction Diagram
-2	 512			B. A.
0	 510		TOP SOIL	
2	508			
4	 506			
6	 504			
8	 502	The second secon		
10	500			
12	498		SAND AND GRAVEL: Brown, angular to subangular gravel, loose, dry to wet	
14	 496			
16	 494			
18				
20	490			
22	488			
24	486			
26	484 484		AMABEL FORMATION: Dolostone, buff to	
28	482		white, fossiliferous, weathered upper surface of bedrock	
30	480	//		

Drilling Date: Aug-04

Drilling Company: Keith Lang Drilling

Geologist: Keith Lang

Location: Township of Melancthon

Easting: 561,431 Northing: 4,887,669





Project Name: Bonnefiel Pit #3

Well ID: OW17

			57 (URL CROST 50.51)	
Depth (m)	Elevation (masl)	Lithology	Lithology Description	Well Construction Diagram
-4	506			T T
-2	 504			A B
0 -	 502		TOP SOIL	
2 -	 500			
4 -	 498			
6 -	496		SAND AND GRAVEL: Brown, angular to subangular gravel, loose, dry to wet	
8 -	 494			
10	 492			
12 —	 490	Δ. Δ.		
14	488	D. O.		
16	486	V. V		
18	484		TAVISTOCK TILL: Grey, clay with stones, dense to soft, damp	
20 —	 482	V. O.		
22 —	 480			
24	 478		AMABEL FORMATION: Dolostone, buff to	
26	 476		white, fossiliferous	
28				<u> </u>

Drilling Date: 28-Sep

Drilling Company: Keith Lang Drilling

Geologist: Keith Lang

Location: Township of Melancthon

Easting: 561,472 Northing: 4,887,382





Well ID: OW16

Depth (m)	Elevation (masl)	Lithology	Lithology Description	Well Construction Diagram
-4	500			В
-2	 498			
0 —	 496			
2 -	494 		SAND AND GRAVEL: Brown, angular to subangular gravel, loose, dry to wet	
4 —	492 		casanigalar glavel, reces, all te met	
6 -	490	/		
8 -	488 488			
10	486 			
12 -	484			
16	482		AMABEL FORMATION: Dolostone, buff to	
18	480 		white, fossiliferous, weathered upper surface of bedrock	
	478 			
20	476	/ / /		
22	474 			
24	472			
26	470	7 1		
28	468			

Drilling Date: Jun-12

Drilling Company: Keith Lang Drilling

Geologist: Tecia White

Location: Township of Melancthon

Easting:

Northing:





Project Name: Bonnefiel Pit #3

Well ID: OW18

Depth (m)	Elevation (masl)	Lithology	Lithology Description	Well Construction Diagram
-4	504			
-2	 502			A B
0 =	 500		TOP SOIL	
2 =	 498			
4	 496			
6	 494		SAND AND GRAVEL: Brown, angular to subangular gravel, loose, dry to wet	
8	 492			
10	 490			
12	 488			
14	 486	V		
16	 484	0.0	TAVISTOCK TILL: Grey, clay with stones, dense to soft, damp	
18	 482	D .		
20	 480		AMAREL FORMATION S. L. (	
22	 478		AMABEL FORMATION: Dolostone, buff to white, fossiliferous	
24	_	/ /		

Drilling Date: 28-Sep

Drilling Company: Keith Lang Drilling

Geologist: Keith Lang

Location: Township of Melancthon

Easting: 561,653 Northing: 4,887,686



# Whitewater Hydrogeology Ltd.

Project Name: Prince Pit #4

Well ID: OW19

Depth (m)	Elevation (masl)	Lithology	Lithology Description	Well Construction Diagram
-4 -2	512			B A
0	510	. 100 / 200 - 100 / 2	TOP SOIL	
2	508		TOI GOIL	
4	506		SAND AND GRAVEL: Brown, angular to	
6	 504		subangular gravel, loose, dry to wet	
8	502	.0		
10	500	.b⇔. ⊡. □	TAVISTOCK TILL, Crow alove and ailt with	
12	498		TAVISTOCK TILL: Grey, clay and silt with stones, dense to soft, damp	
14	496	V		
16	494			
18	492			
20	490			
22	488			
24	486		AMABEL FORMATION: Dolostone, buff to	
26	484	//	white, fossiliferous	
28	482 	7		
30	480			
32	478	7 1		
34	476 			
36	474	7		

Drilling Date: Feb-17

Drilling Company: Highland Water Well Drilling

Geologist: Highland Water Well Drilling Location: Township of Melancthon

Easting: 561,035 Northing: 4,888,193





Project Name: Prince Pit #4

Well ID: OW20

Depth (m)	Elevation (masl)	Lithology	Lithology Description	Well Construction Diagram
-4	512			
-2	<u> </u>			B A
0	 508		TOP SOIL	
2	506			
4	 504			
6	502			
8 =	 500			
10	498		SAND AND GRAVEL: Brown, angular to	
12	496		subangular gravel, loose, dry to wet	
14	494			
16	492			
18	490			
20	488			
22	486	//		
24	484		AMABEL FORMATION: Dolostone, buff to white, fossiliferous	
26	 482			
28	_			

Drilling Date: Feb-17

Drilling Company: Highland Water Well Drilling

Geologist: Highland Water Well Drilling Location: Township of Melancthon

Easting: 561,544 Northing: 4,888,334





Project Name: Prince Pit #4

Well ID: OW21

		-		
Depth (m)	Elevation (masl)	Lithology	Lithology Description	Well Construction Diagram
-4 _	514			
-2	 512			A B
0 =	510		TOP SOIL	
2 -	508			
4 -	506			
6 =	504			
8 -	502			
10 =	500 500		SAND AND GRAVEL: Brown, angular to	
12 -	 498 		subangular gravel, loose, dry to wet, some silt	
14 —	 496 			
16 -	 494 			
18 —	492			
20 =	490			
22 -	488	7 1	AMAREI EORMATION: Delectore buff to	
24 —	486		AMABEL FORMATION: Dolostone, buff to white, fossiliferous	
26				

Drilling Date: Feb-17

Drilling Company: Highland Water Well Drilling

Geologist: Highland Water Well Drilling

Location: Township of Melancthon

Easting: 561,593 Northing: 4,888,681





Project Name: Prince Pit #4

Well ID: OW22

Depth (m)	Elevation (masl)	Lithology	Lithology Description	Well Construction Diagram
-4	516			
-2 =	 514			B A
0 =			TOP SOIL	
2 =	 510			
4 =	 508			
6 -	 506	The second of th		
8 -	 504		SAND AND GRAVEL: Brown, angular to subangular gravel, loose, dry to wet, some silt	
10 -	 502			
12 -	 500			
14 =	 498			
16	 496			
18 —	 494	. N \ \ . \ . \ . \ . \ . \ . \ .		
20 =	492	0.4.6	TAVISTOCK TILL: Grey, clay and silt with stones, dense to soft, damp, silt and gravel	
22 -	 490	Δ. [] . _Δ	layer at base	
24 =	 488			
26	486		AMABEL FORMATION: Dolostone, buff to white, fossiliferous	
28 =				

Drilling Date: Feb-17

Drilling Company: Highland Water Well Drilling

Geologist: Highland Water Well Drilling Location: Township of Melancthon

Easting: 561,384 Northing: 4,888,891



# Whitewater Hydrogeology Ltd.

Project Name: Prince Pit #4

Well ID: OW23

		I					
Depth (m)	Elevation (masl)	Lithology	Lithology Description	Well Construction Diagram			
-4							
-2	512 			B A			
0	510		TOP SOIL				
2 =	<u> </u>						
4	506						
6 =	504		SAND AND GRAVEL: Brown, angular to subangular gravel, loose, dry to wet, some silt				
8 =	502 502						
10	500 						
12 —	498 	Δ. iΔ . Δ					
14	496 	0.4.					
16	494	. D ⊘	TAVISTOCK TILL: Grey, clay and silt with stones, dense to soft, damp,				
18	492	<ul><li>□</li><li>□</li><li>□</li><li>□</li><li>□</li><li>□</li><li>□</li><li>□</li><li>□</li><li>□</li><li>□</li><li>□</li><li>□</li><li>□</li><li>□</li><li>□</li><li>□</li><li>□</li><li>□</li><li>□</li><li>□</li><li>□</li><li>□</li><li>□</li><li>□</li><li>□</li><li>□</li><li>□</li><li>□</li><li>□</li><li>□</li><li>□</li><li>□</li><li>□</li><li>□</li><li>□</li><li>□</li><li>□</li><li>□</li><li>□</li><li>□</li><li>□</li><li>□</li><li>□</li><li>□</li><li>□</li><li>□</li><li>□</li><li>□</li><li>□</li><li>□</li><li>□</li><li>□</li><li>□</li><li>□</li><li>□</li><li>□</li><li>□</li><li>□</li><li>□</li><li>□</li><li>□</li><li>□</li><li>□</li><li>□</li><li>□</li><li>□</li><li>□</li><li>□</li><li>□</li><li>□</li><li>□</li><li>□</li><li>□</li><li>□</li><li>□</li><li>□</li><li>□</li><li>□</li><li>□</li><li>□</li><li>□</li><li>□</li><li>□</li><li>□</li><li>□</li><li>□</li><li>□</li><li>□</li><li>□</li><li>□</li><li>□</li><li>□</li><li>□</li><li>□</li><li>□</li><li>□</li><li>□</li><li>□</li><li>□</li><li>□</li><li>□</li><li>□</li><li>□</li><li>□</li><li>□</li><li>□</li><li>□</li><li>□</li><li>□</li><li>□</li><li>□</li><li>□</li><li>□</li><li>□</li><li>□</li><li>□</li><li>□</li><li>□</li><li>□</li><li>□</li><li>□</li><li>□</li><li>□</li><li>□</li><li>□</li><li>□</li><li>□</li><li>□</li><li>□</li><li>□</li><li>□</li><li>□</li><li>□</li><li>□</li><li>□</li><li>□</li><li>□</li><li>□</li><li>□</li><li>□</li><li>□</li><li>□</li><li>□</li><li>□</li><li>□</li><li>□</li><li>□</li><li>□</li><li>□</li><li>□</li><li>□</li><li>□</li><li>□</li><li>□</li><li>□</li><li>□</li><li>□</li><li>□</li><li>□</li><li>□</li><li>□</li><li>□</li><li>□</li><li>□</li><li>□</li><li>□</li><li>□</li><li>□</li><li>□</li><li>□</li><li>□</li><li>□</li><li>□</li><li>□</li><li>□</li><li>□</li><li>□</li><li>□</li><li>□</li><li>□</li><li>□</li><li>□</li><li>□</li><li>□</li><li>□</li><li>□</li><li>□</li><li>□</li><li>□</li><li>□</li><li>□</li><li>□</li><li>□</li><li>□</li><li>□</li><li>□</li><li>□</li><li>□</li><li>□</li><li>□</li><li>□</li><li>□</li><li>□</li>&lt;</ul>					
20	490	A. (2)					
22	488 						
24	486		AMABEL FORMATION: Dolostone, buff to				
26	484		white, fossiliferous				
28	482 482	/					
30	480	7 7					

Drilling Date: Feb-17

Drilling Company: Highland Water Well Drilling

Geologist: Highland Water Well Drilling Location: Township of Melancthon

Easting: 560,938 Northing: 4,888,788



# APPENDIX C WATER BALANCE

Date	PET	Р	P-PET	Soil Moisture	AET	PET-AET	Snow Storage	Surplus	ROtotal
	======= == 46.5			===			20.7		========
Mar-62	16.5	39.7	-16.5 62.4	117.1	32.9	-16.5	39.7	0 104.5	5.1
Aug-62	78.1	120.6		75 75	78.1	0	19.8	104.5 117.7	25
Apr-62	33.9	141.7	117.7	75 67	33.9	0	9.9		43.5
Jan-62	8 70.6	155.2	-8 160.3	67	8 70.6	0	165.1	161.3	34.8
Jun-62	79.6	166.3	169.2	75 	79.6	0	82.5	161.3	60.1
May-62	67.7	188.4	162	75 65.5	67.7	0	41.3	162	80.5
Dec-62	9.5	230	-9.5	65.5	9.5	0	271.3	0	64.4
Feb-62	8.4	257.1	-8.4	58.2	7.3	1.1	528.4	0	51.5
Sep-62	5.5	288.3	-5.5	53.9	4.3	1.2	816.7	0	41.2
Jul-62	83.4	293.2	618.2	75 	83.4	0	408.4	597.2	152.4
Nov-62	15.3	378.3	379.6	75 75	15.3	0	391.8	379.6	197.8
Oct-62	31.4	433.6	598.1	75	31.4	0	195.9	598.1	277.9
Jun-63	81.8	48.7	64.8	75	81.8	0	97.9	64.8	235.3
Feb-63	7.5	53.9	-7.5	67.5	7.5	0	151.9	0	188.2
Oct-63	4.9	59.4	-4.9	63	4.4	0.5	211.2	0	150.6
Jan-63	7.5	82.6	-7.5	56.7	6.3	1.2	293.8	0	120.5
Mar-63	18.1	185.2	43.5	75	18.1	0	417.4	25.2	101.4
Dec-63	8	190	-8	67	8	0	607.4	0	81.1
Apr-63	4.2	198.3	-4.2	63.3	3.7	0.4	805.7	0	64.9
Sep-63	43.7	219.3	578.4	75	43.7	0	402.8	566.7	165.3
Jul-63	93.7	228.7	336.4	75	93.7	0	201.4	336.4	199.5
Nov-63	19.4	237	318.3	75	19.4	0	100.7	318.3	223.2
Aug-63	70.1	258.1	238.4	75	70.1	0	50.4	238.4	226.3
May-63	51.6	306.8	280.3	75	51.6	0	25.2	280.3	237.1
Sep-64	48.3	72	36.3	75	48.3	0	12.6	36.3	196.9
Nov-64	17.8	107.7	96.2	75	17.8	0	6.3	96.2	176.8
Feb-64	9.5	109.7	-9.5	65.5	9.5	0	116	0	141.4
Jun-64	78.7	112.7	92	75	78.7	0	58	82.5	129.6
Oct-64	27.7	117.1	118.4	75	27.7	0	29	118.4	127.4
May-64	63	192.3	143.7	75	63	0	14.5	143.7	130.7
Dec-64	10.6	211	-10.6	64.4	10.6	0	225.5	0	104.5
Jan-64	10.1	233.9	-10.1	55.7	8.7	1.4	459.3	0	83.6
Mar-64	17.5	237.4	17.2	72.9	17.5	0	662	0	66.9
Apr-64	31.4	239.7	539.3	75	31.4	0	331	537.2	161
Aug-64	67.3	439	537.3	75	67.3	0	165.5	537.3	236.2
Jul-64	99.3	492.3	475.7	75	99.3	0	82.8	475.7	284.1
Jun-65	74.3	117.7	84.7	75	74.3	0	41.4	84.7	244.2
Apr-65	26.4	160.7	125.4	75	26.4	0	50.3	125.4	220.5
Mar-65	14.8	161.9	-14.8	60.2	14.8	0	212.2	0	176.4
Jul-65	77.9	189	217.2	75	77.9	0	106.1	202.4	181.6
Dec-65	12.2	239.7	47	75	12.2	0	286.6	47	154.6
May-65	62.2	242.3	323.3	75	62.2	0	143.3	323.3	188.4
Sep-65	51.6	269.7	289.7	75	51.6	0	71.6	289.7	208.6
Jan-65	8.4	286.4	-8.4	66.6	8.4	0	358.1	0	166.9
Aug-65	73.5	311.3	416.8	75	73.5	0	179	408.4	215.2
Nov-65	16.1	311.7	308.1	75	16.1	0	166.6	308.1	233.8
Feb-65	9.8	345	-9.8	65.2	9.8	0	511.6	0	187
Oct-65	3.7	390.6	-3.7	62	3.2	0.5	902.2	0	149.6
Jul-66	97.7	130.3	483.7	75	97.7	0	451.1	470.7	213.8
Feb-66	10.4	132.9	-10.4	64.6	10.4	0	584	0	171.1
Apr-66	28.9	160.3	421.6	75	28.9	0	293.9	411.1	219.1
Oct-66	28.7	169	287.3	75 75	28.7	0	146.9	287.3	232.7

Date	PET ======== ==	P ====================================	P-PET	Soil Moisture	AET	PET-AET	Snow Storage	Surplus	ROtotal
Mar-66	 19.5	194.2	96.7	75	19.5	0	224.9	96.7	205.5
Jan-66	8.3	217.7	-8.3	66.7	8.3	0	442.6	0	164.4
May-66	47.6	222.6	396.3	75	47.6	0	221.3	388	209.1
Dec-66	1.4	232.9	-1.4	73.6	1.4	0	454.2	0	167.3
Aug-66	78.8	241	389.2	75	78.8	0	227.1	387.9	211.4
Sep-66	45.4	293.3	361.5	75	45.4	0	113.5	361.5	241.4
Jun-66	82.1	337.3	312	75	82.1	0	56.8	312	255.5
Nov-66	17.4	376	373.4	75	17.4	0	42	373.4	279.1
Mar-67	16.4	71.3	-16.4	58.6	16.4	0	113.3	0	223.3
May-67	44.3	145.8	158.1	75	44.3	0	56.7	141.7	207
Feb-67	8	167.1	-8	67	8	0	223.8	0	165.6
Jan-67	1.5	214.2	-1.5	65.7	1.3	0.2	438	0	132.5
Nov-67	14.3	222.3	198.1	75	14.3	0	447.9	188.8	143.7
Apr-67	32.1	249.3	441.2	75	32.1	0	223.9	441.2	203.2
Sep-67	45.4	253.3	319.9	75	45.4	0	112	319.9	226.6
Jul-67	86.8	254.2	223.3	75	86.8	0	56	223.3	225.9
Dec-67	11.1	284.8	-11.1	63.9	11.1	0	340.8	0	180.7
Oct-67	29.4	322.9	463.9	75	29.4	0	170.4	452.7	235.1
Aug-67	71.1	360.6	374.8	75	71.1	0	85.2	374.8	263.1
Jun-67	90	639.7	592.2	75	90	0	42.6	592.2	328.9
Apr-68	36.6	135	119.7	75	36.6	0	21.3	119.7	287.1
Mar-68	19.9	177.7	76.5	75	19.9	0	102.7	76.5	244.9
Jun-68	79.3	206.3	178.4	75	79.3	0	51.4	178.4	231.6
Jan-68	7.8	211.6	-7.8	67.2	7.8	0	263	0	185.3
Oct-68	33.6	217.1	315	75	33.6	0	131.5	307.2	209.7
Jul-68	92.4	221.3	194.6	75	92.4	0	65.7	194.6	206.7
Dec-68	9.3	237.4	-9.3	65.7	9.3	0	303.2	0	165.3
May-68	50	298.7	400.3	75	50	0	151.6	391	210.5
Nov-68	16	359	330.3	75 	16	0	164.3	330.3	234.4
Sep-68	56	418.3	444.5	75 	56	0	82.2	444.5	276.5
Aug-68	78.4	485.2	447.8	75 	78.4	0	41.1	447.8	310.7
Sep-69	51.3	53	22.2	75 65	51.3	0	20.5	22.2	253
Feb-69 Dec-69	10 9	140.4 168.4	-10 -9	65 57.2	10 7.8	0 1.2	160.9 329.3	0 0	202.4 161.9
Jul-69	89.9	181	255.8	75 50.4	89.9	0	164.6	238	177.1
Mar-69	15.9	181.3	-15.9	59.1	15.9	0	345.9	0	141.7
Aug-69	86.7	181.9	268.2	75 CF 7	86.7	0	173	252.3	163.8
Jan-69 Oct-69	9.3 29	205.5	-9.3	65.7	9.3 29	0	378.4 189.2	0	131.1 187.9
		264.5	424.7	75 75		0		415.4	
May-69 Jun-69	54.9 73.2	271 285.7	310.7 259.7	75 75	54.9 73.2	0	94.6 47.3	310.7 259.7	212.5 221.9
Nov-69	75.2 17	342.7	323.5	75 75	75.2 17	0	47.5 49.5	323.5	242.2
Apr-69	34.4	391.7	382	75 75	34.4	0	24.8	382	270.2
Feb-70	9.1	82.5	-9.1	65.9	9.1	0	107.3	0	216.2
Jan-70	7.1	146.1	- <del>7</del> .1	59.7	6.2	0.9	253.4	0	172.9
Mar-70	15.1	157.1	-15.1	47.7	12.1	3.1	410.5	0	138.3
Jun-70	80.3	179	304	75	80.3	0	205.2	276.6	166
Nov-70	17.5	191	269.4	75 75	17.5	0	109.3	269.4	186.7
May-70	60	228.7	223.4	75 75	60	0	54.7	223.4	194
Apr-70	33	241.7	236	75 75	33	0	27.3	236	202.4
Dec-70	9.2	259.4	-9.2	65.8	9.2	0	286.7	0	161.9
Aug-70	80.4	278.7	341.6	75	80.4	0	143.3	332.5	196

				Soil			Snow		
Date	PET	P ====================================	P-PET ====================================	Moisture	AET	PET-AET	Storage	Surplus	ROtotal
Jul-70	96.7	 293.2	268.2	75	 96.7	0	71.7	268.2	210.5
Oct-70	32.3	327.1	330.7	75	32.3	0	35.8	330.7	234.5
Sep-70	52.2	369.3	335.1	75	52.2	0	17.9	335.1	254.6
Sep-71	57.6	73	24.3	75	57.6	0	9	24.3	208.6
Apr-71	28.7	86.7	61.5	75	28.7	0	5.4	61.5	179.2
May-71	54.8	99.7	50.2	75	54.8	0	0	50.2	153.4
Mar-71	14.9	118.7	-14.9	60.1	14.9	0	118.7	0	122.7
Oct-71	38.7	121.9	142.6	75	38.7	0	59.4	127.8	123.7
Jan-71	7.6	142.3	-7.6	67.4	7.6	0	201.6	0	99
Nov-71	16.2	149.7	187.4	75	16.2	0	147.6	179.9	115.1
Feb-71	10.3	240.7	-10.3	64.7	10.3	0	388.3	0	92.1
Jun-71	86.9	272	379.3	75	86.9	0	194.2	369	147.5
Jul-71	87.5	281	290.5	75	87.5	0	97.1	290.5	176.1
Aug-71	76	314.5	287	75	76	0	48.5	287	198.3
Dec-71	11.8	343.2	16.5	75	11.8	0	363.5	16.5	161.9
Jul-72	93.8	119	207	75	93.8	0	181.8	207	170.9
Aug-72	77.1	137.4	151.2	75	77.1	0	90.9	151.2	167
Sep-72	53.1	168.7	161	75	53.1	0	45.4	161	165.8
May-72	61.9	181.3	142.1	75	61.9	0	22.7	142.1	161.1
Jan-72	9.2	181.9	-9.2	65.8	9.2	0	204.7	0	128.8
Feb-72	8.7	193.8	-8.7	58.2	7.7	1.1	398.4	0	103.1
Apr-72	26	200.7	280.9	75 	26	0	292.2	264.1	135.3
Nov-72	14.7	207	183	75	14.7	0	301.5	183	144.8
Mar-72	14	283.6	-14	61	14	0	585	0	115.9
Jun-72	72.4	365.3	585.4	75 75	72.4	0	292.5	571.4	207
Oct-72 Dec-72	25.7 10.7	375.2 400.3	495.8 -10.7	75 64.3	25.7 10.7	0	146.3	495.8	264.7
Dec-72	10.7	400.3	-10.7	04.3	10.7	U	546.6	0	211.8
Jan-73	10.2	142.6	-10.2	55.6	8.7	1.5	689.2	0	169.4
Jul-73	98.3	148.1	394.3	75	98.3	0	344.6	374.9	210.5
Feb-73	8.6	153.2	-8.6	66.4	8.6	0	497.8	0	168.4
Sep-73	52	166.7	363.6	75	52	0	248.9	355	205.7
Dec-73	10.2	243.9	-10.2	64.8	10.2	0	492.8	0	164.6
Apr-73	34.3	256	468.1	75	34.3	0	246.4	457.9	223.2
Jun-73	88.8	259.3	293.8	75 	88.8	0	123.2	293.8	237.3
Nov-73	16.9	297.7	310.4	75 	16.9	0	93.6	310.4	252
Oct-73	33.9	307.4	320.3	75 75	33.9	0	46.8	320.3	265.6
Mar-73	23.7	316.4	289.1	75 75	23.7	0	50.4	289.1	270.3
May-73 Aug-73	52.4 92.8	316.4 373.2	289.3 293.1	75 75	52.4 92.8	0	25.2 12.6	289.3 293.1	274.1 277.9
_									
Jul-74	97	107.7	17	75 	97	0	6.3	17	225.7
Oct-74	28.1	117.7	95.9	75 	28.1	0	0	95.9	199.8
Dec-74	12	134.5	8.1	75 75	12	0	114.4	8.1	161.4
Sep-74	47.9 17.3	169.7	179	75 67.7	47.9 17.2	0	57.2 242	179	164.9
Mar-74 Jun-74	17.3 80	194.8 216.7	-7.3 257.7	67.7 75	17.3 80	0	242 121	0 250.4	132 155.6
Feb-74	8.4	216.7	-8.4	66.6	8.4	0	369.6	250.4	133.6 124.5
Aug-74	84.1	311.6	412.3	75	84.1	0	184.8	403.9	180.4
Jan-74	9.7	330.3	-9.7	65.3	9.7	0	515.1	405.9	144.3
Nov-74	17.1	330.3	528	75	17.1	0	304	518.3	219.1
May-74	50.3	342.6	444.2	75 75	50.3	0	152	444.2	264.1
Apr-74	35.3	347.3	388	75 75	35.3	0	76	388	288.9
•									

Date	PET	Р	P-PET	Soil Moisture	AET	PET-AET	Snow Storage	Surplus	ROtotal
Oct-75	====== == 32.2	91.9	97.7	======= =: 75	32.2	0	38	97.7	======= 250.7
Jan-75	10.8	169.4	-10.8	64.2	10.8	0	207.3	0	200.5
Nov-75	21	175	257.7	75	21	0	103.7	246.8	209.8
May-75	72.2	191.6	171.2	75	72.2	0	51.8	171.2	202.1
Apr-75	25.3	192.7	136.8	75	25.3	0	82.4	136.8	189
Mar-75	15.5	214.2	-15.5	59.5	15.5	0	296.6	0	151.2
Sep-75	45.1	217.3	320.6	75	45.1	0	148.3	305.1	182
Jun-75	88.2	221.7	207.7	75	88.2	0	74.2	207.7	187.1
Dec-75	1.3	268.4	-1.3	73.7	1.3	0	342.5	0	149.7
Jul-75	100.3	274.5	345.5	75.0 1	0.3	0	171.3	344.2	188.6
Feb-75	10.8	323.6	-10.8	64.2	10.8	0	494.8	0	150.9
Aug-75	81.8	380.6	546.3	75	81.8	0	247.4	535.5	227.8
Nov-76	13.4	119.3	57.2	75	13.4	0	296.2	57.2	193.7
Dec-76	8	134.5	-8	67	8	0	430.7	0	154.9
Oct-76	25	240.6	431	75	25	0	215.3	423	208.6
Apr-76	36	242	313.6	75	36	0	107.7	313.6	229.6
Jun-76	90.3	254.3	217.9	75	90.3	0	53.8	217.9	227.2
May-76	52.7	275.5	249.7	75	52.7	0	26.9	249.7	231.7
Jan-76	7.5	286.1	-7.5	67.5	7.5	0	313	0	185.4
Feb-76	1.4	314.1	-1.4	66.2	1.3	0.1	627.2	0	148.3
Mar-76	19.2	342.6	222	75	19.2	0	728.5	213.2	161.3
Jul-76	90.8	364.2	637.6	75 75	90.8	0	364.3	637.6	256.6
Sep-76	49.1	389	522	75 75	49.1	0	182.1	522	309.6
May-77	66.3	76.4	101.3	75	66.3	0	91.1	101.3	268
Feb-77	9.6	118.9	-9.6	65.4	9.6	0	210	0	214.4
Apr-77	36.5	135.7	204.2	75	36.5	0	105	194.6	210.4
Jan-77	6.6	234.5	-6.6	68.4	6.6	0	339.5	0	168.3
Jun-77	75.3	243.3	337.8	75	75.3	0	169.8	331.2	200.9
Mar-77	21.3	274.8	222.5	75	21.3	0	200.8	222.5	205.2
Oct-77	28.2	280	352.2	75	28.2	0	100.4	352.2	234.6
Nov-77	17.4	286.3	306.7	75	17.4	0	62.7	306.7	249
Jul-77	100.8	291.3	221.8	75.0 1	0.8	0	31.3	221.8	243.6
Dec-77	9.6	369.7	-9.6	65.4	9.6	0	401	0	194.9
Sep-77	51.1	476.3	625.8	75	51.1	0	200.5	616.2	279.1
Aug-77	76.7	529	552.6	75	76.7	0	100.3	552.6	333.8
Feb-78	7.4	61.4	-7.4	67.6	7.4	0	161.7	0	267.1
Jul-78	95.5	76.8	62.1	75	95.5	0	80.8	54.7	224.6
Oct-78	28.9	145.8	157.4	75	28.9	0	40.4	157.4	211.1
Mar-78	14.7	161.3	-14.7	60.3	14.7	0	201.7	0	168.9
Apr-78	28.1	205.3	260.5	75	28.1	0	118.5	245.7	184.3
Nov-78	16.2	210.3	207.8	75	16.2	0	104.8	207.8	189
Jun-78	80.4	216	188	75	80.4	0	52.4	188	188.8
Dec-78	10.6	234.8	-10.6	64.4	10.6	0	287.2	0	151
Jan-78	7.9	266.1	-7.9	57.7	6.7	1.1	553.4	0	120.8
May-78	60.7	323.2	539.2	75	60.7	0	276.7	521.9	201
Aug-78	82.8	496.1	551.6	75	82.8	0	138.3	551.6	271.2
Sep-78	49.2	507.3	527.3	75	49.2	0	69.2	527.3	322.4
Jul-79	94.8	80.6	20.4	75	94.8	0	34.6	20.4	262
Feb-79	6.9	104.3	-6.9	68.1	6.9	0	138.9	0	209.6
Sep-79	50.9	124.7	143.2	75	50.9	0	69.4	136.3	194.9
Jan-79	8.2	216.8	-8.2	66.8	8.2	0	286.2	0	155.9
Jun-79	81.5	261.3	322.9	75	81.5	0	143.1	314.7	187.7

				Soil			Snow		
Date	PET	P	P-PET	Moisture	AET	PET-AET	Storage	Surplus	ROtotal
Mar-79	20.5	269	177.7	75	20.5	0	213.9	177.7	185.7
May-79	55.7	281.9	333.2	75	55.7	0	107	333.2	215.2
Aug-79	75.4	287.7	265.8	75	75.4	0	53.5	265.8	225.3
Dec-79	11.6	294.2	-7.7	67.3	11.6	0	343.8	0	180.3
Oct-79	28.7	361.9	505.1	75	28.7	0	171.9	497.4	243.7
Nov-79	17	368	402.4	75	17	0	120.5	402.4	275.4
Apr-79	29.9	380.7	411	75	29.9	0	60.2	411	302.5
Feb-80	8.5	66.6	-8.5	66.5	8.5	0	126.8	0	242
May-80	63	110.3	110.7	75	63	0	63.4	102.2	214.1
Aug-80	87.7	148.4	92.4	75	87.7	0	31.7	92.4	189.7
Jan-80	9.5	152.9	-9.5	65.5	9.5	0	184.6	0	151.8
Nov-80	15	169.3	149	75	15	0	189.9	139.5	149.3
Dec-80	8.3	191.6	-8.3	66.7	8.3	0	381.5	0	119.5
Mar-80	16.4	206.4	-16.4	52.2	14.6	1.8	588	0	95.6
Oct-80	25.2	212.9	481.7	75	25.2	0	294	458.8	168.2
Sep-80	48.9	286.7	384.7	75	48.9	0	147	384.7	211.5
Jun-80	69.7	340	343.8	75	69.7	0	73.5	343.8	238
Apr-80	32.5	372.3	376.6	75	32.5	0	36.7	376.6	265.7
Jul-80	95.8	503.9	426.4	75	95.8	0	18.4	426.4	297.8
Jan-81	7.1	41.9	-7.1	67.9	7.1	0	60.3	0	238.3
Mar-81	18.5	100.6	16.5	75	18.5	0	125.9	9.4	192.5
Dec-81	10.6	143.9	-10.6	64.4	10.6	0	269.8	0	154
Apr-81	34.8	145.3	245.4	75	34.8	0	134.9	234.8	170.2
Feb-81	12.5	191.8	-12.5	62.5	12.5	0	326.7	0	136.1
May-81	54.2	193.6	302.7	75	54.2	0	163.3	290.3	167
Nov-81	16.7	206	238.4	75	16.7	0	114.2	238.4	181.2
Oct-81	25.8	295.5	326.8	75	25.8	0	57.1	326.8	210.4
Sep-81	49.1	296	275.5	75	49.1	0	28.6	275.5	223.4
Jun-81	83.1	339.3	270.5	75	83.1	0	14.3	270.5	232.8
Jul-81	96.4	372.3	283	75	96.4	0	7.1	283	242.9
Aug-81	78.4	438.7	367.4	75	78.4	0	0	367.4	267.8
Feb-82	9	75	-9	66	9	0	75	0	214.2
Oct-82	31	132.9	139.4	75	31	0	37.5	130.4	197.5
Apr-82	29.2	186.7	176.2	75	29.2	0	18.8	176.2	193.2
May-82	69.8	195.5	135.1	75	69.8	0	9.4	135.1	181.6
Jan-82	7	203.9	-7	68	7	0	213.2	0	145.3
Mar-82	16.4	226.4	-16.4	53.1	14.9	1.5	439.7	0	116.2
Jul-82	97.3	270.3	392.9	75	97.3	0	219.8	371	167.2
Dec-82	13.1	329.7	174.1	75	13.1	0	362.3	174.1	168.6
Sep-82	49.7	369.3	500.8	75	49.7	0	181.1	500.8	235
Aug-82	70.5	427.7	447.8	75	70.5	0	90.6	447.8	277.6
Jun-82	71.1	442	416.1	75	71.1	0	45.3	416.1	305.3
Nov-82	17.4	448	440.3	75	17.4	0	35.5	440.3	332.3
Feb-83	11.8	115	-11.8	63.2	11.8	0	150.5	0	265.8
Jun-83	83.1	116.7	108.9	75	83.1	0	75.3	97.1	232.1
Jan-83	10.1	121.3	-10.1	64.9	10.1	0	196.6	0	185.7
Sep-83	56.3	144.7	186.6	75	56.3	0	98.3	176.6	183.8
Mar-83	19.4	212.9	91.1	75	19.4	0	200.7	91.1	165.3
Jul-83	105.6	243.2	238		5.6	0	100.3	238	179.8
Nov-83	16.7	256.7	256.5	75	16.7	0	83.9	256.5	195.2
Aug-83	88.8	261.9	215.1	75	88.8	0	41.9	215.1	199.1
Oct-83	30.1	264.5	255.4	75	30.1	0	21	255.4	210.4

Date	PET	P	P-PET	Soil Moisture ====================================	AET	PET-AET	Snow Storage	Surplus	ROtotal
====== =: Dec-83	====== == 8.8	310	-8.8	======= = 66.2	8.8	0	331	0	168.
Apr-83	30.6	320.7	455.5	75	30.6	0	165.5	446.8	22
May-83	49.4	407.7	441.1	75	49.4	0	82.7	441.1	267.
Jan-84	7.7	133.9	-7.7	67.3	7.7	0	216.6	0	213.
Jul-84	92.9	159.4	174.8	75	92.9	0	108.3	167.1	204.
Oct-84	32.7	160	181.4	75	32.7	0	54.2	181.4	199.
Apr-84	4.3	167.3	-4.3	70.7	4.3	0	221.5	0	159.
Jun-84	84.9	182	207.8	75	84.9	0	110.7	203.5	168.
Aug-84	89.6	238.1	203.9	75	89.6	0	55.4	203.9	175.
Mar-84	14	244.5	-14	61	14	0	299.9	0	140.
Feb-84	13.2	255.2	25.1	75	13.2	0	516.7	11.1	114.
Nov-84	16.2	261.3	401.8	75	16.2	0	360	401.8	172.
May-84	31.6	265.2	337.7	75	31.6	0	255.8	337.7	205.
Sep-84	46.4	289	370.5	75	46.4	0	127.9	370.5	238.
Dec-84	12.5	315.2	90.9	75	12.5	0	339.7	90.9	208.
Jun-85	73.2	88.7	185.3	75	73.2	0	169.8	185.3	204.
Apr-85	37.5	144.3	191.7	75	37.5	0	84.9	191.7	201.
Dec-85	9.2	189.7	-9.2	65.8	9.2	0	274.6	0	161.
Jul-85	93.6	192.3	235.9	75	93.6	0	137.3	226.7	174.
Oct-85	30.4	201.3	239.5	75	30.4	0	68.6	239.5	187.
Jan-85	8.1	204.2	-8.1	66.9	8.1	0	272.8	0	149.
Mar-85	18.4	308.7	90.8	75	18.4	0	472.3	82.8	136.
Nov-85	16.2	382	483.2	75	16.2	0	354.9	483.2	205.
Feb-85	9.8	388.9	-9.8	65.2	9.8	0	743.8	0	164.
Sep-85	56.8	396.3	711.4	75	56.8	0	371.9	701.6	272.
Aug-85	79.1	479.7	586.5	75	79.1	0	186	586.5	33.
Jan-86	9.4	99.4	-9.4	65.6	9.4	0	285.3	0	26
Nov-86	14.9	111.3	131.9	75	14.9	0	249.8	122.6	238.
Dec-86	11.4	173.6	-11.4	63.6	11.4	0	423.4	0	191.
Mar-86	19.9	191.3	162.2	75	19.9	0	432.6	150.7	18
Apr-86	37.3	210.3	389.4	75	37.3	0	216.3	389.4	224.
Feb-86	9.3	229.6	-9.3	65.7	9.3	0	446	0	179.
May-86	67.1	232.6	388.5	75	67.1	0	223	379.2	219.
Jun-86	76.1	356.3	391.7	75	76.1	0	111.5	391.7	253.
Jul-86	102	393.6	347.3		2	0	55.7	347.3	272.
Aug-86	75.4	469.7	422.1	75	75.4	0	27.9	422.1	302.
Sep-86	50.8	729.7	692.8	75	50.8	0	13.9	692.8	380.
Feb-87	9.9	71.4	-9.9	65.1	9.9	0	85.4	0	304.
May-87	66.7	108.4	84.4	75	66.7	0	42.7	74.4	258.
Dec-87	12	144.8	13	75	12	0	162.5	13	209.
Jun-87	89.2	206.7	198.7	75	89.2	0	81.3	198.7	207.
Mar-87	20.6	221.6	135.2	75	20.6	0	147.1	135.2	192.
Jan-87	9.8	227.1	-9.8	65.2	9.8	0	374.2	0	154.
Sep-87	53.3	228.3	362.1	75	53.3	0	187.1	352.4	193.
Oct-87	26.5	256.4	323.5	75	26.5	0	93.6	323.5	219.
Apr-87	39.3	283.3	290.8	75	39.3	0	46.8	290.8	23
Aug-87	81.9	295.5	237	75	81.9	0	23.4	237	234.
Jul-87	110.8	306.8	207.7		10.8	0	11.7	207.7	229.
Nov-87	16.6	310.7	265.2	75	16.6	0	40.6	265.2	236.
Mar-88	17.7	103.9	-3.6	71.4	17.7	0	130.5	0	189.
Dec-88	10.3	119.4	-10.3	61.6	9.8	0.5	249.8	0	151.

Date ==	PET ======== ==	P	P-PET M	Soil oisture	AET	PET-AET	Snow Storage	Surplus	ROtotal
Jun-88	81.5	160.7	204	 75	81.5	0	124.9	190.6	 159.
May-88	65.3	169	166.2	75	65.3	0	62.5	166.2	160.
Jan-88	9.4	170.3	-9.4	65.6	9.4	0	232.8	0	128.
Apr-88	32.5	196.3	280.2	75	32.5	0	116.4	270.8	156.
Jul-88	110.1	197.4	145.6 75.0	1	10.1	0	58.2	145.6	154.
Aug-88	90.8	235.5	173.8	75	90.8	0	29.1	173.8	158.
Oct-88	25.5	301.6	290.7	75	25.5	0	14.5	290.7	184.
Feb-88	9.2	315.2	-9.2	65.8	9.2	0	329.7	0	147.
Nov-88	17.9	339.7	486.6	75	17.9	0	164.9	477.4	213.
Sep-88	50.6	353.7	385.5	75	50.6	0	82.4	385.5	248.
Jul-89	100.3	84.5	25.4 75.0	1	0.3	0	41.2	25.4	203.
Dec-89	6.7	132.3	-6.7	68.3	6.7	0	173.5	0	162.
Sep-89	51.3	132.3	167.8	75	51.3	0	86.7	161.1	162.
Feb-89	9	141.4	-9	66	9	0	228.2	0	13
Jan-89	11.4	158.1	-11.4	56	10	1.4	386.2	0	10
Apr-89	29.7	158.3	321.7	75	29.7	0	193.1	302.7	143.
Mar-89	15.8	187.1	-15.8	59.2	15.8	0	380.2	0	11
Oct-89	30.4	242.6	402.3	75	30.4	0	190.1	386.5	169.
Aug-89	80.3	324.5	339.3	75 75	80.3	0	95.1	339.3	203.
May-89	58.4	342.6	331.7	75 75	58.4	0	47.5	331.7	203
Jun-89	85.6	440	378.1	75 75	85.6	0	23.8	378.1	258.
Nov-89	14.8	515.3	320.2	75 75	14.8	0	204.1	320.2	271.
Apr-90	37.7	165.3	229.7	75	37.7	0	102	229.7	262.
Jan-90	12.2	194.2	-9.4	65.6	12.2	0	293.4	0	210.
Mar-90	20	207.7	153.5	75	20	0	327.6	144.1	19
Feb-90	11	215	-11	64	11	0	542.6	0	157.
Jul-90	95.2	259.4	435.4	75	95.2	0	271.3	424.4	21
Nov-90	18.3	277	394.3	75 75	18.3	0	135.6	394.3	247.
Aug-90	82.2	284.2	269.8	75 75	82.2	0	67.8	269.8	252.
Sep-90	50.6	303	286.3	75 75	50.6	0	33.9	286.3	258.
Dec-90	11.8	316.1	17.1	75 75	11.8	0	321.1	17.1	210.
Jun-90	84.9	366	441.7	75 75	84.9	0	160.6	441.7	256.
May-90	54.4	400	425.8	75 75	54.4	0	80.3	425.8	290.
Oct-90	29.3	433.6	444.4	75 75	29.3	0	40.1	444.4	321.
Jun-91	92.6	147	74.4	75	92.6	0	20.1	74.4	27
Jan-91	9	154.8	-9	66	9	0	174.9	0	217.
Sep-91	48.4	170.3	209.4	75	48.4	0	87.5	200.4	214.
Nov-91	15.4	198.7	158.6	75	15.4	0	112.1	158.6	20
Dec-91	10.7	206.4	-10.7	64.3	10.7	0	318.5	0	162.
May-91	73.6	211.6	297.3	75	73.6	0	159.3	286.6	187.
Feb-91	11.9	226.1	-11.9	63.1	11.9	0	385.3	0	149.
Aug-91	88.7	247.1	351.1	75	88.7	0	192.7	339.2	187.
Jul-91	99.5	300	296.8	75 75	99.5	0	96.3	296.8	209.
Oct-91	32.6	323.2	338.8	75 75	32.6	0	48.2	338.8	235.
Mar-91	20.2	342.3	181.3	75 75	20.2	0	189	181.3	224.
Apr-91	37.8	445.3	502	75 75	37.8	0	94.5	502	28
Jan-92	10.2	137.1	-10.2	64.8	10.2	0	231.6	0	22
Oct-92	26.3	156.8	246.3	75	26.3	0	115.8	236.1	226.
Feb-92	10.9	159.3	-10.9	64.1	10.9	0	275.1	230.1	181.
Mar-92	2.3	169.7	-2.3	62.1	1.9	0.3	444.8	0	144.
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Jun-92	72.1	184.7	335	75	72.1	0	222.4	322.1	180.

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Date	PET	Р	P-PET	Soil	AET	PET-AET	Snow Storage	Cumplus	ROtotal
Date				Moisture ====================================			======= ==============================	Surplus	ROtotai ======
May-92	 57	276.1	 444.2	 75	 57	0	225.1	432.7	202
Sep-92	49.7	304.7	367.5	75	49.7	0	112.5	367.5	235.1
Apr-92	30.9	357.3	382.7	75	30.9	0	56.3	382.7	264.6
Jul-92	80.6	408.4	355.9	75	80.6	0	28.1	355.9	282.9
Nov-92	15.7	557.3	427.9	75	15.7	0	141.8	427.9	311.9
Aug-92	71.3	560.6	560.2	75	71.3	0	70.9	560.2	361.6
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Dec-93	10.6	64.5	-10.6	64.4	10.6	0	135.4	0	289.2
Mar-93	15.7	107.1	-15.7	50.9	13.5	2.2	242.5	0	231.4
Feb-93	7.9	121.4	-7.9	45.6	5.3	2.5	364	0	185.1
Aug-93	86.9	175.5	270.6	75	86.9	0	182	241.2	196.3
May-93	55.6	198.7	234.1	75	55.6	0	91	234.1	203.9
Nov-93	15.7	211.3	177.6	75	15.7	0	109.1	177.6	198.6
Sep-93	44	229.3	239.9	75	44	0	54.6	239.9	206.9
Oct-93	27.5	233.2	233	75	27.5	0	27.3	233	212.1
Apr-93	33.3	252	232.4	75	33.3	0	13.6	232.4	216.1
Jul-93	100	259.4	166.2		0	0	6.8	166.2	206.2
Jan-93	10.1	277.1	-10.1	64.9	10.1	0	283.9	0	164.9
Jun-93	77.2	371.3	436.1	75	77.2	0	142	425.9	217.1
Feb-94	8.1	64.3	-8.1	66.9	8.1	0	206.2	0	173.7
Mar-94	17.2	114.2	-14.9	53.6	15.6	1.6	318.2	0	139
Dec-94	12.3	123.9	39.7	75	12.3	0	390.1	18.3	114.8
Aug-94	74.6	161.3	281.7	75 75	74.6	0	195	281.7	148.2
Jun-94	86.5	164.7	175.6	75 75	86.5	0	97.5	175.6	153.7
Jul-94	98.9	176.4	126.3	75 75	98.9	0	48.8	126.3	148.2
Oct-94	30.8	191.9	185.5	75 75	30.8	0	24.4	185.5	155.7
Sep-94	50.4	210	171.8	75 75	50.4	0	12.2	171.8	158.9
Jan-94	6.1	222.6	-6.1	68.9	6.1	0	234.8	0	127.1
Nov-94	18.6	236.7	335.4	75	18.6	0	117.4	329.3	167.6
Apr-94	34.7	291.3	315.3	75 75	34.7	0	58.7	315.3	197.1
May-94	53	347.1	323.4	75 75	53	0	29.3	323.4	222.4
ividy 54	55	347.1	323.4	73	33	O	23.3	323.4	222.7
Feb-95	8.6	86.4	-8.6	66.4	8.6	0	115.8	0	177.9
Sep-95	46.5	151.3	162.7	75	46.5	0	57.9	154.1	173.1
Aug-95	92	200.6	137.6	75	92	0	28.9	137.6	166
Jul-95	102	212.6	125.1	75.0 1	2	0	14.5	125.1	157.8
May-95	57.4	245.8	195.6	75	57.4	0	7.2	195.6	165.4
Apr-95	27.5	310.7	262.2	75	27.5	0	28.2	262.2	184.7
Jan-95	11	377.1	-11	64	11	0	405.3	0	147.8
Oct-95	33	471.9	641.6	75	33	0	202.7	630.5	244.3
Nov-95	13.6	474	193	75	13.6	0	470.1	193	234.1
Nov-96	14.1	135.3	138.8	75	14.1	0	452.6	138.8	215
Feb-96	9.7	155.5	-9.7	65.3	9.7	0	603.6	0	172
Aug-96	84.1	167.7	385.4	75	84.1	0	301.8	375.7	212.8
Mar-96	15.5	202.6	-15.5	59.5	15.5	0	504.4	0	170.2
Oct-96	29.7	210.3	432.8	75	29.7	0	252.2	417.3	219.6
Jan-96	8.5	215.5	-8.5	66.5	8.5	0	467.7	417.5	175.7
May-96	53.6	300	480.3	75	53.6	0	233.8	471.8	234.9
Apr-96	28.3	326	396.7	75 75	28.3	0	134.8	396.7	267.3
Dec-96	12.3	347.4	81	75 75	12.3	0	389	81	230
Jul-96	89.6	362.6	467.4	75 75	89.6	0	194.5	467.4	277.5
Jun-96	86.7	497.3	507.9	75 75	86.7	0	97.2	507.9	323.6
Sep-96	51.6	517	514	75 75	51.6	0	48.6	514	361.7
5cp 30	31.0	31,	311	, ,	31.0	0	10.0	317	551.7

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Date	PET	Р	P-PET	Soil Moisture	AET	PET-AET	Snow	Surplus	ROtotal
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Apr-97	31	98.7	92	75	31	0	24.3	92	307.7
Dec-97	11.7	98.7	-7.2	67.8	11.7	0	118.5	0	246.2
Jul-97	93.9	188.1	153.4	75	93.9	0	59.3	146.2	226.2
Aug-97	73.8	233.9	189.7	75	73.8	0	29.6	189.7	218.9
Nov-97	15.2	235.3	157.4	75	15.2	0	92.4	157.4	206.6
Jun-97	93.1	265.7	218.7	75	93.1	0	46.2	218.7	209
Mar-97	16.8	271	-16.8	58.2	16.8	0	317.2	0	167.2
Feb-97	11.4	277.1	-11.4	49.4	8.8	2.5	594.3	0	133.8
Jan-97	8.7	282.3	-8.7	43.6	5.8	3	876.6	0	107
May-97	46	292.9	685.2	75	46	0	438.3	653.9	216.4
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Oct-98	30.9	43.9	232.1	75	30.9	0	219.1	232.1	219.5
Apr-98	36.1	130.7	204.1	75	36.1	0	109.6	204.1	216.5
Feb-98	13.4	145.7	15.3	75	13.4	0	226.5	15.3	176.2
Sep-98	55.2	146.7	204.7	75	55.2	0	113.3	204.7	181.9
Jul-98	96	154.2	114.9	75	96	0	56.6	114.9	168.5
May-98	75.3	182.9	135.9	75	75.3	0	28.3	135.9	162
, Jun-98	84.6	190	119.6	75	84.6	0	14.2	119.6	153.5
Aug-98	86	311	232.1	75	86	0	7.1	232.1	169.2
Mar-98	20.1	380	189.4	75	20.1	0	177.6	189.4	173.2
Jan-98	11.1	416.8	-11.1	63.9	11.1	0	594.4	0	138.6
Mar-99	22.6	50	239.7	75	22.6	0	382.1	228.6	156.6
Feb-99	20	145	316.1	75	20	0	191.1	316.1	188.5
Apr-99	24.8	160.7	144.2	75	24.8	0	182.8	144.2	179.6
Dec-99	11.7	177.4	2.4	75	11.7	0	346	2.4	144.2
Oct-99	29.7	206.8	350.1	75	29.7	0	173	350.1	185.4
Aug-99	77.8	228.1	236.8	75	77.8	0	86.5	236.8	195.7
Jun-99	35	229	230.2	75	35	0	50.3	230.2	202.6
Sep-99	55.5	238.7	208.4	75	55.5	0	25.2	208.4	203.7
May-99	31.5	274.2	213.2	75	31.5	0	54.6	213.2	205.6
Nov-99	18.9	341.3	349.7	75	18.9	0	27.3	349.7	234.4
0-1-00	22.5	05.5	75.6	75	22.5	0	42.7	75.0	202 7
Oct-00	33.5	95.5	75.6	75 75	33.5	0	13.7	75.6	202.7
Mar-00	23.6	131	102.9	75	23.6	0	18.1	102.9	182.7
Jan-00	9.5	148.7	-9.5	65.5	9.5	0	166.8	0	146.2
Feb-00	12	192.1	-12	55	10.5	1.5	358.9	0	116.9
Nov-00	16.1	218	299.5	75 	16.1	0	261.2	279.5	149.5
Aug-00	78.9	220.6	272.3	75 	78.9	0	130.6	272.3	174
Apr-00	32.2	223.3	256.4	75 	32.2	0	65.3	256.4	190.5
Jul-00	88.1	294.2	238.8	75	88.1	0	32.7	238.8	200.2
Sep-00	6.4	368.7	-6.4	68.6	6.4	0	401.3	0	160.1
May-00	63.1	531.9	669.5	75 75	63.1	0	200.7	663.1	260.7
Jun-00	85	730	745.3	75	85	0	100.3	745.3	357.6
Mar-01	17.3	98.4	-11.1	63.9	17.3	0	192.5	0	286.1
Dec-01	13.5	119.4	89.7	75	13.5	0	208.6	78.6	244.6
Apr-01	35.7	136.7	205.3	75	35.7	0	104.3	205.3	236.7
Aug-01	92.6	156.8	116.4	75	92.6	0	52.2	116.4	212.7
Feb-01	10.8	251.8	-10.8	64.2	10.8	0	304	0	170.1
May-01	63.9	255.5	343.5	75	63.9	0	152	332.7	202.7
Sep-01	51.8	281.3	305.5	75	51.8	0	76	305.5	223.2
Nov-01	20.9	285.3	302.4	75	20.9	0	38	302.4	239.1
Jun-01	85.5	314.7	248.2	75	85.5	0	19	248.2	240.9
Oct-01	30.8	484.8	463.5	75	30.8	0	9.5	463.5	285.4

			Soil				Snow		
Date	PET	Р	P-PET	Moisture	AET	PET-AET	Storage	Surplus	ROtotal
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Jan-02	12.4	101.6	-6.7	68.3	12.4	0	105.4	0	228.3
Dec-02	11	108.1	-11	58.3	10	1	213.5	0	182.7
Aug-02	87.9	112.9	131.8	75	87.9	0	106.7	115.1	169.2
Feb-02	12.4	163.6	-12.4	62.6	12.4	0	270.3	0	135.3
Mar-02	18.8	174.5	74.4	75	18.8	0	351.6	62	120.7
Sep-02	62.9	175	287.9	75	62.9	0	175.8	287.9	154.1
Nov-02	15.5	186.7	178	75	15.5	0	169	178	158.9
Jul-02	111.4	214.8	187.9 7	5.0 1	11.4	0	84.5	187.9	164.7
Jun-02	86.3	249.3	205.3	75	86.3	0	42.3	205.3	172.8
Oct-02	27.6	251.6	245.2	75	27.6	0	21.1	245.2	187.3
May-02	50	359.4	319.9	75	50	0	10.6	319.9	213.8
Apr-02	34.8	375	345.5	75	34.8	0	5.3	345.5	240.1
Jan-03	7.8	93.6	-7.8	67.2	7.8	0	98.8	0	192.1
Apr-03	30.5	112	130.9	75	30.5	0	49.4	123	178.3
Mar-03	17.9	124.5	5.9	75	17.9	0	150.1	5.9	143.8
Jul-03	97.2	125.2	103	75	97.2	0	75.1	103	135.7
Feb-03	8.4	180.4	-8.4	66.6	8.4	0	255.4	0	108.5
Jun-03	83.5	257.7	301.9	75	83.5	0	127.7	293.5	145.5
Dec-03	12	260	26.4	75	12	0	349.4	26.4	121.7
Oct-03	28.1	308.4	454.9	75	28.1	0	174.7	454.9	188.3
May-03	55.5	308.4	340.2	75	55.5	0	87.3	340.2	218.7
Aug-03	88.6	322.3	277.3	75	88.6	0	43.7	277.3	230.4
Sep-03	52.6	359.3	328.5	75	52.6	0	21.8	328.5	250
Nov-03	18	388	380.9	75	18	0	10.9	380.9	276.2
Feb-04	10.7	69	-10.7	64.3	10.7	0	79.9	0	221
Sep-04	57.2	132.3	115.1	75	57.2	0	39.9	104.4	197.7
Oct-04	30.7	188.4	177.7	75	30.7	0	20	177.7	193.7
Jun-04	78.7	191.7	123	75	78.7	0	10	123	179.5
Aug-04	73.6	196.1	132.5	75	73.6	0	0	132.5	170.1
Jan-04	7.4	234.5	-7.4	67.6	7.4	0	234.5	0	136.1
Apr-04	33	239.3	323.6	75	33	0	117.3	316.3	172.1
Nov-04	17.7	246.3	285.1	75	17.7	0	60.8	285.1	194.7
Dec-04	9.8	334.5	-9.8	65.2	9.8	0	395.3	0	155.8
Mar-04	20.3	354.8	272.3	75	20.3	0	457.6	262.5	177.1
Jul-04	93.1	376.4	512.1	75	93.1	0	228.8	512.1	244.1
May-04	58.3	377.4	433.5	75	58.3	0	114.4	433.5	282
Jun-05	104.7	107.7	60.2 7	5.0 1	4.7	0	57.2	60.2	237.6
May-05	50.8	152.3	130	75	50.8	0	28.6	130	216.1
Oct-05	32.5	164.5	146.3	75	32.5	0	14.3	146.3	202.2
Mar-05	16.4	182.3	-16.4	58.6	16.4	0	196.6	0	161.7
Jan-05	8.4	206.4	-8.4	52.1	6.6	1.8	403	0	129.4
Sep-05	58.6	255.3	398.2	75	58.6	0	201.5	375.3	178.6
Feb-05	10.6	280.4	-10.6	64.4	10.6	0	481.9	0	142.9
Dec-05	10	313.9	-10	55.8	8.6	1.4	795.7	0	114.3
Apr-05	33.6	323.7	687.9	75	33.6	0	397.9	668.7	225.2
Nov-05	17.9	409.7	590.7	75	17.9	0	198.9	590.7	298.3
Jul-05	107.9	457.1	448.7 7	5.0 1	7.9	0	99.5	448.7	328.4
Aug-05	11.6	478.4	-11.6	63.4	11.6	0	577.9	0	262.7
Mar-06	19.1	202.9	142.7	75	19.1	0	619	131.1	236.4
Jan-06	12.8	354.5	94.9	75	12.8	0	865.8	94.9	208.1
Feb-06	10.4	503.6	-10.4	64.6	10.4	0	1369.4	0	166.5