

*Water Table Conditions  
Proposed Martin Pit Extension*

*Part Lots 72 & 73, GCT  
Township of Woolwich  
Regional Municipality of Waterloo*

*Prepared for*

*Lockhart Excavators Ltd.  
and  
Gibson Consulting Services*

*November 2010*

*ARL Groundwater Resources Ltd.  
Township of North Dumfries (Ayr), Ontario*

**ARL Groundwater Resources Ltd.**  
*P.O. Box 1106*  
*Ayr ON N0B 1E0*

(519) 632-9887

November 1, 2010

Reference: 005 - 005

Gibson Consulting Services  
15 Idlewood Drive  
Kitchener, ON N2A 1H9

Dear Sir:

**Water Table Conditions - Proposed Martin Pit Expansion**  
**Part Lots 72 & 73, G.C.T., Middlebrook Road, Township of Woolwich**

This report provides the results of our re-interpretation of the water table conditions at the proposed Martin Pit expansion. The re-interpretation is based on additional groundwater level data available from monitoring wells installed at the site in September 2010. The additional work was undertaken to address concerns about the water table, and hydrogeology in general, expressed by planning staff at the Township of Woolwich.

**Description of the Field Program (late August - late October 2010)**

The locations for three monitoring wells were identified during a site visit by the hydrogeologist (A.R. Lotimer, P.Geo.) and a well contractor in late August 2010. The wells were drilled and installed by the well contractor using rotary drilling methods.

The ground surface and top of pipe at each monitoring well were surveyed for location and elevation by an Ontario Land Surveyor (OLS), and then added to the site plans prepared by Gibson Consulting Services. The location of the monitoring wells (MW1, MW2, MW3) are shown in **Figure 1**.

Water levels were recorded in the new monitoring wells on four occasions from September 14 - October 29.

## Results and Interpretation of the Water Table Conditions

Water well records and as-constructed drawings for the monitoring wells, together with the water level monitoring data from September - October are included in an **Appendix**. A summary of the geological log, well construction details and water levels recorded for each well are provided as follows.

### MW1

0.0 - 11.3 m gravel, sand, silt  
11.3 - 12.2 m clay, stones (till)

- monitoring well screens installed from 7 - 10.1 m and 10.7 - 11.3 m below surface
- measured water levels range from 8.9 - 9 m below the top of the well riser pipes
- corresponding elevations in metres above sea level (m ASL) are 334.6 - 334.7 m ASL.

### MW2

0.0 - 2.4 m gravel, sand  
2.4 - 4.6 m clay, stones (till)

- monitoring well screen installed from 1.5 - 4.6 m below surface
- measured water levels range from 2.8 - 3.1 m below the top of the well riser pipes
- corresponding elevations in metres above sea level (m ASL) are 331.2 - 331.5 m ASL.

### MW3

0.0 - 0.9 m topsoil, silty clay  
0.9 - 2.1 m gravel, sand  
2.1 - 4.6 m clay, stones (till)

- monitoring well screen installed from 1.5 - 4.6 m below surface.
- measured water levels range from 2.6 - dry (5.3 m) below the top of the well riser pipes
- corresponding elevations in metres above sea level (m ASL) are <326.7 - 329.4 m ASL.

The high water level elevation at each monitoring well were plotted and contoured to produce a map of the water table surface at the proposed pit (**Figure 2**). The interpretation indicates that the water table surface ranges from an elevation of 330 m near the southeast corner of the property to 337 m ASL in the northwest part of the property. The water level elevations in the interpretation are lower than the water elevations estimated in in 2008 (ARL Groundwater letter of June 17, 2008) and recommended at the time in establishing the pit floor elevation. It is now evident that those earlier water table estimates were conservative.

We plan to collect groundwater samples from the new wells for general water quality analysis prior to the start of aggregate extraction operations. The intent of the sample collection and analyses is to provide information on background water quality in the shallow groundwater zone at the site. As noted above, MW3 was dry at the end of October, so monitoring of the well water levels should continue to determine an optimum time to collect the groundwater samples.

We recommend that the following conditions be included on the site plan.

1. *"A groundwater level monitoring program shall be implemented as part of the aggregate extraction operation. Groundwater levels shall be recorded at the onsite monitoring wells on a monthly basis for an initial period of 2 years. At the end of the initial 2 year period, the data shall be reviewed by a hydrogeologist, and the frequency of monitoring may be adjusted at that time, if recommended by the hydrogeologist."*

2. *"Prior to the start of aggregate extraction, water samples are to be collected from the monitoring wells, where possible, and submitted to a laboratory for analysis of water quality indicator parameters including nitrate and chloride. These analyses will serve as background indicators of water quality at the site. Water quality samples shall be collected from the monitoring wells every 2 years, where possible, for the first four years that the license is in effect and aggregate extraction is occurring. Upon the recommendation of a hydrogeologist, and under the direction of a hydrogeologist, samples for water quality analysis shall also be collected on a more frequent basis, where possible, if there are legitimate concerns of potential impacts on groundwater quality associated with the pit operation."*

### **Additional Information on Domestic Wells**

Water well record information available from the Ontario Ministry of the Environment (MOE) for the general area is included with the **Appendix**. The well records include 21 wells in GCT 72 and one well in GCT 73. GCT 72 includes the village of West Montrose. Of the 21 well records for GCT 72; 15 show wells extending into the bedrock (depths ranging from 18.3 - >150 m), one well record is for the horizontal collectors in West Montrose, one well record is for an abandoned hole with no details, two well records are for shallow dug or bored wells (depths of 3 m and 6 m), and two well records are for deep overburden wells (depths of 32 - 34 m).


The location of a domestic well at the F. Martin farm located on the west side of Middlebrook Road (opposite the I. Martin farm property), was inspected with farm owner. The well is located in a metal shed beside a livestock barn. According to the owner, the well is a 150 mm nominal diameter drilled well with a total depth of approximately 27 m, and a typical water level of about 4 - 6 m. The owner indicated that the well provides the water supply for the farm livestock operations and the farmhouse. The well itself was not accessible for water level monitoring at the time of the inspection.

This well appears to correspond with the only well record available for GCT 73 (MOE 6502733). However, the well record indicates a 75 mm nominal diameter well drilled in 1950 to a depth of 30 m, with a static water level of 21 m.

We were not able to locate a water well record that matches the church meeting house to the southwest of the proposed pit area, and it is our understanding that there is no well supply at that facility.

Based on the site setting and the results of the well inventory, it is our conclusion that the proposed pit will have no effect on other wells in the area, including the domestic/farm wells and the flowing well adjacent to Highway 86 to the southeast of the proposed pit.

Respectfully submitted,  
ARL Groundwater Resources Ltd.

  
A.R. (Tony) Lotimer  
Principal Hydrogeologist







## **APPENDIX**

**Monitoring Well Water Level Data**

**Well Records for the Monitoring Wells**

**MOE Water Well Record Information**

**D & J Lockhart Excavators Ltd. "Martin" Pit**

Water Level Monitoring Readings

**MW1 – north west side of pit**

top of well (inside casing): 343.58 masl (shallow well)

ground elevation: 343.0 masl

	(Shallow)	(Deep)
September 14	8.88 m	8.86 m
September 24	8.90 m	8.88 m
September 30	8.90 m	8.88 m
October 29	8.98 m	8.96 m

**MW2 – east side**

top of well (inside casing): 334.31 masl

ground elevation: 333.83 masl

September 14	3.09 m
September 24	2.87 m
September 30	2.90 m
October 29	2.83 m

**MW3 – south end along railroad ROW**

top of well (inside casing): 331.98 masl

ground elevation: 331.40 masl

September 14	2.79 m
September 24	2.75 m
September 30	2.63 m
October 29	dry to bottom at 5.25 m

***Notes: all measurements taken from top of inside casing  
monitoring well numbers correspond to GCS Existing Features sheet of site plan.***



Ministry of the Environment

Well Tag No. **A 090018**

Well Record  
Regulation 803 Ontario Water Resources Act

MW1

Measurements recorded in:  Metric  Imperial

Page \_\_\_ of \_\_\_

**Well Owner's Information**

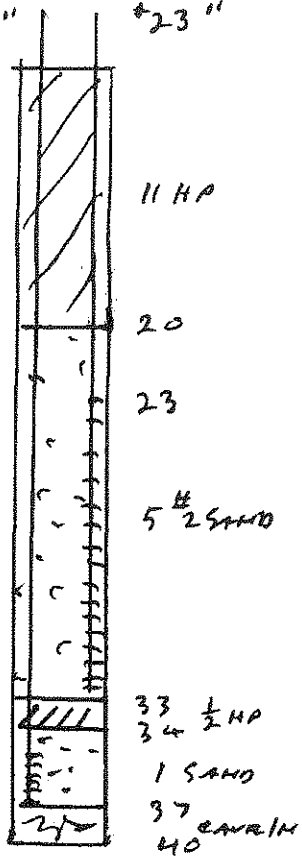
First Name: **LOCKHART EXCAVATORS LTD** Last Name / Organization: **LOCKHART EXCAVATORS LTD** E-mail Address: \_\_\_\_\_  
 Mailing Address (Street Number/Name): **RR 1 ARISS** Municipality: **ARISS** Province: **ONT** Postal Code: **N0B 1B05** Telephone No. (inc. area code): **519 669 7613**

**Well Location**

Address of Well Location (Street Number/Name): **625 HIDDLEBROOK ROAD** Township: **WOOLWICH** Lot: **73** Concession: **GCT**  
 County/District/Municipality: **WATERLOO** City/Town/Village: **WEST MONTAIGNE** Province: **Ontario** Postal Code: **N0B 2Y0**  
 UTM Coordinates: Zone: **17** Easting: **542490** Northing: **4827516** Municipal Plan and Sublot Number: \_\_\_\_\_

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

General Colour	Most Common Material	Other Materials	General Description	Depth (mft) From	To
	<b>TOP SOIL</b>			<b>0</b>	<b>0.3</b>
	<b>BROWN GRAVEL</b>	<b>SAND</b>		<b>0.3</b>	<b>10.1</b>
	<b>BROWN GRAVEL</b>	<b>SAND &amp; SILT</b>		<b>10.1</b>	<b>11.3</b>
	<b>BROWN CLAY</b>	<b>STONES</b>		<b>11.3</b>	<b>12.2</b>



**Annular Space**

Depth Set at (mft) From	To	Type of Sealant Used (Material and Type)	Volume Placed (m <sup>3</sup> /ft)
<b>0</b>	<b>6.1</b>	<b>BENTONITE HOLE PLUG</b>	<b>0.22</b>
<b>6.1</b>	<b>10.1</b>	<b>#2 SAND</b>	<b>0.09</b>
<b>10.1</b>	<b>10.4</b>	<b>BENTONITE HOLE PLUG</b>	<b>0.01</b>
<b>10.4</b>	<b>12.2</b>	<b>#2 SAND</b>	<b>0.05</b>

**Results of Well Yield Testing**

Time (min)	Draw Down		Recovery	
	Time (min)	Water Level (mft)	Time (min)	Water Level (mft)
Static Level		<b>8.87</b>		
1		<b>8.86</b>		
2				
3				
4				
5				
10				
15				
20				
25				
30				
40				
50				
60				

**Method of Construction**

Cable Tool  Diamond  Rotary (Conventional)  Jetting  Rotary (Reverse)  Driving  Boring  Air percussion  Other, specify \_\_\_\_\_

**Well Use**

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

**Construction Record - Casing**

Inside Diameter (cm/in)	Open Hole OR Material (Galvanized, Fibreglass, Concrete, Plastic, Steel)	Wall Thickness (cm/in)	Depth (mft)		Status of Well
			From	To	
<b>A 35.0</b>	<b>PLASTIC</b>	<b>4.0</b>	<b>5.56</b>	<b>10.7</b>	<input type="checkbox"/> Water Supply <input type="checkbox"/> Replacement Well <input checked="" type="checkbox"/> Test Hole <input type="checkbox"/> Recharge Well <input type="checkbox"/> Dewatering Well <input checked="" type="checkbox"/> Observation and/or Monitoring Hole <input type="checkbox"/> Alteration (Construction) <input type="checkbox"/> Abandoned <input type="checkbox"/> Insufficient Supply <input type="checkbox"/> Abandoned, Poor Water Quality <input type="checkbox"/> Abandoned other, specify _____ <input type="checkbox"/> Other, specify _____
<b>B 35.0</b>	<b>PLASTIC</b>	<b>4.0</b>	<b>5.58</b>	<b>7.0</b>	

**Construction Record - Screen**

Outside Diameter (cm/in)	Material (Plastic, Galvanized Steel)	Slot No.	Depth (mft)		Status of Well
			From	To	
<b>A 43.0</b>	<b>PLASTIC</b>	<b>10</b>	<b>10.7</b>	<b>11.3</b>	
<b>3</b>	<b>PLASTIC</b>	<b>10</b>	<b>7.0</b>	<b>10.1</b>	

**Water Details**

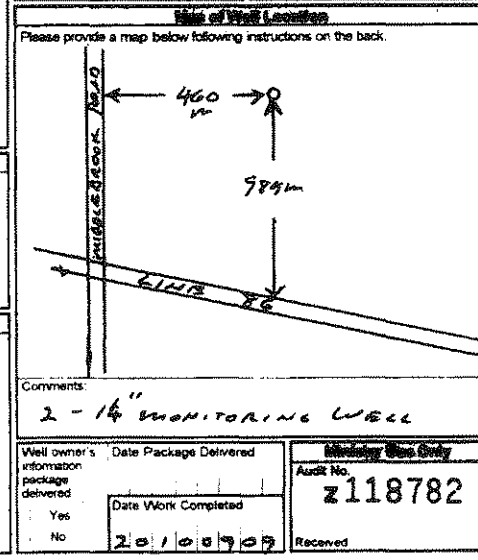
Water found at Depth (mft)	Kind of Water	Fresh	Untested	Gas	Other, specify
<b>0</b>					
<b>12.2</b>					

**Note Diameter**

Depth (mft)	Diameter (cm/in)
<b>0</b>	<b>12.2 15.6</b>

**Well Contractor and Well Technician Information**

Business Name of Well Contractor: **WELL INITIATIVES** Well Contractor's Licence No: **7 2 2 1**  
 Business Address (Street Number/Name): **15 TOWNLINE** Municipality: **ORANGEVILLE**  
 Province: **ONT** Postal Code: **L9W 3R5** Business E-mail Address: \_\_\_\_\_  
 Bus Telephone No. (inc. area code): **519 846 8289** Name of Well Technician (Last Name, First Name): **BROADBENT JIM**  
 Well Technician's Licence No.: **0370** Signature of Technician and/or Contractor: \_\_\_\_\_ Date Submitted: \_\_\_\_\_





Ministry of the Environment

Well Tag No. **A 090019**  
1090019

Well Record  
Regulation 903 Ontario Water Resources Act

MW2

Measurements recorded in:  Metric  Imperial

Page \_\_\_ of \_\_\_

**Well Owner's Information**

First Name: **LOCKHART** Last Name / Organization: **EXCAVATORS** E-mail Address: \_\_\_\_\_  
Mailing Address (Street Number/Name): **RR 1** Municipality: **ARISS** Province: **ONT** Postal Code: **N0B 1H0** Telephone No. (inc. area code): **519 619 3169**  
 Well Constructed by Well Owner

**Well Location**

Address of Well Location (Street Number/Name): **6225 MIDDLEBROOK ROAD** Township: **WOOLWICH** Lot: **73** Concession: **GCT**  
County/District/Municipality: **WATERLOO** City/Town/Village: **WEST MONTROSE** Province: **Ontario** Postal Code: **N0B 1Y0**  
UTM Coordinates: Zone: **18** Easting: **42678** Northing: **4827381**

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

General Colour	Most Common Material	Other Materials	General Description	Depth (mft)	
				From	To
	<b>TOP SOIL</b>			0	0.3
<b>BROWN</b>	<b>GRAVEL</b>	<b>SAND</b>		0.3	2.4
<b>BROWN</b>	<b>CLAY</b>	<b>STONES</b>		2.4	4.3
<b>GREY</b>	<b>CLAY</b>			4.3	4.6

**Annular Space**

Depth Set at (mft)	Type of Sealant Used (Material and Type)	Volume Placed (m <sup>3</sup> )
0 to 1.2	<b>BENTONITE HOLEPLUG</b>	<b>.04</b>
1.2 to 4.6	<b>#2 SAND</b>	<b>.07</b>

**Results of Well Yield Testing**

After test of well yield, water was:  
 Clear and sand free  
 Other, specify: \_\_\_\_\_

If pumping discontinued, give reason: \_\_\_\_\_

Time (min)	Draw Down		Recovery	
	Water Level (mft)	Time (min)	Water Level (mft)	Time (min)
Static Level	<b>2.43</b>			
1		1		
2		2		
3		3		
4		4		
5		5		
10		10		
15		15		
20		20		
25		25		
30		30		
40		40		
50		50		
60		60		

Pump intake set at (mft): \_\_\_\_\_  
Pumping rate (l/min / GPM): \_\_\_\_\_  
Duration of pumping: \_\_\_\_\_ hrs + \_\_\_\_\_ min  
Final water level end of pumping (mft): \_\_\_\_\_  
If flowing give rate (l/min / GPM): \_\_\_\_\_  
Recommended pump depth (mft): \_\_\_\_\_  
Recommended pump rate (l/min / GPM): \_\_\_\_\_  
Well production (l/min / GPM): \_\_\_\_\_  
Disinfected?  Yes  No

**Method of Construction**

<input type="checkbox"/> Cable Tool	<input type="checkbox"/> Diamond	<input type="checkbox"/> Public	<input type="checkbox"/> Commercial	<input type="checkbox"/> Not used
<input checked="" type="checkbox"/> Rotary (Conventional)	<input type="checkbox"/> Jetting	<input type="checkbox"/> Domestic	<input type="checkbox"/> Municipal	<input type="checkbox"/> Dewatering
<input type="checkbox"/> Rotary (Reverse)	<input type="checkbox"/> Drilling	<input type="checkbox"/> Livestock	<input checked="" type="checkbox"/> Test Hole	<input checked="" type="checkbox"/> Monitoring
<input type="checkbox"/> Boring	<input type="checkbox"/> Digging	<input type="checkbox"/> Irrigation	<input type="checkbox"/> Cooling & Air Conditioning	
<input type="checkbox"/> Air percussion		<input type="checkbox"/> Industrial		
<input type="checkbox"/> Other, specify: _____		<input type="checkbox"/> Other, specify: _____		

**Construction Record - Casing**

Inside Diameter (cm/ft)	Open Hole OR Material (Galvanized Fibreglass Concrete Plastic Steel)	Wall Thickness (cm/ft)	Depth (mft)	
			From	To
<b>35.0</b>	<b>PLASTIC</b>	<b>4.0</b>	<b>5.48</b>	<b>1.5</b>

**Systems of Well**

<input type="checkbox"/> Water Supply	<input type="checkbox"/> Replacement Well
<input checked="" type="checkbox"/> Test Hole	<input type="checkbox"/> Recharge Well
<input type="checkbox"/> Dewatering Well	<input checked="" type="checkbox"/> Observation and/or Monitoring Hole
<input type="checkbox"/> Alteration (Construction)	<input type="checkbox"/> Abandoned Insufficient Supply
<input type="checkbox"/> Abandoned Poor Water Quality	<input type="checkbox"/> Abandoned other, specify: _____
<input type="checkbox"/> Other, specify: _____	

**Construction Record - Screen**

Outside Diameter (cm/ft)	Material (Plastic Galvanized Steel)	Slot No.	Depth (mft)	
			From	To
<b>43.0</b>	<b>PLASTIC</b>	<b>10</b>	<b>1.5</b>	<b>4.6</b>

**Water Details**

Water found at Depth (mft)	Kind of Water:	Fresh	Untested	Depth (mft) From	To	Diameter (cm/ft)
	Gas: _____ Other, specify: _____			0	4.6	15.6
	Gas: _____ Other, specify: _____					
	Gas: _____ Other, specify: _____					

**Well Contractor and Well Technician Information**

Business Name of Well Contractor: **WELL INITIATIVES** Well Contractor's Licence No: **7 2 2 1**  
Business Address (Street Number/Name): **15 TOWNLINE** Municipality: **ORANGEVILLE**  
Province: **ONT** Postal Code: **L9W 3R5** Business E-mail Address: \_\_\_\_\_  
Bus. Telephone No. (inc. area code): **519 846 8299** Name of Well Technician (Last Name, First Name): **BROADFOOT JIM**  
Well Technician's Licence No: **0 3 7 0** Signature of technician and/or Contractor: \_\_\_\_\_ Date Submitted: **20100909**

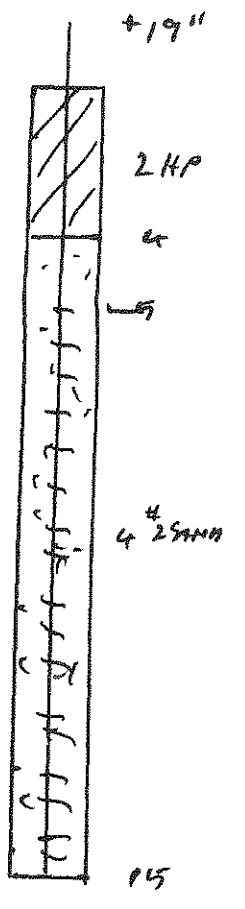
**Map of Well Location**

Please provide a map below following instructions on the back.

Comments: **1 1/2" MONITORING WELL**

Well owner's information package delivered:  Yes  No  
Date Work Completed: **20100909**

**Ministry Use Only**  
Audit No: **Z118783**  
Received: \_\_\_\_\_





Ministry of the Environment

Well Tag No. **A 090020**  
1090020

Well Record  
Regulation 803 Ontario Water Resources Act

MW3

Measurements recorded in:  Metric  Imperial

Page \_\_\_ of \_\_\_

**Well Owner's Information**

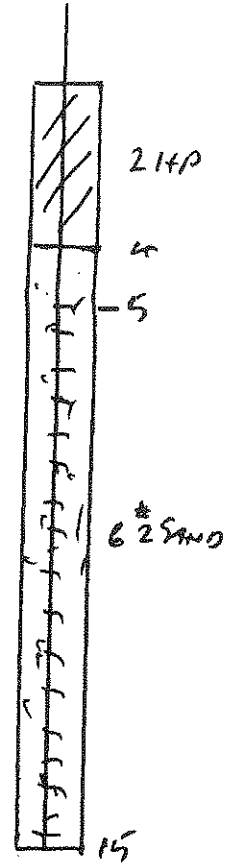
First Name: **LOCALHART EXCAVATIONS** Last Name / Organization: **ARRI** E-mail Address: \_\_\_\_\_  
Mailing Address (Street Number/Name): **ARRI** Municipality: **ARISS** Province: **ONT** Postal Code: **N0B1A0** Telephone No. (inc. area code): **5196693693**

**Well Location**

Address of Well Location (Street Number/Name): **6101 MIDDLEBROOK ROAD** Township: **WOOLWICH** Lot: **72** Concession: **6CT**  
County/District/Municipality: **WATERLOO** City/Town/Village: **WEST MONTROSE** Province: **Ontario** Postal Code: **N0B1A0**  
UTM Coordinates: Zone: **18** Easting: **754252348** Northing: **269111**

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

General Colour	Most Common Material	Other Materials	General Description	Depth (m)	
				From	To
	<b>TOP SOIL</b>			0	0.3
<b>BROWN</b>	<b>SILTY CLAY</b>			0.3	0.9
<b>BROWN</b>	<b>GRAVEL</b>	<b>SAND</b>		0.9	2.1
<b>BROWN</b>	<b>CLAY</b>	<b>STONES</b>		2.1	4.6



**Annular Space**

Depth Set at (m)	Type of Sealant Used (Material and Type)	Volume Placed (m³)
0 to 1.2	<b>BANTONITE HOLEPLUG</b>	0.04
1.2 to 4.6	<b>#2 SAND</b>	0.1

**Results of Well Yield Testing**

Time (min)	Draw Down		Recovery	
	Water Level (m)	Time (min)	Water Level (m)	Time (min)
Static Level	2.76			
1		1		
2		2		
3		3		
4		4		
5		5		
10		10		
15		15		
20		20		
25		25		
30		30		
40		40		
50		50		
60		60		

**Method of Construction**

<input type="checkbox"/> Cable Tool	<input type="checkbox"/> Diamond	<input type="checkbox"/> Public	<input type="checkbox"/> Commercial	<input type="checkbox"/> Not used
<input checked="" type="checkbox"/> Rotary (Conventional)	<input type="checkbox"/> Jetting	<input type="checkbox"/> Domestic	<input type="checkbox"/> Municipal	<input type="checkbox"/> Dewatering
<input type="checkbox"/> Rotary (Reverse)	<input type="checkbox"/> Driving	<input type="checkbox"/> Livestock	<input checked="" type="checkbox"/> Test Hole	<input checked="" type="checkbox"/> Monitoring
<input type="checkbox"/> Boring	<input type="checkbox"/> Digging	<input type="checkbox"/> Irrigation	<input type="checkbox"/> Cooling & Air Conditioning	
<input type="checkbox"/> Air percussion		<input type="checkbox"/> Industrial		
<input type="checkbox"/> Other specify		<input type="checkbox"/> Other specify		

**Construction Record - Casing**

Inside Diameter (cm)	Open Hole OR Material (Galvanized, Fibreglass, Concrete, Plastic, Steel)	Wall Thickness (cm)	Depth (m)	
			From	To
75.0	PLASTIC	4.0	5.8	1.5

**Status of Well**

<input type="checkbox"/> Water Supply	<input type="checkbox"/> Replacement Well
<input checked="" type="checkbox"/> Test Hole	<input type="checkbox"/> Recharge Well
<input type="checkbox"/> Dewatering Well	<input checked="" type="checkbox"/> Observation and/or Monitoring Hole
<input type="checkbox"/> Alteration (Construction)	<input type="checkbox"/> Abandoned, Insufficient Supply
<input type="checkbox"/> Abandoned, Poor Water Quality	<input type="checkbox"/> Abandoned, other, specify
<input type="checkbox"/> Other, specify	

**Construction Record - Screen**

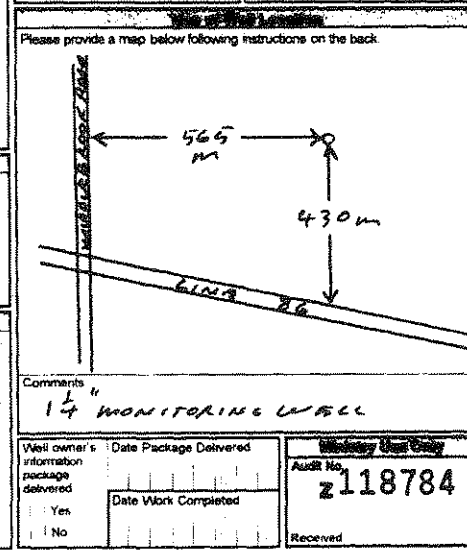
Outside Diameter (cm)	Material (Plastic, Galvanized Steel)	Slot No.	Depth (m)	
			From	To
43.0	PLASTIC	10	1.5	4.6

**Water Details**

Water found at Depth (m)	Kind of Water:	Fresh	Untested	Depth (m) From	To	Diameter (cm)
	Gas: _____ Other: specify _____			0	4.6	15.6
	Gas: _____ Other: specify _____					
	Gas: _____ Other: specify _____					

**Well Contractor and Well Technician Information**

Business Name of Well Contractor: **WELL INITIATIVES** Well Contractor's Licence No.: **7221**  
 Business Address (Street Number/Name): **15 TOWNLINE** Municipality: **CRAWFORD**  
 Province: **ONT** Postal Code: **L9W3R4** Business E-mail Address: \_\_\_\_\_  
 Bus Telephone No. (inc. area code): **5198468277** Name of Well Technician (Last Name First Name): **BRADFORD JAM**  
 Well Technician's Licence No.: **0370** Signature of technician and/or Contractor: *[Signature]* Date Submitted: \_\_\_\_\_



Comments: **1 1/2" MONITORING WELL**

Well owner's information package delivered:  Yes  No

Date Package Delivered: \_\_\_\_\_ Date Work Completed: \_\_\_\_\_

Ministry Use Only  
 Audit No.: **2118784**  
 Received: \_\_\_\_\_

TOWNSHIP	CONCESSION (LOT)	UTM <sup>1</sup>	DATE <sup>2</sup>	CASING	WATER <sup>5,6</sup>	STAT LVL/PUMP LVL <sup>7</sup>	WATER	SCREEN	WELL #	DEPTH TO WHICH FORMATIONS EXTEND <sup>5,11</sup>
GCT (070)			CNTR <sup>3</sup>	DIA <sup>4</sup>	DETAIL	RATE <sup>8</sup> /TIME HR:MIN	USE <sup>9</sup>	INFO <sup>10</sup>		
WOOLWICH TOWNSHIP		17 540140 4825548 <sup>4</sup>	2001/09 6865	06 06	UK 0119	-002 / -002 010 / 1:0	DO		6508960 (225296)	BRWN FILL 0005 BRWN GRVL SAND 0015 GREY GRVL CLAY 0043 GREY CLAY GRVL 0063 GREY CLAY STNS 0077 GREY SHLE CLAY STNS 0098 BLUE SHLE CLAY 0114 GREY LMSN 0119
WOOLWICH TOWNSHIP		17 540140 4825548 <sup>4</sup>	2001/08 1737	06	FR 0070	047 / 062 020 / 2:0	DO ST	67 3	6508934 (233862)	BRWN CLAY HARD 0026 GREY CLAY STNS HARD 0052 BRWN GRVL CLAY 0063 BRWN CGVL 0070 GREY TILL HARD 0093
WOOLWICH TOWNSHIP		17 539558 4829025 <sup>4</sup>	1998/09 1737	06 06	FR 0137	/ 025 010 / 2:0	DO		6508368 (196197)	BRWN CLAY SOFT 0006 GREY CLAY 0064 GREY CLAY STNS 0104 BLUE SHLE 0123 BRWN LMSN 0144
WOOLWICH TOWNSHIP		17 540143 4825550 <sup>4</sup>	1983/11 4854	30	FR 0018	015 / / :0	DO		6505528 ( )	BRWN SAND SAND CLAY 0003 WHIT SAND 0015 BRWN SAND 0020 BLUE CLAY HARD CLAY 0021
WOOLWICH TOWNSHIP		17 540824 4825548 <sup>4</sup>	1962/11 3523	04 04	FR 0095	018 / 025 004 / 3:0	DO ST		6502724 ( )	LOAM 0003 CLAY STNS 0080 MSND 0090 BLUE ROCK 0100
WOOLWICH TOWNSHIP		17 542146 4826165 <sup>4</sup>	2004/03 6370	02	FR 0007		NU	10 10	6509708 (204215) A004119	
WOOLWICH TOWNSHIP		17 541614 4826223 <sup>4</sup>	1963/08 3523	04 04	FR 0080	/ 2:0	DO		6502725 ( )	FILL 0003 BLUE CLAY 0040 HPAN 0065 MSND 0077 BLUE ROCK 0080
WOOLWICH TOWNSHIP		17 542819 4814851 <sup>4</sup>	1984/10 3518	06	FR 0078	025 / 045 010 / 2:0	DO		6505785 ( )	GREY CLAY 0025 BRWN CLAY STNS LOOS 0078 BRWN GRVL LOOS 0080
WOOLWICH TOWNSHIP		17 543656 4815574 <sup>4</sup>	2009/04 6865	06	0154	075 / 094 029 / 1:0	DO	153 4	7127589 (290014) A050908	BRWN SAND SILT 0027 BRWN CLAY SNDY 0032 GREY CLAY HARD 0059 GREY STNS CLAY SNDY 0120 GREY CLAY HARD 0129 GREY STNS CLAY SNDY 0149 BRWN SAND 0154 BRWN SAND GRVL 0168 BRWN CLAY 0170
WOOLWICH TOWNSHIP		17 542174 4826263 <sup>4</sup>	2000/07 1737						6508825 (217882)	
WOOLWICH TOWNSHIP		17 542173 4826265 <sup>4</sup>	2000/07 1737	06	FR 0068	/ 060 / :0	DO		6508826 (217883)	LOAM 0001 BRWN CGVL 0007 GREY TILL HARD 0037 BLUE SHLE 0047 BRWN LMSN SHLE 0075

TOWNSHIP	UTM <sup>1</sup>	DATE <sup>2</sup>	CASING	WATER <sup>5,6</sup>	STAT LVL/PUMP LVL <sup>7</sup>	WATER	SCREEN	WELL # (AUDITH) WELL TAG #
CONCESSION (LOT)		CNTR <sup>3</sup>	DIA <sup>4</sup>	DETAIL	RATE <sup>8</sup> /TIME HR:MIN	USE <sup>9</sup>	INFO <sup>10</sup>	DEPTHS TO WHICH FORMATIONS EXTEND <sup>5,11</sup>
WOOLWICH TOWNSHIP	17 541672	1992/01	06 04	UK 0346	020 /			6507240 ( ) LOAM 001 BRWN CLAY SOFT 0013 GREY CLAY STNS HARD 0020 GREY TILL STNS HARD 0047 GREY GRVL TILL SOFT 0053 GREY TILL HARD 0058 GREY GRVL SOFT 0060 GREY TILL STNS HARD 0073 BLUE SHLE SOFT 0077 BRWN LMSN SOFT 0079 BRWN LMSN SHLE SOFT 0132 BRWN LMSN SOFT 0135 BRWN LMSN SHLE HARD 0194 BRWN LMSN HARD 0300 BRWN LMSN HARD 0495 GREY LMSN 0528 BLUE SHLE LMSN SOFT 0543
WOOLWICH TOWNSHIP	17 542907	1991/10	06 06	FR 0073	/ 008	DO		6507239 ( ) BRWN GRVL HARD 0012 BRWN CLAY STNS HARD 0056 BLUE CLAY SOFT 0063 BLUE LMSN HARD 0073
WOOLWICH TOWNSHIP	17 542153	2003/11	06 06	FR 0086	024 / 046	DO		6509560 (261852) BRWN FILL SAND SOFT 0006 BRWN CLAY HARD 0017 GREY CLAY HARD 0045 GREY TILL HARD 0078 BLUE SHLE LMSN SOFT 0090
WOOLWICH TOWNSHIP	17 542133	2009/11	04 06		/			7142657 (Z109940) R063669 LOAM 001 BRWN CLAY SILT 0003 SAND GRVL BLDR 0011 BRWN CLAY 0040 BLUE CLAY 0065 BRWN LMSN 0070
WOOLWICH TOWNSHIP	17 541616	1981/01	05 05	FR 0080	025 / 080	DO		6505191 ( ) BLACK LOAM 0001 BLACK GRVL 0025 GREY CLAY 0070 BLUE SHLE 0082
WOOLWICH TOWNSHIP	17 542614	1968/06	07 07	FR 0056	/	PS		6502972 ( ) LOAM 003 GRVL 0012 GREY CLAY HPAN 0050 BLUE SHLE 0056 GREY LMSN 0060
WOOLWICH TOWNSHIP	17 541814	1966/11	04 04	FR 0097	010 / 022	DO		6502732 ( ) LOAM 001 CLAY 0003 MSND GRVL 0020 CLAY MSND 0047 GRN SHLE 0069 BLUE SHLE 0097
WOOLWICH TOWNSHIP	17 542029	1967/03	10 10	FR 0095	006 / 012	IN		6502731 ( ) GRVL STNS 0006 GRVL HPAN 0089 SHLE LMSN 0107
WOOLWICH TOWNSHIP	17 541964	1967/09	36	FR 0088	008 / 008	DO		6502730 ( ) LOAM 0001 GRVL 0010
WOOLWICH TOWNSHIP	17 541614	1965/07	07 07	FR 0105	050 / 100	DO		6502729 ( ) CLAY HPAN 0075 HPAN 0088 GREY ROCK 0110
WOOLWICH TOWNSHIP	17 541924	1963/09	07 07	FR 0104	019 / 028	DO		6502728 ( ) LOAM 0001 GRVL 0016 CLAY 0050 CLAY HPAN 0056 HPAN 0070 BLUE CLAY STNS 0104 ROCK 0108
WOOLWICH TOWNSHIP	17 541714	1961/10	05 05	FR 0103	010 / 012	DO		6502727 ( ) GRVL CLAY 0043 HPAN 0054 GRVL CLAY 0063 HPAN 0075 BLUE CLAY 0083 HPAN 0095 BLUE CLAY 0101 GREY ROCK 0108

TOWNSHIP	CONCESSION (LOT)	UTM <sup>1</sup>	DATE <sup>2</sup>	CASING	WATER <sup>5,6</sup>	STAT LVL/PUMP LVL <sup>7</sup>	WATER	SCREEN	WELL # (AUDIT#)	WELL TAG #	DEPTHS TO WHICH FORMATIONS EXTEND <sup>5,11</sup>
			CNTR <sup>3</sup>	DIA <sup>4</sup>	DETAIL	RATE <sup>8</sup> /TIME HR:MIN	USE <sup>9</sup>	INFO <sup>10</sup>			
WOOLWICH TOWNSHIP	GCT (072)	17 541864 4826373*	1957/12 3524	07 07	FR 0110	015 / 040 020 / 14:0	DO		6502726 ( )		PRDG 0015 HPAN 0082 CLAY 0104 LMSN 0112
WOOLWICH TOWNSHIP	GCT (072)	17 542034 4826343*	1971/06 2519	30 24	FR 0005	003 / 006 050 / 3:0	PS		6503370 ( )		BLCK LOAM 0001 BRWN CLAY MSND STNS 0004 BRWN HPAN 0005 BRWN GRVL 0014 BRWN CLAY MSND 0018
WOOLWICH TOWNSHIP	GCT (072)	17 542139 4826723*	1971/11 4725	04	FR 0108	028 / 100 008 / 3:15	DO		6503521 ( )		BRWN LOAM 0001 BRWN STNS CLAY 0021 WHIT BLDR 0029 BRWN CLAY STNS 0044 GREY HPAN 0061 BLDR STNS 0065 STNS BLDR 0070 GREY CLAY 0077 BLUE SHLE 0105 WHIT LMSN 0108
WOOLWICH TOWNSHIP	GCT (072)	17 541500 4826047*	1987/09 3518	06	FR 0110	050 / 065 025 / 1:0	DO		6506220 ( )		BRWN CLAY STNS HARD 0055 GREY STNS GRVL LOOS 0075 GREY CLAY STNS HARD 0100 BRWN GRVL SAND LOOS 0110
WOOLWICH TOWNSHIP	GCT (072)	17 541950 4826495*	1989/01 4552	06	FR 0090	030 / 050 015 / 3:0	DO		6506777 ( )		BRWN GRVL LOOS 0030 BRWN GRVL SAND DNSE 0065 BRWN GRVL CLAY DNSE 0078 GREY GRVL SAND DNSE 0090 GREY GRVL LOOS 0105
WOOLWICH TOWNSHIP	GCT (072)	17 542153 4826891*	2003/07 1737	06 06	FR 0137	032 / 070 020 / 2:0	DO		6508941 (233817)		BRWN CGVL 0006 BRWN CLAY SOFT 0010 GREY CLAY HARD 0031 GREY TILL STNS HARD 0086 BLUE SHLE SOFT 0098 GREY LMSN HARD 0106 BLUE SHLE SOFT 0132 BRWN LMSN SHLE SOFT 0140
WOOLWICH TOWNSHIP	GCT (072)	17 542111 4826073*	1998/10 3428	08 08	FR 0002	004 / 012 002 / 23:0	MN	9 33	6508305 (093327)		SAND SILT 0001 SAND GRVL 0003 CLAY 0005
WOOLWICH TOWNSHIP	GCT (072)	17 542114 4827433*	1950/12 2411	03	FR 0100	070 / 080 005 / 10:0	DO ST		6502733 ( )		PRDG 0035 MSND GRVL 0100
WOOLWICH TOWNSHIP	GCT (074)	17 543279 4826073*	1954/08 2411	04	FR 0104	030 / 050 006 / :0	DO		6502734 ( )		BRWN CLAY 0080 GRVL CLAY 0104 GRVL 0105
WOOLWICH TOWNSHIP	GCT (074)	17 543131 4825739*	1996/09 1737	06 06	FR 0063	/	DO		6508024 (146326)		LOAM 0001 BRWN CGVL STNS 0018 GREY CLAY SOFT 0037 BLUE SHLE LYRD SOFT 0063
WOOLWICH TOWNSHIP	GCT (074)	17 543039 4826138*	1964/09 2518	05	FR 0121	040 / 052 015 / :0	DO		6502740 ( )		STNS GRVL 0012 CLAY 0023 HPAN 0109 MSND CLAY 0111 HPAN 0119 GRVL 0121
WOOLWICH TOWNSHIP	GCT (074)	17 542914 4826123*	1977/09 5469	05	FR 0110	047 / 052 010 / 2:0	DO		6504673 ( )		LOAM 0001 BRWN CLAY 0010 GRVL 0014 GREY CLAY STNS 0103 HPAN 0108 GRVL 0110

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