Annual Operation and Monitoring Report
Longueuil Waste Disposal Site
2004

Prepared for:

Township of Champlain
Attn: Mr. Robert Lefebvre, Clerk-Treasurer
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1 INTRODUCTION

The Township of Champlain retained the services of Levac Robichaud Leclerc Associates Ltd. (LRL) to prepare an Operation and Monitoring Report for the Longueuil Waste Disposal Site. This includes a groundwater sampling and monitoring program.

The Township owns the 24.8 hectare (61 acre) landfill located off County Road 11 (Cassburn Road), approximately 4.5 km south of the Village of L'Orignal in the Township of Champlain, Ontario. The location of the landfill is shown on the map included in **Appendix A**. The Township operates the landfill under Certificate of Approval No. A471601 issued on March 11, 1980 and amended on November 19, 2004.

The monitoring program was performed in accordance with the Ministry of the Environment (MOE) review and recommendations of past monitoring reports and our report entitled *"Annual Monitoring Program (2003)"* dated January 2004.

This report is intended to fulfill Condition 10 of the amended Provisional Certificate of Approval No. A471601 (November 2004).

2 SCOPE OF WORK

LRL's scope of work for this project consisted of the following tasks:

- Review of landfill operation activities during the 2004 operating year;
- Conducting a semi-annual groundwater monitoring program that included sampling all monitoring wells (if possible) located within the landfill property. The sampling events took place during the spring and fall of 2004 in order to obtain the seasonal change of the groundwater chemistry;
- Analyze the samples according to the Ontario Ministry of the Environment (MOE) landfill standards and guidelines, including analyzing several samples for Volatile Organic Compounds (VOC);
- Confirming the groundwater flow paths by obtaining the water levels of the monitoring wells;
- Verifying the presence or absence of landfill (methane) gas at the site;
- Review the current and historical laboratory analysis of groundwater obtained from the monitoring wells to determine if there is a trend in the levels of selected parameters;
- Ensuring that the site is in compliance with the MOE's Guideline B-7;
- Preparing an annual monitoring report.

3 SUMMARY OF OPERATION

A Design, Opeation and Maintenance Plan has been prepared for the waste disposal site by LRL. This document has been submitted to the MOE for review. The specifications of the plan will be implemented during the 2005 operating season and be reported in future annual reports. Below is a summary of the activities that have occurred at the landfill.

3.1 Type and Quantity of Waste Accepted

The Longueuil Waste Disposal Site is licensed to receive domestic and commercial non-hazardous solid industrial waste, with all other regular domestic liquid wastes being disposed of at a separate landfill site. These waste include white goods (with CFC removed and tagged), tires, scrap metal, construction debris, wood and furniture.

Currently the landfill does not record the amount of waste received at the site. However this will be done during future operations in order to comply with Condition 10(a) of the Amendment to the Certificate of Approval. Due to the small size of the landfill a scale facility is not economically justified therefore one alternative is to count the number of incoming vehicles or estimate the volume based on the increase in the waste footprint and height.

3.2 Remaining Capacity

The licensed area of the landfill is 24.84 ha. Approximately 30 percent (7 ha) is cleared with the remainder being dense brush. The footprint of the waste is approximately 1.5 ha. The footprint of the waste has only advanced approximately 3.0 m during the 2004 operating season. The capacity of the landfill has not been determined however based on the licensed size and the amount of waste accepted, the landfill could operate for at least another 20 to 30 years.

3.3 Compliance with Design, Operation and Maintenance Plan

A Design, Operation and Maintenance Plan has been prepared and submitted to the MOE for review. The plan includes, but not limited to, the following:

- Types of waste accepted;
- Waste inspection and accepting procedures;
- Inspection schedules;
- Emergency response and contingency plans; and
- Information that must be recorded (i.e. amounts of waste accepted, summary of recycling operation, inspections conducted);

3.4 Recycling Operation

Waste accepted at the site such as tires, white goods, concrete, asphalt and metals are removed by local contractors for recycling. The quantity of waste recycled is not currently recorded however it will be in future operations in order to comply with Condition 10(d) of the Amendment to the Certificate of Approval.

4 LANDFILL'S HYDROGEOLOGICAL SETTINGS

Hydrogeological site assessments of the Longueuil Waste Disposal Site have been conducted by LRL in 1996 and 2001. The assessment involved drilling boreholes and installation of monitoring wells. The following information regarding the site was revealed:

- The landfill site is located on a topographical high point, showing a shallow rock ridge within the existing landfill operations. The rock dips in both an east and west direction.
- Bedrock was located at depth ranging between 2.1 to 4.4 m on the shallow ridge dipping to depth below 5.5 m towards the west and 11.5 m towards the east. The first 1.2 m of the bedrock formation east of the ridge is considered fractured and pervious while the entire depth tested (3.0 m) on the west side of the ridge is fractured rock.
- The site geology consist of a sand deposit on the bedrock ridge approximately 0.9 to 4.1 metres in thickness underlained by a dense to very dense silt and sand glacial till.
- A typical cross-section of the site in succession away from the ridge going east or west shows:
    - Pervious loose beach sand;
    - Silt and silty sand transition layer
    - Impervious firm to hard marine clay; and
    - Sandy silty medium dense glacial till resting over bedrock.
- Due to the topographic high point and the bedrock ridge a water divide line crosses the site in the area of the high point where the waste material is buried.
- Three (3) water tables are encountered at this site:
    - Shallow perched water table located in the surficial sand layer, which flows towards the northeast;
    - Deep water table located within the till layer and the fractured bedrock which flows to the north; and
    - Overburden groundwater flow is from the high point towards the northwest.
- The groundwater recharge at this site comes mainly from the rain falling over the site. The recharge rate of the aquifers is considered small.

A site plan and a profile of the above-mentioned geological features are included in **Appendix B**.

5 ANNUAL MONITORING PROGRAM

5.1 Groundwater Sampling

LRL technical staff conducted groundwater sampling on June 2nd, 2004 and December 17th, 2004. This involved sampling eighteen (18) monitoring wells installed within the landfill. The location of all monitoring wells and site features are shown on our site plan presented in **Appendix B.** Fourteen (14) of the existing monitoring wells were sampled during these two events. The remaining wells were not sampled because they were either dry or there was an insufficient amount of water for sampling and chemical analysis.

The monitoring wells were developed and purged of standing water prior to sampling of the groundwater. The development of the monitoring wells generally consisted of purging them dry three (3) times or removing the equivalent of three (3) well volumes. The monitoring wells were purged using "Waterra" flexible tubing fitted with a foot valve. All "Waterra" tubing and foot valves were left in the monitoring wells to permit future sampling and avoid cross contamination.

The water was filtered in the field using high efficiency "Waterra" filters and was transferred immediately into laboratory prepared bottles containing the appropriate preservative for the target parameters. Some wells contained too much sediment, rendering any field filtering impractical; these samples were filtered at the laboratory. All groundwater samples collected were submitted to Paracel Laboratories Ltd. of Ottawa for analysis of Column 1 parameters listed in Schedule 5 of the MOE's *Landfill Standards* (May 1998) with the inclusion of arsenic, manganese, Total Kjeldahl Nitrogen (TKN), potassium, hardness (calculated), nitrites and volatile organic compounds (VOC). Inclusion of arsenic in the groundwater analysis will determine if the use of arsenic contaminated soil as cover material has impacted the groundwater. Field parameters such as temperature and pH were measured on site using a hand held instrument.

The static water elevation of all monitoring wells was measured prior to collecting the groundwater samples. The groundwater elevations are shown on the site plan and are summarized in Table 1. Water levels have generally decreased by 0.17 m when compared to the 2003 measurements.

The flow directions of the shallow and deep overburden aquifers have remained the same: to the east and west for the shallow aquifer and to the northeast for the deep aquifer from the water division line located on the site's high point.

Table 1 Summary of monitoring wells sampled in 2004.

MONITORING WELL	WATER LEVEL DEPTH/ELEVATION (m)		WELLS SAMPLED		COMMENTS
	SPRING	FALL	SPRING	FALL	
MW-1S	1.00 / 98.35	1.23 / 98.12			Insufficient water present in well for sampling
MW-1D	1.32 / 98.03	1.57 / 97.78	X	X	Water could not be field filtered during the spring
MW-2	1.5 / 98.76	1.63 / 98.63	X	X	
MW-3S	1.64 / 98.16	2.00 / 97.80	X	X	
MW-3D	1.65 / 98.15	2.04 / 97.76	X	X	Water could not be field filtered during the spring
MW-4S	DRY	1.34 / 97.37			Insufficient water present in well for sampling
MW-4D	DRY	DRY			Insufficient water present in well for sampling
MW-5S	0.30 / 97.41	0.39 / 97.34	X	X	
MW-5D	6.59 / 91.05	7.41 / 90.23	X	X	
MW-7	6.74 / 89.43	DRY			Insufficient water present in well for sampling
MW-8S	0.29 / 98.94	1.38 / 97.85	X	X	
MW-8D	8.12 / 91.07	8.81 / 90.38	X	X	
MW-11	4.62 / 94.91	4.66 / 94.87	X	X	
MW-12S	0.36 / 95.69	0.29 / 95.76	X	X	
MW-12D	3.71 / 92.23	4.14 / 91.80	X	X	
MW-14	1.87 / 95.29	4.28 / 92.88	X	X	
MW-15S	1.24 / 92.26	1.44 / 96.86	X	X	
MW-15D	5.84 / 92.00	6.74 / 91.10	X	X	

The summary tables of the groundwater chemistry of each well are presented in **Appendix C**. These tables show the evolution of the groundwater since monitoring commenced in 1996. Excedances in relation to the Ontario Drinking Water Standard – 2003 (ODWS) are given. The laboratory analysis reports for the groundwater samples collected during the spring and fall sampling events of 2004 are enclosed in **Appendix D** and **Appendix E,** respectively.

5.2 Discussion and Interpretation of Results

In general, the groundwater chemistry has remained relatively unchanged from the previous year with only marginal increases or decreases in some parameters. General exceedances to the ODWS remain similar to those in previous years such as for aluminium, iron, manganese and DOC with no major increases in concentrations. These elements are considered aesthetic. In addition, they are commonly found in exceedances within groundwater aquifers throughout Ontario and are naturally occurring. Nevertheless, these levels shall be monitored through an annual sampling program for any increases.

5.2.1 Background Monitors

The background water quality is measured in MW11, MW12-S, MW12-D and MW14. In the past, only MW11 was used as a background monitor however according the the MOE Landfill Standards, at least five (5) monitoring wells should be used to establish the background water quality. Therefore monitoring wells MW12-S, MW12-D and MW14 will also be used as background wells. Although these wells are down gradient to the waste, their distance from the buried waste (at least 40 m down gradient) and the fact that the concentrations of leachate parameters have remained relatively low, allow them to be used as background monitors. The chemical analysis of these wells will be closely examined in the future to ensure that potential leachate plumes do not impact the wells. If it is determined so, they will be used as impact monitors and new background wells will be drilled further down gradient.

For MW11, the levels of the parameters have remained relatively constant over the years; indicating the well has not been influenced by the landfill activities down gradient, to the northwest. However the levels of nitrates are high relative to the other monitoring wells, including the leachate monitor MW3-D. The levels of nitrate range from 2.9 to 3.2 mg/L; while in most of the wells the levels are either below 1.0 mg/L or not detected. MW-11 is located upstream of the groundwater flow and along the south property line, suggesting a potential exterior source. This may be related to agricultural activities such as the application of manure or fertilizer onto neighbouring lands.

The remaining monitoring wells to the east of the buried waste (MW12-S, MW12-D, MW14) generally showed no increasing trend in the measured parameters. The levels of iron and manganese are found to be above the ODWS in MW12-S and MW12-D; however the levels were similar to that found in the past.

A VOC scan was done on the groundwater samples from MW11, MW12-S and MW12-D; trace amounts of tetrachloroethylene (TCE) were detected in the water during the fall sampling. The level of this parameter (0.0008 mg/L) is significantly lower than the ODWS (0.03 mg/L). Trace VOCs have been detected in these wells and in MW14 in the past.

5.2.2 Leachate Monitor

Excedances in MW3-D (leachate quality) included dissolved organic carbon (DOC), hardness, total dissolved solids (TDS), aluminium and manganese. A trend in the levels of some of these contaminants is observed. Over the years, the levels of calcium and magnesium have increased (thus increasing hardness). Additionally the levels of barium have been gradually increasing although it is still below the ODWS. The levels of

nitrates during the 2004 sampling is similar to that found in the past and in other monitoring wells. Therefore the high level of nitrates (20 mg/L) found during the Fall 2003 sampling event could have been an anomalous event. The level of manganese has increased significantly during the Fall 2004 sampling; sampling during 2005 will confirm if a trend is occurring.

VOCs were not detected in the groundwater samples during 2004.

5.2.3 Impact Monitors

MW8 is located directly downstream (to the east) of the buried waste. The nitrate concentrations have steadily increased in MW8-S in the past, however they were not detected during the 2004 sampling. This trend over the years may indicate the presence of a leaching plume from the buried waste. Future sampling will indicate if the monitoring well is under the influence of a leaching plume. All other parameters have remained relatively at the same levels, except DOC. There was a significant increase in the DOC levels in MW8-D; the levels increased ten fold.

MW4 and MW7 are also located directly downstream of the buried waste, however there was insufficient amount of water for sampling from both the shallow and deep wells. These wells are important in determining if the leachate plume is migrating towards the north and northwest. These wells will be abandoned and new wells will be drilled in the same areas. MW1-S, in addition, had an insufficient amount of water for sampling. As discussed in past reports, this well and MW1-D are interconnected.

MW1-D, like MW-11 has consistently shown above normal nitrate levels. MW-1 is also located upstream of the groundwater flow and along the south property line, suggesting a probable exterior source (agricultural activity). During the spring sampling event, high levels of hardness, TDS, barium, iron, magnesium and manganese were measured. This may be due to the fact the samples were not filtered in the field rather in the laboratory and this may have biased the results. The sampling in the fall, in which the water was filtered, had lower levels of these parameters. DOC was measured above the ODWS in the fall sampling, however the levels were similar to that found in the past.

The remaining wells to the east of the buried waste (MW5-S, MW5-D, MW15-S, MW15-D) generally showed no increasing trend in the levels of measured parameters. Levels of iron and manganese are found above the ODWS in MW5-S and MW5-D; however the levels were similar to that found in the past. It is noted that the DOC level in MW15-S rose significantly during the fall sampling (from 1.5 mg/L to 7.0 mg/L). MW15-S is the closest of the above-mentioned well to the buried waste. Future sampling will determine if this is an increasing trend or an anomalous result.

A VOC scan was performed on samples collected during the spring and fall from the following indicator monitors: MW-8D and MW-8S. VOC were not detected during the spring sampling; however trace amounts of TCE were detected in all the samples taken during the fall. These were significantly below the ODWS.

6 ENVIRONMENTAL IMPACT ASSESSMENT

6.1 Guideline B-7

The Environmental Impact Assessment was performed in accordance with the Reasonable Use Guideline (RUG) (MOEE Guidelines, B-7, 1995, also O. Reg. 232/98). The Guideline B-7 addresses the levels of off-site leachate impacts on the groundwater considered acceptable by the MOE and defines the level of impact on the groundwater beyond which some form of mitigation measure would be warranted. Under Guideline B-7 a change in the quality of the groundwater on adjacent properties will only be acceptable if the quality is not degraded in excess of fifty (50) percent of the difference between the background concentrations and the established water quality criteria for non-health related parameters and twenty-five (25) percent of the difference for health related parameters. The reasonable use for groundwater in the subject area has been determined for domestic supplies therefore the water quality criteria used is the ODWS. The reasonable use assessment was limited to landfill leachate indicator parameters such as chloride, alkalinity, hardness and sulphate as recommended by the MOE.

For the purpose of the environmental impact assessment the following were taken into consideration:

- **Background Concentration (C_b):** MW-11, MW12-S, MW12-D and MW14 were chosen as background water quality concentration. The average concentration of a given parameter was obtained for the spring and fall sampling.
- **On Site Leachate Concentrations:** Samples obtained from MW-3D installed in the buried waste was chosen as representative of on site leachate concentrations.
- **Leachate Quality:** The monitoring wells located downstream of the groundwater flow direction and near the property line were retained to perform the analysis, which included MW2, MW5-S, MW8-S, MW8-D, MW15-S and MW15-D.

Table 2 and Table 3 presents the RUG assessment of the leachate indicator parameters for spring and fall, respectively, and compares the results with leachate quality parameters obtained from the monitoring wells located within the waste area and downstream of the flow direction. Calculation of the RUG is included in **Appendix F**.

The reasonable use assessment reveals that the groundwater within the immediate vicinity of the buried waste is impacted with high levels of hardness and alkalinity. Levels of hardness and alkalinity are above C_m in MW3-D. The groundwater quality in the remainder of the wells meets Guideline B-7. The leachate plume has not affected the monitoring wells located downstream. The results show that the leachate plume is contained within the landfill and the monitoring wells network.

Included in **Appendix G** are time-series graphs of alkalinity, chloride, sulphate and hardness.

Table 2 Groundwater chemistry using RUG, Spring 2004.

	Monitoring Well	Concentration (mg/L)			
		Alkalinity	Chloride	Hardness	Sulphate
Ontario Drinking Water Standard (C_r)		500	250	500	500
Background Monitors* (C_b)		106	2	106	9
Maximum Concentration (C_m)**		**303**	**126**	**303**	**255**
Leachate Monitor	MW3-D	260	2	**1216**	64
Impact Monitors	MW2	60	ND	43	6
	MW5-S	60	2	69	13
	MW5-D	150	1	145	8
	MW8-S	10	7	40	24
	MW8-D	120	3	125	15
	MW15-S	10	3	19	8
	MW15-D	110	ND	116	0.2

* Average of wells MW11, MW12-S, MW12-D, MW14 for spring sampling.
** $C_m = C_b - 0.5(C_r - C_b)$
BOLD: Above RUG limit (C_m)
ND: Not Detected

Table 3 Groundwater chemistry using RUG, Fall 2004.

	Monitoring Well	Concentration (mg/L)			
		Alkalinity	Chloride	Hardness	Sulphate
Ontario Drinking Water Standard (C_r)		500	250	500	500
Background Monitor* (C_b)		133	3	107	17
Maximum Concentration (C_m)**		**316**	**126**	**303**	**258**
Leachate Monitor	MW3-D	**410**	2	**1115**	57
Impact Monitors	MW2	65	ND	31	7
	MW5-S	55	3	46	14
	MW5-D	160	2	123	7
	MW8-S	20	6	34	12
	MW8-D	130	4	34	22
	MW15-S	20	5	22	7
	MW15-D	120	ND	97	36

* Average of wells MW11, MW12-S, MW12-D, MW14 for spring and fall sampling.
** $C_m = C_b - 0.5(C_r - C_b)$
BOLD: Above RUG limit (C_m)
ND: Not Detected

6.2 Ion Balance

A major ion balance was conducted on the groundwater sample analytical results. This was done to comply with Condition 10(m) of the Amendment to the Certificate of Approval. The percent difference between the sum (expressed as meq/L) of major cations and ions is calculated as follows:

$$\%Difference = 100 \times \frac{\Sigma cation - \Sigma anion}{\Sigma cation + \Sigma anion}$$

The percent difference between the sums is summarized in Table 4. Calculation of the ion balance is included in **Appendix F**. The ions included in the balance include alkalinity (HCO_3^-), chloride, sulphate, nitrates, calcium, magnesium, potassium and sodium.

Table 4 Summary of ion calculations.

	Monitoring Well	% Difference	
		Spring 2004	Fall 2004
Background Monitor (C_b)	MW11	4.8	5.5
	MW12-S	**13.9**	**-27.6**
	MW12-D	**10.9**	0.9
	MW14	9.2	4.0
Leachate Monitor	MW3-D	**62.4**	**47.8**
Impact Monitors	MW1-D	**61.8**	2.1
	MW2	**11.1**	-9.8
	MW5-S	8.1	-9.6
	MW5-D	8.3	-0.3
	MW8-S	6.5	3.1
	MW8-D	5.7	**-52.7**
	MW15-S	-0.2	**-13.2**
	MW15-D	5.1	-3.3

BOLD: Difference greater than ±10%

The ionic balance is one of the most common ways to check for analytical errors. Water is electronically neutral, so the sum of the cations in meq/L should equal the sum of the anions in meq/L. The ionic balance error should be less than 10 %. If the balance is much greater then

- The analysis is poor; or
- There were other constituents present that were not used to calculate the balance.

Some of the wells were marginally above 10 %, namely MW12-S, MW12-D and MW2 in the spring and MW15-S in the fall. MW3-D in the spring and fall, MW1-D in the spring and MW8-D in the fall were significantly above the 10% limit. Inclusion of other constituents (such as metals) did not bring down the percent difference. The high percent difference may be due to the presence of high levels of calcium (as in MW3-D and MW1-D) and of alkalinity (as in MW12-S and MW8-D).

6.3 Piper Trilinear Diagrams

Trends in groundwater quality have been plotted on Piper Trilinear diagrams, which are included in **Appendix G**. This was done to comply with Condition 10(k) of the Amendment to the Certificate of Approval. A Piper diagram is a plot that provides visual representation of the concentration of major ions in water. The diagram can be used in determining similarities and differences among water samples. Plots were done for the spring and fall sampling events. Calculation for the diagram is included in **Appendix F**.

Many of the wells sampled are clustered together on the diagram, indicating they are similar in ion ratios. The Piper diagram indicates that for most of the wells, the predominant ions in the groundwater are sodium, potassium, calcium and alkalinity (HCO_3).

From the spring 2004 sampling, MW8-S and MW15-S appear to have different water chemistry from the other wells. The data for these wells is separate from the cluster of wells in the anion triangular field and diamond shape field. These two wells are downstream of the buried waste. A similar trend was observed in the fall data, however these two wells are not as separated for the cluster of wells.

7 LANDFILL GASES

The presence or absence of landfill gas (methane) was determined with the use of a piezometer installed above the groundwater table and located within waste area. This piezometer was placed in MW-3 and landfill gas was measured using a Thermo Gastech vapour monitor (model GT-105). Landfill gases were not detected during the investigation.

The total available waste disposal volume of the landfill is considerably lower than 3.0 million m^3 and the waste is predominantly non-hazardous dry waste. Therefore, landfill gases should not be a concern for this site (O. Reg. 232/1998, Section 15).

8 CONCLUSIONS

Presently, there are eighteen (18) single and multi-level monitoring wells installed across the landfill site which bisect the two (2) overburden groundwater tables. During the course of 2004, most of them were sampled. Those that could not be sampled were either dry or had insufficient water quantity to permit proper water sampling. These were MW1-S, MW3-S, MW4-S, MW4-D and MW7.

Generally, the groundwater chemistry has remained essentially unchanged from the previous years with only marginal increases or decreases in some parameters. General exceedances to the ODWS remain similar to those in previous years such as for aluminium, iron, manganese and DOC with no major increases in concentrations. As noted before, these substances are commonly found in exceedance in groundwater throughout Ontario.

Some parameters are increasing in MW-3, which is located in the buried waste. Over the years, the levels of calcium and magnesium have increased (thus increasing hardness). Additionally the levels of barium have been gradually increasing although it is still below the ODWS.

Again this year, above average nitrate nitrogen levels were found in monitoring wells located upstream from the landfill (MW1-D and MW11), which may indicate a potential exterior source of contamination such as the surrounding agricultural activities. In any case, these levels shall be monitored closely in the subsequent sampling events.

Arsenic has not been detected in any of the groundwater samples. This indicates that the storage and use of the arsenic contaminated soil as cover material has not impacted the groundwater during the 2004 operation. However, continued sampling will confirm if there will be an impact in the future.

The groundwater impact assessment indicated that the site is in compliance with the Guideline B-7 requirements. The water samples collected from the monitoring well MW3-D, located within the buried waste, were impacted by the landfill operations but the leachate plume appears to be presently isolated within the active landfill itself. The downstream wells set along the property's limit meet the guidelines.

Finally, landfill gases were not detected during this investigation, which is common considering the volume and type of waste being buried (dry solids).

9 RECOMMENDATIONS

Based on the information presented herein, we offer the following recommendations:

1. MW4 (shallow and deep) has only been sampled four (4) times since its installation. In addition MW7 has been sampled only twice. It is assumed that MW4 may have become clogged with sediment over the years. MW7 has not been drilled deep enough into the bedrock to ensure sufficient quantities of groundwater for sampling. MW4 is located closest to the buried waste, downstream of the landfill and is important in determining if the leachate plume is migrating towards the north. In the past some leachate indicator levels have been identified in this well. MW 7 is the only well located down gradient of the northwest groundwater flow. In order to permit proper sampling, to confirm these levels and continue the on-going monitoring, it is recommended that these wells be abandoned and new wells be drilled in this critical area. The new well shall be constructed using piezometer fitted with a filter membrane to prevent sediments from entering the well.

2. A Design, Operation and Maintenance Plan have been prepared and submitted to the MOE for review and comments. Future operation and monitoring reports will indicate whether the landfill is complying with the plan. This will be done to comply with Condition 10 of the amended Provisional Certificate of Approval No. A471601

3. The amount of waste accepted and recycled is currently not being recorded. In order to comply with Condition 10(a) and 10(d) of the Amendment to the Certificate of Approval, it should be done and summarized in future reports.

10 2005 MONITORING PROGRAM

The proposed monitoring program for the upcoming year shall be conducted in the same manner as in the past year and shall generally consist of the following tasks:

- The sampling events shall be carried out during the spring and fall to obtain the seasonal variation of water chemistry and to compare with previous sampling data. The spring sampling shall be conducted in May in an effort to obtain sufficient water in some of the monitoring wells.
- Parameters monitored will include the indicator list given in the MOE Landfill Standards (Schedule 5, Column 2) with the inclusion of arsenic, manganese, Total Kjeldahl Nitrogen (TKN), potassium, hardness (calculated), nitrites and volatile organic compounds (VOC). Arsenic was added to the parameter list in order to monitor any impact of the arsenic impaired soil that was imported to the landfill this fall.
- VOC scan shall be performed on groundwater from MW3-D and in the monitoring wells where traces of VOC were detected (MW-8D, MW-8S, MW11, MW12-D, MW12-S).
- Field parameters shall include conductivity, TDS, temperature and pH.
- Water elevation shall be taken during each sampling event to confirm the groundwater flow direction.
- Monitoring for landfill gases will be during both sampling events.

We trust this report meets with your requirements. If you have any questions or comments regarding this report, please do not hesitate to contact the undersigned.

Yours truly,

Levac Robichaud Leclerc Associates Ltd.

Michelle Hanna
Environmental Consultant

Marc-Antoine Laforte, P. Eng. Ph. D

APPENDIX A
SITE LOCATION

PROJECT

ANNUAL MONITORING REPORT, 2004
LONGUEIUL WASTE DISPOSAL SITE
TOWNSHIP OF CHAMPLAIN

DRAWING TITLE

SITE LOCATION
Topographic Map 31G/10 Hawkesbury, 2000

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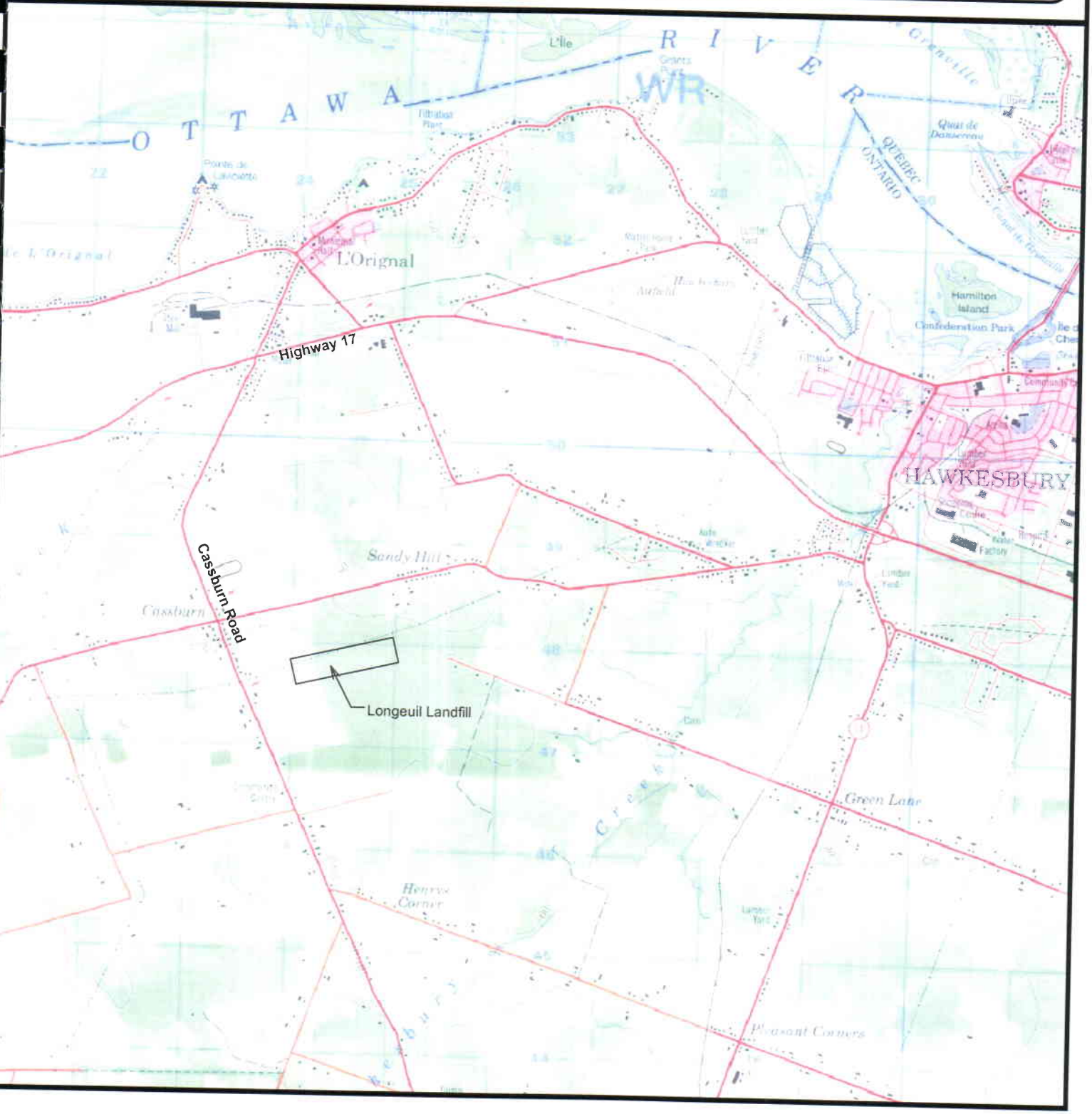
CLIENT

TOWNSHIP OF CHAMPLAIN

DATE	FILE	DWG No.
MARCH 2005	L9618	L9618-01



APPENDIX B
SITE PLAN AND
GEOLOGICAL CROSS SECTION

APPENDIX C
GROUNDWATER CHEMISTRY SUMMARY TABLES

MW1-S

Well Details:

	Height (m)	Elevation (m)
Ground Surface	0	99.35
Casing	1.15	100.5
PVC Pipe	0.97	100.32
Depth of Well	2.44	96.91

Parameter	Units	ODWS Guidelines	1996	Fall 2000	Spring 2001	Spring 2002	Fall 2002	Spring 2003	Fall 2003	Spring 2004	Fall 2004
			Dec-96	Nov-00	May-01	Jun-02	Nov-02	Jul-03	Nov-03	Jun-04	Dec-04
Field Parameters											
Water Depth	m	**NA**	1.32	1.56	0.84	–	1.9	1.52	1.38	1	1.23
Water Level Elevation	m	**NA**	98.03	97.79	98.51	–	97.45	97.83	97.97	98.35	98.12
Conductivity	US/cm	**NV**	–	–	–	–	–	–	223	116	306
pH	unitless	**6.5-8.5**	7.78	–	–	–	–	–	6.68	8.27	6.83
TDS	mg/L	**500**	–	–	–	–	–	–	112	–	152
Temperature	°C	**<15**	4.3	–	–	–	–	–	7.7	11.5	4.3
Comments											
The well is used only to measure field parameters indicated above as it contains in sufficient groundwater to permit adequate sampling and analysis. In addition MW1-D, which is installed in the same location, is representative of the same targeted parameters											

MW1-D

Well Details:

	Height (m)	Elevation (m)
Ground Surface	0	99.35
Casing	1.15	100.5
PVC Pipe	0.97	100.32
Depth of Well	4.42	94.93

Parameter	Units	ODWS Guidelines	1996	Fall 2000	Spring 2001	Spring 2002	Fall 2002	Spring 2003	Fall 2003	Spring 2004	Fall 2004
			Dec-96	Nov-00	May-01	Jun-02	Nov-02	Jul-03	Nov-03	Jun-04	Dec-04
Field Parameters											
Water Depth	m	**NA**	1.22	1.84	1.3	--	2.15	1.27	1.16	1.32	1.57
Water Level Elevation	m	**NA**	98.13	97.5	98.1	--	97.2	98.08	98.19	98.03	97.78
Conductivity	US/cm	**NV**	--	--	--	--	--	--	--	198	340
pH	unitless	**6.5-8.5**	--	--	--	--	--	--	--	7.6	6.75
TDS	mg/L	**500**	--	--	--	--	--	--	--	--	170
Temperature	°C	**<15**	4.2	4.2	5.5	6	9	6.2	7.9	9.5	2.8
General Chemistry											
Alkalinity	mg/L	**30-500**	--	62	85	50	95	70	110	120	90
BOD	mg/L	**NV**	--	2	ND	ND	ND	1	2	2	2
Chloride	mg/L	**250**	17	25.6	17	11	16	21	21	12	16
COD	mg/L	**NV**	--	553	16	ND	32	42	36	55	23
Conductivity	mg/L	**NV**	--	303	170	--	340	270	340	260	320
DOC	mg/L	**5**	--	--	--	--	**7**	4.4	**8**	2	**9.5**
Hardness	mg/L	**500**	--	136	105	61	93	123	158	**548**	117
Nitrite (N) [1]	mg/L	**1**	0.34	ND	0.01	ND	ND	--	--	ND	ND
Nitrate (N)	mg/L	**10**	ND	ND	4.7	0.4	3.8	2.8	2	3	5
Nitrates + Nitrites (N)	mg/L	**10** [2]	0.34	ND	4.7	0.4	3.8	2.8	--	3	5
Ammonia/Ammonium (N)	mg/L	**NV**	0.87	0.12	0.19	0.06	0.25	0.01	0.05	0.12	0.12
TKN	mg/L	**NV**	1.04	3.3	0.05	0.12	1	--	--	0.05	1.1
Sulphate	mg/L	**500**	25	22.5	31	15	26	19	18	17	22
pH	mg/L	**6.5 - 8.5**	8.14	**6.36**	**6.4**	6.6	7	**6.34**	7.37	6.75	6.62
TDS	mg/L	**500**	--	155	290	120	190	230	360	**2 700**	300
TOC	mg/L	**NV**	8.8	54	3.9	3.2	13	--	--	--	--
Total Phosphorus	mg/L	**NV**	0.13	9.4	1.4	0.05	0.03	--	--	--	--
Metals											
Aluminum	mg/L	**0.1**	ND	--	**5.6**	**1.4**	**0.5**	ND	**0.71**	--	ND
Antimony	mg/L	**0.06**	--	--	ND	ND	ND	ND	ND	--	ND
Arsenic	mg/L	**0.025**	--	--	ND	ND	ND	ND	ND	ND	ND
Barium	mg/L	**1**	--	0.05	0.21	0.07	0.05	0.02	0.03	**1.4**	0.03
Beryllium	mg/L	**NV**	ND	--	ND	ND	ND	ND	ND	--	ND
Boron	mg/L	**5**	0.01	0.02	0.05	ND	ND	ND	ND	ND	ND
Cadmium	mg/L	**0.005**	ND	--	ND	ND	ND	ND	ND	--	ND
Calcium	mg/L	**NV**	43	42.5	33	18	23	42	50	170	35
Chromium	mg/L	**0.05**	ND	--	ND	ND	ND	ND	ND	--	ND
Cobalt	mg/L	**NV**	0.01	--	0.015	ND	ND	ND	ND	--	ND
Copper	mg/L	**1**	ND	--	0.12	ND	0.005	ND	ND	--	ND
Iron	mg/L	**0.3**	--	**19.1**	**77**	**11**	**2**	ND	**0.4**	**24**	ND
Lead	mg/L	**0.01**	--	--	**0.025**	0.005	ND	ND	ND	NA	ND
Magnesium	mg/L	**NV**	--	7.2	5.6	3.8	8.6	4.4	8	30	7.2
Manganese	mg/L	**0.05**	--	**0.438**	**0.4**	**0.1**	**0.45**	**0.1**	ND	**3.8**	**0.25**
Mercury	mg/L	**0.001**	--	--	--	--	--	--	ND	--	--
Molybdenum	mg/L	**NV**	--	--	ND	ND	ND	ND	ND	--	ND
Nickel	mg/L	**NV**	--	--	0.03	0.01	ND	ND	ND	--	ND
Potassium	mg/L	**NV**	--	1.4	3.2	1	1.4	1.2	2.6	7.4	1
Selenium	mg/L	**0.01**	--	--	ND	ND	ND	ND	ND	--	ND
Silver	mg/L	**NV**	--	--	ND	ND	ND	ND	ND	--	ND
Sodium	mg/L	**200**	--	6.3	7.6	5.8	13	6.6	6.6	7.4	4.8
Thallium	mg/L	**NV**	--	--	ND	ND	ND	ND	ND	--	ND
Vanadium	mg/L	**NV**	--	--	0.08	0.01	ND	ND	ND	--	ND
Zinc	mg/L	**5**	--	--	0.12	0.04	ND	ND	ND	--	ND
Comments											
Spring 2004: Sediment in sample may have biased results.											

MW2

Well Details:

	Height (m)	Elevation (m)
Ground Surface	0	100.26
Casing	1.16	101.42
PVC Pipe	1.07	101.33
Depth of Well	3.66	96.6

Parameter	Units	ODWS Guidelines	1996	Fall 2000	Spring 2001	Spring 2002	Fall 2002	Spring 2003	Fall 2003	Spring 2004	Fall 2004
			Dec-96	Nov-00	May-01	Jun-02	Nov-02	Jul-03	Nov-03	Jun-04	Dec-04
Field Parameters											
Water Depth	m	**NA**	1.19	--	1.47	--	2.5	1.9	2.01	1.5	1.63
Water Level Elevation	m	**NA**	99.07	--	98.79	--	97.76	98.36	98.25	98.76	98.63
Conductivity	US/cm	**NV**	--	--	--	--	--	--	--	--	159
pH	unitless	**6.5-8.5**	--	--	--	--	--	--	--	--	8.3
TDS	mg/L	**500**	--	--	--	--	--	--	--	--	79
Temperature	°C	**<15**	4.8	4	5	5.1	9.5	6.2	9.9	--	4.3
General Chemistry											
Alkalinity	mg/L	**30-500**	--	80	80	70	70	65	70	60	65
BOD	mg/L	**NV**	--	ND	ND	2	2	ND	4	2	2
Chloride	mg/L	**250**	5	2.6	22	ND	ND	21	1	ND	ND
COD	mg/L	**NV**	--	79	22	4	ND	11	25	24	5
Conductivity	mg/L	**NV**	--	207	140	--	160	170	160	140	80
DOC	mg/L	**5**	--	--	--	--	2.6	2.6	3	1	7
Hardness	mg/L	**500**	--	68	72	49	80	82	62	43	31
Nitrite (N) [1]	mg/L	**1**	ND	ND	0.3	ND	ND	--	--	ND	ND
Nitrate (N)	mg/L	**10**	ND	1.3	0.3	0.1	0.2	0.3	0.5	0.01	ND
Nitrates + Nitrites (N)	mg/L	**10** [2]	ND	1.3	0.6	0.1	0.2	--	--	0.01	ND
Ammonia/Ammonium (N)	mg/L	**NV**	--	0.03	0.05	ND	0.26	0.11	0.06	0.04	0.12
TKN	mg/L	**NV**	0.3	1.43	0.05	0.12	3.4	--	--	0.7	0.7
Sulphate	mg/L	**500**	57	15.5	240	8	9	10	9	6	7
pH	mg/L	**6.5 - 8.5**	7.08	8.15	7.9	6.8	6.9	8.1	**6.28**	8.11	6.88
TDS	mg/L	**500**	--	116	240	74	74	120	81	110	56
TOC	mg/L	**NV**	7.3	1	2.1	6.6	3	--	34	--	--
Total Phosphorus	mg/L	**NV**	7.08	8.9	0.01	0.02	0.02	--	--	--	--
Metals											
Aluminum	mg/L	**0.1**	ND	--	**0.67**	0.01	ND	0.01	0.02	--	ND
Antimony	mg/L	**0.06**	--	--	ND	ND	ND	ND	ND	--	ND
Arsenic	mg/L	**0.025**	--	--	ND	ND	ND	ND	ND	ND	ND
Barium	mg/L	**1**	--	0.03	0.03	ND	0.01	0.01	0.01	ND	0.01
Beryllium	mg/L	**NV**	ND	--	ND	ND	ND	ND	ND	--	ND
Boron	mg/L	**5**	ND	ND	0.05	ND	ND	ND	ND	ND	ND
Cadmium	mg/L	**0.005**	**0.009**	NA	ND	ND	ND	ND	ND	--	ND
Calcium	mg/L	**NV**	49	22	25	ND	24	29	21	14	7.8
Chromium	mg/L	**0.05**	ND	NA	ND	**16**	ND	ND	ND	--	ND
Cobalt	mg/L	**NV**	0.05	NA	ND	ND	ND	ND	ND	--	ND
Copper	mg/L	**1**	ND	NA	0.01	ND	ND	ND	0.015	--	ND
Iron	mg/L	**0.3**	--	**2.61**	**1**	ND	ND	ND	ND	ND	ND
Lead	mg/L	**0.01**	--	--	ND	ND	ND	ND	ND	--	ND
Magnesium	mg/L	**NV**	--	3.1	3	2.4	5	2.2	2.2	2	2.8
Manganese	mg/L	**0.05**	--	0.029	0.05	ND	ND	ND	ND	ND	ND
Mercury	mg/L	**0.001**	--	--	--	--	--	--	ND	--	--
Molybdenum	mg/L	**NV**	--	--	ND	ND	ND	0.005	ND	--	ND
Nickel	mg/L	**NV**	--	--	ND	ND	ND	ND	ND	--	ND
Potassium	mg/L	**NV**	--	--	1	ND	0.8	0.4	0.2	ND	0.4
Selenium	mg/L	**0.01**	--	--	ND	ND	ND	ND	ND	--	ND
Silver	mg/L	**NV**	--	--	ND	ND	ND	ND	ND	--	ND
Sodium	mg/L	**200**	--	--	6.2	7.4	3.8	11	9.6	12	8.4
Thallium	mg/L	**NV**	--	--	ND	ND	ND	ND	ND	--	ND
Vanadium	mg/L	**NV**	--	--	ND	ND	ND	ND	ND	--	ND
Zinc	mg/L	**5**	--	--	0.02	ND	ND	ND	ND	--	ND
Comments											

MW3-S

Well Details:

	Height (m)	Elevation (m)
Ground Surface	0	99.8
Casing	1.2	101
PVC Pipe	1.06	100.86
Depth of Well	1.5	98.3

Parameter	Units	ODWS Guidelines	1996	Fall 2000	Spring 2001	Spring 2002	Fall 2002	Spring 2003	Fall 2003	Spring 2004	Fall 2004
			Dec-96	Nov-00	May-01	Jun-02	Nov-02	Jul-03	Nov-03	Jun-04	Dec-04
Field Parameters											
Water Depth	m	**NA**	1.96	2.38	1.78	--	DRY	2.08	1.78	1.64	2
Water Level Elevation	m	**NA**	97.84	97.42	98.02	--	DRY	97.72	98.02	98.16	97.8
Conductivity	US/cm	**NV**	--	--	--	--	--	--	--	678	767
pH	unitless	**6.5-8.5**	--	--	--	--	--	--	--	7.3	6.81
TDS	mg/L	**500**	--	--	--	--	--	--	--	--	381
Temperature	°C	**<15**	--	--	--	--	--	--	--	11.3	2.4
General Chemistry											
Alkalinity	mg/L	**30-500**	--	--	--	330	--	--	--	--	--
BOD	mg/L	**NV**	--	--	--	1	--	--	--	--	--
Chloride	mg/L	**250**	--	--	--	1	--	--	--	--	--
COD	mg/L	**NV**	--	--	--	24	--	--	--	--	--
Conductivity	mg/L	**NV**	--	--	--	--	--	--	--	--	--
DOC	mg/L	**5**	--	--	--	--	--	--	--	--	--
Hardness	mg/L	**500**	--	--	--	49	--	--	--	--	--
Nitrite (N) [1]	mg/L	**1**	--	--	--	ND	--	--	--	--	--
Nitrate (N)	mg/L	**10**	--	--	--	3.6	--	--	--	--	--
Nitrates + Nitrites (N)	mg/L	**10** [2]	--	--	--	0.1	--	--	--	--	--
Ammonia/Ammonium (N)	mg/L	**NV**	--	--	--	0.05	--	--	--	--	--
TKN	mg/L	**NV**	--	--	--	0.9	--	--	--	--	--
Sulphate	mg/L	**500**	--	--	--	70	--	--	--	--	--
pH	mg/L	**6.5 - 8.5**	--	--	--	6.8	--	--	--	--	--
TDS	mg/L	**500**	--	--	--	420	--	--	--	--	--
TOC	mg/L	**NV**	--	--	--	19	--	--	--	--	--
Total Phosphorus	mg/L	**NV**	--	--	--	0.06	--	--	--	--	--
Metals											
Aluminum	mg/L	**0.1**	--	--	--	0.05	--	--	--	--	--
Antimony	mg/L	**0.06**	--	--	--	ND	--	--	--	--	--
Arsenic	mg/L	**0.025**	--	--	--	ND	--	--	--	--	--
Barium	mg/L	**1**	--	--	--	0.03	--	--	--	--	--
Beryllium	mg/L	**NV**	--	--	--	ND	--	--	--	--	--
Boron	mg/L	**5**	--	--	--	0.2	--	--	--	--	--
Cadmium	mg/L	**0.005**	--	--	--	ND	--	--	--	--	--
Calcium	mg/L	**NV**	--	--	--	120	--	--	--	--	--
Chromium	mg/L	**0.05**	--	--	--	ND	--	--	--	--	--
Cobalt	mg/L	**NV**	--	--	--	ND	--	--	--	--	--
Copper	mg/L	**1**	--	--	--	ND	--	--	--	--	--
Iron	mg/L	**0.3**	--	--	--	ND	--	--	--	--	--
Lead	mg/L	**0.01**	--	--	--	ND	--	--	--	--	--
Magnesium	mg/L	**NV**	--	--	--	9.4	--	--	--	--	--
Manganese	mg/L	**0.05**	--	--	--	**0.3**	--	--	--	--	--
Mercury	mg/L	**0.001**	--	--	--	ND	--	--	--	--	--
Molybdenum	mg/L	**NV**	--	--	--	ND	--	--	--	--	--
Nickel	mg/L	**NV**	--	--	--	0.025	--	--	--	--	--
Potassium	mg/L	**NV**	--	--	--	4.8	--	--	--	--	--
Selenium	mg/L	**0.01**	--	--	--	ND	--	--	--	--	--
Silver	mg/L	**NV**	--	--	--	ND	--	--	--	--	--
Sodium	mg/L	**200**	--	--	--	13	--	--	--	--	--
Thallium	mg/L	**NV**	--	--	--	ND	--	--	--	--	--
Vanadium	mg/L	**NV**	--	--	--	ND	--	--	--	--	--
Zinc	mg/L	**5**	--	--	--	0.04	--	--	--	--	--

Comments

The well is used only to measure field parameters indicated above as it contains in sufficient groundwater to permit adequate sampling and analysis. In addition MW3-D, *which is installed in the same location, is representative of the same targeted parameters*

MW3-D

Well Details:

	Height (m)	Elevation (m)
Ground Surface	0	99.8
Casing	1.2	101
PVC Pipe	1.1	100.9
Depth of Well	4.88	94.92

Parameter	Units	ODWS Guidelines	1996	Fall 2000	Spring 2001	Spring 2002	Fall 2002	Spring 2003	Fall 2003	Spring 2004	Fall 2004
			Dec-96	Nov-00	May-01	Jun-02	Nov-02	Jul-03	Nov-03	Jun-04	Dec-04
Field Parameters											
Water Depth	m	**NA**	2.01	2.38	1.78	--	2.89	2.1	1.8	1.65	2.04
Water Level Elevation	m	**NA**	97.79	97.42	98.02	--	96.91	97.7	98	98.15	97.76
Conductivity	uS/cm	**NV**	--	--	--	--	--	--	--	571	821
pH	unitless	**6.5-8.5**	--	--	--	--	--	--	--	7.4	6.78
TDS	mg/L	**500**	--	--	--	--	--	--	--	--	410
Temperature	°C	**<15**	4.9	4.1	5	5.2	9.8	6.4	7.9	10.2	4.7
General Chemistry											
Alkalinity	mg/L	**30-500**	--	434	310	380	440	340	330	260	410
BOD	mg/L	**NV**	--	3	3	1	--	ND	--	2	2
Chloride	mg/L	**250**	9	3.3	6.5	2	4	3	2	2	2
COD	mg/L	**NV**	--	247	10	15	30	25	47	11	13
Conductivity	mg/L	**NV**	--	849	760	--	710	850	820	630	850
DOC	mg/L	**5**	--	--	**6**	**14**	**8**	**6.4**	**17**	4	**6**
Hardness	mg/L	**500**	--	426	220	320	210	**578**	**849**	**1216**	**1115.2**
Nitrite (N) [1]	mg/L	**1**	ND	ND	0.01	ND	ND	ND	ND	0.05	ND
Nitrate (N)	mg/L	**10**	ND	0.8	4.7	0.3	0.2	0.3	**20**	1.9	0.7
Nitrates + Nitrites (N)	mg/L	**10** [2]	ND	0.8	4.71	0.3	0.2	0.3	**20**	1.95	0.7
Ammonia/Ammonium (N)	mg/L	**NV**	--	0.07	0.06	0.08	0.18	ND	0.05	0.12	0.12
TKN	mg/L	**NV**	0.65	2.67	0.7	2.4	0.4	0.8	0.8	1	0.4
Sulphate	mg/L	**500**	226	38	120	100	43	140	50	64	57
pH	mg/L	**6.5 - 8.5**	6.68	6.5	7.5	7	6.8	6.56	7.24	7.01	6.64
TDS	mg/L	**500**	--	483	480	**660**	**510**	**600**	**540**	400	**1300**
TOC	mg/L	**NV**	10.6	23	6	22	10	--	--	--	--
Total Phosphorus	mg/L	**NV**	0.02	19	0.02	0.08	0.03	0.01	1.4	--	--
Metals											
Aluminum	mg/L	**0.1**	ND	--	0.06	**0.13**	**0.78**	ND	**0.32**	--	**9.9**
Antimony	mg/L	**0.06**	--	--	ND	ND	ND	ND	ND	--	ND
Arsenic	mg/L	**0.025**	--	--	ND	ND	ND	ND	ND	ND	ND
Barium	mg/L	**1**	--	0.1	0.12	0.1	0.14	0.1	0.33	0.24	1
Beryllium	mg/L	**NV**	ND	--	ND	ND	ND	ND	ND	--	0.003
Boron	mg/L	**5**	0.22	0.19	0.2	0.2	0.2	0.15	0.2	0.25	0.15
Cadmium	mg/L	**0.005**	ND	--	ND	ND	ND	ND	ND	NA	ND
Calcium	mg/L	**NV**	153	159	76	120	70	220	320	470	410
Chromium	mg/L	**0.05**	ND	--	ND	ND	ND	ND	ND	--	ND
Cobalt	mg/L	**NV**	0.02	--	ND	ND	ND	ND	ND	--	0.03
Copper	mg/L	**1**	0.02	--	0.01	ND	0.005	ND	ND	--	0.02
Iron	mg/L	**0.3**	--	--	0.2	ND	**1.6**	ND	ND	ND	ND
Lead	mg/L	**0.01**	--	**0.06**	ND	ND	ND	ND	ND	--	0.001
Magnesium	mg/L	**NV**	--	7	6.4	7.4	8.4	6.8	12	10	22
Manganese	mg/L	**0.05**	--	**2.07**	**0.95**	**0.35**	**0.1**	ND	**0.4**	**0.55**	**3.3**
Mercury	mg/L	**0.001**	--	NA	ND	ND	ND	ND	ND	--	NA
Molybdenum	mg/L	**NV**	--	NA	ND	ND	ND	ND	ND	--	ND
Nickel	mg/L	**NV**	--	NA	0.005	0.005	ND	0.005	0.01	--	0.02
Potassium	mg/L	**NV**	--	6.5	5.2	5.6	5.4	6.2	5.4	6	8.2
Selenium	mg/L	**0.01**	--	--	ND	ND	ND	ND	ND	--	ND
Silver	mg/L	**NV**	--	--	ND	ND	ND	ND	ND	--	ND
Sodium	mg/L	**20/200**	--	3.5	3.8	4.4	4.2	2.8	11	3.2	2.8
Thallium	mg/L	**NV**	--	--	ND	ND	ND	ND	ND	--	ND
Vanadium	mg/L	**NV**	--	--	ND	ND	ND	ND	ND	--	0.01
Zinc	mg/L	**5**	--	--	ND	0.04	ND	0.04	0.06	--	0.06
Volatile Organic Compounds [3]											
Styrene	mg/L	**NV**	--	--	ND	ND	0.0004	ND	ND	ND	ND
Tetrachloroethylene	mg/L	**0.03**	--	--	ND	ND	0.002	ND	ND	ND	ND
Toluene	mg/L	**NV**	--	--	ND	ND	0.005	ND	ND	ND	ND
Comments											
Spring 2004: Sediment in pre-preserved metals containers may haved biased results.											

MW4-S

Well Details:

	Height (m)	Elevation (m)
Ground Surface	0	99.35
Casing	1.02	100.37
PVC Pipe	0.84	100.19
Depth of Well	2.44	96.91

Parameter	Units	ODWS Guidelines	1996	Fall 2000	Spring 2001	Spring 2002	Fall 2002	Spring 2003	Fall 2003	Spring 2004	Fall 2004
			Dec-96	Nov-00	May-01	Jun-02	Nov-02	Jul-03	Nov-03	Jun-04	Dec-04
Field Parameters											
Water Depth	m	**NA**	1.09	0.94	0.86	--	DRY	DRY	0.96	DRY	1.34
Water Level Elevation	m	**NA**	98.26	98.41	98.49	--	DRY	DRY	98.39	DRY	98.01
Conductivity	US/cm	**NV**	--	--	--	--	--	--	--	--	1123
pH	mg/L	**6.5-8.5**	7.58	--	--	7	--	--	7.33	--	7.7
TDS	mg/L	**500**	--	--	--	--	--	--	--	--	576
Temperature	°C	**<15**	4.2	--	--	5	--	--	9.8	--	3.4
General Chemistry											
Alkalinity	mg/L	**30-500**	--	--	--	170	--	--	90	--	--
BOD	mg/L	**NV**	--	--	--	ND	--	--	4	--	--
Chloride	mg/L	**250**	12		--	43	--	--	42	--	--
COD	mg/L	**NV**	--	--	--	16	--	--	42	--	--
Conductivity	mg/L	**NV**	--	--	--	--	--	--	960	--	--
DOC	mg/L	**5**	--	--	--	--	--	--	17	--	--
Hardness	mg/L	**500**	--	--	--	240	--	--	**615**	--	--
Nitrite (N) [1]	mg/L	**1**	ND	--	--	ND	--	--	--	--	--
Nitrate (N)	mg/L	**10**	ND	--	--	ND	--	--	ND	--	--
Nitrates + Nitrites (N)	mg/L	**10** [2]	ND	--	--	ND	--	--	--	--	--
Ammonia/Ammonium (N)	mg/L	**NV**	ND	--	--	ND	--	--	0.09	--	--
TKN	mg/L	**NV**	0.15	--	--	2.7	--	--	--	--	--
Sulphate	mg/L	**500**	53	--	--	130	--	--	460	--	--
pH	mg/L	**6.5 - 8.5**	7.44	--	--	7	--	--	7.33	--	--
TDS	mg/L	**500**	--	--	--	380	--	--	**710**	--	--
TOC	mg/L	**NV**	3.1	--	--	13	--	--	--	--	--
Total Phosphorus	mg/L	**NV**	2.5	--	--	0.05	--	--	--	--	--
Metals											
Aluminum	mg/L	**0.1**	0.05	--	--	0.02	--	--	**14**	--	--
Antimony	mg/L	**0.06**	--	--	--	ND	--	--	ND	--	--
Arsenic	mg/L	**0.025**	--	--	--	ND	--	--	ND	--	--
Barium	mg/L	**1**	--	--	--	0.03	--	--	0.27	--	--
Beryllium	mg/L	**NV**	ND	--	--	ND	--	--	0.003	--	--
Boron	mg/L	**5**	--	--	--	0.25	--	--	0.25	--	--
Cadmium	mg/L	**0.005**	--	--	--	ND	--	--	ND	--	--
Calcium	mg/L	**NV**	51	--	--	72	--	--	210	--	--
Chromium	mg/L	**0.05**	ND	--	--	ND	--	--	ND	--	--
Cobalt	mg/L	**NV**	0.02	--	--	ND	--	--	ND	--	--
Copper	mg/L	**1**	0.039	--	--	ND	--	--	0.05	--	--
Iron	mg/L	**0.3**	--	--	--	ND	--	--	**1**	--	--
Lead	mg/L	**0.01**	--	--	--	ND	--	--	0.01	--	--
Magnesium	mg/L	**NV**	--	--	--	16	--	--	22	--	--
Manganese	mg/L	**0.05**	--	--	--	**0.2**	--	--	**2.6**	--	--
Mercury	mg/L	**0.001**	--	--	--	ND	--	--	ND	--	--
Molybdenum	mg/L	**NV**	--	--	--	ND	--	--	ND	--	--
Nickel	mg/L	**NV**	--	--	--	0.005	--	--	0.015	--	--
Potassium	mg/L	**NV**	--	--	--	2	--	--	20	--	--
Selenium	mg/L	**0.01**	--	--	--	ND	--	--	ND	--	--
Silver	mg/L	**NV**	--	--	--	ND	--	--	ND	--	--
Sodium	mg/L	**200**	--	--	--	16	--	--	33	--	--
Thallium	mg/L	**NV**	--	--	--	ND	--	--	ND	--	--
Vanadium	mg/L	**NV**	--	--	--	ND	--	--	0.01	--	--
Zinc	mg/L	**5**	--	--	--	0.06	--	--	0.06	--	--
Comments											

MW4-D

Well Details:

	Height (m)	Elevation (m)
Ground Surface	0	99.35
Casing	1.02	100.37
PVC Pipe	0.85	100.2
Depth of Well	4.26	95.09

Parameter	Units	ODWS Guidelines	1996	Fall 2000	Spring 2001	Spring 2002	Fall 2002	Spring 2003	Fall 2003	Spring 2004	Fall 2004
			Dec-96	Nov-00	May-01	Jun-02	Nov-02	Jul-03	Nov-03	Jun-04	Dec-04
Field Parameters											
Water Depth	m	**NA**	3.82	DRY	3.75	--	DRY	DRY	DRY	DRY	DRY
Water Level Elevation	m	**NA**	95.53	DRY	95.6	--	DRY	DRY	DRY	DRY	DRY
Conductivity	US/cm	**NV**	--	--	--	--	--	--	--	--	--
pH	mg/L	**6.5-8.5**	7.58	--	--	7.2	--	--	--	--	--
TDS	mg/L	**500**	--	--	--	--	--	--	--	--	--
Temperature	°C	**<15**	4.2	--	--	5	--	--	--	--	--
General Chemistry											
Alkalinity	mg/L	**30-500**	--	--	--	140	--	--	--	--	--
BOD	mg/L	**NV**	--	--	--	ND	--	--	--	--	--
Chloride	mg/L	**250**	12	--	--	4	--	--	--	--	--
COD	mg/L	**NV**	--	--	--	10	--	--	--	--	--
Conductivity	mg/L	**NV**	--	--	--	--	--	--	--	--	--
DOC	mg/L	**5**	--	--	--	--	--	--	--	--	--
Hardness	mg/L	**500**	--	--	--	100	--	--	--	--	--
Nitrite (N) [1]	mg/L	**1**	ND	--	--	ND	--	--	--	--	--
Nitrate (N)	mg/L	**10**	0.28	--	--	0.2	--	--	--	--	--
Nitrates + Nitrites (N)	mg/L	**10** [2]	0.28	--	--	0.2	--	--	--	--	--
Ammonia/Ammonium (N)	mg/L	**NV**	--	--	--	ND	--	--	--	--	--
TKN	mg/L	**NV**	0.89	--	--	1.8	--	--	--	--	--
Sulphate	mg/L	**500**	54	--	--	55	--	--	--	--	--
pH	mg/L	**6.5 - 8.5**	7.58	--	--	7.2	--	--	--	--	--
TDS	mg/L	**500**	--	--	--	420	--	--	--	--	--
TOC	mg/L	**NV**	21.4	--	--	17	--	--	--	--	--
Total Phosphorus	mg/L	**NV**	21.4	--	--	0.4	--	--	--	--	--
Metals											
Aluminum	mg/L	**0.1**	--	--	--	ND	--	--	--	--	--
Antimony	mg/L	**0.06**	--	--	--	ND	--	--	--	--	--
Arsenic	mg/L	**0.025**	--	--	--	ND	--	--	--	--	--
Barium	mg/L	**1**	--	--	--	0.05	--	--	--	--	--
Beryllium	mg/L	**NV**	--	--	--	ND	--	--	--	--	--
Boron	mg/L	**5**	--	--	--	0.3	--	--	--	--	--
Cadmium	mg/L	**0.005**	**0.008**	--	--	ND	--	--	--	--	--
Calcium	mg/L	**NV**	35	--	--	31	--	--	--	--	--
Chromium	mg/L	**0.05**	ND	--	--	ND	--	--	--	--	--
Cobalt	mg/L	**NV**	0.1	--	--	ND	--	--	--	--	--
Copper	mg/L	**1**	0.117	--	--	ND	--	--	--	--	--
Iron	mg/L	**0.3**	--	--	--	ND	--	--	--	--	--
Lead	mg/L	**0.01**	--	--	--	ND	--	--	--	--	--
Magnesium	mg/L	**NV**	--	--	--	5.2	--	--	--	--	--
Manganese	mg/L	**0.05**	--	--	--	ND	--	--	--	--	--
Mercury	mg/L	**0.001**	--	--	--	NA	--	--	--	--	--
Molybdenum	mg/L	**NV**	--	--	--	0.01	--	--	--	--	--
Nickel	mg/L	**NV**	--	--	--	ND	--	--	--	--	--
Potassium	mg/L	**NV**	--	--	--	9.6	--	--	--	--	--
Selenium	mg/L	**0.01**	--	--	--	ND	--	--	--	--	--
Silver	mg/L	**NV**	--	--	--	ND	--	--	--	--	--
Sodium	mg/L	**20/ 200**	--	--	--	**21**	--	--	--	--	--
Thallium	mg/L	**NV**	--	--	--	ND	--	--	--	--	--
Vanadium	mg/L	**NV**	--	--	--	ND	--	--	--	--	--
Zinc	mg/L	**5**	--	--	--	0.02	--	--	--	--	--
Comments											

MW5-S

Well Details:

	Height (m)	Elevation (m)
Ground Surface	0	97.67
Casing	1.04	98.71
PVC Pipe	1.03	98.7
Depth of Well	3.66	94.01

Parameter	Units	ODWS Guidelines	Fall 2000	Spring 2001	Spring 2002	Fall 2002	Spring 2003	Fall 2003	Spring 2004	Fall 2004
			Nov-00	May-01	Jun-02	Nov-02	Jul-03	Nov-03	Jun-04	Dec-04
Field Parameters										
Water Depth	m	**NA**	0.15	0.11	--	0.85	0.73	0.82	0.3	0.39
Water Level Elevation	m	**NA**	97.52	97.56	--	96.82	96.94	96.85	97.37	97.28
Conductivity	US/cm	**NV**	--	--	--	--	--	--	225	363
pH	mg/L	**6.5-8.5**	--	--	--	--	--	--	8.6	7.15
TDS	mg/L	**500**	--	--	--	--	--	--	--	165
Temperature	°C	**<15**	4	5.5	5.2	13	5.4	7.9	8	2.6
General Chemistry										
Alkalinity	mg/L	**30-500**	91	90	75	60	60	60	60	55
BOD	mg/L	**NV**	ND	1	1	ND	ND	2	2	2
Chloride	mg/L	**250**	3.6	26	3	2	2	3	2	3
COD	mg/L	**NV**	23	31	8	22	19	40	8	7
Conductivity	mg/L	**NV**	245	210	--	180	160	170	170	160
DOC	mg/L	**5**	--	--	--	2.8	2	3.5	1.5	3.5
Hardness	mg/L	**500**	108	84	68	66	87	74	69	46
Nitrite (N) [1]	mg/L	**1**	ND	0.2	ND	ND	--	--	ND	ND
Nitrate (N)	mg/L	**10**	0.8	0.1	ND	0.7	ND	ND	0.1	ND
Nitrates + Nitrites (N)	mg/L	**10** [2]	0.8	0.3	ND	0.7	--	--	0.1	ND
Ammonia/Ammonium (N)	mg/L	**NV**	0.08	0.08	0.04	0.1	0.11	0.06	0.16	0.18
TKN	mg/L	**NV**	0.72	0.35	1.3	0.3	--	--	0.6	0.7
Sulphate	mg/L	**500**	19.9	220	14	14	15	15	13	14
pH	mg/L	**6.5 - 8.5**	7.45	7.7	6.7	6.7	7.37	7.72	7.01	7.15
TDS	mg/L	**500**	127	270	110	98	120	120	140	120
TOC	mg/L	**NV**	4	2.1	9	2.8	--	--	--	--
Total Phosphorus	mg/L	**NV**	5.32	0.01	0.03	0.03	--	--	--	--
Metals										
Aluminum	mg/L	**0.1**	--	**0.71**	0.01	0.05	0.01	ND	--	ND
Antimony	mg/L	**0.06**	--	ND	ND	ND	ND	ND	--	ND
Arsenic	mg/L	**0.025**	--	ND	ND	ND	ND	ND	ND	ND
Barium	mg/L	**1**	0.02	0.04	0.01	0.01	0.1	ND	0.01	ND
Beryllium	mg/L	**NV**	--	ND	ND	ND	ND	ND	--	ND
Boron	mg/L	**5**	ND	0.05	ND	ND	ND	ND	ND	ND
Cadmium	mg/L	**0.005**	--	ND	ND	ND	ND	ND	--	ND
Calcium	mg/L	**NV**	32	28	19	18	27	22	19	8.8
Chromium	mg/L	**0.05**	--	ND	ND	ND	ND	ND	--	ND
Cobalt	mg/L	**NV**	--	ND	ND	ND	ND	ND	--	ND
Copper	mg/L	**1**	--	0.01	ND	ND	ND	ND	--	ND
Iron	mg/L	**0.3**	**0.88**	**2.6**	**2.4**	**2**	**2**	**2.6**	**1.7**	**2.2**
Lead	mg/L	**0.01**	--	ND	ND	ND	ND	ND	--	ND
Magnesium	mg/L	**NV**	6.8	4.4	5	4.8	4.8	4.6	5.2	5.8
Manganese	mg/L	**0.05**	**0.089**	**0.15**	**0.1**	**0.1**	**0.1**	**0.15**	**0.15**	**0.1**
Mercury	mg/L	**0.001**	--	--	--	--	ND	ND	--	--
Molybdenum	mg/L	**NV**	--	ND	0.01	ND	ND	ND	--	ND
Nickel	mg/L	**NV**	--		ND	ND	ND	ND	--	ND
Potassium	mg/L	**NV**	1.9	0.2	ND	0.4	3.4	1.2	0.8	0.6
Selenium	mg/L	**0.01**	--	ND	ND	ND	ND	ND	--	ND
Silver	mg/L	**NV**	--	ND	ND	ND	ND	ND	--	ND
Sodium	mg/L	**200**	3.6	2	3.2	3.8	3.4	3.4	3.4	2.8
Thallium	mg/L	**NV**	--	ND	ND	ND	ND	ND	--	ND
Vanadium	mg/L	**NV**	--	ND	ND	ND	ND	ND	--	ND
Zinc	mg/L	**5**	--	0.02	0.02	ND	ND	0.04	--	ND
Comments										

MW5-D

Well Details:

	Height (m)	Elevation (m)
Ground Surface	0	97.64
Casing	0.87	98.51
PVC Pipe	0.8	98.44
Depth of Well	11.99	85.65

Parameter	Units	ODWS Guidelines	Fall 2000	Spring 2001	Spring 2002	Fall 2002	Spring 2003	Fall 2003	Spring 2004	Fall 2004
			Nov-00	May-01	Jun-02	Nov-02	Jul-03	Nov-03	Jun-04	Dec-04
Field Parameters										
Water Depth	m	NA	7.11	5.39	--	7.99	6.58	7.7	6.59	7.41
Water Level Elevation	m	NA	90.53	92.25	--	89.65	91.06	89.94	91.05	90.23
Conductivity	US/cm	NV	--	--	--	--	--	--	350	203
pH	mg/L	6.5-8.5	--	--	--	--	--	--	7.95	7.87
TDS	mg/L	500	--	--	--	--	--	--	--	103
Temperature	°C	<15	3.8	7	--	8	7.1	7.5	10.1	4
General Chemistry										
Alkalinity	mg/L	30-500	171	160	--	160	160	150	150	160
BOD	mg/L	NV	ND	1	--	ND	ND	1	2	2
Chloride	mg/L	250	5.4	8.5	--	1	--	2	1	2
COD	mg/L	NV	34	19	--	24	16	62	10	10
Conductivity	mg/L	NV	286	340	--	310	330	330	320	310
DOC	mg/L	5	--	--	--	**6**	**6.2**	**9.5**	4.5	5
Hardness	mg/L	500	170	130	--	79	196	172	145.3	122.84
Nitrite (N) [1]	mg/L	1	ND	0.1	--	ND	--	ND	ND	ND
Nitrate (N)	mg/L	10	0.8	0.2	--	ND	ND	ND	ND	ND
Nitrates + Nitrites (N)	mg/L	10 [2]	0.8	0.3	--	ND	--	ND	ND	ND
Ammonia/Ammonium (N)	mg/L	NV	0.16	0.09	--	0.11	0.16	0.09	0.17	0.15
TKN	mg/L	NV	2.75	0.45	--	0.3	--	0.5	0.6	6
Sulphate	mg/L	500	21.2	50	--	11	9	13	8	7
pH	mg/L	6.5 - 8.5	7.29	8	--	7.3	7.61	8.28	7.38	6.88
TDS	mg/L	500	207	230	--	170	210	220	390	180
TOC	mg/L	NV	1	3.9	--	7.2	--	--	--	--
Total Phosphorus	mg/L	NV	2.56	0.08	--	0.06	--	0.05	--	--
Metals										
Aluminum	mg/L	0.1	--	**0.28**	--	0.03	0.02	ND	--	ND
Antimony	mg/L	0.06	--	ND	--	ND	ND	ND	--	ND
Arsenic	mg/L	0.025	--	ND	--	ND	ND	ND	ND	ND
Barium	mg/L	1	0.14	0.14	--	0.15	0.13	0.13	0.12	0.09
Beryllium	mg/L	NV	--	ND	--	ND	ND	ND	ND	ND
Boron	mg/L	5	0.06	0.05	--	ND	ND	ND	ND	ND
Cadmium	mg/L	0.005	NA	ND	--	ND	ND	ND	--	ND
Calcium	mg/L	NV	52	43	--	19	67	56	45	37
Chromium	mg/L	0.05	--	ND	--	ND	ND	ND	--	ND
Cobalt	mg/L	NV	--	ND	--	ND	ND	ND	--	ND
Copper	mg/L	1	--	0.01	--	ND	ND	ND	--	ND
Iron	mg/L	0.3	0.05	0.08	--	**1.2**	**1.2**	**1.4**	**1.4**	**1**
Lead	mg/L	0.01	NA	ND	--	ND	ND	ND	--	ND
Magnesium	mg/L	NV	9.7	6.4	--	7.6	7	7.8	8	7.4
Manganese	mg/L	0.05	**0.105**	**0.2**	--	**0.2**	**0.35**	**0.25**	**0.25**	**0.15**
Mercury	mg/L	0.001	--	--	--	ND	--	ND	--	--
Molybdenum	mg/L	NV	--	ND	--	ND	ND	ND	--	ND
Nickel	mg/L	NV	--	ND	--	ND	ND	ND	--	ND
Potassium	mg/L	NV	3.8	1	--	0.6	1.4	2	1.2	1.2
Selenium	mg/L	0.01	--	ND	--	ND	ND	ND	--	ND
Silver	mg/L	NV	--	ND	--	ND	ND	ND	--	ND
Sodium	mg/L	200	8.4	8.8	--	5	4.2	5.4	4.6	7.4
Thallium	mg/L	NV	--	ND	--	ND	ND	ND	--	ND
Vanadium	mg/L	NV	--	ND	--	ND	ND	ND	--	ND
Zinc	mg/L	5	--	0.02	--	ND	ND	0.04	--	ND
Volatile Organic Compounds [3]										
Styrene	mg/L	NV	--	--	--	ND	--	ND	--	--
Tetrachloroethylene	mg/L	0.03	--	--	--	ND	--	ND	--	--
Toluene	mg/L	NV	--	--	--	ND	--	ND	--	--
Comments										

MW7

Well Details:

	Height (m)	Elevation (m)
Ground Surface	0	96.17
Casing	0.87	97.04
PVC Pipe	0.85	97.02
Depth of Well	6.76	89.41

Parameter	Units	ODWS Guidelines	Fall 2000	Spring 2001	Spring 2002	Fall 2002	Spring 2003	Fall 2003	Spring 2004	Fall 2004
			Nov-00	May-01	Jun-02	Nov-02	Jul-03	Nov-03	Jun-04	Dec-04
Field Parameters										
Water Depth	m	NA	--	5.31	--	6.6	DRY	DRY	6.74	DRY
Water Level Elevation	m	NA	--	90.86	--	89.57	DRY	DRY	89.43	DRY
Conductivity	US/cm	NV	--	--	--	--	--	--	--	--
pH	mg/L	6.5-8.5	--	--	--	--	--	--	--	--
TDS	mg/L	500	--	--	--	--	--	--	--	--
Temperature	°C	<15	--	--	--	--	--	--	--	--
General Chemistry										
Alkalinity	mg/L	30-500	22	80	70	--	--	--	--	--
BOD	mg/L	NV	ND	1	1	--	--	--	--	--
Chloride	mg/L	250	7.5	12	ND	--	--	--	--	--
COD	mg/L	NV	55	2	3	--	--	--	--	--
Conductivity	mg/L	NV	105	220	--	--	--	--	--	--
DOC	mg/L	5	--	2	**8.8**	--	--	--	--	--
Hardness	mg/L	500	37	91	51	--	--	--	--	--
Nitrite (N) [1]	mg/L	1	ND	0.1	ND	--	--	--	--	--
Nitrate (N)	mg/L	10	ND	0.2	0.2	--	--	--	--	--
Nitrates + Nitrites (N)	mg/L	10 [2]	ND	0.3	0.2	--	--	--	--	--
Ammonia/Ammonium (N)	mg/L	NV	0.09	0.04	0.03	--	--	--	--	--
TKN	mg/L	NV	1.61	0.3	0.5	--	--	--	--	--
Sulphate	mg/L	500	15.3	34	10	--	--	--	--	--
pH	mg/L	6.5 - 8.5	5.82	7.9	6.8	--	--	--	--	--
TDS	mg/L	500	55	120	180	--	--	--	--	--
TOC	mg/L	NV	23	3	8.6	--	--	--	--	--
Total Phosphorus	mg/L	NV	9.87	0.02	0.04	--	--	--	--	--
Metals										
Aluminum	mg/L	0.1	--	**0.16**	ND	--	--	--	--	--
Antimony	mg/L	0.06	--	ND	ND	--	--	--	--	--
Arsenic	mg/L	0.025	--	ND	ND	--	--	--	--	--
Barium	mg/L	1	0.02	0.01	ND	--	--	--	--	--
Beryllium	mg/L	NV	--	ND	ND	--	--	--	--	--
Boron	mg/L	5	0.05	0.05	ND	--	--	--	--	--
Cadmium	mg/L	0.005	NA	ND	ND	--	--	--	--	--
Calcium	mg/L	NV	11.4	28	17	--	--	--	--	--
Chromium	mg/L	0.05	--	ND	ND	--	--	--	--	--
Cobalt	mg/L	NV	--	ND	ND	--	--	--	--	--
Copper	mg/L	1	--	0.05	0.01	--	--	--	--	--
Iron	mg/L	0.3	0.43	0.2	ND	--	--	--	--	--
Lead	mg/L	0.01	--	ND	ND	--	--	--	--	--
Magnesium	mg/L	NV	2	5	2	--	--	--	--	--
Manganese	mg/L	0.05	0.24	0.05	ND	--	--	--	--	--
Mercury	mg/L	0.001	--	ND	ND	--	--	--	--	--
Molybdenum	mg/L	NV	--	ND	ND	--	--	--	--	--
Nickel	mg/L	NV	--	ND	ND	--	--	--	--	--
Potassium	mg/L	NV	ND	0.4	ND	--	--	--	--	--
Selenium	mg/L	0.01	--	ND	ND	--	--	--	--	--
Silver	mg/L	NV	--	ND	ND	--	--	--	--	--
Sodium	mg/L	200	4.9	9.6	3.4	--	--	--	--	--
Thallium	mg/L	NV	--	ND	ND	--	--	--	--	--
Vanadium	mg/L	NV	--	ND	ND	--	--	--	--	--
Zinc	mg/L	5	--	ND	0.02	--	--	--	--	--
Volatile Organic Compounds [3]										
Styrene	mg/L	NV	--	ND	0.0012	--	--	--	--	--
Tetrachloroethylene	mg/L	0.03	--	ND	0.0015	--	--	--	--	--
Toluene	mg/L	NV	--	ND	0.001	--	--	--	--	--
Comments										

MW8-S

Well Details:

	Height (m)	Elevation (m)
Ground Surface	0	99.23
Casing	1.04	100.27
PVC Pipe	0.9	100.13
Depth of Well	3.76	95.47

Parameter	Units	ODWS Guidelines	Fall 2000	Spring 2001	Spring 2002	Fall 2002	Spring 2003	Fall 2003	Spring 2004	Fall 2004
			Nov-00	May-01	Jun-02	Nov-02	Jul-03	Nov-03	Jun-04	Dec-04
Field Parameters										
Water Depth	m	NA	1.61	1.08	--	1.98	1.6	1.27	1.29	1.38
Water Level Elevation	m	NA	97.62	98.15	--	97.25	97.63	97.96	97.94	97.85
Conductivity	US/cm	NV	--	--	--	--	--	--	116	100
pH	mg/L	6.5-8.5	--	--	--	--	--	--	8.27	7.05
TDS	mg/L	500	--	--	--	--	--	--	--	51
Temperature	°C	<15	4.2	5	5.2	7.1	5.4	11.1	11.5	5.6
General Chemistry										
Alkalinity	mg/L	30-500	22	15	5	10	ND	5	10	20
BOD	mg/L	NV	ND	ND	1	2	ND	2	ND	2
Chloride	mg/L	250	7.5	14	3	3	2	2	7	6
COD	mg/L	NV	55	51	2	28	14	23	1	35
Conductivity	mg/L	NV	105	80	--	80	80	90	120	90
DOC	mg/L	5	--	1	**9.4**	**13**	**18**	1	1.5	3
Hardness	mg/L	500	37	31	20	30	27	27	40	34
Nitrite (N) [1]	mg/L	1	ND	0.1	ND	ND	--	ND	0.4	ND
Nitrate (N)	mg/L	10	ND	0.2	2.5	4	5.3	6.9	ND	ND
Nitrates + Nitrites (N)	mg/L	10 [2]	ND	0.3	2.5	4	--	6.9	0.4	ND
Ammonia/Ammonium (N)	mg/L	NV	0.09	0.05	ND	0.03	0.03	ND	0.1	0.04
TKN	mg/L	NV	1.61	ND	0.6	0.6	--	0.6	0.1	0.7
Sulphate	mg/L	500	15.3	34	6	7	6	7	24	12
pH	mg/L	6.5 - 8.5	5.82	**6.4**	7	7	5.86	6.46	5.71	5.94
TDS	mg/L	500	55	100	120	58	110	90	110	76
TOC	mg/L	NV	23	3.9	9.4	20	--	--	--	--
Total Phosphorus	mg/L	NV	9.98	0.001	0.001	0.0001	--	0.06	--	--
Metals										
Aluminum	mg/L	0.1	--	**0.49**	ND	ND	ND	ND	--	ND
Antimony	mg/L	0.06	--	ND	ND	ND	ND	ND	--	ND
Arsenic	mg/L	0.025	--	ND	ND	ND	ND	ND	ND	ND
Barium	mg/L	1	0.02	0.2	ND	ND	ND	ND	0.01	0.01
Beryllium	mg/L	NV	--	ND	ND	ND	ND	ND	--	ND
Boron	mg/L	5	0.05	0.05	ND	ND	ND	ND	ND	ND
Cadmium	mg/L	0.005	--	ND	ND	ND	ND	ND	--	ND
Calcium	mg/L	NV	11.4	8.4	6	7.6	8.8	9	12	10
Chromium	mg/L	0.05	--	ND	ND	ND	ND	ND	--	ND
Cobalt	mg/L	NV	--	ND	ND	ND	ND	ND	--	ND
Copper	mg/L	1	--	0.01	ND	ND	ND	ND	--	ND
Iron	mg/L	0.3	**0.43**	**0.4**	ND	ND	ND	ND	ND	ND
Lead	mg/L	0.01	--	ND	ND	ND	ND	ND	--	ND
Magnesium	mg/L	NV	2	2.4	1.2	2.6	1.2	1.2	2.4	2.2
Manganese	mg/L	0.05	**0.24**	**0.15**	0.05	ND	ND	ND	ND	**0.1**
Mercury	mg/L	0.001	--	ND	ND	ND	--	ND	--	--
Molybdenum	mg/L	NV	--	ND	ND	ND	ND	ND	--	ND
Nickel	mg/L	NV	--	ND	ND	ND	ND	ND	--	ND
Potassium	mg/L	NV	ND	0.2	ND	1.2	0.6	0.4	0.4	0.4
Selenium	mg/L	0.01	--	ND	ND	ND	ND	ND	--	ND
Silver	mg/L	NV	--	ND	ND	ND	ND	ND	--	ND
Sodium	mg/L	200	4.9	3.8	2.8	2.8	2.6	2.4	4	2.4
Thallium	mg/L	NV	--	ND	ND	ND	ND	ND	--	ND
Vanadium	mg/L	NV	--	ND	ND	ND	ND	ND	--	ND
Zinc	mg/L	5	--	ND	0.02	ND	ND	0.2	--	ND
Volatile Organic Compounds [3]										
Styrene	mg/L	NV	--	ND	0.0008	0.0044	--	0.0024	ND	ND
Tetrachloroethylene	mg/L	0.03	--	ND	0.0005	0.001	--	ND	ND	0.0004
Toluene	mg/L	NV	--	ND	0.0025	0.002	--	ND	ND	ND
Comments										

MW8-D

Well Details:

	Height (m)	Elevation (m)
Ground Surface	0	99.19
Casing	1.01	100.2
PVC Pipe	0.93	100.12
Depth of Well	11.46	87.73

Parameter	Units	ODWS Guidelines	Fall 2000	Spring 2001	Spring 2002	Fall 2002	Spring 2003	Fall 2003	Spring 2004	Fall 2004
			Nov-00	May-01	Jun-02	Nov-02	Jul-03	Nov-03	Jun-04	Dec-04
Field Parameters										
Water Depth from Well Casing	m	NA	8.84	7.13	--	8.66	8.39	8.85	8.12	8.81
Water Level Elevation	m	NA	90.35	92.06	--	90.53	90.8	90.34	91.07	90.38
Conductivity	US/cm	NV	--	--	--	--	--	--	289	315
pH	mg/L	6.5-8.5	--	--	--	--	--	--	7.95	7.15
TDS	mg/L	500	--	--	--	--	--	--	--	157
Temperature	°C	<15	3.7	8	8	8.1	8.2	10	12	4.4
General Chemistry										
Alkalinity	mg/L	30-500	201	130	130	130	120	130	120	130
BOD	mg/L	NV	5	27	1	ND	ND	2	ND	ND
Chloride	mg/L	250	8.7	13	6	4	3	4	3	4
COD	mg/L	NV	982	22	2	32	8	42	1	1
Conductivity	mg/L	NV	--	479	280	--	300	280	300	290
DOC	mg/L	5	--	2	--	1.4	2	2.5	**20**	**25**
Hardness	mg/L	500	250	130	130	74	167	157	125	34
Nitrite (N) [1]	mg/L	1	ND	0.1	ND	ND	0.3	--	ND	ND
Nitrate (N)	mg/L	10	ND	0.3	1.5	0.7	0.3	0.3	0.3	ND
Nitrates + Nitrites (N)	mg/L	10 [2]	ND	0.4	1.5	0.7	0.6	--	0.3	ND
Ammonia/Ammonium (N)	mg/L	NV	0.11	0.04	0.03	0.02	0.05	0.02	0.07	0.1
TKN	mg/L	NV	2.35	0.2	0.5	0.2	0.2	--	0.3	0.5
Sulphate	mg/L	500	58.1	100	26	22	17	24	15	22
pH	mg/L	6.5 - 8.5	7.63	8	7	6.9	7.74	8.35	7.57	7.24
TDS	mg/L	500	291	280	170	76	190	153	190	260
TOC	mg/L	NV	ND	2.1	5.2	3.2	--	8	--	--
Total Phosphorus	mg/L	NV	0.01	0.01	0.05	0.09	0.03	--	--	--
Metals										
Aluminum	mg/L	0.1	--	**0.34**	0.03	**0.12**	0.02	ND	--	ND
Antimony	mg/L	0.06	--	ND	ND	ND	ND	ND	--	ND
Arsenic	mg/L	0.025	--	ND	ND	ND	ND	ND	ND	ND
Barium	mg/L	1	0.09	0.06	0.04	0.04	ND	0.04	0.05	0.03
Beryllium	mg/L	NV	--	ND	ND	ND	ND	ND	ND	ND
Boron	mg/L	5	ND	0.05	ND	ND	ND	ND	ND	ND
Cadmium	mg/L	0.005	--	ND	ND	ND	ND	ND	--	ND
Calcium	mg/L	NV	68.5	42	38	17	62	50	39	10
Chromium	mg/L	0.05	--	ND	ND	ND	ND	ND	NA	ND
Cobalt	mg/L	NV	--	ND	ND	ND	ND	ND	--	ND
Copper	mg/L	1	--	0.01	ND	ND	ND	ND	--	ND
Iron	mg/L	0.3	**0.85**	**0.6**	ND	ND	ND	ND	ND	ND
Lead	mg/L	0.01	--	ND	ND	ND	ND	ND	--	ND
Magnesium	mg/L	NV	19.1	7	7.4	7.8	3	7.8	6.6	2.2
Manganese	mg/L	0.05	**0.554**	**0.15**	ND	0.05	ND	ND	ND	**0.1**
Mercury	mg/L	0.001	--	ND	--	ND	ND	ND	--	--
Molybdenum	mg/L	NV	--	ND	0.01	ND	ND	ND	--	ND
Nickel	mg/L	NV	--	ND	ND	ND	ND	ND	--	ND
Potassium	mg/L	NV	5.6	1	0.8	1	1.2	1.6	1	1.4
Selenium	mg/L	0.01	--	ND	ND	ND	ND	ND	--	ND
Silver	mg/L	NV	--	ND	ND	ND	ND	ND	--	ND
Sodium	mg/L	200	9.1	3	3.2	3.6	2.2	2.8	3.2	2.8
Thallium	mg/L	NV	--	ND	ND	ND	ND	ND	--	ND
Vanadium	mg/L	NV	--	ND	ND	ND	ND	ND	--	ND
Zinc	mg/L	5	--	ND	0.02	ND	ND	0.02	--	ND
Volatile Organic Compounds [3]										
Styrene	mg/L	NV	--	ND	0.0004	0.0004	ND	--	ND	ND
Tetrachloroethylene	mg/L	0.03	--	ND	ND	0.001	ND	--	ND	0.0008
Toluene	mg/L	NV	--	ND	0.0015	0.0005	ND	--	ND	ND
Comments										

MW11

Well Details:

	Height (m)	Elevation (m)
Ground Surface	0	99.53
Casing	0.96	100.49
PVC Pipe	0.88	100.41
Depth of Well	5.86	93.67

Parameter	Units	ODWS Guidelines	Fall 2000	Spring 2001	Spring 2002	Fall 2002	Spring 2003	Fall 2003	Spring 2004	Fall 2004
			Nov-00	May-01	Jun-02	Nov-02	Jul-03	Nov-03	Jun-04	Dec-04
Field Parameters										
Water Depth	m	NA	4.87	4.27	--	5.13	4.48	4.5	4.62	4.66
Water Level Elevation	m	NA	94.66	95.26	--	94.4	95.05	95.03	94.91	94.87
Conductivity	US/cm	NV	--	--	--	--	--	--	390	525
pH	mg/L	6.5-8.5	--	--	--	--	--	--	8.28	6.75
TDS	mg/L	500	--	--	--	--	--	--	--	260
Temperature	°C	<15	4.1	8	6	7	6.2	9.6	10.1	5
General Chemistry										
Alkalinity	mg/L	30-500	167	160	160	190	160	170	160	180
BOD	mg/L	NV	ND	2	ND	2	ND	1	4	ND
Chloride	mg/L	250	10.5	19	8	9	8	8	8	9
COD	mg/L	NV	233	40	19	33	6	45	6	1
Conductivity	mg/L	NV	410	380	--	420	390	410	400	400
DOC	mg/L	5	--	--	0.6	2.4	2.2	2.5	2	2.5
Hardness	mg/L	500	199	110	140	100	256	234	140	165
Nitrite (N) [1]	mg/L	1	ND	0.1	ND	ND	ND	ND	ND	ND
Nitrate (N)	mg/L	10	3.1	2.2	2.2	2.5	2.7	3	3.2	2.9
Nitrates + Nitrites (N)	mg/L	10 [2]	3.1	2.3	2.2	2.5	2.7	3	3.2	2.9
Ammonia/Ammonium (N)	mg/L	NV	0.05	0.08	ND	0.07	0.03	0.04	0.05	0.03
TKN	mg/L	NV	0.71	1.4	0.6	0.5	ND	0.6	0.3	0.6
Sulphate	mg/L	500	24.7	63	18	15	18	21	17	18
pH	mg/L	6.5 - 8.5	7.4	7.8	7	7.4	7.67	8.5	7.78	7.55
TDS	mg/L	500	233	270	270	210	260	270	260	300
TOC	mg/L	NV	ND	3.9	4	3.4	--	ND	--	--
Total Phosphorus	mg/L	NV	ND	0.01	0.02	0.03	ND	0.03	--	--
Metals										
Aluminum	mg/L	0.1	--	0.09	ND	ND	ND	ND	--	ND
Antimony	mg/L	0.06	--	ND	ND	ND	ND	ND	--	ND
Arsenic	mg/L	0.025	--	ND	ND	ND	ND	ND	ND	ND
Barium	mg/L	1	0.05	0.04	0.03	0.04	0.03	0.04	0.03	0.03
Beryllium	mg/L	NV	--	ND	ND	ND	ND	ND	--	ND
Boron	mg/L	5	0.02	0.05	ND	ND	ND	ND	ND	ND
Cadmium	mg/L	0.005	--	ND	ND	ND	ND	ND	--	ND
Calcium	mg/L	NV	66.4	34	44	30	92	81	56	66
Chromium	mg/L	0.05	--	ND	ND	ND	ND	ND	--	ND
Cobalt	mg/L	NV	--	ND	ND	ND	ND	ND	--	ND
Copper	mg/L	1	--	0.01	ND	0.01	ND	ND	--	ND
Iron	mg/L	0.3	ND	0.2	ND	ND	ND	ND	ND	ND
Lead	mg/L	0.01	--	ND	ND	ND	ND	ND	--	ND
Magnesium	mg/L	NV	8	5.8	6.4	7.2	6.4	7.6	7.6	7.6
Manganese	mg/L	0.05	ND	0.05	ND	ND	ND	ND	ND	ND
Mercury	mg/L	0.001	--	--	ND	ND	ND	ND	--	--
Molybdenum	mg/L	NV	--	ND	ND	ND	ND	ND	--	ND
Nickel	mg/L	NV	--	ND	ND	ND	ND	ND	--	ND
Potassium	mg/L	NV	4.4	1	ND	0.4	1	1	0.6	0.4
Selenium	mg/L	0.01	--	ND	ND	ND	ND	ND	--	ND
Silver	mg/L	NV	--	ND	ND	ND	ND	ND	--	ND
Sodium	mg/L	200	5.1	4	3.4	4	3.2	3.2	3.4	2.8
Thallium	mg/L	NV	--	ND	ND	ND	ND	ND	--	ND
Vanadium	mg/L	NV	--	ND	ND	ND	ND	ND	--	ND
Zinc	mg/L	5	--	ND	0.02	ND	ND	0.02	--	ND
Volatile Organic Compounds [3]										
Styrene	mg/L	NV	--	--	0.0008	0.002	ND	ND	ND	ND
Tetrachloroethylene	mg/L	0.03	--	--	0.003	0.002	ND	ND	ND	0.0008
Toluene	mg/L	NV	--	--	0.0025	0.001	ND	ND	ND	ND
Comments										

MW12-S

Well Details:

	Height (m)	Elevation (m)
Ground Surface	0	96.05
Casing	0.96	97.01
PVC Pipe	0.81	96.86
Depth of Well	3.07	92.98

Parameter	Units	ODWS Guidelines	Fall 2002	Spring 2003	Fall 2003	Spring 2004	Fall 2004
			Nov-02	Jul-03	Nov-03	Jun-04	Dec-04
Field Parameters							
Water Depth	m	NA	0.74	0.4	0.33	0.36	0.29
Water Level Elevation	m	NA	95.31	95.65	95.72	95.69	95.76
Conductivity	US/cm	NV	--	--	--	200	207
pH	unitless	6.5 - 8.5	7.5	6.74	7.5	7.7	7.4
TDS	mg/L	500	--	--	--	--	104
Temperature	°C	<15	11	6.4	6.8	9.9	2.2
General Chemistry							
Alkalinity	mg/L	30-500	110	40	70	70	70
BOD	mg/L	NV	1	ND	3	2	ND
Chloride	mg/L	250	1	ND	1	ND	1
COD	mg/L	NV	68	33	59	7	310
Conductivity	mg/L	NV	230	120	180	180	180
DOC	mg/L	5	**8**	**5.6**	**14**	4	4.5
Hardness	mg/L	500	95	45	76	79	48
Nitrite (N) [1]	mg/L	1	ND	--	ND	ND	ND
Nitrate (N)	mg/L	10	ND	ND	ND	ND	0.6
Nitrates + Nitrites (N)	mg/L	10 [2]	ND	--	ND	ND	0.6
Ammonia/Ammonium (N)	mg/L	NV	0.118	0.04	0.09	0.18	0.09
TKN	mg/L	NV	0.3	--	0.5	1.2	0.4
Sulphate	mg/L	500	9	10	13	9	36
pH	mg/L	6.5 - 8.5	7.5	6.74	7.5	6.77	7.55
TDS	mg/L	500	190	120	150	150	300
TOC	mg/L	NV	12	--	--	--	--
Total Phosphorus	mg/L	NV	0.44	--	0.07	--	--
Metals							
Aluminum	mg/L	0.1	1.7	0.1	0.06	--	0.06
Antimony	mg/L	0.06	ND	ND	ND	--	ND
Arsenic	mg/L	0.025	ND	ND	ND	ND	ND
Barium	mg/L	1	0.08	ND	0.01	0.01	ND
Beryllium	mg/L	NV	ND	ND	ND	--	ND
Boron	mg/L	5	ND	ND	ND	ND	ND
Cadmium	mg/L	0.005	ND	ND	ND	--	ND
Calcium	mg/L	NV	23	13	23	22	9.6
Chromium	mg/L	0.05	ND	ND	ND	--	ND
Cobalt	mg/L	NV	ND	ND	ND	--	ND
Copper	mg/L	1	ND	ND	ND	--	ND
Iron	mg/L	0.3	**7.6**	**3**	**3**	**3.7**	**5.8**
Lead	mg/L	0.01	ND	ND	ND	--	ND
Magnesium	mg/L	NV	9.4	3	4.6	5.8	5.8
Manganese	mg/L	0.05	**0.5**	**0.15**	**0.2**	**0.25**	**0.25**
Mercury	mg/L	0.001	--	--	ND	--	--
Molybdenum	mg/L	NV	ND	ND	ND	--	ND
Nickel	mg/L	NV	0.01	ND	ND	--	ND
Potassium	mg/L	NV	0.8	0.8	1	0.6	0.4
Selenium	mg/L	0.01	ND	ND	ND	--	ND
Silver	mg/L	NV	ND	ND	ND	--	ND
Sodium	mg/L	200	3	4.4	ND	4	3
Thallium	mg/L	NV	ND	ND	6.8	--	ND
Vanadium	mg/L	NV	0.02	ND	ND	--	ND
Zinc	mg/L	5	0.02	ND	0.04	--	ND
Volatile Organic Compounds [3]							
Styrene	mg/L	NV	--	--	ND	ND	ND
Tetrachloroethylene	mg/L	0.03	--	--	ND	ND	0.008
Toluene	mg/L	NV	--	--	ND	ND	ND
Comments							

MW12-D

Well Details:

	Height (m)	Elevation (m)
Ground Surface	0	96.08
Casing	1.04	97.12
PVC Pipe	0.805	96.885
Depth of Well	9.05	87.03

Parameter	Units	ODWS Guidelines	Fall 2002	Spring 2003	Fall 2003	Spring 2004	Fall 2004
			Nov-02	Jul-03	Nov-03	Jun-04	Dec-04
Field Parameters							
Water Depth	m	NA	5.5	4.26	4.07	3.71	4.14
Water Level Elevation	m	NA	90.58	91.82	92.01	92.37	91.94
Conductivity	US/cm	NV	--	--	--	225	305
pH	mg/L	6.5-8.5	--	--	--	8.6	7.51
TDS	mg/L	500	--	--	--	--	152
Temperature	°C	<15	11	NA	7.5	8	3
General Chemistry							
Alkalinity	mg/L	30-500	160	140	140	140	140
BOD	mg/L	NV	6	ND	2	4	2
Chloride	mg/L	250	5	ND	1	ND	ND
COD	mg/L	NV	30	12	42	7	7
Conductivity	mg/L	NV	380	280	300	290	270
DOC	mg/L	5	11	4	2.5	3.5	5
Hardness	mg/L	500	120	144	126	116	87
Nitrite (N) [1]	mg/L	1	ND	ND	--	ND	ND
Nitrate (N)	mg/L	10	ND	ND	ND	ND	ND
Nitrates + Nitrites (N)	mg/L	10 [2]	ND	ND	--	ND	ND
Ammonia/Ammonium (N)	mg/L	NV	0.36	0.05	0.34	0.44	0.3
TKN	mg/L	NV	0.6	0.6	--	1.2	0.9
Sulphate	mg/L	500	19	3	5	5	7
pH	mg/L	6.5 - 8.5	6.8	8.12	8.32	8	7.91
TDS	mg/L	500	240	200	190	210	150
TOC	mg/L	NV	12	--	--	--	--
Total Phosphorus	mg/L	NV	0.12	0.15	--	--	--
Metals							
Aluminum	mg/L	0.1	ND	0.02	ND	--	ND
Antimony	mg/L	0.06	ND	ND	ND	--	ND
Arsenic	mg/L	0.025	ND	ND	ND	ND	ND
Barium	mg/L	1	0.05	0.05	0.03	0.04	ND
Beryllium	mg/L	NV	ND	ND	ND	--	ND
Boron	mg/L	5	0.1	ND	0.05	0.05	ND
Cadmium	mg/L	0.005	ND	ND	ND	--	ND
Calcium	mg/L	NV	21	38	29	25	15
Chromium	mg/L	0.05	ND	ND	ND	--	ND
Cobalt	mg/L	NV	ND	ND	ND	--	ND
Copper	mg/L	1	ND	ND	ND	--	ND
Iron	mg/L	0.3	ND	ND	0.2	0.1	ND
Lead	mg/L	0.01	ND	ND	ND	NA	ND
Magnesium	mg/L	NV	16	12	13	13	12
Manganese	mg/L	0.05	**0.15**	0.05	0.05	**0.1**	**0.06**
Mercury	mg/L	0.001	NA	ND	ND	--	--
Molybdenum	mg/L	NV	0.01	ND	0.005	--	0.01
Nickel	mg/L	NV	ND	ND	ND	--	ND
Potassium	mg/L	NV	7.4	6	6.4	5.8	5.4
Selenium	mg/L	0.01	ND	ND	ND	--	ND
Silver	mg/L	NV	ND	ND	ND	--	ND
Sodium	mg/L	200	12	9	12	12	14
Thallium	mg/L	NV	ND	ND	ND	--	ND
Vanadium	mg/L	NV	ND	ND	ND	--	ND
Zinc	mg/L	5	ND	ND	0.02	--	ND
Volatile Organic Compounds [3]							
Styrene	mg/L	NV	--	ND	--	ND	ND
Tetrachloroethylene	mg/L	0.03	--	ND	--	ND	0.0008
Toluene	mg/L	NV	--	ND	--	ND	ND
Comments							

MW14

Well Details:

	Height (m)	Elevation (m)
Ground Surface	0	97.16
Casing	0.95	98.11
PVC Pipe	0.83	97.99
Depth of Well	6.3	90.86

Parameter	Units	ODWS Guidelines	Fall 2002	Spring 2003	Fall 2003	Spring 2004	Fall 2004
			Nov-02	Jul-03	Nov-03	Jun-04	Dec-04
Field Parameters							
Water Depth	m	**NA**	DRY	3.22	4.17	1.87	4.28
Water Level Elevation	m	**NA**	DRY	93.94	92.99	95.29	92.88
Conductivity	US/cm	**NV**	--	--	--	1.57	300
pH	mg/L	**6.5-8.5**	--	--	--	8.25	7.35
TDS	mg/L	**500**	--	--	--	--	150
Temperature	°C	**<15**	--	5.5	9.4	8	5.6
General Chemistry							
Alkalinity	mg/L	**30-500**	--	95	110	55	140
BOD	mg/L	**NV**	--	ND	2	ND	ND
Chloride	mg/L	**250**	--	ND	1	ND	ND
COD	mg/L	**NV**	--	9	26	1	ND
Conductivity	mg/L	**NV**	--	210	230	130	280
DOC	mg/L	**5**	--	3.2	2	1.5	ND
Hardness	mg/L	**500**	--	165	127	57	128
Nitrite (N) [1]	mg/L	**1**	--	ND	ND	ND	ND
Nitrate (N)	mg/L	**10**	--	0.3	0.9	ND	1
Nitrates + Nitrites (N)	mg/L	**10** [2]	--	0.3	0.9	ND	1
Ammonia/Ammonium (N)	mg/L	**NV**	--	0.11	0.05	0.08	0.1
TKN	mg/L	**NV**	--	3.2	0.2	0.2	0.5
Sulphate	mg/L	**500**	--	7	7	6	6
pH	mg/L	**6.5 - 8.5**	--	7.71	7.9	7	7.71
TDS	mg/L	**500**	--	ND	170	110	180
TOC	mg/L	**NV**	--	--	--	--	--
Total Phosphorus	mg/L	**NV**	--	ND	0.01	--	--
Metals							
Aluminum	mg/L	**0.1**	--	**0.11**	0.04	--	ND
Antimony	mg/L	**0.06**	--	ND	ND	--	ND
Arsenic	mg/L	**0.025**	--	ND	ND	ND	ND
Barium	mg/L	**1**	--	0.04	ND	ND	0.2
Beryllium	mg/L	**NV**	--	ND	ND	--	ND
Boron	mg/L	**5**	--	ND	ND	ND	ND
Cadmium	mg/L	**0.005**	--	ND	ND	--	ND
Calcium	mg/L	**NV**	--	55	46	19	42
Chromium	mg/L	**0.05**	--	ND	ND	--	ND
Cobalt	mg/L	**NV**	--	ND	ND	--	ND
Copper	mg/L	**1**	--	ND	ND	--	ND
Iron	mg/L	**0.3**	--	ND	ND	ND	ND
Lead	mg/L	**0.01**	--	ND	ND	--	ND
Magnesium	mg/L	**NV**	--	6.6	2.8	2.2	5.6
Manganese	mg/L	**0.05**	--	ND	ND	ND	ND
Mercury	mg/L	**0.001**	--	ND	ND	--	--
Molybdenum	mg/L	**NV**	--	ND	ND	--	ND
Nickel	mg/L	**NV**	--	ND	ND	--	ND
Potassium	mg/L	**NV**	--	1.6	0.6	0.4	0.4
Selenium	mg/L	**0.01**	--	ND	ND	--	ND
Silver	mg/L	**NV**	--	ND	ND	--	ND
Sodium	mg/L	**200**	--	3	1.6	2.2	1.6
Thallium	mg/L	**NV**	--	ND	ND	--	ND
Vanadium	mg/L	**NV**	--	ND	ND	--	ND
Zinc	mg/L	**5**	--	ND	0.04	--	ND
Volatile Organic Compounds [3]							
Styrene	mg/L	**NV**	--	0.0016	ND	--	--
Tetrachloroethylene	mg/L	**0.03**	--	0.001	ND	--	--
Toluene	mg/L	**NV**	--	0.002	ND	--	--
Comments							

MW15-S

Well Details:

	Height (m)	Elevation (m)
Ground Surface	0	98.1
Casing	1.04	99.14
PVC Pipe	0.94	99.04
Depth of Well	3.02	95.08

Parameter	Units	ODWS Guidelines	Fall 2002	Spring 2003	Fall 2003	Spring 2004	Fall 2004
			Nov-02	Jul-03	Nov-03	Jun-04	Dec-04
Field Parameters							
Water Depth	m	NA	1.93	3.45	3.38	1.24	1.44
Water Level Elevation	m	NA	96.17	94.65	94.72	96.86	96.66
Conductivity	US/cm	NV	--	--	--	85	108
pH	mg/L	6.5-8.5	--	--	--	8.5	7.58
TDS	mg/L	500	--	--	--	--	53
Temperature	°C	<15	13	NA	8.5	8.8	5
General Chemistry							
Alkalinity	mg/L	30-500	50	25	20	10	20
BOD	mg/L	NV	ND	ND	2	2	ND
Chloride	mg/L	250	3	3	4	3	5
COD	mg/L	NV	37	10	30	4	4
Conductivity	mg/L	NV	160	75	80	60	80
DOC	mg/L	5	2.8	1.6	2	1.5	**7**
Hardness	mg/L	500	61	27	18	19	22
Nitrite (N) [1]	mg/L	1	ND	--	ND	ND	ND
Nitrate (N)	mg/L	10	ND	ND	ND	0.4	ND
Nitrates + Nitrites (N)	mg/L	10 [2]	ND	--	ND	0.4	ND
Ammonia/Ammonium (N)	mg/L	NV	0.02	0.01	0.02	0.09	0.12
TKN	mg/L	NV	0.2	--	0.3	0.5	0.7
Sulphate	mg/L	500	13	10	10	8	7
pH	mg/L	6.5 - 8.5	6.7	6.5	6.97	**6.16**	6.88
TDS	mg/L	500	120	62	80	78	56
TOC	mg/L	NV	5.4	--	--	--	--
Total Phosphorus	mg/L	NV	0.8	--	0.8	--	--
Metals							
Aluminum	mg/L	0.1	0.09	ND	ND	--	ND
Antimony	mg/L	0.06	ND	ND	ND	--	ND
Arsenic	mg/L	0.025	ND	ND	ND	ND	ND
Barium	mg/L	1	ND	ND	ND	ND	0.01
Beryllium	mg/L	NV	ND	ND	ND	--	ND
Boron	mg/L	5	ND	ND	ND	ND	ND
Cadmium	mg/L	0.005	ND	ND	ND	--	ND
Calcium	mg/L	NV	18	8.2	7	5.6	6.2
Chromium	mg/L	0.05	ND	ND	ND	--	ND
Cobalt	mg/L	NV	ND	ND	ND	--	ND
Copper	mg/L	1	ND	ND	ND	--	ND
Iron	mg/L	0.3	ND	ND	ND	ND	ND
Lead	mg/L	0.01	ND	ND	ND	--	ND
Magnesium	mg/L	NV	3.8	1.6	ND	1.2	1.6
Manganese	mg/L	0.05	**0.1**	0.05	**1.6**	ND	ND
Mercury	mg/L	0.001	--	--	ND	--	--
Molybdenum	mg/L	NV	ND	ND	ND	--	ND
Nickel	mg/L	NV	ND	ND	ND	--	ND
Potassium	mg/L	NV	0.8	0.4	0.2	ND	0.2
Selenium	mg/L	0.01	ND	ND	ND	--	ND
Silver	mg/L	NV	ND	ND	ND	--	ND
Sodium	mg/L	200	2.8	2.2	1.8	2	1.4
Thallium	mg/L	NV	ND	ND	ND	--	ND
Vanadium	mg/L	NV	ND	ND	ND	--	ND
Zinc	mg/L	5	ND	ND	0.02	--	ND
Volatile Organic Compounds [3]							
Styrene	mg/L	NV	--	--	ND	--	--
Tetrachloroethylene	mg/L	0.03	--	--	ND	--	--
Toluene	mg/L	NV	--	--	ND	--	--
Comments							

MW15-D

Well Details:

	Height (m)	Elevation (m)
Ground Surface	0	97.84
Casing	1.01	98.85
PVC Pipe	0.94	98.78
Depth of Well	7.34	90.5

Parameter	Units	ODWS Guidelines	Fall 2002	Spring 2003	Fall 2003	Spring 2004	Fall 2004
			Nov-02	Jul-03	Nov-03	Jun-04	Dec-04
Field Parameters							
Water Depth	m	NA	7.16	7.29	8.01	5.84	6.74
Water Level Elevation	m	NA	90.68	90.55	89.83	92	91.1
Conductivity	US/cm	NV	--	--	--	335	310
pH	mg/L	6.5-8.5	--	--	--	7.97	7.43
TDS	mg/L	500	--	--	--	--	155
Temperature	°C	<15	--	--	--	10.1	4
General Chemistry							
Alkalinity	mg/L	30-500	--	110	--	110	120
BOD	mg/L	NV	--	ND	--	2	ND
Chloride	mg/L	250	--	2	--	ND	ND
COD	mg/L	NV	--	9	--	4	7
Conductivity	mg/L	NV	--	340	--	290	300
DOC	mg/L	5	--	3	--	2	4.5
Hardness	mg/L	500	--	175	--	116	97
Nitrite (N) [1]	mg/L	1	--	ND	--	0.4	ND
Nitrate (N)	mg/L	10	--	0.6	--	ND	0.6
Nitrates + Nitrites (N)	mg/L	10 [2]	--	0.6	--	0.04	0.6
Ammonia/Ammonium (N)	mg/L	NV	--	ND	--	0.05	0.9
TKN	mg/L	NV	--	0.2	--	200	0.4
Sulphate	mg/L	500	--	62	--	35	36
pH	mg/L	6.5 - 8.5	--	7.73	--	7.85	7.55
TDS	mg/L	500	--	250	--	200	300
TOC	mg/L	NV	--	--	--	--	--
Total Phosphorus	mg/L	NV	--	0.02	--	--	--
Metals							
Aluminum	mg/L	0.1	--	ND	--	--	ND
Antimony	mg/L	0.06	--	ND	--	--	ND
Arsenic	mg/L	0.025	--	ND	--	ND	ND
Barium	mg/L	1	--	0.02	--	0.01	ND
Beryllium	mg/L	NV	--	ND	--	--	ND
Boron	mg/L	5	--	ND	--	ND	ND
Cadmium	mg/L	0.005	--	ND	--	--	ND
Calcium	mg/L	NV	--	55	--	31	24
Chromium	mg/L	0.05	--	ND	--	--	ND
Cobalt	mg/L	NV	--	ND	--	--	ND
Copper	mg/L	1	--	0.1	--	--	ND
Iron	mg/L	0.3	--	ND	--	ND	ND
Lead	mg/L	0.01	--	ND	--	--	ND
Magnesium	mg/L	NV	--	9.2	--	9.4	9
Manganese	mg/L	0.05	--	ND	--	ND	ND
Mercury	mg/L	0.001	--	ND	--	--	--
Molybdenum	mg/L	NV	--	0.015	--	--	0.005
Nickel	mg/L	NV	--	ND	--	--	ND
Potassium	mg/L	NV	--	2.6	--	2.2	2
Selenium	mg/L	0.01	--	ND	--	--	ND
Silver	mg/L	NV	--	ND	--	--	ND
Sodium	mg/L	200	--	19	--	10	13
Thallium	mg/L	NV	--	ND	--	--	ND
Vanadium	mg/L	NV	--	ND	--	--	ND
Zinc	mg/L	5	--	ND	--	--	ND
Volatile Organic Compounds [3]							
Styrene	mg/L	NV	--	0.0008	--	--	--
Tetrachloroethylene	mg/L	0.03	--	ND	--	--	--
Toluene	mg/L	NV	--	0.0015	--	--	--
Comments							

Notes:

1 Measured as nitrogen

2 Where both nitrate and nitrite are present, the total of the two should not exceed 10 mg/L as nitrogen.

3 Only VOCs detected in past are listed in the summary tables. Refer to Laboratory Certificate of Analysis for list of all VOCs scanned.

BOLD Above ODWS

-- Not Analysed/Not Available/Not Measured

Glossary terms:

NA: Not Applicable
ND: Not Detected
NV: No values established by provincial governing agent
BOD: Biological Oxygen Demand
TOC: Total organic compounds
TDS: Total dissolved solids
TSS: Total Suspended Solids
TKN: Total Kjeldahl Nitrogen
COD: Chemical Oxygen Demand
DOC: Dissolved Organic Carbon
VOC: Volatile Organic Compounds

APPENDIX D
LABORATORY CERTIFICATE OF ANALYSIS
SPRING 2004

PARACEL Laboratories Ltd.
Environmental &
Indoor Air Quality

300-2319 St. Laurent Blvd.
Ottawa ON K1G 4J8
Phone: (613) 731-9577
Fax: (613) 731-9064
Toll Free: 800-7491947
email: paracel@paracellabs.com

Order #: J1946

Certificate of Analysis

Levac Robichaud Leclerc Associates Ltd.

1-2884, Chamberland Street
Rockland, ON K4K 1M6
Attn: Mr. Mario Elie

Phone: (613)-446-7777
Fax: (613)-446-1427

Client PO:
Project: **L96-18**
Custody #: **16105**

Report Date: 15-Jun-2004
Order Date: 03-Jun-2004

This Certificate of Analysis contains analytical data applicable to the following samples as submitted:

Paracel ID	Client ID
J1946.1	MW1D
J1946.2	MW3D
J1946.3	MW5D
J1946.4	MW5S
J1946.5	MW2
J1946.6	MW8S
J1946.7	MW8D
J1946.8	MW11
J1946.9	MW12A
J1946.10	MW12B
J1946.11	MW14
J1946.12	MW15A
J1946.13	MW15B

+ MW-7

Approved By: _____ Dale Robertson, B.Sc.
Laboratory Director

Certificate of Analysis

Report Date: 15-Jun-2004
Order Date: 03-Jun-2004

Client: **Levac Robichaud Leclerc Associates Ltd.**

Client PO: Project: **L96-18**

Analysis Summary Table

Analysis	Method Reference/Description
Metals	EPA 200.8 - ICP-MS
Alkalinity	EPA 310.1 - titration
Ammonia	MOE SDNP-E3223A - colourimetric
Anions	EPA 300.1 - ion chromatography
COD	EPA 410.1 - digestion, colourimetric
Conductivity	EPA 120.1 - electrode
pH	EPA 150.1 - pH probe
Solids, dissolved	SM17 2540C - filtration, gravimetric
Solids, total suspended	SM17 2540C - gravimetric
Total Kjeldahl Nitrogen	MOE RTNP-E3180A - digestion, colourimetric
DOC	E3247B - combustion IR
BOD, 5-day	APHA 5210B
VOCs	EPA 624 - P&T GC-MS

n/a: not applicable
MDL: Method Detection Limit

Sample/Test Specific Notes

SampleID	Analysis	Note
MW1D	Metals	Sediment in pre-preserved metals containers may have biased results
MW3D	Metals	Sediment in pre-preserved metals containers may have biased results

Certificate of Analysis

Report Date: 15-Jun-2004
Order Date: 03-Jun-2004

Client: **Levac Robichaud Leclerc Associates Ltd.**

Client PO: Project: **L96-18**

Matrix: Water
Sample Date: 02-Jun-2004

Parameter	MDL/Units	MW1D	MW3D	MW5D
		J1946.1	J1946.2	J1946.3
Arsenic	0.01 mg/L	< 0.01	< 0.01	< 0.01
Barium	0.01 mg/L	1.4	0.24	0.12
Boron	0.05 mg/L	< 0.05	0.25	< 0.05
Calcium	0.2 mg/L	170	470	45
Iron	0.1 mg/L	24	< 0.1	1.4
Magnesium	0.2 mg/L	30	10	8.0
Manganese	0.05 mg/L	3.8	0.55	0.25
Potassium	0.2 mg/L	7.4	6.0	1.2
Sodium	0.2 mg/L	7.4	3.2	4.6
Alkalinity	5 mg/L	120	260	150
Ammonia/ammonium asN	0.01 mg/L	0.12	0.12	0.17
Chloride	1 mg/L	12	2	1
Nitrate as N	0.1 mg/L	3.0	1.9	< 0.1
Nitrite as N	0.05 mg/L	< 0.05	0.05	< 0.05
Sulphate	1 mg/L	17	64	8
Conductivity	5 uS/cm	260	630	320
COD	1 mg/L	55	11	10
pH	0.05 pH units	6.75	7.01	7.38
Solids, dissolved	1 mg/L	2,700	400	390
Total Kjeldahl Nitrogen	0.1 mg/L	0.5	1.0	0.6
Solids, total suspended	1 mg/L	40,000	19,000	42
DOC	0.5 mg/L	2.0	4.0	4.5
BOD	2 mg/L	2	2	2
Benzene	0.0005 mg/L		< 0.0005	
Bromodichloromethane	0.0004 mg/L		< 0.0004	
Bromoform	0.0008 mg/L		< 0.0008	
Bromomethane	0.001 mg/L		< 0.001	
Carbon Tetrachloride	0.0005 mg/L		< 0.0005	
Chlorobenzene	0.0004 mg/L		< 0.0004	
Chloroethane	0.001 mg/L		< 0.001	

Certificate of Analysis

Report Date: 15-Jun-2004
Order Date: 03-Jun-2004

Client: **Levac Robichaud Leclerc Associates Ltd.**

Client PO: Project: **L96-18**

		MW1D	MW3D	MW5D
		J1946.1	J1946.2	J1946.3
Chloroform	0.0006 mg/L		< 0.0006	
Chloromethane	0.003 mg/L		< 0.003	
Dibromochloromethane	0.0005 mg/L		< 0.0005	
1,2-Dibromoethane	0.001 mg/L		< 0.001	
m-Dichlorobenzene	0.0004 mg/L		< 0.0004	
o-Dichlorobenzene	0.0004 mg/L		< 0.0004	
p-Dichlorobenzene	0.0004 mg/L		< 0.0004	
1,1-Dichloroethane	0.0005 mg/L		< 0.0005	
1,2-Dichloroethane	0.0005 mg/L		< 0.0005	
1,1-Dichloroethylene	0.0006 mg/L		< 0.0006	
c-1,2-Dichloroethylene	0.0004 mg/L		< 0.0004	
t-1,2-Dichloroethylene	0.001 mg/L		< 0.001	
1,2-Dichloropropane	0.0007 mg/L		< 0.0007	
c-1,3-Dichloropropene	0.0004 mg/L		< 0.0004	
t-1,3-Dichloropropene	0.0005 mg/L		< 0.0005	
Ethylbenzene	0.0005 mg/L		< 0.0005	
Methylene Chloride	0.004 mg/L		< 0.004	
Styrene	0.0004 mg/L		< 0.0004	
1,1,1,2-Tetrachloroethane	0.0005 mg/L		< 0.0005	
1,1,2,2-Tetrachloroethane	0.0006 mg/L		< 0.0006	
Tetrachloroethylene	0.0005 mg/L		< 0.0005	
Toluene	0.0005 mg/L		< 0.0005	
1,1,1-Trichloroethane	0.0004 mg/L		< 0.0004	
1,1,2-Trichloroethane	0.0006 mg/L		< 0.0006	
Trichloroethylene	0.0004 mg/L		< 0.0004	
Trichlorofluoromethane	0.001 mg/L		< 0.001	
1,3,5-Trimethylbenzene	0.0005 mg/L		< 0.0005	
Vinyl Chloride	0.0005 mg/L		< 0.0005	
m/p-Xylene	0.001 mg/L		< 0.001	
o-Xylene	0.0005 mg/L		< 0.0005	

Certificate of Analysis

Report Date: 15-Jun-2004
Order Date: 03-Jun-2004

Client: **Levac Robichaud Leclerc Associates Ltd.**

Client PO: Project: **L96-18**

		MW1D	MW3D	MW5D
		J1946.1	J1946.2	J1946.3
1,4-Bromofluorobenzene	surrogate		101%	
Dibromofluoromethane	surrogate		104%	
Toluene-d8	surrogate		97%	

Certificate of Analysis

Report Date: 15-Jun-2004
Order Date: 03-Jun-2004

Client: **Levac Robichaud Leclerc Associates Ltd.**

Client PO: Project: **L96-18**

Matrix: Water
Sample Date: 02-Jun-2004

Parameter	MDL/Units	MW5S	MW2	MW8S
		J1946.4	J1946.5	J1946.6
Arsenic	0.01 mg/L	< 0.01	< 0.01	< 0.01
Barium	0.01 mg/L	0.01	< 0.01	0.01
Boron	0.05 mg/L	< 0.05	< 0.05	< 0.05
Calcium	0.2 mg/L	19	14	12
Iron	0.1 mg/L	1.7	< 0.1	< 0.1
Magnesium	0.2 mg/L	5.2	2.0	2.4
Manganese	0.05 mg/L	0.15	< 0.05	< 0.05
Potassium	0.2 mg/L	0.8	< 0.2	0.4
Sodium	0.2 mg/L	3.4	12	4.0
Alkalinity	5 mg/L	60	60	10
Ammonia/ammonium asN	0.01 mg/L	0.16	0.04	0.10
Chloride	1 mg/L	2	< 1	7
Nitrate as N	0.1 mg/L	< 0.1	0.1	0.4
Nitrite as N	0.05 mg/L	< 0.05	< 0.05	< 0.05
Sulphate	1 mg/L	13	6	24
Conductivity	5 uS/cm	170	140	120
COD	1 mg/L	8	24	1
pH	0.05 pH units	7.01	8.11	5.71
Solids, dissolved	1 mg/L	140	110	110
Total Kjeldahl Nitrogen	0.1 mg/L	0.6	0.7	0.1
Solids, total suspended	1 mg/L	6	4	< 1
DOC	0.5 mg/L	1.5	1.0	1.5
BOD	2 mg/L	2	2	< 2
Benzene	0.0005 mg/L			< 0.0005
Bromodichloromethane	0.0004 mg/L			< 0.0004
Bromoform	0.0008 mg/L			< 0.0008
Bromomethane	0.001 mg/L			< 0.001
Carbon Tetrachloride	0.0005 mg/L			< 0.0005
Chlorobenzene	0.0004 mg/L			< 0.0004
Chloroethane	0.001 mg/L			< 0.001

Certificate of Analysis

Report Date: 15-Jun-2004
Order Date: 03-Jun-2004

Client: **Levac Robichaud Leclerc Associates Ltd.**

Client PO: Project: **L96-18**

		MW5S	MW2	MW8S
		J1946.4	J1946.5	J1946.6
Chloroform	0.0006 mg/L			< 0.0006
Chloromethane	0.003 mg/L			< 0.003
Dibromochloromethane	0.0005 mg/L			< 0.0005
1,2-Dibromoethane	0.001 mg/L			< 0.001
m-Dichlorobenzene	0.0004 mg/L			< 0.0004
o-Dichlorobenzene	0.0004 mg/L			< 0.0004
p-Dichlorobenzene	0.0004 mg/L			< 0.0004
1,1-Dichloroethane	0.0005 mg/L			< 0.0005
1,2-Dichloroethane	0.0005 mg/L			< 0.0005
1,1-Dichloroethylene	0.0006 mg/L			< 0.0006
c-1,2-Dichloroethylene	0.0004 mg/L			< 0.0004
t-1,2-Dichloroethylene	0.001 mg/L			< 0.001
1,2-Dichloropropane	0.0007 mg/L			< 0.0007
c-1,3-Dichloropropene	0.0004 mg/L			< 0.0004
t-1,3-Dichloropropene	0.0005 mg/L			< 0.0005
Ethylbenzene	0.0005 mg/L			< 0.0005
Methylene Chloride	0.004 mg/L			< 0.004
Styrene	0.0004 mg/L			< 0.0004
1,1,1,2-Tetrachloroethane	0.0005 mg/L			< 0.0005
1,1,2,2-Tetrachloroethane	0.0006 mg/L			< 0.0006
Tetrachloroethylene	0.0005 mg/L			< 0.0005
Toluene	0.0005 mg/L			< 0.0005
1,1,1-Trichloroethane	0.0004 mg/L			< 0.0004
1,1,2-Trichloroethane	0.0006 mg/L			< 0.0006
Trichloroethylene	0.0004 mg/L			< 0.0004
Trichlorofluoromethane	0.001 mg/L			< 0.001
1,3,5-Trimethylbenzene	0.0005 mg/L			< 0.0005
Vinyl Chloride	0.0005 mg/L			< 0.0005
m/p-Xylene	0.001 mg/L			< 0.001
o-Xylene	0.0005 mg/L			< 0.0005

Certificate of Analysis

Report Date: 15-Jun-2004
Order Date: 03-Jun-2004

Client: **Levac Robichaud Leclerc Associates Ltd.**

Client PO: Project: **L96-18**

		MW5S	MW2	MW8S
		J1946.4	J1946.5	J1946.6
1,4-Bromofluorobenzene	surrogate			106%
Dibromofluoromethane	surrogate			104%
Toluene-d8	surrogate			98%

Certificate of Analysis

Report Date: 15-Jun-2004
Order Date: 03-Jun-2004

Client: **Levac Robichaud Leclerc Associates Ltd.**

Client PO:

Project: **L96-18**

Matrix: Water
Sample Date: 02-Jun-2004

Parameter	MDL/Units	MW8D	MW11	MW12A
		J1946.7	J1946.8	J1946.9
Arsenic	0.01 mg/L	< 0.01	< 0.01	< 0.01
Barium	0.01 mg/L	0.05	0.03	0.04
Boron	0.05 mg/L	< 0.05	< 0.05	0.05
Calcium	0.2 mg/L	39	56	25
Iron	0.1 mg/L	< 0.1	< 0.1	0.1
Magnesium	0.2 mg/L	6.6	7.6	13
Manganese	0.05 mg/L	< 0.05	< 0.05	0.10
Potassium	0.2 mg/L	1.0	0.6	5.8
Sodium	0.2 mg/L	3.2	3.4	12
Alkalinity	5 mg/L	120	160	140
Ammonia/ammonium asN	0.01 mg/L	0.07	0.05	0.44
Chloride	1 mg/L	3	8	< 1
Nitrate as N	0.1 mg/L	0.3	3.2	< 0.1
Nitrite as N	0.05 mg/L	< 0.05	< 0.05	< 0.05
Sulphate	1 mg/L	15	17	5
Conductivity	5 uS/cm	280	400	290
COD	1 mg/L	1	6	11
pH	0.05 pH units	7.57	7.78	8.00
Solids, dissolved	1 mg/L	190	260	210
Total Kjeldahl Nitrogen	0.1 mg/L	0.3	0.3	1.2
Solids, total suspended	1 mg/L	2	8	2
DOC	0.5 mg/L	2.0	2.0	3.5
BOD	2 mg/L	< 2	4	4
Benzene	0.0005 mg/L	< 0.0005	< 0.0005	< 0.0005
Bromodichloromethane	0.0004 mg/L	< 0.0004	< 0.0004	< 0.0004
Bromoform	0.0008 mg/L	< 0.0008	< 0.0008	< 0.0008
Bromomethane	0.001 mg/L	< 0.001	< 0.001	< 0.001
Carbon Tetrachloride	0.0005 mg/L	< 0.0005	< 0.0005	< 0.0005
Chlorobenzene	0.0004 mg/L	< 0.0004	< 0.0004	< 0.0004
Chloroethane	0.001 mg/L	< 0.001	< 0.001	< 0.001

Certificate of Analysis

Report Date: 15-Jun-2004
Order Date: 03-Jun-2004

Client: **Levac Robichaud Leclerc Associates Ltd.**

Client PO: Project: **L96-18**

		MW8D	MW11	MW12A
		J1946.7	J1946.8	J1946.9
Chloroform	0.0006 mg/L	< 0.0006	< 0.0006	< 0.0006
Chloromethane	0.003 mg/L	< 0.003	< 0.003	< 0.003
Dibromochloromethane	0.0005 mg/L	< 0.0005	< 0.0005	< 0.0005
1,2-Dibromoethane	0.001 mg/L	< 0.001	< 0.001	< 0.001
m-Dichlorobenzene	0.0004 mg/L	< 0.0004	< 0.0004	< 0.0004
o-Dichlorobenzene	0.0004 mg/L	< 0.0004	< 0.0004	< 0.0004
p-Dichlorobenzene	0.0004 mg/L	< 0.0004	< 0.0004	< 0.0004
1,1-Dichloroethane	0.0005 mg/L	< 0.0005	< 0.0005	< 0.0005
1,2-Dichloroethane	0.0005 mg/L	< 0.0005	< 0.0005	< 0.0005
1,1-Dichloroethylene	0.0006 mg/L	< 0.0006	< 0.0006	< 0.0006
c-1,2-Dichloroethylene	0.0004 mg/L	< 0.0004	< 0.0004	< 0.0004
t-1,2-Dichloroethylene	0.001 mg/L	< 0.001	< 0.001	< 0.001
1,2-Dichloropropane	0.0007 mg/L	< 0.0007	< 0.0007	< 0.0007
c-1,3-Dichloropropene	0.0004 mg/L	< 0.0004	< 0.0004	< 0.0004
t-1,3-Dichloropropene	0.0005 mg/L	< 0.0005	< 0.0005	< 0.0005
Ethylbenzene	0.0005 mg/L	< 0.0005	< 0.0005	< 0.0005
Methylene Chloride	0.004 mg/L	< 0.004	< 0.004	< 0.004
Styrene	0.0004 mg/L	< 0.0004	< 0.0004	< 0.0004
1,1,1,2-Tetrachloroethane	0.0005 mg/L	< 0.0005	< 0.0005	< 0.0005
1,1,2,2-Tetrachloroethane	0.0006 mg/L	< 0.0006	< 0.0006	< 0.0006
Tetrachloroethylene	0.0005 mg/L	< 0.0005	< 0.0005	< 0.0005
Toluene	0.0005 mg/L	< 0.0005	< 0.0005	< 0.0005
1,1,1-Trichloroethane	0.0004 mg/L	< 0.0004	< 0.0004	< 0.0004
1,1,2-Trichloroethane	0.0006 mg/L	< 0.0006	< 0.0006	< 0.0006
Trichloroethylene	0.0004 mg/L	< 0.0004	< 0.0004	< 0.0004
Trichlorofluoromethane	0.001 mg/L	< 0.001	< 0.001	< 0.001
1,3,5-Trimethylbenzene	0.0005 mg/L	< 0.0005	< 0.0005	< 0.0005
Vinyl Chloride	0.0005 mg/L	< 0.0005	< 0.0005	< 0.0005
m/p-Xylene	0.001 mg/L	< 0.001	< 0.001	< 0.001
o-Xylene	0.0005 mg/L	< 0.0005	< 0.0005	< 0.0005

Certificate of Analysis

Report Date: 15-Jun-2004
Order Date: 03-Jun-2004

Client: **Levac Robichaud Leclerc Associates Ltd.**

Client PO: Project: **L96-18**

		MW8D	MW11	MW12A
		J1946.7	J1946.8	J1946.9
1,4-Bromofluorobenzene	surrogate	103%	102%	105%
Dibromofluoromethane	surrogate	105%	104%	105%
Toluene-d8	surrogate	98%	97%	97%

Certificate of Analysis

Report Date: 15-Jun-2004
Order Date: 03-Jun-2004

Client: **Levac Robichaud Leclerc Associates Ltd.**

Client PO: Project: **L96-18**

Matrix: Water
Sample Date: 02-Jun-2004

Parameter	MDL/Units	MW12B	MW14	MW15A
		J1946.10	J1946.11	J1946.12
Arsenic	0.01 mg/L	< 0.01	< 0.01	< 0.01
Barium	0.01 mg/L	0.01	< 0.01	0.01
Boron	0.05 mg/L	< 0.05	< 0.05	< 0.05
Calcium	0.2 mg/L	22	19	31
Iron	0.1 mg/L	3.7	< 0.1	< 0.1
Magnesium	0.2 mg/L	5.8	2.2	9.4
Manganese	0.05 mg/L	0.25	< 0.05	< 0.05
Potassium	0.2 mg/L	0.6	0.4	2.2
Sodium	0.2 mg/L	4.0	2.2	10
Alkalinity	5 mg/L	70	55	110
Ammonia/ammonium asN	0.01 mg/L	0.18	0.08	0.05
Chloride	1 mg/L	< 1	< 1	< 1
Nitrate as N	0.1 mg/L	< 0.1	< 0.1	0.4
Nitrite as N	0.05 mg/L	< 0.05	< 0.05	< 0.05
Sulphate	1 mg/L	9	6	35
Conductivity	5 uS/cm	180	130	290
COD	1 mg/L	7	1	4
pH	0.05 pH units	6.77	7.00	7.85
Solids, dissolved	1 mg/L	150	110	200
Total Kjeldahl Nitrogen	0.1 mg/L	1.2	0.2	0.2
Solids, total suspended	1 mg/L	4	6	2
DOC	0.5 mg/L	4.0	1.5	2.0
BOD	2 mg/L	2	< 2	2
Benzene	0.0005 mg/L	< 0.0005		
Bromodichloromethane	0.0004 mg/L	< 0.0004		
Bromoform	0.0008 mg/L	< 0.0008		
Bromomethane	0.001 mg/L	< 0.001		
Carbon Tetrachloride	0.0005 mg/L	< 0.0005		
Chlorobenzene	0.0004 mg/L	< 0.0004		
Chloroethane	0.001 mg/L	< 0.001		

Certificate of Analysis

Report Date: 15-Jun-2004
Order Date: 03-Jun-2004

Client: **Levac Robichaud Leclerc Associates Ltd.**

Client PO: Project: **L96-18**

		MW12B	MW14	MW15A
		J1946.10	J1946.11	J1946.12
Chloroform	0.0006 mg/L	< 0.0006		
Chloromethane	0.003 mg/L	< 0.003		
Dibromochloromethane	0.0005 mg/L	< 0.0005		
1,2-Dibromoethane	0.001 mg/L	< 0.001		
m-Dichlorobenzene	0.0004 mg/L	< 0.0004		
o-Dichlorobenzene	0.0004 mg/L	< 0.0004		
p-Dichlorobenzene	0.0004 mg/L	< 0.0004		
1,1-Dichloroethane	0.0005 mg/L	< 0.0005		
1,2-Dichloroethane	0.0005 mg/L	< 0.0005		
1,1-Dichloroethylene	0.0006 mg/L	< 0.0006		
c-1,2-Dichloroethylene	0.0004 mg/L	< 0.0004		
t-1,2-Dichloroethylene	0.001 mg/L	< 0.001		
1,2-Dichloropropane	0.0007 mg/L	< 0.0007		
c-1,3-Dichloropropene	0.0004 mg/L	< 0.0004		
t-1,3-Dichloropropene	0.0005 mg/L	< 0.0005		
Ethylbenzene	0.0005 mg/L	< 0.0005		
Methylene Chloride	0.004 mg/L	< 0.004		
Styrene	0.0004 mg/L	< 0.0004		
1,1,1,2-Tetrachloroethane	0.0005 mg/L	< 0.0005		
1,1,2,2-Tetrachloroethane	0.0006 mg/L	< 0.0006		
Tetrachloroethylene	0.0005 mg/L	< 0.0005		
Toluene	0.0005 mg/L	< 0.0005		
1,1,1-Trichloroethane	0.0004 mg/L	< 0.0004		
1,1,2-Trichloroethane	0.0006 mg/L	< 0.0006		
Trichloroethylene	0.0004 mg/L	< 0.0004		
Trichlorofluoromethane	0.001 mg/L	< 0.001		
1,3,5-Trimethylbenzene	0.0005 mg/L	< 0.0005		
Vinyl Chloride	0.0005 mg/L	< 0.0005		
m/p-Xylene	0.001 mg/L	< 0.001		
o-Xylene	0.0005 mg/L	< 0.0005		

Certificate of Analysis

Report Date: 15-Jun-2004
Order Date: 03-Jun-2004

Client: **Levac Robichaud Leclerc Associates Ltd.**

Client PO: Project: **L96-18**

		MW12B	MW14	MW15A
		J1946.10	J1946.11	J1946.12
1,4-Bromofluorobenzene	surrogate	101%		
Dibromofluoromethane	surrogate	105%		
Toluene-d8	surrogate	97%		

Certificate of Analysis

Report Date: 15-Jun-2004
Order Date: 03-Jun-2004

Client: **Levac Robichaud Leclerc Associates Ltd.**

Client PO: Project: **L96-18**

Matrix: Water
Sample Date: 02-Jun-2004

Parameter	MDL/Units	MW15B J1946.13
Arsenic	0.01 mg/L	< 0.01
Barium	0.01 mg/L	< 0.01
Boron	0.05 mg/L	< 0.05
Calcium	0.2 mg/L	5.6
Iron	0.1 mg/L	< 0.1
Magnesium	0.2 mg/L	1.2
Manganese	0.05 mg/L	< 0.05
Potassium	0.2 mg/L	< 0.2
Sodium	0.2 mg/L	2.0
Alkalinity	5 mg/L	10
Ammonia/ammonium asN	0.01 mg/L	0.09
Chloride	1 mg/L	3
Nitrate as N	0.1 mg/L	0.4
Nitrite as N	0.05 mg/L	< 0.05
Sulphate	1 mg/L	8
Conductivity	5 uS/cm	60
COD	1 mg/L	4
pH	0.05 pH units	6.16
Solids, dissolved	1 mg/L	78
Total Kjeldahl Nitrogen	0.1 mg/L	0.5
Solids, total suspended	1 mg/L	2
DOC	0.5 mg/L	1.5
BOD	2 mg/L	2

Certificate of Analysis

Report Date: 15-Jun-2004
Order Date: 03-Jun-2004

Client: **Levac Robichaud Leclerc Associates Ltd.**

Client PO: Project: **L96-18**

QA/QC Results

	Blank	Spike (QC Limits)	Duplicate	
Arsenic	< 0.01 mg/L	95% (70 - 130%)	< 0.01	< 0.01
Barium	< 0.01 mg/L	95% (70 - 130%)	1.5	1.4
Boron	< 0.05 mg/L	92% (70 - 130%)	< 0.05	< 0.05
Manganese	< 0.05 mg/L	99% (80 - 120%)	3.9	3.8
Alkalinity	< 5 mg/L	n/a	260	260
Ammonia/ammonium asN	< 0.01 mg/L	96% (75 - 125%)	0.05	0.04
Chloride	< 1 mg/L	94% (75 - 125%)	12	12
Nitrate as N	< 0.1 mg/L	97% (75 - 125%)	3.0	3.0
Nitrite as N	< 0.05 mg/L	92% (75 - 125%)	< 0.05	< 0.05
Sulphate	< 1 mg/L	97% (75 - 125%)	17	17
Conductivity	< 5 uS/cm	n/a	310	310
COD	< 1 mg/L	97% (70 - 135%)	54	55
pH	n/a	n/a	7.85	7.80
Solids, dissolved	< 1 mg/L	n/a	74	78
Total Kjeldahl Nitrogen	< 0.1 mg/L	105% (75 - 125%)	0.4	0.5
Solids, total suspended	< 1 mg/L	n/a	< 1	< 1
DOC	< 0.5 mg/L	89% (70 - 130%)	2.5	2.0
BOD	< 2 mg/L	107% (75 - 125%)	84	84
Benzene	< 0.0005 mg/L	92% (61 - 135%)	< 0.0005	< 0.0005
Bromodichloromethane	< 0.0004 mg/L	96% (48 - 164%)	< 0.0004	< 0.0004
Bromoform	< 0.0008 mg/L	110% (3 - 182%)	< 0.0008	< 0.0008
Carbon Tetrachloride	< 0.0005 mg/L	101% (19 - 155%)	< 0.0005	< 0.0005
Chlorobenzene	< 0.0004 mg/L	88% (61 - 139%)	< 0.0004	< 0.0004
Chloroethane	< 0.001 mg/L	103% (50 - 150%)	< 0.001	< 0.001
Chloroform	< 0.0006 mg/L	95% (52 - 134%)	0.0024	0.0024
Chloromethane	< 0.003 mg/L	115% (50 - 193%)	< 0.003	< 0.003
Dibromochloromethane	< 0.0005 mg/L	76% (33 - 175%)	< 0.0005	< 0.0005
1,2-Dibromoethane	< 0.001 mg/L	90% (33 - 172%)	< 0.001	< 0.001
m-Dichlorobenzene	< 0.0004 mg/L	87% (63 - 133%)	< 0.0004	< 0.0004
o-Dichlorobenzene	< 0.0004 mg/L	81% (55 - 141%)	< 0.0004	< 0.0004

Certificate of Analysis

Report Date: 15-Jun-2004
Order Date: 03-Jun-2004

Client: **Levac Robichaud Leclerc Associates Ltd.**

Client PO: Project: **L96-18**

	Blank	Spike (QC Limits)	Duplicate	
p-Dichlorobenzene	< 0.0004 mg/L	81% (64 - 134%)	< 0.0004	< 0.0004
1,1-Dichloroethane	< 0.0005 mg/L	96% (51 - 134%)	< 0.0005	< 0.0005
1,2-Dichloroethane	< 0.0005 mg/L	95% (38 - 164%)	< 0.0005	< 0.0005
1,1-Dichloroethylene	< 0.0006 mg/L	90% (47 - 150%)	< 0.0006	< 0.0006
c-1,2-Dichloroethylene	< 0.0004 mg/L	92% (62 - 139%)	< 0.0004	< 0.0004
t-1,2-Dichloroethylene	< 0.001 mg/L	93% (48 - 153%)	< 0.001	< 0.001
1,2-Dichloropropane	< 0.0007 mg/L	93% (45 - 155%)	< 0.0007	< 0.0007
c-1,3-Dichloropropene	< 0.0004 mg/L	101% (27 - 178%)	< 0.0004	< 0.0004
t-1,3-Dichloropropene	< 0.0005 mg/L	99% (40 - 167%)	< 0.0005	< 0.0005
Ethylbenzene	< 0.0005 mg/L	89% (58 - 147%)	< 0.0005	< 0.0005
Styrene	< 0.0004 mg/L	99% (48 - 146%)	< 0.0004	< 0.0004
1,1,1,2-Tetrachloroethane	< 0.0005 mg/L	105% (70 - 131%)	< 0.0005	< 0.0005
1,1,2,2-Tetrachloroethane	< 0.0006 mg/L	85% (24 - 171%)	< 0.0006	< 0.0006
Tetrachloroethylene	< 0.0005 mg/L	91% (33 - 153%)	< 0.0005	< 0.0005
Toluene	< 0.0005 mg/L	90% (55 - 148%)	< 0.0005	< 0.0005
1,1,1-Trichloroethane	< 0.0004 mg/L	95% (44 - 133%)	< 0.0004	< 0.0004
1,1,2-Trichloroethane	< 0.0006 mg/L	94% (38 - 163%)	< 0.0006	< 0.0006
Trichloroethylene	< 0.0004 mg/L	95% (55 - 152%)	< 0.0004	< 0.0004
Trichlorofluoromethane	< 0.001 mg/L	101% (60 - 163%)	< 0.001	< 0.001
1,3,5-Trimethylbenzene	< 0.0005 mg/L	86% (57 - 135%)	< 0.0005	< 0.0005
Vinyl Chloride	< 0.0005 mg/L	110% (51 - 168%)	< 0.0005	< 0.0005
m/p-Xylene	< 0.001 mg/L	90% (45 - 168%)	< 0.001	< 0.001
o-Xylene	< 0.0005 mg/L	92% (28 - 183%)	< 0.0005	< 0.0005

PARACEL Laboratories Ltd.
Environmental & Indoor Air Quality

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№ 16105

CHAIN OF CUSTODY REPORT

CONTACT: Mario Elia
COMPANY: Levac Rohrbach Leclerc
ADDRESS: 1-2884 Chamberland St
CITY: Rockland
PROV: ON POSTAL: K4K 1M6
TEL: (613) 446-7777 FAX: (613) 446-1427
P.O. NUMBER: PROJECT: L 96-18

DATE: June 3, 2004

TURN AROUND TIME
[ ] 1-day [ ] 2-day [✓] Regular

REPORTING REQUIREMENTS
[ ] Hard Copy [✓] Email – PDF
[✓] FAX [ ] Email – Spreadsheet

REFERENCE:

SAMPLE INFORMATION / **ANALYSIS REQUIRED**

	Paracel Order Number: 1946 / SAMPLE IDENTIFICATION	MATRIX	NO. OF BOTTLES	SAMPLE DATE	Quotation # BB6470	Arsenic	VOC						
1	MW1	W	5	03/06/04	✓	✓							
2	MW3	|	7	|	|	|	✓						
3	MW5-D	|	5	|	|	|							
4	MW5-S	|	5	|	|	|							
5	MW2	|	5	|	|	|							
6	MW8-S	|	7	|	|	|	✓						
7	MW8-D	|	7	|	|	|	✓						
8	MW11	|	7	|	|	|	✓						
9	MW12A	|	7	|	|	|	✓						
10	MW12B	|	7	|	|	|	✓						
	Preservation done in field (Y/N):												
	Preservative to be added by Paracel (Y/N):												

Comments: MW1 & MW3 are labeled with a D after them

Relinquished by: [signature]	Received by: [signature]
Date: June 3/04 Time: 8:26	Date: June 3/04 Time: 8:26
Relinquished by:	Verified by: [signature]
Date: Time:	Date: June 3/04 Time: 9:08

PARACEL Laboratories Ltd.
Environmental & Indoor Air Quality

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№ 16106

CHAIN OF CUSTODY REPORT

CONTACT: Marie Ellis
COMPANY: Levac Robichaud Leclerc
ADDRESS: 1-2884 Chamberland St.
CITY: Rockland
PROV: ON POSTAL: K4K 1M6
TEL: (613) 446-7777 FAX: (613) 446-1427
P.O. NUMBER: PROJECT: L96-18 REFERENCE:

DATE: June 3, 2004

TURN AROUND TIME
[ ] 1-day [ ] 2-day [✓] Regular

REPORTING REQUIREMENTS
[ ] Hard Copy [✓] Email – PDF
[✓] FAX [ ] Email – Spreadsheet

SAMPLE INFORMATION / **ANALYSIS REQUIRED**

	Paracel Order Number: 1446 / SAMPLE IDENTIFICATION	MATRIX	NO. OF BOTTLES	SAMPLE DATE	Quotation # BB6470	Arsenic	[redacted]						
1	MW 14	W	5	02/06/04	✓	✓							
2	MW 15 A		5	"	|	|							
3	MW 15 B		5	"	|	|							
4													
5													
6													
7													
8													
9													
10													
	Preservation done in field (Y/N):												
	Preservative to be added by Paracel (Y/N):												

Comments:

Relinquished by: [signature]	Received by: [signature]
Date: June 3/04 Time: 8:26	Date: June 3/04 Time: 8:26
Relinquished by:	Verified by: [signature]
Date: Time:	Date: June 3/04 Time: 9:08

APPENDIX E
LABORATORY CERTIFICATE OF ANALYSIS
FALL 2004

PARACEL Laboratories Ltd.
Environmental &
Indoor Air Quality

300-2319 St. Laurent Blvd.
Ottawa ON K1G 4J8
Phone: (613) 731-9577
Fax: (613) 731-9064
Toll Free: 800-7491947
email: paracel@paracellabs.com

Order #: J5867

Certificate of Analysis

Levac Robichaud Leclerc Associates Ltd.

1-2884, Chamberland Street
Rockland, ON K4K 1M6
Attn: Mr. Mario Elie

Phone: (613)-446-7777
Fax: (613)-446-1427

Client PO:
Project: **L9618 Dump Champlain**
Custody #: **10605**

Report Date: 30-Dec-2004
Order Date: 20-Dec-2004

This Certificate of Analysis contains analytical data applicable to the following samples as submitted:

Paracel ID	Client ID
J5867.1	MW15-D
J5867.2	MW1-D
J5867.3	MW12-S
J5867.4	MW11
J5867.5	MW8-D
J5867.6	MW8-S
J5867.7	MW14
J5867.8	MW12-D
J5867.9	MW5-S
J5867.10	MW2-D
J5867.11	MW15-S
J5867.12	MW5-D
J5867.13	MW3-D

Approved By: _____ Dale Robertson, B.Sc.
Laboratory Director

Certificate of Analysis

Report Date: 30-Dec-2004
Order Date: 20-Dec-2004

Client: **Levac Robichaud Leclerc Associates Ltd.**

Client PO: Project: **L9618 Dump Champlain**

Analysis Summary Table

Analysis	Method Reference/Description
Metals	EPA 200.8 - ICP-MS
Alkalinity	EPA 310.1 - titration
Ammonia, total	MOE SDNP-E3223A - colourimetric
Anions	EPA 300.1 - ion chromatography
COD	EPA 410.1 - digestion, colourimetric
Conductivity	EPA 120.1 - electrode
pH	EPA 150.1 - pH probe
Solids, dissolved	SM17 2540C - filtration, gravimetric
Solids, total suspended	SM17 2540D - gravimetric
Total Kjeldahl Nitrogen	MOE RTNP-E3180A - digestion, colourimetric
DOC	E3247B - combustion IR
BOD, 5-day	APHA 5210B
VOCs	EPA 624 - P&T GC-MS

n/a: not applicable
MDL: Method Detection Limit

Certificate of Analysis

Report Date: 30-Dec-2004
Order Date: 20-Dec-2004

Client: **Levac Robichaud Leclerc Associates Ltd.**
Client PO:

Project: **L9618 Dump Champlain**

Matrix: Water

Parameter	Sample ID: / Sample Date: / MDL/Units	MW15-D 17-Dec-2004 J5867.1	MW1-D 17-Dec-2004 J5867.2	MW12-S 17-Dec-2004 J5867.3
Aluminum	0.01 mg/L	< 0.01	< 0.01	0.05
Antimony	0.001 mg/L	< 0.001	< 0.001	< 0.001
Arsenic	0.01 mg/L	< 0.01	< 0.01	< 0.01
Barium	0.01 mg/L	< 0.01	0.03	< 0.01
Beryllium	0.001 mg/L	< 0.001	< 0.001	< 0.001
Boron	0.05 mg/L	< 0.05	< 0.05	< 0.05
Cadmium	0.001 mg/L	< 0.001	< 0.001	< 0.001
Calcium	0.2 mg/L	24	35	9.6
Chromium	0.05 mg/L	< 0.05	< 0.05	< 0.05
Cobalt	0.005 mg/L	< 0.005	< 0.005	< 0.005
Copper	0.005 mg/L	< 0.005	< 0.005	< 0.005
Iron	0.2 mg/L	< 0.2	< 0.2	5.8
Lead	0.001 mg/L	< 0.001	< 0.001	< 0.001
Magnesium	0.2 mg/L	9.0	7.2	5.8
Manganese	0.05 mg/L	< 0.05	0.25	0.25
Molybdenum	0.005 mg/L	0.005	< 0.005	< 0.005
Nickel	0.005 mg/L	< 0.005	< 0.005	< 0.005
Potassium	0.2 mg/L	2.0	1.0	0.4
Selenium	0.005 mg/L	< 0.005	< 0.005	< 0.005
Silver	0.001 mg/L	< 0.001	< 0.001	< 0.001
Sodium	0.2 mg/L	13	4.8	3.0
Thallium	0.001 mg/L	< 0.001	< 0.001	< 0.001
Tin	0.01 mg/L	< 0.01	< 0.01	< 0.01
Vanadium	0.01 mg/L	< 0.01	< 0.01	< 0.01
Zinc	0.02 mg/L	< 0.02	< 0.02	< 0.02
Alkalinity	5 mg/L	120	90	70
Ammonia, total as N	0.01 mg/L	0.09	0.12	0.13
Chloride	1 mg/L	< 1	16	1
Nitrate as N	0.1 mg/L	0.6	5.0	< 0.1

Certificate of Analysis

Report Date: 30-Dec-2004
Order Date: 20-Dec-2004

Client: **Levac Robichaud Leclerc Associates Ltd.**
Client PO:

Project: **L9618 Dump Champlain**

		MW15-D	MW1-D	MW12-S
		17-Dec-2004	17-Dec-2004	17-Dec-2004
		J5867.1	J5867.2	J5867.3
Nitrite as N	0.05 mg/L	< 0.05	< 0.05	< 0.05
Sulphate	1 mg/L	36	22	14
Conductivity	5 uS/cm	300	320	180
COD	1 mg/L	7	23	310
pH	0.05 pH units	7.55	6.62	6.33
Solids, dissolved	1 mg/L	300	300	180
Total Kjeldahl Nitrogen	0.1 mg/L	0.4	1.1	0.6
Solids, total suspended	1 mg/L	< 1	22	< 1
DOC	0.5 mg/L	4.5	9.5	9.0
BOD	2 mg/L	< 2	2	< 2
Benzene	0.0005 mg/L			< 0.0005
Bromodichloromethane	0.0004 mg/L			< 0.0004
Bromoform	0.0008 mg/L			< 0.0008
Bromomethane	0.001 mg/L			< 0.001
Carbon Tetrachloride	0.0005 mg/L			< 0.0005
Chlorobenzene	0.0004 mg/L			< 0.0004
Chloroethane	0.001 mg/L			< 0.001
Chloroform	0.0006 mg/L			< 0.0006
Chloromethane	0.003 mg/L			< 0.003
Dibromochloromethane	0.0005 mg/L			< 0.0005
1,2-Dibromoethane	0.001 mg/L			< 0.001
m-Dichlorobenzene	0.0004 mg/L			< 0.0004
o-Dichlorobenzene	0.0004 mg/L			< 0.0004
p-Dichlorobenzene	0.0004 mg/L			< 0.0004
1,1-Dichloroethane	0.0005 mg/L			< 0.0005
1,2-Dichloroethane	0.0005 mg/L			< 0.0005
1,1-Dichloroethylene	0.0006 mg/L			< 0.0006
c-1,2-Dichloroethylene	0.0004 mg/L			< 0.0004
t-1,2-Dichloroethylene	0.001 mg/L			< 0.001

Certificate of Analysis

Report Date: 30-Dec-2004
Order Date: 20-Dec-2004

Client: **Levac Robichaud Leclerc Associates Ltd.**

Client PO: Project: **L9618 Dump Champlain**

		MW15-D	MW1-D	MW12-S
		17-Dec-2004	17-Dec-2004	17-Dec-2004
		J5867.1	J5867.2	J5867.3
1,2-Dichloropropane	0.0007 mg/L			< 0.0007
c-1,3-Dichloropropene	0.0004 mg/L			< 0.0004
t-1,3-Dichloropropene	0.0005 mg/L			< 0.0005
Ethylbenzene	0.0005 mg/L			< 0.0005
Methylene Chloride	0.004 mg/L			< 0.004
Styrene	0.0004 mg/L			< 0.0004
1,1,1,2-Tetrachloroethane	0.0005 mg/L			< 0.0005
1,1,2,2-Tetrachloroethane	0.0006 mg/L			< 0.0006
Tetrachloroethylene	0.0005 mg/L			< 0.0005
Toluene	0.0005 mg/L			< 0.0005
1,1,1-Trichloroethane	0.0004 mg/L			< 0.0004
1,1,2-Trichloroethane	0.0006 mg/L			< 0.0006
Trichloroethylene	0.0004 mg/L			0.0008
Trichlorofluoromethane	0.001 mg/L			< 0.001
1,3,5-Trimethylbenzene	0.0005 mg/L			< 0.0005
Vinyl Chloride	0.0005 mg/L			< 0.0005
m/p-Xylene	0.001 mg/L			< 0.001
o-Xylene	0.0005 mg/L			< 0.0005
1,4-Bromofluorobenzene	surrogate			106%
Dibromofluoromethane	surrogate			97%
Toluene-d8	surrogate			95%

Certificate of Analysis

Report Date: 30-Dec-2004
Order Date: 20-Dec-2004

Client: **Levac Robichaud Leclerc Associates Ltd.**
Client PO:

Project: **L9618 Dump Champlain**

Matrix: Water

Parameter	Sample ID: / Sample Date: / MDL/Units	MW11 17-Dec-2004 J5867.4	MW8-D 17-Dec-2004 J5867.5	MW8-S 17-Dec-2004 J5867.6
Aluminum	0.01 mg/L	< 0.01	< 0.01	< 0.01
Antimony	0.001 mg/L	< 0.001	< 0.001	< 0.001
Arsenic	0.01 mg/L	< 0.01	< 0.01	< 0.01
Barium	0.01 mg/L	0.03	0.03	0.01
Beryllium	0.001 mg/L	< 0.001	< 0.001	< 0.001
Boron	0.05 mg/L	< 0.05	< 0.05	< 0.05
Cadmium	0.001 mg/L	< 0.001	< 0.001	< 0.001
Calcium	0.2 mg/L	66	39	10
Chromium	0.05 mg/L	< 0.05	< 0.05	< 0.05
Cobalt	0.005 mg/L	< 0.005	< 0.005	< 0.005
Copper	0.005 mg/L	< 0.005	< 0.005	< 0.005
Iron	0.2 mg/L	< 0.2	< 0.2	< 0.2
Lead	0.001 mg/L	< 0.001	< 0.001	< 0.001
Magnesium	0.2 mg/L	7.6	9.0	2.2
Manganese	0.05 mg/L	< 0.05	0.05	0.10
Molybdenum	0.005 mg/L	< 0.005	< 0.005	< 0.005
Nickel	0.005 mg/L	< 0.005	< 0.005	< 0.005
Potassium	0.2 mg/L	0.4	1.4	0.4
Selenium	0.005 mg/L	< 0.005	< 0.005	< 0.005
Silver	0.001 mg/L	< 0.001	< 0.001	< 0.001
Sodium	0.2 mg/L	2.8	2.8	2.4
Thallium	0.001 mg/L	< 0.001	< 0.001	< 0.001
Tin	0.01 mg/L	< 0.01	< 0.01	< 0.01
Vanadium	0.01 mg/L	< 0.01	< 0.01	< 0.01
Zinc	0.02 mg/L	< 0.02	< 0.02	< 0.02
Alkalinity	5 mg/L	180	130	20
Ammonia, total as N	0.01 mg/L	0.03	0.10	0.04
Chloride	1 mg/L	9	4	6
Nitrate as N	0.1 mg/L	2.9	< 0.1	< 0.1

Certificate of Analysis

Report Date: 30-Dec-2004
Order Date: 20-Dec-2004

Client: **Levac Robichaud Leclerc Associates Ltd.**

Client PO: Project: **L9618 Dump Champlain**

		MW11	MW8-D	MW8-S
		17-Dec-2004	17-Dec-2004	17-Dec-2004
		J5867.4	J5867.5	J5867.6
Nitrite as N	0.05 mg/L	< 0.05	< 0.05	< 0.05
Sulphate	1 mg/L	18	22	12
Conductivity	5 uS/cm	400	290	90
COD	1 mg/L	1	1	35
pH	0.05 pH units	7.55	7.24	5.94
Solids, dissolved	1 mg/L	300	260	76
Total Kjeldahl Nitrogen	0.1 mg/L	0.6	0.5	0.7
Solids, total suspended	1 mg/L	< 1	2	< 1
DOC	0.5 mg/L	2.5	25	3.0
BOD	2 mg/L	< 2	< 2	2
Benzene	0.0005 mg/L	< 0.0005	< 0.0005	< 0.0005
Bromodichloromethane	0.0004 mg/L	< 0.0004	< 0.0004	< 0.0004
Bromoform	0.0008 mg/L	< 0.0008	< 0.0008	< 0.0008
Bromomethane	0.001 mg/L	< 0.001	< 0.001	< 0.001
Carbon Tetrachloride	0.0005 mg/L	< 0.0005	< 0.0005	< 0.0005
Chlorobenzene	0.0004 mg/L	< 0.0004	< 0.0004	< 0.0004
Chloroethane	0.001 mg/L	< 0.001	< 0.001	< 0.001
Chloroform	0.0006 mg/L	< 0.0006	< 0.0006	< 0.0006
Chloromethane	0.003 mg/L	< 0.003	< 0.003	< 0.003
Dibromochloromethane	0.0005 mg/L	< 0.0005	< 0.0005	< 0.0005
1,2-Dibromoethane	0.001 mg/L	< 0.001	< 0.001	< 0.001
m-Dichlorobenzene	0.0004 mg/L	< 0.0004	< 0.0004	< 0.0004
o-Dichlorobenzene	0.0004 mg/L	< 0.0004	< 0.0004	< 0.0004
p-Dichlorobenzene	0.0004 mg/L	< 0.0004	< 0.0004	< 0.0004
1,1-Dichloroethane	0.0005 mg/L	< 0.0005	< 0.0005	< 0.0005
1,2-Dichloroethane	0.0005 mg/L	< 0.0005	< 0.0005	< 0.0005
1,1-Dichloroethylene	0.0006 mg/L	< 0.0006	< 0.0006	< 0.0006
c-1,2-Dichloroethylene	0.0004 mg/L	< 0.0004	< 0.0004	< 0.0004
t-1,2-Dichloroethylene	0.001 mg/L	< 0.001	< 0.001	< 0.001

Certificate of Analysis

Report Date: 30-Dec-2004
Order Date: 20-Dec-2004

Client: **Levac Robichaud Leclerc Associates Ltd.**

Client PO:

Project: **L9618 Dump Champlain**

		MW11	MW8-D	MW8-S
		17-Dec-2004	17-Dec-2004	17-Dec-2004
		J5867.4	J5867.5	J5867.6
1,2-Dichloropropane	0.0007 mg/L	< 0.0007	< 0.0007	< 0.0007
c-1,3-Dichloropropene	0.0004 mg/L	< 0.0004	< 0.0004	< 0.0004
t-1,3-Dichloropropene	0.0005 mg/L	< 0.0005	< 0.0005	< 0.0005
Ethylbenzene	0.0005 mg/L	< 0.0005	< 0.0005	< 0.0005
Methylene Chloride	0.004 mg/L	< 0.004	< 0.004	< 0.004
Styrene	0.0004 mg/L	< 0.0004	< 0.0004	< 0.0004
1,1,1,2-Tetrachloroethane	0.0005 mg/L	< 0.0005	< 0.0005	< 0.0005
1,1,2,2-Tetrachloroethane	0.0006 mg/L	< 0.0006	< 0.0006	< 0.0006
Tetrachloroethylene	0.0005 mg/L	< 0.0005	< 0.0005	< 0.0005
Toluene	0.0005 mg/L	< 0.0005	< 0.0005	< 0.0005
1,1,1-Trichloroethane	0.0004 mg/L	< 0.0004	< 0.0004	< 0.0004
1,1,2-Trichloroethane	0.0006 mg/L	< 0.0006	< 0.0006	< 0.0006
Trichloroethylene	0.0004 mg/L	0.0008	0.0008	0.0004
Trichlorofluoromethane	0.001 mg/L	< 0.001	< 0.001	< 0.001
1,3,5-Trimethylbenzene	0.0005 mg/L	< 0.0005	< 0.0005	< 0.0005
Vinyl Chloride	0.0005 mg/L	< 0.0005	< 0.0005	< 0.0005
m/p-Xylene	0.001 mg/L	< 0.001	< 0.001	< 0.001
o-Xylene	0.0005 mg/L	< 0.0005	< 0.0005	< 0.0005
1,4-Bromofluorobenzene	surrogate	114%	116%	122%
Dibromofluoromethane	surrogate	96%	95%	95%
Toluene-d8	surrogate	97%	100%	100%

Certificate of Analysis

Report Date: 30-Dec-2004
Order Date: 20-Dec-2004

Client: **Levac Robichaud Leclerc Associates Ltd.**
Client PO: Project: **L9618 Dump Champlain**

Matrix: Water

Parameter	Sample ID: / Sample Date: / MDL/Units	MW14 17-Dec-2004 J5867.7	MW12-D 17-Dec-2004 J5867.8	MW5-S 17-Dec-2004 J5867.9
Aluminum	0.01 mg/L	< 0.01	< 0.01	< 0.01
Antimony	0.001 mg/L	< 0.001	< 0.001	< 0.001
Arsenic	0.01 mg/L	< 0.01	< 0.01	< 0.01
Barium	0.01 mg/L	0.02	0.02	< 0.01
Beryllium	0.001 mg/L	< 0.001	< 0.001	< 0.001
Boron	0.05 mg/L	< 0.05	< 0.05	< 0.05
Cadmium	0.001 mg/L	< 0.001	< 0.001	< 0.001
Calcium	0.2 mg/L	42	15	8.8
Chromium	0.05 mg/L	< 0.05	< 0.05	< 0.05
Cobalt	0.005 mg/L	< 0.005	< 0.005	< 0.005
Copper	0.005 mg/L	< 0.005	< 0.005	< 0.005
Iron	0.2 mg/L	< 0.2	< 0.2	2.2
Lead	0.001 mg/L	< 0.001	< 0.001	< 0.001
Magnesium	0.2 mg/L	5.6	12	5.8
Manganese	0.05 mg/L	< 0.05	0.05	0.10
Molybdenum	0.005 mg/L	< 0.005	0.010	< 0.005
Nickel	0.005 mg/L	< 0.005	< 0.005	< 0.005
Potassium	0.2 mg/L	0.4	5.4	0.6
Selenium	0.005 mg/L	< 0.005	< 0.005	< 0.005
Silver	0.001 mg/L	< 0.001	< 0.001	< 0.001
Sodium	0.2 mg/L	1.6	14	2.8
Thallium	0.001 mg/L	< 0.001	< 0.001	< 0.001
Tin	0.01 mg/L	< 0.01	< 0.01	< 0.01
Vanadium	0.01 mg/L	< 0.01	< 0.01	< 0.01
Zinc	0.02 mg/L	< 0.02	< 0.02	< 0.02
Alkalinity	5 mg/L	140	140	55
Ammonia, total as N	0.01 mg/L	0.10	0.30	0.18
Chloride	1 mg/L	< 1	< 1	3
Nitrate as N	0.1 mg/L	1.0	< 0.1	< 0.1

Certificate of Analysis

Report Date: 30-Dec-2004
Order Date: 20-Dec-2004

Client: **Levac Robichaud Leclerc Associates Ltd.**
Client PO:

Project: **L9618 Dump Champlain**

		MW14	MW12-D	MW5-S
		17-Dec-2004	17-Dec-2004	17-Dec-2004
		J5867.7	J5867.8	J5867.9
Nitrite as N	0.05 mg/L	< 0.05	< 0.05	< 0.05
Sulphate	1 mg/L	6	7	14
Conductivity	5 uS/cm	280	270	160
COD	1 mg/L	< 1	7	160
pH	0.05 pH units	7.71	7.91	7.15
Solids, dissolved	1 mg/L	180	150	120
Total Kjeldahl Nitrogen	0.1 mg/L	0.5	0.9	0.7
Solids, total suspended	1 mg/L	< 1	4	6
DOC	0.5 mg/L	1.5	5.0	3.5
BOD	2 mg/L	< 2	2	18
Benzene	0.0005 mg/L		< 0.0005	
Bromodichloromethane	0.0004 mg/L		< 0.0004	
Bromoform	0.0008 mg/L		< 0.0008	
Bromomethane	0.001 mg/L		< 0.001	
Carbon Tetrachloride	0.0005 mg/L		< 0.0005	
Chlorobenzene	0.0004 mg/L		< 0.0004	
Chloroethane	0.001 mg/L		< 0.001	
Chloroform	0.0006 mg/L		< 0.0006	
Chloromethane	0.003 mg/L		< 0.003	
Dibromochloromethane	0.0005 mg/L		< 0.0005	
1,2-Dibromoethane	0.001 mg/L		< 0.001	
m-Dichlorobenzene	0.0004 mg/L		< 0.0004	
o-Dichlorobenzene	0.0004 mg/L		< 0.0004	
p-Dichlorobenzene	0.0004 mg/L		< 0.0004	
1,1-Dichloroethane	0.0005 mg/L		< 0.0005	
1,2-Dichloroethane	0.0005 mg/L		< 0.0005	
1,1-Dichloroethylene	0.0006 mg/L		< 0.0006	
c-1,2-Dichloroethylene	0.0004 mg/L		< 0.0004	
t-1,2-Dichloroethylene	0.001 mg/L		< 0.001	

Certificate of Analysis

Report Date: 30-Dec-2004
Order Date: 20-Dec-2004

Client: **Levac Robichaud Leclerc Associates Ltd.**

Client PO: Project: **L9618 Dump Champlain**

		MW14	MW12-D	MW5-S
		17-Dec-2004	17-Dec-2004	17-Dec-2004
		J5867.7	J5867.8	J5867.9
1,2-Dichloropropane	0.0007 mg/L		< 0.0007	
c-1,3-Dichloropropene	0.0004 mg/L		< 0.0004	
t-1,3-Dichloropropene	0.0005 mg/L		< 0.0005	
Ethylbenzene	0.0005 mg/L		< 0.0005	
Methylene Chloride	0.004 mg/L		< 0.004	
Styrene	0.0004 mg/L		< 0.0004	
1,1,1,2-Tetrachloroethane	0.0005 mg/L		< 0.0005	
1,1,2,2-Tetrachloroethane	0.0006 mg/L		< 0.0006	
Tetrachloroethylene	0.0005 mg/L		< 0.0005	
Toluene	0.0005 mg/L		< 0.0005	
1,1,1-Trichloroethane	0.0004 mg/L		< 0.0004	
1,1,2-Trichloroethane	0.0006 mg/L		< 0.0006	
Trichloroethylene	0.0004 mg/L		0.0008	
Trichlorofluoromethane	0.001 mg/L		< 0.001	
1,3,5-Trimethylbenzene	0.0005 mg/L		< 0.0005	
Vinyl Chloride	0.0005 mg/L		< 0.0005	
m/p-Xylene	0.001 mg/L		< 0.001	
o-Xylene	0.0005 mg/L		< 0.0005	
1,4-Bromofluorobenzene	surrogate		121%	
Dibromofluoromethane	surrogate		95%	
Toluene-d8	surrogate		101%	

Certificate of Analysis

Report Date: 30-Dec-2004
Order Date: 20-Dec-2004

Client: **Levac Robichaud Leclerc Associates Ltd.**

Client PO: Project: **L9618 Dump Champlain**

Matrix: Water

Parameter	Sample ID:	MW2-D	MW15-S	MW5-D
	Sample Date:	17-Dec-2004	17-Dec-2004	17-Dec-2004
	MDL/Units	J5867.10	J5867.11	J5867.12
Aluminum	0.01 mg/L	< 0.01	< 0.01	< 0.01
Antimony	0.001 mg/L	< 0.001	< 0.001	< 0.001
Arsenic	0.01 mg/L	< 0.01	< 0.01	< 0.01
Barium	0.01 mg/L	0.01	0.01	0.09
Beryllium	0.001 mg/L	< 0.001	< 0.001	< 0.001
Boron	0.05 mg/L	< 0.05	< 0.05	< 0.05
Cadmium	0.001 mg/L	< 0.001	< 0.001	< 0.001
Calcium	0.2 mg/L	7.8	6.2	37
Chromium	0.05 mg/L	< 0.05	< 0.05	< 0.05
Cobalt	0.005 mg/L	< 0.005	< 0.005	< 0.005
Copper	0.005 mg/L	< 0.005	< 0.005	< 0.005
Iron	0.2 mg/L	< 0.2	< 0.2	1.0
Lead	0.001 mg/L	< 0.001	< 0.001	< 0.001
Magnesium	0.2 mg/L	2.8	1.6	7.4
Manganese	0.05 mg/L	< 0.05	< 0.05	0.15
Molybdenum	0.005 mg/L	< 0.005	< 0.005	< 0.005
Nickel	0.005 mg/L	< 0.005	< 0.005	< 0.005
Potassium	0.2 mg/L	0.4	0.2	1.2
Selenium	0.005 mg/L	< 0.005	< 0.005	< 0.005
Silver	0.001 mg/L	< 0.001	< 0.001	< 0.001
Sodium	0.2 mg/L	8.4	1.4	7.4
Thallium	0.001 mg/L	< 0.001	< 0.001	< 0.001
Tin	0.01 mg/L	< 0.01	< 0.01	< 0.01
Vanadium	0.01 mg/L	< 0.01	< 0.01	< 0.01
Zinc	0.02 mg/L	< 0.02	< 0.02	< 0.02
Alkalinity	5 mg/L	65	20	160
Ammonia, total as N	0.01 mg/L	0.04	0.12	0.15
Chloride	1 mg/L	< 1	5	2
Nitrate as N	0.1 mg/L	< 0.1	< 0.1	< 0.1

Certificate of Analysis

Report Date: 30-Dec-2004
Order Date: 20-Dec-2004

Client: **Levac Robichaud Leclerc Associates Ltd.**

Client PO: Project: **L9618 Dump Champlain**

		MW2-D	MW15-S	MW5-D
		17-Dec-2004	17-Dec-2004	17-Dec-2004
		J5867.10	J5867.11	J5867.12
Nitrite as N	0.05 mg/L	< 0.05	< 0.05	< 0.05
Sulphate	1 mg/L	5	7	11
Conductivity	5 uS/cm	140	80	310
COD	1 mg/L	5	4	10
pH	0.05 pH units	8.05	6.88	7.28
Solids, dissolved	1 mg/L	100	56	180
Total Kjeldahl Nitrogen	0.1 mg/L	1.1	0.7	0.7
Solids, total suspended	1 mg/L	6	< 1	6
DOC	0.5 mg/L	1.5	7.0	5.0
BOD	2 mg/L	2	< 2	4

Certificate of Analysis

Report Date: 30-Dec-2004
Order Date: 20-Dec-2004

Client: **Levac Robichaud Leclerc Associates Ltd.**
Client PO: Project: **L9618 Dump Champlain**

Matrix: Water

Parameter	MDL/Units	Sample ID: MW3-D Sample Date: 17-Dec-2004 J5867.13
Aluminum	0.01 mg/L	9.9
Antimony	0.001 mg/L	< 0.001
Arsenic	0.01 mg/L	< 0.01
Barium	0.01 mg/L	1.0
Beryllium	0.001 mg/L	0.003
Boron	0.05 mg/L	0.15
Cadmium	0.001 mg/L	< 0.001
Calcium	0.2 mg/L	410
Chromium	0.05 mg/L	< 0.05
Cobalt	0.005 mg/L	0.030
Copper	0.005 mg/L	0.020
Iron	0.2 mg/L	< 0.2
Lead	0.001 mg/L	0.001
Magnesium	0.2 mg/L	22
Manganese	0.05 mg/L	3.3
Molybdenum	0.005 mg/L	< 0.005
Nickel	0.005 mg/L	0.020
Potassium	0.2 mg/L	8.2
Selenium	0.005 mg/L	< 0.005
Silver	0.001 mg/L	< 0.001
Sodium	0.2 mg/L	2.8
Thallium	0.001 mg/L	< 0.001
Tin	0.01 mg/L	< 0.01
Vanadium	0.01 mg/L	0.01
Zinc	0.02 mg/L	0.06
Alkalinity	5 mg/L	410
Ammonia, total as N	0.01 mg/L	0.12
Chloride	1 mg/L	2
Nitrate as N	0.1 mg/L	0.7

Certificate of Analysis

Report Date: 30-Dec-2004
Order Date: 20-Dec-2004

Client: **Levac Robichaud Leclerc Associates Ltd.**
Client PO:

Project: **L9618 Dump Champlain**

		MW3-D
		17-Dec-2004
		J5867.13
Nitrite as N	0.05 mg/L	< 0.05
Sulphate	1 mg/L	57
Conductivity	5 uS/cm	850
COD	1 mg/L	13
pH	0.05 pH units	6.64
Solids, dissolved	1 mg/L	1300
Total Kjeldahl Nitrogen	0.1 mg/L	0.4
Solids, total suspended	1 mg/L	12000
DOC	0.5 mg/L	6.0
BOD	2 mg/L	2
Benzene	0.0005 mg/L	< 0.0005
Bromodichloromethane	0.0004 mg/L	< 0.0004
Bromoform	0.0008 mg/L	< 0.0008
Bromomethane	0.001 mg/L	< 0.001
Carbon Tetrachloride	0.0005 mg/L	< 0.0005
Chlorobenzene	0.0004 mg/L	< 0.0004
Chloroethane	0.001 mg/L	< 0.001
Chloroform	0.0006 mg/L	< 0.0006
Chloromethane	0.003 mg/L	< 0.003
Dibromochloromethane	0.0005 mg/L	< 0.0005
1,2-Dibromoethane	0.001 mg/L	< 0.001
m-Dichlorobenzene	0.0004 mg/L	< 0.0004
o-Dichlorobenzene	0.0004 mg/L	< 0.0004
p-Dichlorobenzene	0.0004 mg/L	< 0.0004
1,1-Dichloroethane	0.0005 mg/L	< 0.0005
1,2-Dichloroethane	0.0005 mg/L	< 0.0005
1,1-Dichloroethylene	0.0006 mg/L	< 0.0006
c-1,2-Dichloroethylene	0.0004 mg/L	< 0.0004
t-1,2-Dichloroethylene	0.001 mg/L	< 0.001

Certificate of Analysis

Report Date: 30-Dec-2004
Order Date: 20-Dec-2004

Client: **Levac Robichaud Leclerc Associates Ltd.**

Client PO: Project: **L9618 Dump Champlain**

		MW3-D
		17-Dec-2004
		J5867.13
1,2-Dichloropropane	0.0007 mg/L	< 0.0007
c-1,3-Dichloropropene	0.0004 mg/L	< 0.0004
t-1,3-Dichloropropene	0.0005 mg/L	< 0.0005
Ethylbenzene	0.0005 mg/L	< 0.0005
Methylene Chloride	0.004 mg/L	< 0.004
Styrene	0.0004 mg/L	< 0.0004
1,1,1,2-Tetrachloroethane	0.0005 mg/L	< 0.0005
1,1,2,2-Tetrachloroethane	0.0006 mg/L	< 0.0006
Tetrachloroethylene	0.0005 mg/L	< 0.0005
Toluene	0.0005 mg/L	< 0.0005
1,1,1-Trichloroethane	0.0004 mg/L	< 0.0004
1,1,2-Trichloroethane	0.0006 mg/L	< 0.0006
Trichloroethylene	0.0004 mg/L	< 0.0004
Trichlorofluoromethane	0.001 mg/L	< 0.001
1,3,5-Trimethylbenzene	0.0005 mg/L	< 0.0005
Vinyl Chloride	0.0005 mg/L	< 0.0005
m/p-Xylene	0.001 mg/L	< 0.001
o-Xylene	0.0005 mg/L	< 0.0005
1,4-Bromofluorobenzene	surrogate	120%
Dibromofluoromethane	surrogate	98%
Toluene-d8	surrogate	104%

Certificate of Analysis

Report Date: 30-Dec-2004
Order Date: 20-Dec-2004

Client: **Levac Robichaud Leclerc Associates Ltd.**

Client PO: Project: **L9618 Dump Champlain**

QA/QC Results

	Blank	Spike (QC Limits)	Duplicate	
Aluminum	< 0.01 mg/L	98% (70 - 130%)	< 0.01	< 0.01
Antimony	< 0.001 mg/L	85% (70 - 130%)	< 0.001	< 0.001
Arsenic	< 0.01 mg/L	94% (70 - 130%)	< 0.01	< 0.01
Barium	< 0.01 mg/L	89% (70 - 130%)	< 0.01	< 0.01
Beryllium	< 0.001 mg/L	99% (70 - 130%)	< 0.001	< 0.001
Boron	< 0.05 mg/L	90% (70 - 130%)	< 0.05	< 0.05
Cadmium	< 0.001 mg/L	91% (70 - 130%)	< 0.001	< 0.001
Chromium	< 0.05 mg/L	95% (70 - 130%)	< 0.05	< 0.05
Cobalt	< 0.005 mg/L	95% (70 - 130%)	< 0.005	< 0.005
Copper	< 0.005 mg/L	91% (70 - 130%)	< 0.005	< 0.005
Lead	< 0.001 mg/L	96% (70 - 130%)	< 0.001	< 0.001
Manganese	< 0.05 mg/L	97% (70 - 130%)	< 0.05	< 0.05
Molybdenum	< 0.005 mg/L	89% (70 - 130%)	0.005	0.005
Nickel	< 0.005 mg/L	94% (70 - 120%)	< 0.005	< 0.005
Selenium	< 0.005 mg/L	100% (70 - 130%)	< 0.005	< 0.005
Silver	< 0.001 mg/L	92% (70 - 108%)	< 0.001	< 0.001
Thallium	< 0.001 mg/L	105% (70 - 130%)	< 0.001	< 0.001
Tin	< 0.01 mg/L	78% (70 - 130%)	< 0.01	< 0.01
Vanadium	< 0.01 mg/L	100% (70 - 130%)	< 0.01	< 0.01
Zinc	< 0.02 mg/L	92% (70 - 130%)	< 0.02	< 0.02
Alkalinity	< 5 mg/L	n/a	25	25
Ammonia, total as N	< 0.01 mg/L	90% (75 - 125%)	0.09	0.09
Chloride	< 1 mg/L	98% (75 - 125%)	1	< 1
Nitrate as N	< 0.1 mg/L	98% (75 - 125%)	0.6	0.6
Nitrite as N	< 0.05 mg/L	88% (75 - 125%)	< 0.05	< 0.05
Sulphate	< 1 mg/L	97% (75 - 125%)	37	36
Conductivity	< 5 uS/cm	n/a	150	150
COD	< 1 mg/L	104% (70 - 135%)	7	7
pH	n/a	n/a	6.65	6.55
Solids, dissolved	< 1 mg/L	n/a	290	300

Certificate of Analysis

Report Date: 30-Dec-2004
Order Date: 20-Dec-2004

Client: **Levac Robichaud Leclerc Associates Ltd.**

Client PO: Project: **L9618 Dump Champlain**

	Blank	Spike (QC Limits)	Duplicate	
Total Kjeldahl Nitrogen	< 0.1 mg/L	109% (75 - 125%)	0.4	0.4
Solids, total suspended	< 1 mg/L	n/a	< 1	< 1
DOC	< 0.5 mg/L	105% (70 - 130%)	3.5	3.0
BOD	< 2 mg/L	113% (75 - 125%)	1400	1500
Benzene	< 0.0005 mg/L	80% (61 - 135%)	< 0.0005	< 0.0005
Bromodichloromethane	< 0.0004 mg/L	97% (48 - 164%)	< 0.0004	< 0.0004
Bromoform	< 0.0008 mg/L	103% (3 - 182%)	< 0.0008	< 0.0008
Carbon Tetrachloride	< 0.0005 mg/L	70% (19 - 155%)	< 0.0005	< 0.0005
Chlorobenzene	< 0.0004 mg/L	90% (61 - 139%)	< 0.0004	< 0.0004
Chloroethane	< 0.001 mg/L	73% (50 - 150%)	< 0.001	< 0.001
Chloroform	< 0.0006 mg/L	87% (52 - 134%)	< 0.0006	< 0.0006
Chloromethane	< 0.003 mg/L	64% (50 - 193%)	< 0.003	< 0.003
Dibromochloromethane	< 0.0005 mg/L	111% (33 - 175%)	< 0.0005	< 0.0005
1,2-Dibromoethane	< 0.001 mg/L	82% (33 - 172%)	< 0.001	< 0.001
m-Dichlorobenzene	< 0.0004 mg/L	99% (63 - 133%)	< 0.0004	< 0.0004
o-Dichlorobenzene	< 0.0004 mg/L	90% (55 - 141%)	< 0.0004	< 0.0004
p-Dichlorobenzene	< 0.0004 mg/L	87% (64 - 134%)	< 0.0004	< 0.0004
1,1-Dichloroethane	< 0.0005 mg/L	82% (51 - 134%)	< 0.0005	< 0.0005
1,2-Dichloroethane	< 0.0005 mg/L	78% (38 - 164%)	< 0.0005	< 0.0005
1,1-Dichloroethylene	< 0.0006 mg/L	72% (47 - 150%)	< 0.0006	< 0.0006
c-1,2-Dichloroethylene	< 0.0004 mg/L	81% (62 - 139%)	< 0.0004	< 0.0004
t-1,2-Dichloroethylene	< 0.001 mg/L	79% (48 - 153%)	< 0.001	< 0.001
1,2-Dichloropropane	< 0.0007 mg/L	81% (45 - 155%)	< 0.0007	< 0.0007
c-1,3-Dichloropropene	< 0.0004 mg/L	81% (27 - 178%)	< 0.0004	< 0.0004
t-1,3-Dichloropropene	< 0.0005 mg/L	80% (40 - 167%)	< 0.0005	< 0.0005
Ethylbenzene	< 0.0005 mg/L	90% (58 - 147%)	< 0.0005	< 0.0005
Styrene	< 0.0004 mg/L	94% (48 - 146%)	< 0.0004	< 0.0004
1,1,1,2-Tetrachloroethane	< 0.0005 mg/L	110% (70 - 131%)	< 0.0005	< 0.0005
1,1,2,2-Tetrachloroethane	< 0.0006 mg/L	85% (24 - 171%)	< 0.0006	< 0.0006
Tetrachloroethylene	< 0.0005 mg/L	85% (33 - 153%)	< 0.0005	< 0.0005
Toluene	< 0.0005 mg/L	81% (55 - 148%)	< 0.0005	< 0.0005

Certificate of Analysis

Report Date: 30-Dec-2004
Order Date: 20-Dec-2004

Client: **Levac Robichaud Leclerc Associates Ltd.**

Client PO: Project: **L9618 Dump Champlain**

	Blank	Spike (QC Limits)	Duplicate	
1,1,1-Trichloroethane	< 0.0004 mg/L	84% (44 - 133%)	< 0.0004	< 0.0004
1,1,2-Trichloroethane	< 0.0006 mg/L	79% (38 - 163%)	< 0.0006	< 0.0006
Trichloroethylene	< 0.0004 mg/L	76% (55 - 152%)	0.0008	0.0008
Trichlorofluoromethane	< 0.001 mg/L	76% (60 - 163%)	< 0.001	< 0.001
1,3,5-Trimethylbenzene	< 0.0005 mg/L	83% (57 - 135%)	< 0.0005	< 0.0005
Vinyl Chloride	< 0.0005 mg/L	68% (51 - 168%)	< 0.0005	< 0.0005
m/p-Xylene	< 0.001 mg/L	91% (45 - 168%)	< 0.001	< 0.001
o-Xylene	< 0.0005 mg/L	92% (28 - 183%)	< 0.0005	< 0.0005

PARACEL Laboratories Ltd.
Environmental & Indoor Air Quality

300-2319 St. Laurent Blvd., Ottawa, ON K1G 4J8
Tel: 613-731-9577 Fax: (613) 731-9064
Toll Free: 1-800-749-1947 email: paracel@magma.ca

№ 10605

CHAIN OF CUSTODY REPORT

pg ___ of ___

CONTACT: Mario Filo
COMPANY: Levac Robichaud Leclerc Ass Ltd.
ADDRESS: 1-2884 Chamberland St.
CITY: Rockland
PROV: Ont. POSTAL: K4K 1M6
TEL: 446-7777 FAX: 446-1407
P.O. NUMBER: ___ PROJECT: L 9618 REFERENCE: Dump Champlain

DATE: 17 Nov, 2004

TURN AROUND TIME
[ ] 1-day [ ] 2-day [X] Regular

REPORTING REQUIREMENTS
[X] Hard Copy [ ] Email – PDF
[ ] FAX [ ] Email – Spreadsheet

SAMPLE INFORMATION | **ANALYSIS REQUIRED**

	Paracel Order Number: 5867 SAMPLE IDENTIFICATION	MATRIX	NO. OF BOTTLES	SAMPLE DATE	VOC	O.Y. B3B4470	Arsenic						
1	MW15-D	W	5	16-17 Dec 2004		X	X						
2	MW1-D		5			X	X						
3	MW12-S		7		X	X	X						
4	MW11		7		X	X	X						
5	MW8-D		7		X	X	X						
6	MW8-S		7		X	X	X						
7	MW14		5			X	X						
8	MW12-D		7		X	X	X						
9	MW5-S		5			X	X						
10	MW2-D	V	5	V		X	X						
	Preservation done in field (Y/N):												
	Preservative to be added by Paracel (Y/N):												

Comments: ___

Relinquished by: Jenica Rapas	Received by: MSO
Date: Dec. 17/04 Time: 6:35	Date: Dec 17, 04 Time: 6:37 pm
Relinquished by:	Verified by:
Date: Time:	Date: Time:

PARACEL Laboratories Ltd.
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№ 10599

CHAIN OF CUSTODY REPORT

pg ___ of ___

CONTACT: Mario Elie
COMPANY: Leroux Rowland Leroux Assoc. Ltd.
ADDRESS: 1-2284 Chambermont St
CITY: Rockland
PROV: Ont. POSTAL: K4K 1M6
TEL: 446 7777 FAX: 446 1407
P.O. NUMBER: ___ PROJECT: L9618 REFERENCE: Dump Champlain

DATE: 17 Nov. 2004

TURN AROUND TIME
[ ] 1-day [ ] 2-day [X] Regular

REPORTING REQUIREMENTS
[X] Hard Copy [ ] Email – PDF
[ ] FAX [ ] Email – Spreadsheet

SAMPLE INFORMATION / **ANALYSIS REQUIRED**

	Paracel Order Number: 5869 / SAMPLE IDENTIFICATION	MATRIX	NO. OF BOTTLES	SAMPLE DATE	VOC	O.G. BB&470	Arsenic						
1	MW15-S	W	5	16 & 17 Dec, 2004		X	X						
2	MW5-D	↓	5	↓		X	X						
3	MW3-D	↓	7	↓	X	X	X						
4													
5													
6													
7													
8													
9													
10													
	Preservation done in field (Y/N):												
	Preservative to be added by Paracel (Y/N):												

Comments: ___

Relinquished by: Jean-W Rapaw	Received by: MSO
Date: Dec. 17/04 Time: 6:35	Date: Dec 17,04 Time: 6:36pm
Relinquished by:	Verified by:
Date: Time:	Date: Time:

APPENDIX F
CALCULATIONS

PIPER DIAGRAM
Fall 2004

Parameter	Units	ODWS	Background Monitor				Leachate Monitor	Impact Monitors							
			MW11	MW12-S	MW12-D	MW14	MW3-D	MW1-D	MW2	MW5-S	MW5-D	MW8-S	MW8-D	MW15-S	MW15-D
Alkalinity	mg/L	30-500	180	70	140	140	410	90	65	55	160	20	130	20	120
Chloride	mg/L	250	9	1	0	0	2	16	0	3	2	6	4	5	0
Sulphate	mg/L	500	18	36	7	6	57	22	7	14	7	12	22	7	36
Calcium	mg/L	NV	66	9.6	15	42	410	35	7.8	8.8	37	10	10	6.2	24
Magnesium	mg/L	NV	7.6	5.8	12	5.6	22	7.2	2.8	5.8	7.4	2.2	2.2	1.6	9
Potassium	mg/L	NV	0.4	0.4	5.4	0.4	8.2	1	0.4	0.6	1.2	0.4	1.4	0.2	2
Sodium	mg/L	200	2.8	3	14	1.6	2.8	4.8	8.4	2.8	7.4	2.4	2.8	1.4	13

Concentrations in meq/L

Parameter	Molecular Weight	Charge	Background Monitor				Leachate Monitor	Impact Monitors							
			MW11	MW12-S	MW12-D	MW14	MW3-D	MW1-D	MW2	MW5-S	MW5-D	MW8-S	MW8-D	MW15-S	MW15-D
Alkalinity	61	-1	-3.0	-1.1	-2.3	-2.3	-6.7	-1.5	-1.1	-0.9	-2.6	-0.3	-2.1	-0.3	-2.0
Chloride	35.45	-1	-0.3	0.0	0.0	0.0	-0.1	-0.5	0.0	-0.1	-0.1	-0.2	-0.1	-0.1	0.0
Sulphate	96.06	-2	-0.4	-0.7	-0.1	-0.1	-1.2	-0.5	-0.1	-0.3	-0.1	-0.2	-0.5	-0.1	-0.7
Calcium	40.08	2	3.3	0.5	0.7	2.1	20.5	1.7	0.4	0.4	1.8	0.5	0.5	0.3	1.2
Magnesium	24.3	2	0.6	0.5	1.0	0.5	1.8	0.6	0.2	0.5	0.6	0.2	0.2	0.1	0.7
Potassium	39.09	1	0.0	0.0	0.1	0.0	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1
Sodium	23	1	0.1	0.1	0.6	0.1	0.1	0.2	0.4	0.1	0.3	0.1	0.1	0.1	0.6
% ANIONS															
Magnesium			15.4	43.5	39.8	17.5	8.0	23.0	23.2	45.3	21.7	22.8	21.6	26.0	29.0
Calcium			81.3	43.7	30.1	79.5	90.5	67.9	39.1	41.7	65.8	62.8	59.6	61.0	46.9
Sodium + Potassium			3.3	12.8	30.1	3.0	1.5	9.1	37.7	13.0	12.6	14.4	18.8	13.0	24.1
% CATIONS															
Alkalinity			82.4	59.6	94.0	94.8	84.4	61.9	88.0	70.6	92.8	43.9	78.9	53.3	72.4
Chloride			7.1	1.5	0.0	0.0	0.7	18.9	0.0	6.6	2.0	22.7	4.2	22.9	0.0
Sulphate			10.5	38.9	6.0	5.2	14.9	19.2	12.0	22.8	5.2	33.4	17.0	23.7	27.6

PIPER DIAGRAM

Spring 2004

Parameter	Units	ODWS	Background Monitor				Leachate Monitor	Impact Monitors							
			MW11	MW12-S	MW12-D	MW-14	MW3-D	MW1-D	MW2	MW5-S	MW5-D	MW8-S	MW8-D	MW15-S	MW15-D
Alkalinity	mg/L	30-500	160	70	140	55	260	120	60	60	150	10	120	10	110
Chloride	mg/L	250	8	0	0	0	2	12	0	2	1	7	3	3	0
Sulphate	mg/L	500	17	9	5	6	64	17	6	13	8	24	15	8	35
Calcium	mg/L	NV	56	22	25	19	470	170	14	19	45	12	39	5.6	31
Magnesium	mg/L	NV	7.6	5.8	13	2.2	10	30	2	5.2	8	2.4	6.6	1.2	9.4
Potassium	mg/L	NV	0.6	0.6	5.8	0.4	6	7.4	0	0.8	1.2	0.4	1	0	2.2
Sodium	mg/L	200	3.4	4	12	2.2	3.2	7.4	12	3.4	4.6	4	3.2	2	10

Concentrations in meq/L

Parameter	Molecular Weight	Charge	Background Monitor				Leachate Monitor	Impact Monitors							
			MW11	MW12-S	MW12-D	MW14	MW3-D	MW1-D	MW2	MW5-S	MW5-D	MW8-S	MW8-D	MW15-S	MW15-D
Alkalinity	61	-1	-2.6	-1.1	-2.3	-0.9	-4.3	-2.0	-1.0	-1.0	-2.5	-0.2	-2.0	-0.2	-1.8
Chloride	35.45	-1	-0.2	0.0	0.0	0.0	-0.1	-0.3	0.0	-0.1	0.0	-0.2	-0.1	-0.1	0.0
Sulphate	96.06	-2	-0.4	-0.2	-0.1	-0.1	-1.3	-0.4	-0.1	-0.3	-0.2	-0.5	-0.3	-0.2	-0.7
Calcium	40.08	2	2.8	1.1	1.2	0.9	23.5	8.5	0.7	0.9	2.2	0.6	1.9	0.3	1.5
Magnesium	24.3	2	0.6	0.5	1.1	0.2	0.8	2.5	0.2	0.4	0.7	0.2	0.5	0.1	0.8
Potassium	39.09	1	0.0	0.0	0.1	0.0	0.2	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.1
Sodium	23	1	0.1	0.2	0.5	0.1	0.1	0.3	0.5	0.1	0.2	0.2	0.1	0.1	0.4
% ANIONS															
Magnesium			17.5	27.1	35.8	14.7	3.3	21.5	11.9	27.7	21.0	20.1	20.5	21.2	27.5
Calcium			78.0	62.2	41.8	76.8	95.5	74.0	50.4	61.4	71.6	61.1	73.3	60.1	55.0
Sodium + Potassium			4.6	10.7	22.4	8.6	1.2	4.5	37.7	10.9	7.4	18.8	6.2	18.7	17.5
% CATIONS															
Alkalinity			81.9	86.0	95.7	87.8	75.4	74.0	88.7	75.0	92.7	19.0	83.2	39.5	71.2
Chloride			7.0	0.0	0.0	0.0	1.0	12.7	0.0	4.3	1.1	22.9	3.6	20.4	0.0
Sulphate			11.1	14.0	4.3	12.2	23.6	13.3	11.3	20.7	6.3	58.0	13.2	40.1	28.8

Ion Balance
SPRING 2004

Parameter	Units	Background Monitor				Leachate Monitor	Impact Monitors							
		MW11	MW12-S	MW12-D	MW14	MW3-D	MW1-D	MW2	MW5-S	MW5-D	MW8-S	MW8-D	MW15-S	MW15-D
Alkalinity	mg/L	160	70	140	55	260	120	60	60	150	10	120	10	110
Chloride	mg/L	8	0	0	0	2	12	0	2	1	7	3	3	0
Sulphate	mg/L	17	9	5	6	64	17	6	13	8	24	15	8	35
Nitrates	mg/L	3.2	0	0	0	1.95	3	0.01	0.1	0	0	0.3	3.2	0.4
Calcium	mg/L	56	22	25	19	470	170	14	19	45	12	39	5.6	31
Magnesium	mg/L	7.6	5.8	13	2.2	10	30	2	5.2	8	2.4	6.6	1.2	9.4
Potassium	mg/L	0.6	0.6	5.8	0.4	6	7.4	0	0.8	1.2	0.4	1	0	2.2
Sodium	mg/L	3.4	4	12	2.2	3.2	7.4	12	3.4	4.6	4	3.2	2	10

Concentration in meq/L

Parameter	Molecular Weight	Charge	Background Monitor				Leachate Monitor	Impact Monitors							
			MW11	MW12-S	MW12-D	MW14	MW3-D	MW1-D	MW2	MW5-S	MW5-D	MW8-S	MW8-D	MW15-S	MW15-D
Alkalinity	61	-1	-2.62	-1.15	-2.30	-0.90	-4.26	-1.97	-0.98	-0.98	-2.46	-0.16	-1.97	-0.16	-1.80
Chloride	35.45	-1	-0.23	0.00	0.00	0.00	-0.06	-0.34	0.00	-0.06	-0.03	-0.20	-0.08	-0.08	0.00
Sulphate	96.06	-2	-0.35	-0.19	-0.10	-0.12	-1.33	-0.35	-0.12	-0.27	-0.17	-0.50	-0.31	-0.17	-0.73
Nitrates	62	-1	-0.05	0.00	0.00	0.00	-0.03	-0.05	0.00	0.00	0.00	0.00	0.00	-0.05	-0.01
Calcium	40.08	2	2.79	1.10	1.25	0.95	23.45	8.48	0.70	0.95	2.25	0.60	1.95	0.28	1.55
Magnesium	24.3	2	0.63	0.48	1.07	0.18	0.82	2.47	0.16	0.43	0.66	0.20	0.54	0.10	0.77
Potassium	39.09	1	0.02	0.02	0.15	0.01	0.15	0.19	0.00	0.02	0.03	0.01	0.03	0.00	0.06
Sodium	23	1	0.15	0.17	0.52	0.10	0.14	0.32	0.52	0.15	0.20	0.17	0.14	0.09	0.43
Ion Balance			0.33	0.43	0.59	0.21	18.89	8.76	0.28	0.23	0.48	0.12	0.29	0.00	0.27
% Difference			4.8	**13.9**	**10.9**	9.2	**62.4**	**61.8**	**11.1**	8.1	8.3	6.5	5.7	-0.2	5.1

Ion Balance
Fall 2004

Parameter	Units	Background Monitor				Leachate Monitor	Impact Monitors							
		MW11	MW12-S	MW12-D	MW14	MW3-D	MW1-D	MW2	MW5-S	MW5-D	MW8-S	MW8-D	MW15-S	MW15-D
Alkalinity	mg/L	180	70	140	140	410	90	65	55	160	20	130	20	120
Chloride	mg/L	9	1	0	0	2	16	0	3	2	6	4	5	0
Sulphate	mg/L	18	36	7	6	57	22	7	14	7	12	22	7	36
Nitrates	mg/L	2.9	0.6	0	1	0.7	5	0	0	0	0	0	2.9	0.6
Calcium	mg/L	66	9.6	15	42	410	35	7.8	8.8	37	10	10	6.2	24
Magnesium	mg/L	7.6	5.8	12	5.6	22	7.2	2.8	5.8	7.4	2.2	2.2	1.6	9
Potassium	mg/L	0.4	0.4	5.4	0.4	8.2	1	0.4	0.6	1.2	0.4	1.4	0.2	2
Sodium	mg/L	2.8	3	14	1.6	2.8	4.8	8.4	2.8	7.4	2.4	2.8	1.4	13

Concentration in meq/L

Parameter	Molecular Weight	Charge	Background Monitor				Leachate Monitor	Impact Monitors							
			MW11	MW12-S	MW12-D	MW14	MW3-D	MW1-D	MW2	MW5-S	MW5-D	MW8-S	MW8-D	MW15-S	MW15-D
Alkalinity	61	-1	-2.95	-1.15	-2.30	-2.30	-6.72	-1.48	-1.07	-0.90	-2.62	-0.33	-2.13	-0.33	-1.97
Chloride	35.45	-1	-0.25	-0.03	0.00	0.00	-0.06	-0.45	0.00	-0.08	-0.06	-0.17	-0.11	-0.14	0.00
Sulphate	96.06	-2	-0.37	-0.75	-0.15	-0.12	-1.19	-0.46	-0.15	-0.29	-0.15	-0.25	-0.46	-0.15	-0.75
Nitrates	62	-1	-0.05	-0.01	0.00	-0.02	-0.01	-0.08	0.00	0.00	0.00	0.00	0.00	-0.05	-0.01
Calcium	40.08	2	3.29	0.48	0.75	2.10	20.46	1.75	0.39	0.44	1.85	0.50	0.50	0.31	1.20
Magnesium	24.3	2	0.63	0.48	0.99	0.46	1.81	0.59	0.23	0.48	0.61	0.18	0.18	0.13	0.74
Potassium	39.09	1	0.01	0.01	0.14	0.01	0.21	0.03	0.01	0.02	0.03	0.01	0.04	0.01	0.05
Sodium	23	1	0.12	0.13	0.61	0.07	0.12	0.21	0.37	0.12	0.32	0.10	0.12	0.06	0.57
Ion Balance			0.42	-0.84	0.04	0.20	14.63	0.11	-0.22	-0.22	-0.02	0.05	-1.86	-0.15	-0.17
% Difference			5.5	**-27.6**	0.9	4.0	**47.8**	2.1	-9.8	-9.6	-0.3	3.1	**-52.7**	**-13.2**	-3.3

RUG Caluclations

Spring 2004

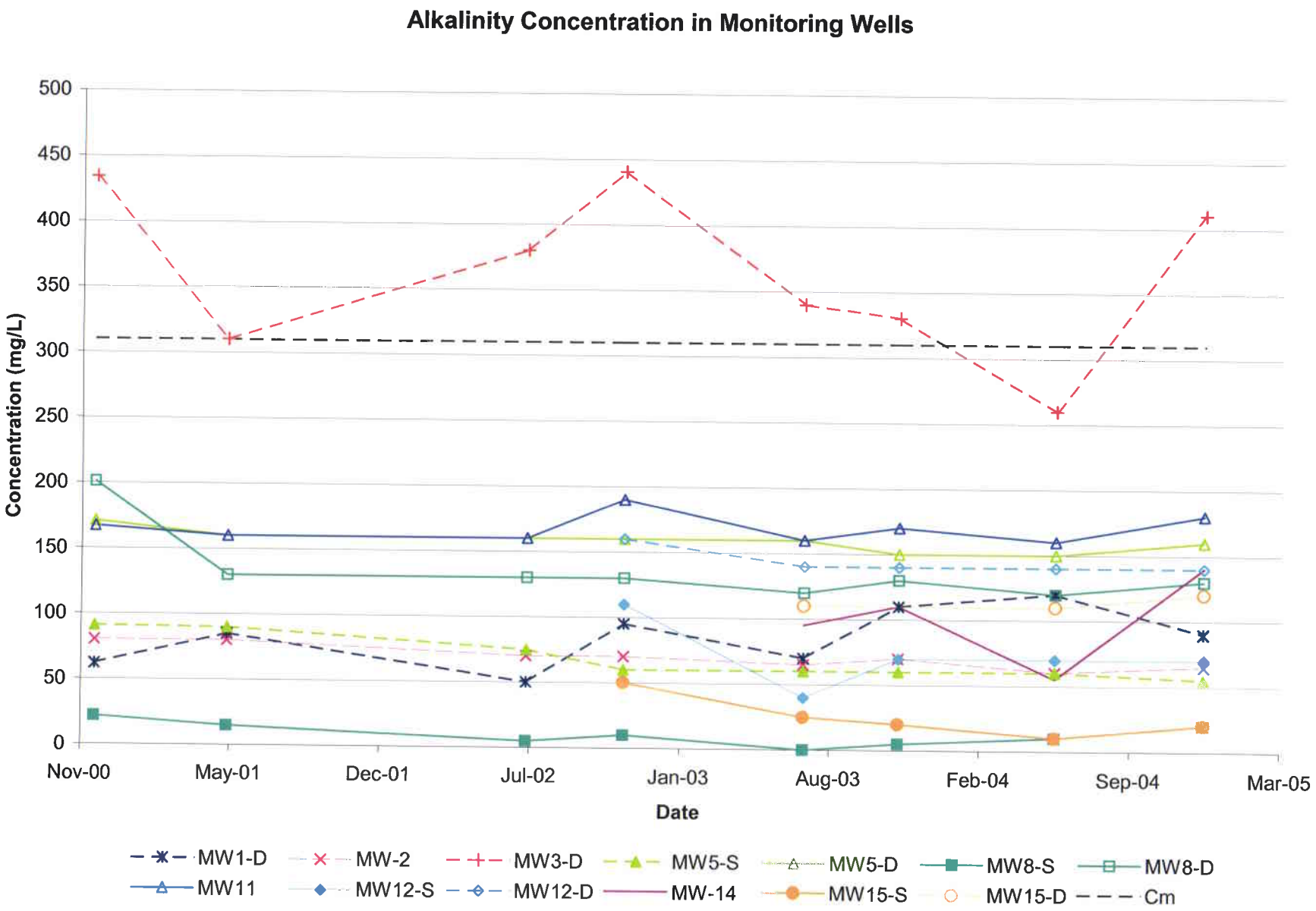
Parameter	Units	ODWS	Background Monitors					Cm	Leachate Monitor	Impact Monitors						
			MW11	MW12-S	MW12-D	MW14	Average		MW3-D	MW2	MW5-S	MW5-D	MW8-S	MW8-D	MW15-S	MW15-D
Alkalinity	mg/L	**500**	160	70	140	55	106	303	260	60	60	150	10	120	10	110
Chloride	mg/L	**250**	8	0	0	0	2	126	2	ND	2	1	7	3	3	ND
Hardness	mg/L	**500**	171	79	116	57	106	303	**1216**	43	69	145	40	125	19	116
Sulphate	mg/L	**500**	17	9	5	6	9	255	64	6	13	8	24	15	8	35

RUG Caluclation

Fall 2004

Parameter	Units	ODWS	Background Monitor					Cm	Leachate Monitor	Impact Monitors						
			MW11	MW12-S	MW12-D	MW14	Average		MW3-D	MW2	MW5-S	MW5-D	MW8-S	MW8-D	MW15-S	MW15-D
Alkalinity	mg/L	**500**	180	70	140	140	133	316	410	65	55'	160	20	130	20	120
Chloride	mg/L	**250**	9	1	0	0	3	126	2	ND	3	2	6	4	5	ND
Hardness	mg/L	**500**	165	48	87	128	107	303	**1115**	31	46	123	34	34	22	97
Sulphate	mg/L	**500**	18	36	7	6	17	258	57	7	14	7	12	22	7	36

APPENDIX G
TIME SERIES GRAPHS


Alkalinity Concentration in Monitoring Wells
Concentration (mg/L)
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400
350
300
250
200
150
100
50
0
Nov-00
May-01
Dec-01
Jul-02
Jan-03
Aug-03
Feb-04
Sep-04
Mar-05
Date
MW1-D
MW-2
MW3-D
MW5-S
MW5-D
MW8-S
MW8-D
MW11
MW12-S
MW12-D
MW-14
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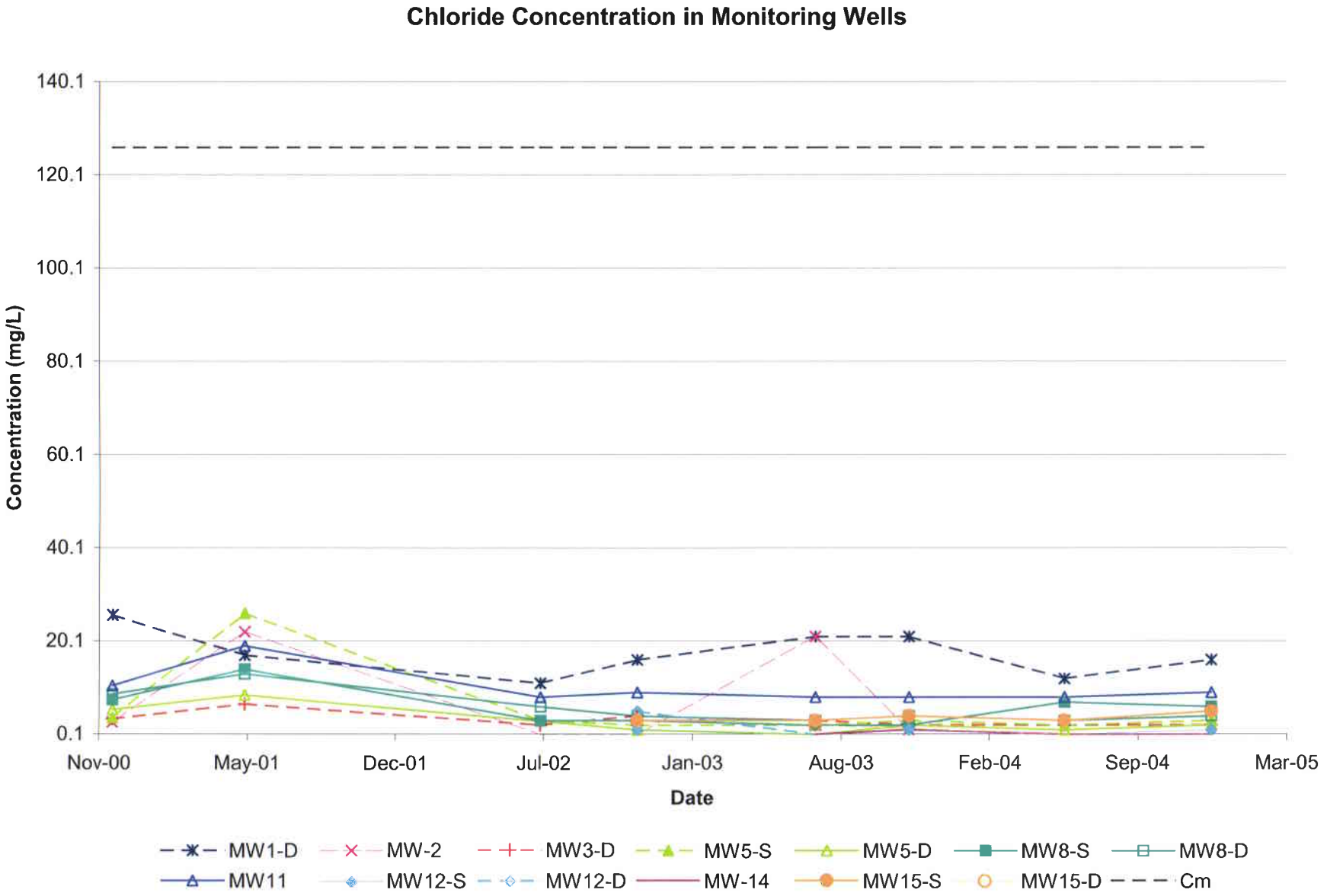
Cm


Chloride Concentration in Monitoring Wells
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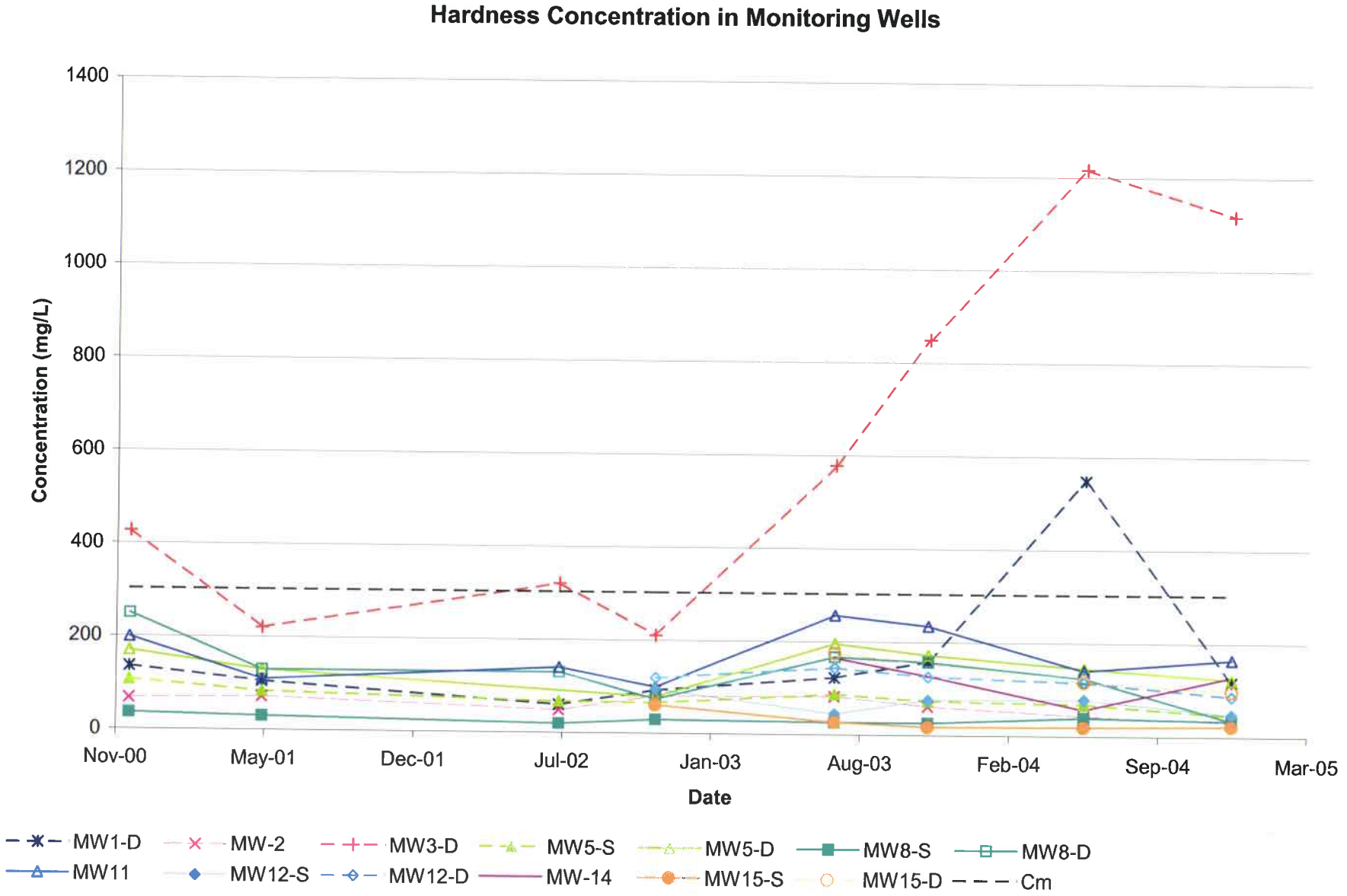
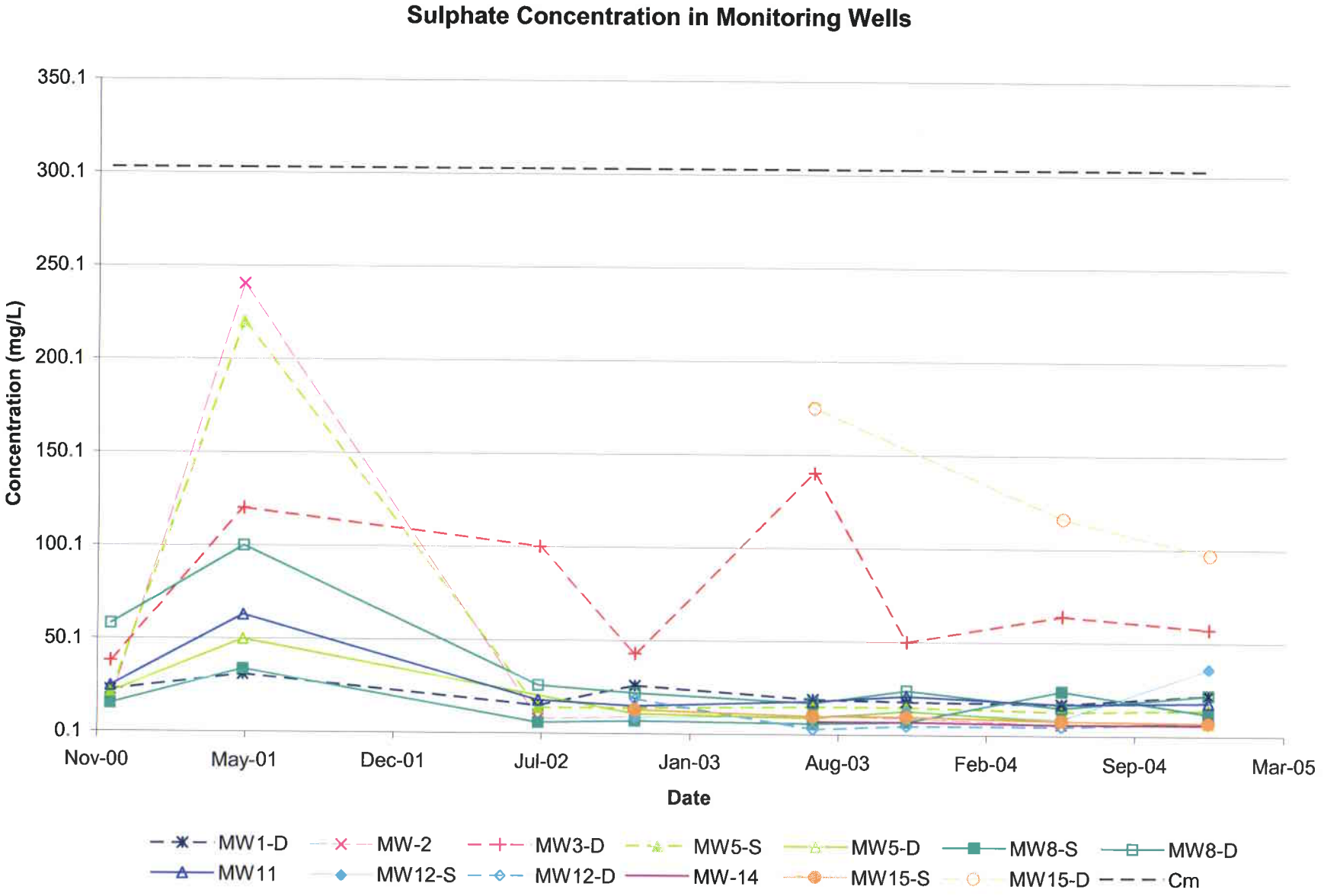
100.1
80.1
60.1
40.1
20.1
0.1
Concentration (mg/L)
Nov-00
May-01
Dec-01
Jul-02
Jan-03
Aug-03
Feb-04
Sep-04
Mar-05
Date
MW1-D
MW-2
MW3-D
MW5-S
MW5-D
MW8-S
MW8-D
MW11
MW12-S
MW12-D
MW-14
MW15-S
MW15-D
Cm


Hardness Concentration in Monitoring Wells
Concentration (mg/L)
1400
1200
1000
800
600
400
200
0
Nov-00
May-01
Dec-01
Jul-02
Jan-03
Aug-03
Feb-04
Sep-04
Mar-05
Date
MW1-D
MW-2
MW3-D
MW5-S
MW5-D
MW8-S
MW8-D
MW11
MW12-S
MW12-D
MW-14
MW15-S
MW15-D
Cm


Sulphate Concentration in Monitoring Wells
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300.1
250.1
200.1
150.1
100.1
50.1
0.1
Concentration (mg/L)
Nov-00
May-01
Dec-01
Jul-02
Jan-03
Aug-03
Feb-04
Sep-04
Mar-05
Date
MW1-D
MW-2
MW3-D
MW5-S
MW5-D
MW8-S
MW8-D
MW11
MW12-S
MW12-D
MW-14
MW15-S
MW15-D
Cm

APPENDIX H
PIPER TRILINEAR DIAGRAMS

PROJECT

OPERATION AND MONITORING REPORT 2004
LONGUEUIL WASTE DISPOSAL SITE
CHAMPLAIN TOWNSHIP

DRAWING TITLE

PIPER TRILINEAR DIAGRAM
SPRING 2004

LEVAC ROBICHAUD LECLERC ASSOCIATES LTD.
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CLIENT

TOWNSHIP OF CHAMPLAIN

DATE	FILE	DWG No.
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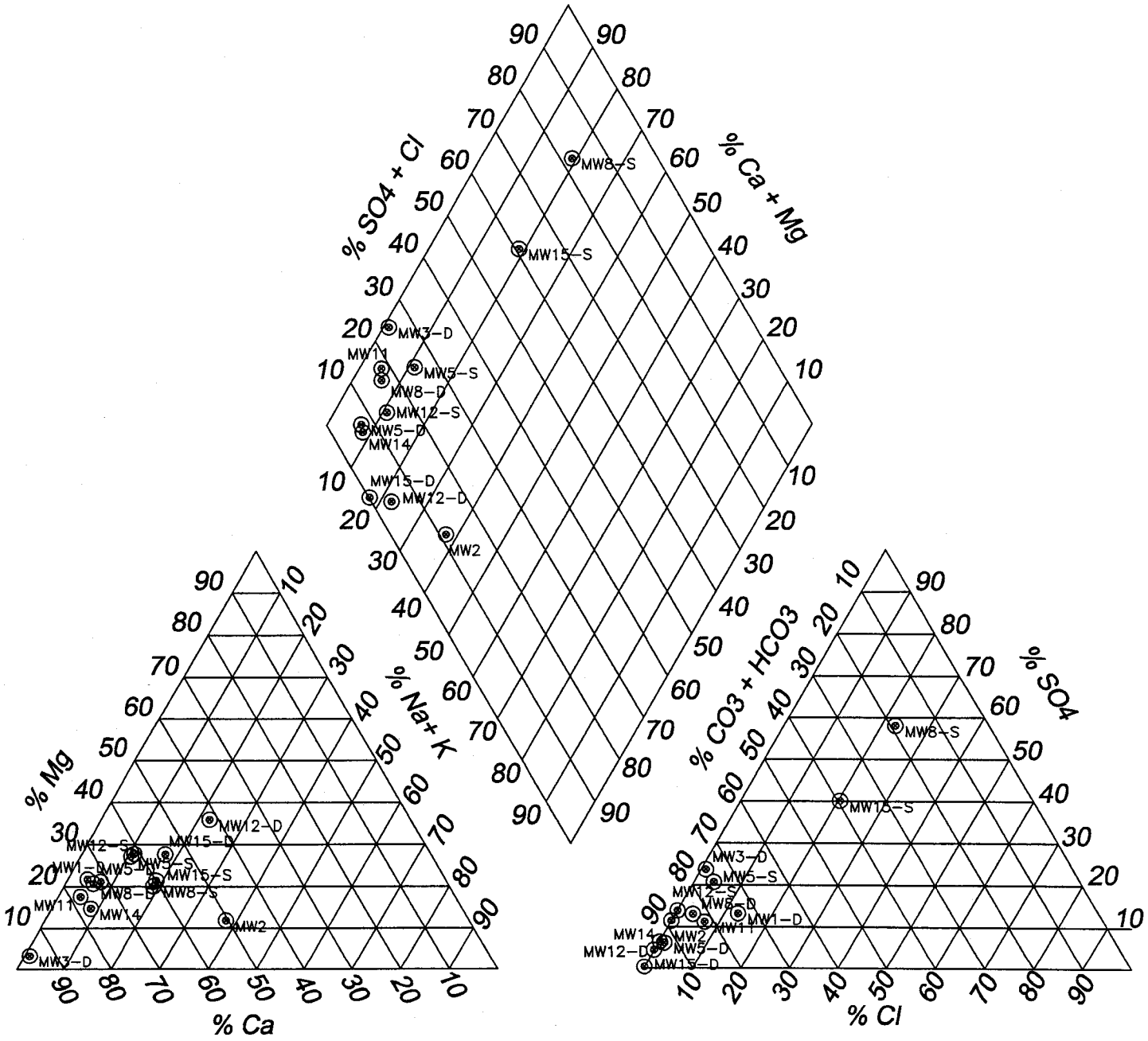

SPRING 2004

PROJECT

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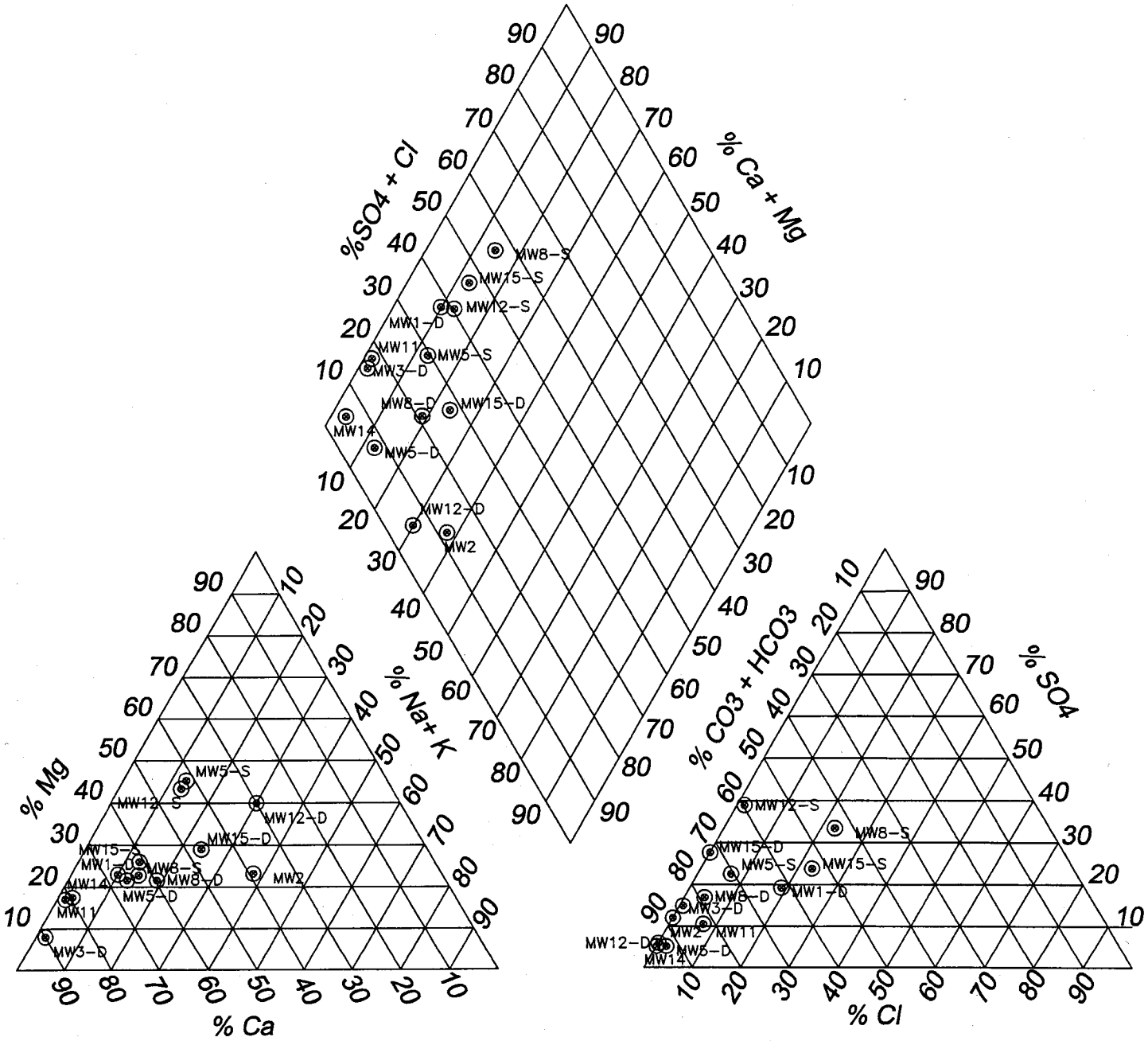

FALL 2004