## HYDROGEOLOGICAL ASSESSMENT

# EMBRUN WELL MONITORING PROGRAM

## **2003 ANNUAL REPORT**



Report prepared for the Township of Russell Prepared by Sauriol Environmental Inc.

Dated: January 2004 Our File: P03-02B



## SAURIOL ENVIRONMENTAL Inc.

## SAURIOL ENVIRONNEMENT

GROUNDWATER IMPACT ASSESSMENT SPECIALIST Helping society find solutions to environmental problems

SPÉCIALISTE DE L'ÉVALUATION D'IMPACT SUR LES EAUX SOUTERRAINES Contribuant à l'élaboration de solutions aux problèmes environnementaux

January 30, 2004

Township of Russell 717 Notre Dame Street Embrun, ON K0A 1W1

Attention:

Mr. Craig Cullen

Re:

Hydrogeological Assessment Embrun Well Monitoring Program

Annual Report 2003 Our file P03-02B

Dear Sir:

The following report contains the Hydrogeological Assessment of the Embrun Well Monitoring Program for the Year 2003.

The report includes a brief review of past studies, a summary of the environmental liabilities associated with the site, results from water level measurements and water samples taken in the spring and fall of 2003, and results from the Township's average monthly surveys. Conclusions and recommendations for future monitoring and hydrogeological works are also contained within, and a proposed work plan for 2004 is provided in Appendix C.

We bring to the Township's immediate attention the need to confirm by the Township Staff the absence of BTEX components in the production well water, since some elevated ethylbenzene was detected in the nearby PZ16. The potential contamination of groundwater around PZ16 should be further investigated.

Trusting that the above is satisfactory.

Yours Truly,

Sauriol Environmental Inc.

Jacques Sauriol M. Sc., P.Geo.

President

Circulation:

**Township of Russell 4 copies** 

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## HYDROGEOLOGICAL ASSESSMENT EMBRUN WELL MONITORING PROGRAM 2003 ANNUAL REPORT

### 1.0 INTRODUCTION

The following document presents a Hydrogeological Assessment of the Embrun Well Head Monitoring Program for the year of 2003. The program consisted of both sampling by the Township and bi-annual sampling by Sauriol Environmental Ltd.

The Embrun well site is located on Part Lot A, Concession 4 in Township of Russell is operated under the Certificate of Approval # 7-0226-93-958. The study site for 2003 consists of one production well, eight monitoring wells, and two residential wells. The photo on the cover page shows the site as flown over by the author on September 10, 2003.

## 1.1 Objectives

The primary objective of the year 2003 Hydrogeological Assessment of the Embrun Well Monitoring Program is to ensure the productivity and protection of the production well and of the aquifer. Specifically, this is done by providing an interpretation of the monitoring data collected in 2003, including a detailed review of aquifer hydraulics and an assessment of the transient and spatial changes to the well water quality.

## 1.2 Review of Past Surveys and Environmental Liabilities

The following subsection provides a brief review of the history and any environmental liabilities attached to the Embrun Wells, based on previous hydrogeological assessments (i.e. Robinson Consultants Inc. 2001 & 2002 Annual Reports). A map of the study site, showing the relation of the study site to the village of Russell, is provided in Figure 1. The site plan, showing the locations of the current production well, monitoring piezometers, and residential wells as of the time of this reporting is illustrated in Figure 2.

The Embrun production well is situated in an aquifer that consists of a buried glacio-fluvial deposit (buried esker core) made of granular materials and flanked by outwash sands and marine clays. The buried deposit is indicated in Figure 2 by the light grey shaded area. Groundwater velocities in previous reports were estimated to be 4m/yr; however more recent estimates indicated a range of groundwater velocities at about 20 m/yr in the outwash sands and 125 m/yr along the buried esker core (ref. Landfill Leachate Management Strategies – Preliminary Estimates – Russell WDS by Sauriol Environmental, 2003).

The Russell WDS is located to the Northwest of the Embrun production well and aquifer. The direction of groundwater flow from the landfill is to the East i.e. towards the aquifer. The Landfill is monitored by the Township and annual reports are produced to monitor the impact of the landfill groundwater (separate report). The landfill is noted to currently be impacting the groundwater in the localized area of the landfill and the current impact on the aquifer is minimal. Continued monitoring of the groundwater from the landfill site is recommended.

The Dore pit is located to the Southeast of the Embrun production well. The activities at the pit consist of sand and gravel extraction business that requires the use of heavy equipment. Two 500 gal fuel tanks within a concrete spill containment area are located onsite to fuel the heavy equipment. The 2002 annual report noted some 50 gal drums with contents unknown and some derelict equipment. The ongoing activities and storage of fuel at this site remain of concern should there be an accident due to the proximity of the pit to the production well and the high groundwater flows in the aquifer.

Other environmental concerns for this site include a manure pit to the South of the production well and the application of road salt by the Township. The nearby manure pit is reported to be concrete lined to prevent leakage. The current status of operation of the manure pit is unknown. Past estimates of the impacts of the road salts on the local groundwater showed low concentrations of Sodium, Chloride, and Calcium.

Past reports compared measured concentrations to Ontario Drinking Water Standards (ODWS) and some parameters such as Aluminium, Hardness, Manganese, Iron, TDS, and Sulphate were noted to exceed the ODWS. The highest concentrations have tended to be at monitoring piezometers PZ13 and PZ16. No concentrations of petroleum hydrocarbons were detected above the laboratory detection limits in 2002.

## 2.0 **ACTIVITIES (2003)**

A number of activities were undertaken in 2003 to address the hydrogeological items of concern for the Embrun Well Monitoring Program. SEI field staff measured static water levels and collected groundwater samples in the spring and fall at monitoring piezometers (PZ8, PZ13, PZ16, PZ18, PZ28, PZ29, and PZ30) and two residential wells (Patenaude and Schoeni). Township staff collected samples from the primary production well. Subsections 2.1 – 2.3 provide a summary of monitoring activities undertaken in 2003 at the Embrun Wells.

## 2.1 Hydraulic Monitoring by SEI

SEI personnel measured static water levels at groundwater monitoring piezometers for both sampling runs in spring and fall 2003. The spring monitoring event took place on the July 9 and 10, 2003 and the fall monitoring event took place on the October 6 and 7, 2003. The water levels of the eight monitoring piezometers were measured. From the water level measurements and top of well casing elevations, groundwater table elevations were calculated for all stations (Table 1). Also included in Table 1 are water level measurements for spring and fall in 1998, 2000, 2001 and 2002.

## 2.2 Groundwater Quality Monitoring by SEI

SEI staff conducted two groundwater monitoring events, in spring and fall of 2003 at the Embrun Well Site. Samples were collected from the eight monitoring piezometers (PZ8, PZ13, PZ16, PZ18, PZ28, PZ29, and PZ30) and two residential wells (Schoeni and Patenaude).

The monitoring piezometers sampled after water level measurements were made. Water level measurements were not made at the residential wells. The stations were pumped with a portable submersible pump at about 19 litres per minute (5 gal/min) for 30 minutes, yielding an approximate pumped volume of 570 liters. The samples were then collected in supplied bottles from Accutest Laboratories Ltd. All samples were subsequently submitted to Accutest Labs for analysis.

Samples were analyzed for pre-specified parameters given in Tables B, C, and D of the Ontario Drinking Water Protection Regulation 459/00, as per the contents of the Terms of Reference. The laboratory results from Accutest Labs are included in Appendix A. It is noted that common groundwater quality parameters of Chloride, Calcium, Sodium, and Total Dissolved Solids (TDS) were not included in the analysis of groundwater samples at this site. It is recommended that the analysis of these parameters be included in future monitoring programs.

Figure 2 illustrates the location of production well, monitoring piezometers, and residential wells that located at the Embrun Well site.

## 2.3 Township Monitoring

Township personnel collected water samples from the Embrun production well throughout 2003. Only a limited amount of data was made available by the Township for the production of this report. The data supplied by the Township at the time of writing this report is presented Appendix B. Data was submitted for the parameters of Colour, pH, Temperature, Iron, Manganese, Turbidity, and Hydrogen Sulphide for the 12 months of 2003. The average monthly raw water flows for 2003 were also provided by the Township.

## 3.0 INTERPRETATION

## 3.1 Hydraulic Monitoring by SEI

A summary of the Potentiometric Elevations (P.E.) calculated for all measured wells is provided in Table 1. Figure 3 presents the transient trends observed from water table elevation data for the monitored piezometers. Water levels in 2003 were similar to levels measured in 2001 and lower than those measured in 2000 and 2002. The spring groundwater recharge effect can be seen from the elevated water levels measured in the spring of each year when compared to levels measured in the fall. The measured seasonal water levels at each well have generally fluctuated over a range of 1.5 m over the last 5 years, and the measured potentiometric elevations fall between the elevations of 67 m and 71 m.

Conceptual models of the spatial differences of groundwater levels and hydraulic gradients measured in the spring and fall of 2003 are presented in Figures 4A and 4B. The conceptual model displayed is only an estimate of possible gradients based on the data collected and may not represent the actual gradients present at the site. The depressed potentiometric elevation of the water table around the production well is attributed to pumping activities at the production well.

## 3.2 Groundwater Quality of PW-1 by Township

Limited chemical data was made available for the sampling of the Embrun production well in 2003 and is provided in Appendix B with the monthly average water flows. The data was compared to the Drinking Water Standards (DWS; Reg 169/03) and the following parameters were noted to exceed the Standards: Iron and Manganese. It is noted that these parameters have only Aesthetic Objectives (AO) under DWS. Both Iron and Manganese exceeded the DWS for every month. Iron and Manganese concentrations measured at the production well in 2003 are similar to past concentrations measured at the production well and nearby piezometers PZ16 and PZ18.

The Annual Summary of Raw Water Flows for 2003 was compared to the same from 2002. The total amount of water used in 2003 increased approximately 7 % compared to 2002 and is attributed to an increase of 359 in the serviced population of the water system. The average water used per person per day decreased slightly in 2003 with respect to 2002.

## 3.3 Groundwater Quality by SEI

## 3.3.1 Comparison to DWS

In the spring of 2003, several monitoring stations (PZ13, PZ16, PZ18, and PZ29) were found to exceed the Drinking Water Standards (DWS; Reg 169/03) for Iron and Manganese. It is noted that these parameters have only Aesthetic Objectives (AO) under DWS. The concentrations of other metals and inorganic parameters are either below the detection limit of the laboratory or well below the Maximum Acceptable Concentration (MAC) specified in the DWS, and are not of concern. All concentrations of Volatile Organic Compounds (VOC's), PCB's, herbicides, and pesticides were below the detection limit of the laboratory in the spring of 2003, with the exception of ethylbenzene at PZ16. Elevated concentration of ethylbenzene was noted at 3.2 ug/L for July, above the DWS of 2.4 ug/L.

In the fall of 2003, several monitoring stations (PZ13, PZ16, PZ18, and PZ29) were found to exceed the Drinking Water Standards (DWS) for Iron and Manganese. An elevated concentration of ethylbenzene (2.9 ug/L) was again noted at PZ16 that was above the DWS (2.4 ug/L). It is noted that these parameters have only Aesthetic Objectives (AO) under DWS. The concentrations of other metals and inorganic parameters are either below the detection limit of the laboratory or well below the Maximum Acceptable Concentration (MAC) specified in the DWS, and should not be of concern. All concentrations of Volatile Organic Compounds (VOC's), PCB's, herbicides, and pesticides were below the detection limit of the laboratory in the fall of 2003, with the exception of ethylbenzene at PZ16.

The observed concentrations of ethylbenzene at PZ16 in both the spring and fall of 2003 may indicate some form of contamination. PZ16 is directly downgradient of the Dore pit where fuel and petroleum hydrocarbons are stored in tanks. This should be monitored closely in the future.

The monitoring piezometers PZ28 and PZ29 appear to be slightly impacted by surface runoff in the spring of 2003. This is evidenced by the slightly elevated concentration of Nitrate (0.16 mg/L) in the spring and fall 2003 samples (see Appendix A). It should be noted that the observed concentrations of Nitrate at PZ28 and PZ29 in the spring of 2003 are well below the MAC specified by DWS (10 mg/L).

## 3.3.2 Transient and Spatial Analysis of OB-1 & OB-2 Water Quality

The concentrations of Barium, Boron, Iron, and Manganese at the production well, the eight monitoring piezometers, and the two residential wells in the spring and fall from 2000 to 2003 are given Tables 2A to 2K.

The transient trends of the selected parameter concentrations vs. time are presented in Figures 5A to 5D.

The concentrations of Barium as presented in Figure 5A show that the well at the Patenaude residence had the highest measured concentrations in 2003, and historically has had some of the highest concentrations. Additionally the residence Schoeni and the monitoring piezometers PZ08, PZ27, PZ29, and PZ30 have displayed higher concentrations than monitoring piezometers PZ13, PZ16, PZ 18, and PZ28.

The concentrations of Boron as presented in Figure 5B show that the two residential wells (Patenaude and Schoeni) and piezometer PZ30 had the highest Boron concentrations when compared to the rest of the monitored stations, both in 2003 and historically. Concentrations of Boron measured in 2003 remain consistent with concentrations of Boron measured in the past.

The concentrations of Iron as presented in Figure 5C show the piezometers PZ16, PZ18, and PZ29 had the highest Iron concentrations when compared to the rest of the monitored stations, both in 2003 and historically. Concentrations of Iron measured in 2003 remain consistent with concentrations of Iron measured in the past.

The concentrations of Manganese as presented in Figure 5D show the piezometers PZ16, PZ18, and PZ29 had the highest Manganese concentrations when compared to the rest of the monitored stations, both in 2003 and historically. Concentrations of Manganese measured in 2003 remain consistent with concentrations of Iron measured in the past.

The spatial distribution of concentrations of Barium, Boron, Iron, and Manganese are expressed as conceptual models of concentration gradients in Figures 6 to 9. In Figures 6 and 7, it can be seen that Barium and Boron concentrations are highest to the Northwest of the production well towards the landfill. In Figures 8 to 9, it can be seen that the highest concentrations of Iron and Manganese are located around the production well and the Dore Pit.

## 4.0 CONCLUSIONS

Overall the water quality measured at the site was good and the results of the samples do not suggest significant imminent threat to the production or quality of the water from the Embrun production well.

Water levels were measured in the spring and fall of 2003 at eight monitoring piezometers. Water levels of these piezometers were found to be similar to historical water level measurements and water levels at individual wells have fluctuated by about 1.5 m over the last five years. The flow of groundwater is estimated to be towards the production well due to the large drawdown in the potentiometric elevation of the water table due to pumping activities.

The total amount of raw water used in 2003 was greater than the amount used in 2002. This increased usage was attributed to a rise in the serviced population of the water system. It is noted that the average amount of water used per person per day in 2003 decreased slightly when compared to 2002.

Limited data was provided for the sampling of the production well PW-1 by the Township in time for the writing of this report. The parameters of Iron and Manganese were noted to exceed the Aesthetic Objectives of the DWS, similar to previous testing.

SEI staff sampled eight monitoring piezometers and two residential wells in the spring and fall of 2003. The samples were analyzed for the parameters specified in Tables B, C, and D of the Drinking Water Protection Regulation 459/00, as per Terms of Reference. There were no health related exceedences of the ODWS noted in any of the samples in 2003. There were several exceedences of Aesthetic Objectives of DWS by the parameters of Iron and Manganese, primarily from PZ13, PZ16, PZ18, and PZ29.

An elevated concentration of ethylbenzene was noted at PZ16 in both the spring and fall of 2003. It is noted that ethylbenzene is considered a Volatile Organic Compound (VOC) and is regulated by an Aesthetic Objective under the DWS (Reg 169/03). PZ16 is directly down-gradient of the Dore pit for groundwater flow. Township Staff should confirm the absence of BTEX component in the production well water. The potential contamination of groundwater around PZ16 should be further investigated.

The concentrations of many of the inorganic parameters analyzed in 2003 at the observation wells were below the detection limit of the laboratory or well below the MAC as specified by DWS. All concentrations of VOC's, PCB's, herbicides, and pesticides were below the detection limit of the laboratory in the spring and fall 2003, with the exception of reported ethylbenzene at PZ16.

It was suggested that PZ28 and PZ29 may be under the influence of surface water runoff in the spring, as shown by the slightly elevated concentrations of Nitrate in the spring of 2003. It should be noted that the observed concentrations of Nitrate in the spring are well below the MAC specified by DWS.

The standards for drinking water quality in Ontario are now prescribed in O. Reg. 169/03 under the Safe Drinking Water Act, 2002 and have replaced the Drinking Water Protection Regulation for Larger Waterworks (O. Reg. 459/00) and the Drinking Water Protection Regulation for Smaller Waterworks Serving Designated Facilities (O. Reg. 505/01).

It is noted that common groundwater parameters of Chloride, TDS, and Sodium were not analyzed in either the spring or fall of 2003 at either the eight monitoring piezometers or two residential wells. As these are common indicator parameters of groundwater quality, they should be included in the analysis in the future.

## 4.1 Recommendations

- 1. For future monitoring events, water level measurements should be made prior to any pumping activities in production well.
- 2. It should be investigated if there are any sources of ethylbenzene impacting the groundwater near PZ16. BTEX should be analyzed at PZ16 and Dore Lake water in 2004.
- 3. It should be investigated if there are any nitrate sources affecting PZ28 and PZ29. NO3 should be included in the 2004 survey to confirm the low concentration occurrence at the well head.
- 4. There is no technical need to run the exhaustive listing of parameters on a regular basis in the future. The sampling and analysis of the common groundwater quality indicator parameters Chloride, Total Dissolved Solids, and Sodium (plus Ba, B, Fe and Mn) should be included in future monitoring events of the well head piezometer.

	TABLE 1: POTENTIOMETRIC ELEVATIONS EMBRUN WELL MONITORING PROGRAM												
Station	Top of Casing	Potentiometric Elevation (m)											
Station	Elevation (m)	May-98	Nov-98	Jul-00	Dec-00	Jun-01	Oct-01	Jul-02	Nov-02	Jul-03	Oct-03		
PZ-08	74.49	70.09	69.96	70.11	69.98	70.01	69.69	70.23	69.99	70.02	69.87		
PZ-13	72.99	69.18	69.09	69.62	69.43	69.43	69.12	69.89	69.47	69.47	69.28		
PZ-16	72.34	69.10	68.80	69.22	68.71	68.67	68.19	68.94	68.53	68.49	68.22		
PZ-18	72.27	69.01	68.67	69.00	68.35	68.41	67.74	68.45	68.31	68.06	67.69		
PZ-27	71.63	70.48	69.97	70.53	69.93	70.12	69.52	70.18	69.68	69.75	69.19		
PZ-28	71.72	70.33	69.61	70.55	69.58	69.78	69.09	70.21	69.25	69.48	68.95		
PZ-29	72.45	70.35	70.08	70.74	70.31	70.28	69.91	70.80	69.99	70.11	69.72		
PZ-30	71.795	69.68	69.72	70.10	69.93	69.63	69.64	70.16	69.60	69.41	69.34		

<sup>-</sup> May 1998 to November 2002 data Taken from Table 1, Embrun Aquifer Monitoring , 2002 Annual Report by Robinson Consultants Inc.

	TABLE 2A: CONCENTRATIONS OF SELECTED PARAMETERS EMBRUN PRODUCTION WELL (2000 - 2003) EMBRUN WELL MONITORING PROGRAM											
Parameter	opws				PRODUC	TION WELL						
raiameter	ODWS	Jul-00	Nov-00	Jun-01	Oct-01	Jun-02	Nov-02	Jul-03	Oct-03			
Ba (mg/L)	1	0.12	0.1	0.14	0.09	0.12	0.09					
B (mg/L)	5	0.02	0.02	0.01	0.03	<0.02	<0.05					
Fe (mg/L)	0.3	2.36	2.27	1.94	2.22	2.39	2.64	2.55	2.61			
Mn (mg/L)	0.05	0.32	0.29	0.29	0.32	0.366	0.321	0.38	0.376			

- 2000 to 2002 data taken from Tables, Embrun Well Monitoring Program, 2002 Annual Report by Robinson Consultants Inc.
- Bold indicates that measured parameters exceeds Ontario Drinking Water Standard (ODWS)

TABLE 2B: CONCENTRATIONS OF SELECTED PARAMETERS EMBRUN WELL PZ-08 (2000 - 2003) EMBRUN WELL MONITORING PROGRAM												
Parameter	00146	Parameter ODWS PZ-08										
raiailletei	ODWS	Jul-00	Nov-00	Jun-01	Oct-01	Jui-02	Nov-02	Jul-03	Oct-03			
Ba (mg/L)	1	0.08	0.07	0.08	0.07	0.08	0.08	0.07	0.07			
B (mg/L)	5	0.02	0.02	0.01	0.03	<0.02	<0.05	<0.05	0.01			
Fe (mg/L)	0.3	0.11	0.1	0.06	0.07	0.05	0.08	0.08	0.07			
Mn (mg/L)	0.05	0.03	0.03	0.02	0.03	0.025	0.026	0.027	0.026			

#### Notes:

- 2000 to 2002 data taken from Tables, Embrun Well Monitoring Program, 2002 Annual Report by Robinson Consultants Inc.
- Bold indicates that measured parameters exceeds Ontario Drinking Water Standard (ODWS)

TABLE 2C: CONCENTRATIONS OF SELECTED PARAMETERS EMBRUN WELL PZ-13 (2000 - 2003) EMBRUN WELL MONITORING PROGRAM											
Parameter	ODWS			PZ-13							
rajailietei		Jul-00	Nov-00	Jun-01	Oct-01	Jul-02	Nov-02	Jul-03	Oct-03		
Ba (mg/L)	1	0.04	0.03	0.03	0.02	0.03	0.03	0.02	0.03		
B (mg/L)	5	0.02	0.02	0.01	0.03	<0.02	<0.05	<0.05	0.01		
Fe (mg/L)	0.3	0.82	0.61	0.5	0.55	0.56	0.61	0.77	0.79		
Mn (mg/L)	0.05	0.06	0.05	0.05	0.04	0.046	0.048	0.048	0.047		

#### Notes:

- 2000 to 2002 data taken from Tables, Embrun Well Monitoring Program, 2002 Annual Report by Robinson Consultants Inc.
- Bold indicates that measured parameters exceeds Ontario Drinking Water Standard (ODWS)

TABLE 2D: CONCENTRATIONS OF SELECTED PARAMETERS EMBRUN WELL PZ-16 (2000 - 2003) EMBRUN WELL MONITORING PROGRAM											
Parameter	ODWS				P	Z-16					
		Jul-00	Nov-00	Jun-01	Oct-01	Jun-02	Nov-02	Jul-03	Oct-03		
Ba (mg/L)	1	0.05	0.03	0.03	0.05	0.05	0.03	0.03	0.03		
B (mg/L)	5	<0.01	0.02	0.01	0.03	<0.02	<0.05	<0.05	0.02		
Fe (mg/L)	0.3	12.8	4.62	3.08	4.56	8.02	3.54	3.26	2.84		
Mn (mg/L)	0.05	0.74	0.44	0.46	0.37	0.724	0.437	0.406	0.351		

- 2000 to 2002 data taken from Tables, Embrun Well Monitoring Program, 2002 Annual Report by Robinson Consultants Inc.
- Bold indicates that measured parameters exceeds Ontario Drinking Water Standard (ODWS)

TABLE 2E: CONCENTRATIONS OF SELECTED PARAMETERS EMBRUN WELL PZ-18 (2000 - 2003) EMBRUN WELL MONITORING PROGRAM											
Parameter	ODWS	peter ODWS PZ-18									
r arameter		Jul-00	Nov-00	Jun-01	Oct-01	Jun-02	Nov-02	Jul-03	Oct-03		
Ba (mg/L)	1	0.06	0.03	0.04	0.05	0.05	0.03	0.04	0.03		
B (mg/L)	5	<0.01	0.02	<0.01	0.03	<0.02	<0.05	<0.05	0.01		
Fe (mg/L)	0.3	17.6	2.84	1.34	1.93	2.69	1.96	1.44	1.83		
Mn (mg/L)	0.05	1.46	0.5	0.62	0.48	0.697	0.408	0.494	0.28		

- 2000 to 2002 data taken from Tables, Embrun Well Monitoring Program, 2002 Annual Report by Robinson Consultants Inc.
- Bold indicates that measured parameters exceeds Ontario Drinking Water Standard (ODWS)

TABLE 2F: CONCENTRATIONS OF SELECTED PARAMETERS EMBRUN WELL PZ-27 (2000 - 2003) EMBRUN WELL MONITORING PROGRAM											
Parameter	ODWS				Р	Z-27					
r atameter		Jul-00	Nov-00	Jun-01	Oct-01	Jun-02	Nov-02	Jul-03	Oct-03		
Ba (mg/L)	1	0.11	0.11	0.13	0.11	0.12	0.11	0.11	0.1		
B (mg/L)	5	0.07	0.07	0.06	0.07	<0.02	<0.05	<0.05	0.06		
Fe (mg/L)	0.3	0.23	0.05	0.03	0.31	0.01	0.06	0.02	0.17		
Mn (mg/L)	0.05	0.02	0.02	0.02	0.03	0.019	0.019	0.015	0.037		

#### Notes:

- 2000 to 2002 data taken from Tables, Embrun Well Monitoring Program, 2002 Annual Report by Robinson Consultants Inc.
- Bold indicates that measured parameters exceeds Ontario Drinking Water Standard (ODWS)

TABLE 2G: CONCENTRATIONS OF SELECTED PARAMETERS EMBRUN WELL PZ-28 (2000 - 2003) EMBRUN WELL MONITORING PROGRAM											
Parameter	ODWS				P	Z-28					
r arameter		Jul-00	Nov-00	Jun-01	Oct-01	Jun-02	Nov-02	Jul-03	Oct-03		
Ba (mg/L)	1	0.04	0.04	0.15	0.03	0.04	0.03	0.03	0.02		
B (mg/L)	5	0.03	0.04	0.03	0.04	<0.02	<0.05	<0.05	0.02		
Fe (mg/L)	0.3	0.25	0.07	0.03	0.49	0.07	<0.01	<0.01	0.07		
Mn (mg/L)	0.05	0.02	0.01	0.02	0.03	0.021	0.011	0.009	0.018		

#### Notes:

- 2000 to 2002 data taken from Tables, Embrun Well Monitoring Program, 2002 Annual Report by Robinson Consultants Inc.
- Bold indicates that measured parameters exceeds Ontario Drinking Water Standard (ODWS)

TABLE 2H: CONCENTRATIONS OF SELECTED PARAMETERS EMBRUN WELL PZ-29 (2000 - 2003) EMBRUN WELL MONITORING PROGRAM											
Parameter	ODWS				P	Z-29					
ratatiletei		Jul-00	Nov-00	Jun-01	Oct-01	Jun-02	Nov-02	Jul-03	Oct-03		
Ba (mg/L)	1	0.05	0.11	0.11	0.13	0.09	0.09	0.08	0.12		
B (mg/L)	5	0.02	0.01	<0.01	0.03	<0.02	<0.05	<0.05	0.01		
Fe (mg/L)	0.3	0.05	0.12	1.06	1.93	1.06	1.45	0.96	1.44		
Mn (mg/L)	0.05	0.04	0.05	0.09	0.13	0.125	0.11	0.148	0.15		

- 2000 to 2002 data taken from Tables, Embrun Well Monitoring Program, 2002 Annual Report by Robinson Consultants Inc.
- Bold indicates that measured parameters exceeds Ontario Drinking Water Standard (ODWS)

TABLE 2I: CONCENTRATIONS OF SELECTED PARAMETERS EMBRUN WELL PZ-30 (2000 - 2003) EMBRUN WELL MONITORING PROGRAM											
Parameter	ODWS	ODWS PZ-30									
, aramotor		Jul-00	Nov-00	Jun-01	Oct-01	Jun-02	Nov-02	Jul-03	Oct-03		
Ba (mg/L)	1	0.08	0.11	0.08	0.13	0.1	0.12	0.08	0.1		
B (mg/L)	5	0.14	0.12	0.13	0.12	0.06	0.13	0.1	0.12		
Fe (mg/L)	0.3	0.21	0.15	0.02	0.29	<0.01	0.03	0.75	0.04		
Mn (mg/L)	0.05	0.01	0.03	0.01	0.04	0.012	0.038	0.063	0.025		

- 2000 to 2002 data taken from Tables, Embrun Well Monitoring Program, 2002 Annual Report by Robinson Consultants Inc.
- Bold indicates that measured parameters exceeds Ontario Drinking Water Standard (ODWS)

TABLE 2J: CONCENTRATIONS OF SELECTED PARAMETERS PATENAUDE RESIDENCE (2000 - 2003) EMBRUN WELL MONITORING PROGRAM											
Parameter	ODWS	PATENAUDE									
raiailleter		Jul-00	Dec-00	Jun-01	Oct-01	Jun-02	Nov-02	Jul-03	Oct-03		
Ba (mg/L)	1	0.13	0.14	0.14	0.12	0.15	-	0.13	0.13		
B (mg/L)	5	0.11	0.11	0.11	0.11	0.04	-	0.09	0.1		
Fe (mg/L)	0.3	0.12	0.07	0.12	0.07	0.23		0.12	0.12		
Mn (mg/L)	0.05	<0.01	<0.01	<0.01	<0.01	0.013	-	0.011	0.008		

#### Notes:

- 2000 to 2002 data taken from Tables, Embrun Well Monitoring Program, 2002 Annual Report by Robinson Consultants Inc.
- Bold indicates that measured parameters exceeds Ontario Drinking Water Standard (ODWS)

	TABLE 2K: CONCENTRATIONS OF SELECTED PARAMETERS SCHOENI RESIDENCE (2000 - 2003) EMBRUN WELL MONITORING PROGRAM										
Parameter	ODWS	SCHOENI									
1 arameter		Jul-00	Nov-00	Jun-01	Oct-01	Jun-02	Nov-02	Jul-03	Oct-03		
Ba (mg/L)	1	0.11	0.11	0.12	0.1	0.1		0.09	0.09		
B (mg/L)	5	0.15	0.15	0.14	0.15	0.08	•	0.12	0.14		
Fe (mg/L)	0.3	0.26	0.14	0.23	0.17	0.09	1	0.15	0.1		
Mn (mg/L)	0.05	<0.01	<0.01	<0.01	<0.01	0.008		0.009	0.008		

- 2000 to 2002 data taken from Tables, Embrun Well Monitoring Program, 2002 Annual Report by Robinson Consultants Inc.
- Bold indicates that measured parameters exceeds Ontario Drinking Water Standard (ODWS)

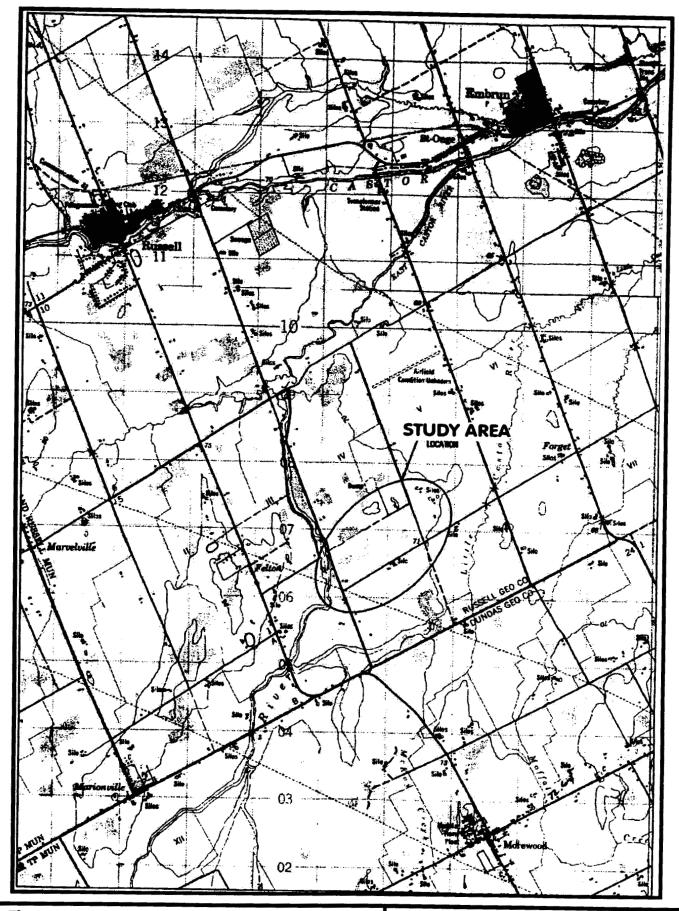


Figure 1

EMBRUN WATER SUPPLY
STUDY SITE

TOWNSHIP OF RUSSELL



DATE: JANUARY 2004

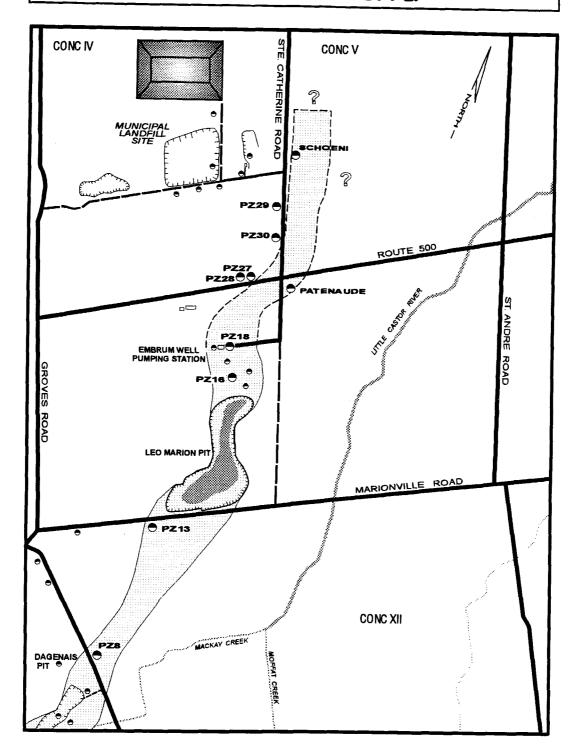




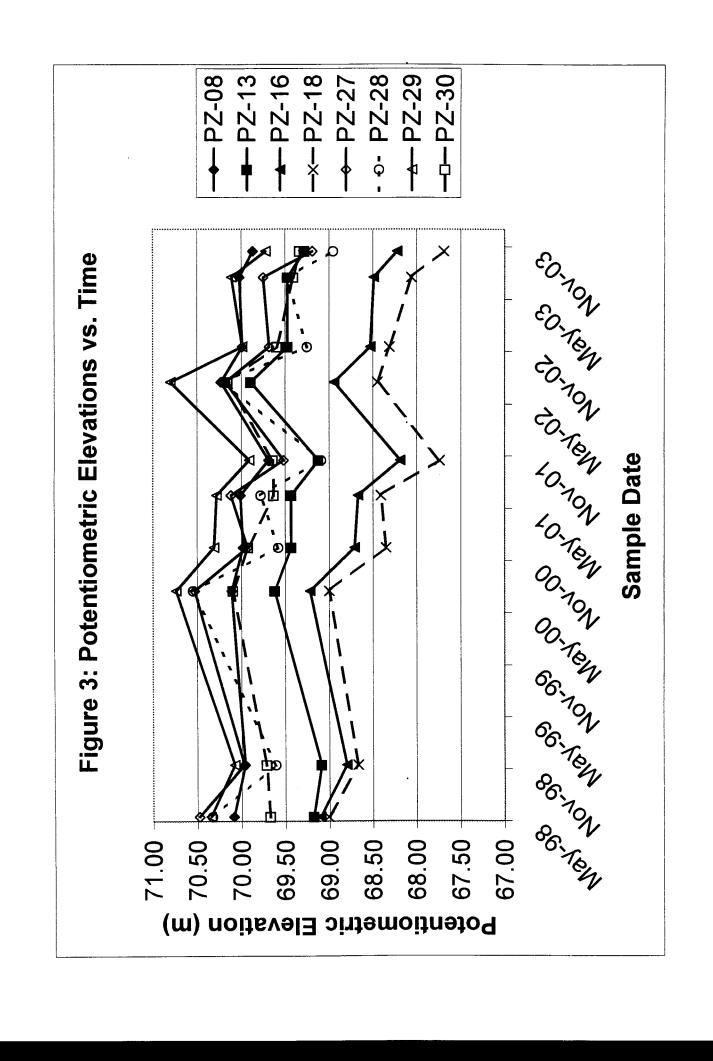
Figure 2

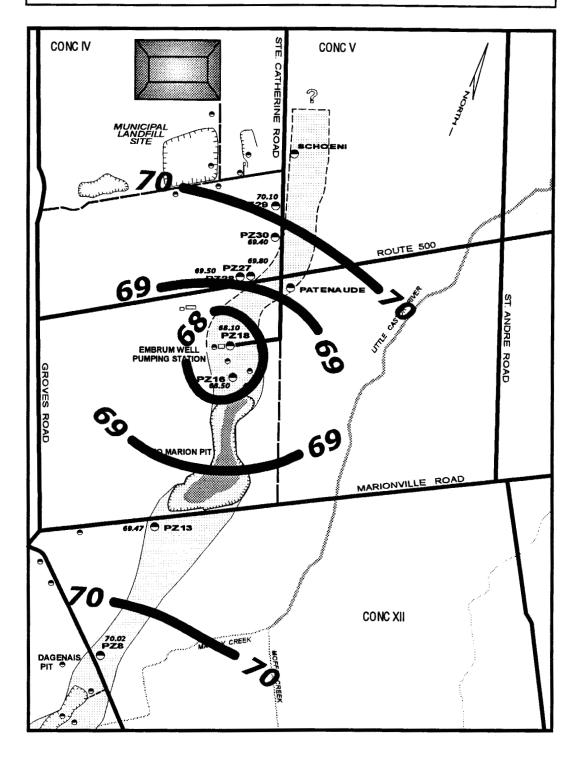
SITE PLAN TOWNSHIP OF RUSSELL



SAURIOL ENVIRONMENTAL Inc.

DATE: Jan. 2004





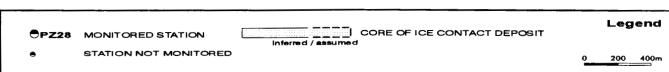


Figure 4A
POTENTIOMETRIC ELEVATIONS (masl)
(Spring, 2003)
TOWNSHIP OF RUSSELL



SAURIOL ENVIRONMENTAL Inc.

DATE: Jan. 2004

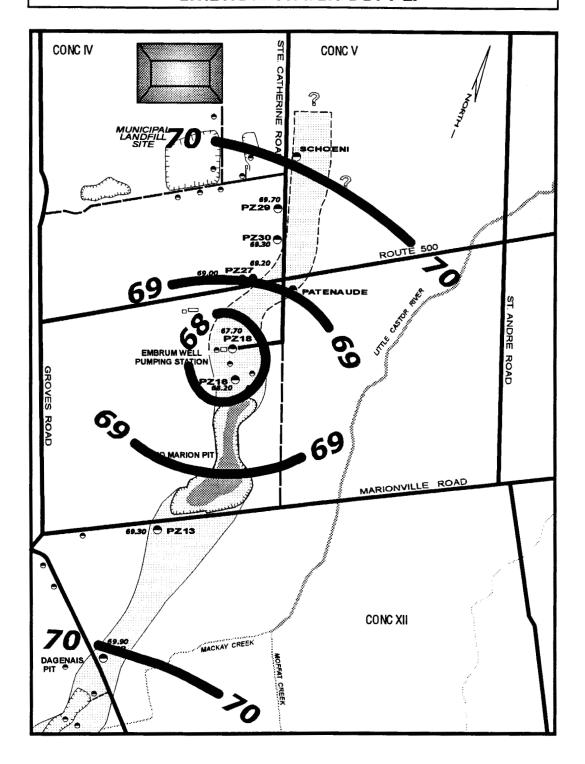


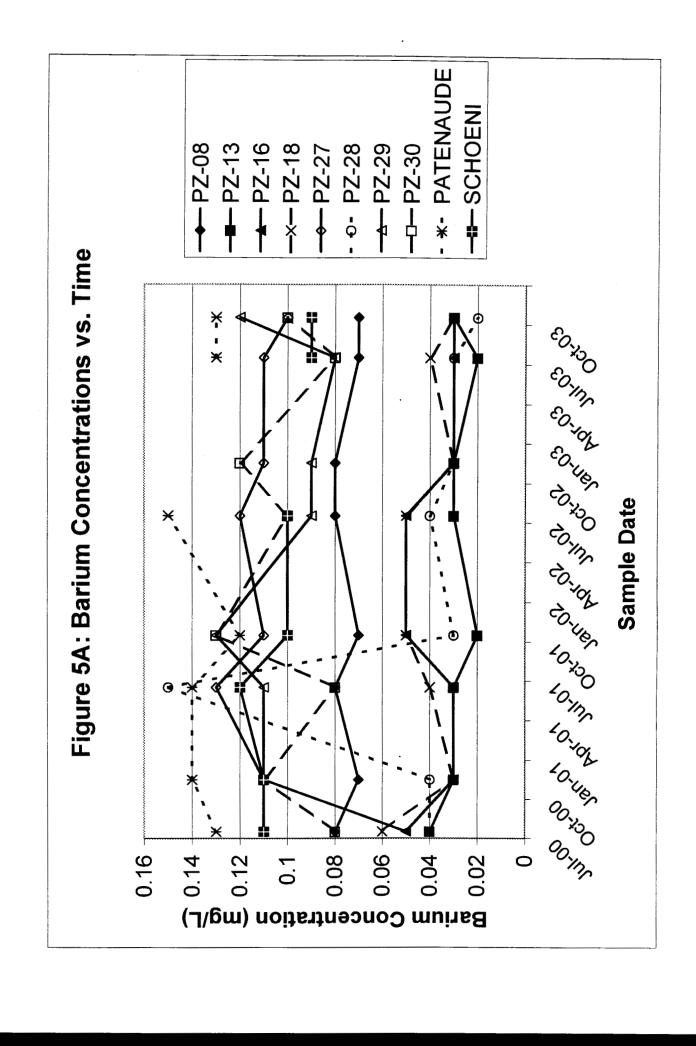


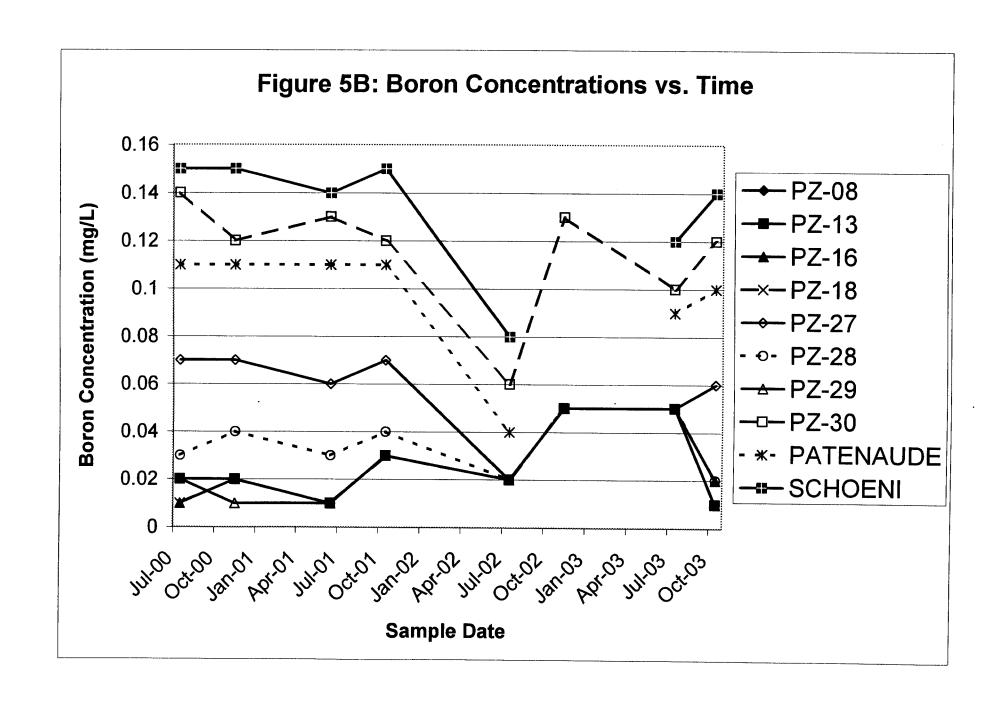
Figure 4B
POTENTIOMETRIC ELEVATIONS (masi)
(Fall, 2003)
TOWNSHIP OF RUSSELL

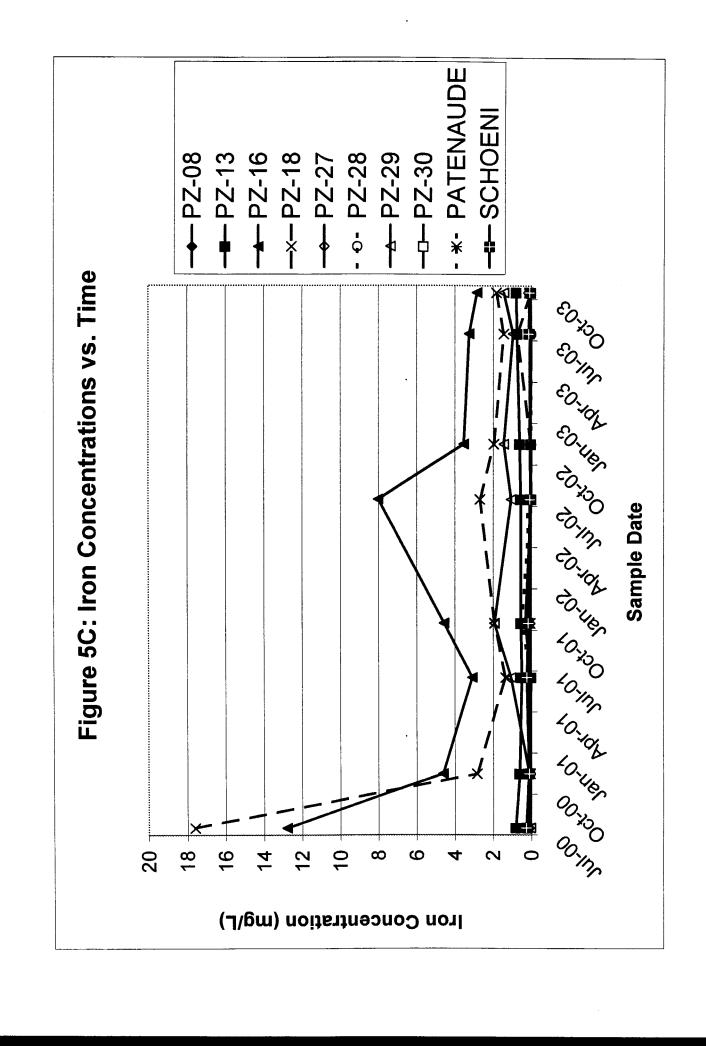


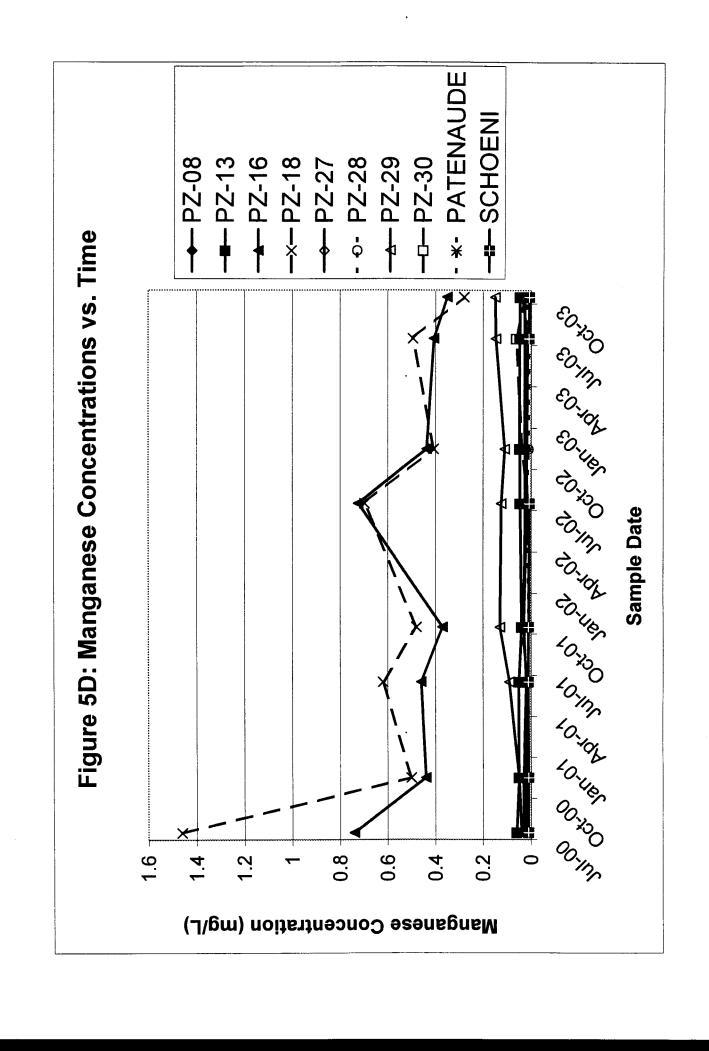
SAURIOL ENVIRONMENTAL Inc.

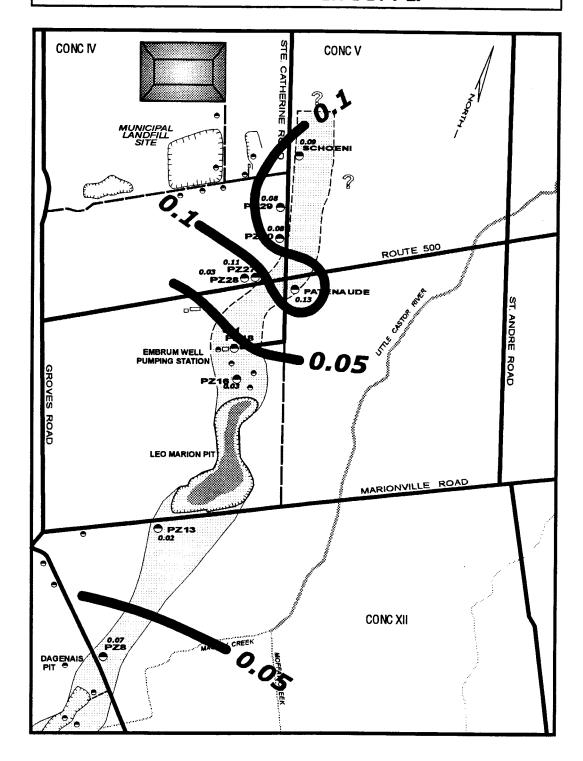
DATE: Jan. 2004











⊕PZ28	MONITORED STATION	Inferred / assumed	Legend
•	STATION NOT MONITORED		0 200 400m

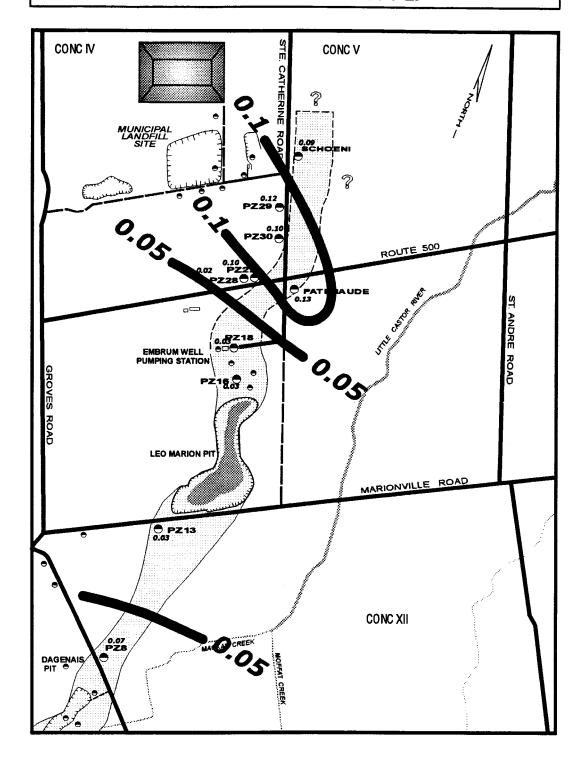
Figure 6A

Barium (mg/L) (Spring, 2003) TOWNSHIP OF RUSSELL



SAURIOL ENVIRONMENTAL Inc.

DATE: Jan. 2004



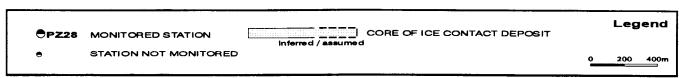


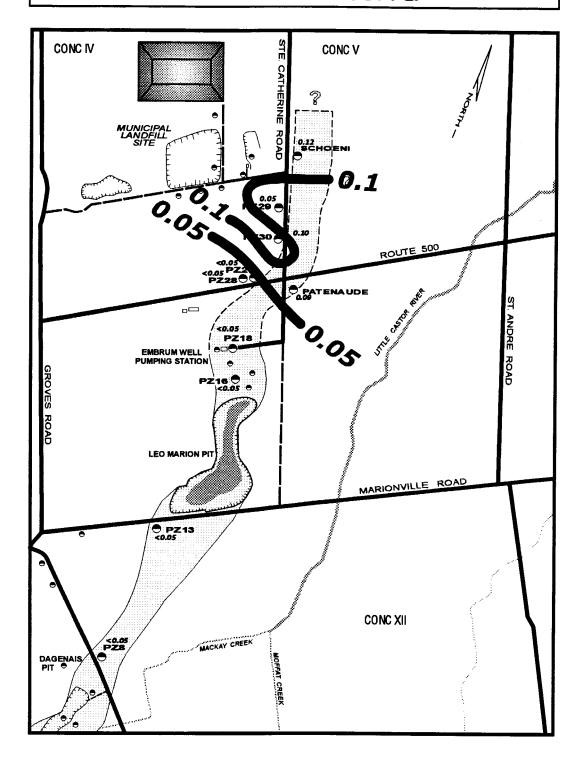
Figure 6B

Barium (mg/L) (Fall, 2003) TOWNSHIP OF RUSSELL



SAURIOL ENVIRONMENTAL Inc.

DATE: Jan. 2004



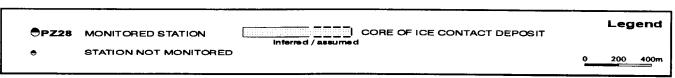


Figure 7A

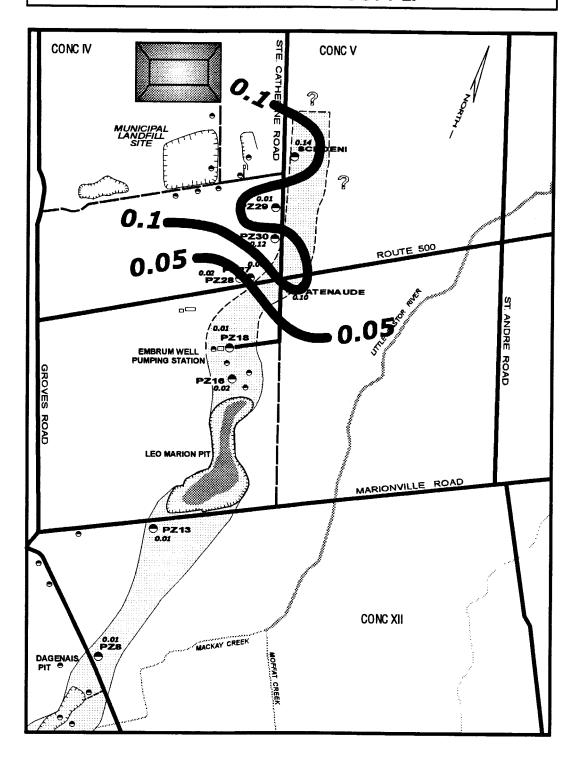
Boron (mg/L) (Spring 2003) TOWNSHIP OF RUSSELL



SAURIOL ENVIRONMENTAL Inc.

MAPFILE: GEOPICS G 03 03\_EMBRUM - JAN 2004

DATE: Jan. 2004



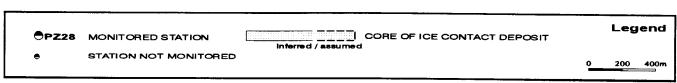


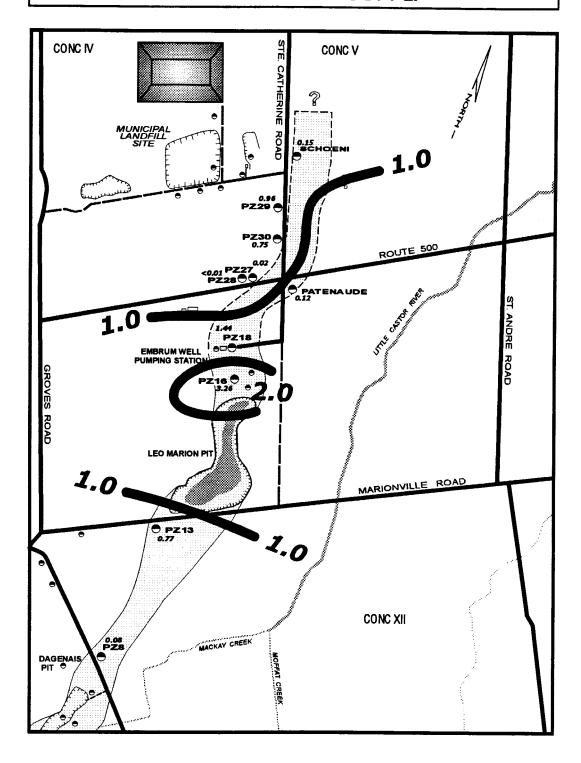
Figure 7B

Boron (mg/L) (Fall 2003) TOWNSHIP OF RUSSELL



SAURIOL ENVIRONMENTAL Inc.

DATE: Jan. 2004



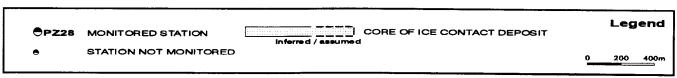


Figure 8a

Iron(mg/L)
(Spring, 2003)
TOWNSHIP OF RUSSELL



SAURIOL ENVIRONMENTAL Inc.

DATE: Jan. 2004

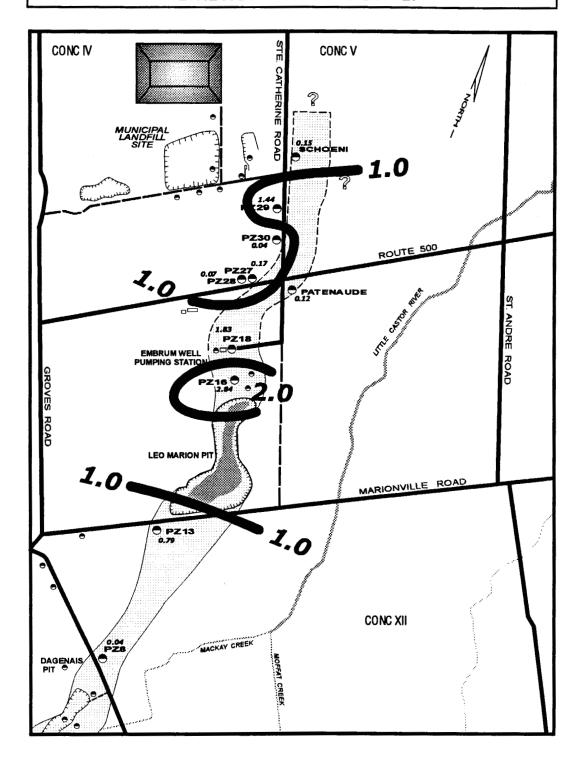




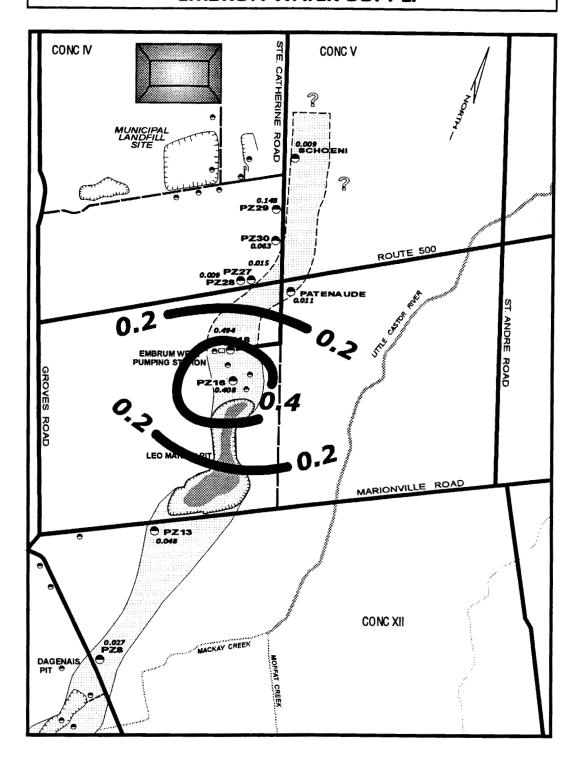
Figure 8b

**Iron** (mg/L) (Fall, 2003) TOWNSHIP OF RUSSELL



SAURIOL ENVIRONMENTAL Inc. MAPFLE: GEOPES G 00 3\_EMBRUM - JAN 2 004

DATE: Jan. 2004



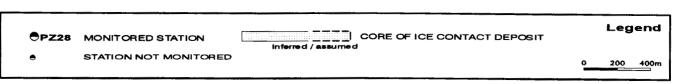


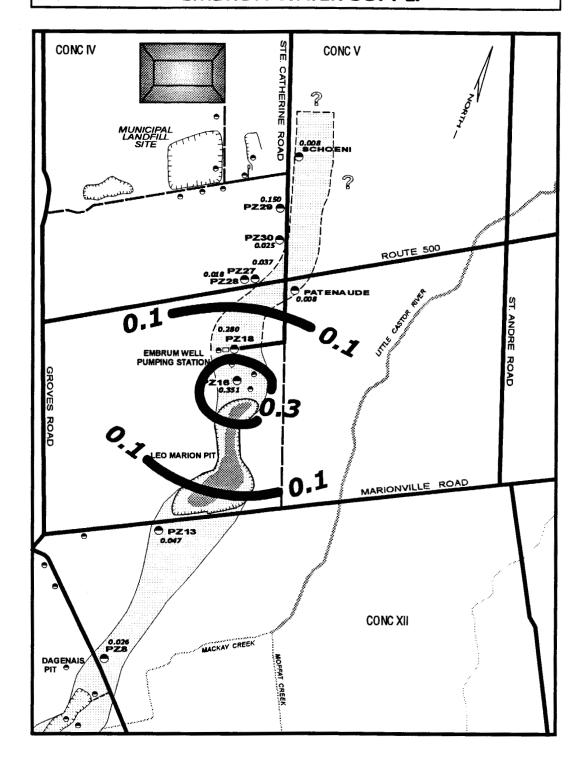
Figure 9A

Manganese (mg/L) (Spring, 2003) TOWNSHIP OF RUSSELL



SAURIOL ENVIRONMENTAL Inc.

DATE: Jan. 2004



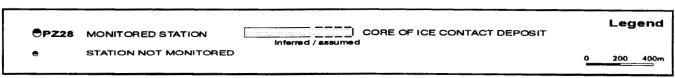


Figure 9B

Manganese (mg/L) (Fall, 2003) TOWNSHIP OF RUSSELL



SAURIOL ENVIRONMENTAL Inc.

DATE: Jan. 2004

## **APPENDIX A**

# LABORATORY RESULTS EMBRUN WELL MONITORING PROGRAM

Client: Township of Russell c/o Sauriol Environmental Inc.

134 St. Paul St. P.O. Box 7181

Vanier, ON K1L 8E3

Attention: Mr. Jacques Sauriol

Report Number:

2310519

Date:

2003-07-22 2003-07-10

Project:

P03-02 Embrum

P.O. Number:

Date Submitted:

							Matrix:		Water	
	LAB ID:			259853 <b>259854</b> 259855 25985			259857	GUIDELINE		
	Sample Date:		2003-07-10	2003-07-10	2003-07-10	2003-07-10	2003-07-10			
	Sam	ple ID:	PZ-28	PZ-27	PZ-13	PZ-8	Schoeni			
							]			
	<del></del>									
PARAMETER	UNITS	MDL						TYPE	LIMIT	UNITS
N-NO2 (Nitrite)	mg/L	0.10	<0.10	<0.10	<0.10	<0.10	<0.10			
N-NO3 (Nitrate)	mg/L	0.10	0.17	<0.10	<0.10	<0.10	<0.10		1	
Arsenic		0.001	<0.001	<0.001	<0.001	<0.001	<0.001			
Barium	mg/L	0.01	0.03	0.11	0.02	0.07	0.09			
Boron	mg/L	0.05	<0.05	<0.05	<0.05	<0.05	0.12			
Cadmium	1 - 1	0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001			
Chromium	mg/L	0.001	<0.001	<0.001	0.003	0.002	0.001			
Copper	mg/L	0.001	<0.001	<0.001	0.001	<0.001	<0.001		İ	
ron	mg/L	0.01	<0.01	0.02	0.77	0.08	0.15			
_ead	mg/L	0.001	<0.001	<0.001	<0.001	<0.001	<0.001			
Manganese	mg/L	0.005	0.009	0.015	0.048	0.027	0.009			
Mercury		0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001			
Selenium		0.001	<0.001	<0.001	<0.001	<0.001	<0.001			
Uranium		0.001	<0.001	<0.001	0.001	0.004	<0.001			
Antimony		0.001	<0.001	<0.001	<0.001	<0.001	<0.001			
•	"		·		3,20,		5.55			
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MDL = Method Detection Limit INC = Incomplete AO = Aesthetic Objective OG = Operational Guideline MAC = Maximum Allowable Concentration IMAC = Interim Maximum Allowable Concentration Comment:

APPROVAL:

Inorganic Láb Supervisor

134 St. Paul St. P.O. Box 7181

Vanier, ON K1L 8E3

Attention: Mr. Jacques Sauriol

Report Number:

2310519

Date:

2003-07-22 2003-07-10

**Date Submitted:** 

\_\_\_\_\_\_

Project:

P03-02 Embrum

P.O. Number:

Matrix:

Water

						_	Matrix:		Water	
		LAB ID:	259853	259854	259855	259856	259857		GUIDELINE	
	Samı	ole Date:	2003-07-10	2003-07-10	2003-07-10	2003-07-10	2003-07-10			
	Sa	mple ID:	PZ-28	PZ-27	PZ-13	PZ-8	Schoeni			
PARAMETER	UNITS	T MDL	<u> </u>					TYPE	LIMIT	UNITS
TABLE B COMPOUNDS (VOCs)	UNITS	MUL			<u> </u>			I TPE	LIMII	UNITS
1,1-dichloroethylene	ug/L	0.5	<0.5	<0.5	<0.5	<0.5	<0.5			
1.2-dichlorobenzene	ug/L	0.4	<0.4	<0.4	<0.4	<0.4	<0.4			
1,2-dichloroethane	ug/L	0.7	<0.7	<0.7	<0.7	<0.7	<0.7			
1,4-dichlorobenzene	ug/L	0.4	<0.4	<0.4	<0.4	<0.4	<0.4	l	1	
Renzene	ug/L ug/L	0.5	<0.4	<0.4	<0.5	<0.4 <0.5	<0.4 <0.5			
Carbon Tetrachloride	ug/L ug/L	0.9	<0.9	<0.9	<0.9	<0.3 <0.9	<0.5 <0.9			
Dichloromethane	ug/L	4.0	<4.0	<4.0	<4.0	<4.0	<4.0			
Ethylbenzene	ug/L	0.5	<0.5	<0.5	<0.5	<0.5	<0.5	1		
Monochlorobenzene	ug/L	0.2	<0.2	<0.2	<0.2	<0.2	<0.2			
Tetrachloroethylene	ug/L	0.3	<0.3	<0.3	<0.3	<0.3	<0.3			
Toluene	ug/L ug/L	0.5	<0.5	<0.5	<0.5	<0.5	<0.5			
Trichloroethylene	ug/L	0.3	<0.3	<0.3	<0.3	<0.3	<0.3			
Vinyl Chloride	ug/L	0.5	<0.5	<0.5	<0.5	<0.5	<0.5		•	
Bromodichloromethane	ug/L	0.3	<0.3	<0.3	<0.3	<0.3	<0.3		ŀ	
Bromoform	ug/L	0.4	<0.4	<0.4	<0.4	<0.4	<0.4			
Chloroform	ug/L	0.5	<0.5	<0.5	<0.5	<0.5	<0.5		1	
Dibromochloromethane	ug/L	0.3	<0.3	<0.3	<0.3	<0.3	<0.3			
Trihalomethanes (total)	ug/L	2.0	<2.0	<2.0	<2.0	<2.0	<2.0		ŀ	ł
m/p-xylene	ug/L	1.0	<1.0	<1.0	<1.0	<1.0	<1.0		1	l
p-xylene	ug/L	0.5	<0.5	<0.5	<0.5	<0.5	<0.5			
Xylene; total	ug/L	2.0	<2.0	<2.0	<2.0	<2.0	<2.0			
TABLE B SURROGATES	-3		""							
Toluene-d8	%		99	99	98	101	97		1	
4-bromofluorobenzene	%		83	82	83	87	85			
1,2-dichloroethane-d4	~	ľ	98	98	98	103	100		1	
,	~		1							1
				1						
	ļ									
		<u> </u>	<u></u>							

MDL = Method Detection Limit INC = Incomplete AO = Aesthetic Objective OG = Operational Guideline MAC = Maximum Allowable Concentration IMAC = Interim Maximum Allowable Concentration Comment:

Δ	PI	O'	V.	ΔI	

134 St. Paul St. P.O. Box 7181

Vanier, ON K1L 8E3

Attention: Mr. Jacques Sauriol

Report Number:

2310519

Date:

2003-07-22

Date Submitted:

2003-07-10

Project:

P03-02 Embrum

P.O. Number:

Matriv.

Water

							Matrix:		Water	
		LAB ID:	259853	259854	259855	259856	259857		GUIDELINE	
	Samp	ole Date:	2003-07-10	2003-07-10	2003-07-10	2003-07-10	2003-07-10			
	Sa	mple ID:	PZ-28	PZ-27	PZ-13	PZ-8	Schoeni			
					·					
PARAMETER	UNITS	MDL						TYPE	LIMIT	UNITS
Organochlorine Pesticides (OCPs) & PCBs										
Aldrin	ug/L	0.006	<0.006	<0.006	<0.006	<0.006	<0.006		[	
Dieldrin	ug/L	0.006	<0.006	<0.006	<0.006	<0.006	<0.006			
Aldrin + Dieldrin	ug/L	0.012	<0.012	<0.012	<0.012	<0.012	<0.012			
a-chlordane	ug/L	0.006	<0.006	<0.006	<0.006	<0.006	<0.006			
g-chlordane	ug/L	0.006	<0.006	<0.006	<0.006	<0.006	<0.006			
Oxychlordane	ug/L	0.006	<0.006	<0.006	<0.006	<0.006	<0.006	· 		
Chlordane (Total)	ug/L	0.015	<0.015	<0.015	<0.015	<0.015	<0.015			
op-DDT	ug/L	0.006	<0.006	<0.006	<0.006	<0.006	<0.006			
pp-DDD	ug/L	0.006	<0.006	<0.006	<0.006	<0.006	<0.006			
pp-DDE	ug/L	0.006	<0.006	<0.006	<0.006	<0.006	<0.006			i
pp-DDT	ug/L	0.006	<0.006	<0.006	<0.006	<0.006	<0.006		1	
(DDT) + Metabolites	ug/L	0.024	<0.024	<0.024	<0.024	<0.024	<0.024			
Heptachlor	ug/L	0.006	<0.006	<0.006	<0.006	<0.006	<0.006		1	
Heptachlor epoxide	ug/L	0.006	<0.006	<0.006	<0.006	<0.006	<0.006			
Heptachlor + Heptachlor Epoxide	ug/L	0.012	<0.012	<0.012	<0.012	<0.012	<0.012			
Lindane	ug/L	0.006	<0.006	<0.006	<0.006	<0.006	<0.006			
Methoxychlor	ug/L	0.024	<0.024	<0.024	<0.024	<0.024	<0.024			
Trifluralin	ug/L	1	<1	<1	<1	<1	<1			
Polychlorinated Biphenyls (PCBs)	ug/L	0.1	<0.1	<0.1	<0.1	<0.1	<0.1			
CHLOROPHENOLS		ļ							1	
2,3,4,6-tetrachlorophenol	ug/L	0.5	<0.5	<0.5	<0.5	<0.5	<0.5			
2,4,6-trichlorophenol	ug/L	0.5	<0.5	<0.5	<0.5	<0.5	<0.5			
2,4-dichlorophenol	ug/L	0.5	<0.5	<0.5	<0.5	<0.5	<0.5			
Pentachlorophenol	ug/L	0.5	<0.5	<0.5	<0.5	<0.5	<0.5		<b> </b>	
PHENOXYACID HERBICIDES		1	1	}		'			j '	
2,4,5-trichlorophenoxyacetic acid (2,4,5-T)	ug/L	1	<1	<1	<1	<1	<1			
2,4-dichlorophenoxyacetic acid (2,4-D)	ug/L	1	<1	<1	<1	<1	<1		1	
Bromoxynil	ug/L	0.5	<0.5	<0.5	<0.5	<0.5	<0.5		1	
Dicamba	ug/L	1	<1	<1	<1	<1	<1			

MDL = Method Detection Limit INC = Incomplete AO = Aesthetic Objective OG = Operational Guideline MAC = Maximum Allowable Concentration IMAC = Interim Maximum Allowable Concentration Comment:

APPROVAL:

Mina Nasirai
Organic Lab Supervisor

Client: Township of Russell c/o Sauriol Environmental Inc. 134 St. Paul St. P.O. Box 7181

Vanier, ON K1L 8E3

Attention: Mr. Jacques Sauriol

Report Number:

2310519

Date: Date Submitted:

2003-07-22 2003-07-10

Project:

P03-02 Embrum

P.O. Number:

PARAMETER   UNITS   MDL   Diclofop-methyl   Ug/L   0.9   ug/L   1   v1   v1   v1   v1   v1   v1   v1		
Sample Date:   2003-07-10   2		
Parameter   Units   MDL     PZ-28   PZ-27   PZ-13   PZ-8   Schoeni     Schoeni   PZ-8   Schoeni   PZ-8   PZ-13	DELINE	
Diclofop-methyl   Ug/L   0.9   <0.9   <0.9   <0.9   <0.9   <0.9   <0.9   <0.9   <0.9   <0.9   <0.9   <0.9   <0.9   <0.9   <0.9   <0.9   <0.9   <0.9   <0.9   <0.9   <0.9   <0.9   <0.9   <0.9   <0.9   <0.9   <0.9   <0.9   <0.9   <0.9   <0.9   <0.9   <0.9   <0.9   <0.9   <0.9   <0.9   <0.9   <0.9   <0.9   <0.9   <0.9   <0.9   <0.9   <0.9   <0.9   <0.9   <0.9   <0.9   <0.9   <0.9   <0.9   <0.9   <0.9   <0.9   <0.9   <0.9   <0.9   <0.9   <0.9   <0.9   <0.9   <0.9   <0.9   <0.9   <0.9   <0.9   <0.9   <0.9   <0.9   <0.9   <0.9   <0.9   <0.9   <0.9   <0.9   <0.9   <0.9   <0.9   <0.9   <0.9   <0.9   <0.9   <0.9   <0.9   <0.9   <0.9   <0.9   <0.9   <0.9   <0.9   <0.9   <0.9   <0.9   <0.9   <0.9   <0.9   <0.9   <0.9   <0.9   <0.9   <0.9   <0.9   <0.9   <0.9   <0.9   <0.9   <0.9   <0.9   <0.9   <0.9   <0.9   <0.9   <0.9   <0.9   <0.9   <0.9   <0.9   <0.9   <0.9   <0.9   <0.9   <0.9   <0.9   <0.9   <0.9   <0.9   <0.9   <0.9   <0.9   <0.9   <0.9   <0.9   <0.9   <0.9   <0.9   <0.9   <0.9   <0.9   <0.9   <0.9   <0.9   <0.9   <0.9   <0.9   <0.9   <0.9   <0.9   <0.9   <0.9   <0.9   <0.9   <0.9   <0.9   <0.9   <0.9   <0.9   <0.9   <0.9   <0.9   <0.9   <0.9   <0.9   <0.9   <0.9   <0.9   <0.9   <0.9   <0.9   <0.9   <0.9   <0.9   <0.9   <0.9   <0.9   <0.9   <0.9   <0.9   <0.9   <0.9   <0.9   <0.9   <0.9   <0.9   <0.9   <0.9   <0.9   <0.9   <0.9   <0.9   <0.9   <0.9   <0.9   <0.9   <0.9   <0.9   <0.9   <0.9   <0.9   <0.9   <0.9   <0.9   <0.9   <0.9   <0.9   <0.9   <0.9   <0.9   <0.9   <0.9   <0.9   <0.9   <0.9   <0.9   <0.9   <0.9   <0.9   <0.9   <0.9   <0.9   <0.9   <0.9   <0.9   <0.9   <0.9   <0.9   <0.9   <0.9   <0.9   <0.9   <0.9   <0.9   <0.9   <0.9   <0.9   <0.9   <0.9   <0.9   <0.9   <0.9   <0.9   <0.9   <0.9   <0.9   <0.9   <0.9   <0.9   <0.9   <0.9   <0.9   <0.9   <0.9   <0.9   <0.9   <0.9   <0.9   <0.9   <0.9   <0.9   <0.9   <0.9   <0.9   <0.9   <0.9   <0.9   <0.9   <0.9   <0.9   <0.9   <0.9   <0.9   <0.9   <0.9   <0.9   <0.9   <0.9   <0.9   <0.9   <0.9   <0.9   <0.9   <0.9   <0.9   <0.9   <0.9   <0.9   <0.9   <0.9   <0.9		
Diclofop-methyl		
Diclofop-methyl		
Ug/L   0.9   <0.9   <0.9   <0.9   <0.9   <0.9   <0.9   <0.9   <0.9   <0.9   <0.9   <0.9   <0.9   <0.9   <0.9   <0.9   <0.9   <0.9   <0.9   <0.9   <0.9   <0.9   <0.9   <0.9   <0.9   <0.9   <0.9   <0.9   <0.9   <0.9   <0.9   <0.9   <0.9   <0.9   <0.9   <0.9   <0.9   <0.9   <0.9   <0.9   <0.9   <0.9   <0.9   <0.9   <0.9   <0.9   <0.9   <0.9   <0.9   <0.9   <0.9   <0.9   <0.9   <0.9   <0.9   <0.9   <0.9   <0.9   <0.9   <0.9   <0.9   <0.9   <0.9   <0.9   <0.9   <0.9   <0.9   <0.9   <0.9   <0.9   <0.9   <0.9   <0.9   <0.9   <0.9   <0.9   <0.9   <0.9   <0.9   <0.9   <0.9   <0.9   <0.9   <0.9   <0.9   <0.9   <0.9   <0.9   <0.9   <0.9   <0.9   <0.9   <0.9   <0.9   <0.9   <0.9   <0.9   <0.9   <0.9   <0.9   <0.9   <0.9   <0.9   <0.9   <0.9   <0.9   <0.9   <0.9   <0.9   <0.9   <0.9   <0.9   <0.9   <0.9   <0.9   <0.9   <0.9   <0.9   <0.9   <0.9   <0.9   <0.9   <0.9   <0.9   <0.9   <0.9   <0.9   <0.9   <0.9   <0.9   <0.9   <0.9   <0.9   <0.9   <0.9   <0.9   <0.9   <0.9   <0.9   <0.9   <0.9   <0.9   <0.9   <0.9   <0.9   <0.9   <0.9   <0.9   <0.9   <0.9   <0.9   <0.9   <0.9   <0.9   <0.9   <0.9   <0.9   <0.9   <0.9   <0.9   <0.9   <0.9   <0.9   <0.9   <0.9   <0.9   <0.9   <0.9   <0.9   <0.9   <0.9   <0.9   <0.9   <0.9   <0.9   <0.9   <0.9   <0.9   <0.9   <0.9   <0.9   <0.9   <0.9   <0.9   <0.9   <0.9   <0.9   <0.9   <0.9   <0.9   <0.9   <0.9   <0.9   <0.9   <0.9   <0.9   <0.9   <0.9   <0.9   <0.9   <0.9   <0.9   <0.9   <0.9   <0.9   <0.9   <0.9   <0.9   <0.9   <0.9   <0.9   <0.9   <0.9   <0.9   <0.9   <0.9   <0.9   <0.9   <0.9   <0.9   <0.9   <0.9   <0.9   <0.9   <0.9   <0.9   <0.9   <0.9   <0.9   <0.9   <0.9   <0.9   <0.9   <0.9   <0.9   <0.9   <0.9   <0.9   <0.9   <0.9   <0.9   <0.9   <0.9   <0.9   <0.9   <0.9   <0.9   <0.9   <0.9   <0.9   <0.9   <0.9   <0.9   <0.9   <0.9   <0.9   <0.9   <0.9   <0.9   <0.9   <0.9   <0.9   <0.9   <0.9   <0.9   <0.9   <0.9   <0.9   <0.9   <0.9   <0.9   <0.9   <0.9   <0.9   <0.9   <0.9   <0.9   <0.9   <0.9   <0.9   <0.9   <0.9   <0.9   <0.9   <0.9   <0.9   <0.9   <0.9   <0.9   <0.9   <0.9   <	IMIT	UNITS
Ug/L   1   <1   <1   <1   <1   <1   <1   <1	<del></del>	ONITS
CARBAMATES         ug/L         5         <5         <5         <5         <5         <5         <5         <5         <5         <5         <5         <5         <5         <5         <5         <5         <5         <5         <5         <5         <5         <5         <5         <5         <5         <5         <5         <5         <5         <5         <5         <5         <5         <5         <5         <5         <5         <5         <5         <5         <5         <5         <5         <5         <5         <5         <5         <5         <5         <5         <5         <5         <5         <5         <5         <5         <5         <5         <5         <5         <5         <5         <5         <5         <5         <5         <5         <5         <5         <5         <5         <5         <5         <5         <5         <5         <5         <5         <5         <5         <5         <5         <5         <5         <5         <5         <5         <5         <5         <5         <5         <5         <5         <5         <5         <5         <5         <5         <5		
Aldicarb  Bendiocarb  Carbanyl  Ug/L  9  <9  <9  <9  <9  <9  <9  <9  <9  <9	- 1	
Bendiocarb  Ug/L 2 <9 <9 <9 <9 <9 <9 <9 <9 <9 C4	- 1	
ug/L         2         <2		
Carbaryi ug/L 5 5 5 5		
TRIAZINE & RELATED HERBICIDES		
Alachlor		
Atrazine   ug/L   0.5   <0.5   <0.5   <0.5	İ	
De-ethylated atrazine ug/l 0.5 <0.5		
Atrazine + N-dealkylated metabolites		
Cyanazine ug/ 1 c1 c1 c1 c1 c1 c1 c1 c1 c1 c1 c1 c1 c	- 1	
Metolachlor Ug/ 0.5 co.5 co.5	- 1	
Metribuzin 100   Co.5		
Prometryne up/ ops ops 55		
Simazine Vo.25 Vo.25 Vo.25		
ORGANOPHOSPHOROUS PESTICIDES  ug/L 1 <1 <1 <1 <1 <1 <1	- 1	
Azinphos-methyl	1	
Chlorpyrifos Chlor		
Diazinon Grant Control of the Contro	1	
Dimethoate   ug/L   <1   <1   <1   <1   <1   <1   <1	- 1	
Malathion ug/L 2.5 <2.5 <2.5 <2.5 <2.5 <2.5		
Parathion ug/L 5 <5 <5 <5 <5		
Ug/L   1   <1   <1   <1   <1	1	
emonas   ug/L   0.5   <0.5   <0.5   <0.5   <0.5		
ug/L 10 <10 <10 <10 <10 <10		
ug/L 0.7 <0.7 <0.7 <0.7 <0.7		

MDL = Method Detection Limit INC = Incomplete AO = Aesthetic Objective OG = Operational Guideline MAC = Maximum Allowable Concentration IMAC = Interim Maximum Allowable Concentration

APPROVAL:

Organic Lab Supervisor

BEPOPT OF ANALYSIS

Client: Township of Russell c/o Sauriol Environmental Inc.

134 St. Paul St. P.O. Box 7181

Vanier, ON K1L 8E3

Attention: Mr. Jacques Sauriol

Report Number:

Date:

2310519 2003-07-22

**Date Submitted:** 

2003-07-10

Project:

P03-02 Embrum

P.O. Number:

		1.15.15	T				Matrix:		Water	
		LAB ID:	259853	259854	259855	259856	259857		GUIDELINE	
		ole Date:	2003-07-10	2003-07-10	2003-07-10	2003-07-10	2003-07-10			
	Sa	mple ID:	PZ-28	PZ-27	PZ-13	PZ-8	Schoeni	1		
			j	[						
PARAMETER	UNITS	MDL								
DIURON & GLYPHOSATE	OMITS	MIDL						TYPE	LIMIT	UNITS
Diuron	ug/L	10	-40							
Slyphosate			<10	<10	<10	<10	<10	ł	į .	l
DIQUAT & PARAQUAT	ug/L	10	<10	<10	<10	<10	<10	1	1	ĺ
Diquat								l	j	ł
Paraquat	ug/L	7	<7	<7	<7	<7	<7		1	ĺ
araquat	ug/L	1	<1	<1	<1	<1	<1	ĺ	į į	ĺ
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		1	1	- 1	j	1	Ĭ	İ		
		j	ł	į.	ł	1	I	Į.	ļ	
L = Method Detection Limit INC = Incomplete AO = Aestheti	ic Objective OC - C						<u>·</u>		l	

MDL = Method Detection Limit INC = Incomplete AO = Aesthetic Objective OG = Operational Guideline MAC = Maximum Allowable Concentration IMAC = Interim Maximum Allowable Concentration

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134 St. Paul St. P.O. Box 7181

Vanier, ON

K1L 8E3

Attention: Mr. Jacques Sauriol

Report Number:

2310437

Date:

2003-07-22

**Date Submitted:** 

2003-07-09

Project:

P03-02 Embrun

P.O. Number:

							Matrix:		Water	
		LAB ID:	259650	259651	259652	259653	259654		GUIDELINE	
	Samp	le Date:	2003-07-09	2003-07-09	2003-07-09	2003-07-09	2003-07-09			
		nple ID:	PZ-18	PZ-16	PZ-29	PZ-30	Patenaude			
				ļ			1			
							ļ			
PARAMETER	UNITS	MDL						TYPE	LIMIT	UNITS
N-NO2 (Nitrite)	mg/L	0.10	<0.10	<0.10	<0.10	<0.10	<0.10			
N-NO3 (Nitrate)	mg/L	0.10	<0.10	<0.10	0.16	<0.10	<0.10		i i	
Arsenic	mg/L	0.001	<0.001	<0.001	<0.001	<0.001	<0.001			
Barium	mg/L	0.01	0.04	0.03	0.08	0.08	0.13			
Boron	mg/L	0.05	<0.05	<0.05	<0.05	0.10	0.09			
Cadmium	mg/L	0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001			
Chromium	mg/L	0.001	0.001	<0.001	0.002	0.001	<0.001			
Copper	mg/L	0.001	0.001	<0.001	<0.001	0.001	0.004			
Iron	mg/L	0.01	1.44	3.26	0.96	0.75	0.12		1	
Lead	mg/L	0.001	<0.001	<0.001	<0.001	<0.001	<0.001			
Manganese	mg/L	0.005	0.494	0.406	0.148	0.063	0.011	ļ	ļ	
Mercury	mg/L	0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001		[	
Selenium	mg/L	0.001	<0.001	<0.001	<0.001	<0.001	<0.001		1	•
Uranium	mg/L	0.001	<0.001	<0.001	<0.001	<0.001	<0.001		1	
Antimony	mg/L	0.001	<0.001	<0.001	<0.001	<0.001	<0.001	ļ	1	
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MDL = Method Detection Limit INC = Incomplete AO = Aesthetic Objective OG = Operational Guideline MAC = Maximum Allowable Concentration IMAC = Interim Maximum Allowable Concentration Comment:

APPROVAL:

Ewan McRobbie Inorganic Lab Supervisor

134 St. Paul St. P.O. Box 7181

Vanier, ON K1L 8E3

Attention: Mr. Jacques Sauriol

Report Number:

2310437

Date:

2003-07-22

**Date Submitted:** 

2003-07-09

Project:

P03-02 Embrun

P.O. Number:

Matrix:

Water

		•					Matrix:		Water	
	<u> </u>	LAB ID:	259650	259651	259652	259653	259654		GUIDELINE	
	Samp	ole Date:	2003-07-09	2003-07-09	2003-07-09	2003-07-09	2003-07-09			
	Sa	mple ID:	PZ-18	PZ-16	PZ-29	PZ-30	Patenaude			
PARAMETER	UNITS	MDL						TYPE	LIMIT	UNITS
TABLE B COMPOUNDS (VOCs)				i						
1,1-dichloroethylene	ug/L	0.5	<0.5	<0.5	<0.5	<0.5	<0.5			
1,2-dichlorobenzene	ug/L	0.4	<0.4	<0.4	<0.4	<0.4	<0.4		l	
1,2-dichloroethane	ug/L	0.7	<0.7	<0.7	<0.7	<0.7	<0.7			
1,4-dichlorobenzene	ug/L	0.4	<0.4	<0.4	<0.4	<0.4	<0.4			
Benzene	ug/L	0.5	<0.5	<0.5	<0.5	<0.5	<0.5		ļ	
Carbon Tetrachloride	ug/L	0.9	<0.9	<0.9	<0.9	<0.9	<0.9			
Dichloromethane	ug/L	4.0	<4.0	<4.0	<4.0	<4.0	<4.0			
Ethylbenzene	ug/L	0.5	<0.5	3.2	<0.5	<0.5	<0.5		1	
Monochlorobenzene	ug/L	0.2	<0.2	<0.2	<0.2	<0.2	<0.2			
Tetrachioroethylene	ug/L	0.3	<0.3	<0.3	<0.3	<0.3	<0.3			
Toluene	ug/L	0.5	<0.5	<0.5	<0.5	<0.5	<0.5		:	
Trichloroethylene	ug/L	0.3	<0.3	<0.3	<0.3	<0.3	<0.3		1	
Vinyl Chloride	ug/L	0.5	<0.5	<0.5	<0.5	<0.5	<0.5		1	
Bromodichloromethane	ug/L	0.3	<0.3	<0.3	<0.3	<0.3	<0.3	i		1
Bromoform	ug/L	0.4	<0.4	<0.4	<0.4	<0.4	<0.4			1
Chloroform	ug/L	0.5	<0.5	<0.5	<0.5	<0.5	<0.5			
Dibromochloromethane	ug/L	0.3	<0.3	<0.3	<0.3	<0.3	<0.3		1	
Trihalomethanes (total)	ug/L	2.0	<2.0	<2.0	<2.0	<2.0	<2.0			
m/p-xylene	ug/L	1.0	<1.0	<1.0	<1.0	<1.0	<1.0	i	1	l
o-xylene	ug/L	0.5	<0.5	<0.5	<0.5	<0.5	<0.5			
Xylene; total	ug/L	2.0	<2.0	<2	<2.0	<2.0	<2.0	:	<b>!</b>	
TABLE B SURROGATES		1						ŀ	1	
Toluene-d8	%		101	95	101	100	95		1	
4-bromofluorobenzene	%		89	83	85	84	81			
1,2-dichloroethane-d4	%		99	97	98	99	94			
		1	Ī					Į	Ī	1

MDL = Method Detection Limit INC = Incomplete AO = Aesthetic Objective OG = Operational Guideline MAC = Maximum Allowable Concentration IMAC = Interim Maximum Allowable Concentration Comment:

APPROVÁL:

Mina Nasirai

134 St. Paul St. P.O. Box 7181

Vanier, ON

K1L 8E3 Attention: Mr. Jacques Sauriol Report Number:

2310437

Date:

2003-07-22

**Date Submitted:** 

2003-07-09

Project:

P03-02 Embrun

P.O. Number:

							Matrix:		Water	
		LAB ID:	259650	259651	259652	259653	259654		GUIDELINE	
	Samp	ole Date:	2003-07-09	2003-07-09	2003-07-09	2003-07-09	2003-07-09			
	Sa	mple ID:	PZ-18	PZ-16	PZ-29	PZ-30	Patenaude			
			1		[					
PARAMETER	UNITS	MDL						TYPE	LIMIT	UNITS
Organochlorine Pesticides (OCPs) & PCBs			<u> </u>						1	011113
Aldrin	ug/L	0.006	<0.006	<0.006	<0.006	<0.006	<0.006		ĺ	
Dieldrin	ug/L	0.006	<0.006	<0.006	<0.006	<0.006	<0.006		ŀ	
Aldrin + Dieldrin	ug/L	0.012	<0.012	<0.012	<0.012	<0.012	<0.012			
a-chlordane	ug/L	0.006	<0.006	<0.006	<0.006	<0.006	<0.006		ŀ	
g-chlordane	ug/L	0.006	<0.006	<0.006	<0.006	<0.006	<0.006			
Oxychlordane	ug/L	0.006	<0.006	<0.006	<0.006	<0.006	<0.006			1
Chlordane (Total)	ug/L	0.015	<0.015	<0.015	<0.015	<0.015	<0.015			ł
op-DDT	ug/L	0.006	<0.006	<0.006	<0.006	<0.006	<0.006			
pp-DDD	ug/L	0.006	<0.006	<0.006	<0.006	<0.006	<0.006			
pp-DDE	ug/L	0.006	<0.006	<0.006	<0.006	<0.006	<0.006		ļ	1
pp-DDT	ug/L	0.006	<0.006	<0.006	<0.006	<0.006	<0.006			
(DDT) + Metabolites	ug/L	0.024	<0.024	<0.024	<0.024	<0.024	<0.024		ļ	
Heptachlor	ug/L	0.006	<0.006	<0.006	<0.006	<0.006	<0.006			
Heptachlor epoxide	ug/L	0.006	<0.006	<0.006	<0.006	<0.006	<0.006	1		
Heptachlor + Heptachlor Epoxide	ug/L	0.012	<0.012	<0.012	<0.012	<0.012	<0.012			
Lindane	ug/L	0.006	<0.006	<0.006	<0.006	<0.006	<0.006			
Methoxychlor	ug/L	0.024	<0.024	<0.024	<0.024	<0.024	<0.024			
Trifluralin	ug/L	1	<1	<1	<1	<1	<1			
Polychlorinated Biphenyls (PCBs)	ug/L	0.1	<0.1	<0.1	<0.1	<0.1	<0.1			
CHLOROPHENOLS								1		
2,3,4,6-tetrachlorophenol	ug/L	0.5	<0.5	<0.5	<0.5	<0.5	<0.5			ŀ
2,4,6-trichlorophenol	ug/L	0.5	<0.5	<0.5	<0.5	<0.5	<0.5			
2,4-dichlorophenol	ug/L	0.5	<0.5	<0.5	<0.5	<0.5	<0.5			
Pentachlorophenol	ug/L	0.5	<0.5	<0.5	<0.5	<0.5	<0.5		1	
PHENOXYACID HERBICIDES	"-						3.5			
2,4,5-trichlorophenoxyacetic acid (2,4,5-T)	ug/L	1	<1	<1	<1	<1	<1			
2,4-dichlorophenoxyacetic acid (2,4-D)	ug/L	1	<1	<1	<1	<1	<1			
Bromoxynil	ug/L	0.5	<0.5	<0.5	- <0.5	<0.5	<0.5			1
Dicamba	ug/L	1	<1	<1	<1	<1	<1			

MDL = Method Detection Limit INC = Incomplete AO = Aesthetic Objective OG = Operational Guideline MAC = Maximum Allowable Concentration IMAC = Interim Maximum Allowable Concentration Comment:

APPROVAL:

Mina Nasirai

PEPOPT OF ANALYSIS

Client: Township of Russell c/o Sauriol Environmental Inc.

134 St. Paul St. P.O. Box 7181

Vanier, ON K1L 8E3

Attention: Mr. Jacques Sauriol

Report Number:

2310437

Date:

2003-07-22

**Date Submitted:** 

2003-07-09

Project:

P03-02 Embrun

P.O. Number:

Matrix:

Water

							matrix:		water	
	- L	LAB ID:	259650	259651	259652	259653	259654		GUIDELINE	
	Sampl	e Date:	2003-07-09	2003-07-09	2003-07-09	2003-07-09	2003-07-09			
	San	nple ID:	PZ-18	PZ-16	PZ-29	PZ-30	Patenaude			
						•				
PARAMETER	UNITS	MDL						TYPE	LIMIT	UNITS
Diclofop-methyl	ug/L	0.9	<0.9	<0.9	<0.9	<0.9	<0.9			
Dinoseb	ug/L	1	<1	<1	<1	<1	<1			
Picloram	ug/L	5	<5	<5	<5	<5	<5			
CARBAMATES										
Aldicarb	ug/L	9	<9	<9	<9	<9	<9			
Bendiocarb	ug/L	2	<2	<2	<2	<2	<2			
Carbaryl	ug/L	5	<5	<5	<5	<5	<5			
Carbofuran	ug/L	5	<5	<5	<5	<5	<5			
Triallate	ug/L	1	<1	<1	<1	<1	<1			
TRIAZINE & RELATED HERBICIDES									İ	
Alachlor	ug/L	0.5	<0.5	<0.5	<0.5	<0.5	<0.5		1	
Atrazine	ug/L	0.5	<0.5	<0.5	<0.5	<0.5	<0.5			
De-ethylated atrazine	ug/L	0.5	<0.5	<0.5	<0.5	<0.5	<0.5	İ		
Atrazine + N-dealkylated metabolites	ug/L	1.0	<1.0	<1.0	<1.0	<1.0	<1.0			
Cyanazine	ug/L	1	<1	<1	<1	<1	<1	1	Ì	
Metolachlor	ug/L	0.5	<0.5	<0.5	<0.5	<0.5	<0.5			
Metribuzin	ug/L	5	<5	<5	<5	<5	<5			
Prometryne	ug/L	0.25	<0.25	<0.25	<0.25	<0.25	<0.25	ŀ	l	
Simazine	ug/L	1	<1	<1	<1	<1	<1			
ORGANOPHOSPHOROUS PESTICIDES							1		i	
Azinphos-methyl	ug/L	2	<2	<2	<2	<2	<2		1	1
Chlorpyrifos	ug/L	1	<1	<1	<1	<1	<1			
Diazinon	ug/L	1	<1	<1	<1	<1	<1	į		
Dimethoate	ug/L	2.5	<2.5	<2.5	<2.5	<2.5	<2.5			
Malathion	ug/L	5	<5	<5	<5	<5	<5			
Parathion	ug/L	1	<1	<1	<1	<1	<1			
Phorate	ug/L	0.5	<0.5	<0.5	<0.5	<0.5	<0.5	1	1	
Temephos	ug/L	10	<10	<10	<10	<10	<10		1	
Terbufos	ug/L	0.7	<0.7	<0.7	<0.7	<0.7	<0.7			
	1 1		ı	-						

MDL = Method Detection Limit INC = Incomplete AO = Aesthetic Objective OG = Operational Guideline MAC = Maximum Allowable Concentration IMAC = Interim Maximum Allowable Concentration Comment:

APPROVAL:

Mina Nasirai

Organic Lab Supervisor

134 St. Paul St. P.O. Box 7181

Vanier, ON K1L 8E3

Attention: Mr. Jacques Sauriol

Report Number:

2310437

Date:

2003-07-22

Date Submitted:

2003-07-09

Project:

P03-02 Embrun

P.O. Number:

Matrix:

Water

							Matrix:		Water	
		LAB ID:	259650	259651	259652	259653	259654		GUIDELINE	
	Samp	le Date:	2003-07-09	2003-07-09	2003-07-09	2003-07-09	2003-07-09			
		mple ID:	PZ-18	PZ-16	PZ-29	PZ-30	Patenaude			
DADAMETER	UNITS	MDL						TVDE	I I INAIT	UNITS
PARAMETER DIURON & GLYPHOSATE	UNITS	MDL						TYPE	LIMIT	UNITS
Diuron & GETPHOSATE	ug/L	10	<10	<10	<10	<10	<10			
Glyphosate	ug/L	10	<10	<10	<10 <10	<10	<10 <10			
DIQUAT & PARAQUAT	ug/L	l ''	\ \'\	<b>\</b> 10	\10	<b>~10</b>	\ \10			
Diquat	ug/L	7	<7	<7	<7	<7	<7			
Paraquat	ug/L	'1	<1	<1	<1	<1	<1			
raiaquat	ug/L	l '	`'	`'	`'	`'	`'			
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MDL = Method Detection Limit INC = Incomplete AO = Aesthetic Objective OG = Operational Guideline MAC = Maximum Allowable Concentration IMAC = Interim Maximum Allowable Concentration Comment:

APPROVAL:

Mina-Nasirai

Organic Lab Supervisor

134 St. Paul St. P.O. Box 7181

Vanier, ON K1L 8E3

Attention: Mr. Jacques Saurioi

Report Number:

2316258

Date:

2003-10-21

**Date Submitted:** 

2003-10-08

Project:

P03-02

P.O. Number:

trix: Water

							Matrix:		Water	-
		LAB ID:	276309	276310	276311	276312	276313		GUIDELINE	
	Samı	ole Date:	2003-10-07	2003-10-07	2003-10-07	2003-10-07				
	Sa	mple ID:	P2-16	P2-29	P2-30	Schoeni	Patenaude	м	OE REG 170	<b>′</b> 03
PARAMETER	UNITS	MDL						TYPE	LIMIT	UNITS
N-NO2 (Nitrite)	mg/L	0.10	<0.10	<0.10	<0.10	<0.10	<0.10	MAC	1.0	mg/L
V-NO3 (Nitrate)	mg/L	0.10	<0.10	<0.10	<0.10	<0.10	<0.10	MAC	10.0	mg/L
Antimony	mg/L	0.001	<0.001	<0.001	<0.001	<0.001	<0.001	MAC	0.006	mg/L
Arsenic	mg/L	0.001	<0.001	<0.001	<0.001	<0.001	<0.001	MAC	0.025	mg/L
Barium Sa	mg/L	0.01	0.03	0.12	0.10	0.09	0.13	MAC	1.0	mg/L
Boron	mg/L	0.01	0.02	0.01	0.12	0.14	0.10	MAC	5.0	mg/L
Cadmium	mg/L	0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	MAC	0.005	mg/L
Chromium	mg/L	0.001	0.002	<0.001	0.001	0.001	0.001	MAC	0.05	mg/L
Copper	mg/L	0.001	<0.001	0.001	<0.001	<0.001	0.003	AO	1.0	mg/L
ron	mg/L	0.01	2.84	1.44	0.04	0.10	0.12	AO	0.30	mg/L
_ead	mg/L	0.001	<0.001	<0.001	<0.001	<0.001	<0.001	MAC	0.01	mg/L
Manganese	mg/L	0.005	0.351	0.150	0.025	0.008	0.008	AO	0.05	mg/L
Mercury	mg/L	0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	MAC	0.001	mg/L
Selenium	mg/L	0.001	<0.001	<0.001	<0.001	<0.001	<0.001	MAC	0.01	mg/L
Uranium	mg/L	0.001	<0.001	<0.001	<0.001	<0.001	<0.001	MAC	0.02	mg/L
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MDL = Method Detection Limit INC = Incomplete AO = Aesthetic Objective OG = Operational Guideline MAC = Maximum Allowable Concentration IMAC = Interim Maximum Allowable Concentration Comment:

APPROVAL:

Inorganic Lab Supervisor

Client: Sauriol Environmental Inc. 134 St. Paul St. P.O. Box 7181

Vanier, ON

K1L 8E3

Attention: Mr. Jacques Sauriol

2316258 2003-10-21 Report Number: Date:

MEPONING PRINCE

2003-10-08 Date Submitted:

Project:

P03-02

P.O. Number: Matrix:

							Matrix:		Water	
		LAB ID:	276309	276310	276311	276312	276313		GUIDELINE	
	Samp	Sample Date:	2003-10-07	2003-10-07	2003-10-07	2003-10-07	2003-10-07			
	Sam	nple ID:	P2-16	P2-29	P2-30	Schoeni	Patenaude	W	MOE REG 170/03	e
PARAMETER	UNITS	MDL						TYPE	LiMIT	UNITS
Organochlorine Pesticides (OCPs) & PCBs										
Aldrin	ng/L	900.0	<0.006	<0.006	<0.006	<0.006	<0.006			-
Dieldrin	ng/L	900.0	<0.006	<0.006	<0.006	<0.006	<0.006			-
Aldrin + Dieldrin	ng/L	0.012	<0.012	<0.012	<0.012	<0.012	<0.012	MAC	0.7	ng/L
a-chlordane	ng/L	900.0	<0.006	<0.006	<0.006	>0.006	<0.006			)
g-chlordane	ng/L	900.0	<0.006	>0.006	<0.006	<0.006	>0.006			-
Oxychlordane	ng/L	9000	<0.006	<0.006	<0.006	<0.006	<0.006		•	
Chlordane (Total)	ng/L	0.018	<0.018	<0.018	<0.018	<0.018	<0.018	MAC	7	ng/L
op-DDT	ng/L	900.0	<0.006	<0.006	<0.006	<0.006	>0.006			,
DDO-dd	ng/L	900.0	<0.006	<0.006	<0.006	<0.006	<0.006			
pp-DDE	ng/L	900.0	<0.006	<0.006	<0.006	<0.006	<0.006			
TOC-dd	ng/L	9000	<0.006	>0.006	<0.006	<0.006	<0.006	-		
(DDT) + Metabolites	ng/L	0.024	<0.024	<0.024	<0.024	<0.024	<0.024	MAC	30	ng/L
Heptachlor	ng/L	900.0	<0.006	>0.006	<0.006	>0.006	<0.006			ı
Heptachlor epoxide	ng/L	9000	<0.006	>0.006	<0.006	<0.006	<0.006			
Heptachlor + Heptachlor Epoxide	ng/L	0.012	<0.012	<0.012	<0.012	<0.012	<0.012	MAC	8	ng/L
Lindane	ng/L	900.0	<0.006	>0.006	>0.006	<0.006	>0.006	MAC	4	ng/L
Methoxychlor	ng/L	0.024	<0.024	<0.024	<0.024	<0.024	<0.024	MAC	006	ng/L
Trifluralin	ng/L	-	⊽	٧	₹	⊽	⊽	MAC	45	ng/L
Polychlorinated Biphenyls (PCBs)	ng/L	0.1	0.1	0.1	€0.1	<0.1	<b>6</b> 0.1	MAC	က	ng/L
CHLOROPHENOLS										
2,3,4,6-tetrachlorophenol	ng/L	0.5	<0.5	<0.5	<0.5	<0.5	<0.5	MAC	100	ng/L
2,4,6-trichloraphenol	ng/L	0.5	<0.5	<0.5	<0.5	<0.5	<0.5	MAC	2	ng/L
2,4-dichlorophenol	ng/L	0.5	<0.5	<0.5	<0.5	<0.5	<0.5	MAC	006	ug/L
Pentachlorophenol	ng/L	0.5	<0.5	<0.5	<0.5	<0.5	<0.5	MAC	09	na/L
PHENOXYACID HERBICIDES										) )
2,4,5-trichlorophenoxyacetic acid (2,4,5-T)	ng/L	-	₹	⊽	⊽	₹	۲	MAC	280	na/L
2,4-dichlorophenoxyacetic acid (2,4-D)	ng/L	-	₹	⊽	₹	7	₹	MAC	100	na/L
Bromoxynil	ng/L	0.5	<0.5	<0.5	<0.5	<0.5	<0.5	MAC	5	ng/L
Dicamba	ng/L	-	۸1	<1	۲	۲	₹	MAC	120	na/L
MDL = Method Detection Limit INC = Incomplete AO = Aesthetic Objective OG = Operational Guideline MAC = Maximum Allowable Concentration IMAC = Interim Maximum Allowable Concentration	OG = Operati	onal Guidel	ne MAC = Maxin	mum Allowable C	oncentration IM	AC = Interim Maxi	mum Allowable C	oncentration		

Aesthetic Objective OG = Operational Guideline MAC = Maximum Allowable Concentration IMAC = Interim Maximum Allowable Concentration Comment: APPROVAL: Mina Nasirai

608 Norris Court, Kingston, ON, K7P 2R9

8-146 Colonnade Road, Ottawa, ON, K2E 7Y1

AGOUTE LABORATOR LT

MIPOMPOF MINALWAYS

Client: Sauriol Environmental Inc.

134 St. Paul St. P.O. Box 7181

Vanier, ON K1L 8E3

Attention: Mr. Jacques Sauriol

Report Number:

2316258

Date:
Date Submitted:

2003-10-21 2003-10-08

Project:

P03-02

P.O. Number:

Matrix: Water

							Matrix:		Water	
		LAB ID:	276309	276310	276311	276312	276313		GUIDELINE	
	Sam	ole Date:	2003-10-07	2003-10-07	2003-10-07	2003-10-07	2003-10-07			
	Sa	mple ID:	P2-16	P2-29	P2-30	Schoeni	Patenaude		OE REG 170/	/O3
			<u> </u>	<b>\</b>				. '''	OL NEO 170	00
PARAMETER	UNITS	MDL	ļ	<u></u>				TYPE	LIMIT	UNITS
Diclofop-methyl	ug/L	0.9	<0.9	<0.9	<0.9	<0.9	<0.9	MAC	9	ug/L
Dinoseb	ug/L	1	<1	<1	<1	<1	<1	MAC	10	ug/L
Picloram	ug/L	5	<5	<5	<5	<5	<5	MAC	190	ug/L
CARBAMATES					_	-			1	
Aldicarb	ug/L	9	<9	<9	<9	<9	<9	MAC	9	ug/L
Bendiocarb	ug/L	2	<2	<2	<2	<2	<2	MAC	40	ug/L
Carbaryl	ug/L	5	<5	<5	<5	<5	<5	MAC	90	ug/L
Carbofuran	ug/L	5	<5	<5	<5	<5	<5	MAC	90	ug/L
Triallate	ug/L	1 1	<1	<1	<1	<1	<1	MAC	230	ug/L
TRIAZINE & RELATED HERBICIDES									ł	
Alachlor	ug/L	0.5	<0.5	<0.5	<0.5	<0.5	<0.5	IMAC	5	ug/L
Atrazine	ug/L	0.5	<0.5	<0.5	<0.5	<0.5	<0.5			
De-ethylated atrazine	ug/L	0.5	<0.5	<0.5	<0.5	<0.5	<0.5			
Atrazine + N-dealkylated metabolites	ug/L	1.0	<1.0	<1.0	<1.0	<1.0	<1.0	MAC	5	ug/L
Cyanazine	ug/L	1	<1	<1	<1	<1	<1	MAC	10	ug/L
Metolachlor	ug/L	0.5	<0.5	<0.5	<0.5	<0.5	<0.5	MAC	50	ug/L
Metribuzin	ug/L	5	<5	<5	<5	<5	<5	MAC	80	ug/L
Prometryne	ug/L	0.25	<0.25	<0.25	<0.25	<0.25	<0.25	MAC	1	ug/L
Simazine	ug/L	1	<1	<1	<1	<1	<1	MAC	10	ug/L
ORGANOPHOSPHOROUS PESTICIDES			ł		ļ			Į		
Azinphos-methyl	ug/L	2	<2	<2	<2	<2	<2	MAC	20	ug/L
Chlorpyrifos	ug/L	1	<1	<1	<1	<1	<1	MAC	90	ug/L
Diazinon	ug/L	1	<1	<1	<1	<1	<1	MAC	20	ug/L.
Dimethoate	ug/L	2.5	<2.5	<2.5	<2.5	<2.5	<2.5	MAC	20	ug/L
Malathion	ug/L	5	<5	<5	<5	<5	<5	MAC	190	ug/L
Parathion	ug/L	1	<1	<1	<1	<1	<1	MAC	50	ug/L
Phorate	ug/L	0.5	<0.5	<0.5	<0.5	<0.5	<0.5	MAC	2	ug/L
Temephos	ug/L	10	<10	<10	<10	<10	<10	MAC	280	ug/L
Terbufos	ug/L	0.7	<0.7	<0.7	<0.7	<0.7	<0.7	MAC	1	ug/L
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MDL = Method Detection Limit INC = Incomplete AO = Aesthetic Objective OG = Operational Guideline MAC = Maximum Allowable Concentration IMAC = Interim Maximum Allowable Concentration Comment:

Mina Nasiral
Organic Lab Supervisor

134 St. Paul St. P.O. Box 7181 Vanier, ON

Attention: Mr. Jacques Sauriol K1L 8E3

Report Number: Date Submitted: Date:

2316258 2003-10-21

Project:

2003-10-08 P03-02

P.O. Number:

		- AB ID.	276200	070020			Matrix:		Water	
			200072	2/0310	2/6311	276312	276313		GUIDELINE	
	oam oam	Sample Date:	2003-10-07	2003-10-07	2003-10-07	2003-10-07	2003-10-07			
	e o	Sample ID:	P2-16	P2-29	P2-30	Schoeni	Patenande	ž _	MOE REG 170/03	03
PARAMETER	UNITS	MDL						TVDE	1000	C.F.
DINOR & GLYPHOSATE										SIND
Clarkonite	ng/L	<b>£</b>	<del>1</del> 0	<10	<del>د</del> 10	<10	<10	MAC	150	,,,,
DIOLIAT & PARACITAT	ng/L	ę	×10	×10	۲ <u>۰</u>	~10 ~10	<10	WAC	280	7 // 00/
Diquat	•	ı								i h
Paraquat	ng/L		<b>V</b>	<b>\</b>	۷2	· · ·	<b>'</b>	MAC	02	//011
	ng/L	-	₹	₹	₹	₹	₹	MAC	£ 6	ug/L
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MDL = Method Detection Limit INC = Incomplete AO = Aesthetic Objective OG = Operational Guideline MAC = Maximum Allowable Concentration IMAC = Interim Maximum Allowable Concentration Comment:

Organic Lab Supervisor Mina Nasirai . APPROVAL:

134 St. Paul St. P.O. Box 7181

Vanier, ON K1L 8E3

Attention: Mr. Jacques Sauriol

Report Number:

**Date Submitted:** 

2316258

Date:

2003-10-21 2003-10-08

Project:

P03-02

P.O. Number:

Samp	MDL  0.5 0.4 0.5 0.4 0.5	276309 2003-10-07 P2-16 <0.5 <0.4 <0.5 <0.4	276310 2003-10-07 P2-29 <0.5 <0.4 <0.5	276311 2003-10-07 P2-30 <0.5 <0.4	276312 2003-10-07 Schoeni <0.5 <0.4	276313 2003-10-07 Patenaude <0.5	MAC MAC	GUIDELINE  OE REG 170/  LIMIT	03 UNITS
UNITS  UG/L  UG/L  UG/L  UG/L  UG/L  UG/L  UG/L  UG/L  UG/L	MDL 0.5 0.4 0.5 0.4 0.5	<0.5 <0.4 <0.5 <0.4	<0.5 <0.4	P2-30 <0.5 <0.4	Schoeni	Patenaude	TYPE	LIMIT	UNITS
UNITS  ug/L  ug/L  ug/L  ug/L  ug/L  ug/L  ug/L	0.5 0.4 0.5 0.4 0.5	<0.5 <0.4 <0.5 <0.4	<0.5 <0.4	<0.5 <0.4	<0.5		TYPE	LIMIT	UNITS
ug/L ug/L ug/L ug/L ug/L ug/L	0.5 0.4 0.5 0.4 0.5	<0.4 <0.5 <0.4	<0.4	<0.4		<0.5	TYPE	LIMIT	UNITS
ug/L ug/L ug/L ug/L ug/L ug/L	0.5 0.4 0.5 0.4 0.5	<0.4 <0.5 <0.4	<0.4	<0.4		<0.5			
ug/L ug/L ug/L ug/L ug/L	0.4 0.5 0.4 0.5	<0.4 <0.5 <0.4	<0.4	<0.4		<0.5			
ug/L ug/L ug/L ug/L ug/L	0.4 0.5 0.4 0.5	<0.4 <0.5 <0.4	<0.4	<0.4		<0.5	MAC	14	١
ug/L ug/L ug/L ug/L	0.5 0.4 0.5	<0.5 <0.4			-04	-			ug/L
ug/L ug/L ug/L	0.4 0.5	<0.4	<0.5		~0.4	<0.4	MAC	200	ug/L
ug/L ug/L	0.5			<0.5	<0.5	<0.5	MAC	5	ug/L
ug/L			<0.4	<0.4	<0.4	<0.4	MAC	5	ug/L
•	1 05	<0.5	<0.5	<0.5	<0.5	<0.5	MAC	5	ug/L
ug/L	0.5	<0.5	<0.5	<0.5	<0.5	<0.5	MAC	5	ug/L
	4.0	<4.0	<4.0	<4.0	<4.0	<4.0	MAC	50	ug/L
ug/L	0.5	2.9	<0.5	<0.5	<0.5	<0.5		2.4	ug/L
ug/L	0.2	<0.2	<0.2	<0.2	<0.2	<0.2		80	ug/L
ug/L	0.3	<0.3	<0.3	<0.3	1	li i			ug/L
ug/L	0.5	<0.5	<0.5	<0.5	<0.5	<0.5	AO	24	ug/L
ug/L	0.3	<0.3	<0.3	<0.3	<0.3	<0.3	MAC	50	ug/L
ug/L	0.2	<0.2	<0.2	<0.2	<0.2	<0.2	MAC	2	ug/L
ug/L	0.3	<0.3	<0.3	<0.3	<0.3			_	-3-
ug/L	0.4	<0.4	<0.4	<0.4	<0.4	<0.4			
ug/L	0.5	<0.5	<0.5	<0.5	<0.5				
ug/L	0.3	<0.3	<0.3	<0.3	<0.3				į
ug/L	2.0	<2.0	<2.0	<2.0			MAC	100	ug/L
ug/L	1.0	<1.0	<1.0	<1.0	<1.0				<b>-</b>
ug/L	0.5	<0.5	<0.5	<0.5	<0.5				I
ug/L	2.0	<2.0	· <2.0	4			AO I	300	ug/L
- I		l			[	2.0	,. <u> </u>	-	
%		96	99	100	100	98			
%			96		· · · · · · · · · · · · · · · · · · ·		1		İ
%		99	101	1					İ
				]		. 1			!
	ug/L ug/L ug/L ug/L ug/L ug/L ug/L ug/L	ug/L	ug/L     0.5     2.9       ug/L     0.2     <0.2	ug/L     0.5     2.9     <0.5	ug/L       0.5       2.9       <0.5	ug/L         0.5         2.9         <0.5	ug/L         0.5         2.9         <0.5	ug/L         0.5         2.9         <0.5	ug/L         0.5         2.9         <0.5

MDL = Method Detection Limit INC = Incomplete AO = Aesthetic Objective OG = Operational Guideline MAC = Maximum Allowable Concentration IMAC = Interim Maximum Allowable Concentration Comment:

APPROVAL:

Mina Nasirat

Organic Lab Supervisor

134 St. Paul St. P.O. Box 7181

Vanier, ON K1L 8E3

Attention: Mr. Jacques Sauriol

Report Number:

2316152

Date:

2003-10-21 2003-10-07

Date Submitted:

P03-02

P.O. Number:

Project:

14/-4

							Matrix:		Water	
		LAB ID:	276018	276019	276020	276021	276022		GUIDELINE	
	Samp	ie Date:	2003-10-06	2003-10-06	2003-10-06	2003-10-06	2003-10-06			
	Sa	mple iD:	P2-18	P2-13	P2-27	P2-8	P2-28			
				ł	ŧ			1		
								Ĺ		
PARAMETER	UNITS	MDL						TYPE	LIMIT	UNITS
V-NO2 (Nitrite)	mg/L	0.10	<0.10	<0.10	<0.10	<0.10	<0.10			
I-NO3 (Nitrate)	mg/L	0.10	<0.10	<0.10	<0.10	<0.10	<0.10	ĺ	{ ;	Į.
Intimony	mg/L	0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<b>.</b>	1	
Arsenic	mg/L	0.001	<0.001	<0.001	<0.001	<0.001	<0.001	i	}	i.
Barium	mg/L	0.01	0.03	0.03	0.10	0.07	0.02			ł
Boron	mg/L	0.01	0.01	0.01	0.06	0.01	0.02		1	
Cadmium	mg/L	0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	ł	ļ	ł
Chromium	mg/L	0.001	0.002	0.004	0.001	0.003	<0.001			1
Copper	mg/L	0.001	0.001	0.001	<0.001	<0.001	<0.001		]	Ì
ron	mg/L	0.01	1.83	0.79	0.17	0.07	0.07		ļ .	ł
_ead	mg/L	0.001	<0.001	<0.001	< 0.001	<0.001	<0.001		l	
Manganese	mg/L	0.005	0.280	0.047	0.037	0.026	0.018	}	Ì	
Mercury	mg/L	0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001			
Selenium	mg/L	0.001	<0.001	<0.001	<0.001	<0.001	<0.001	ļ		l
Uranium	mg/L	0.001	<0.001	<0.001	<0.001	0.003	<0.001		ì	]
				]	0.55	0.000	-0.001	f .	ļ	Í
	ł	Ì	}		1			İ	İ	1
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MDL = Method Detection Limit INC = Incomplete AO = Aesthetic Objective OG = Operational Guideline MAC = Maximum Allowable Concentration IMAC = Interim Maximum Allowable Concentration Comment:

APPROVAL:

Inorganic Lab Supervisor

134 St. Paul St. P.O. Box 7181

Vanier, ON K1L 8E3

Attention: Mr. Jacques Sauriol

Report Number:

2316152

Date:

2003-10-21

**Date Submitted:** 

2003-10-07

Project:

P03-02

P.O. Number:

Matrix Water

							Matrix:		Water	
		LAB ID:	276018	276019	276020	276021	276022		GUIDELINE	
•	Samp	ole Date:	2003-10-06	2003-10-06	2003-10-06	2003-10-06	2003-10-06			
	Sa	mple ID:	P2-18	P2-13	P2-27	P2-8	P2-28			
			ļ			!				
PARAMETER	UNITS	MDL						TYPE	LIMIT	UNITS
Organochlorine Pesticides (OCPs) & PCBs			<del>                                     </del>	<del> </del>				ITPE	LIMIT	UNIIS
Aldrin	ug/L	0.006	<0.006	<0.006	<0.006	<0.006	<0.006		j	
Dieldrin	ug/L	0.006	<0.006	<0.006	<0.006	<0.006	<0.006		•	
Aldrin + Dieldrin	ug/L	0.012	<0.012	<0.012	<0.012	<0.012	<0.012		ì	]
a-chlordane	ug/L	0.006	<0.006	<0.006	<0.006	<0.006	<0.012			
g-chlordane	ug/L	0.006	<0.006	<0.006	<0.006	<0.006	<0.006		1	
Oxychlordane	ug/L	0.006	<0.006	<0.006	<0.006	<0.006	<0.006			
Chlordane (Total)	ug/L	0.018	<0.018	<0.018	<0.018	<0.018	<0.018		1	
op-DDT	ug/L	0.006	<0.006	<0.006	<0.006	<0.006	<0.006			
pp-DDD	ug/L	0.006	<0.006	<0.006	<0.006	<0.006	<0.006			
p-DDE	ug/L	0.006	<0.006	<0.006	<0.006	<0.006	<0.006		ļ	
p-DDT	ug/L	0.006	<0.006	<0.006	<0.006	<0.006	<0.006		ļ	
DDT) + Metabolites	ug/L	0.024	<0.024	<0.024	<0.024	<0.024	<0.024			<u> </u>
leptachlor	ug/L	0.006	<0.006	<0.006	<0.006	<0.006	<0.006		]	ì
leptachlor epoxide	ug/L	0.006	<0.006	<0.006	<0.006	<0.006	<0.006		j	
deptachlor + Heptachlor Epoxide	ug/L	0.012	<0.012	<0.012	<0.012	<0.012	<0.012		ļ	
indane	ug/L	0.006	<0.006	<0.006	<0.006	<0.006	<0.006			
Methoxychlor	ug/L.	0.024	<0.024	<0.024	<0.024	<0.024	<0.024		ľ	
Frifluralin	ug/L	1	<1	<1	<1	<1	<1		İ	
Polychlorinated Biphenyls (PCBs)	ug/L	0.1	<0.1	<0.1	<0.1	<0.1	<0.1			
CHLOROPHENOLS			[							
2,3,4,6-tetrachlorophenol	ug/L	0.5	<0.5	<0.5	<0.5	<0.5	<0.5			
2,4,6-trichlorophenol	ug/L	0.5	<0.5	<0.5	<0.5	<0.5	<0.5		1	
2,4-dichlorophenol	ug/L	0.5	<0.5	<0.5	<0.5	<0.5	<0.5		1	
Pentachlorophenol	ug/L	0.5	<0.5	<0.5	<0.5	<0.5	<0.5		1	
PHENOXYACID HERBICIDES							-5.5	1	l	
2.4,5-trichlorophenoxyacetic acid (2,4,5-T)	ug/L	1 1	<1	<1	<1	<1	<1			
4,4-dichlorophenoxyacetic acid (2,4-D)	ug/L	1	<1	<1	<1	<1	<1			
Bromoxynil	ug/L	0.5	<0.5	<0.5	<0.5	<0.5	<0.5		1	
Dicamba	ug/L	1	<1	<1	<1	<1	<1		1	

MDL = Method Detection Limit INC = Incomplete AO = Aesthetic Objective OG = Operational Guideline MAC = Maximum Allowable Concentration IMAC = Interim Maximum Allowable Concentration Comment:

APPROVAL:

Mina Nasirai

REPORT OF TRALITIES

Report Number:

P.O. Number: Matrix:

Water

UNITS GUIDELINE LIMIT TYPE 2003-10-06 276022 <0.25 **1.0 ~**0.5 <0.5 <0.5 <2.5 ŝ ⊽ \$ 2 ₹ 8 2 2 5 5 2 ₹ Ç ₹ ۲ ⊽ 2003-10-06 276021 P2-8 <0.5 <0.5 ۸<del>۱</del>.0 <0.5 <0.25 **6**.0> <2.5 **0.5 6**0.5 \$ \$ Δ გ 5 \$ ₽ ₹ ⊽ **♡** ∇ ő Ÿ ⊽ ۲ 2003-10-06 276020 P2-27 <0.25 <0.9 <0.5 <0.5 <0.5 \$ 6 2 2 8 **~0.5** ۲ Δ ₩ ₹ & △ \$ 2 4 4 2 2003-10-06 276019 P2-13 <0.25 6.0> <0.5 <0.5 4.0 <0.5 <2.5 <0.5 လူ ⊽ ٧ ₹ \$ 8 2 2 Ş ۲ 2003-10-06 276018 P2-18 <0.9 <0.5 <u>م</u>2.0 <0.5 <0.25 <0.5 <2.5 <0.5 ⊽ \$ Δ ფ ۲ Ÿ & & Δ ۲ \$ ₹ ⊽ LAB ID: Sample Date: Sample ID: ᅙ 0.25 0.9 <del>ب</del> در 5 -UNITS ng/L ng/L ng/L ng/L ng/L ng/L ng/L ng/L 7/gr ng/L ug/L ng/L ug/L ng/L ng/L ng/L ng/L ng/L ug/L ng/L ď⁄L PARAMETER ORGANOPHOSPHOROUS PESTICIDES **TRIAZINE & RELATED HERBICIDES** Afrazine + N-dealkylated metabolites De-ethylated atrazine Azinphos-methyl CARBAMATES Diclofop-methyl Metolachlor Prometryne **Bendiocarb** Carbofuran Cyanazine Metribuzin Simazine Picloram Carbaryl **Dinoseb** Aldicarb Alachlor **Friallate** Atrazine

MDL = Method Detection Limit INC = Incomplete AO = Aesthetic Objective OG = Operational Guideline MAC = Maximum Allowable Concentration IMAC = Interim Maximum Allowable Concentration

10

<0.5

<del>د</del>

APPROVAL

Mina Nasirai

608 Norris Court, Kinaston ON K7P 2R9

Diazinon

Mafathion

**Temephos** Phorate

Comment:

8-146 Colonnade Road, Ottawa, ON, K2E 7Y1

erbufos

Chlorpyrifos

Dimethoate

Parathion

Attention: Mr. Jacques Sauriol

Vanier, ON

K1L 8E3

Date Submitted:

2316152

Project:

P03-02

2003-10-07 2003-10-21

Organic Lab Supervisor

134 St. Paul St. P.O. Box 7181 Client: Sauriof Environmental Inc.

ACTIVEDIAL

134 St. Paul St. P.O. Box 7181

Vanier, ON K1L 8E3 Attention: Mr. Jacques Sauriol

Client: Sauriol Environmental Inc.

608 Norris Court, Kingston, ON, K7P 2R9

8-146 Colonnade Road, Ottawa, ON, K2E 7Y1

2316152 Report Number:

REPORTED FRICAL PERS

2003-10-21

2003-10-07 Date Submitted:

P03-02

**Project**:

P.O. Number: Matrix:

GUIDELINE Water 
 LAB ID:
 276018
 276019
 276020
 276021
 276022

 Sample Date:
 2003-10-06
 2003-10-06
 2003-10-06
 2003-10-06
 2003-10-06

	TIME	╁									-	 _
	TVBE		<u> </u>									
P2-28			×10	<10	ŗ	⊽ ⊽	•					
P2-8			<10	×10	7	7 ⊽						
P2-27			<10	×10	72	₹ ⊽						
P2-13			- V	×10	<b>!</b> >	. ∠						
P2-18			<10 40	010	<i>L</i> >	. ₽						
Sample ID:	MDL		2 9	2	7	-						
Sai	UNITS		ng/L	ng/L	ng/L	ng/L						
	PARAMETER	DIURON & GLYPHOSATE	Glyphosate	DIQUAT & PARAQUAT	Diquat	Paraquat						

MDL = Method Detection Limit INC = Incomplete AO = Aesthetic Objective OG = Operational Guideline MAC = Maximum Allowable Concentration IMAC = Interim Maximum Allowable Concentration Comment: Organic Lab Supervisor

3 of 3

134 St. Paul St. P.O. Box 7181 Vanier, ON

K1L 8E3

Attention: Mr. Jacques Sauriol

2003-10-21 2003-10-07 2316152 Report Number: Date Submitted: Date:

METPONION DE PRIMAL PERS

**Project:** 

P03-02

P.O. Number:

Water

Matrix:

		LAB ID:	276018	276019	276020	276021	276022		GUIDELINE	
	Sample	le Date:	2003-10-06	2003-10-06	2003-10-06	2003-10-06	2003-10-06			
	Sar	Sample ID:	P2-18	P2-13	P2-27	P2-8	P2-28			
PARAMETER	UNITS	MDL						TYPE	LIMIT	UNITS
TABLE B COMPOUNDS (VOCs)										
1,1-dichloroethylene	ng/L	0.5	<0.5	<0.5	<0.5	<0.5	<0.5			
1,2-dichlorobenzene	ng/L	0.4	<0.4	<0.4	<0.4	<0.4	<0.4			
1,2-dichloroethane	ng/L	0.5	<0.5	<0.5	<0.5	<0.5	<0.5			
1,4-dichlorobenzene	ng/L	0.4	<b>4</b> 0.4	<0.4	<0.4	<0.4	<0.4			
Benzene	ng/L	0.5	<0.5	<0.5	<0.5	<0.5	<0.5			
Carbon Tetrachloride	ug/L	6.0	6.0>	6.0>	6.0>	6.0>	<0.9			
Dichloromethane	ng/L	4.0	<4.0	<4.0	<4.0	<4.0	<4.0			
Ethylbenzene	ng/L	0.5	<0.5	<0.5	<0.5	<0.5	<0.5		-	
Monochlorobenzene	ng/L	0.2	<0.2	<0.2	<0.2	<0.2	<0.2			-
Tetrachloroethylene	ng/L	0.3	<0.3	<0.3	<0.3	<0.3	<0.3			
Toluene	ng/L	0.5	<0.5	<0.5	<0.5	<0.5	<0.5			
Trichloroethylene	ng/L	0.3	<0.3	<0.3	<0.3	<0.3	<0.3			
Vinyl Chloride	ng/L	0.5	<0.5	<0.5	<0.5	<0.5	<0.5			
Bromodichloromethane	ng/L	0.3	<0.3	<0.3	<0.3	<0.3	<0.3	•		
Bromoform	ng/L	0.4	<0.4	<0.4	<0.4	<0.4	<0.4			
Chloroform	ng/L	0.5	<0.5	<0.5	<0.5	<0.5	<0.5			
Dibromochloromethane	ng/L	0.3	<0.3	<0.3	<0.3	<0.3	<0.3			
Trihalomethanes (total)	ng/L	2.0	<2.0	<2.0	<2.0	<2.0	<2.0			
m/p-xylene	ng/L	1.0	<u>م</u> .0	<1.0	<1.0	<1.0	<1.0			
o-xylene	ng/L	0.5	<0.5	<0.5	<0.5	<0.5	<0.5			
Xylene; total	ng/L	2.0	<2.0	<2.0	<2.0	<2.0	<2.0			
TABLE B SURROGATES										
Toluene-d8	%		66	101	101	101	100			
4-bromofluorobenzene	%		96	66	100	86	86			
1,2-dichloroethane-d4	%		101	101	105	103	101			
								•		
		-								

MDL = Method Detection Limit INC = Incomplete AO = Aesthetic Objective OG = Operational Guideline MAC = Maximum Allowable Concentration IMAC = Interim Maximum Allowable Concentration Comment: · APPROVAL:

Organic Lab Supervisor Mina Nasirai

	SEI PO3-02 Embrum	Oct 6   03
P2-18	W.L. 4.58 m Cond 720 Temp 11.1 P.H. 7.3	PZ-8 W.L. 4.62 m Cond 580 Temp 9-6 P.H. 7.4
PZ-13	W.L. 3.71 m Cond 910 Temp 9.4 P.H. 7.4	PZ-28 W.L. 2.77m Cond 170 Temp 10 P.H. 8.2
PZ-27	W-L. 2.44 m Cord 170 Temp 11.1 P.H. 7.8	Oct 7/03  P2-16 W.L. 4.12m  Cond 650  Temp 12.0
PZ- 30	W.L. 2.46 m Cond 410 Temp 10.2 P.H. 7.6	PZ-29 W.L. 2.73 m Cond 1030 Temp 12.5 P.H. 7.4
Schoeni	Cond 250 Temp 14.0 P.H. 7.7	P.H. 7.4  Patenoude Cond 320  Temp 11.3  P.H. 7.6

Ily10103

SEI P03.0:	ኒ
---------------	---

PZ-18 W.L. 4.21 m Cond 9 40 Temp 11 P.H! 7.5 July 9/03
Patenaude Temp 14<sup>-C</sup>
Cond 380
P.H. 7.7

12-16 W.L. 3.85 m Cond 640 Temp 14 PH. 7.3 P2-30 W.L. 239m Cond 320 Temp 13 PH. 78

P2-29 W.L. 2.34 m Cond #000 830 Temp 12 P.H. 7.3

P2-28 W.L. 2.24m Cnd 200 Tenp 10 PH. 7.1

F2-17 W.L. 1.88 m Gond 270 Temp 10.5 P.H. 8.1 PL-13 W.L. 3.52m Cond 920 Temp 11°C P.H. 7.4

P2-8 W.L. 4.47m Gond 530 Temp 12 PH. 7.6 Schoen Cond 140 Temp 12° P.H. 7.1



## **APPENDIX B**

# TOWNSHIP MONITORING RESULTS EMBRUN WELL MONITORING PROGRAM

### EMBRUN/MARIONVILLE WTP DAILY IN-HOUSE TESTING - 2003

RAW WATER	COLOUR	₽H	TEMP	FE	MN	FL	TUR
JAN	4	7.4	9	2.56	0.375		0.21
FEB	3	7,4	9	2.82	0.381		0.18
MAR	4	7.4	8	2.60	0.391		0,21
APR	2	7.4	9	2.65	0.400		0.14
MAY	4	7.3	9	2.69	0.387		0.42
JUN	3	7.3	9	2.58	0.361		0.23
JUL	2	7.3	9	2.55	0.380		0.19
AUG	3	7.3	g	2.64	0.366		0.32
SEP	2	7.3	g	2.64	0.381		0.26
OCT	1	7.3	9	2.61	0.376		0.17
NOV	3	7.3	9	2.54	0.379		0.26
DEC	2	7.2	9	2.53	D.388		0.22
AVG	3	7.3	9	2.60	0.384		0.23

### **ANNUAL SUMMARY - RAW WATER FLOWS**

WATER WORKS NAME:

**EMBRUN WTP** 

YEAR:

2003

SERVICED POPULATION:

4611

**DESIGN CAPACITY:** 

6000

		WELL #2	
	AVERAGE	MAXIMUM	MONTHLY
MONTH	DAY	DAY	TOTAL
	(1000 m3)	(1000 m3)	(1000 m3)
JAN	2.23	3.57	69.24
FEB	2.38	2.92	. 66.52
MAR	2.36	2.92	73.29
APR	2.36	2.90	55.80
MAY	2.55	3.64	79.08
JUN	2.82	3.81	84.63
JUL	2.69	3.80	83.49
AUG	2.46	3.25	76.24
SEP	2.83	3.37	84.88
OCT	2.54	3.04	78.75
NOV	2.31	3.41	69.43
DEC	2.64	2.82	81.83
TOTAL			903.18
AVERAGE	2.51		75.27
MAXIMUM		3.81	84.88

# **APPENDIX C**

# PROPOSED WORK PLAN (2004) EMBRUN WELL MONITORING PROGRAM

### **YEAR 2004**

### Objectives:

Continued monitoring the hydraulics and water quality of aquifer with the Embrun Well Monitoring Program.

#### **Hydraulics:**

- Measure Spring (May) and Fall (October) depth to water level survey in PZ8, PZ13, PZ16, PZ 18, PZ27, PZ28, PZ29, and PZ30.
- > Analyze spatial and transient water level trends

### Water Quality:

- Collect water quality samples at PZ8, PZ13, PZ16, PZ 18, PZ27, PZ28, PZ29, PZ30 and both Patenaude and Schoeni residences in the spring and fall. Analyze for parameters of Cl, TDS, Ba, B, Fe, Mn and Na).
- ➤ Run BTEX + TPHs gas and diesel in PZ16 and Dore Lake water to firm up the probable source of Petroleum Hydrocarbon
- > Run NO3 at PZ28 and PZ29 in 2004 to confirm the low concentration occurrence around the well head.
- > Analyze spatial and transient water quality trends.