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REPORT ON

GROUNDWATER MONITORING PROGRAM FOR FIRST TWELVE MONTHS OF OPERATION

WELL SITE NO. 7

VILLAGE OF WINCHESTER WATER SUPPLY SYSTEM EXPANSION PROJECT

Submitted to:

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EXECUTIVE SUMMARY

This document has been prepared to summarize the results of the groundwater monitoring program associated with the first twelve months of operation of Village of Winchester Well Site No. 7. The objectives of this monitoring program were to monitor groundwater level variations, flow characteristics, and groundwater quality conditions on site and in the vicinity of Well Site No. 7 during operation, and to compare these to seasonal variations and baseline groundwater quality, as determined during the pre-operational monitoring program.

The water levels observed in October 1997 at the groundwater monitors within about 100 metres of the well site were approximately one metre lower than the water levels measured at the same locations in October 1996. The water levels observed in October 1997 at groundwater monitors located within about 750 metres of the well site were approximately 0.5 metres lower than the water levels measured at the same locations in October 1996.

Based on the groundwater level data obtained during the first twelve months of operation, the interpreted general direction of groundwater flow remains consistent with pre-operational flow directions, with slight variations in the immediate vicinity of the pumping wells.

In general, the pumping operations at the Village of Winchester Well Site No. 7 do not appear to have adversely affected groundwater quality to date in the vicinity of the well site.

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1.0 INTRODUCTION

This document has been prepared to summarize the results of the groundwater monitoring program associated with the first twelve months of operation of Village of Winchester Well Site No. 7. The scope of the monitoring program was described in Section 5.0 of Golder Associates (1996a). Well Site No. 7 was put into operation on March 21, 1997.

The objectives of the groundwater monitoring program for the first twelve months of operation were:

- to monitor groundwater level variations and flow characteristics on site and in the vicinity of Well Site No. 7 during operation, and to compare these to seasonal variations as determined during the pre-operational groundwater monitoring program (Golder Associates, 1996b);

- to compare groundwater quality conditions on site and in the vicinity of Well Site No. 7 during operation to baseline groundwater quality established in the pre-operational groundwater monitoring program (Golder Associates, 1996b).

The Village of Winchester Well Site No. 7 is located on Lot 15, Concession IX in the Township of Winchester, Ontario (see Key Plan, Figure 1). A site plan and overview of the study area, including the locations of all groundwater monitors included in the groundwater monitoring program for the first twelve months of operation and the locations of the production wells (i.e., wells 7A, 7B and 7C), are shown on Figure 2.

2.0 PROCEDURES

A summary of the groundwater monitoring program for the first twelve months of operation is provided in Table 1 including the sampling dates and locations, and the chemical and physical parameters that were measured in the field and in the laboratory.

2.1 Groundwater Level Monitoring

Groundwater level measurements were made biweekly during the first month of operation (April 1997), followed by monthly measurements for the subsequent eleven months. Golder Associates field staff were present to provide assistance and guidance for the water level measurements made during the first month of operation, and during each of the groundwater sampling events. The groundwater level measurements in most of the other months were conducted by personnel from the South Nation Conservation (SNC) authority.

Groundwater level measurements that could not be obtained for various reasons are listed below along with explanations for why the measurements could not be obtained:

Monitor	Months Not Measured	Explanation
94-2	Apr. 1997 – Mar. 1998	Monitor was destroyed during construction period
94-3	Jan. – Feb. 1998	Monitor could not be located
94-4	Apr. 1997 – Mar. 1998	Monitor was reported to be broken
94-7	Apr. 1997 – Mar. 1998	Monitor was destroyed during construction period
94-8A & 94-8B	i. Apr. – Jul. 1997 ii. Jan. – Mar 1998	Monitor was artesian Monitor was covered by ice
94-9A & 94-9B	i. Apr. 4, 1997 ii. Dec. 1997 – Mar. 1998	Monitor was covered by ice Monitor could not be located
94-10	i. Apr. 4, 1997 ii. Mar. 1998	Monitor was submerged Monitor could not be located
94-12	Nov. 1997	Monitor could not be located
WESA-16	Jul. 1997 – Mar. 1998	Monitor was inaccessible
96-19	Apr. 4, 1997	Water in monitor was frozen
96-20	Dec. 1997 – Feb. 1998	Monitor could not be located

Note: Some monitors were unable to be located on June 16, 1997 but were located on June 19, 1997

2.2 Groundwater Quality Monitoring

Groundwater samples were obtained from groundwater monitors 94-5, 94-11, 96-19, 96-20, 96-21 and 96-22 in April, May and September 1997 and in March 1998, as indicated in Table 1.

The groundwater monitors were developed through the removal of at least three standing volumes of water using dedicated sampling devices consisting of a length of flexible low density polyethylene (LDPE) tubing and a Model D-25 foot valve manufactured by Waterra Pumps Ltd. of Toronto, Ontario. Groundwater samples were collected from each monitor immediately after well development.

The temperature, pH and conductivity of the groundwater samples were measured in the field at the time of sample collection. The field pH and conductivity measurements were obtained using a Myron L Conductivity Meter Model EP which was calibrated in the field prior to use. All samples were entered on a Chain of Custody Form and placed in coolers with ice packs until they were delivered in person to the private analytical laboratory.

The groundwater samples were collected, prepared and preserved in the field as follows:

- one plastic bottle, field filtered to 0.45 microns and preserved to pH<2 with nitric acid for analysis of sodium, potassium and total phosphorus.

- one plastic bottle, unfiltered and unpreserved for analysis of chloride and nitrate.

- one amber glass vial with Teflon septum, unfiltered and unpreserved with no headspace for analysis of BTEX (Benzene, Toluene, Ethylbenzene, Xylenes).

All groundwater sampling and field analyses during the groundwater monitoring program for the first twelve months of operation were conducted by Golder Associates technical staff in conjunction with SNC personnel.

Accutest Laboratories Ltd. in Nepean, Ontario, performed all laboratory chemical and physical analyses on the groundwater samples.

3.0 DISCUSSION

3.1 Groundwater Levels

All of the groundwater levels measured during the groundwater monitoring program for the first twelve months of operation along with historical groundwater levels measured during the pre-operational monitoring program are provided in Table 2. The groundwater elevations in Table 2 were calculated using the elevation data presented in Table 3. These groundwater elevations are represented graphically on Figures 3, 4, 5 and 6.

Figure 3 shows groundwater level fluctuations on, and in the immediate vicinity of, the Village of Winchester well site (Well Site No. 7). The screens of these groundwater monitors are located in the core of the Morewood esker in unconfined fine sand and sand and gravel deposits. The trend depicted in this figure shows continued seasonal variation with groundwater levels highest in the spring months and lowest in the late summer to early fall. The groundwater levels recorded at the monitors in the immediate vicinity of Well Site No. 7 in the late summer/early fall of 1997 were about 0.9 to 1.0 metre lower than the levels measured in the late summer/early fall of 1996. This may be due, in part, to the dry conditions experienced in the late summer of 1997, but likely reflects influence from the pumping activities on Well Site No. 7.

Figure 4 shows groundwater level fluctuations in other groundwater monitors located in the core of the Morewood esker to the south of Well Site No. 7 (with the exception of 94-7, which was on the road allowance directly north of the well site). The screens of these monitors are all in unconfined sand and gravel. The trend depicted in Figure 4 is similar to that in Figure 3. As discussed in Section 2.1, groundwater monitor 94-7 was destroyed after November 1996 and monitor WESA-16 was inaccessible after July 1997. The groundwater levels recorded at monitors 94-6 and 94-11 in the late summer/early fall of 1997 were approximately 0.6 metres lower than in the late summer/early fall of 1996. Monitor 94-6, which is located approximately 150 metres closer to the well site than monitor 94-11, showed a slightly greater difference between late summer/early fall 1996 and 1997 groundwater levels than monitor 94-11. It is considered that the groundwater levels in monitors 94-6 and 94-11 during the summer and fall of 1997 reflect influence from the pumping activities on Well Site No. 7 on the order of about half a metre of drawdown.

Figure 5 depicts groundwater level variations in various other geological formations in the vicinity of the Morewood esker. Monitors 94-8A and 94-9A are located in a confined (overlain by clay) silty sand deposit to the west of the core of the esker, while 94-8B and 94-9B are in the overlying silty clay layer in the same area. Monitor 94-10 is located in a confined glacial till unit to the east of the core of the Morewood esker. Monitor 94-12 is located northwest of Well Site No. 7 in a sand and gravel portion of the Morewood esker that is overlain by a thin silty clay layer. Similar trends to Figure 3 are again seen in Figure 5, with a significantly lower piezometric surface in 94-9A, 94-9B and 94-12 than in the other groundwater monitors included in the groundwater level monitoring program. As discussed in Section 2.1, monitors 94-8A and 94-8B were artesian (and actual groundwater elevations could not be determined) between October 1995 and July 1997, therefore comparison of late summer/early fall groundwater levels in these monitors in 1997 to late summer/early fall 1996 levels was not possible. The groundwater levels observed in the late summer/early fall of 1997 in monitors 94-9A and 94-10 were approximately 0.5 metres lower than in the late summer/early fall of 1996, while the groundwater levels in monitors 94-9B and 94-12 were around 0.3 metres lower in 1997 than in 1996. This may, again, represent a minor degree of influence from the pumping activities on the Village of Winchester Well Site No. 7 during the summer and fall of 1997.

Figure 6 represents the groundwater levels in the 96-Series groundwater monitors. Monitors 96-20, 96-21 and 96-22 are located in the Morewood esker to the north of Well Site No. 7, in unconfined fine sand and sand and gravel. Monitor 96-19 is located within the esker to the south of the well site, in confined fine sand. The trends in Figure 6 are similar to the trends in Figure 3 with groundwater levels highest in the spring months and lowest in the late summer to early fall. Deviations in groundwater levels in these monitors between the late summer/early fall of 1996 and the late summer/early fall of 1997 range from about 1.0 metres lower in 1997 at monitor 96-20 (closest to the well site) to about 0.6 metres lower in 1997 at monitor 96-22 (furthest from the well site. The groundwater levels during 1997 at the 96-Series monitors appear to suggest some influence from the pumping activities at Well No. 7. The degree of influence from pumping on the 96-Series groundwater monitors appears to be inversely proportional to the distance from the well site, as would be expected.

The October 1996 and October 1997 groundwater levels are tabulated in the table below for select groundwater monitors. The change in water levels between October 1996 and October 1997 is also indicated.

Monitor	Groundwater Level in October 1996 (m)	Groundwater Level in October 1997 (m)	Change in Groundwater Level (m)
94-1	75.52	74.49	-1.03
94-3	75.63	74.63	-1.00
94-5	75.60	74.70	-0.90
94-6	75.74	75.10	-0.64
94-8A	artesian	74.20	cannot be determined
94-8B	artesian	74.02	cannot be determined
94-9A	72.60	72.08	-0.52
94-9B	72.28	71.94	-0.34
94-10	75.98	75.44	-0.54
94-11	75.74	75.14	-0.60
94-12	72.44	72.13	-0.31
96-19	76.52	75.83	-0.69
96-20	75.47	74.47	-1.00
96-21	75.34	74.42	-0.92
96-22	74.97	74.38	-0.59

Notes: All elevations are relative to Geodetic datum
"-" indicates a drop in groundwater elevation

The change in groundwater levels between October 1996 and October 1997 can be summarized as follows:

- water levels were approximately one metre lower in October 1997 within 100 metres of the well site

- water levels were approximately 0.5 metres lower in October 1997 within 750 metres of the well site

3.2 Flow Directions

Based on the groundwater elevation data available prior to start of operation of Village of Winchester Well Site No. 7 on March 21, 1997, the general direction of natural (pre-operation) groundwater flow within the Morewood esker is to the north, following the long axis of the esker, as illustrated in Figure 2. As would be expected in permeable coarse grained deposits, the

horizontal hydraulic gradient is quite low and was previously reported to be around 10^{-4} (Golder Associates, 1996b).

A component of groundwater flow in a southerly direction was previously reported (Golder Associates, 1996b) in the south portion of the esker, forming a groundwater divide approximately 500 metres north of County Road 3 (see Figure 2). It has been considered that this condition is likely a result of the topographic high spot that is present in this area (Golder Associates, 1996b). Based on the limited groundwater level data available from monitor WESA-16 before it became inaccessible in July 1997, the presence of this groundwater divide does not appear to be altered by the pumping activities at Well Site No. 7.

A decrease in the magnitude of the hydraulic gradient since the start of operations has been observed in the Morewood esker in the area immediately north of the well site. This is evidenced by the hydraulic head differences between monitor pairs 96-20/96-21 and 96-21/96-22 recorded in 1996 (pre-operation) versus during operation in 1997. Conversely an increase in the magnitude of the hydraulic gradient has been observed in the area immediately south of the well site, as indicated by the hydraulic head differences between monitors 94-5 and 94-1 recorded in 1996 versus 1997. The following table shows hydraulic head differences between select groundwater monitor pairs based on groundwater levels recorded in July and October, 1996 (pre-operation) and July and October, 1997 (during operation).

Monitor Pairs (from : to)	Difference in Hydraulic Head (m)				Change in Flow Direction (Y/N)
	1996 (pre-operation)		1997 (during operation)		
	July	October	July	October	
94-11 : 94-6	nd	0	+0.02	+0.04	N
94-6 : 96-19	-0.74	-0.78	-0.73	-0.73	N
96-20 : 96-21	+0.12	+0.13	+0.04	+0.05	N
96-21 : 96-22	+0.25	+0.37	+0.01	+0.04	N
96-22 : 94-12	+2.43	+2.53	+2.33	+2.25	N
94-5 : 94-3	0	-0.03	+0.07	+0.07	Y
94-5 : 94-1	+0.08	+0.08	+0.25	+0.21	N
94-3 : 94-1	+0.08	+0.11	+0.18	+0.14	N
94-1 : 96-20	+0.05	+0.05	-0.02	+0.02	Y (July 1997)
94-3 : 96-20	+0.13	+0.16	+0.16	+0.16	N

Notes: nd = could not be determined
"+" indicates groundwater flow direction is interpreted to be from monitor listed on left of ":" to monitor listed on right
"-" indicates groundwater flow direction is interpreted to be form monitor listed on right of ":" to monitor listed on left.

Based on the groundwater level data obtained during the first twelve months of operation, the interpreted general direction of groundwater flow remains consistent with pre-operational flow directions (see Figure 2), with slight variations in the immediate vicinity of the pumping wells. Figure 2 shows the groundwater elevations at the various groundwater monitors according to measurements on October 16, 1997.

3.3 Groundwater Quality

The results of all field and laboratory chemical and physical analyses conducted during the groundwater monitoring program for the first twelve months of operation, along with the relevant Ontario Drinking Water Objectives (ODWO) (Ministry of Environment and Energy, 1994) are provided in Appendix A. Historical results are also provided, for the monitoring wells included in the groundwater monitoring program for the first twelve months of operation, in Appendix A.

Discussion relating to compliance with the ODWO relates specifically to non-health related objectives (i.e. aesthetic parameters) and health related parameters for which a Maximum Acceptable Concentration (MAC) or Interim Maximum Acceptable Concentration (IMAC) have been established. The following provides a summary of the apparent trends in groundwater quality over time with particular attention to any discrepancies or changes in groundwater quality between the pre-operational monitoring program and the monitoring program for the first twelve months of operation:

- groundwater quality in all of the groundwater monitors included in the monitoring program for the first twelve months of operation was generally consistent over time and met the ODWO for all parameters monitored

- atrazine and BTEX (Benzene, Toluene, Ethylbenzene, Xylenes) were never detected at any of the monitoring locations included in the monitoring program for the first twelve months of operation

- total phosphorus levels have been variable over time at all of the groundwater monitors included in the sampling program

- nitrate was detected in groundwater samples (at low levels) from monitor 94-11 for the first time in September 1997 and was also detected in March 1998

- nitrate has been consistently present (at levels < 3.11 mg/L) at monitors 96-20, 96-21 and 96-22, however no apparent changes in concentration of nitrate has been noticed at these locations since the start of operation

- chloride levels at monitor 96-20 have been slightly elevated since May 1997, compared to previous monitoring sessions

In general, the pumping operations at the Village of Winchester Well Site No. 7 do not appear to have adversely affected groundwater quality to date in the vicinity of the well site.

4.0 PROPOSED MONITORING PROGRAM FOR SECOND YEAR OF OPERATION

A similar monitoring program to the groundwater monitoring program for the first twelve months of operation is considered appropriate for the second year of operation, with the following changes:

- 1994 Series groundwater monitors that were damaged or destroyed can be excluded from the groundwater monitoring program for the second year of operation (i.e., 94-2, 94-4 and 94-7);

- a single groundwater level monitoring session is considered appropriate for the first month of the second year of operation (i.e. April 1998) as opposed to biweekly;

- three groundwater quality monitoring sessions are considered appropriate (i.e., May and September 1998, and March 1999)

Attempts should be made to re-gain access to groundwater monitor WESA-16 prior to the May 1998 monitoring session, as this monitor is integral in characterizing groundwater flow at the south end of the Morewood esker. If access to this monitor cannot be gained, consideration should be given to the installation of a new groundwater monitor in the same area as WESA-16.

The proposed monitoring program for the second year operation is summarized in Table 4.

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TABLE 1

**SUMMARY OF GROUNDWATER MONITORING PROGRAM
FOR ON-SITE AND OFF-SITE BOREHOLES
FIRST TWELVE MONTHS OF OPERATION**

1.0 WATER LEVEL MONITORING COMPONENT

1.1 Monitoring Sessions

Month 1 (April 4 and 18, 1997)
Month 2 (May 16, 1997)
Month 3 (June 16 and 19, 1997)
Month 4 (July 16, 1997)
Month 5 (August 15, 1997)
Month 6 (September 16, 1997)
Month 7 (October 16, 1997)
Month 8 (November 18, 1997)
Month 9 (December 16, 1997)
Month 10 (January 29, 1998)
Month 11 (February 16, 1998)
Month 12 (March 16, 1998)

1.2 Monitoring Locations

1994 Series Groundwater Monitors
Monitor WESA 16
Monitors 96-19, 96-20, 96-21 and 96-22

2.0 WATER QUALITY MONITORING COMPONENT

2.1 Monitoring Sessions

Month 1 (April 18, 1997)
Month 2 (May 16, 1997)
Month 6 (September 16, 1997)
Month 12 (March 16, 1998)

2.2 Monitoring Locations

Groundwater Monitors 94-5 and 94-11
Monitors 96-19, 96-20, 96-21 and 96-22

2.3 Field Measured Physical Parameters

Temperature
Conductivity
pH

2.4 Laboratory Measured Chemical Parameters

Chloride
Nitrate
Sodium
Potassium
Total Phosphorus
Benzene
Toluene
Ethylbenzene
Xylenes
Atrazine

NOTE: All laboratory analyses on groundwater samples are to be performed by a private analytical laboratory and the method detection limits (MDLs) for the specific analyses are to be commensurate with the standards established in the Ontario Drinking Water Objectives (MOEE, 1994).

TABLE 2
Water Level Data

	11/30/94		12/16/94		1/18/95		2/17/95	
	Depth (BGS) (metres)	Elevation (metres)	Depth (BGS) (metres)	Elevation (metres)	Depth (BGS) (metres)	Elevation (metres)	Depth (BGS) (metres)	Elevation (metres)
94-1	1.56	74.70	1.45	74.81	1.20	75.06	1.12	75.14
94-2	1.47	74.72	1.36	74.83	1.11	75.08	1.04	75.15
94-3	1.52	74.72	1.41	74.83	1.25	74.99	1.09	75.15
94-4	2.80	74.72	2.69	74.83	2.43	75.09	2.36	75.16
94-5	1.49	74.74	1.39	74.84	1.13	75.10	1.04	75.19
94-6	7.90	74.89	7.81	74.98	7.59	75.20	7.44	75.35
94-7	5.85	74.71	5.74	74.82	5.49	75.07	5.41	75.15
94-8A	0.39	74.26	0.30	74.35	0.05	74.60	frozen	frozen
94-8B	0.79	73.86	0.87	73.78	0.45	74.20	frozen	frozen
94-9A	0.80	72.28	0.62	72.46	0.43	72.65	0.68	72.40
94-9B	0.84	72.24	0.87	72.21	0.38	72.70	0.97	72.11
94-10	0.80	75.79	0.69	75.90	0.44	76.15	0.78	75.81
94-11	7.73	74.89	7.64	74.98	7.43	75.19	7.26	75.36
94-12	7.67	71.91	n/a	n/a	7.72	71.86	7.60	71.98
WESA16	3.84	74.66	3.70	74.80	3.42	75.08	n/a	n/a
96-19	NC	NC	NC	NC	NC	NC	NC	NC
96-20	NC	NC	NC	NC	NC	NC	NC	NC
96-21	NC	NC	NC	NC	NC	NC	NC	NC
96-22	NC	NC	NC	NC	NC	NC	NC	NC

Notes:

All elevations are relative to Geodetic datum

BGS = "Below Ground Surface"

NC = Monitor not yet been constructed

n/a = Monitor was either inaccessible at time of monitoring, or could not be located.

Negative depth values indicate that groundwater level was *above* ground surface

TABLE 2
Water Level Data

	3/15/95		4/13/95		5/15/95		8/17/95	
	Depth (BGS) (metres)	Elevation (metres)	Depth (BGS) (metres)	Elevation (metres)	Depth (BGS) (metres)	Elevation (metres)	Depth (BGS) (metres)	Elevation (metres)
94-1	0.97	75.29	0.83	75.43	0.79	75.47	0.66	75.60
94-2	0.90	75.29	0.76	75.43	0.71	75.48	0.58	75.61
94-3	0.96	75.28	0.80	75.44	0.75	75.49	0.58	75.66
94-4	2.21	75.31	2.07	75.45	2.03	75.49	1.91	75.61
94-5	0.89	75.34	0.75	75.48	0.70	75.53	0.61	75.62
94-6	7.33	75.46	7.16	75.63	7.10	75.69	7.12	75.67
94-7	5.26	75.30	5.12	75.44	5.07	75.49	n/a	n/a
94-8A	frozen	frozen	0.35	74.30	n/a	n/a	n/a	n/a
94-8B	frozen	frozen	0.10	74.55	n/a	n/a	n/a	n/a
94-9A	0.48	72.60	0.35	72.73	0.49	72.59	0.58	72.50
94-9B	frozen	frozen	0.68	72.40	0.80	72.28	0.92	72.16
94-10	n/a	n/a	0.12	76.47	0.22	76.37	0.47	76.12
94-11	7.16	75.46	6.98	75.64	6.92	75.70	6.97	75.65
94-12	7.64	71.94	7.51	72.07	7.51	72.07	7.46	72.12
WESA16	3.57	74.93	3.39	75.11	3.34	75.16	3.09	75.41
96-19	NC	NC	NC	NC	NC	NC	NC	NC
96-20	NC	NC	NC	NC	NC	NC	NC	NC
96-21	NC	NC	NC	NC	NC	NC	NC	NC
96-22	NC	NC	NC	NC	NC	NC	NC	NC

Notes:
All elevations are relative to Geodetic datum
BGS = "Below Ground Surface"
NC = Monitor not yet been constructed
n/a = Monitor was either inaccessible at time of monitoring, or could not be located.
Negative depth values indicate that groundwater level was *above* ground surface

TABLE 2
Water Level Data

	9/19/95		10/14/95		11/10/95		12/20/95	
	Depth (BGS) (metres)	Elevation (metres)	Depth (BGS) (metres)	Elevation (metres)	Depth (BGS) (metres)	Elevation (metres)	Depth (BGS) (metres)	Elevation (metres)
94-1	0.94	75.32	0.81	75.45	0.66	75.60	0.57	75.69
94-2	0.86	75.33	0.74	75.45	0.59	75.60	0.49	75.70
94-3	0.88	75.36	0.74	75.50	0.61	75.63	n/a	n/a
94-4	2.18	75.34	2.06	75.46	1.90	75.62	1.81	75.71
94-5	0.87	75.36	0.76	75.47	0.59	75.64	0.49	75.74
94-6	7.35	75.44	7.26	75.53	7.03	75.76	6.92	75.87
94-7	n/a	n/a	5.09	75.47	4.94	75.62	4.85	75.71
94-8A	n/a	n/a	artesian	artesian	artesian	artesian	artesian	artesian
94-8B	n/a	n/a	artesian	artesian	artesian	artesian	artesian	artesian
94-9A	0.90	72.18	0.47	72.61	0.43	72.65	0.46	72.62
94-9B	1.24	71.84	0.83	72.25	0.81	72.27	0.86	72.22
94-10	1.08	75.51	0.28	76.31	0.10	76.49	0.17	76.42
94-11	7.20	75.42	7.13	75.49	6.87	75.75	6.76	75.86
94-12	7.50	72.08	7.51	72.07	7.40	72.18	7.26	72.32
WESA16	3.56	74.94	3.15	75.35	2.94	75.56	3.00	75.50
96-19	NC	NC	NC	NC	NC	NC	NC	NC
96-20	NC	NC	NC	NC	NC	NC	NC	NC
96-21	NC	NC	NC	NC	NC	NC	NC	NC
96-22	NC	NC	NC	NC	NC	NC	NC	NC

Notes:
All elevations are relative to Geodetic datum
BGS = "Below Ground Surface"
NC = Monitor not yet been constructed
n/a = Monitor was either inaccessible at time of monitoring, or could not be located.
Negative depth values indicate that groundwater level was *above* ground surface

TABLE 2
Water Level Data

	5/9/96		7/10/96		10/10/96		11/5/96	
	Depth (BGS) (metres)	Elevation (metres)	Depth (BGS) (metres)	Elevation (metres)	Depth (BGS) (metres)	Elevation (metres)	Depth (BGS) (metres)	Elevation (metres)
94-1	0.21	76.05	0.68	75.58	0.74	75.52	0.64	75.62
94-2	0.14	76.05	0.60	75.59	n/a	n/a	destroyed	destroyed
94-3	0.11	76.13	0.58	75.66	0.61	75.63	0.53	75.71
94-4	1.40	76.12	1.86	75.66	1.92	75.60	1.82	75.70
94-5	0.10	76.13	0.57	75.66	0.63	75.60	0.54	75.69
94-6	6.48	76.31	6.97	75.82	7.05	75.74	6.94	75.85
94-7	4.44	76.12	n/a	n/a	n/a	n/a	destroyed	destroyed
94-8A	artesian	artesian	artesian	artesian	artesian	artesian	artesian	artesian
94-8B	artesian	artesian	artesian	artesian	artesian	artesian	artesian	artesian
94-9A	0.38	72.70	0.54	72.54	0.48	72.60	0.46	72.62
94-9B	0.74	72.34	0.88	72.20	0.80	72.28	0.81	72.27
94-10	0.12	76.47	0.70	75.89	0.61	75.98	0.17	76.42
94-11	6.29	76.33	n/a	n/a	6.88	75.74	6.77	75.85
94-12	6.63	72.95	6.85	72.73	7.14	72.44	7.17	72.41
WESA16	0.74	77.76	3.25	75.25	3.09	75.41	3.00	75.50
96-19	-0.44	76.95	-0.05	76.56	-0.01	76.52	-0.17	76.68
96-20	3.39	75.95	3.81	75.53	3.87	75.47	3.78	75.56
96-21	5.82	75.79	6.20	75.41	6.27	75.34	6.19	75.42
96-22	5.90	75.60	6.34	75.16	6.53	74.97	6.46	75.04

Notes:

All elevations are relative to Geodetic datum

BGS = "Below Ground Surface"

NC = Monitor not yet been constructed

n/a = Monitor was either inaccessible at time of monitoring, or could not be located.

Negative depth values indicate that groundwater level was *above* ground surface

TABLE 2
Water Level Data

	1/7/97		2/4/97		4/4/97		4/18/97	
	Depth (BGS) (metres)	Elevation (metres)	Depth (BGS) (metres)	Elevation (metres)	Depth (BGS) (metres)	Elevation (metres)	Depth (BGS) (metres)	Elevation (metres)
94-1	0.33	75.93	0.58	75.68	0.58	75.68	0.49	75.78
94-2	destroyed	destroyed	destroyed	destroyed	destroyed	destroyed	destroyed	destroyed
94-3	0.23	76.01	0.50	75.74	0.37	75.87	0.30	75.94
94-4	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
94-5	0.22	76.01	0.47	75.76	0.32	75.91	0.25	75.99
94-6	6.60	76.19	6.83	75.96	6.64	76.15	6.52	76.27
94-7	destroyed	destroyed	destroyed	destroyed	destroyed	destroyed	destroyed	destroyed
94-8A	artesian	artesian	artesian	artesian	artesian	artesian	artesian	artesian
94-8B	artesian	artesian	artesian	artesian	artesian	artesian	artesian	artesian
94-9A	0.30	72.78	0.55	72.53	n/a	n/a	0.33	72.75
94-9B	0.53	72.55	0.89	72.19	n/a	n/a	0.69	72.39
94-10	0.06	76.53	0.53	76.06	n/a	n/a	-0.09	76.69
94-11	6.43	76.19	6.69	75.93	6.47	76.16	6.34	76.29
94-12	6.89	72.69	6.95	72.63	6.90	72.68	6.61	72.97
WESA16	2.73	75.77	n/a	n/a	2.90	75.60	2.75	75.75
96-19	-0.39	76.90	n/a	n/a	n/a	n/a	-0.41	76.93
96-20	3.47	75.87	3.71	75.63	3.66	75.69	3.53	75.81
96-21	5.87	75.74	6.10	75.51	5.96	75.66	5.88	75.73
96-22	6.13	75.37	6.29	75.21	6.10	75.40	5.82	75.69

Notes:

All elevations are relative to Geodetic datum

BGS = "Below Ground Surface"

NC = Monitor not yet been constructed

n/a = Monitor was either inaccessible at time of monitoring, or could not be located.

Negative depth values indicate that groundwater level was *above* ground surface

TABLE 2
Water Level Data

	5/16/97		6/16/97		6/19/97		7/16/97	
	Depth (BGS) (metres)	Elevation (metres)	Depth (BGS) (metres)	Elevation (metres)	Depth (BGS) (metres)	Elevation (metres)	Depth (BGS) (metres)	Elevation (metres)
94-1	0.62	75.64	1.11	75.15	n/a	n/a	1.27	74.99
94-2	destroyed	destroyed	destroyed	destroyed	destroyed	destroyed	destroyed	destroyed
94-3	0.45	75.79	0.79	75.45	n/a	n/a	1.07	75.17
94-4	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
94-5	0.39	75.84	0.82	75.41	n/a	n/a	0.99	75.24
94-6	6.61	76.18	6.98	75.81	6.84	75.95	7.17	75.62
94-7	destroyed	destroyed	destroyed	destroyed	destroyed	destroyed	destroyed	destroyed
94-8A	artesian	artesian	artesian	artesian	artesian	artesian	artesian	artesian
94-8B	artesian	artesian	artesian	artesian	artesian	artesian	artesian	artesian
94-9A	0.37	72.71	0.49	72.59	n/a	n/a	0.60	72.48
94-9B	0.70	72.38	0.85	72.23	n/a	n/a	0.83	72.25
94-10	-0.01	76.60	0.43	76.16	n/a	n/a	0.57	76.02
94-11	6.42	76.20	n/a	n/a	6.80	75.82	6.98	75.64
94-12	6.59	72.99	6.77	72.81	n/a	n/a	6.95	72.63
WESA16	2.75	75.76	3.67	74.83	n/a	n/a	n/a	n/a
96-19	-0.29	76.80	0.05	76.46	0.05	76.46	0.16	76.35
96-20	3.72	75.62	4.15	75.19	n/a	n/a	4.33	75.01
96-21	6.04	75.58	6.44	75.17	n/a	n/a	6.64	74.97
96-22	5.95	75.55	6.26	75.24	n/a	n/a	6.54	74.96

Notes:
All elevations are relative to Geodetic datum
BGS = "Below Ground Surface"
NC = Monitor not yet been constructed
n/a = Monitor was either inaccessible at time of monitoring, or could not be located.
Negative depth values indicate that groundwater level was *above* ground surface

TABLE 2
Water Level Data

	8/15/97		9/16/97		10/16/97		11/18/97	
	Depth (BGS) (metres)	Elevation (metres)	Depth (BGS) (metres)	Elevation (metres)	Depth (BGS) (metres)	Elevation (metres)	Depth (BGS) (metres)	Elevation (metres)
94-1	1.57	74.69	1.72	74.54	1.77	74.49	1.67	74.59
94-2	destroyed	destroyed	destroyed	destroyed	destroyed	destroyed	destroyed	destroyed
94-3	1.34	74.90	1.54	74.70	1.61	74.63	1.54	74.70
94-4	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
94-5	1.29	74.94	1.47	74.76	1.53	74.70	1.46	74.77
94-6	7.42	75.37	7.60	75.19	7.69	75.10	7.63	75.16
94-7	destroyed	destroyed	destroyed	destroyed	destroyed	destroyed	destroyed	destroyed
94-8A	0.30	74.35	0.41	74.24	0.45	74.20	0.33	74.32
94-8B	0.53	74.12	0.60	74.06	0.63	74.02	0.52	74.13
94-9A	0.96	72.12	1.11	71.97	1.00	72.08	0.67	72.41
94-9B	1.23	71.85	1.29	71.79	1.14	71.94	0.80	72.28
94-10	1.21	75.38	1.27	75.32	1.15	75.44	0.74	75.85
94-11	7.22	75.40	7.38	75.24	7.48	75.14	7.42	75.20
94-12	7.14	72.44	7.30	72.28	7.45	72.13	n/a	n/a
WESA16	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
96-19	0.50	76.01	0.65	75.87	0.68	75.83	0.61	75.90
96-20	4.90	74.44	4.83	74.51	4.87	74.47	4.79	74.55
96-21	6.90	74.71	7.80	73.81	7.19	74.42	7.10	74.51
96-22	6.81	74.69	7.02	74.48	7.12	74.38	7.11	74.39

Notes:

All elevations are relative to Geodetic datum

BGS = "Below Ground Surface"

NC = Monitor not yet been constructed

n/a = Monitor was either inaccessible at time of monitoring, or could not be located.

Negative depth values indicate that groundwater level was *above* ground surface

TABLE 2
Water Level Data

	12/16/97		1/29/98		2/16/98		3/16/98	
	Depth (BGS) (metres)	Elevation (metres)	Depth (BGS) (metres)	Elevation (metres)	Depth (BGS) (metres)	Elevation (metres)	Depth (BGS) (metres)	Elevation (metres)
94-1	1.65	74.61	1.40	74.86	1.50	74.76	1.14	75.12
94-2	destroyed	destroyed	destroyed	destroyed	destroyed	destroyed	destroyed	destroyed
94-3	1.44	74.80	n/a	n/a	n/a	n/a	0.90	75.34
94-4	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
94-5	1.37	74.86	1.21	75.02	1.27	74.96	0.85	75.38
94-6	7.54	75.25	7.37	75.42	7.43	75.36	6.97	75.82
94-7	destroyed	destroyed	destroyed	destroyed	destroyed	destroyed	destroyed	destroyed
94-8A	0.22	74.43	n/a	n/a	n/a	n/a	n/a	n/a
94-8B	0.62	74.03	n/a	n/a	n/a	n/a	n/a	n/a
94-9A	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
94-9B	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
94-10	0.59	76.00	0.50	76.09	0.62	75.97	n/a	n/a
94-11	7.33	75.29	7.16	75.46	7.22	75.40	6.78	75.84
94-12	7.61	71.97	7.58	72.00	7.62	71.96	7.34	72.24
WESA16	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
96-19	0.53	75.98	0.40	76.11	0.46	76.05	0.05	76.46
96-20	n/a	n/a	n/a	n/a	n/a	n/a	4.14	75.20
96-21	7.00	74.61	6.83	74.78	6.90	74.71	6.49	75.12
96-22	7.04	74.46	6.87	74.63	6.94	74.56	6.59	74.91

Notes:
All elevations are relative to Geodetic datum
BGS = "Below Ground Surface"
NC = Monitor not yet been constructed
n/a = Monitor was either inaccessible at time of monitoring, or could not be located.
Negative depth values indicate that groundwater level was *above* ground surface

TABLE 3
Elevation Data

Well Location	Ground Surface Elevation (metres)	Groundwater Measurement Datum	
		Top of Casing Elevation (metres)	Stickup (metres)
94-1	76.26	77.31	1.05
94-2	76.19	77.18	0.99
94-3	76.24	77.25	1.01
94-4	77.52	78.60	1.08
94-5	76.23	77.16	0.93
94-6	82.79	83.55	0.76
94-7	80.56	80.47	-0.09
94-8A	74.65	74.63	-0.02
94-8B	74.65	74.64	-0.01
94-9A	73.08	73.08	0.00
94-9B	73.08	73.08	0.00
94-10	76.59	76.77	0.18
94-11	82.62	82.52	-0.10
94-12	79.58	79.51	-0.07
WESA16	78.50	78.50	0.00
96-19	76.51	77.69	1.18
96-20	79.34	80.09	0.75
96-21	81.61	82.56	0.95
96-22	81.50	82.34	0.84

Note: "-" indicates top of casing is below ground surface.

TABLE 4

PROPOSED GROUNDWATER MONITORING PROGRAM FOR ON-SITE AND OFF-SITE BOREHOLES SECOND YEAR OF OPERATION

1.0 WATER LEVEL MONITORING COMPONENT

1.1 Monitoring Sessions

April 1998
May 1998
June 1998
July 1998
August 1998
September 1998
October 1998
November 1998
December 1998
January 1999
February 1999
March 1999

1.2 Monitoring Locations

Groundwater Monitors 94-1, 94-3, 94-5, 94-6, 94-8A, 94-8B, 94-9A, 94-9B, 94-10, 94-11, 94-12
Monitor WESA-16 (or replacement)
Monitors 96-19, 96-20, 96-21 and 96-22

2.0 WATER QUALITY MONITORING COMPONENT

2.1 Monitoring Sessions

May 1998
September 1998
March 1999

2.2 Monitoring Locations

Groundwater Monitors 94-5 and 94-11
Monitors 96-19, 96-20, 96-21 and 96-22

2.3 Field Measured Physical Parameters

Temperature
Conductivity
pH

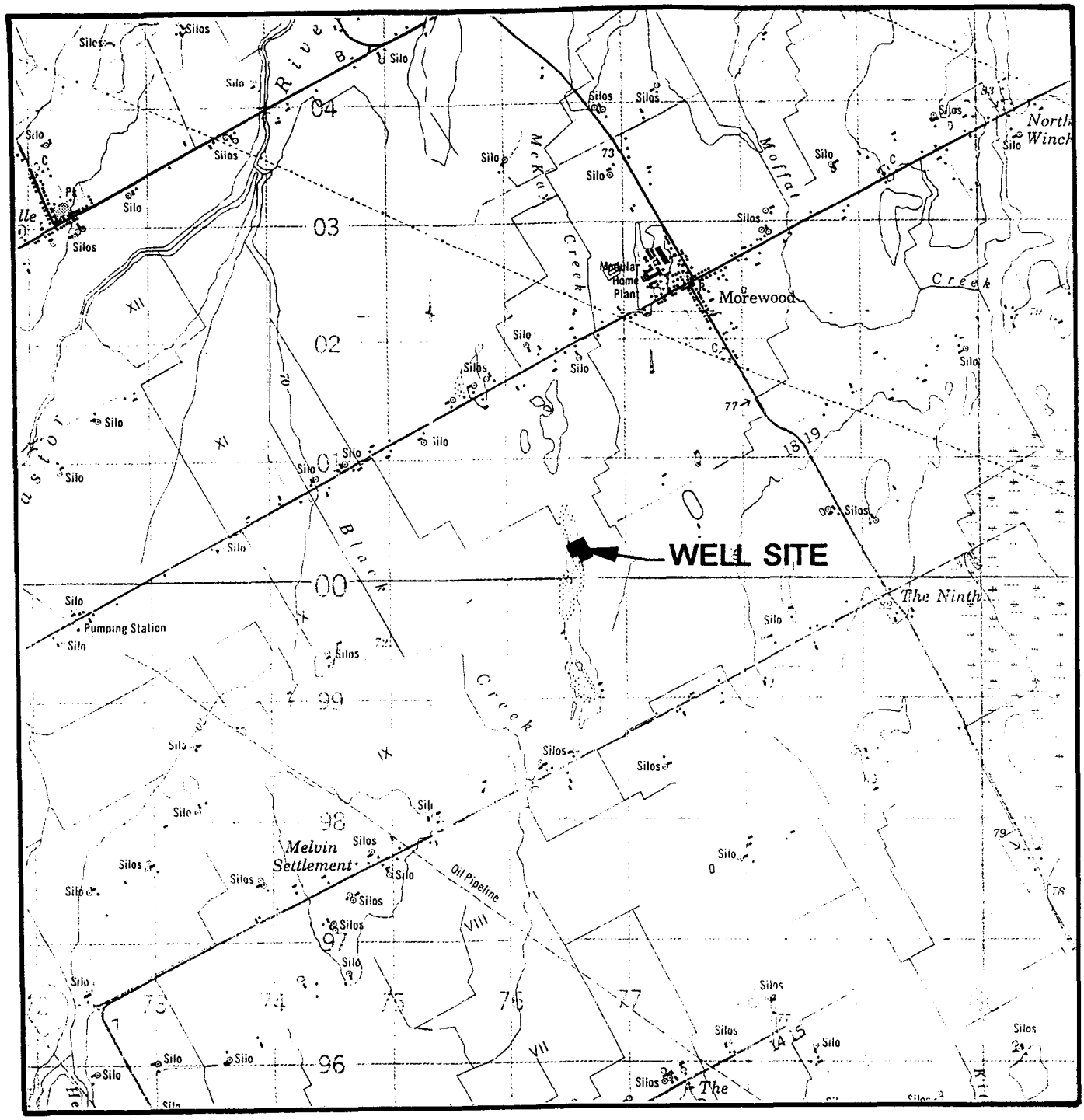
2.4 Laboratory Measured Chemical Parameters

Chloride
Nitrate
Sodium
Potassium
Total Phosphorus
Benzene
Toluene
Ethylbenzene
Xylenes
Atrazine

NOTE: All laboratory analyses on groundwater samples are to be performed by a private analytical laboratory and the method detection limits (MDLs) for the specific analyses are to be commensurate with the standards established in the Ontario Drinking Water Objectives (MOEE, 1994).

KEY PLAN

FIGURE 1



SCALE 1 : 50, 000

SPECIAL NOTE
THIS DRAWING IS TO BE READ IN CONJUNCTION WITH ACCOMPANYING REPORT

Date April 25, 1998

Project 971-2805

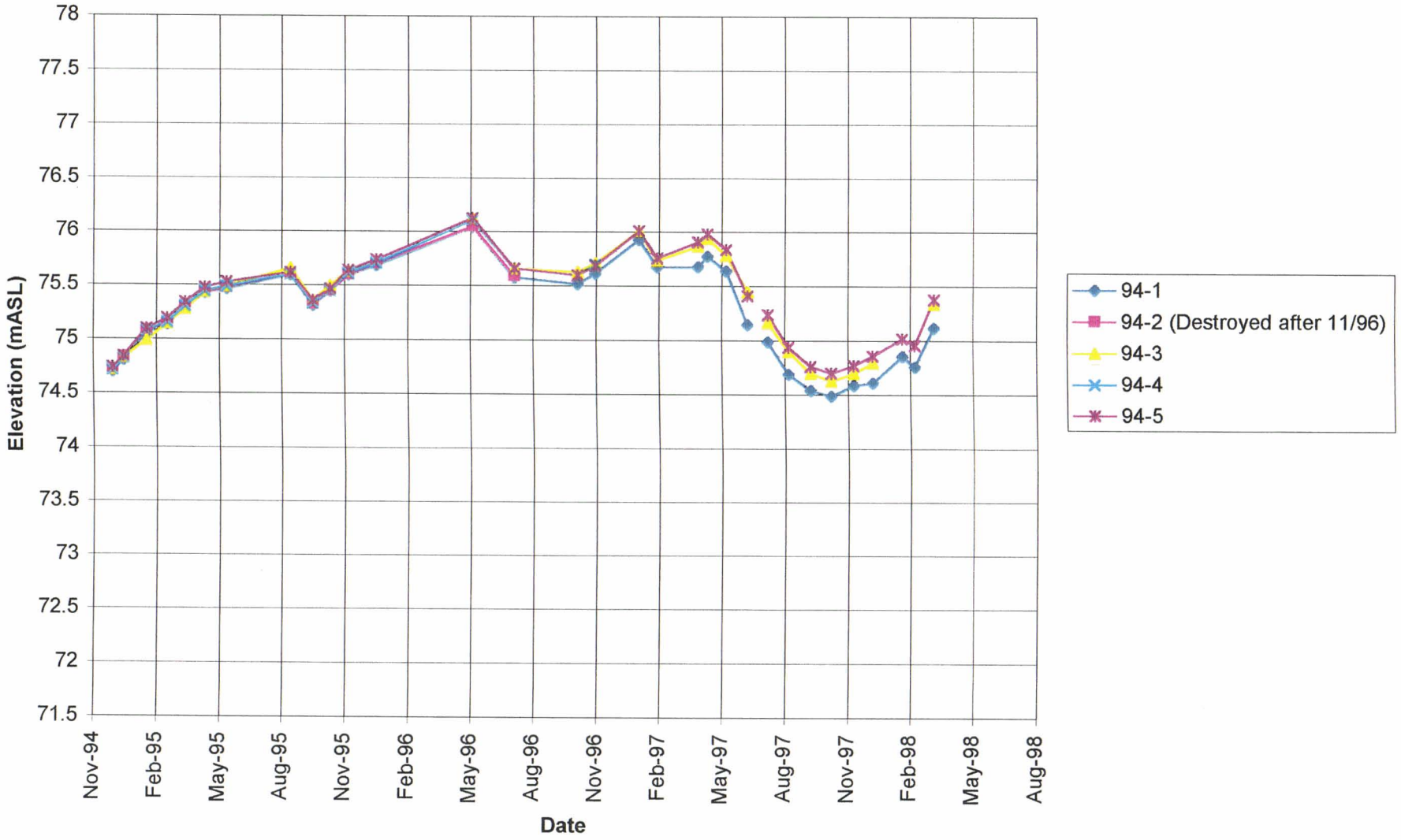
Golder Associates

Drawn S.L

Chkd. KAM

FIGURE 3

Groundwater Elevations in Vicinity of the Village of Winchester Well Site

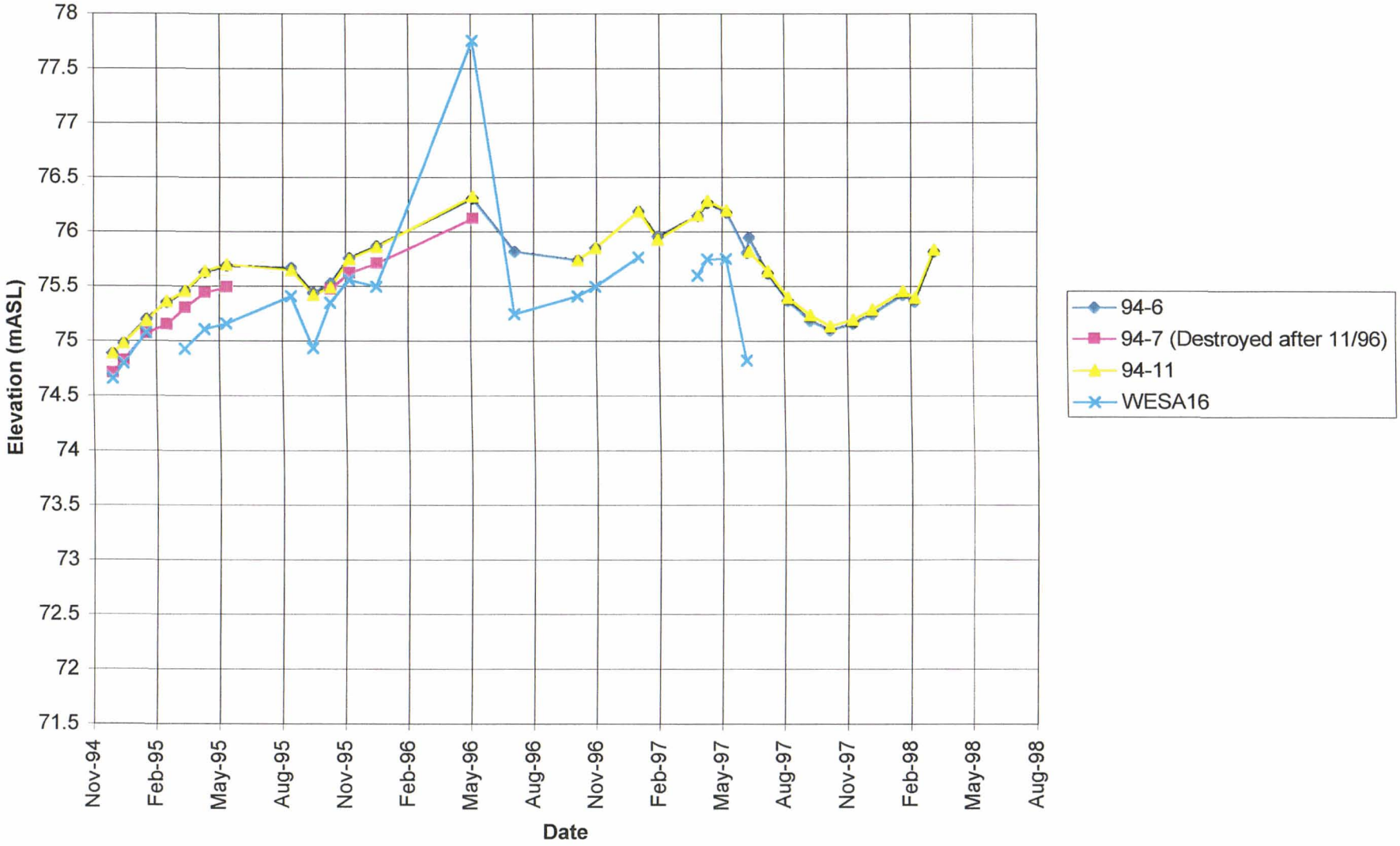


Golder Associates

Waterlev.xls

FIGURE 4

Groundwater Elevations in Morewood Esker



Golder Associates

Waterlev.xls

FIGURE 5

Groundwater Elevations in Various Geological Formations

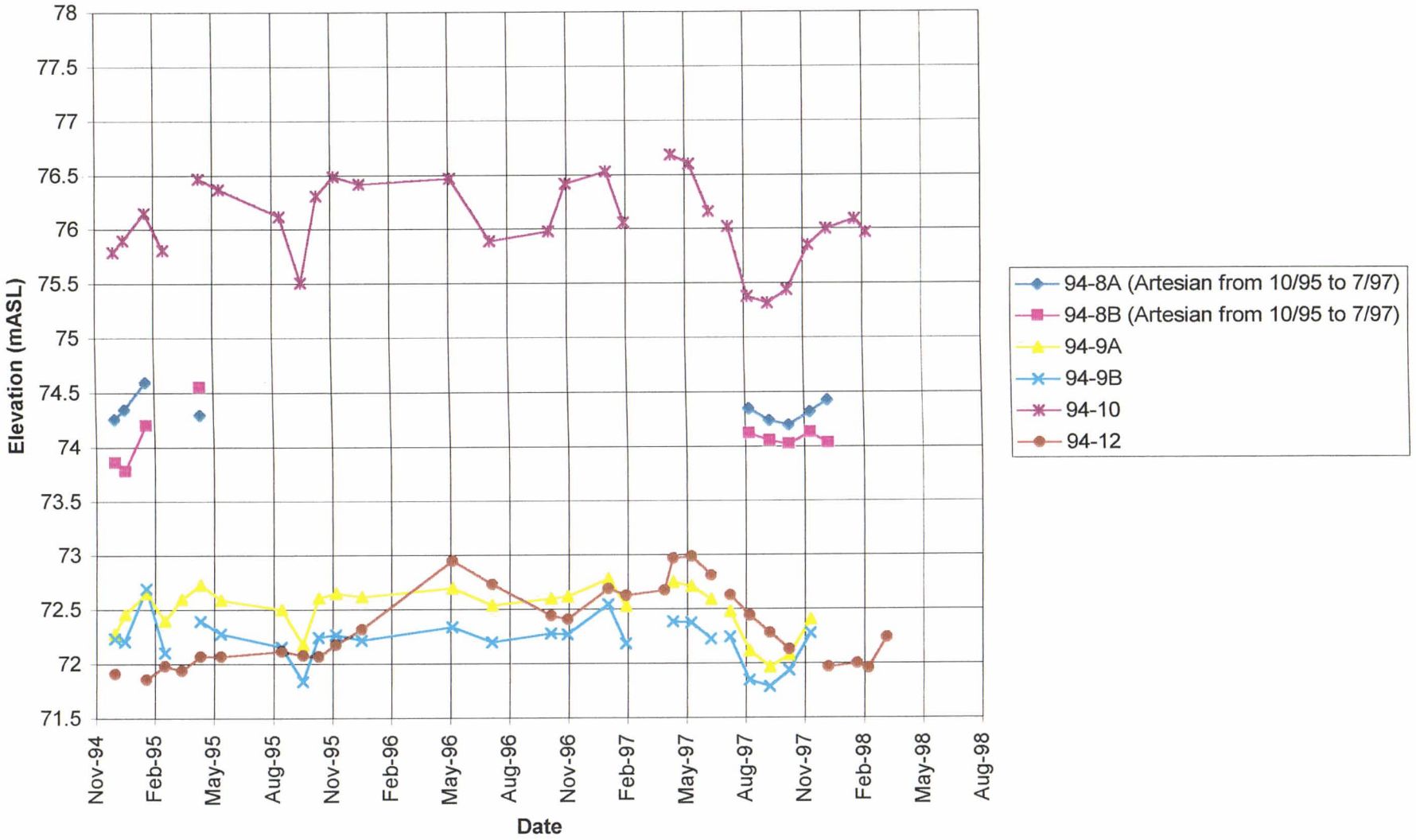
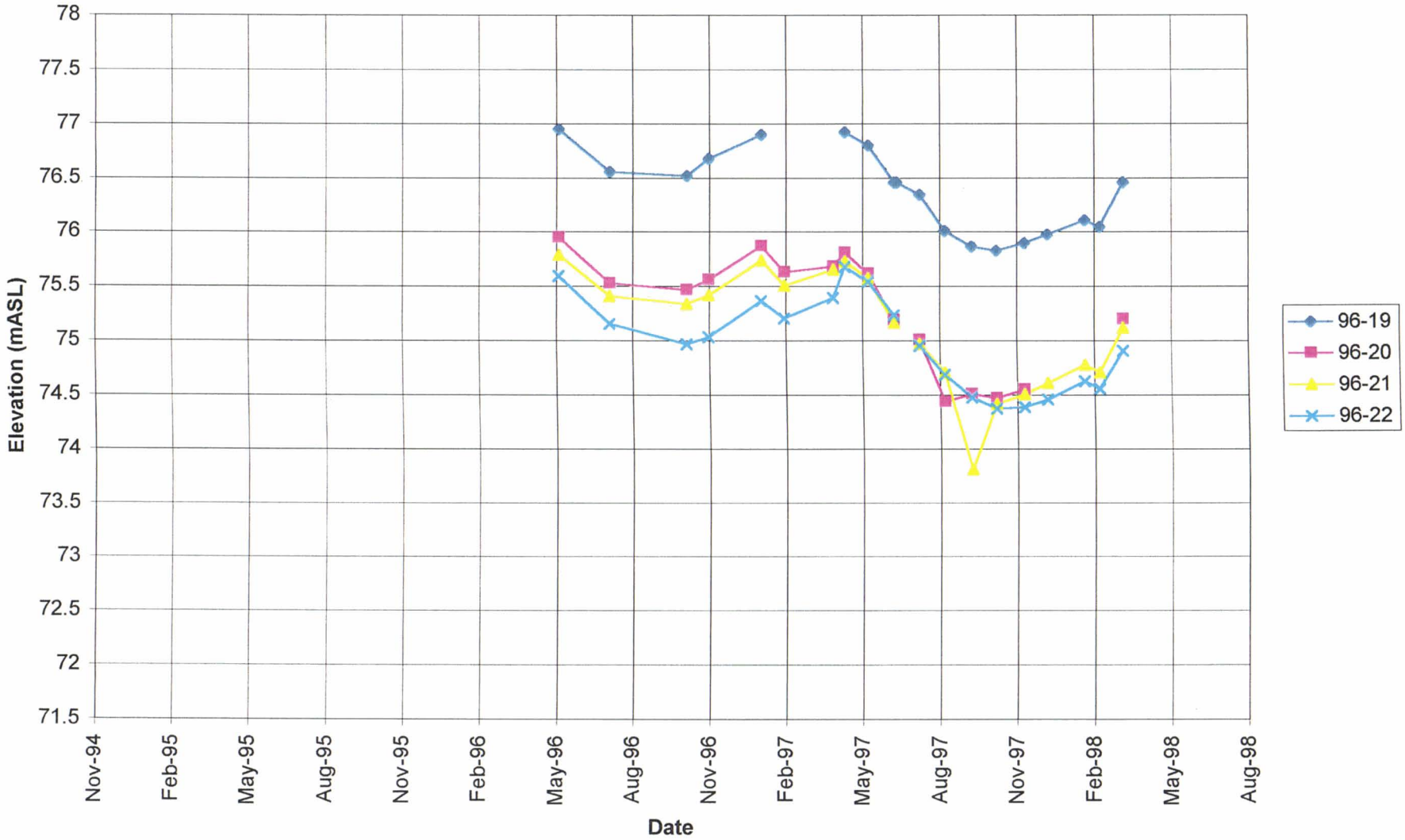


FIGURE 6

Groundwater Elevations in 96-Series Monitoring Wells



APPENDIX A

REPORT OF MONITORING RESULTS

LIST OF ABBREVIATIONS

The abbreviations commonly employed on the "Chemical and Physical Analyses Data Sheets", on the figures, in the tables and in the text of the report as related to the water quality monitoring programs are as follows:

ODWO	Ontario Drinking Water Objective (Ministry of the Environment and Energy, 1994)
N	nitrogen
P	phosphorus
$CaCO_3$	calcium carbonate
C	degrees Celsius
microS/cm	microsiemens per centimetre
NTU	Nephelometric Turbidity Unit
TCU	True Colour Unit
mL	millilitre
mg/L	milligrams per litre
ppm	parts per million
COND.	conductivity
DIS. OXYGEN	dissolved oxygen
TKN	total kjeldahl nitrogen
BOD	biochemical oxygen demand
COD	chemical oxygen demand
DOC	dissolved organic carbon
EC	*Escherichia coli*
TOC	total organic carbon
TS	total solids
TSS	total suspended solids
TDS	total dissolved solids
TC	total coliform
FC	faecal coliform
FS	faecal streptococcus
BKGD	background
*	See Ministry of Environment and Energy (1994) for narrative guideline

WINCHESTER WATER PROJECT - REPORT OF MONITORING RESULTS 971-2805

Sample Source: 94-5 Sheet:1-1

Date Sampled		Oct 18,1994	Oct 26,1994	Nov 3,1994	May 15,1995	Sep 19,1995	May 9,1996	Oct 10,1996	Apr 18,1997
Parameter	ODWO								
CHLORIDE	250.0				12.0	11.0	9.0	9.0	9.0
NITRATE (as N)	10.00	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100
SODIUM	200				7.00	6.00	7.00	13.00	8.00
POTASSIUM						2.00	2.00	2.00	2.00
PHOSPHORUS(total)						0.06	4.54	0.02	< 0.01
TEMPERATURE (C)	15.0				8.5	12.0	8.5	8.0	6.5
COND. (microS/cm)					350	405	360	445	330
PH (pH units)	6.5-8.5				7.1	8.4	7.9	7.7	6.3
BENZENE	0.005				< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005
TOLUENE	0.024				< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005
ETHYLBENZENE	0.0024				< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005
XYLENES	0.30				< 0.0010	< 0.0010	< 0.0010	< 0.0010	< 0.0015
ATRAZINE	0.005						< 0.005	< 0.005	< 0.005

NOTE: All values are reported in mg/L unless otherwise noted

Sample Source: 94-5 Sheet:2-1

Date Sampled		May 16,1997	Sep 16,1997	Mar 16,1998
Parameter	ODWO			
CHLORIDE	250.0	10.0	8.0	10.0
NITRATE (as N)	10.00	< 0.100	< 0.100	< 0.100
SODIUM	200	9.00	7.00	7.00
POTASSIUM		2.00	2.00	2.00
PHOSPHORUS(total)		0.84	0.21	0.05
TEMPERATURE (C)	15.0	7.0	9.0	2.0
COND. (microS/cm)		300	290	360
PH (pH units)	6.5-8.5	7.2	7.0	7.0
BENZENE	0.005	< 0.0005	< 0.0005	< 0.0005
TOLUENE	0.024	< 0.0005	< 0.0005	< 0.0005
ETHYLBENZENE	0.0024	< 0.0005	< 0.0005	< 0.0005
XYLENES	0.30	< 0.0015	< 0.0015	< 0.0015
ATRAZINE	0.005	< 0.005	< 0.005	< 0.005

NOTE: All values are reported in mg/L unless otherwise noted

Sample Source: 94-11 Sheet:1-1

Date Sampled		May 9,1996	Oct 10,1996	Apr 18,1997	May 16,1997	Sep 16,1997	Mar 16,1998
Parameter	ODWO						
CHLORIDE	250.0	7.0	5.0	9.0	4.0	3.0	7.0
NITRATE (as N)	10.00	< 0.100	< 0.100	< 0.100	< 0.100	0.290	0.440
SODIUM	200	3.00	8.00	4.00	4.00	4.00	4.00
POTASSIUM		2.00	2.00	2.00	2.00	2.00	3.00
PHOSPHORUS(total)		8.59	0.02	2.28	1.08	0.56	0.02
TEMPERATURE (C)	15.0	9.4	7.0	6.0	7.0	10.0	1.0
COND. (microS/cm)		360	447	330	320	260	340
PH (pH units)	6.5-8.5	8.0	7.6	7.7	7.0	7.1	7.1
BENZENE	0.005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005
TOLUENE	0.024	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005
ETHYLBENZENE	0.0024	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005
XYLENES	0.30	< 0.0010	< 0.0010	< 0.0015	< 0.0015	< 0.0015	< 0.0015
ATRAZINE	0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005

NOTE: All values are reported in mg/L unless otherwise noted

WINCHESTER WATER PROJECT - REPORT OF MONITORING RESULTS 971-2805

Sample Source: 96-19 Sheet:1-1

Date Sampled		May 9,1996	Oct 10,1996	Apr 18,1997	May 16,1997	Sep 16,1997	Mar 16,1998
Parameter	ODWO						
CHLORIDE	250.0	8.0	8.0	7.0	7.0	6.0	7.0
NITRATE (as N)	10.00	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100
SODIUM	200	3.00	8.00	3.00	3.00	3.00	3.00
POTASSIUM		1.00	1.00	1.00	1.00	1.00	2.00
PHOSPHORUS(total)		1.47	0.02	0.19	2.42	0.23	0.01
TEMPERATURE (C)	15.0	8.3	9.0	6.0	7.0	9.0	2.0
COND. (microS/cm)		370	437	300	300	260	300
PH (pH units)	6.5-8.5	7.8	7.7	6.9	7.7	7.2	6.6
BENZENE	0.005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005
TOLUENE	0.024	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005
ETHYLBENZENE	0.0024	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005
XYLENES	0.30	< 0.0010	< 0.0010	< 0.0015	< 0.0015	< 0.0015	< 0.0015
ATRAZINE	0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005

NOTE: All values are reported in mg/L unless otherwise noted

Sample Source: 96-20 Sheet:1-1

Date Sampled		May 10,1996	Oct 10,1996	Apr 18,1997	May 16,1997	Sep 16,1997	Mar 16,1998
Parameter	ODWO						
CHLORIDE	250.0	13.0	13.0	11.0	20.0	18.0	18.0
NITRATE (as N)	10.00	1.650	0.410	2.380	3.110	2.540	0.730
SODIUM	200	2.00	6.00	1.00	2.00	2.00	2.00
POTASSIUM		2.00	2.00	2.00	2.00	2.00	2.00
PHOSPHORUS(total)		0.86	0.01	1.45	2.00	0.35	< 0.01
TEMPERATURE (C)	15.0	8.3	6.5	6.0	7.0	9.0	2.0
COND. (microS/cm)		410	465	380	380	310	380
PH (pH units)	6.5-8.5	7.9	7.7	6.6	6.9	7.0	6.9
BENZENE	0.005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005
TOLUENE	0.024	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005
ETHYLBENZENE	0.0024	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005
XYLENES	0.30	< 0.0010	< 0.0010	< 0.0015	< 0.0015	< 0.0015	< 0.0015
ATRAZINE	0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005

NOTE: All values are reported in mg/L unless otherwise noted

Sample Source: 96-21 Sheet:1-1

Date Sampled		May 10,1996	Oct 10,1996	Apr 18,1997	May 16,1997	Sep 16,1997	Mar 16,1998
Parameter	ODWO						
CHLORIDE	250.0	10.0	10.0	9.0	9.0	9.0	9.0
NITRATE (as N)	10.00	0.310	1.230	1.220	1.270	1.070	1.200
SODIUM	200	7.00	10.00	6.00	6.00	7.00	6.00
POTASSIUM		4.00	4.00	4.00	4.00	4.00	5.00
PHOSPHORUS(total)		5.34	0.01	1.00	0.53	0.56	< 0.01
TEMPERATURE (C)	15.0	9.7	7.0	6.0	7.0	10.0	1.0
COND. (microS/cm)		440	667	500	400	380	450
PH (pH units)	6.5-8.5	7.9	7.8	6.2	7.2	7.1	7.0
BENZENE	0.005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005
TOLUENE	0.024	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005
ETHYLBENZENE	0.0024	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005
XYLENES	0.30	< 0.0010	< 0.0010	< 0.0015	< 0.0015	< 0.0015	< 0.0015
ATRAZINE	0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005

NOTE: All values are reported in mg/L unless otherwise noted

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Sample Source: 96-22 Sheet:1-1

Date Sampled		May 10,1996	Oct 10,1996	Apr 18,1997	May 16,1997	Sep 16,1997	Mar 16,1998
Parameter	ODWO						
CHLORIDE	250.0	6.0	5.0	3.0	3.0	2.0	2.0
NITRATE (as N)	10.00	0.420	1.160	0.390	0.110	0.150	0.200
SODIUM	200	4.00	7.00	3.00	3.00	4.00	3.00
POTASSIUM		2.00	1.00	2.00	1.00	2.00	2.00
PHOSPHORUS(total)		1.66	0.02	< 0.01	0.47	0.86	< 0.01
TEMPERATURE (C)	15.0	9.4	7.5	6.0	7.0	8.0	2.0
COND. (microS/cm)		440	496	360	350	330	410
PH (pH units)	6.5-8.5	7.9	7.7	6.8	7.0	6.3	6.5
BENZENE	0.005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005
TOLUENE	0.024	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005
ETHYLBENZENE	0.0024	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005
XYLENES	0.30	< 0.0010	< 0.0010	< 0.0015	< 0.0015	< 0.0015	< 0.0015
ATRAZINE	0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005

NOTE: All values are reported in mg/L unless otherwise noted