2012-2017 Environmental Monitoring Report

Tri-Municipal Landfill Site

Prepared for:
City of Kenora

Prepared by:
Azimuth Environmental
Consulting, Inc.

March 2018

AEC 17-021

AZIMUTH ENVIRONMENTAL CONSULTING, INC.

Environmental Assessments & Approvals

March 26, 2018 AEC 17-021

City of Kenora
Waste Management Department
60 14th Street
Kenora, Ontario
P9N 4M9

Attention: Mukesh Pokharal, Environmental Division Lead

Re: **2012 - 2017 Environmental Monitoring Report - City of Kenora - Tri-Municipal Landfill Site**

Dear Mukesh:

We are pleased to present our report on the 2012 to 2017 closure monitoring program conducted at the Tri-Municipal Landfill Site. The monitoring obtained during this period confirms that the landfill continues to be stable and is not causing unacceptable impact on the surrounding environment. Measurable impacts are limited to the ground water regime immediately downgradient of the waste and the southern areas of the adjacent wetland. Impacts are not quantifiable in Breakneck Creek or at the downgradient boundary of the Contaminant Attenuation Zone. As per previous recommendations from the Ministry of Environmental & Climate Change, it is suggested that routine monitoring will continue, as completed in previous years. However, reporting will be completed every five years.

We would like to thank you for the opportunity to complete this project. If you have any questions or comments, please do not hesitate to contact the undersigned.

Yours truly,
AZIMUTH ENVIRONMENTAL CONSULTING, INC.

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1.0 INTRODUCTION & BACKGROUND

The following information is provided as a summary of prior monitoring programs to allow the reader to review this report in context. For more complete assessment of background information, the reader is directed to the original documentation (see Section 5.0 References). On September 1, 2000, the Tri-Municipal Landfill Site ceased accepting municipal waste, however, the site continued to accept treated sewage sludge to provide final cover material until March 2003.

The site was used as a temporary Transfer Facility while the Kenora Area Solid Waste Transfer Facility was being constructed. The new Transfer Facility located on Mellick Avenue opened in November 2000.

Since 2005, the site has also been leased to the Lake of the Wood Aero Modelers for use as a flying field for model airplanes. The by-law and agreement has been included in Appendix F.

This report has been written in compliance with the Tri-Municipal Landfill Site Closure Plan, dated October 2000 as well as MOECC review comments from the 2010-2011 monitoring report (Appendix G).

1.1 Location

The City of Kenora - Tri-Municipal Landfill Site is situated immediately to the north of Highway 17 (TransCanada Highway), approximately 10 km east of the City of Kenora, in the unorganized Haycock Township (Figure 1) on Land Parcel NO. P-357 and Parts 2 and 3 of 23R-2263 of Parcel 28600. The site is operated by the City's Solid Waste Department, and was approved to receive "municipal, commercial and industrial processed organic and solid, non-hazardous waste" under Ministry of the Environment (MOE) Certificate of Approval No. A7068504. The site received wastes between 1980 and 2000.

1.2 Geology

The landfill site is situated in an area of sub-parallel bedrock ridges and valleys that are oriented in a north-south direction. The bedrock valleys are partially infilled with glaciofluvial outwash deposits and organic soils. The overburden throughout the local area is generally thin (i.e. <7 m) and is underlain by greenstone bedrock. The bedrock is exposed along the ridges, which encompasses approximately 30% of the surrounding area. For reference, borehole logs have been included in Appendix C.

1.3 Hydrogeology

Ground water flow in the vicinity of the landfill property is controlled primarily by undulations in the bedrock topography. Active flow is restricted within the overburden sands, with the bedrock forming a lower boundary to the overburden aquifer. The average hydraulic conductivity of these units is $1x10^{-5}$ m/s and $1x10^{-7}$ m/s, respectively. The landfill is located near the top of a watershed. Ground water flow is directed northward from the divide toward a swamp/wetland complex. Flow rates range from 50 to 120 m/year within the overburden soils close to the landfill, however these rates are lower in the wetland to the north of the waste. Landfill leachate flows northerly with the ground water through the wetland complex, which eventually discharges into Breakneck Creek. Migration time from the landfill to the creek is approximately 6 to 15 years. During the migration period, leachate contaminants are attenuated and biodegraded. Therefore, contaminant concentrations reaching Breakneck Creek are either extremely low or non-detectable.

1.4 Hydrology

A small beaver pond is located approximately 700 m north of the landfill, and forms the headwaters of Breakneck Creek. This creek is a small ephemeral stream, fed in part by discharge of ground water, and flows north about 2.4 km before entering Breakneck Lake. Throughout it's length, Breakneck Creek flows through, and is discontinuous within a series of swamp/wetland features.

The D-stream is considered the background for surface water at the site. This stream drains the adjacent watershed to the west and is similar in nature to Breakneck Creek except that it does not include the highway. A small swamp forms the headwaters of the stream, which is also partially sourced by ground water. As in Breakneck Creek, the D-stream also flows through a series of wetland features prior to discharging into Breakneck Lake.

1.5 Final Cover Inspection and Performance Evaluation

According to City of Kenora staff, vegetation cover over the monitoring period (2012-2017) continues to be well established over the entire site and is inspected during each monitoring event.

2.0 SUMMARY OF 2012-2017 MONITORING PROGRAMS

The monitoring of ground water, leachate and surface water for the recent monitoring period of 2012 to 2017 was facilitated through the collection of field measurements and water quality samples by City staff, while Maxxam Laboratories completed the laboratory analysis. The sampling program is outlined in the following table.

Table 1: Current Monitoring Program

Monitor Location	Intended Characterization	Annual Frequency	Parameters
107-II	overburden background	Semi-Annual (Spring & Fall)	Major and Minor Inorganics, VOC's & Water Level Measurements
117	source (new cells)		
121-I	pathway 200 m from source		
122-I	pathway 350 m from source		
A3	trigger compliance point	Spring, Summer & Fall	Major and Minor Inorganics, VOC's
A4	discharge to Breakneck Lake		
D2	surface water background		

The locations of the ground water monitoring wells (MW) in the vicinity of the waste cells are identified on Figure 2, while those further downgradient, as well as all surface water monitoring locations are depicted on Figure 3. The scope of the monitoring program was based on recommendations provided in the Tri-Municipal Landfill - Closure Plan prepared for the City of Kenora by Earth Tech (Canada) in 2000, while it has since been revised based on recommendations made in subsequent monitoring reports with the acceptance of the MOECC (Appendix G). The details of the current closure-monitoring program are summarized in Table 1, and included in Appendix B.

According to the City, water level measurements were obtained from ground water monitors prior to any disturbance of the piezometric surface. Ground water samples were collected after purging three borehole volumes of water from each monitor using dedicated check valve pumps and tubing. Ground water samples for metals analysis were lab filtered, however, some issues were experienced following switching labs in 2016 from the Mississauga Maxxam location to the Winnipeg location. This resulted in ground water samples during 2016 and the first 2017 monitoring event to remain unfiltered which caused elevated and unrepresentative metals concentrations. Surface water samples were collected immediately below the water's surface and were not filtered as is standard protocol. The laboratory provided all sample bottles with appropriate preservatives. Samples were kept in coolers with ice and were delivered to the laboratory within 24-36 hours of collection.

The analytical data have been summarized and are included in Appendix D.

2.1 QA/QC Samples

As part of the sampling program, duplicate samples have been routinely collected and analyzed for quality assurance purposes. Kenora collected a total of 10 QA/QC samples during the 2012 to 2017 monitoring period with at least one collected during each year. It should be noted that duplicates were analyzed for all parameters including the major and minor inorganics and volatile organic compounds. The laboratory was not advised of the sample duplication prior to analysis. The results were found to be within acceptable limits with the exception of lead and copper concentrations at MW121-I during the May 2017 monitoring event, indicating an order of magnitude increase in concentration in the duplicate sample. As the remaining parameters indicated consistency between samples, it is likely the two elevated concentrations were anomalous and may have represent some particulate in the sample bottle during sample collection, which is a field protocol; and not related to lab analysis. Despite this, the overall quality of the laboratory data is considered appropriate.

2.2 Ground Water & Leachate

2.2.1 Ground Water & Leachate Flow

The factors controlling ground water flow within the overburden in the vicinity of the waste are well understood and have remained constant since monitoring began in 1987. As such, water level monitoring was scaled back beginning in 2012 with water levels just collected from monitoring wells targeted for water quality sample collection (MW107-II, MW117, MW121-I & MW122-I). However, as these wells do not have surveyed elevations, a quantitative ground water flow pattern could not be illustrated, however, the general flow direction as derived from previous reporting is illustrated on Figures 2 & 3 as the topographic relief is obvious. Despite a lack of elevation data for the current monitoring wells, water levels were plotted on Figure 4 to illustrate the ground water depth over time**.** It is noted that there is a long term decline in water levels for the period of record (1992-2017), which is more evident at MW107-II and MW117. Given these two are shallower, they may be more prone to frost heave and the increase in depths could be more reflective of an increasing stickup height. Overall, the data does show that there is some variability in ground water levels over time which is likely reflective of the shallow bedrock / thin overburden soils which can create poor drainage such that the shallow ground water is readily influenced by climatic conditions. This is most evident in the lowest ground water levels occurring during the summer or fall monitoring events. Despite this seasonal variance, historical reporting has always indicated a consistent flow path, which is north along the Breakneck Creek alignment within the overburden sands

and is constrained by the bedrock surface. Flow rates within the overburden range from approximately 50 to 120 m per year. In general, ground water flow from the area of the waste funnels northward toward the small beaver pond and creek at A2. Approximately 6 to 15 years is required for the leachate impacted ground water to migrate from the existing waste cells and discharge at A2.

2.2.2 Background Ground Water Quality

The background ground waters are characterized by relatively low concentrations of most parameters. Natural waters dissolve low quantities of elements through reaction with the soil minerals. Iron, copper and manganese are derived through chemical weathering of soil and rock minerals and are naturally at levels approaching or greater than the Ontario Drinking Water Quality Standards (ODWQS). As well, road salt affects the chemistry of natural waters, particularly at monitors that are close to Highway 17.

Currently, MW107-II provides the representation of background water quality for the Site as it is located northwest of the waste, beyond the downgradient area. The water quality from this location is illustrated in a temporal graph in Appendix B. This graph illustrates the water quality over time is variable, although with much lower concentrations observed in the downgradient locations. This variance is likely a result of a combination of the rapid infiltration of precipitation into the sandy overburden and seasonal fluctuations and the variation of glaciofluvial mineralogy.

2.2.3 Leachate Quality

Leachate quality (see Table 2, following section) is controlled by the availability of soluble contaminants in the waste pile, the residence time of infiltrating water in the waste, and the physical conditions, such as temperature, redox potential, and pH of the solution. Compared to the background waters, leachate that is produced from landfilled waste possesses elevated concentrations (x10 or more) of magnesium, sodium, potassium, iron, zinc, chloride, alkalinity, ammonia, total kjeldahl nitrogen, conductivity, total dissolved solids and phenols. It is noted that the leachate quality reflected in Table 3 is historic (1992-2004) from MW113, MW126 & Old 4, however, has been included to provide reference with respect to leachate quality at the Site.

The most representative leachate samples collected in the current monitoring period were from MW-117, which is affected by leachate from the newer cells. The chemistry is more dilute than leachate samples collected from within the older cells and has also exhibited concentrations over the last decade that are slowly declining. As illustrated in the temporal graph in Appendix B, the water quality continues to reflect leachate influence with elevated concentrations for most parameters; however, they are shown to

be relatively stable over the past 10 years, with a slight but continuous declining trend noted for most parameters since 2015. The one exception is the manganese concentrations have shown a persistent increasing trend from 2002 to 2015. The manganese concentrations were noted to be high biased in 2016 and May 2017 due to the metals samples not being properly filtered, however, the October 2017 results indicated a sharp decline in concentration to below the historical range. It is uncertain as to the source to the trend and variability in manganese at this location, however, as similar trends are not observed further downgradient and the remainder of the parameters at MW117 do not show similar trends, it may be more likely sourced to natural variability for this parameter. The manganese concentrations will be tracked in 2018 to further assess this potential trend.

2.2.4 Downgradient Ground Water Quality

Leachate impacts on the quality of ground water are observable within the Contaminant Attenuation Zone (CAZ) to a distance of about 350 m downgradient of the waste. Historically, leachate has been detectable at monitors close to the landfill (i.e. MW 126), while concentrations decline with distance away from the waste (MW 121-I at 200 m and MW 122-I at 350 m). Although a measurable impact is observed at the downgradient monitors, the degree of impact has been relatively consistent for several years indicating the leachate plume is in steady state. Both of these monitors exhibit parameter concentrations that have gradually declined since ~2000 and the rate of decline is slowing as the source leachate generation declines. Given this consistency, the average concentration of these downgradient locations has been summarized along with the upgradient and leachate quality. The past 10 years have been utilized for this average,with the exception of the leachate which has not been sampled since before 2004, such that the historical average was used.

Table 2: Average Concentrations of Leachate Indicator Parameters in Ground Water

Parameter	ODWQS	Background	Leachate*	Downgradient		
		MW107-II		MW117	MW121-I	MW122-I
Calcium		35	226	246	131	318
Magnesium		2.8	103	49	34	42
Sodium	200	6.8	**455**	75	**250**	**212**
Chloride	250	22	**530**	108	**297**	**349**
Alkalinity	500	55	**1869**	**735**	**636**	**931**
Ammonia		0.15	122	0.12	1.7	0.78
TKN		1.8	139	4.6	4.1	3.5
Iron	0.3	**2.4**	**87**	**8.2**	**60**	**55**
Sulphate	500	20	7	86	0.9	0.9
TDS	500	188	**2731**	**1126**	**1311**	**1685**
Conductivity		235	4033	1609	2109	2682
Manganese	0.05	**0.07**	**1.8**	**1.7**	**8.5**	**9.1**

* - Leachate represents average concentrations at MW113, 126 & Old 4 (1992-2004, where available)

As can be observed, there is a defined leachate influence within the downgradient water quality, while the leachate impacts are more pronounced further downgradient than at MW117, which would indicate that this location likely only targets the periphery of the downgradient plume to the east.

Within the leachate plume, concentrations of all major parameters have generally remained consistent since 1995. Of the suite of parameters analyzed, hardness, alkalinity, manganese, chloride, TDS and iron routinely exceed the Ontario Drinking Water Quality Standards (ODWQS). However, significant contributions of chloride are also produced through the use of road salt on Highway 17 and are likely also attributable to the elevated TDS concentrations. Road salt impacts were historically observed at MW 103, 105, 106 and 119 in the old MNR pit. Elevated levels of iron, manganese and alkalinity on the other hand, may be attributed to leachate composition, although iron and manganese also exceed in the background location indicating a natural source that is likely mobilized as a result of the reducing conditions associated with the leachate.

Despite these observable impacts at the downgradient area of the Site, the water quality over time is shown (Appendix B) to be relatively stable, and parameter concentrations are slowly decreasing. The one exception is the ammonia at MW121-I, which has indicated a subtle increasing trend over the past 10 years (0.96 to 2.6 mg/L). It is uncertain as to the source of the ammonia trend; however, as the shift is very small, and similar trends are not observed for any other parameter at this location or further downgradient at MW122-I, it does not likely represent a significant shift in the leachate conditions at the Site. The ammonia concentration will be tracked in 2018 to further assess this trend.

Despite these elevated downgradient concentrations, attenuation is still active further downgradient with the Contaminant Attenuation Zone extending an additional 850 m further north of MW122-I (Figure 3). Given limited depths of overburden in the area and presence of downgradient wetlands, shallow ground water migrating north within the CAZ ultimate discharges into these wetland features, such that leachate impacts are assessed through the surface water monitoring program summarized in Section 2.3.

In addition to the general water quality assessment, volatile organic compounds (VOC's) were analyzed at all monitored locations between 2012 and 2017, the results of which are summarized in Appendix E. Detected volatile organics are similar with consistent low concentrations, mainly of petroleum derivatives (e.g. isomers of benzene, toluene and xylene) with low levels of solvents. The maximum total VOC concentration measured at any location for the current monitoring period was less than 16 µg/L, with all parameters meeting their associated ODWQS. Conversely, these results are much lower than those observed at the former leachate monitors 113 and 114 II, which had historical total VOC concentrations as high as 316.2 µg/L (Oct. 1997, 114 II). The organic presence within the downgradient ground water confirms that leachate impacts are still present, however, the concentrations are lower than when the Site was operational have shown consistent levels with a slight decreasing trend over the past ten years as illustrated on the temporal graph provided in Appendix E.

2.3 Surface Water

2.3.1 Surface Water Flow

A small beaver pond forms the headwaters of Breakneck Creek approximately 700 m downgradient from the landfill. Breakneck Creek flows northward through a wetland and discharges to Breakneck Lake about 2.4 km north of its headwaters. The D-stream is located in the adjacent watershed to the west of the landfill and is considered background for the landfill investigations.

2.3.2 Surface Water Quality

Surface water quality data are compared to the background quality data obtained at D2 and to the Provincial Water Quality Objectives (PWQO). In general, surface water quality is good and falls within the range of background levels. Leachate does not impact on surface water quality. Temporal chemistry graphs in Appendix B, illustrate the concentration of leachate indicator parameters at all surface water locations over time. These graphs indicate that concentrations at these locations are variable as is typical of a

surface water feature in response to climatic influences, however, no trending associated with leachate impacts are observed.

Given the consistency in the data, average data for the past 10 years has been summarized in the following table. As shown, the background and downgradient data indicate very similar values, while marginally elevated concentrations are observed at the location closest to the landfill (A3) indicating the landfill is having a negligible but measurable influence on the downstream surface water. These limited concentrations also indicate that the Contaminant Attenuation Zone (CAZ) (Figure 3) is adequate in attenuating the leachate influence as the values at A3 are significantly reduced from those observed at the furthest downgradient monitor MW122-I.

Table 3: Average Concentrations of Leachate Indicator Parameters in Surface Water

		Background		Downgradient	
Parameter	**PWQO**	**D2**	**Leachate***	**A3**	**A4**
Calcium		12	226	25	11
Magnesium		2.1	103	4.4	2.3
Sodium		15	455	26	16
Chloride		27	530	37	25
Alkalinity		24	1869	75	32
Ammonia		0.09	122	0.11	0.07
TKN		0.8	139	1.1	0.9
Iron	0.3	**0.7**	**87**	0.3	0.2
Sulphate		1.6	7.0	1.8	1.4
TDS		109	2731	193	107
Conductivity		153	4033	280	154
Manganese		0.03	1.8	0.07	0.01

* - Leachate represents average concentrations at MW113, 126 & Old 4 (1992-2004, where available)

During the monitoring period, PWQO exceedances in the downstream locations were noted for total phosphorus, iron, copper and phenols. Despite these exceedances, all these parameters have been noted to have been exceeded at similar concentrations in the upstream location historically such that their source is likely natural.

In addition to the general water quality assessment, volatile organic compounds (VOC's) were analyzed at all monitored locations between 2012 and 2017, the results of which are summarized in Appendix E. No detections were observed at D2 or A4, however, trace detections were observed at A3 for chloroform (0.18 – 0.19 µg/L) and 1,1-dichloroethane (0.53 µg/L). Given trace concentrations have been observed historically at this location as well as downgradient monitoring wells (MW117), it is likely landfill derived. However, the minimal concentrations and lack of detection further downstream would

indicate that this parameter is attenuated within the watershed. Similarly, the 1,1 dichloroethane detection has been observed historically within the downgradient monitoring wells, however, it has never been observed in the surface water and was not observed further downstream at A4. Given there was no change in these parameter concentrations in the monitoring wells, the surface water detection does not represent a concern, however, will be monitored in 2018. Finally, there are no PWQO's associated with either of these parameters such that it is not seen as a concern to the downstream water quality.

2.3.3 Trigger Mechanism Program Compliance

The Trigger Mechanism program as defined in the Certificate of Approval (Schedule D) indicates that contingency plans must be deployed in the event that a significant exceedance has occurred at the target location (A3), which has not occurred since this program was established in 1995. A significant exceedance occurs when any surface water quality parameter exceeds the established trigger limit and is greater than double the PWQO for more than 50% of the yearly individual measurements, and in the case of chloride, when road salting activities on Highway 17 do not contribute significantly to chloride levels. The parameters, trigger concentrations and associated exceedances are summarized in the following tables.

Table 4: Observed Ranges for Trigger Parameters for Station A3

Parameter	Trigger Limit	Maximum Observed	Minimum Observed	Provincial Water Quality Objectives (1994)
Sodium	38	46.6	3.9	---
Potassium	6	22	1.4	---
Chloride	53	110	5.9	---
BOD	4.6	6	0.1	---
Phenols	0.001	0.0079	< 0.0002	0.001
TKN	5.2	2.1	0.56	---
Ammonia (un-ionized)**	0.02	0.014	< 0.00004	0.02
Phosphorus	0.16	0.186	< 0.004	0.03
Copper	0.005	0.32	< 0.00033	0.005
Iron	3.8	190	0.085	0.3
Lead	0.05	< 0.5	< 0.0001	0.005
Nickel	0.025	< 0.05	< 0.0005	0.025
Zinc	0.02	5.9	< 0.001	0.02

* Observed values are based on analyses from 1990 to 2017

** Un-ionized ammonia data from 1995-2017

Table 5: 2012 – 2017 Trigger Parameter Exceedances at A3

Parameter	Trigger Limit	Observed Concentration	Date
Potassium	6 mg/L	22 mg/L	8/20/2014
		7.9 mg/L	10/8/2014
		6.4 mg/L	9/7/2016
Phosphorus	0.16 mg/L	0.19 mg/L	5/30/2016
Copper	0.005 mg/L	0.007 mg/L	5/22/2014
		0.018 mg/L	5/30/2016
Phenols	0.002 mg/L	0.004 mg/L	5/7/2012
		0.006 mg/L	10/16/2013
		0.007 mg/L	10/8/2014
		0.004 mg/L	5/30/2016
		0.003 mg/L	5/18/2017
BOD	4.6 mg/L	6 mg/L	9/7/2016
		5 mg/L	5/18/2017

As can be observed in Table 4, only potassium exceeded the trigger on multiple occasions in a given year, however, there is no PWQO associated with that parameter such that the trigger criteria were not exceeded during this monitoring period.

3.0 CONCLUSIONS AND RECOMMENDATIONS

The City of Kenora Tri-Municipal Landfill is in compliance with its Certificate of Approval and is having only small, acceptable impacts on the surrounding environment. A higher degree of impact is limited primarily to the ground water regime immediately downgradient of the waste pile. Observable impacts decline with distance away from the landfill, as dilution, attenuation and degradation processes reduce leachate concentrations. Impacts are observable at monitor 122-I (350 m from the waste toe), however, impacts are not observed at surface water monitoring location A3 (650 m away from 122-I). The concentration of contaminants within the leachate plume are predicted to decrease with time, as the Site is no longer accepting waste.

The Contaminant Attenuation Zone provides sufficient dilution, attenuation and degradation to fully renovate leachate within its boundaries. No remediation is required under present conditions and the need for remediation is predicted to be minimal.

3.1 Recommended Monitoring Program

Given the post closure state of the landfill and relatively consistent water quality observed in both the downgradient surface and ground water, it is proposed that further reductions to the monitoring program are implemented in 2018. Given this consistency, annual monitoring is proposed for both ground and surface water during the summer, when dilution potential is the lowest such that leachate impacts would be most observable. The monitoring locations for ground and surface water are proposed to remain the same as the previous monitoring period and are outlined in Table 6. These locations will continue to provide both background reference water quality (MW107-II & D2) as well as proximal (MW117) and downgradient ground water quality (MW121-I & MW122-I). As the current trigger mechanism program is initiated when surface water quality parameter exceeds the trigger limit and is greater than double the PWQO for **more than 50% of the yearly** individual measurements, it is proposed that this be considered equivalent to an exceedance of the trigger limits and greater than double the PWQO **during three consecutive monitoring events**. Given the potential for surface water locations to be dry during the summer months on occasion, it is recommended that if dry summer conditions do not permit collection at any downgradient / downstream location, samples should be collected later in the year when sufficient water is present (i.e. fall).

The trigger mechanism is based on exceeding limits for at least half of the analyses during a calendar year. However, the trigger mechanism was written when samples were collected six times per year, and now it is completed only twice per year. However, the historical data provides a good basis for comparison and demonstrates consistent levels and trends for most parameters. For future monitoring, we recommend that, if any trigger limit was exceeded, that the processes and trends be reviewed as part of the assessment to identify the appropriate steps to address elevated levels. This is particularly true given the number of years since closure and that leachate parameter concentrations are stable and decreasing in the ground water and surface water downgradient of the site.

As per recommendations from the MOECC, annual reporting should continue every five years with the next report being submitted to the MOECC by April 15, 2023.

Table 6: Proposed Monitoring Program

Monitor Location	Intended Characterization	Annual Frequency*	Parameters
107-II	overburden background	Once (Summer*)	Major and Minor Inorganics, VOC's & Water Level Measurements
117	source (new cells)		
121-I	pathway 200 m from source		
122-I	pathway 350 m from source		
A3	trigger compliance point	Once (Summer*)	Major and Minor Inorganics, VOC's
A4	discharge to Breakneck Lake		
D2	surface water background		

* - samples to be collected in fall if insufficient water present during summer

4.0 REFERENCES

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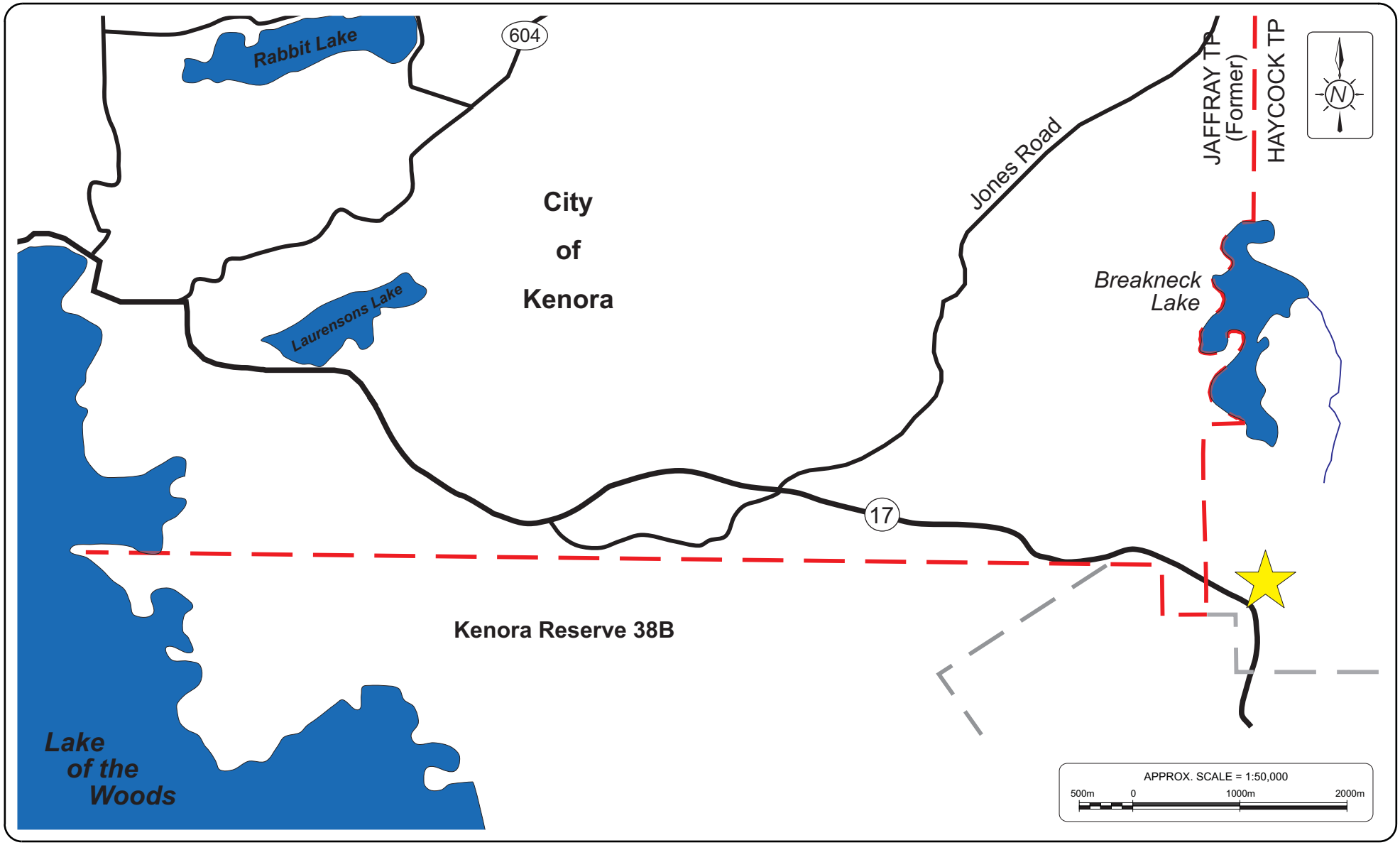
APPENDICES

APPENDIX A

Figures



Legend:

Approximate Location of Landfill Site

AZIMUTH ENVIRONMENTAL CONSULTING, INC.

Site Location

Date Issued:	March 2018
Created By:	CMR
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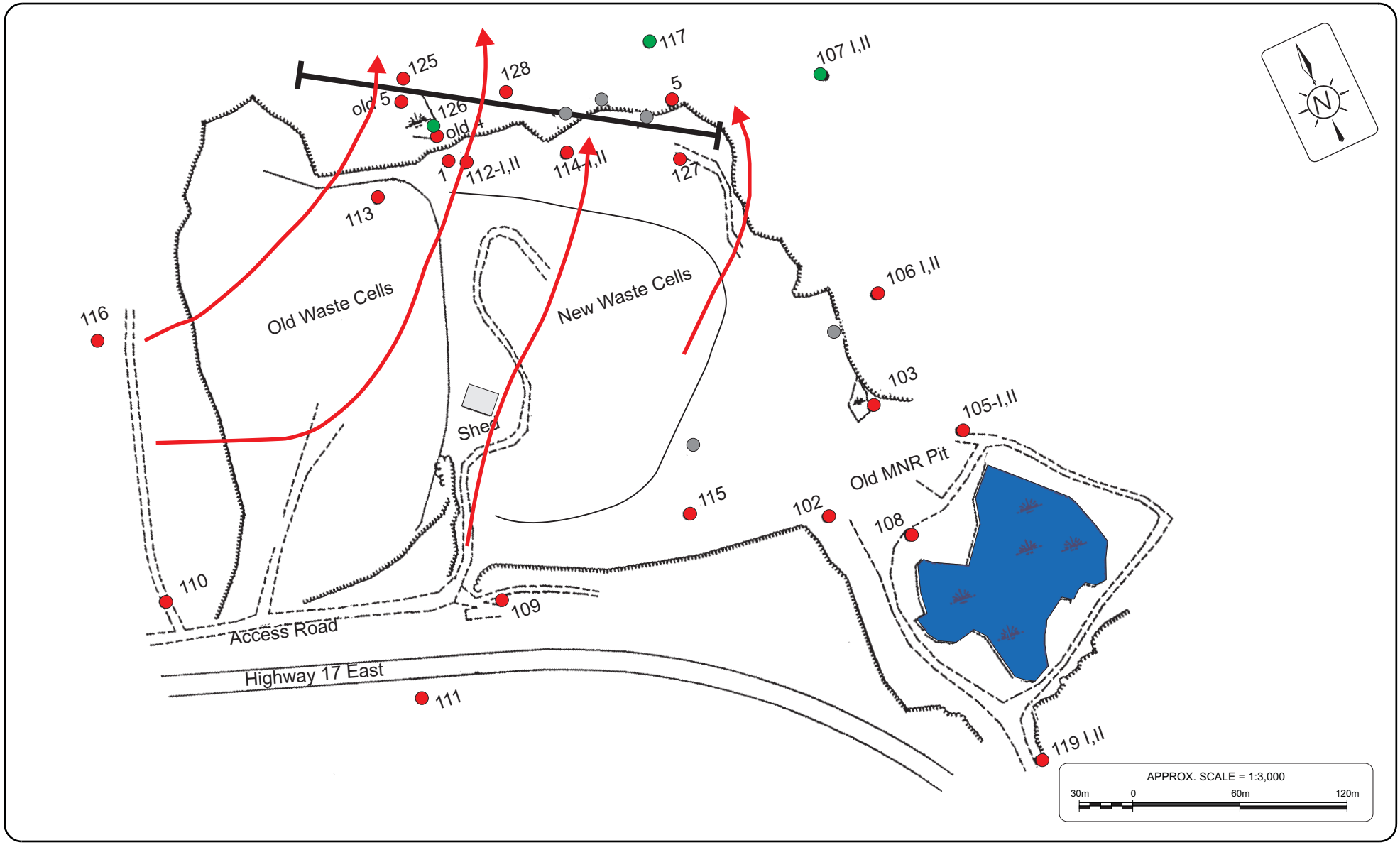
File Name:	Figure 1 - Site Map.CDR

City of Kenora
Tri-Municipal Landfill Site

2012 - 2017 Monitoring Report

Figure No.

1



Legend:

- Existing Ground Water Monitor
- Currently Monitored Ground Water Monitor
- Abandoned Ground Water Monitor
- Site Building
- Wetland Area
- Proposed Alignment of Contingency Leachate Collection System (Remenant from historic Site plan)
- Ground Water Flow Direction (Based on Historic Data)

AZIMUTH ENVIRONMENTAL CONSULTING, INC.

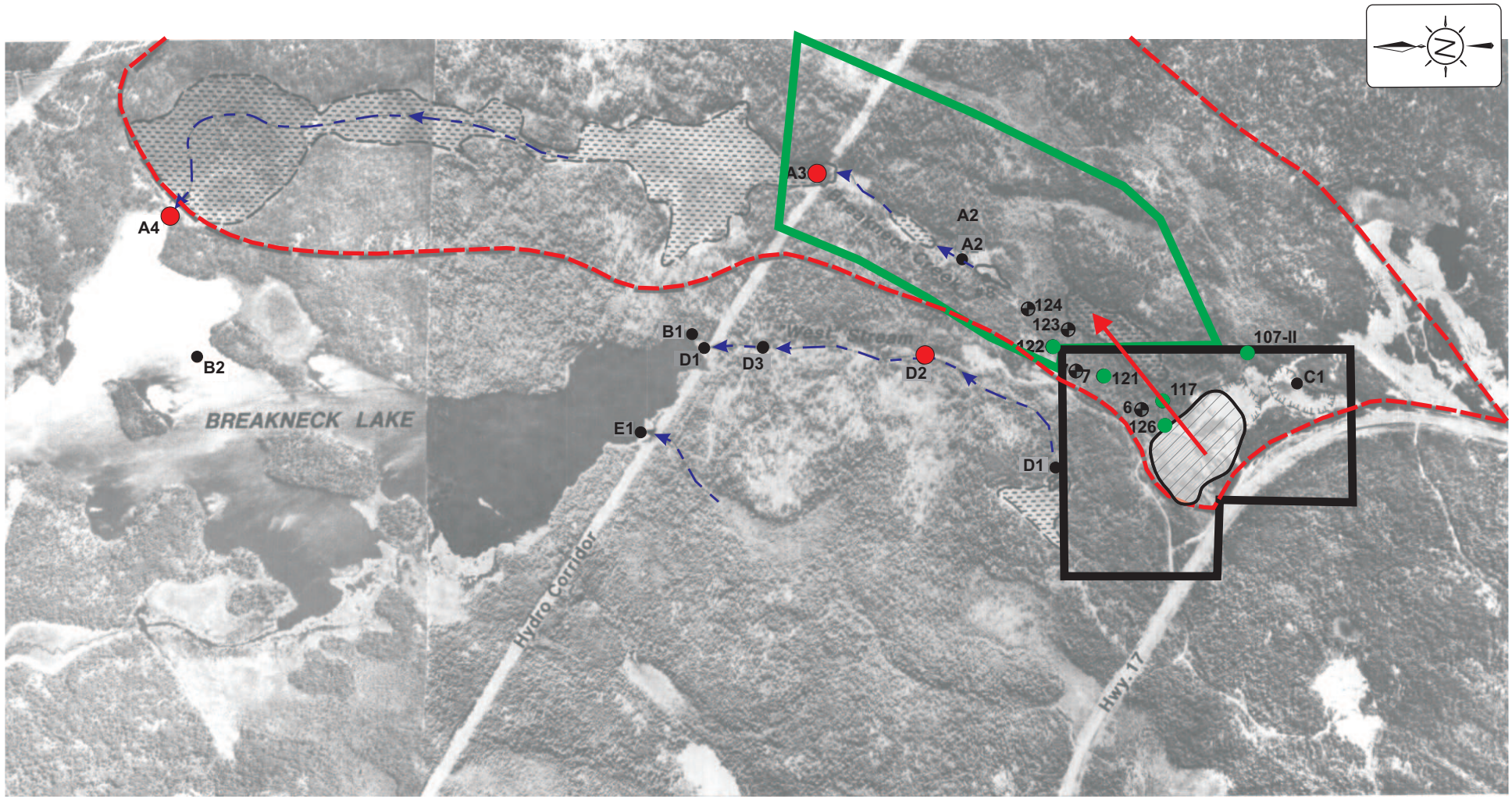
Site Layout & Ground Water Monitor Locations

Date Issued:	March 2018
Created By:	CMR
Project No.	17-021
File Name:	Figure 2 - Site Layout Plan.CDR

City of Kenora
Tri-Municipal Landfill Site

2012 - 2017 Monitoring Report

Figure No. 2



Legend:

- Watershed boundary
- Wetland
- Landfill Footprint
- Creek Flow
- GW Flow
- Surface Water Sampling Location
- Former Surface Water Sampling Location
- Existing Ground Water Monitor
- Currently Monitored Ground Water Monitor

AZIMUTH ENVIRONMENTAL CONSULTING, INC.

Surface Water Monitor Locations

Date Issued:	March 2017
Created By:	CMR
Project No.	17-021
File Name:	Figure 3 - Surface Water Monitors.CDR

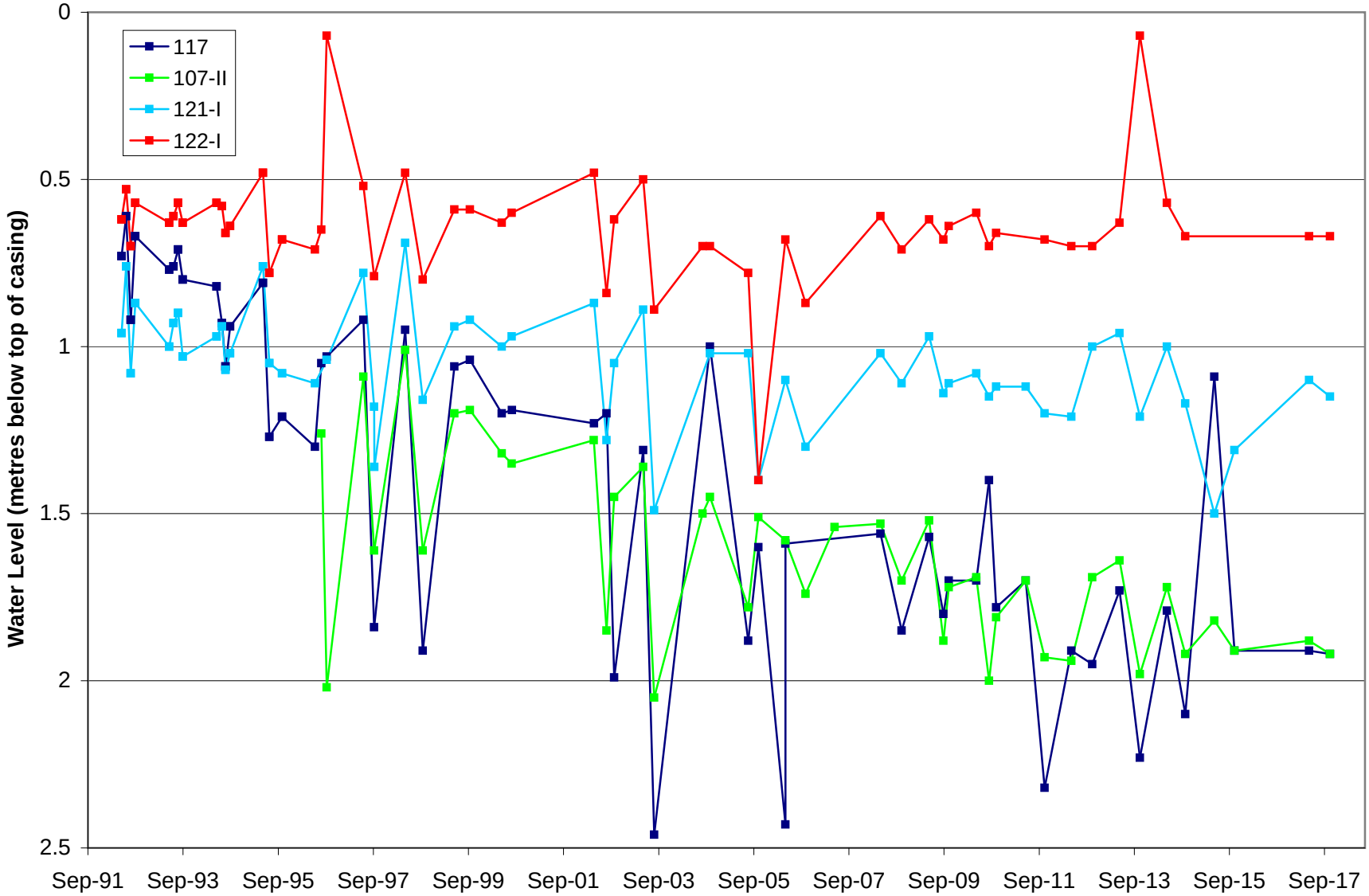
City of Kenora
Tri-Municipal Landfill Site

2012 - 2017 Monitoring Report

Figure No.

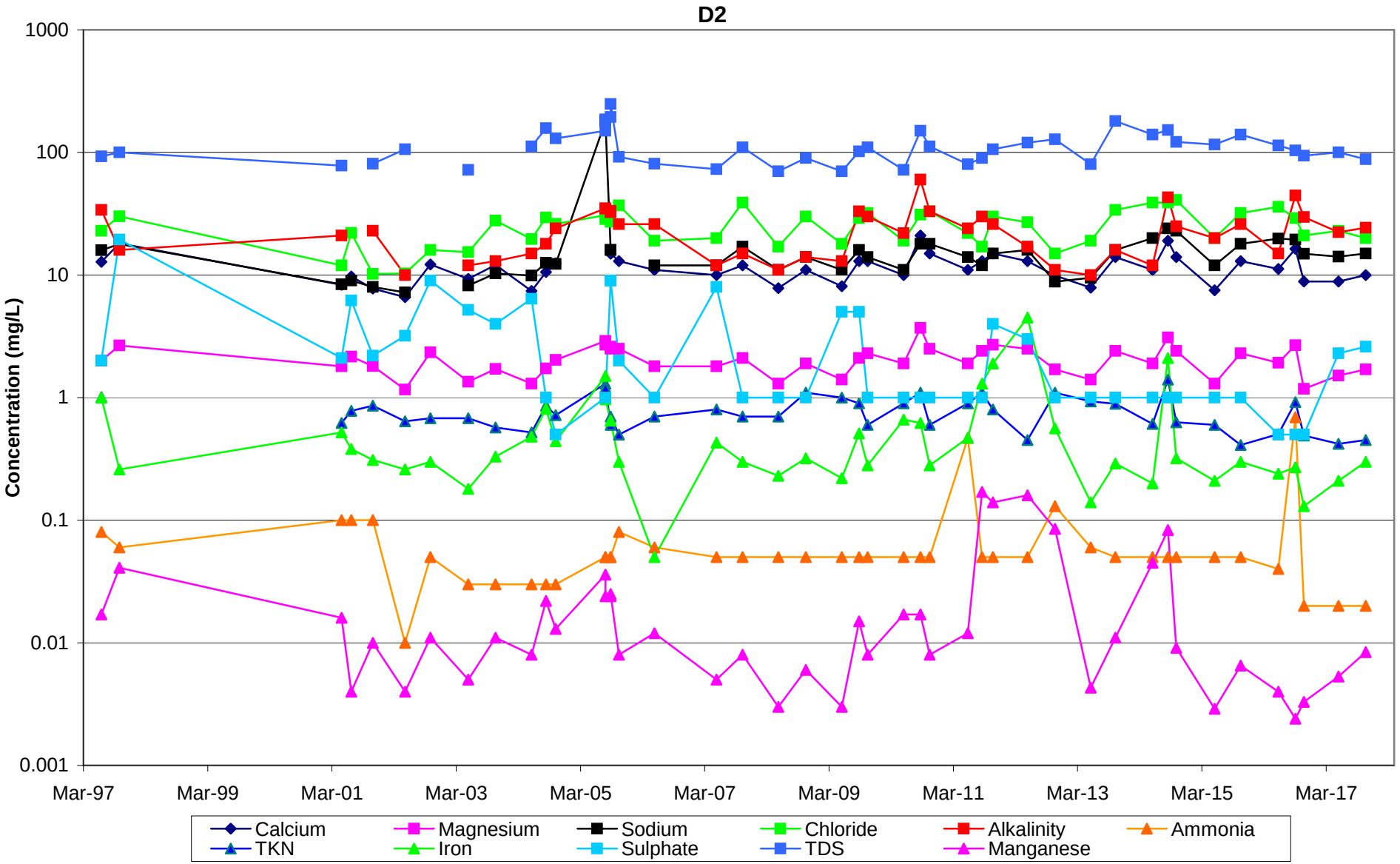
3

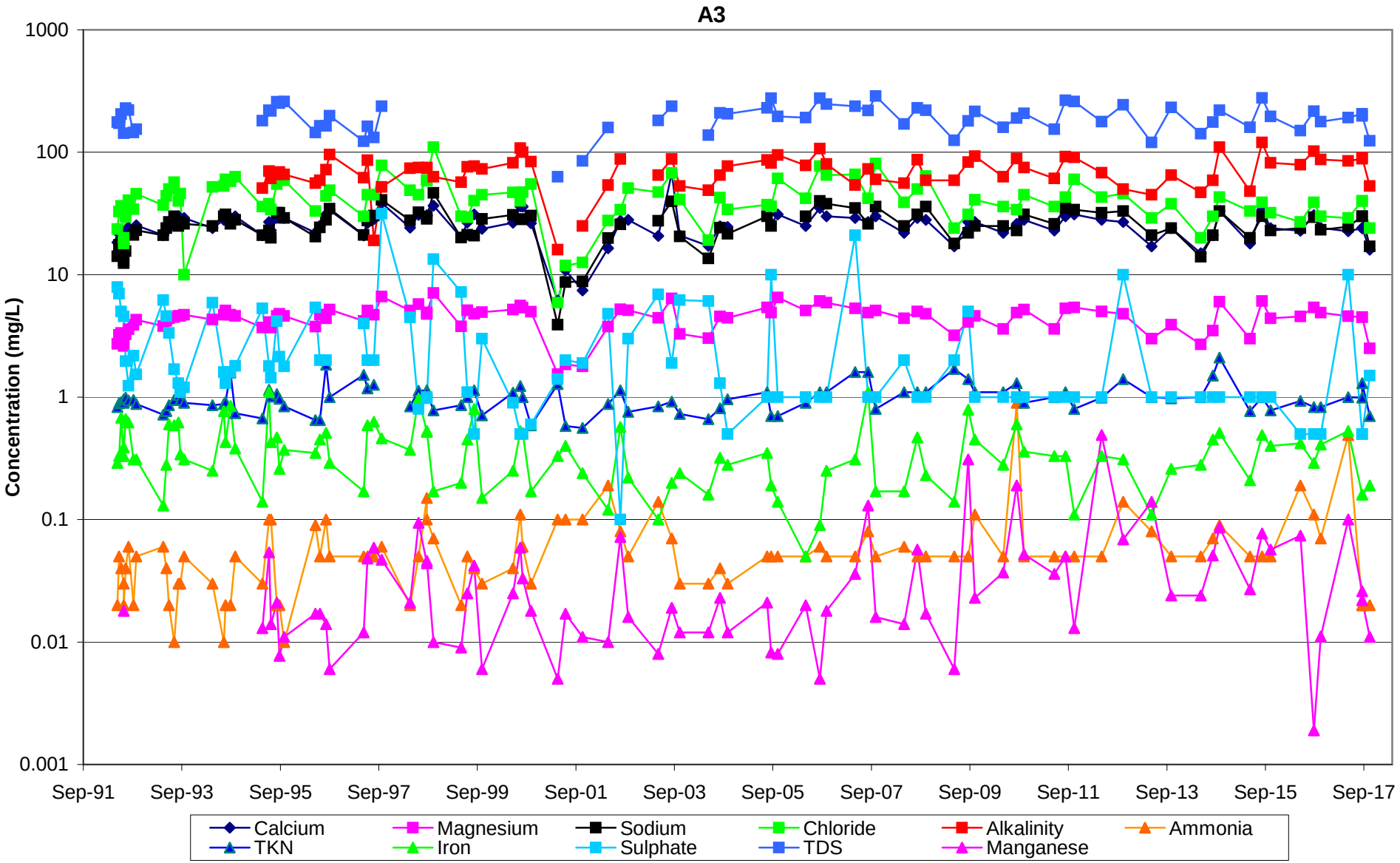
Figure 4 - Water Levels Over Time

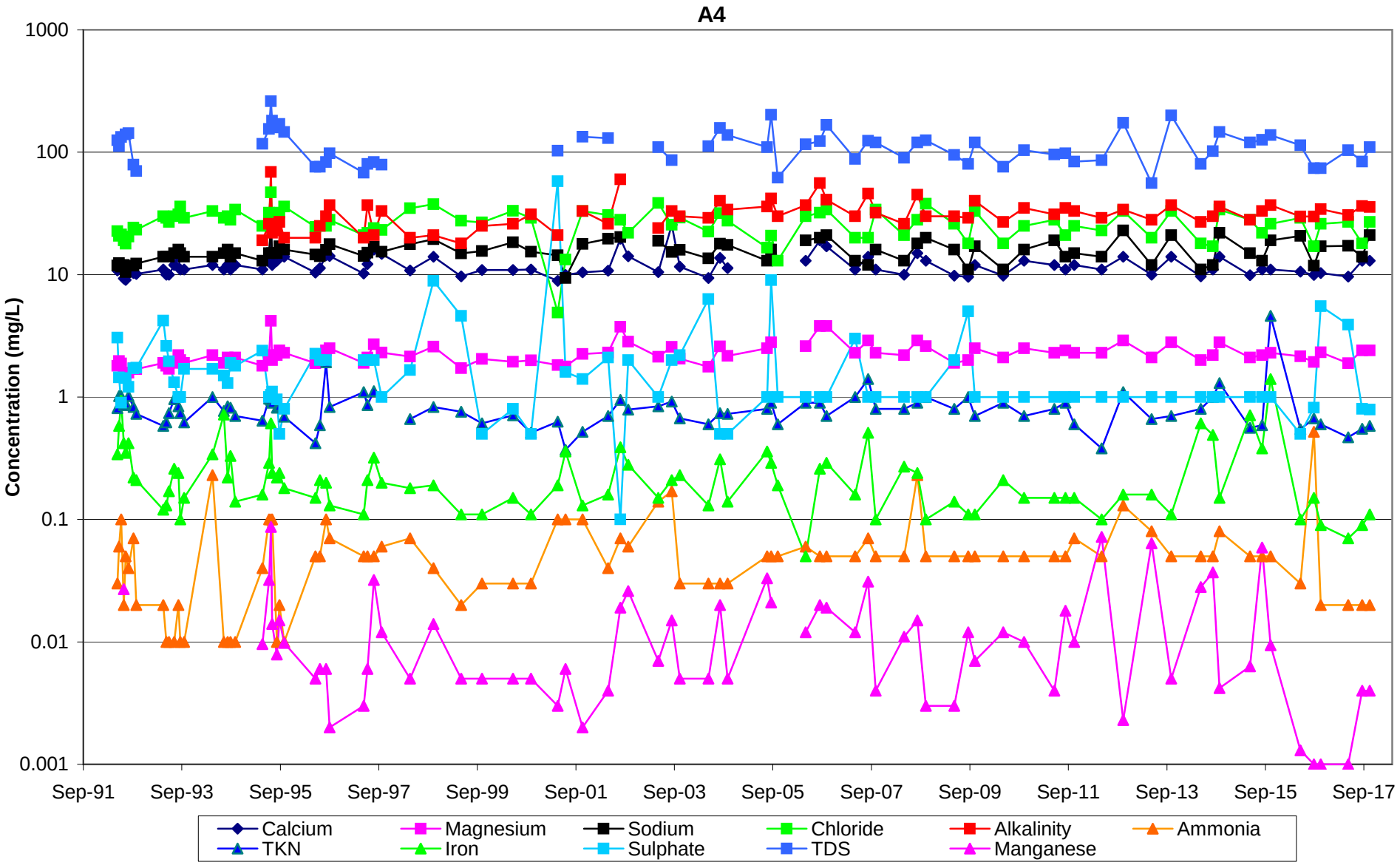


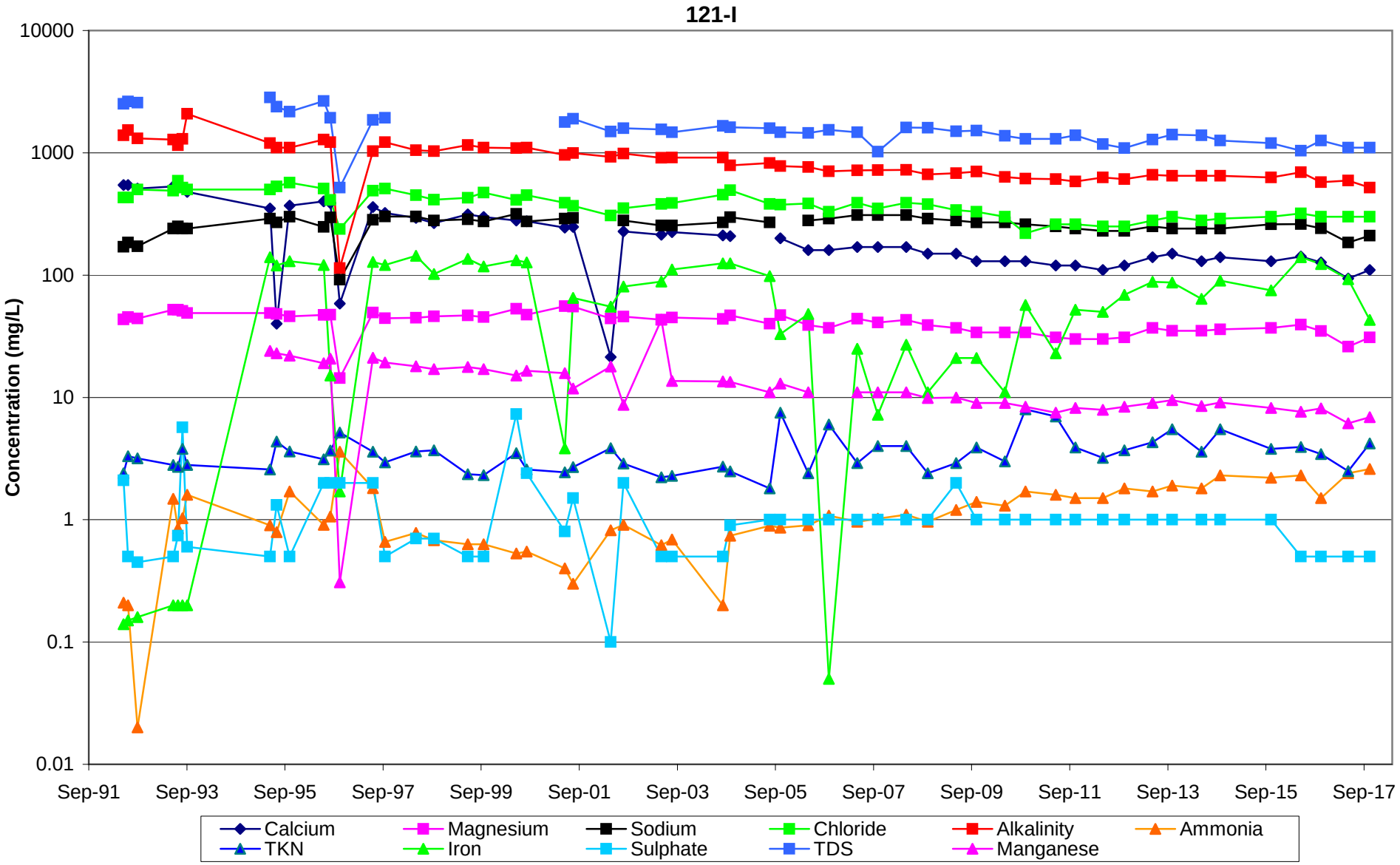
APPENDIX B

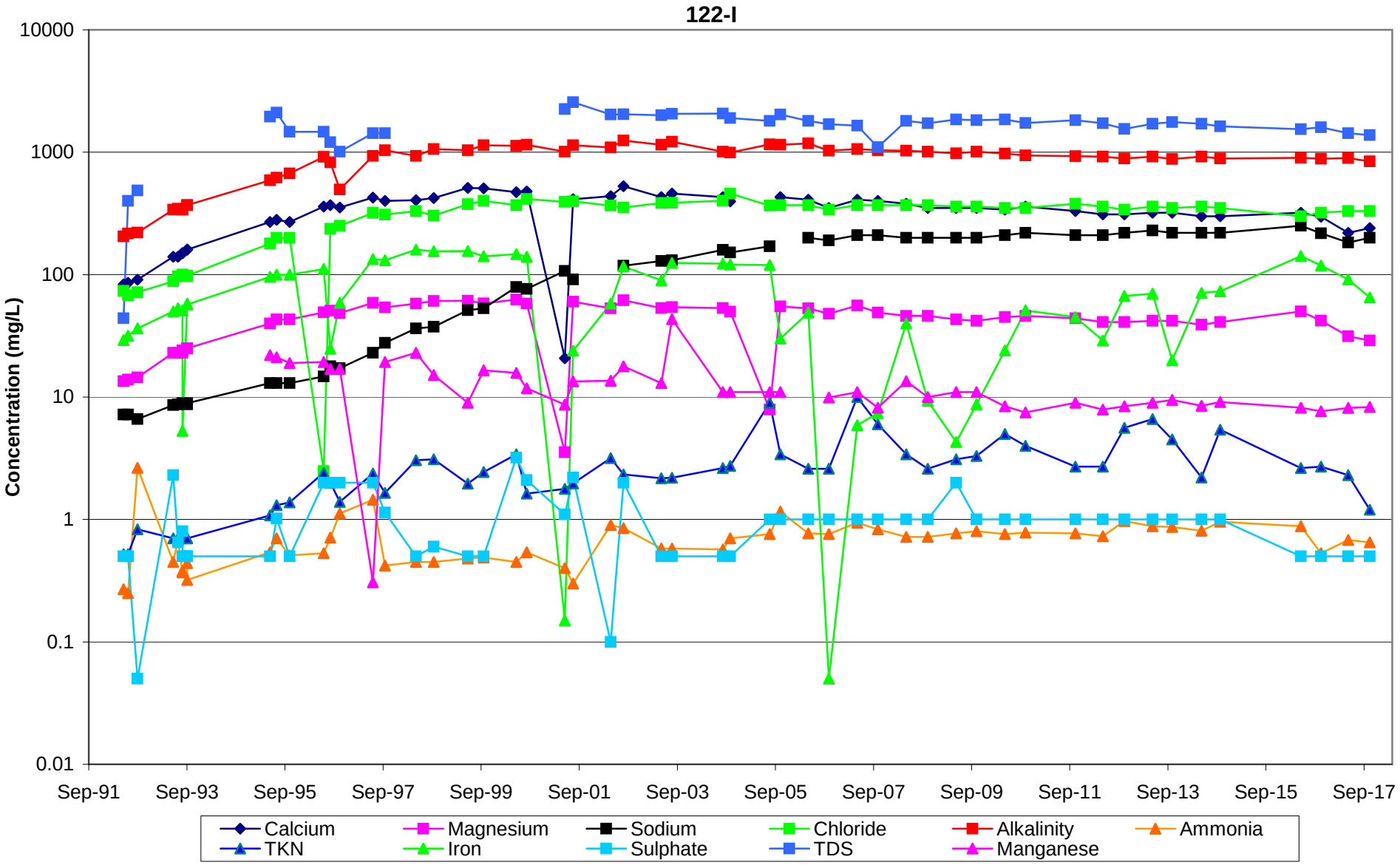
Chemistry Over Time Graphs

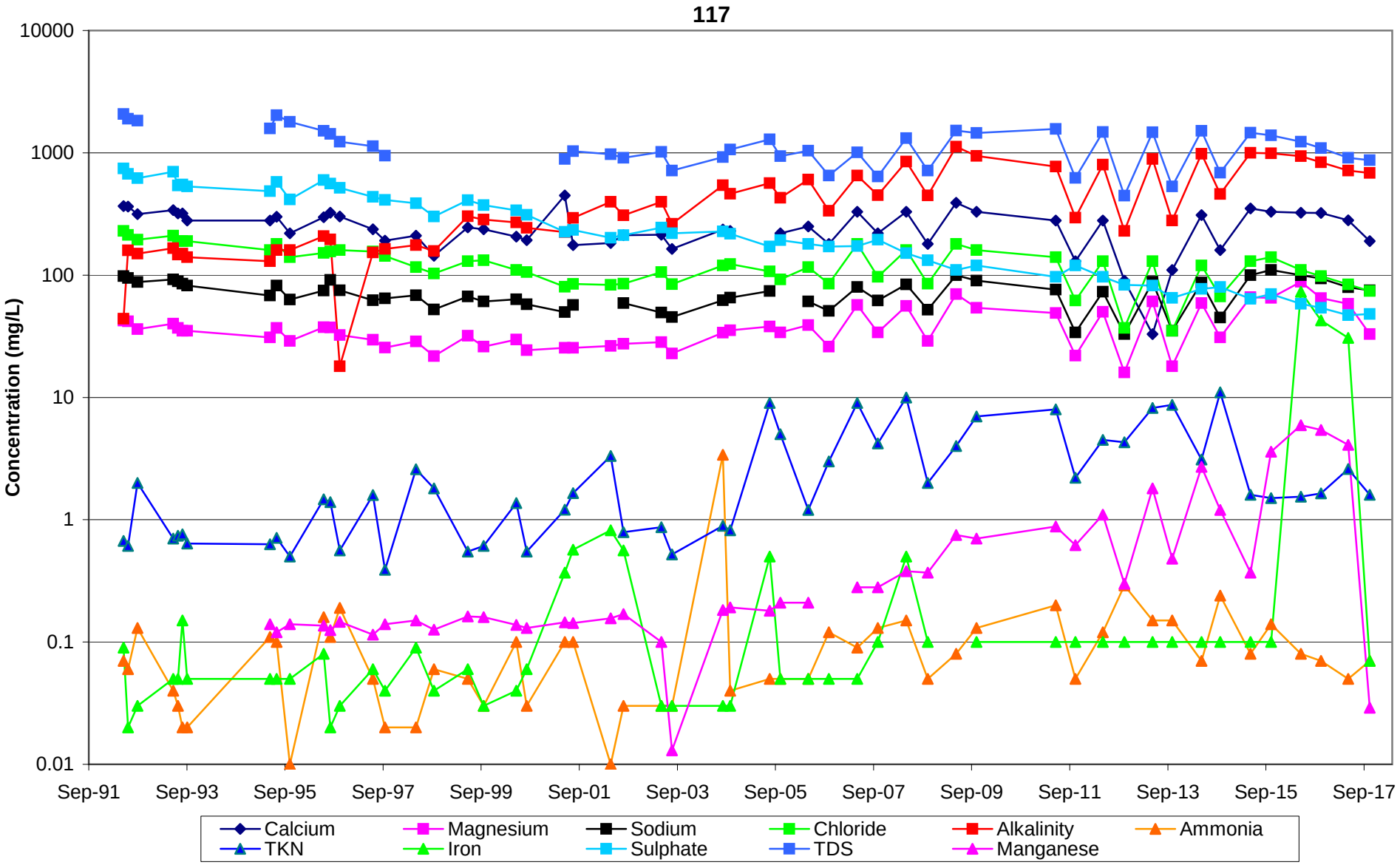

D2
Concentration (mg/L)
1000
100
10
1
0.1
0.01
0.001
Mar-97
Mar-99
Mar-01
Mar-03
Mar-05
Mar-07
Mar-09
Mar-11
Mar-13
Mar-15
Mar-17
Calcium
Magnesium
Sodium
Chloride
Alkalinity
Ammonia
TKN
Iron
Sulphate
TDS
Manganese

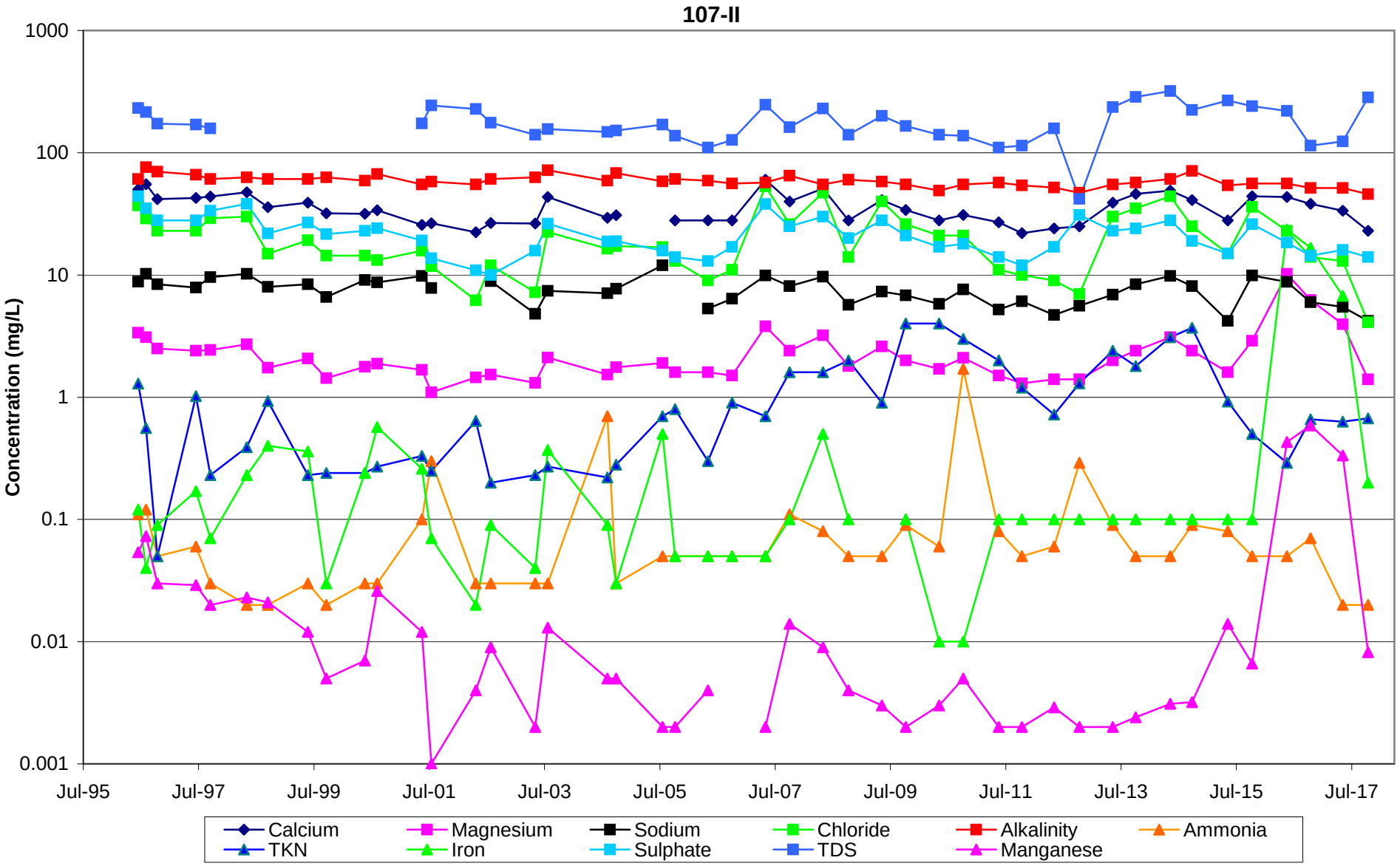

A3
Concentration (mg/L)
1000
100
10
1
0.1
0.01
0.001
Sep-91
Sep-93
Sep-95
Sep-97
Sep-99
Sep-01
Sep-03
Sep-05
Sep-07
Sep-09
Sep-11
Sep-13
Sep-15
Sep-17
Calcium
Magnesium
Sodium
Chloride
Alkalinity
Ammonia
TKN
Iron
Sulphate
TDS
Manganese


A4
Concentration (mg/L)
1000
100
10
1
0.1
0.01
0.001
Sep-91
Sep-93
Sep-95
Sep-97
Sep-99
Sep-01
Sep-03
Sep-05
Sep-07
Sep-09
Sep-11
Sep-13
Sep-15
Sep-17
Calcium
Magnesium
Sodium
Chloride
Alkalinity
Ammonia
TKN
Iron
Sulphate
TDS
Manganese


121-I
Concentration (mg/L)
10000
1000
100
10
1
0.1
0.01
Sep-91
Sep-93
Sep-95
Sep-97
Sep-99
Sep-01
Sep-03
Sep-05
Sep-07
Sep-09
Sep-11
Sep-13
Sep-15
Sep-17
Calcium
Magnesium
Sodium
Chloride
Alkalinity
Ammonia
TKN
Iron
Sulphate
TDS
Manganese


122-I
Concentration (mg/L)
10000
1000
100
10
1
0.1
0.01
Sep-91
Sep-93
Sep-95
Sep-97
Sep-99
Sep-01
Sep-03
Sep-05
Sep-07
Sep-09
Sep-11
Sep-13
Sep-15
Sep-17
Calcium
Magnesium
Sodium
Chloride
Alkalinity
Ammonia
TKN
Iron
Sulphate
TDS
Manganese


117
10000
1000
100
10
1
0.1
0.01
Concentration (mg/L)
Sep-91
Sep-93
Sep-95
Sep-97
Sep-99
Sep-01
Sep-03
Sep-05
Sep-07
Sep-09
Sep-11
Sep-13
Sep-15
Sep-17
Calcium
Magnesium
Sodium
Chloride
Alkalinity
Ammonia
TKN
Iron
Sulphate
TDS
Manganese


107-II
Concentration (mg/L)
1000
100
10
1
0.1
0.01
0.001
Jul-95
Jul-97
Jul-99
Jul-01
Jul-03
Jul-05
Jul-07
Jul-09
Jul-11
Jul-13
Jul-15
Jul-17
Calcium
Magnesium
Sodium
Chloride
Alkalinity
Ammonia
TKN
Iron
Sulphate
TDS
Manganese

APPENDIX C

Monitor Details

MONITOR DETAILS

			Elevations (masl)				
Borehole	Diameter	Stick-up	Ground	Top of Pipe	Screened Interval		
1				374.97		to	
2				375.36		to	
3				374.41		to	
4				373.93		to	
OLD 4				373.95		to	
5				373.79		to	
OLD 5				374.15		to	
6				369.41		to	
7				369.65		to	
102				376.80		to	
103				375.77		to	
104				375.13		to	
105-I	51.0	0.93	374.92	375.85	10.6	to	12.8
105-II	51.0	0.93	374.92	375.85	1.6	to	3.8
106-I	51.0	0.82	374.46	375.28	6.6	to	8.1
106-II	51.0	0.82	374.46	375.28	0.9	to	2.5
107-I				373.21		to	
107-II	51.0	0.68	99.32	100.00	1.5	to	3.9
108				376.50		to	
109		0.75	395.88	396.63		to	
110		0.93	395.31	396.24		to	
111	51.0	0.80	395.00	395.80		to	
112-I	51.0	1.07	373.37	374.44		to	
112-II	51.0	0.88	373.47	374.35		to	
113	51.0	0.98	380.46	381.44		to	
114-I	51.0	0.98	374.26	375.24		to	
114-II	51.0	1.26	374.34	375.60		to	
115R	51.0			383.65	5.1	to	9.7
116	51.0	1.24	398.06	399.30	2.5	to	5.6
117	51.0	1.16	371.36	372.52	2.0	to	2.8
119-I	51.0	0.96	377.43	378.39	11.1	to	14.2
119-II	51.0	0.74	377.39	378.13	3.9	to	5.4
121-I	51.0			100.00	2.8	to	4.3
121-II	51.0			100.00	1.1	to	1.9
122-I	51.0			100.00	5.4	to	7.7
122-II	51.0			100.00	1.8	to	2.5
123-I	51.0			100.00	13.0	to	16.0
123-II	51.0			100.00	1.7	to	2.5
124-I	51.0			100.00	5.1	to	6.6
124-II	51.0			100.00	1.7	to	2.5
125	51.0	0.84	371.89	372.73	1.2	to	3.1
126	51.0	0.53	373.11	373.64	0.9	to	2.8
127	51.0	0.69	373.22	373.91	1.1	to	4.0
128	51.0	0.81	373.07	373.88	1.8	to	3.6

BOREHOLE LOG	PROJECT: 91-278	BOREHOLE: 105-I 1 of 3
KENORA TRI-MUNICIPAL LANDFILL SITE KENORA, ONTARIO **FOR:** The Corporation of the Town of Kenora		**DATE:** 8 April 1992 **GEOLOGIST** TEK **ELEVATION** m ASL

DEPTH (m)	STRATIGRAPHY	STRATIGRAPHIC DESCRIPTION	MONITOR DETAILS & NUMBER	SAMPLE NUMBER	SAMPLE INTERVAL	SAMPLE TYPE	SAMPLE N VALUE	SAMPLE % WATER	SAMPLE % REC	SAMPLE % RQD	COMMENTS
1 2 3 4 5		**FINE TO MEDIUM SAND** Light reddish brown fine to medium sand, trace silt, trace fine gravel, saturated, compact.									

BOREHOLE LOG	PROJECT: 91-278	BOREHOLE: 105-I 2 of 3
KENORA TRI-MUNICIPAL LANDFILL SITE KENORA, ONTARIO **FOR:** The Corporation of the Town of Kenora		**DATE:** 8 April 1992 **GEOLOGIST** TEK **ELEVATION** m ASL

DEPTH (m)	STRATIGRAPHY	STRATIGRAPHIC DESCRIPTION	MONITOR DETAILS & NUMBER	SAMPLE NUMBER	SAMPLE INTERVAL	SAMPLE TYPE	SAMPLE N VALUE	SAMPLE % WATER	SAMPLE % REC	SAMPLE % RQD	COMMENTS
6.9											
7		**SAND AND GRAVEL** Medium to coarse sand and fine gravel, saturated, dense. Visible grains of quartz, granite, gneiss.									
8											
9											
9.7		**GREENSTONE BEDROCK** Greenstone bedrock, finely crystalline, massive. Occasional quartz veining. Most fractures closed or very tight and are infilled by secondary minerals (calcite).				HQ			100		
10											
11						HQ			100		

BOREHOLE LOG	PROJECT: 91-278	BOREHOLE: 105-I 3 of 3
KENORA TRI-MUNICIPAL LANDFILL SITE KENORA, ONTARIO **FOR:** The Corporation of the Town of Kenora		**DATE:** 8 April 1992 **GEOLOGIST** TEK **ELEVATION** m ASL

DEPTH (m)	STRATIGRAPHY	STRATIGRAPHIC DESCRIPTION	MONITOR DETAILS & NUMBER	SAMPLE NUMBER	SAMPLE INTERVAL	SAMPLE TYPE	SAMPLE N VALUE	SAMPLE % WATER	SAMPLE % REC	SAMPLE % RQD	COMMENTS
12.8		Borehole terminated at 12.81 m below ground in greenstone bedrock. Borehole straight augered to bedrock surface for core sample collection. No overburden samples collected. Stratigraphy has been obtained from BH105-II samples.									

BOREHOLE LOG	PROJECT: 91-278	BOREHOLE: 105-II 1 of 2
KENORA TRI-MUNICIPAL LANDFILL SITE KENORA, ONTARIO FOR: The Corporation of the Town of Kenora		DATE: 8 April 1992 GEOLOGIST TEK ELEVATION m ASL

DEPTH (m)	STRATIGRAPHY	STRATIGRAPHIC DESCRIPTION	MONITOR DETAILS & NUMBER	SAMPLE NUMBER	SAMPLE INTERVAL	SAMPLE TYPE	N VALUE	% WATER	% REC	% RQD	COMMENTS
0		**FINE TO MEDIUM SAND** Light reddish brown fine to medium sand, trace silt, trace fine gravel, saturated, compact.				SS	14	15	50		
1						SS	15		50		
2						SS	14	16.3	66		
3						SS	9	18.6	30		
4						SS	10	80	80		
5						SS	6	19.6	100		
						SS	7	17.6	90		

Gartner Lee Limited

BOREHOLE LOG	PROJECT: 91-278	BOREHOLE: 105-II 2 of 2
KENORA TRI-MUNICIPAL LANDFILL SITE KENORA, ONTARIO FOR: The Corporation of the Town of Kenora		DATE: 8 April 1992 GEOLOGIST TEK ELEVATION m ASL

DEPTH (m)	STRATIGRAPHY	STRATIGRAPHIC DESCRIPTION	MONITOR DETAILS & NUMBER	SAMPLE NUMBER	SAMPLE INTERVAL	SAMPLE TYPE	N VALUE	% WATER	% REC	% RQD	COMMENTS
						SS	14	6.5	40		
6.9											
7		**SAND AND GRAVEL** Medium to coarse sand and fine gravel, saturated, dense. Visible grains of quartz, granite, gneiss.				SS	31	8.1	30		
						SS	45	2.8	10		
8											
						SS	55	6.9	50		
9											
						SS	37	10.9	20		
9.7		Borehole terminated at 9.72 m below ground in sand and gravel. Augers removed to 3.78 m below ground for monitor installation.									

Gartner Lee Limited

BOREHOLE LOG	PROJECT: 91-278	BOREHOLE: 106-I 1 of 2
KENORA TRI-MUNICIPAL LANDFILL SITE KENORA, ONTARIO FOR: The Corporation of the Town of Kenora		DATE: 9 April 1992 GEOLOGIST TEK ELEVATION m ASL

DEPTH (m)	STRATIGRAPHY	STRATIGRAPHIC DESCRIPTION	MONITOR DETAILS & NUMBER	SAMPLE NUMBER	SAMPLE INTERVAL	SAMPLE TYPE	SAMPLE N VALUE	% WATER	% REC	% RQD	COMMENTS
0.3		**PEAT** Black peat, wood, leaves, roots, spongy, wet, very loose.									
		FINE TO MEDIUM SAND Light reddish brown fine to medium sand, saturated, compact.									
1											
2											
3											
3.9		**MEDIUM TO COARSE SAND** Light greyish brown medium to coarse sand, trace rounded gravel, trace silt, saturated, compact.									
4											
5											
5.7											
5.8		**GRAVEL** Loose subangular granitic gravel, some small cobbles.				HQ			100		

Gartner Lee Limited

BOREHOLE LOG	PROJECT: 91-278	BOREHOLE: 106-I 2 of 2
KENORA TRI-MUNICIPAL LANDFILL SITE KENORA, ONTARIO FOR: The Corporation of the Town of Kenora		DATE: 9 April 1992 GEOLOGIST TEK ELEVATION m ASL

DEPTH (m)	STRATIGRAPHY	STRATIGRAPHIC DESCRIPTION	MONITOR DETAILS & NUMBER	SAMPLE NUMBER	SAMPLE INTERVAL	SAMPLE TYPE	SAMPLE N VALUE	SAMPLE % WATER	SAMPLE % REC	SAMPLE % RQD	COMMENTS
7		**GREENSTONE BEDROCK** Greenstone bedrock, finely crystalline, massive. Numerous fractures. Most fractures are closed and oblique. Most fractures are infilled by secondary minerals (calcite).				HQ					
8.1 8		Borehole terminated at 8.13 m below ground in greenstone bedrock. Borehole straight augered to top of bedrock for core sampling. No overburden samples collected. Stratigraphy obtained from BH106-II samples.									

BOREHOLE LOG

PROJECT: 91-278

BOREHOLE: 106-II 1 of 1

KENORA TRI-MUNICIPAL LANDFILL SITE
KENORA, ONTARIO
FOR: The Corporation of the Town of Kenora

DATE: 10 April 1992
GEOLOGIST TEK
ELEVATION m ASL

DEPTH (m)	STRATIGRAPHY	STRATIGRAPHIC DESCRIPTION	MONITOR DETAILS & NUMBER	SAMPLE NUMBER	SAMPLE INTERVAL	SAMPLE TYPE	SAMPLE N VALUE	SAMPLE % WATER	SAMPLE % REC	SAMPLE % RQD	COMMENTS
0.3		**PEAT** Black peat, wood, leaves, roots, spongy, wet, very loose.				GS					
		FINE TO MEDIUM SAND Light reddish brown fine to medium sand, saturated, compact.				SS	21	15.3			
1						SS	18	17.1			
2						SS	15	16	100		
3											
3.9		**MEDIUM TO COARSE SAND** Light greyish brown medium to coarse sand, trace rounded gravel, trace silt, saturated, compact.				SS	20	12.1	50		
4						SS	23		0		
5						SS	31	12	15		
6.2		Borehole terminated at 6.17 m below ground in sand. Augers removed to 2.47 m below ground for monitor installation.									

Gartner Lee Limited

BOREHOLE LOG	PROJECT: 91-278	BOREHOLE: 115-R 1 of 2
KENORA TRI-MUNICIPAL LANDFILL SITE KENORA, ONTARIO FOR: The Corporation of the Town of Kenora		DATE: 10 April 1992 GEOLOGIST TEK ELEVATION m ASL

DEPTH (m)	STRATIGRAPHY	STRATIGRAPHIC DESCRIPTION	MONITOR DETAILS & NUMBER	SAMPLE NUMBER	SAMPLE INTERVAL	SAMPLE TYPE	SAMPLE N VALUE	SAMPLE % WATER	SAMPLE % REC	SAMPLE % RQD	COMMENTS
0		**SAND** Medium brown medium sand, some gravel, some silt, trace cobbles. Becoming coarser with depth.				GS					
1											
2											
3						GS					
3.5		**GREENSTONE BEDROCK** Greenstone bedrock, finely crystalline, massive. Numerous tight and closed fractures. Upper weathered zone (3.55 m to 6.63 m) exhibits higher fracture frequency. Most fractures are infilled with secondary mineral deposits (calcite, hematite).				HQ			100		
4											
5						HQ			100		

Gartner Lee Limited

BOREHOLE LOG	PROJECT: 91-278	BOREHOLE: 115-R 2 of 2
KENORA TRI-MUNICIPAL LANDFILL SITE KENORA, ONTARIO **FOR:** The Corporation of the Town of Kenora		**DATE:** 10 April 1992 **GEOLOGIST** TEK **ELEVATION** m ASL

DEPTH (m)	STRATIGRAPHY	STRATIGRAPHIC DESCRIPTION	MONITOR DETAILS & NUMBER	SAMPLE NUMBER	SAMPLE INTERVAL	SAMPLE TYPE	SAMPLE N VALUE	SAMPLE % WATER	SAMPLE % REC	SAMPLE % RQD	COMMENTS
7						HQ			100		
8						HQ			100		
9											
9.7		Borehole terminated at 9.72 m below ground in greenstone bedrock.									

Gartner Lee Limited

BOREHOLE LOG	PROJECT: 91-278	BOREHOLE: 116-I 1 of 2
KENORA TRI-MUNICIPAL LANDFILL SITE KENORA, ONTARIO **FOR:** The Corporation of the Town of Kenora		**DATE:** 10 April 1992 **GEOLOGIST** TEK **ELEVATION** m ASL

DEPTH (m)	STRATIGRAPHY	STRATIGRAPHIC DESCRIPTION	MONITOR DETAILS & NUMBER	SAMPLE NUMBER	SAMPLE INTERVAL	SAMPLE TYPE	SAMPLE N VALUE	SAMPLE % WATER	SAMPLE % REC	SAMPLE % RQD	COMMENTS
0		**GREENSTONE BEDROCK** Greenstone bedrock, finely crystalline, massive. Occasional quartz veining. Generally tight, infrequent oblique fractures. Upper weathered zone exhibits a slightly higher fracture frequency. Fractures are closed or very tight. Open fractures are infilled by secondary minerals (calcite, hematite).				HQ			100		
1						HQ			100		
2						HQ			100		
3						HQ			100		
4						HQ			100		
5											
5.6											

Gartner Lee Limited

BOREHOLE LOG	PROJECT: 91-278	BOREHOLE: 116-I 2 of 2
KENORA TRI-MUNICIPAL LANDFILL SITE KENORA, ONTARIO **FOR:** The Corporation of the Town of Kenora		**DATE:** 10 April 1992 **GEOLOGIST** TEK **ELEVATION** m ASL

DEPTH (m)	STRATIGRAPHY	STRATIGRAPHIC DESCRIPTION	MONITOR DETAILS & NUMBER	SAMPLE							COMMENTS
				NUMBER	INTERVAL	TYPE	N VALUE	% WATER	% REC	% RQD	
		Borehole terminated at 5.56 m below ground in greenstone bedrock.									

BOREHOLE LOG

PROJECT: 91-278

BOREHOLE: 117-I 1 of 1

KENORA TRI-MUNICIPAL LANDFILL SITE
KENORA, ONTARIO
FOR: The Corporation of the Town of Kenora

DATE: 12 April 1992
GEOLOGIST TEK
ELEVATION m ASL

DEPTH (m)	STRATIGRAPHY	STRATIGRAPHIC DESCRIPTION	MONITOR DETAILS & NUMBER	SAMPLE NUMBER	SAMPLE INTERVAL	SAMPLE TYPE	SAMPLE N VALUE	SAMPLE % WATER	SAMPLE % REC	SAMPLE % RQD	COMMENTS
		PEAT Black peat, woods, leaves, roots, wet, very loose.									
						SS	8	19.6	70		
1.1	1										
		SILTY SAND Medium grey fine to medium silty sand, trace clay, fine rootlets, rust staining, A.T.P.L., firm.									
						SS	20	21.3	100		
2.0											
	2	**CLAYEY SILT** Light grey fine clayey silt, rust staining, stiff.									
						SS	50	23.8	50		
2.8											
		Borehole terminated at 2.78 m below ground upon auger refusal on assumed bedrock surface.									

Gartner Lee Limited

BOREHOLE LOG	PROJECT: 91-278	BOREHOLE: 119-I 1 of 2
KENORA TRI-MUNICIPAL LANDFILL SITE KENORA, ONTARIO **FOR:** The Corporation of the Town of Kenora		**DATE:** 7 April 1992 **GEOLOGIST** TEK **ELEVATION** m ASL

DEPTH (m)	STRATIGRAPHY	STRATIGRAPHIC DESCRIPTION	MONITOR DETAILS & NUMBER	SAMPLE							COMMENTS
				NUMBER	INTERVAL	TYPE	N VALUE	% WATER	% REC	% RQD	
0		**FINE TO MEDIUM SAND** Light reddish brown fine to medium sand, trace silt, saturated below 3.40 m, loose to compact.									
1											
2											
3											
4											
5											
6											
7											
8											

Gartner Lee Limited

BOREHOLE LOG	PROJECT: 91-278	BOREHOLE: 119-I 2 of 2
KENORA TRI-MUNICIPAL LANDFILL SITE KENORA, ONTARIO FOR: The Corporation of the Town of Kenora		DATE: 7 April 1992 GEOLOGIST TEK ELEVATION m ASL

DEPTH (m)	STRATIGRAPHY	STRATIGRAPHIC DESCRIPTION	MONITOR DETAILS & NUMBER	SAMPLE NUMBER	SAMPLE INTERVAL	SAMPLE TYPE	SAMPLE N VALUE	SAMPLE % WATER	SAMPLE % REC	SAMPLE % RQD	COMMENTS
9.3											
		COARSE SAND Coarse sand, some medium sand, trace fine sand, trace subangular gravel, saturated, compact. Visible grains of quartz, granite, gneiss.									
10											
11											
11.6		**GRAVEL** Coarse rounded gneissic and granitic gravel, small boulders, large cobbles, trace coarse sand, saturated, dense.									
12											
13											
14											
14.2		Borehole terminated at 14.20 m below ground in coarse gravels.									

Gartner Lee Limited

BOREHOLE LOG	PROJECT: 91-278	BOREHOLE: 119-II 1 of 2
KENORA TRI-MUNICIPAL LANDFILL SITE KENORA, ONTARIO **FOR:** The Corporation of the Town of Kenora		**DATE:** 8 April 1992 **GEOLOGIST** TEK **ELEVATION** m ASL

DEPTH (m)	STRATIGRAPHY	STRATIGRAPHIC DESCRIPTION	MONITOR DETAILS & NUMBER	SAMPLE NUMBER	SAMPLE INTERVAL	SAMPLE TYPE	SAMPLE N VALUE	SAMPLE % WATER	SAMPLE % REC	SAMPLE % RQD	COMMENTS
1		**FINE TO MEDIUM SAND** Light reddish brown fine to medium sand, trace silt, saturated below 3.40 m, loose to compact.									
2						GS					
3						SS	17	19.1	80		
4											
5						SS	13	18.4	15		
6						SS	21		0		
7											
						SS	8	14.7	20		

Gartner Lee Limited

BOREHOLE LOG	PROJECT: 91-278	BOREHOLE: 121-II 1 of 1
KENORA TRI-MUNICIPAL LANDFILL SITE KENORA, ONTARIO FOR: The Corporation of the Town of Kenora		DATE: 14 April 1992 GEOLOGIST TEK ELEVATION m ASL

DEPTH (m)	STRATIGRAPHY	STRATIGRAPHIC DESCRIPTION	MONITOR DETAILS & NUMBER	SAMPLE NUMBER	SAMPLE INTERVAL	SAMPLE TYPE	SAMPLE N VALUE	SAMPLE % WATER	SAMPLE % REC	SAMPLE % RQD	COMMENTS
1		**PEAT** Black peat, wood, leaves, roots, very wet, very soft.									
1.9		Borehole terminated at 1.85 m below ground in peat. Borehole straight augered to 1.85 m below ground for monitor installation. No samples collected. Stratigraphy obtained from BH121-I samples.									

Gartner Lee Limited

BOREHOLE LOG	PROJECT: 91-278	BOREHOLE: 122-I 1 of 2
KENORA TRI-MUNICIPAL LANDFILL SITE KENORA, ONTARIO **FOR:** The Corporation of the Town of Kenora		**DATE:** 13 April 1992 **GEOLOGIST** TEK **ELEVATION** m ASL

DEPTH (m)	STRATIGRAPHY	STRATIGRAPHIC DESCRIPTION	MONITOR DETAILS & NUMBER	SAMPLE NUMBER	SAMPLE INTERVAL	SAMPLE TYPE	SAMPLE N VALUE	SAMPLE % WATER	SAMPLE % REC	SAMPLE % RQD	COMMENTS
0		**PEAT** Black peat, wood, leaves, roots, spongy, very wet, very loose.									
1						GS		399.2			
2											
2.8		**ORGANIC SILT** Medium grey organic silt, W.T.P.L., very soft.									
3											
4											
4.6						GS					
5											

Gartner Lee Limited

BOREHOLE LOG	PROJECT: 91-278	BOREHOLE: 122-I 2 of 2
KENORA TRI-MUNICIPAL LANDFILL SITE KENORA, ONTARIO FOR: The Corporation of the Town of Kenora		DATE: 13 April 1992 GEOLOGIST TEK ELEVATION m ASL

DEPTH (m)	STRATIGRAPHY	STRATIGRAPHIC DESCRIPTION	MONITOR DETAILS & NUMBER	SAMPLE NUMBER	SAMPLE INTERVAL	SAMPLE TYPE	SAMPLE N VALUE	SAMPLE % WATER	SAMPLE % REC	SAMPLE % RQD	COMMENTS
6.3						SS	25	8	100		
6.5		**SAND** Light grey medium sand, some fine sand, saturated, compact.									
7		**GRAVEL** Fine to coarse subangular gravel, some coarse sand, some medium sand, saturated, compact.				SS	26	6	10		
7.7		Borehole terminated at 7.72 m below ground upon auger refusal on assumed bedrock surface.									

Gartner Lee Limited

BOREHOLE LOG	PROJECT: 91-278	BOREHOLE: 122-II 1 of 1
KENORA TRI-MUNICIPAL LANDFILL SITE KENORA, ONTARIO **FOR:** The Corporation of the Town of Kenora		**DATE:** 13 April 1992 **GEOLOGIST** TEK **ELEVATION** m ASL

DEPTH (m)	STRATIGRAPHY	STRATIGRAPHIC DESCRIPTION	MONITOR DETAILS & NUMBER	SAMPLE NUMBER	SAMPLE INTERVAL	SAMPLE TYPE	SAMPLE N VALUE	SAMPLE % WATER	SAMPLE % REC	SAMPLE % RQD	COMMENTS
1 2 2.5		**PEAT** Black peat, wood, leaves, roots, spongy, very wet, very loose.									
		Borehole terminated at 2.47 m below ground in peat. Borehole straight augered to 2.47 m for monitor installation. No samples collected. Stratigraphy obtained from BH122-I samples.									

Gartner Lee Limited

BOREHOLE LOG

PROJECT: 91-278

BOREHOLE: 123-I 1 of 2

KENORA TRI-MUNICIPAL LANDFILL SITE
KENORA, ONTARIO
FOR: The Corporation of the Town of Kenora

DATE: 13 April 1992
GEOLOGIST TEK
ELEVATION m ASL

DEPTH (m)	STRATIGRAPHY	STRATIGRAPHIC DESCRIPTION	MONITOR DETAILS & NUMBER	SAMPLE NUMBER	SAMPLE INTERVAL	SAMPLE TYPE	SAMPLE N VALUE	SAMPLE % WATER	SAMPLE % REC	SAMPLE % RQD	COMMENTS
0		**PEAT** Black peat, leaves, wood, roots, very wet, very loose.				GS		632.7			
1											
2											
2.8		**ORGANIC SILT** Medium grey organic silt, trace clay, W.T.P.L., very soft.									
3											
4											
5						GS		193			
6											
7											
8											
9											

Gartner Lee Limited

BOREHOLE LOG	PROJECT: 91-278	BOREHOLE: 123-I 2 of 2
KENORA TRI-MUNICIPAL LANDFILL SITE KENORA, ONTARIO FOR: The Corporation of the Town of Kenora		DATE: 13 April 1992 GEOLOGIST TEK ELEVATION m ASL

DEPTH (m)	STRATIGRAPHY	STRATIGRAPHIC DESCRIPTION	MONITOR DETAILS & NUMBER	SAMPLE NUMBER	SAMPLE INTERVAL	SAMPLE TYPE	SAMPLE N VALUE	SAMPLE % WATER	SAMPLE % REC	SAMPLE % RQD	COMMENTS
11											
12						SS	1	40.7	100		
12.7		**SILTY CLAY** Medium grey, very fine silty clay, W.T.P.L., very soft.				SS	2		100		
13						SS	6	32.5	100		
14.1 14		**SILTY SAND** Medium grey very fine silty sand, W.T.P.L., very soft.				SS	0	27.2	30		
15						SS	3	21.3	30		
15.8											
16.0 16		**SAND** Medium grey medium sand, some fine sand, saturated, very loose.									
		Borehole terminated at 16.04 m below ground in medium sand upon auger refusal on assumed bedrock surface.									

Gartner Lee Limited

BOREHOLE LOG	PROJECT: 91-278	BOREHOLE: 123-II 1 of 1
KENORA TRI-MUNICIPAL LANDFILL SITE KENORA, ONTARIO FOR: The Corporation of the Town of Kenora		DATE: 13 April 1992 GEOLOGIST TEK ELEVATION m ASL

DEPTH (m)	STRATIGRAPHY	STRATIGRAPHIC DESCRIPTION	MONITOR DETAILS & NUMBER	SAMPLE NUMBER	SAMPLE INTERVAL	SAMPLE TYPE	SAMPLE N VALUE	SAMPLE % WATER	SAMPLE % REC	SAMPLE % RQD	COMMENTS
1 2 2.5		**PEAT** Black peat, leaves, wood, roots, very wet, very loose.									
		Borehole terminated at 2.47 m below ground in peat. Borehole straight augered to 2.47 m below ground. No samples collected. Stratigraphy obtained from BH123-I samples.									

Gartner Lee Limited

BOREHOLE LOG

PROJECT: 91-278

BOREHOLE: 124-I 1 of 1

KENORA TRI-MUNICIPAL LANDFILL SITE
KENORA, ONTARIO
FOR: The Corporation of the Town of Kenora

DATE: 14 April 1992
GEOLOGIST TEK
ELEVATION m ASL

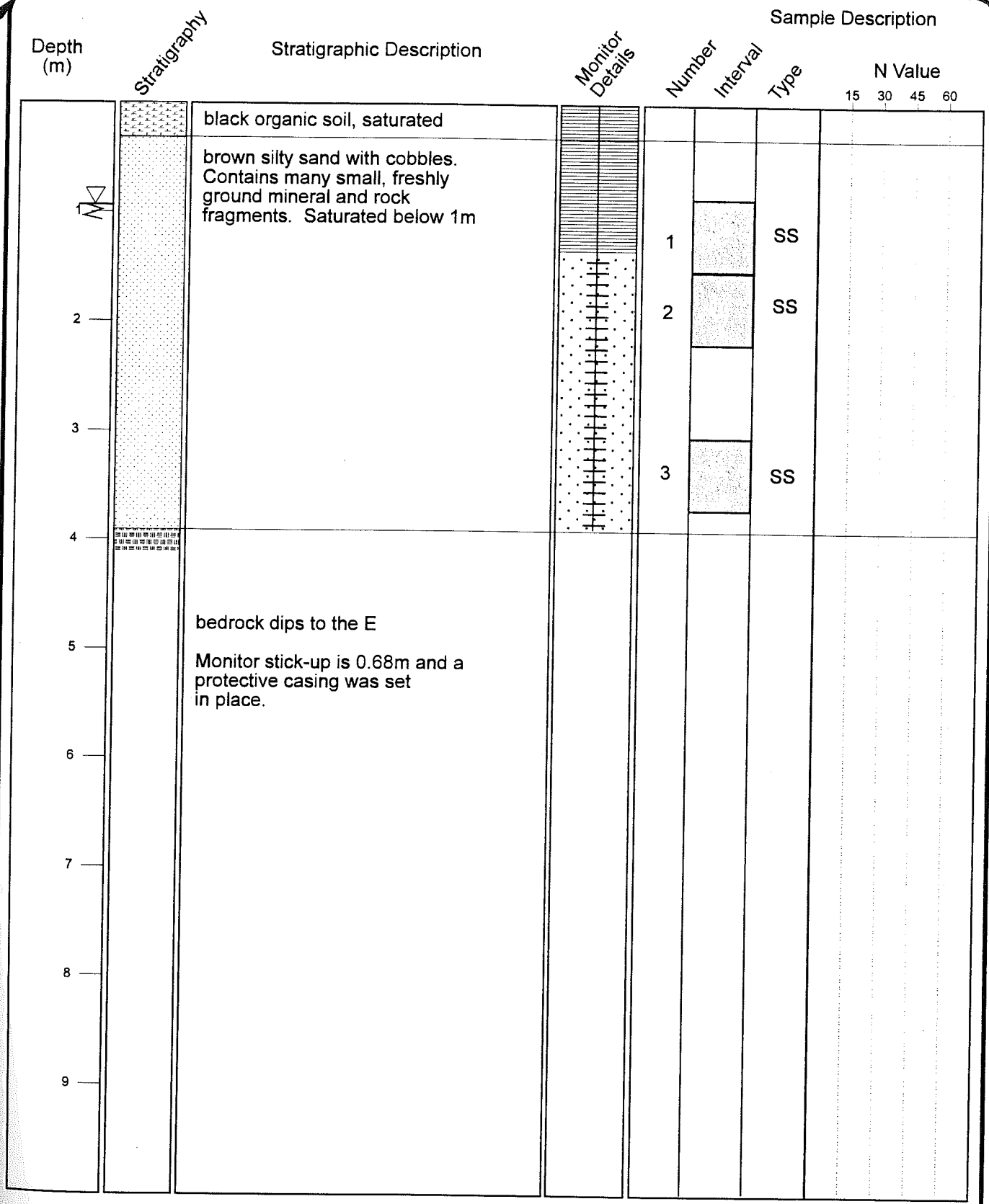
DEPTH (m)	STRATIGRAPHY	STRATIGRAPHIC DESCRIPTION	MONITOR DETAILS & NUMBER	SAMPLE NUMBER	SAMPLE INTERVAL	SAMPLE TYPE	SAMPLE N VALUE	SAMPLE % WATER	SAMPLE % REC	SAMPLE % RQD	COMMENTS
0		**PEAT** Black peat, wood, leaves, roots, very wet, very soft.									
1											
2						GS		384.4			
3											
4											
4.6		**SILTY CLAY** Medium grey silty clay, W.P.T.L., very soft.									
5						GS		25.8			
5.4		**SILTY SAND** Medium grey fine silty sand, saturated, soft.				SS	5	13.4			
5.8		**SAND** Medium grey medium to coarse sand, trace fine subangular gravel, saturated, compact. Becoming coarser with depth.									
6											
6.6						SS	11	17.4	75		
		Borehole terminated at 6.64 m below ground upon auger refusal on assumed bedrock surface.									

Gartner Lee Limited

BOREHOLE LOG	PROJECT: 91-278	BOREHOLE: 124-II 1 of 1
KENORA TRI-MUNICIPAL LANDFILL SITE KENORA, ONTARIO **FOR:** The Corporation of the Town of Kenora		**DATE:** 14 April 1992 **GEOLOGIST** TEK **ELEVATION** m ASL

DEPTH (m)	STRATIGRAPHY	STRATIGRAPHIC DESCRIPTION	MONITOR DETAILS & NUMBER	SAMPLE NUMBER	SAMPLE INTERVAL	SAMPLE TYPE	SAMPLE N VALUE	SAMPLE % WATER	SAMPLE % REC	SAMPLE % RQD	COMMENTS
1 2 2.5		**PEAT** Black peat, wood, leaves, roots, very wet, very soft.									
		Borehole terminated at 2.46 m below ground in peat. Borehole straight augered to 2.46 m below ground for monitor installation. No samples collected. Stratigraphy obtained from BH124-I samples.									

Gartner Lee Limited

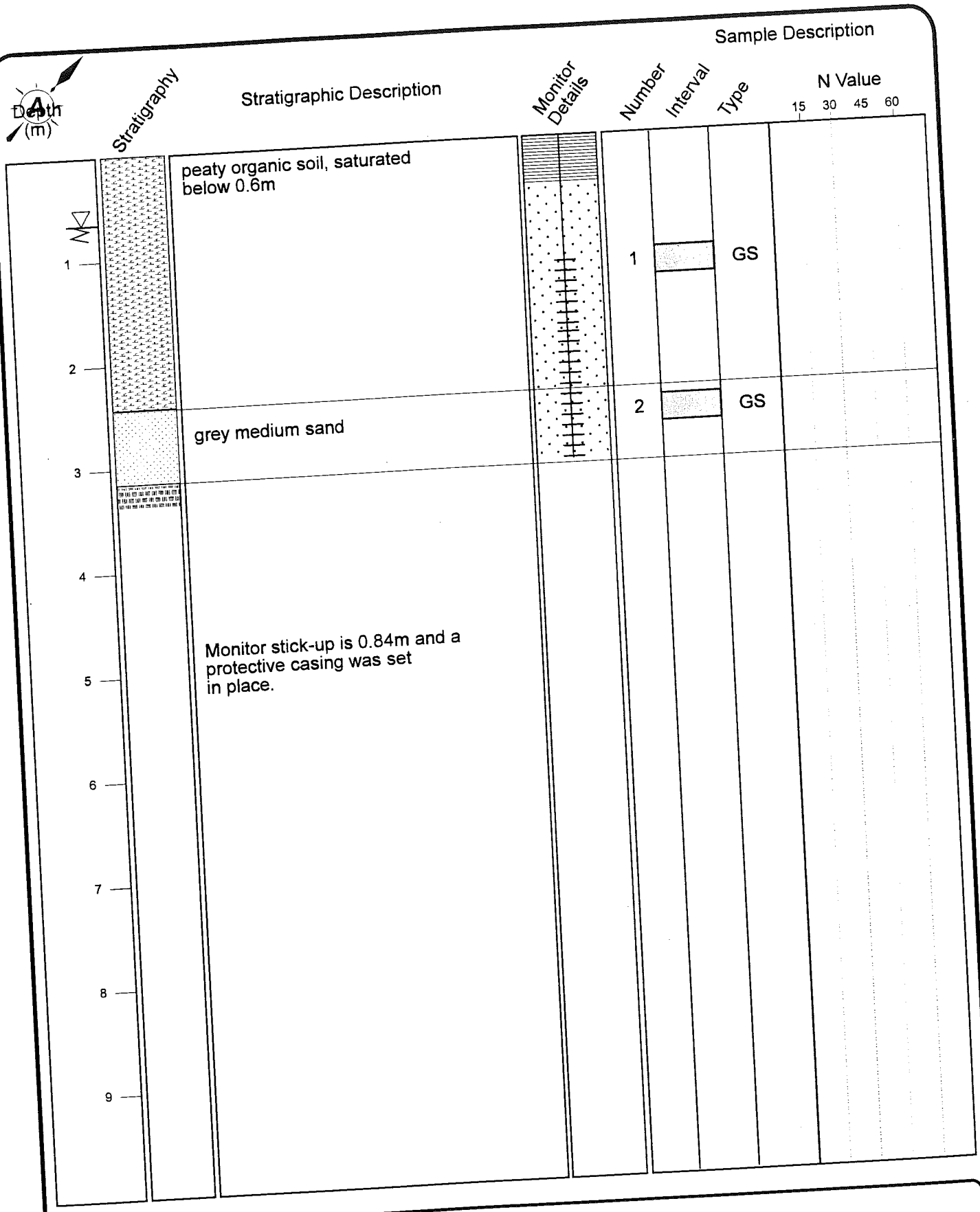


BOREHOLE LOG: 107-II

Client: Tri-Municipal Landfill LCS Drilling Program
Town of Kenora
Project: 96-003

Date Drilled: Feb. 2, 1996
Geologist: M. Jones
Elevation: approx 375 masl

Notes: This borehole was located to replace monitor 107-I and allow monitoring of ground water flow direction and quality.



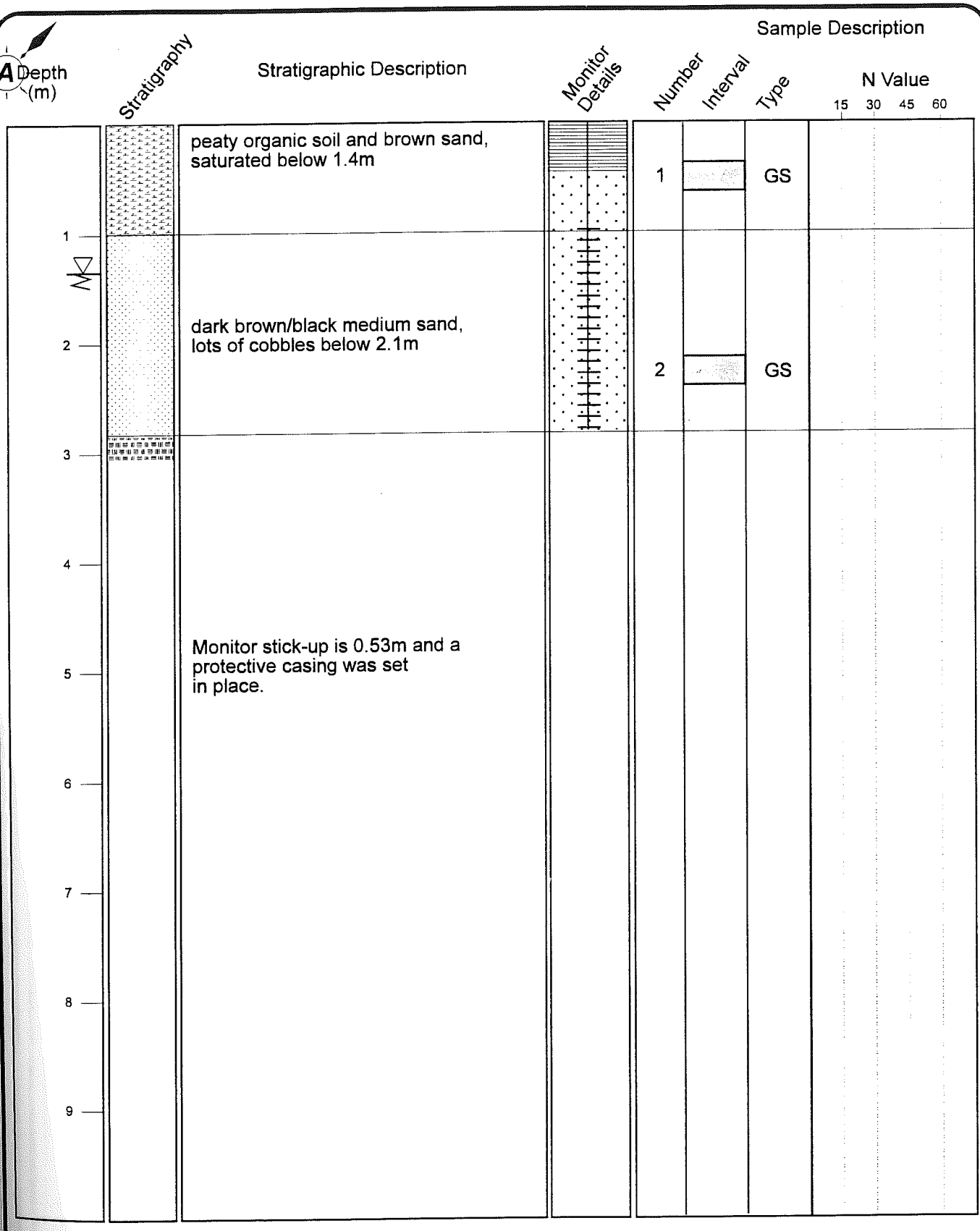
BOREHOLE LOG: 125

Client: Tri-Municipal Landfill LCS Drilling Program
Town of Kenora

Project: 96-003

Date Drilled: Feb. 3, 1996
Geologist: M. Jones
Elevation: approx 373 masl

Notes: This borehole was located to replace monitor old 5 and allow monitoring of ground water levels for the proposed LCS.

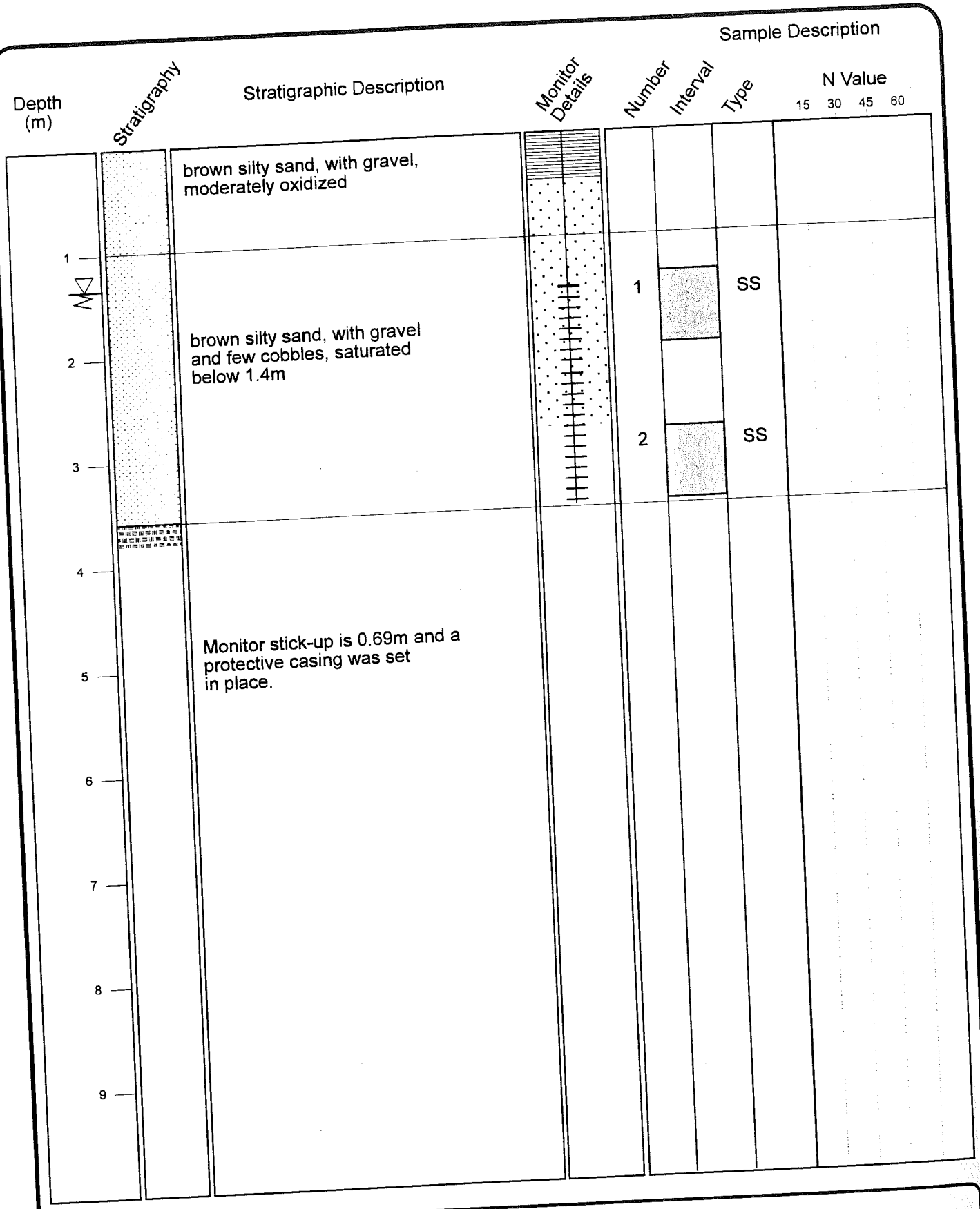


BOREHOLE LOG: 126

Client: Tri-Municipal Landfill LCS Drilling Program
Town of Kenora
Project: 96-003

Date Drilled: Feb. 3, 1996
Geologist: M. Jones
Elevation: approx 373 masl

Notes: This borehole was located to replace monitor old 4 and allow monitoring of ground water quality and levels for the proposed LCS.



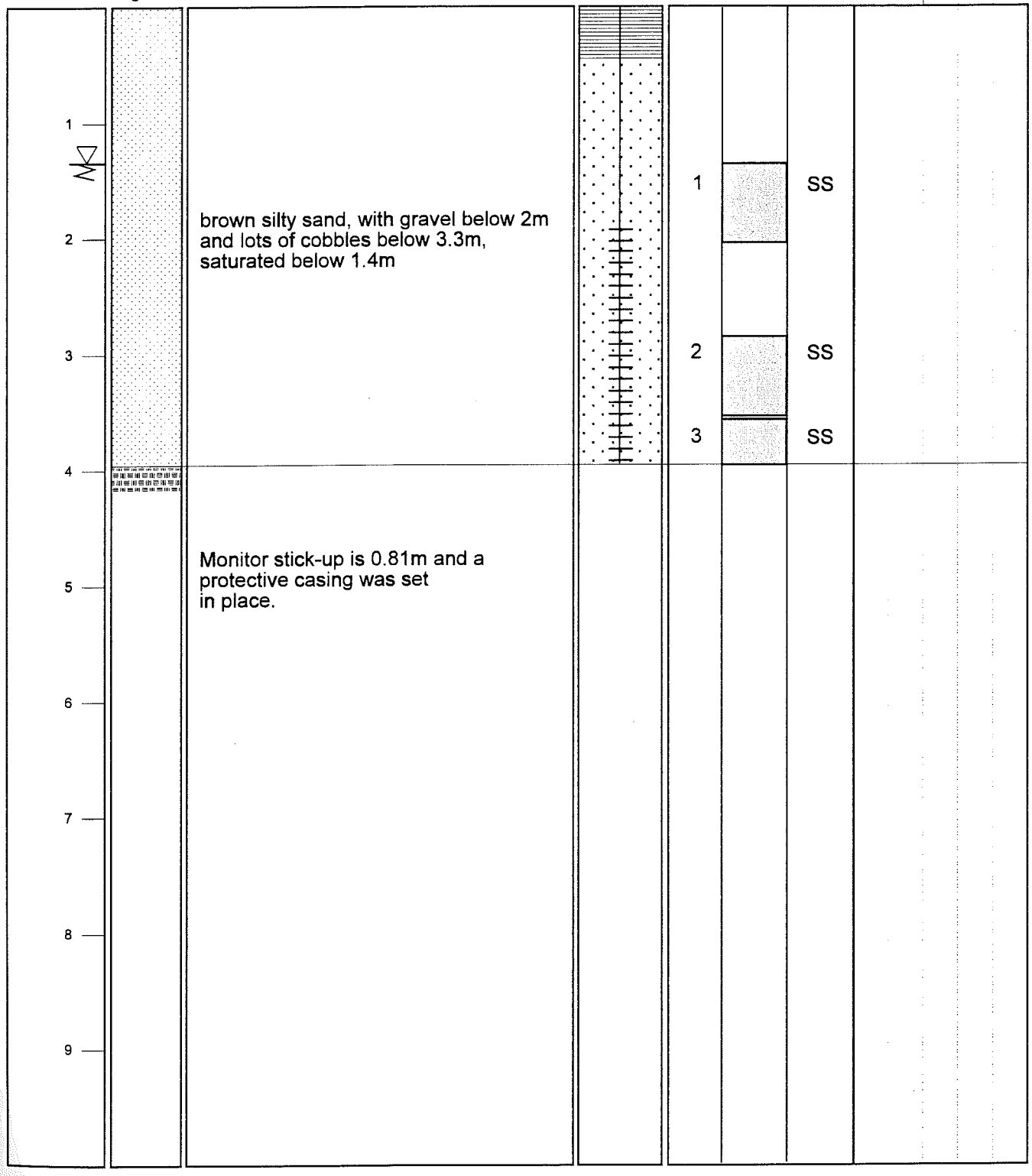
BOREHOLE LOG: 127

Client: Tri-Municipal Landfill LCS Drilling Program
Town of Kenora

Project: 96-003

Date Drilled: Feb. 2, 1996
Geologist: M. Jones
Elevation: approx 372 masl

Notes: This borehole was located to allow monitoring of ground water levels for the proposed LCS.



BOREHOLE LOG: 128

Client: Tri-Municipal Landfill LCS Drilling Program
Town of Kenora
Project: 96-003

Date Drilled: Feb. 2, 1996
Geologist: M. Jones
Elevation: approx 373 masl

Notes: This borehole was located to allow monitoring of ground water levels for the proposed LCS.

APPENDIX D

Summary of Water Quality Data

SUMMARY OF MONITORING DATA - MAJOR PARAMETERS

Monitor 107-II

Date	pH	Ca	Mg	Na	K		alkalinity	Cl	SO4		Fe		Zn		NO3		NO2		NH3		TKN	Hardness	TDS	Sp. Cond.
02-Jul-96	6.40	50	3.36	8.8	3.1		61.0	37.00	44		0.12	<	0.005		5.36	<	0.03		0.11		1.29	139.00	232	
20-Aug-96	7.00	55.3	3.1	10.2	4.9		76.0	29.00	35		0.04	<	0.005		3.87	<	0.01		0.12		0.56	151.00	215	
31-Oct-96	6.90	41.7	2.5	8.4	4		70.0	23.00	28		0.09	<	0.005		1.8	<	0.01	<	0.05	<	0.05	114.00	173	284
02-Jul-97	6.50	42.6	2.4	7.9	2.6		66.0	23.00	28		0.17	<	0.005		2.28	<	0.01		0.06		1.02	116.00	170	288
02-Oct-97	6.57	43.9	2.43	9.6	3	<	61.0	29.10	33.5		0.07	<	0.005		3.82	<	0.02		0.03		0.23	119.80	158	
02-Oct-97	6.57	43.9	2.43	9.6	3	<	61.0	29.10	33.5		0.07	<	0.005		3.82	<	0.02		0.03		0.23	119.80	158	
20-May-98	6.72	47.4	2.71	10.2	2.9		63.0	30.00	38.1		0.23		0.013		3.9	<	0.2	<	0.02		0.39	130.00		
01-Oct-98	6.60	35.9	1.74	8	2.6		61.0	14.90	21.9		0.40		0.004		2	<	0.2	<	0.02		0.93	97.00		
10-Jun-99	6.68	39.1	2.07	8.4	2.4		61.0	19.20	26.9		0.36		0.004		2.4	<	0.2		0.03		0.23	106.00		
06-Oct-99	7.03	32	1.43	6.6	2.1		63.0	14.40	21.6	<	0.03	<	0.002		1.3	<	0.2	<	0.02		0.24	85.70		
05-Jun-00	6.74	31.7	1.77	9.1	1.8		59.0	14.40	23		0.24		0.167		1.4	<	0.2	<	0.03		0.24	86.60		
22-Aug-00	6.83	33.9	1.88	8.7	2.1		67.0	13.20	24.1		0.57		0.168		0.9	<	0.2	<	0.03		0.27	92.50		
01-Jun-01	7.57	25.64	1.673	9.8			55.0	15.80	19.1		0.26		0.153		4.3	<	0.1	<	0.10		0.33		174	218
01-Aug-01	6.92	26.45	1.095	7.8			58.0	11.80	13.7		0.07	<	0.001		4.1		0.1		0.30		0.25		244	190
09-May-02		22.35	1.453				55.0	6.20	10.9		0.02		0.022		2.4	<	0.1		0.03		0.64		228	
12-Aug-02	6.72	26.59	1.533	8.9	2.05		61.0	12.00	10		0.09		0.025		2.3	<	0.5		0.03		0.20		176	188
20-May-03	7.24	26.4	1.31	4.8	1.6		63.0	7.20	15.8		0.04	<	0.005		0.3	<	0.2	<	0.03		0.23		140	178
07-Aug-03	6.71	43.5	2.11	7.4	2.1		72.0	22.50	26.2		0.37		0.042		1.1	<	0.2	<	0.03		0.27		156	280
19-Aug-04	7.04	29.4	1.53	7.1	1.9		59.0	16.40	18.8		0.09		0.008		0.7	<	0.2		0.70		0.22		148	
14-Oct-04	7.04	30.8	1.76	7.7	1.9		68.0	17.20	18.9	<	0.03		0.01		0.8	<	0.2	<	0.03		0.28		152	
03-Aug-05	7.50		1.9	12	2.4		58.2	16.90	15.8	<	0.50		0.015		0.6	<	0.03		0.05		0.70		170	208
21-Oct-05	7.52	28	1.6		1.9		61.0	13.00	14	<	0.05	<	0.005	<	0.2	<	0.03	<	0.05		0.80		138	169
17-May-06	7.50	28	1.6	5.3	1.9		59.0	9.00	13	<	0.05	<	0.005		0.3	<	0.01	<	0.05		0.30		110	167
18-Oct-06	7.40	28	1.5	6.4	2.2		56.0	11.00	17	<	0.05	<	0.005		0.6		0.06		0.05		0.90		127	189
17-May-07	7.20	60	3.8	9.9	2.9		57.0	53.00	38	<	0.05	<	0.005		1.2	<	0.01	<	0.05		0.70		247	381
17-Oct-07	7.40	40	2.4	8.1	2.7		65.0	26.00	25	<	0.10	<	0.005		0.5	<	0.01		0.11		1.60		162	265
15-May-08	7.40	51	3.2	9.7	4		55.0	47.00	30	<	0.50	<	0.025		1.2	<	0.01		0.08		1.60		230	338
23-Oct-08	7.30	28	1.8	5.7	4.6		60.0	14.00	20	<	0.10	<	0.005	<	0.1	<	0.01	<	0.05		2.00		140	205
22-May-09	6.70	41	2.6	7.3	2.6		58.0	40.00	28	<	0.00	<	0.005		1.3	<	0.01	<	0.05		0.90		200	312
21-Oct-09	6.90	34	2	6.8	2.2		55.0	26.00	21	<	0.10	<	0.005		0.8	<	0.01		0.09		4.00		165	251
20-May-10	7.20	28	1.7	5.8	2.1		49.0	21.00	17	<	0.01	<	0.005		0.8	<	0.01		0.06		4.00		140	211
20-Oct-10	7.10	31	2.1	7.6	3		55.0	21.00	18	<	0.01	<	0.005		1.7	<	0.01		1.70		3.00		138	226
02-Jun-11	7.45	27	1.5	5.2	2		57.0	11.00	14	<	0.10	<	0.005		0.3	<	0.01		0.08		2.00		110	181
02-Jun-11	7.30	25	1.5	4.7	1.9		59.0	7.00	14	<	0.10	<	0.005		0.2	<	0.01	<	0.05		4.00		104	169
27-Oct-11	7.39	22	1.3	6.1	2.1		54.0	10.00	12	<	0.10	<	0.005		0.4	<	0.01	<	0.05		1.20		114	166
17-May-12	6.87	24	1.4	4.7	1.9		52.0	9.00	17	<	0.10	<	0.005		0.25	<	0.01		0.06		0.72		158	180
25-Oct-12	6.69	25	1.4	5.6	1.7		47.0	7.00	31	<	0.10	<	0.005		0.18	<	0.01		0.29		1.30		42	200
23-May-13	7.20	39	2	6.9	2.2		55.0	30.00	23	<	0.10	<	0.005		1.2	<	0.01		0.09		2.40		236	280
16-Oct-13	7.20	46	2.4	8.4	2.7		57.0	35.00	24	<	0.10	<	0.005		1.3	<	0.01	<	0.05		1.80		286	310
22-May-14	6.77	49	3.1	9.8	2.4		61.0	44.00	28	<	0.10	<	0.005		1.63	<	0.01	<	0.05		3.10		320	350
08-Oct-14	6.97	41	2.4	8.1	2.4		71.0	25.00	19	<	0.10	<	0.05		0.63	<	0.01		0.09		3.70		224	270
22-May-15	7.23	28	1.6	4.2	1.9		54.0	15.00	15	<	0.10	<	0.005		0.15	<	0.01		0.08		0.92		268	170
22-May-15	7.31	25	1.5	4.1	1.8		56.0	7.00	18	<	0.10	<	0.005	<	0.1	<	0.01		0.07		0.87		278	160
22-Oct-15	7.32	44	2.9	9.9	2.8		56.0	36.00	26	<	0.10	<	0.005		1.43	<	0.01		0.05	<	0.50		240	310
30-May-16	7.13	43.4	10.2	8.78	7.84		56.1	23.00	18.4		23.50		0.067		0.94				0.05		0.29		220	253

SUMMARY OF MONITORING DATA - MAJOR PARAMETERS

27-Oct-16	7.60	38.1	6.23	5.97	4.1	51.5	14.00	14.4	16.70		0.052	0.41		0.002		0.07	0.66		114	178
18-May-17	7.32	33.5	3.95	5.46	3.11	51.5	13.00	16	6.74		0.037	0.49	<	0.01		0.02	0.63		124	179
25-Oct-17	7.37	23	1.4	4.2	1.6	45.8	4.10	14	0.20	<	0.003	0.52	<	0.033	<	0.02	0.67		284	134

SUMMARY OF MONITORING DATA - MINOR PARAMETERS

Monitor 107-II

Date	PO4	P	Al	Cd	Co	Cr	Cu	Ni	Pb	Mn	Mo	BOD	phenols	field pH	field T	field cond
02-Jul-96		< 0.1	0.1	< 0.003	< 0.005	< 0.005	< 0.003	< 0.01	< 0.002	0.054	< 0.01	2	< 0.0010			
20-Aug-96			0.052	< 0.003	< 0.005	< 0.005	< 0.003	< 0.01	< 0.002	0.073	< 0.01	< 2	< 0.0010			
31-Oct-96		< 0.1	0.125	< 0.003	< 0.005	< 0.005	< 0.003	< 0.001	< 0.002	0.03	< 0.01	< 2	< 0.0010			
02-Jul-97		< 0.1	0.157		< 0.005	< 0.005	< 0.003	< 0.01	< 0.002	0.029	< 0.01	1				
02-Oct-97	< 0.2	< 0.1	0.1	< 0.005	< 0.005	< 0.005	0.005	< 0.02	< 0.001	0.02	< 0.01	1.5				
02-Oct-97	< 0.2	< 0.1	0.1	< 0.005	< 0.005	< 0.005	0.005	< 0.02	< 0.001	0.02	< 0.01	1.5				
20-May-98	< 1	< 0.05	0.183	< 0.0001	0.0004	< 0.005	0.0032	0.003	< 0.0005	0.023	< 0.001	1.9	< 0.0010			
01-Oct-98	< 1	< 0.05	0.277	< 0.0001	0.0007	< 0.005	0.0046	0.002	0.0007	0.021	< 0.001	2.1	< 0.0050			
10-Jun-99	< 1	0.06	0.285	< 0.0001	0.0006	< 0.005	0.0038	0.002	0.0007	0.012	< 0.001	< 0.5	< 0.0010			
06-Oct-99	< 1	< 0.05	0.021	< 0.0001	< 0.0001	< 0.005	0.0025	0.001	< 0.005	< 0.005	< 0.001	1.9	< 0.0010			
05-Jun-00	< 1	< 0.05	0.125	< 0.0001	0.0002	< 0.005	0.0034	0.001	< 0.0005	0.007	< 0.001	0.7		7.1	7.4	219
22-Aug-00	< 1	0.06	0.499	< 0.0001	< 0.0001	< 0.005	0.0066	0.002	0.0012	0.026	< 0.001	1.8	< 0.0010	6.33	9.6	235
01-Jun-01		< 0.02				0.001	0.006	< 0.001	< 0.001	0.012						
01-Aug-01		< 0.02				0.003	< 0.001	0.001	< 0.001	< 0.001			< 0.0100			
09-May-02	< 0.01					< 0.002	0.011	0.007	< 0.002	0.004		< 1	< 0.0010	6.5		110
12-Aug-02	< 3					< 0.001	0.017	12	< 0.001	0.009		< 1	< 0.0010	6.5		90
20-May-03	< 1					< 0.005	0.0022	0.001	< 0.0005	0.02		< 0.5	< 0.0010	6.2		150
07-Aug-03	< 1					< 0.005	0.0054	0.002	0.0008	0.013		0.6	< 0.0010	6.1		290
19-Aug-04	< 1	< 0.05	0.06	< 0.0001	0.0001	< 0.005	0.0035	0.002	0.001	< 0.005	< 0.001	< 0.5	< 0.0010			
14-Oct-04	< 1	< 0.05	0.008	< 0.0001	0.0002	< 0.005	0.0035	0.002	0.0009	< 0.0005	< 0.001	< 0.5	< 0.0010	6.2		250
03-Aug-05	< 1			< 0.0001		< 0.005	0.0045	< 0.001	< 0.0002	0.002		< 2	0.0010	6.1		200
21-Oct-05	< 1					< 0.005	0.004	< 0.001	< 0.0005	< 0.002		< 2	< 0.0010	4.7		170
17-May-06		< 0.002	< 0.005	< 0.0001		< 0.005	0.004	< 0.001	< 0.0005	0.004		< 2	< 0.0010			
18-Oct-06		< 0.002	0.007	< 0.0001		< 0.005	0.003	< 0.001	< 0.0005			< 2	< 0.0010			
17-May-07						< 0.005	0.003	0.001	< 0.0005	< 0.002		< 2	< 0.0010			
17-Oct-07						< 0.005	0.003	0.001	< 0.0005	0.014		< 2	< 0.0010			
15-May-08						< 0.005	0.002	0.001	< 0.0005	0.009		< 2	< 0.0010	6.34		164
23-Oct-08						< 0.005	0.008	0.001	< 0.0005	0.004		< 2	< 0.0010	6.47		304
22-May-09						< 0.005	0.003	0.001	< 0.0005	0.003		< 2	< 0.0010	6.72		203
21-Oct-09						< 0.005	0.003	0.002	< 0.0005	0.002		6	< 0.0010	8.11		1210
20-May-10						< 0.005	0.001	0.001	< 0.0005	0.003		< 2	< 0.0010	7.26		
20-Oct-10						< 0.005	0.005	0.001	< 0.0005	0.005		< 2	0.0020	7.59		
02-Jun-11						< 0.005	0.004	0.001	< 0.0005	0.002		< 2	< 0.0010	6.97		
02-Jun-11						< 0.005	0.006	0.001	< 0.0005	0.007		< 2	< 0.0010	6.97		
27-Oct-11						< 0.005	0.003	< 0.001	< 0.0005	0.002		< 2	< 0.0010	6.92		
17-May-12						< 0.005	0.004	0.001	< 0.0005	0.0029		< 2	< 0.0010	7.69		
25-Oct-12						< 0.005	0.0051	< 0.001	< 0.0005	< 0.002		< 2	< 0.0010	7.18		
23-May-13						< 0.005	0.0031	< 0.001	< 0.0005	< 0.002		< 2	< 0.0010	7.69	5.3	133
16-Oct-13						< 0.005	0.0046	0.0012	< 0.0005	0.0024		< 2	< 0.0010	7.21	6.9	142
22-May-14						< 0.005	0.0028	0.0013	< 0.0005	0.0031		< 2	< 0.0010	7.79	4.8	152
08-Oct-14						< 0.005	0.0049	< 0.001	< 0.0005	0.0032		< 2	< 0.0010	6.89	7.8	119
22-May-15						< 0.005	0.0075	0.0016	< 0.0005	0.014		< 2	< 0.0010	6.98		84
22-May-15						< 0.005	0.0078	0.0017	< 0.0005	0.013		< 2	< 0.0010	6.98		84
22-Oct-15						< 0.005	0.003	0.0017	< 0.0005	0.0066		< 2	< 0.0010	6.72		140

SUMMARY OF MONITORING DATA - MINOR PARAMETERS

30-May-16							0.04	0.077	0.0323		0.0153	0.43				0.0026	7.7	4.3	96
27-Oct-16							0.0266	0.0795	0.0198		0.0213	0.586		<	6	< 0.0010	7.54		76
18-May-17							0.0112	0.0416	0.01		0.0104	0.333		<	3	0.0020	7.92	7.2	69
25-Oct-17							< 0.001	0.0067	0.0018	<	0.0002	0.0082		<	3	< 0.0020	7.77	7.8	59

SUMMARY OF MONITORING DATA - MAJOR PARAMETERS

Monitor 117

Date	pH	Ca	Mg	Na	K		alkalinity	Cl	SO4		Fe		Zn		NO3		NO2		NH3	TKN	Hardness	TDS	Sp. Cond.
03-Jun-92	6.61	367	42.4	98.1	16		44.0	230.00	746		0.09		0.02		26.9	<	0.2		0.07	0.67	1094.00	2074	
08-Jul-92	6.58	363	41.8	94.7	15		159.2	213.00	673		0.02	<	0.01		24.6	<	0.2		0.06	0.61	1081.00	1896	
08-Jul-92	6.55	365	42.4	95.6	16		154.8	212.00	670		0.02	<	0.01		24.4	<	0.2		0.06	0.65	1089.00	1889	
16-Sep-92	6.63	315	36.1	87.6	14		150.0	195.00	619		0.03		0.01		23.4	<	0.2		0.13	2.00	938.90	1832	
08-Jun-93	6.50	340	40	92	13		166.0	210.00	701	<	0.05	<	0.01		23.3				0.04	0.70	1010.00		
13-Jul-93	6.50	320	37	89	14		147.0	190.00	540	<	0.05		0.019		26				0.03	0.74	951.00		
13-Jul-93	6.50	310	36	85	13		145.0	180.00	596	<	0.05	<	0.01		0.022				0.03	0.68	922.00		
17-Aug-93	6.50	320	35	85	13		150.0	190.00	550		0.15	<	0.01		20				0.02	0.76	943.00		
20-Sep-93	6.60	280	35	82	13		140.0	190.00	530	<	0.05	<	0.01		20				0.02	0.64	843.00		
20-Sep-93	6.60	280	33	77	12		140.0	180.00	510	<	0.05	<	0.01		21				0.01	0.40	835.00		
30-May-95	6.50	280	31	68	12		130.0	160.00	486	<	0.05		0.012		21		0.04		0.11	0.63	830.00	1580	1600
18-Jul-95	6.60	300	37	82	12		160.0	180.00	578	<	0.05		0.013		22		0.06		0.10	0.71	900.00	2030	1780
24-Oct-95	6.80	220	29	63	12		160.0	140.00	416	<	0.05	<	0.01		3.5		0.006	<	0.01	0.50	670.00	1790	1380
02-Jul-96	6.60	298	37.4	74.6	8.8		208.0	152.00	598		0.08	<	0.005		28.7	<	0.03		0.16	1.47	898.00	1510	
20-Aug-96	6.80	324	37.3	91.2	12.9		196.0	156.00	561	<	0.02	<	0.005		25.5	<	0.01		0.11	1.39	963.00	1430	
31-Oct-96	6.90	302	32.3	75.2	10.5		18.0	160.00	516		0.03	<	0.005		23.2	<	0.01		0.19	0.56	887.00	1230	1830
04-Jul-97	6.40	237	29.6	62.3	10.9		153.0	156.00	436		0.06		0.006		20.7	<	0.01	<	0.05	1.59	715.00	1130	1620
02-Oct-97	6.63	191	25.6	64.5	11	<	164.0	143.00	411		0.04	<	0.005		2.22	<	0.2	<	0.02	0.39	585.00	946	
02-Oct-97	6.63	191	25.6	64.5	11	<	164.0	143.00	411		0.04	<	0.005		2.22	<	0.2	<	0.02	0.39	585.00	946	
21-May-98	6.59	210	28.7	68.5	10.3		176.0	116.00	387		0.09		0.032		17.2	<	0.2	<	0.02	2.59	646.00		
01-Oct-98	6.70	144	21.8	52.3	9.7		157.0	103.00	302		0.04		0.017		0.2	<	0.2		0.06	1.80	451.00		
10-Jun-99	6.62	246	31.9	66.9	10.6		303.0	130.00	410		0.06		0.004		16.9		0.3		0.05	0.55	747.00		
06-Oct-99	6.79	237	26	60.9	11.3		285.0	132.00	373	<	0.03		0.005		16.9	<	2		0.03	0.61	700.00		
05-Jun-00	6.59	206	29.7	63.5	9.8		270.0	110.00	338		0.04		0.005		13.4	<	0.2		0.10	1.37	639.00		
22-Aug-00	6.62	193	24.3	57.6	10.6		243.0	106.00	311		0.06		0.039		12.2		0.2		0.03	0.55	583.00		
01-Jun-01	7.71	447.3	25.41	49.9			225.0	80.30	226		0.37		0.023		34.8	<	0.1	<	0.10	1.21		891	1179
01-Aug-01	7.00	176.2	25.43	56.9			293.0	84.50	234		0.57		0.41		32.7		0.7	<	0.10	1.65		1032	1214
09-May-02		182.8	0.156				398.0	83.00	202		0.82		0.01		33	<	0.1	<	0.01	3.32		972	
12-Aug-02	6.80	212.4	27.48	58.9	10.9		308.0	85.00	212		0.56		0.036		28	<	0.5		0.03	0.79		912	1271
20-May-03	7.24	214	28.3	49.3	9.2		397.0	106.00	244	<	0.03		0.006		6.3	<	0.2		0.03	0.87		1016	1438
07-Aug-03	6.83	164	22.9	45.4	10.1		262.0	84.40	220	<	0.03		0.009		0.2	<	0.2	<	0.03	0.52		714	1116
19-Aug-04	7.03	236	33.8	62.4	10.9		542.0	120.00	228	<	0.03		0.017		3.4	<	0.2		3.40	0.89		922	
14-Oct-04	7.32	230	35.4	65.5	10.7		462.0	123.00	218	<	0.03		0.01		0.8	<	0.2		0.04	0.82		1064	
03-Aug-05	7.40		38	74	12		564.0	107.00	171	<	0.50		0.017		1.9	<	0.03	<	0.05	9.00		1290	1510
21-Oct-05	7.67	220	34		12		429.0	92.00	193	<	0.05	<	0.005	<	0.2	<	0.03		0.05	5.00		938	1140
17-May-06	7.60	250	39	61	11		605.0	116.00	180	<	0.05	<	0.005		3.2		0.09	<	0.05	1.20		1040	1590
18-Oct-06	7.50	180	26	51	1.1		336.0	85.00	171	<	0.05	<	0.005	<	0.1	<	0.01		0.12	3.00		652	1230
17-May-07	7.30	330	57	80	12		652.0	180.00	173	<	0.05		0.007		1.6		0.1		0.09	9.00		1010	2030
17-Oct-07	7.60	220	34	62	12		451.0	97.00	195	<	0.10	<	0.005	<	0.1	<	0.01		0.13	4.20		640	1420
15-May-08	7.50	330	56	84	13		846.0	160.00	151	<	0.50	<	0.025		0.5		0.07		0.15	10.00		1320	2100
23-Oct-08	7.60	180	29	52	11		448.0	85.00	132	<	0.10	<	0.005	<	0.1	<	0.01	<	0.05	2.00		715	1270
22-May-09	7.20	390	70	100	13		1120.0	180.00	110	<	0.00	<	0.005		0.1		0.03		0.08	4.00		1520	2490
21-Oct-09	7.10	330	54	90	12		942.0	160.00	120	<	0.10	<	0.005	<	0.1	<	0.01		0.13	7.00		1450	2230
02-Jun-11	7.50	280	49	76	12		770.0	140.00	97	<	0.10	<	0.005	<	0.1	<	0.01		0.20	8.00		1570	1870
27-Oct-11	7.46	130	22	34	7.7		295.0	62.00	120	<	0.10	<	0.005	<	0.1	<	0.01		0.05	2.20		624	982

SUMMARY OF MONITORING DATA - MAJOR PARAMETERS

17-May-12	7.06	280	50	73	12	800.0	130.00	97	<	0.10		0.007	<	0.1	<	0.01	0.12	4.50	1480	1900
25-Oct-12	7.05	90	16	33	6.8	230.0	37.00	83	<	0.10	<	0.005		0.14	<	0.01	0.29	4.30	446	750
23-May-13	7.24	33	61	88	12	890.0	130.00	82	<	0.10		0.01	<	0.01	<	0.01	0.15	8.20	1470	2000
16-Oct-13	7.54	110	18	35	7.6	280.0	35.00	65	<	0.10		0.013	<	0.01	<	0.01	0.15	8.70	530	770
22-May-14	7.24	310	59	87	11	980.0	120.00	77	<	0.10	<	0.005	<	0.2	<	0.02	0.07	3.10	1510	2200
08-Oct-14	7.34	160	31	45	8.9	460.0	67.00	80	<	0.10		0.007	<	0.1	<	0.01	0.24	11.00	686	1200
22-May-15	7.42	350	66	100	12	1000.0	130.00	64	<	0.10	<	0.005	<	0.1	<	0.01	0.08	1.60	1460	220
22-Oct-15	7.57	330	65	110	13	990.0	140.00	70	<	0.10	<	0.005	<	0.1	<	0.01	0.14	1.50	1390	2200
30-May-16	7.16	323	88	100	34.3	939.0	110.00	58.3		73.00		0.243	<	0.2			0.08	1.54	1230	2040
27-Oct-16	7.58	322	64.9	93.8	18.5	836.0	98.00	54		42.70		0.156	<	0.02	<	0.002	0.07	1.64	1090	1760
18-May-17	7.40	281	58.3	79.5	15.9	717.0	84.00	47		30.70		0.113	<	0.01	<	0.01	0.05	2.60	908	1550
25-Oct-17	7.24	190	33	75	9.6	683.0	74.00	48		0.07	<	0.003	<	0.044	<	0.033	0.07	1.60	870	1430

SUMMARY OF MONITORING DATA - MINOR PARAMETERS

Monitor 117

Date	PO4	P	Al	Cd	Co	Cr	Cu	Ni	Pb	Mn	Mo	BOD	phenols	field pH	field T	field cond
03-Jun-92	< 1	< 0.1		< 0.005			< 0.01	0.06	< 0.05			0	< 0.0005			
08-Jul-92	< 1	< 0.1		< 0.005			< 0.01	< 0.05	< 0.05			0	< 0.0005			
08-Jul-92	< 1	< 0.1		< 0.005			0.02	< 0.05	< 0.05			0.1	< 0.0005			
16-Sep-92	< 0.1	< 0.1		< 0.005			0.01	< 0.05	< 0.05			< 1	< 0.0005			
08-Jun-93	0.002	0.009		< 0.002			0.015	0.035	< 0.02			0.3	< 0.0002			
13-Jul-93	0.002	0.008		< 0.002			0.023	0.03	< 0.02			0.5	< 0.0002			
13-Jul-93	< 0.001	0.01		< 0.002			0.017	0.025	< 0.02			1	0.0006			
17-Aug-93	< 0.001	0.003		< 0.002			0.015	0.022	< 0.02			1.3	0.0006			
20-Sep-93	< 0.001	0.007		< 0.002			0.011	0.026	< 0.02			0.8	0.0004			
20-Sep-93	0.002	0.01		< 0.002			0.008	0.027	< 0.02			0.8	< 0.0002			
30-May-95	0.01	0.006	0.079	0.0028	0.003	< 0.005	0.012	0.016	< 0.02	0.14	< 0.005	0.8	0.0002			
18-Jul-95	0.01	0.007	< 0.05	< 0.002	0.0029	< 0.005	0.0098	0.016	< 0.02	0.12	< 0.005	0.5	< 0.0002	6.42	13	1495
24-Oct-95	< 0.001	0.007	< 0.05	0.004	0.0032	< 0.005	0.0065	0.012	< 0.02	0.14	< 0.005	< 0.1	< 0.0002	6.26	7.2	1345
02-Jul-96		< 0.1	0.084	< 0.003	< 0.005	< 0.005	< 0.003	< 0.02	< 0.002	0.136	< 0.01	2	< 0.0010			
20-Aug-96			0.06	< 0.003	0.008	< 0.005	0.01	0.02	0.002	0.125	< 0.01	< 2	0.0080			
31-Oct-96		< 0.1	< 0.025	< 0.003	< 0.005	< 0.005	0.003	0.02	< 0.002	0.146	< 0.01	< 2	0.0010			
04-Jul-97		< 0.1	0.079		< 0.005	< 0.005	0.004	0.02	< 0.02	0.115	< 0.01	1.4				
02-Oct-97	< 1	< 0.1	0.05	< 0.005	< 0.005	< 0.005	0.006	< 0.02	< 0.001	0.14	< 0.01	1				
02-Oct-97	< 1	< 0.1	0.05	< 0.005	< 0.005	< 0.005	0.006	< 0.02	< 0.001	0.14	< 0.01	1				
21-May-98	< 1	< 0.05	0.072	< 0.0001	0.003	< 0.005	0.0059	0.014	< 0.0005	0.15	< 0.001	2.2	< 0.0010			
01-Oct-98	< 1	< 0.05	0.014	< 0.0001	0.0017	< 0.005	0.0039	0.009	< 0.0005	0.126	0.001	0.9	< 0.0050			
10-Jun-99	< 1	< 0.05	0.069	< 0.0001	0.0027	< 0.005	0.0079	0.013	< 0.005	0.162	< 0.001	1.6	< 0.0010			
06-Oct-99	< 10	< 0.05	0.033	< 0.0001	0.0026	< 0.005	0.0067	0.013	< 0.005	0.16	< 0.001	3.2	< 0.0010			
05-Jun-00	< 1	< 0.05	< 0.005	< 0.0001	0.0029	< 0.005	0.007	0.013	< 0.0005	0.138	< 0.001	2.4		6.53	8.8	1535
22-Aug-00	< 1	< 0.05	0.092	0.0001	0.0021	< 0.005	0.0064	0.011	< 0.0005	0.13	< 0.001	0.8	< 0.0010	6.39	10.4	1436
01-Jun-01		< 0.02				0.007	0.007	0.014	< 0.001	0.145						
01-Aug-01		< 0.02				0.008	0.003	0.016	< 0.001	0.143			< 0.0100			
09-May-02	< 0.01					< 0.002	0.006	0.014	< 0.002	26.142		3	< 0.0010	6.5		1990
12-Aug-02	< 3					0.003	0.01	19	< 0.001	0.169		2	< 0.0010	6.4		1290
20-May-03	< 1					< 0.005	0.0049	0.013	< 0.0005	0.1		9.9	< 0.0020	6.6		1320
07-Aug-03	< 1					< 0.005	0.0038	0.01	< 0.0005	0.013		1	< 0.0010	6.3		1090
19-Aug-04	< 1	< 0.05	< 0.005	< 0.0001	0.0042	< 0.005	0.0069	0.017	0.001	0.183	0.001	3.6	< 0.0010			
14-Oct-04	< 1	< 0.05	< 0.005	0.0001	0.0039	< 0.005	0.0071	0.013	0.001	0.192	0.001	6.5	< 0.0010	6.4		1860
03-Aug-05	< 1			< 0.0001		< 0.005	0.0098	0.014	0.0002	0.18		4	< 0.0010	6.8		1440
21-Oct-05	< 1					< 0.005	0.006	0.014	< 0.0005	0.21		< 2	< 0.0010	3.4		1200
17-May-06		< 0.002	< 0.005	< 0.0001		< 0.005	0.007	0.016	< 0.0005	0.21		7	< 0.0010			
18-Oct-06		< 0.002	< 0.005	< 0.0001		< 0.005	0.003	< 0.001	< 0.0005			< 2	< 0.0010			
17-May-07						< 0.005	0.011	0.021	< 0.0005	0.28		8	0.0090			
17-Oct-07						< 0.005	0.004	0.012	< 0.0005	0.28		3	< 0.0010			
15-May-08						< 0.005	0.01	0.022	< 0.0005	0.38		9	< 0.0010	6.35		982
23-Oct-08						< 0.005	0.005	0.011	< 0.0005	0.37		4	< 0.0010	6.61		1218
22-May-09						< 0.005	0.017	0.034	< 0.0005	0.75		7	< 0.0010	6.53		1475
21-Oct-09						< 0.005	0.01	0.029	< 0.0005	0.7		8	< 0.0010	6.73		1047
02-Jun-11						< 0.005	0.012	0.025	< 0.0005	0.88		10	< 0.0010	6.63		

SUMMARY OF MONITORING DATA - MINOR PARAMETERS

27-Oct-11						<	0.005	0.003	0.01	<	0.0005	0.62		<	2	<	0.0010	7.12				
17-May-12						<	0.005	0.0082	0.028	<	0.0005	1.1			5		0.0110	6.78				
25-Oct-12						<	0.005	0.0026	0.0066	<	0.0005	0.3		<	2	<	0.0010	6.86				
23-May-13						<	0.005	0.015	0.033	<	0.0005	1.8			3		0.0071	6.73	5.4	765		
16-Oct-13						<	0.005	0.0053	0.0097	<	0.0005	0.48		<	2		0.0018	7.12	6.8	188		
22-May-14						<	0.005	0.023	0.036	<	0.0005	2.7		<	2	<	0.0016	6.89	6.5	601		
08-Oct-14						<	0.005	0.0037	0.014	<	0.0005	1.2		<	2		0.0020	6.55	6.9	232		
22-May-15						<	0.005	0.024	0.041	<	0.0005	0.37		<	2	<	0.0010	5.39		762		
22-Oct-15						<	0.005	0.019	0.04	<	0.0005	3.6		<	2		0.0014	6.1		795		
30-May-16							0.121	0.289	0.142		0.0569	5.93					0.0080	6.68	4.7	382		
27-Oct-16							0.0516	0.306	0.0963		0.0698	5.41		<	6		0.0050	7.03		291		
18-May-17							0.0274	0.238	0.0679		0.0376	4.09		<	3		0.0040	7.9	7.7	236		
25-Oct-17						<	0.001	0.0051	0.029	<	0.0002	0.029		<	10	<	0.0020	7.31	6.2	239		

SUMMARY OF MONITORING DATA - MAJOR PARAMETERS

Monitor 121-I

Date	pH	Ca	Mg	Na	K	alkalinity	Cl	SO4	Fe	Zn	NO3	NO2	NH3	TKN	Hardness	TDS	Sp. Cond.
03-Jun-92	6.75	544	43.4	170.3	16	1388.0	430.00	2.1	0.14	0.02	< 0.2	< 0.2	0.21	2.40	1540.00	2515	
03-Jun-92	7.00	552	43.6	171	17	1394.0	437.00	1.7	0.15	0.01	< 0.2	< 0.2	0.22	2.50	1561.00	2694	
08-Jul-92	6.89	545	45.4	185	19	1529.6	430.00	< 0.5	0.15	< 0.01	< 0.2	< 0.2	0.20	3.30	1550.00	2627	
08-Jul-92	6.87	544	43.7	182	18	1561.6	426.00	1.1	0.05	< 0.01	< 0.2	< 0.2	0.19	3.10	1541.00	2632	
16-Sep-92	6.62	511	44.1	172	15	1310.0	501.00	0.45	0.16	< 0.01	0.15	< 0.02	< 0.02	3.18	1459.00	2567	
08-Jun-93	6.70	530	52	240	19	1280.0	490.00	< 0.5	0.20	0.018	0.025		1.48	2.80	1530.00		
13-Jul-93	6.70	520	52	250	19	1150.0	590.00	0.74	0.20	0.015	0.15		0.85	2.70	1512.00		
17-Aug-93	6.80	520	51	240	18	1300.0	520.00	5.7	0.20	< 0.01	0.1		1.03	3.80	1508.00		
20-Sep-93	6.80	480	49	240	18	2080.0	500.00	0.6	0.20	0.018	0.05		1.60	2.80	1400.00		
30-May-95	6.80	350	49	290	18	1200.0	500.00	< 0.5	140.00	0.015	0.05	0.05	0.90	2.58	1100.00	2840	3200
18-Jul-95	6.80	40	48	270	17	1100.0	530.00	1.32	120.00	0.026	0.045	0.005	0.79	4.35	1200.00	2380	3060
23-Oct-95	6.90	370	46	300	16	1100.0	570.00	< 0.5	130.00	0.019	0.09	0.01	1.70	3.61	1100.00	2170	3020
02-Jul-96	6.70	401	47.2	248	15.3	1280.0	510.00	< 2	121.00	< 0.005	< 0.05	< 0.03	0.91	3.12	1200.00	2650	
20-Aug-96	6.80	388	47.4	296	18.4	1220.0	411.00	< 2	15.10	0.02	< 0.05	< 0.01	1.06	3.68	1160.00	1930	
31-Oct-96	6.40	58.6	14.4	91.9	12.3	114.0	238.00	< 2	1.70	0.006	0.26	< 0.01	3.60	5.15	206.00	519	869
03-Jul-97	6.60	361	49.3	283	20.7	1030.0	490.00	< 2	128.00	< 0.005	< 0.05	< 0.01	1.81	3.59	1100.00	1860	3360
02-Oct-97	6.63	322	44.4	301	20	< 1220.0	511.00	< 0.5	121.00	< 0.005	< 0.2	< 0.2	0.66	2.95	987.40	1932	
02-Oct-97	6.63	322	44.4	301	20	< 1220.0	511.00	< 0.5	121.00	< 0.005	< 0.2	< 0.2	0.66	2.95	987.40	1932	
20-May-98	6.67	293	44.7	301	20.4	1050.0	451.00	0.7	144.00	0.017	< 0.2	< 0.2	0.78	3.62	919.00		
01-Oct-98	6.69	266	46	279	19.2	1030.0	413.00	0.7	102.00	0.015	< 0.2	< 0.2	0.68	3.70	854.00		
10-Jun-99	6.59	314	46.9	286	24.1	1160.0	429.00	0.5	136.00	0.027	2.2	< 0.2	0.63	2.36	978.00		
06-Oct-99	6.85	299	45.4	275	22.9	1100.0	472.00	< 0.5	118.00	0.031	< 0.2	< 2	0.63	2.31	935.00		
05-Jun-00	6.58	279	53	317	24.4	1090.0	412.00	7.3	132.00	0.09	0.2	< 0.2	0.53	3.50	916.00		
22-Aug-00	6.58	276	47.4	274	23.6	1100.0	450.00	2.4	127.00	0.044	0.2	< 0.2	0.55	2.58	885.00		
01-Jun-01	7.77	244.8	55.64	290		959.0	391.00	0.8	3.83	0.085	0.2	< 0.1	0.40	2.44		1781	2820
01-Aug-01	6.72	247.6	55.3	293		993.0	369.00	1.5	65.20	0.109	1.5	< 0.1	0.30	2.69		1901	2670
09-May-02		21.34	44.26			925.0	307.00	< 0.1	55.33	0.064	< 0.1	< 0.1	0.82	3.84		1492	
12-Aug-02	6.84	227.7	45.83	280	26.7	986.0	352.00	< 2	80.55	0.019	< 0.3	< 0.5	0.91	2.88		1590	2770
20-May-03	6.82	214	43.2	254	25.6	910.0	381.00	< 0.5	88.70	0.011	< 0.2	< 0.2	0.62	2.22		1552	2548
07-Aug-03	6.60	225	45	255	26.8	914.0	388.00	< 0.5	111.00	0.008	< 0.2	< 0.2	0.69	2.28		1474	2530
19-Aug-04	6.83	211	43.8	270	27.5	914.0	454.00	< 0.5	125.00	0.027	< 0.2	< 0.2	< 0.20	2.72		1662	
14-Oct-04	6.70	208	46.8	297	27.4	790.0	494.00	0.9	125.00	0.008	< 0.2	< 0.2	0.74	2.49		1620	
03-Aug-05	6.96		42	280	28	843.0	396.00	< 1	100.00	0.022	< 0.2	< 0.03	0.92	4.40		1510	2510
03-Aug-05	7.01		40	270	26	824.0	381.00	< 1	98.00	0.013	< 0.2	< 0.03	0.89	1.80		1590	2500
21-Oct-05	7.35	200	47		34	778.0	376.00	< 1	33.00	< 0.005	< 0.2	< 0.03	0.86	7.50		1470	2090
17-May-06	7.10	160	39	280	29	765.0	385.00	< 1	48.00	< 0.005	< 0.1	< 0.01	0.90	2.40		1450	2240
17-May-06	7.30	170	41	300	31	768.0	376.00	< 1	28.00	< 0.005	< 0.1	< 0.01	0.91	2.30		1530	2340
18-Oct-06	7.20	160	37	290	31	705.0	330.00	< 1	< 0.05	< 0.005	< 0.5	< 0.05	1.08	6.00		1540	2390
17-May-07	7.10	170	44	310	30	718.0	390.00	< 1	25.00	< 0.005	< 0.1	< 0.01	0.96	2.90		1470	2320
17-Oct-07	7.20	170	41	310	32	723.0	350.00	< 1	7.20	< 0.005	< 0.1	0.01	1.02	4.00		1020	2360
15-May-08	7.10	170	43	310	33	724.0	390.00	< 1	27.00	< 0.025	< 0.1	< 0.01	1.10	4.00		1610	2450
15-May-08	7.10	180	46	320	33	746.0	390.00	< 1	37.00	0.026	< 0.1	< 0.01	1.10	4.10		1550	2490
23-Oct-08	7.10	150	39	290	32	666.0	380.00	1	11.00	< 0.005	< 0.1	< 0.01	0.96	2.40		1600	2390
22-May-09	7.00	140	37	280	31	653.0	340.00	< 2	1.40	< 0.005	< 0.1	< 0.01	1.20	3.00		1560	2280
22-May-09	6.90	150	37	280	31	680.0	340.00	< 2	21.00	< 0.005	< 0.1	< 0.01	1.20	2.90		1500	2290

SUMMARY OF MONITORING DATA - MAJOR PARAMETERS

21-Oct-09	6.80	130	34	270	28	702.0	330.00	<	1	21.00	<	0.005	<	0.1	<	0.01	1.40	3.90	1520	2320
20-May-10	7.20	120	33	260	29	629.0	300.00		10	< 0.01	<	0.005	<	0.1	<	0.01	1.30	4.00	1370	2130
20-May-10	7.20	130	34	270	30	634.0	300.00	<	1	11.00	<	0.005	<	0.1	<	0.01	1.30	3.00	1380	2150
20-Oct-10	7.00	130	34	260	31	615.0	220.00	<	1	57.00	<	0.005	<	0.1	<	0.01	1.70	8.00	1300	2090
02-Jun-11	7.02	120	31	250	27	609.0	260.00	<	1	23.00	<	0.005	<	0.1	<	0.01	1.60	7.00	1300	1940
27-Oct-11	7.13	120	30	240	30	583.0	260.00	<	1	52.00	<	0.005	<	0.1	<	0.01	1.50	3.90	1390	1920
27-Oct-11	7.15	120	30	240	29	583.0	260.00	<	1	45.00	<	0.005	<	0.1	<	0.01	1.70	6.00	1380	1920
17-May-12	6.73	110	30	230	27	630.0	250.00	<	1	50.00	<	0.005	<	0.1	<	0.01	1.50	3.20	1180	2000
25-Oct-12	6.77	120	31	230	29	610.0	250.00	<	1	69.00	<	0.005	<	0.1	<	0.01	1.80	3.70	1090	2000
25-Oct-12	6.83	120	30	220	28	600.0	240.00	<	1	69.00	<	0.005	<	0.1	<	0.01	1.80	3.70	1010	2000
23-May-13	6.87	140	37	250	33	660.0	280.00	<	1	88.00		0.005	<	0.01	<	0.01	1.70	4.30	1280	2100
16-Oct-13	6.86	150	35	240	31	650.0	300.00	<	1	87.00		0.008	<	0.01	<	0.01	1.90	5.50	1410	2100
22-May-14	6.67	130	35	240	31	650.0	280.00	<	1	64.00	<	0.005	<	0.2		0.051	1.80	3.60	1390	2100
08-Oct-14	6.95	140	36	240	34	650.0	290.00	<	1	90.00		0.006	<	0.1	<	0.01	2.30	5.50	1260	2100
22-Oct-15	6.75	130	37	260	32	630.0	300.00	<	1	75.00	<	0.005	<	0.1	<	0.01	2.20	3.80	1200	2100
22-Oct-15	6.79	130	37	260	34	620.0	300.00	<	1	82.00	<	0.005	<	0.1	<	0.01	2.30	3.40	1200	2100
30-May-16	6.68	142	39.4	261	36.2	693.0	320.00	<	0.5	140.00		0.011	<	0.2			2.30	3.93	1040	2180
27-Oct-16	7.05	127	34.9	241	31.1	575.0	300.00	<	0.5	123.00		0.040	<	0.2		0.029	1.50	3.44	1260	2000
18-May-17	6.83	93.7	26	185	25.1	594.0	300.00	<	0.5	92.70	<	0.005	<	0.01	<	0.01	2.40	2.50	1100	1950
25-Oct-17	6.85	110	26	210	29	546.0	300.00	<	0.5	66.00	<	0.003	<	0.044	<	0.033	2.60	4.40	1080	1900
25-Oct-17	6.81	110	31	210	30	520.0	300.00	<	0.5	43.00	<	0.003	<	0.044	<	0.033	2.60	4.20	1100	1900

SUMMARY OF MONITORING DATA - MINOR PARAMETERS

Monitor 121-I

Date	PO4	P	Al	Cd	Co	Cr	Cu	Ni	Pb	Mn	Mo	BOD	phenols	field pH	field T	field cond
03-Jun-92	< 1	0.1		< 0.005			< 0.01	< 0.05	< 0.05			9.8	* 0.1025			
03-Jun-92	< 1	< 0.1		< 0.005			< 0.01	< 0.05	< 0.05			173	* 0.0925			
08-Jul-92	< 1	< 0.1		< 0.005			0.02	< 0.05	< 0.05			177	* 0.0900			
08-Jul-92	< 1	< 0.1		< 0.005			< 0.01	< 0.05	< 0.05			233	* 0.0915			
16-Sep-92	< 0.01	0.1		< 0.005			< 0.01	< 0.05	< 0.05			137.8	* 0.1050			
08-Jun-93	0.06	0.03		< 0.002			< 0.005	0.02	< 0.02			130	0. 74.0000			
13-Jul-93	0.05	0.04		< 0.002			< 0.005	0.015	< 0.02			100				
17-Aug-93	0.01	0.03		< 0.002			< 0.005	0.01	0.02			110	0. 200.0000			
20-Sep-93	0.05	0.06		< 0.002			< 0.005	0.015	< 0.02			66	0. 57.6000			
30-May-95	0.03	0.05	0.073	< 0.002	0.095	< 0.005	< 0.005	0.015	< 0.02	24	0.031	62	0.0250			
18-Jul-95	0.015	0.07	0.072	< 0.002	0.052	< 0.005	< 0.005	0.014	0.027	23	0.03	12	0.0190	6.67	11	3000
23-Oct-95	0.09	0.07	< 0.05	< 0.002	0.043	0.0079	< 0.005	0.014	< 0.02	22	0.035	72	0.0166	6.34	5.6	3250
02-Jul-96		< 0.1	0.11	< 0.003	0.051	0.011	< 0.003	< 0.02	< 0.002	19	< 0.01	17	< 1.0000			
20-Aug-96			0.033	< 0.003	0.051	0.007	< 0.003	0.02	< 0.002	20.7	0.01	18	13.0000			
31-Oct-96		0.1	0.052	< 0.003	< 0.005	< 0.005	< 0.003	0.02	< 0.002	0.307	< 0.01	6	0.0010			
03-Jul-97		< 0.1	0.081		0.055	0.018	< 0.003	0.03	< 0.002	21.1	< 0.01	37.3				
02-Oct-97	< 1	< 0.1	0.06	< 0.005	0.046	< 0.005	< 0.003	< 0.02	< 0.001	19.3	< 0.01	45.9				
02-Oct-97	< 1	< 0.1	0.06	< 0.005	0.046	< 0.005	< 0.003	< 0.02	< 0.001	19.3	< 0.01	45.9				
20-May-98	< 1	0.05	0.14	< 0.0001	0.0585	0.007	0.0015	0.018	0.0007	18	0.009	37.4	0.0050			
01-Oct-98	< 1	0.08	0.092	< 0.0001	0.048	0.006	0.0018	0.013	0.0006	17	0.007	3.8	< 0.0050			
10-Jun-99	< 1	0.08	0.163	< 0.0001	0.0645	< 0.01	0.0001	0.018	< 0.005	17.7	0.007	12	0.0060			
06-Oct-99	< 1	0.05	0.043	< 0.0001	0.0578	< 0.005	0.0007	0.017	< 0.005	17	0.007	41.8	0.0050			
05-Jun-00	< 1	0.09	0.035	< 0.0001	0.0573	< 0.05	0.0014	0.018	< 0.0005	15.1	0.007	23.9		6.66	6.4	3250
22-Aug-00	< 1	< 0.05	0.063	< 0.0001	0.0596	< 0.05	0.0017	0.02	< 0.0005	16.5	0.006	14.2	0.0300	6.55	8.3	3260
01-Jun-01		< 0.02				0.025	0.031	< 0.001	< 0.001	15.764						
01-Aug-01		< 0.02				0.036	< 0.001	0.021	< 0.001	11.8			0.0280			
09-May-02	< 0.01					0.011	0.016	0.021	< 0.002	17.851		3	0.0080	6.6		1990
12-Aug-02	< 3					0.041	0.11	28	< 0.001	8.68		4	< 0.0010	6.6		1990
20-May-03	< 1					< 0.005	0.0009	0.014	< 0.0005	43.2		35	0.0020	6.7		1990
07-Aug-03	< 1					0.008	< 0.0005	0.013	< 0.0005	13.6		15.5	0.0040	6.4		1990
19-Aug-04	< 1	< 0.05	0.035	< 0.0001	0.0652	< 0.01	0.0009	0.017	0.0009	13.5	0.004	18.1	0.0050			
14-Oct-04	< 1	0.06	0.027	< 0.0001	0.0661	< 0.005	0.001	0.014	0.0011	13.4	0.004	22	0.0030	6.4		1990
03-Aug-05	< 1			< 0.0001		0.0075	0.0018	0.011	0.0004	11		25	0.0080	6.3		
03-Aug-05	< 1			0.0001		0.0074	0.0015	0.011	< 0.0002	11		21	0.0060	6.3		
21-Oct-05	< 1					< 0.005	< 0.001	0.014	< 0.0005	13		51	< 0.0010	6.3		1100
17-May-06		< 0.002	< 0.005	< 0.0001		< 0.005	0.002	0.012	< 0.0005	11		15	< 0.0010			
17-May-06		< 0.002	< 0.005	< 0.0001		< 0.005	< 0.001	0.011	< 0.0005	11		12	0.0010			
18-Oct-06		< 0.002	< 0.005	< 0.0001		< 0.005	0.003	< 0.001	< 0.0005			8	0.0020			
17-May-07						< 0.005	< 0.001	0.011	< 0.0005	11		16	0.0120			
17-Oct-07						< 0.005	< 0.001	0.011	< 0.0005	11		12	0.0030			
15-May-08						< 0.005	< 0.001	0.012	< 0.0005	11		29	< 0.0010	6.36		1294
15-May-08						< 0.005	< 0.001	0.013	< 0.0005	12		26	< 0.0010	6.36		1294
23-Oct-08						< 0.005	< 0.001	0.01	< 0.0005	9.9		14	< 0.0010	6.65		2424
22-May-09						< 0.005	< 0.001	0.001	< 0.0005	9.7		9	0.0010	6.65		1533

SUMMARY OF MONITORING DATA - MINOR PARAMETERS

22-May-09						<	0.005	<	0.001	0.001	<	0.0005	10		10	<	0.0010	6.65		1533
21-Oct-09						<	0.005	<	0.001	0.01	<	0.0005	9		9	<	0.0010	7.65		1153
20-May-10						<	0.005	<	0.001	0.009	<	0.0005	8.5		12	<	0.0010			
20-May-10						<	0.005	<	0.001	0.01	<	0.0005	9		10	<	0.0010	6.54		
20-Oct-10						<	0.005		0.001	0.01	<	0.0005	8.4		15	<	0.0010	6.6		
02-Jun-11						<	0.005	<	0.001	0.01		0.0008	7.5		22	<	0.0010	6.46		
27-Oct-11						<	0.005	<	0.001	0.01	<	0.0005	8.2		11		0.0050	6.69		
27-Oct-11						<	0.005	<	0.001	0.01	<	0.0005	8		7		0.0080	6.69		
17-May-12						<	0.005	<	0.001	0.01		0.00066	7.9		15		0.0170	6.68		
25-Oct-12						<	0.005	<	0.001	0.0098	<	0.0005	8.4		8		0.0095	6.56		
25-Oct-12						<	0.005	<	0.001	0.0093	<	0.0005	7.9		7		0.0075			
23-May-13							0.0072	<	0.005	0.012	<	0.0005	9		9		0.0110	6.58	6.9	851
16-Oct-13						<	0.005	<	0.001	0.014	<	0.0005	9.5		7		0.0170	6.65	5.7	722
22-May-14						<	0.005	<	0.001	0.013	<	0.0005	8.5		2		0.0020	6.7	7.8	619
08-Oct-14						<	0.005	<	0.001	0.012	<	0.0005	9.1		12		0.0150	6.92	7.5	521
22-Oct-15						<	0.005	<	0.001	0.013	<	0.0005	8		10		0.0018	6.08		816
22-Oct-15						<	0.005	<	0.001	0.013	<	0.0005	8.2		11		0.0017	6.08		816
30-May-16							0.008		0.007	0.016		0.0018	7.65				0.0120	6.7	5.7	430
27-Oct-16							0.0082		0.0167	0.0163		0.0044	8.14		13		0.0050	6.61		325
18-May-17							0.0044		0.00329	0.0102		0.00081	6.13		13		0.0100	7.09	10.1	321
25-Oct-17							0.002	<	0.0002	0.011	<	0.0002	6.9		12	<	0.0020	7.59	6.5	286
25-Oct-17							0.0014	<	0.0002	0.011	<	0.0002	0.011		13	<	0.0020	7.59	6.5	286

SUMMARY OF MONITORING DATA - MAJOR PARAMETERS

Monitor 122-I

Date	pH	Ca	Mg	Na	K	alkalinity	Cl	SO4	Fe	Zn	NO3	NO2	NH3	TKN	Hardness	TDS	Sp. Cond.
03-Jun-92	6.79	83.1	13.5	7.2	7	205.6	73.80	< 0.5	29.20	0.02	< 0.2	< 0.2	0.27	0.52	263.60	44	
08-Jul-92	6.62	86	13.9	7.2	8	216.4	67.80	< 0.5	31.70	0.01	< 0.2	< 0.2	0.25	0.52	272.80	401	
16-Sep-92	6.61	90.8	14.5	6.6	7	221.0	71.80	< 0.05	36.40	< 0.01	< 0.02	< 0.02	2.64	0.83	286.90	486	
08-Jun-93	6.70	140	23	8.6	8.7	339.0	88.00	2.3	50.00	12	0.06		0.45	0.70	443.00		
08-Jun-93	6.70	140	23	8.7	8.8	328.0	89.00	< 0.5	5.00	0.011	0.05		0.44	0.60	443.00		
13-Jul-93	6.70	140	23	8.7	8.7	346.0	97.00	0.65	53.00	< 0.01	0.09		0.68	0.70	444.00		
13-Jul-93	6.60	150	24	8.9	8.8	340.0	94.00	0.65	5.30	< 0.01	< 0.01		0.43	0.70	473.00		
17-Aug-93	6.60	150	23	8.9	8.7	340.0	100.00	0.8	51.00	< 0.01	0.11		0.37	0.75	469.00		
17-Aug-93	6.70	150	24	8.8	8.9	340.0	100.00	< 0.5	5.30	< 0.01	0.03		0.38	0.70	473.00		
20-Sep-93	6.70	160	25	8.7	8.8	370.0	97.00	< 0.5	58.00	< 0.01	0.09		0.44	0.70	502.00		
21-Sep-93	6.70	160	25	8.9	8.8	370.0	98.00	< 0.5	57.00	< 0.01	0.09		0.32	0.70	502.00		
30-May-95	6.60	270	40	13	11	590.0	180.00	< 0.5	96.00	0.012	0.04	0.06	0.54	1.08	840.00	1950	1470
18-Jul-95	6.70	280	43	13	11	620.0	200.00	1.02	100.00	0.019	0.13	0.125	0.70	1.31	880.00	2110	1550
23-Oct-95	6.70	270	43	13	11	670.0	200.00	< 0.5	100.00	0.018	0.09	0.01	0.51	1.38	850.00	1470	1670
23-Oct-95	6.70	260	44	13	11	720.0	250.00	< 0.5	110.00	0.014	0.09	0.01	0.63	1.34	830.00	1240	1660
02-Jul-96	6.50	359	49.3	14.7	9.8	916.0	2.48	< 2	111.00	< 0.005	< 0.05	< 0.03	0.53	2.42	1100.00	1470	
20-Aug-96	6.80	369	50.8	17.8	11.9	827.0	237.00	< 2	24.80	0.017	< 0.05	< 0.01	0.71	2.00	1130.00	1210	
31-Oct-96	6.80	353	48.6	17.2	12.6	496.0	251.00	< 2	58.90	< 0.005	< 0.05	< 0.01	1.12	1.39	1080.00	1010	2020
03-Jul-97	6.50	426	58.7	23	12.8	933.0	319.00	< 2	134.00	< 0.005	< 0.05	< 0.01	1.45	2.37	1300.00	1430	2490
02-Oct-97	6.63	400	54	27.7	12	< 1040.0	309.00	1.14	131.00	< 0.005	< 0.2	< 4	0.42	1.65	1222.00	1430	
02-Oct-97	6.63	400	54	27.7	12	< 1040.0	309.00	1.14	131.00	< 0.005	< 0.2	< 4	0.42	1.65	1222.00	1430	
20-May-98	6.59	406	58.1	36.3	13	934.0	331.00	0.5	160.00	0.023	< 0.2	< 0.2	0.45	3.05	1250.00		
30-Sep-98	6.85	423	60.8	37.5	13	1060.0	304.00	0.6	155.00	< 0.002	< 0.2	< 0.2	0.45	3.10	1300.00		
10-Jun-99	6.63	511	61.2	51.3	14.8	1040.0	377.00	< 0.5	156.00	0.005	< 0.2	< 0.2	0.48	1.96	1520.00		
06-Oct-99	6.92	507	58.3	53	13.6	1140.0	401.00	< 0.5	141.00	< 0.002	< 0.2	< 2	0.49	2.44	1500.00		
05-Jun-00	6.64	473	62.7	79.3	14.1	1130.0	370.00	3.2	147.00	0.067	0.3	< 0.2	0.45	3.40	1440.00		
22-Aug-00	6.69	478	58	76.5	14	1150.0	415.00	2.1	140.00	0.037	0.2	< 0.2	0.54	1.63	1430.00		
01-Jun-01	7.58	20.71	3.551	107		1011.0	393.00	1.1	0.15	0.015	< 0.1	< 0.1	0.40	1.78		2249	2930
01-Aug-01	7.09	413.4	60.2	91.4		1140.0	397.00	2.2	23.88	0.078	1.5	< 0.1	0.30	1.97		2565	2810
09-May-02		437.4	52.96			1093.0	367.00	< 0.1	57.97	0.011	< 0.1	< 0.1	0.90	3.17		2036	
12-Aug-02	6.84	528	61.67	118	16.5	1243.0	353.00	< 2	116.88	0.064	< 0.3	< 0.5	0.85	2.33		2040	3200
20-May-03	6.93	429	53.2	129	15	1150.0	384.00	< 0.5	89.90	< 0.005	< 0.2	< 0.2	0.58	2.17		2002	2850
07-Aug-03	6.69	459	54.2	131	15.7	1220.0	387.00	< 0.5	125.00	< 0.005	< 0.2	< 0.2	0.58	2.19		2060	2753
19-Aug-04	7.02	430	53.3	159	15.3	1010.0	403.00	0.5	123.00	0.016	< 0.2	< 0.2	0.57	2.63		2070	
14-Oct-04	6.89	396	49.9	152	14.1	994.0	459.00	0.5	121.00	0.006	< 0.2	< 0.2	0.70	2.74		1898	
03-Aug-05	7.15		7.9	170	16	1160.0	367.00	< 1	120.00	0.019	< 0.2	< 0.03	0.76	9.00		1800	2830
21-Oct-05	7.58	430	55		18	1150.0	370.00	< 1	30.00	< 0.005	< 0.2	< 0.03	1.16	3.40		2030	2380
17-May-06	7.20	410	53	200	18	1180.0	369.00	< 1	49.00	< 0.005	< 0.1	< 0.01	0.77	2.60		1800	2760
18-Oct-06	7.40	350	48	190	17	1030.0	340.00	< 1	< 0.05	< 0.005	< 0.5	< 0.05	0.76	2.60		1690	2790
17-May-07	7.30	410	56	210	18	1060.0	370.00	< 1	5.90	< 0.005	< 0.1	< 0.01	0.94	10.00		1650	2900
17-Oct-07	7.50	400	49	210	18	1040.0	370.00	< 1	7.40	< 0.005	< 0.1	< 0.01	0.83	6.00		1100	2840
17-Oct-07	7.40	390	47	190	17	1060.0	390.00	< 1	30.00	< 0.005	< 0.1	< 0.01	0.83	5.80		1080	2850
15-May-08	7.40	380	46	200	16	1030.0	370.00	< 1	40.00	< 0.025	< 0.1	< 0.01	0.72	3.40		1800	2880
23-Oct-08	7.30	350	46	200	17	1010.0	370.00	< 1	9.30	< 0.005	< 0.1	< 0.01	0.72	2.60		1720	2830
23-Oct-08	7.30	350	47	200	17	1020.0	370.00	< 1	26.00	< 0.005	< 0.1	< 0.01	0.77	5.00		1820	2850

SUMMARY OF MONITORING DATA - MAJOR PARAMETERS

22-May-09	7.30	350	43	200	17	981.0	360.00	<	2	4.30	<	0.005	<	0.1	<	0.01	0.77	3.10	1850	2820
21-Oct-09	7.10	340	42	200	15	1010.0	360.00	<	1	3.60	<	0.005	<	0.1	<	0.01	0.79	3.40	1870	2830
21-Oct-09	7.00	350	42	200	15	1010.0	360.00	<	1	8.70	<	0.005	<	0.1	<	0.01	0.80	3.30	1830	2840
20-May-10	7.40	340	45	210	16	977.0	350.00	<	1	24.00	<	0.005	<	0.1	<	0.01	0.76	5.00	1850	2820
20-Oct-10	7.20	360	46	220	17	943.0	350.00	<	1	51.00	<	0.005	<	0.1	<	0.01	0.78	4.00	1730	2780
27-Oct-11	7.28	330	44	210	16	929.0	380.00	<	1	45.00		0.01	<	0.1	<	0.01	0.77	2.70	1830	2740
17-May-12	7.01	310	41	210	16	930.0	350.00	<	1	30.00	<	0.005	<	0.1	<	0.01	0.72	2.70	1720	2700
17-May-12	7.03	310	41	210	16	920.0	360.00	<	1	29.00	<	0.005	<	0.1	<	0.01	0.73	2.70	1720	2700
25-Oct-12	7.10	310	41	220	16	890.0	340.00	<	1	67.00	<	0.005	<	0.1	<	0.01	0.97	5.60	1550	2700
23-May-13	7.03	320	42	230	16	920.0	360.00	<	1	70.00	<	0.005	<	0.01	<	0.01	0.88	6.60	1710	2600
16-Oct-13	7.26	320	42	220	17	880.0	350.00	<	1	20.00	<	0.005	<	0.01	<	0.01	0.87	4.50	1760	2600
22-May-14	6.91	300	39	220	16	920.0	360.00	<	1	71.00	<	0.005	<	0.2	<	0.02	0.81	2.20	1710	2700
08-Oct-14	7.23	300	41	220	16	890.0	350.00	<	1	73.00	<	0.05	<	0.1	<	0.01	0.96	5.40	1630	2700
22-Oct-15																				
30-May-16	6.97	321	50	251	22	902.0	300.00	<	0.5	142.00		0.051	<	0.2			0.88	2.63	1540	2580
27-Oct-16	7.24	297	42.2	218	15.9	883.0	320.00	<	0.5	119.00		0.037	<	0.2		0.021	0.53	2.70	1600	2480
18-May-17	6.96	220	31.4	183	12.9	895.0	330.00	<	0.5	91.50		0.012	<	0.01	<	0.01	0.68	2.30	1430	2460
18-May-17	6.80	230	34.2	187	13.5	864.0	340.00	<	0.5	96.70		0.035	<	0.01	<	0.01	0.69	3.30	1330	2440
25-Oct-17	6.97	240	29	200	14	841.0	330.00	<	0.5	65.00	<	0.003	<	0.044	<	0.033	0.65	1.20	1380	2370

SUMMARY OF MONITORING DATA - MINOR PARAMETERS

Monitor 122-I

Date	PO4	P	Al	Cd	Co	Cr	Cu	Ni	Pb	Mn	Mo	BOD	phenols	field pH	field T	field cond
03-Jun-92	< 1	< 0.1		< 0.005			< 0.01	< 0.05	< 0.05			15.3	< 0.0005			
08-Jul-92	< 1	< 0.1		< 0.005			< 0.01	< 0.05	< 0.05			10.9	* 0.0095			
16-Sep-92	< 0.01	< 0.01		< 0.005			< 0.01	< 0.05	< 0.05			10.9	* 0.0140			
08-Jun-93	0.02	0.01		0.002			< 0.005	< 0.01	0.025			34	0.0260			
08-Jun-93	0.04	0.01		< 0.002			< 0.005	< 0.01	< 0.02			33	0.0250			
13-Jul-93	0.002	0.005		< 0.002			< 0.005	< 0.01	< 0.02			25	0.0260			
13-Jul-93	0.01	0.01		< 0.002			< 0.005	< 0.01	< 0.02			28	0.0250			
17-Aug-93	0.01	0.01		< 0.002			< 0.005	< 0.005	< 0.02			28	0.0240			
17-Aug-93	0.005	0.32		< 0.002			< 0.005	< 0.005	< 0.02			24	0.0376			
20-Sep-93	0.02	0.006		< 0.002			< 0.005	< 0.005	< 0.02			35	0.0270			
21-Sep-93	0.01	0.008		< 0.002			< 0.005	< 0.005	< 0.02			33	0.0280			
30-May-95	0.05	0.03	0.079	< 0.002	0.017	< 0.005	< 0.005	< 0.005	0.025	5.9	0.015	80	0.0304			
18-Jul-95	0.025	0.04	< 0.05	< 0.002	0.017	< 0.005	< 0.005	< 0.005	< 0.02	6.1	0.017	0.82	0.0600	6.53	10	1701
23-Oct-95	0.03	0.02	< 0.05	< 0.002	0.02	< 0.005	< 0.005	< 0.005	< 0.02	6.2	0.016	90	0.0636	6.38	5.1	1765
23-Oct-95	0.1	0.02	< 0.05	< 0.002	0.018	< 0.005	< 0.005	< 0.005	0.021	6.4	0.018	90	0.0730			
02-Jul-96		< 0.1	0.069	< 0.003	0.017	0.006	< 0.003	< 0.01	< 0.002	6.39	< 0.01	65	0.0530			
20-Aug-96			< 0.025	< 0.003	0.016	< 0.005	< 0.003	< 0.01	< 0.002	7.39	< 0.01	138	0.0650			
31-Oct-96		< 0.1	< 0.025	< 0.003	0.015	0.006	< 0.003	< 0.001	< 0.002	7.55	< 0.01	50	0.0570			
03-Jul-97		< 0.1	< 0.02		0.016	< 0.005	< 0.003	< 0.01	< 0.002	8.58	< 0.01	57				
02-Oct-97	< 1	< 0.1	0.04	< 0.005	0.018	< 0.005	< 0.003	< 0.02	< 0.001	8.38	0.01	70.8				
02-Oct-97	< 1	< 0.1	0.04	< 0.005	0.018	< 0.005	< 0.003	< 0.02	< 0.001	8.38	0.01	70.8				
20-May-98	< 1	< 0.05	0.051	< 0.0001	0.0201	< 0.005	0.001	0.006	< 0.0005	8.56	0.001	52.1	0.0620			
30-Sep-98	< 1	0.07	0.008	< 0.0001	0.0208	< 0.005	0.001	0.003	< 0.0005	8.76	0.001	35.1	0.0550			
10-Jun-99	< 1	< 0.05	0.01	< 0.0001	0.0226	< 0.005	0.0006	0.004	< 0.005	9.72	0.001	17	0.0560			
06-Oct-99	< 1	< 0.05	0.008	< 0.0001	0.021	< 0.005	0.0007	0.006	< 0.005	9.47	0.001	42	0.0400			
05-Jun-00	< 1	0.05	0.014	< 0.0001	0.0205	< 0.01	0.0011	0.01	< 0.0005	8.63	0.002	11.7		6.71	6	1871
22-Aug-00	< 1	< 0.05	0.013	< 0.0001	0.02	< 0.05	0.0007	0.009	< 0.0005	9.34	0.001	31.6	0.0280	6.62	8.8	1916
01-Jun-01		< 0.02				< 0.001	0.016	0.003	0.001	0.452						
01-Aug-01		< 0.02				0.032	< 0.001	0.025	< 0.001	5.6		< 1	0.0270			
09-May-02	< 0.01					0.015	0.007	0.019	< 0.002	9.959		< 1	0.0110	6.6		1260
12-Aug-02	< 3					0.025	0.11	28	< 0.001	11.181		3	< 0.0010	6.7		1990
20-May-03	< 1					< 0.005	< 0.0005	0.01	< 0.0005	53.2		38	0.0070	6.9		1990
07-Aug-03	< 1					< 0.005	< 0.0005	0.009	< 0.0005	9.33		7.6	0.0060	6.5		1990
19-Aug-04	< 1	< 0.05	0.008	< 0.0001	0.0182	< 0.005	< 0.0005	0.01	0.0009	8.63	0.002	20.9	0.0080			
14-Oct-04	< 1	0.06	0.011	< 0.0001	0.0179	< 0.005	0.0015	< 0.01	0.0011	8.12	0.002	27	0.0050	6.6		1990
03-Aug-05	< 1			< 0.0001		< 0.005	0.0039	0.01	< 0.0002	7.9		10	0.0060	6.5		
21-Oct-05	< 1					< 0.005	< 0.001	0.013	< 0.0005	9.2		52	0.0030	3.4		1260
17-May-06		< 0.002	< 0.005	< 0.0001		< 0.005	< 0.001	0.012	< 0.0005	8.5		6	0.0040			
18-Oct-06		< 0.002	< 0.005	< 0.0001		< 0.005	0.003	< 0.001	< 0.0005			8	0.0040			
17-May-07						< 0.005	0.001	0.012	< 0.0005	8.5		10	0.0160			
17-Oct-07						< 0.005	< 0.001	0.008	< 0.0005	8.6		11	0.0040			
17-Oct-07						< 0.005	< 0.001	0.013	< 0.0005	8.8		110	0.0040			
15-May-08						< 0.005	< 0.001	0.01	< 0.0005	8.5		29	0.0010	6.72		1454
23-Oct-08						< 0.005	< 0.001	0.01	< 0.0005	8.2		5	< 0.0010	6.76		2970

SUMMARY OF MONITORING DATA - MINOR PARAMETERS

23-Oct-08						<	0.005	<	0.001	0.009	<	0.0005	8.4		5	<	0.0010	6.76		2970
22-May-09						<	0.005	<	0.001	0.012	<	0.0005	8.1		9		0.0020	6.82		1861
21-Oct-09						<	0.005	<	0.001	0.01	<	0.0005	8.1		6		0.0010	6.66		1434
21-Oct-09						<	0.005	<	0.001	0.011	<	0.0005	8.4		9		0.0010	6.66		1434
20-May-10						<	0.005		0.002	0.011	<	0.0005	8.8		10	<	0.0010	7		
20-Oct-10						<	0.005		0.001	0.009	<	0.0005	9		9	<	0.0010	6.73		
27-Oct-11						<	0.005	<	0.001	0.011	<	0.0005	8.9		6		0.0090	6.83		
17-May-12						<	0.005	<	0.001	0.0099		0.00083	8.7		7		0.0210			
17-May-12						<	0.005	<	0.001	0.0099		0.00079	8.7		22		0.0210	6.76		
25-Oct-12						<	0.005	<	0.001	0.0079	<	0.0005	8.7		3		0.0120	6.86		
23-May-13							0.0051	<	0.005	0.0086	<	0.0005	8.5		4		0.0130	6.78	9	1080
16-Oct-13						<	0.005	<	0.001	0.011	<	0.0005	8.7		5		0.0180	6.93	6.7	854
22-May-14						<	0.005	<	0.001	0.01	<	0.0005	8.5		4		0.0020	6.95	9.1	708
08-Oct-14						<	0.005	<	0.001	0.0078	<	0.0005	8.8		8		0.0150	7	7	585
22-Oct-15																				
30-May-16							0.026		0.041	0.033		0.014	8.57				0.0080	6.86	5.2	449
27-Oct-16							0.0098		0.0338	0.0217		0.0129	9.31		15		0.0090	6.83		345
18-May-17							0.0039		0.0055	0.0124		0.00454	7.43		17		0.0120	7.45	11.6	362
18-May-17							0.0066		0.0107	0.0168		0.0101	7.24		13		0.0120	7.45	11.6	362
25-Oct-17							0.0021	<	0.0002	0.011	<	0.0002	8.3		23		0.0030	7.21	5.8	301

SUMMARY OF MONITORING DATA - MAJOR PARAMETERS

SW Stations A3

Date	pH	Ca	Mg	Na	K	alkalinity	Cl	SO4	Fe	Zn	NO3	NO2	NH3	TKN	hardness	TDS	Sp. Cond.
28-May-92	7.08	18.4	2.72	14.1	3		23.60	7.91	0.29	< 0.01	< 0.02	< 0.2	< 0.02	0.83	57.20	176	183
28-May-92	7.08	18.4	2.72	14.1	3		23.60	7.91	0.29	< 0.01	< 0.02	< 0.2	< 0.02	0.83	57.20	176	183
10-Jun-92	7.33	21.6	3.23	17.5	4		32.70	7	0.33	< 0.01	< 0.02	0.01	0.05	0.89	67.30	172	214
25-Jun-92	6.66	22.8	3.34	18.2	3		36.40	5	0.68	< 0.01	< 0.02	< 0.2	0.04	0.91	70.80	205	224
14-Jul-92	7.10	18	2.7	13			20.00		0.33	< 0.01	< 0.01	0.007	0.03	0.90	81.00		162
15-Jul-92	7.06	17.9	2.61	12.4	2		18.00	4.56	0.39	0.01	< 0.02	< 0.2	< 0.02	0.96	55.70	143	151
29-Jul-92	7.07	21.1	3.25	15.6	3		29.70	1.97	0.66	< 0.01	< 0.02	< 0.2	0.04	0.99	66.30	229	203
19-Aug-92	7.06	24.3	3.59		3		40.50	1.24	0.62	0.01	< 0.02	< 0.2	0.06	0.94	75.70	221	115
24-Sep-92	7.34	22.7	3.88	21.1	4		34.20	2.18	0.31	< 0.01	< 0.02	< 0.2	< 0.02	0.95	72.80	145	246
16-Oct-92	6.62	25.3	4.29	23.1	5		45.83	1.534	0.31	< 0.01	< 0.02	< 0.02	0.05	0.88	80.80	154	282
03-May-93	7.30	21	3.8	21	4		37.00	6.19	0.13	< 0.01	0.11		0.06	0.72	68.00		216
26-May-93	7.20	23	4.2	24	5.1		44.00	4.58	0.28	< 0.01	0.02		0.04	0.77	74.00		256
15-Jun-93	7.10	24	4.4	27	5		50.00	3.34	0.60	< 0.01	< 0.01	0.004	0.02	0.86	78.00		283
23-Jul-93	7.00	28	4.5	30	4.6		57.00	1.69	0.59	< 0.01	< 0.01		0.01	0.95	88.00		306
24-Aug-93	7.30	30	4.6	25	4.3		40.00	1.3	0.62	< 0.01	< 0.01		0.03	1.04	94.00		273
07-Sep-93	7.00	28	4.6	27	4.9		46.00	1.1	0.34	< 0.01	< 0.01	0.005	0.03	0.95	89.00		290
05-Oct-93	7.20	29	4.7	26	5.2		10.00	1.2	0.31	< 0.01	0.01		0.05	0.90	92.00		307
03-May-94	7.20	24	4.3	25	6.6		52.00	5.9	0.25	< 0.01	0.03	0.006	0.03	0.86	78.00		282
26-Jul-94	7.20	28	4.7	30	4.5		53.00	1.6	0.77	0.018	< 0.01		< 0.01	0.88	89.00		306
08-Aug-94	7.70	30	5.1	31	4.8		60.00	1.3	0.43	0.005	< 0.01		0.02	0.91	96.00		309
13-Sep-94	7.30	29	4.7	26	4.7		58.00	1.6	0.85	< 0.01	< 0.01		0.02	1.59	92.00		307
18-Oct-94	7.40	30	4.6	28	4.8		63.00	1.8	0.38	< 0.01	0.03		0.05	0.74	94.00		303
09-May-95	7.40	21	3.7	21	4.1	51.0	36.00	5.3	0.14	< 0.01	0.03	0.003	0.03	0.67	68.00	181	231
26-Jun-95	7.30	27	4.1	23	3.7	70.0	38.00	1.79	1.10	< 0.01	0.09	0.01	0.10	1.15	84.00	220	255
10-Jul-95	7.50	23	3.7	20	2.7	61.0	34.00	1.44	0.43	< 0.01	0.09	0.01	0.10	1.01	73.00	217	225
23-Aug-95	7.10	29	4.6	32	5.1	66.0	55.00	4.18	0.47	< 0.01	< 0.01	0.006	0.02	1.06	91.00	259	303
12-Sep-95	7.50	31	4.8	32	4.9	69.0	61.00	2.14	0.26	< 0.01	< 0.01	0.004	0.02	0.97	97.00	252	329
16-Oct-95	7.30	29	4.6	29	4.5	66.0	59.00	1.78	0.37	< 0.01	< 0.01	0.004	0.01	0.84	91.00	260	315
04-Jun-96	6.70	22.1	3.77	20.4	3.2	56.0	33.00	5.41	0.35	< 0.005	< 0.05	< 0.03	0.09	0.65	71.00	145	
08-Jul-96	7.30	25.1	4.72	24.3	4.7	59.0		< 2	0.45	< 0.007	< 0.05	< 0.03	< 0.05	0.65	82.00	164	
22-Aug-96	7.20	31	4.4	28.1	3.9	72.0	44.00	< 2	0.51	0.005	0.07	< 0.01	0.10	1.84	95.60	164	
17-Sep-96	7.20	33.6	5.2	34.6	5.7	96.0	49.00	<	0.29	< 0.002	< 0.05	< 0.01	< 0.05	1.00	105.00	199	0.0003
27-May-97	7.00	20.9	4.2	21.1	5.3	62.0	30.00	4	0.17	0.002	< 0.05	< 0.01	< 0.05	1.52	69.60	123	238
27-May-97	7.00	20.9	4.2	21.1	5.3	62.0	30.00	4	0.17	0.002	< 0.05	< 0.01	< 0.05	1.52	69.60	123	238
24-Jun-97	7.70	26.4	5.1	27.7	4.7	86.0	45.00	< 2	0.59	< 0.001	< 0.05	< 0.01	0.05	1.18	86.70	163	316
12-Aug-97	7.20	28.4	4.7	30.4	4.4	19.0	45.00	< 2	0.63	0.005	< 0.05	< 0.01	< 0.05	1.26	90.40	132	340
08-Oct-97	6.54	38.4	6.63	40.7	10.9	52.0	78.00	31.5	0.46	0.019	< 0.1	< 0.1	0.06		123.10	237	
06-May-98	7.24	24.2	5.1	27.8	7	74.0	48.90	4.49	0.37	0.211	0.04	< 0.02	< 0.02	0.84	81.60		
08-Jul-98	7.22	30.8	5.75	32.4	5.3	75.0	44.90	0.8	0.98	0.007	< 0.2	< 0.2	0.05	1.13	100.00		
08-Sep-98	7.35	30.3	4.93	29.8	5.2	74.0	58.50	0.98	0.53	0.023	< 0.2	< 0.02	0.10	1.10	106.00		
08-Sep-98	7.43	30.7	4.78	28.6	5.2	75.0	59.20	1	0.52	0.025	< 0.2	< 0.02	0.15	1.14	103.00		
27-Oct-98	7.46	36.7	7.08	46.6	7.8	63.0	110.00	13.4	0.17	0.019	< 0.2	< 0.2	0.07	0.78	120.00		
21-May-99	7.65	20.2	3.79	20.1	4.1	57.0	30.00	7.2	0.20	0.003	< 0.2	< 0.2	0.02	0.86	68.00		
05-Jul-99	6.97	26.7	5.12	21.2	4.2	76.0	29.50	1.1	0.45	0.008	< 0.2	< 0.2	0.05	1.00	89.70		

SUMMARY OF MONITORING DATA - MAJOR PARAMETERS

25-Aug-99	7.62	31.1	4.79	20.8	2.6	77.0	40.30	<	0.5	0.80		0.022	<	0.2	<	0.2		0.04	1.14	106.00		
22-Oct-99	7.43	23.7	4.95	28.6	5.8	73.0	44.90		3	0.15		0.008	<	0.2	<	0.2		0.03	0.71	90.00		
07-Jun-00	7.90	26.6	5.18	30.8	6	82.0	47.00		0.9	0.25		0.026	<	0.2	<	0.2		0.04	1.09	88.20		
01-Aug-00	7.49	36.1	5.59	28.4	5.9	108.0	40.00	<	0.5	0.53		0.015	<	0.2	<	0.2		0.11	1.23	104.00		
18-Aug-00	8.10	36	5.38	28.3	6.1	100.0	47.20	<	0.5	0.51		0.01	<	0.2	<	0.2		0.06	1.00	104.00		
19-Oct-00	7.97	26.3	4.99	30.4	6.4	84.0	54.80		0.6	0.17		0.012	<	0.2	<	0.2	<	0.03	0.59	83.80		
05-May-01	6.98	6.148	1.538	3.9	1.4	16.0	5.90		1.4	0.33		0.003	<	0.1	<	0.1		0.10	1.28		63	63
01-Jul-01	7.41	10.87	1.845	8.7	2.1		11.90		2	0.40		0.003		0.2	<	0.1	<	0.10	0.58			104
05-Nov-01	7.06	7.43	1.78	8.8	2	25.0	12.60		1.9	0.24	<	0.001		0.1	<	0.1	<	0.10	0.56		85	103
13-May-02		16.45	3.762	19.9	4.32	54.0	27.70		4.8	0.12	<	0.005		0.5	<	0.1		0.19	0.88		159	
12-Aug-02	7.86	27.53	5.214	25.8	2.22	88.0	34.00	<	0.1	0.57		0.009	<	0.1	<	0.1		0.08	1.14			297
09-Oct-02	7.24	28.03	5.12				51.00		3	0.22		0.007	<	1	<	0.5		0.05	0.76			
20-May-03	7.46	20.7	4.44	27.5	5.1	65.0	47.20		6.9	0.10	<	0.005	<	0.2	<	0.2		0.14	0.84		182	310
27-Aug-03		67.7	6.41	39.7	4.3	88.0	67.70		1.9	0.20		0.005	<	0.2	<	0.2		0.07	0.92		238	415
27-Oct-03		20.9	3.28	20.5	3.4	53.0	41.10		6.2	0.24	<	0.005	<	0.2	<	0.2	<	0.03	0.73			
25-May-04	7.22	17.2	3.03	13.6	3	49.0	19.10		6.1	0.16		0.014	<	0.2	<	0.2	<	0.03	0.66		138	
19-Aug-04	7.49	24.9	4.56	24.2	3.6	65.0	42.60		1.3	0.32		0.028	<	0.2	<	0.2		0.04	0.81		210	
15-Oct-04	7.52	24.5	4.45	21.6	3.8	77.0	34.10	<	0.5	0.28	<	0.005	<	0.2	<	0.2		0.03	0.96		206	
03-Aug-05	7.79		5.4	30	4.5	86.3	37.30	<	1	0.35	<	0.005	<	0.2	<	0.03	<	0.05	1.10		230	278
02-Sep-05	7.84	26	4.9	25	3.5	81.7	36.10		10	0.19		0.006		1.6	<	0.03	<	0.05	0.70		276	264
21-Oct-05	8.08					95.0																349
21-Oct-05	8.10	31	6.5		6.4	95.0	61.00		1	0.14	<	0.005	<	0.9	<	0.03	<	0.05	0.70		196	351
17-May-06	7.80	25	5.1	30	5.8	78.0	42.00	<	1	< 0.05	<	0.005	<	0.1	<	0.01	<	0.05	0.90		192	287
30-Aug-06	8.20	35	6.1	40	4.2	107.0	77.00	<	1	0.09	<	0.005	<	0.1	<	0.01		0.06	1.10		276	420
18-Oct-06	7.80	30	5.9	39	6	83.0	71.00	<	1	0.27		0.006	<	0.1	<	0.01	<	0.05	0.80		235	381
18-Oct-06	7.90	30	5.9	38	5.9	80.0	65.00	<	1	0.25	<	0.005	<	0.1	<	0.01	<	0.05	1.10		247	367
17-May-07	7.20	29	5.3	35	5.1	54.0	66.00		21	0.31		0.005	<	0.1	<	0.01	<	0.05	1.60		237	369
23-Aug-07	7.80	27	4.9	26	3	73.0	42.00	<	1	1.10	<	0.005	<	0.1	<	0.01		0.08	1.60		219	270
17-Oct-07	7.80	30	5.1	36	4.9	60.0	81.00	<	1	0.17		0.006	<	0.1	<	0.01	<	0.05	0.80		287	406
15-May-08	7.70	22	4.4	25	4.4	56.0	39.00		2	0.17		0.008	<	0.1	<	0.01		0.06	1.10		170	253
21-Aug-08	8.00	29	5	31	4.1	87.0	50.00	<	1	0.47	<	0.005	<	0.1	<	0.01	<	0.05	1.10		230	353
23-Oct-08	7.50	28	4.8	36	5.1	59.0	64.00	<	1	0.23		0.011	<	0.1	<	0.01	<	0.05	1.10		220	361
22-May-09	7.00	17	3.2	18	3.6	59.0	24.00	<	2	0.14		0.005	<	0.1	<	0.01	<	0.05	1.70		125	205
01-Sep-09	7.30	27	4.1	22	3.7	83.0	31.00	<	5	0.79	<	0.005	<	0.1	<	0.01	<	0.05	1.40		180	278
21-Oct-09	7.30	27	4.6	25	5	93.0	41.00	<	1	0.45	<	0.005	<	0.1	<	0.01		0.11	1.10		215	330
20-May-10	7.70	22	3.6	25	4.3	63.0	36.00	<	1	0.28	<	0.005	<	0.1	<	0.01	<	0.05	1.10		160	253
27-Aug-10	7.60	26	4.9	23	4.6	89.0	34.00	<	1	0.60	<	0.005	<	0.1	<	0.01		0.90	1.30		190	291
20-Oct-10	7.30	28	5.2	31	5.4	75.0	45.00	<	1	0.36	<	0.005	<	0.1	<	0.01	<	0.05	0.90		208	325
02-Jun-11	7.75	23	3.6	26	4.3	61.0	36.00	<	1	0.33	<	0.005	<	0.1	<	0.01	<	0.05	1.00		154	251
24-Aug-11	7.51	30	5.3	35	5.3	92.0	43.00	<	1	0.33	<	0.005	<	0.1	<	0.01	<	0.05	1.10		266	343
27-Oct-11	7.84	31	5.4	34	6.4	91.0	60.00	<	1	0.11	<	0.005	<	0.1	<	0.01	<	0.05	0.80		260	389
17-May-12	7.43	28	5	32	6	68.0	43.00		1	0.33	<	0.005	<	0.1	<	0.01	<	0.05	0.99		178	310
25-Oct-12	7.16	27	4.8	33	5.5	50.0	46.00		10	0.31	<	0.005	<	0.1	<	0.01		0.14	1.40		244	310
23-May-13	7.41	17	3	21	3.7	45.0	29.00	<	1	0.11	<	0.005	<	0.1	<	0.01		0.08	1.00		120	20
16-Oct-13	7.48	24	3.9	24	4.2	65.0	38.00	<	1	0.26	<	0.005	<	0.01	<	0.01	<	0.05	0.98		232	280
22-May-14	7.40	15	2.7	14	3	47.0	20.00	<	1	0.28	<	0.005	<	0.5	<	0.05	<	0.05	1.00		142	170
20-Aug-14	7.62	21	3.5	21	22	59.0	30.00	<	1	0.45		0.006	<	0.1	<	0.01		0.07	1.50		176	220
08-Oct-14	7.41	33	6	33	7.9	110.0	43.00	<	1	0.51		0.006	<	0.1	<	0.01		0.09	2.10		220	380

SUMMARY OF MONITORING DATA - MAJOR PARAMETERS

22-May-15	7.41	18	3	20	3.4	48.0	33.00		1	0.21	<	0.005	<	0.5	0.57	<	0.05	0.77		160	220
19-Aug-15	7.67	34	6.1	30	5.3	120.0	39.00	<	1	0.49	<	0.005	<	0.1	< 0.01	<	0.05	1.00		278	360
22-Oct-15	7.66	24	4.4	23	4.9	82.0	32.00	<	1	0.40	<	0.005	<	0.1	< 0.01	<	0.05	0.78		196	270
30-May-16	7.51	22.9	4.57	24	5.64	79.0	27.00	<	0.5	0.42		0.007		0.193			0.19	0.93		150	253
07-Sep-16	7.88	30.7	5.4	29.5	6.36	102.0	39.00	<	0.5	0.29	<	0.005		0.02	< 0.002		0.11	0.83		216	332
27-Oct-16	7.76	24.1	4.9	23.3	5.05	87.4	30.00	<	0.5	0.41	<	0.005	<	0.2	0.003		0.07	0.83		178	268
18-May-17	7.78	22.6	4.59	24.7	5.89	84.9	29.00		10	0.53	<	0.005		0.11	< 0.01		0.49	1.00		192	261
30-Aug-17	7.98	24	4.5	30	3.9	88.4	40.00	<	0.5	0.16	<	0.003	<	0.044	< 0.014		0.02	0.99		206	317
30-Aug-17	7.92	24	4.5	30	3.9	90.5	40.00	<	0.5	0.16	<	0.003	<	0.044	< 0.014		0.02	1.30		198	318
25-Oct-17	7.33	16	2.5	17	2.7	52.9	24.00		1.5	0.19	<	0.003	<	0.044	< 0.033	<	0.02	0.70		124	190

SUMMARY OF MONITORING DATA - MINOR PARAMETERS

SW Stations: A3

Date	PO4	P	Al	Cd	Co	Cr	Cu	Ni	Pb	Mn	Mo	BOD	phenols	field pH	field T	field cond
28-May-92	< 0.1	< 0.1		< 0.005			< 0.01	< 0.05	< 0.05			0.8				
28-May-92	< 0.1	< 0.1		< 0.005			< 0.01	< 0.05	< 0.05			0.8				
10-Jun-92	< 0.1	< 0.1		< 0.005			< 0.01	< 0.05	< 0.05			1.4				
25-Jun-92	< 0.1	< 0.1		< 0.005			< 0.01	< 0.05	< 0.05			1				
14-Jul-92		0.01		< 0.005			< 0.005	< 0.01	< 0.02	0.018		2.1				
15-Jul-92	< 0.1	< 0.1		< 0.005			< 0.01	< 0.05	< 0.05			1.2				
29-Jul-92	< 0.1	< 0.1		< 0.005			< 0.01	< 0.05	< 0.05			1.3				
19-Aug-92	< 0.1	< 0.1		< 0.005			< 0.01	< 0.05	< 0.05			1				
24-Sep-92	< 0.1	< 0.1		< 0.005			< 0.01	< 0.05	< 0.05			1.2				
16-Oct-92	< 0.05	< 0.1		< 0.005			< 0.01	< 0.05	< 0.05			2.1				
03-May-93	< 0.001	0.01		< 0.002			< 0.005	< 0.01	< 0.02			1.1				
26-May-93	< 0.001	0.01		< 0.002			0.32	< 0.01	< 0.02			0.8				
15-Jun-93	0.002	0.03		< 0.002			0.011	< 0.01	0.02			2.8				
23-Jul-93	0.002	0.03		< 0.002			< 0.005	< 0.01	< 0.02			3.4				
24-Aug-93	0.003	0.02		< 0.002			< 0.005	< 0.005	< 0.02			1.5				
07-Sep-93	0.002	0.02		< 0.002			< 0.005	0.007	< 0.02			0.8				
05-Oct-93	0.002	0.02		0.002			< 0.005	< 0.005	< 0.02			1				
03-May-94	< 0.001	0.03		< 0.002			< 0.005	< 0.005	< 0.02			1.7				
26-Jul-94	0.004	0.02		< 0.002			< 0.005	< 0.005	< 0.02			1.6				
08-Aug-94	0.002	0.02		0.0003			0.0006	0.001	0.002			2.1				
13-Sep-94		0.07		< 0.002			< 0.005	< 0.0005	< 0.02			1.6				
18-Oct-94	0.002	0.02		< 0.002			< 0.005	< 0.01	< 0.02			0.8				
09-May-95	< 0.001	0.01	0.2	< 0.002	< 0.002	< 0.005	< 0.005	< 0.005	< 0.02	0.013	< 0.005	1.4	0.0010	6.5	11.3	175
26-Jun-95	0.01	0.03	0.064	< 0.002	< 0.002	< 0.005	< 0.005	< 0.005	0.025	0.054	< 0.005	1.7	0.0010	7.08	26.5	270
10-Jul-95	0.01	0.02	0.064	< 0.002	< 0.002	0.0062	< 0.005	< 0.005	< 0.02	0.014	< 0.005	1.1	0.0002	7.08	25.4	247
23-Aug-95	0.003	0.02	0.06	< 0.002	< 0.002	< 0.005	< 0.005	< 0.005	< 0.02	0.021	< 0.005	1.3	< 0.0002	8.77	18.2	289
12-Sep-95	0.002	0.01	< 0.05	< 0.002	< 0.002	< 0.005	< 0.005	< 0.005	< 0.02	0.0077	< 0.005	2.3	< 0.0002	7.64	20	470
16-Oct-95	< 0.001	0.02	< 0.05	< 0.002	< 0.002	< 0.005	< 0.005	< 0.005	< 0.02	0.011	< 0.005	1.1	0.0008	6.05	9.8	290
04-Jun-96		< 0.009	0.078	< 0.003	< 0.005	< 0.005	< 0.005		< 0.025	0.017	< 0.01	2	0.0010			
08-Jul-96	< 0.1	< 0.004	0.048	< 0.003	< 0.005	< 0.005	< 0.003	< 0.01	< 0.025	0.017	< 0.01	2	< 0.0010			
22-Aug-96	0.019	< 0.01	0.071	< 0.003	< 0.005	< 0.005	< 0.003	< 0.01	< 0.002	0.014	< 0.01	< 2	< 0.0010			
17-Sep-96		< 0.02	0.05	< 0.0005	< 0.001	< 0.002	< 0.002	0.002	0.0002	0.006		< 2	< 0.0010			
27-May-97		< 0.01	0.07	< 5E-05	< 0.0002	< 0.005	0.0005	< 0.001	0.0001	0.012	< 0.01	< 0.1				
27-May-97		< 0.01	0.07	< 0.003	< 0.0002	< 0.005	0.0005	< 0.01	0.0001	0.012	< 0.001	< 0.1				
24-Jun-97		< 0.01	0.02	< 0.003	0.0003	< 0.005	< 0.0005	< 0.01	< 0.0001	0.048	< 0.001	1.3				
12-Aug-97		< 0.01	0.05	<	0.0002	< 0.005	0.0016	0.002	0.0001	0.059	< 0.01	1.1				
08-Oct-97	< 1	0.02	0.103	< 0.0001	0.0003	< 0.005	0.002	0.002	< 0.0005	0.047	< 0.001	0.9				
06-May-98	< 0.2	0.01	0.065	< 0.0001	0.0002	< 0.005	0.0008	0.002	< 0.0005	0.021	< 0.001	2.1	< 0.0010			
08-Jul-98	< 1	0.04	0.211	< 0.0001	0.0005	< 0.005	0.0009	0.002	< 0.0005	0.094	< 0.001	3.7	< 0.0010			
08-Sep-98	< 0.1	0.06	0.067	< 0.0001	0.0002	< 0.005	0.0233	0.002	0.001	0.046	< 0.001	2.1	< 0.0010			
08-Sep-98	< 0.1	0.05	0.07	< 0.0001	0.0002	< 0.005	0.0016	0.001	0.0012	0.044	< 0.001	3.1	< 0.0010			
27-Oct-98	< 1	0.006	< 0.03	0.0002	0.0002	< 0.005	0.0007	0.001	0.0019	0.01	< 0.001	1.6	< 0.0010			
21-May-99	< 1	0.02	0.137	< 0.0001	0.0003	< 0.005	0.0022	0.002	< 0.005	0.009	< 0.001	1.4	< 0.0010			
05-Jul-99	< 1	0.03	0.128	< 0.0001		< 0.005	0.0011	0.002	< 0.005	0.025		1	< 0.0010			

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25-Aug-99	<	1		0.03		0.056	<	0.0001			<	0.005		0.0354	<	0.001	<	0.005	0.042				5.7							
22-Oct-99	<	1		0.03		0.131	<	0.0001		0.0002	<	0.005		0.0017		0.001	<	0.005	0.006	<	0.001		1.1	<	0.0010					
07-Jun-00	<	1		0.03		0.073	<	0.0001		0.0004	<	0.005		0.0011		0.002	<	0.0005	0.025	<	0.001		2.5	<	0.0010		7.52		23.9		307
01-Aug-00	<	1		0.01		0.05	<	0.0001			<	0.005		0.0023		0.002	<	0.0005	0.059				1.3	<	0.0010					
18-Aug-00	<	1		0.02		0.063		0.0001		0.0004	<	0.005		0.0012		0.002	<	0.0005	0.033	<	0.001		1	<	0.0010					
19-Oct-00	<	1		0.009		0.036	<	0.0001		0.0002	<	0.005		0.0016		0.002	<	0.0005	0.018	<	0.001		0.7	<	0.0010		7.25		8.7		338
05-May-01	<	0.1		0.1							<	0.001		0.001			<	0.001	0.005							6.4		13		50
01-Jul-01	<	0.1	<	0.02							<	0.001	<	0.001	<	0.001	<	0.001	0.017			<	1	<	0.0010					
05-Nov-01	<	0.1	<	0.005							<	0.001	<	0.005			<	0.001	0.011				2							
13-May-02	<	0.01									<	0.002	<	0.005	<	0.003	<	0.002	0.01				1	<	0.0010		7.1		4		130
12-Aug-02	<	0.01										0.002		0.008		0.005	<	0.002	0.072			<	1	<	0.0010		7.5		24		250
09-Oct-02	<	0.02										0.001		0.002		0.002	<	0.001	0.016				3				7.1		5		80
20-May-03	<	1									<	0.005		0.0018		0.002	<	0.0005	0.008				1.3	<	0.0010		7.9		4		
27-Aug-03	<	1									<	0.005		0.0012		0.002	<	0.0005	0.019				2.2		0.0010		8.7		18		
27-Oct-03	<	1									<	0.005		0.0012		0.001	<	0.0005	0.012				0.8	<	0.0010		7.1		0		
25-May-04	<	1		0.02		0.107	<	0.0001		0.0002	<	0.005		0.61	<	0.001	<	0.0005	0.012	<	0.001		0.9	<	0.0010		6.1		6		
19-Aug-04	<	1		0.06							<	0.005		0.0038		0.001	<	0.00005	0.023				1.6		0.0030		6.1		6		
15-Oct-04	<	1		0.10		0.067	<	0.0001		0.0002	<	0.005		0.001		0.001	<	0.0005	0.012	<	0.001		1.7	<	0.0010		6.8		5		280
03-Aug-05	<	1					<	0.0001			<	0.005		0.0014		0.015		0.0002	0.021			<	2		0.0010		7.6		23.7		
02-Sep-05		2									<	0.005		0.0011	<	0.001	<	0.0002	0.0082			<	2	<	0.0010		5.8		16.1		
21-Oct-05																														
21-Oct-05				0.01							<	0.005	<	0.001		0.001	<	0.0005	0.008			<	2	<	0.0010		1.6		9.1		
17-May-06			<	0.002	<	0.005	<	0.0001			<	0.005	<	0.001		0.001	<	0.0005	0.02			<	2	<	0.0010		7.4		15		280
30-Aug-06				0.02	<	0.005	<	0.0001			<	0.005	<	0.001		0.001	<	0.0005	0.005			<	2	<	0.0010						
18-Oct-06				0.01	<	0.005	<	0.0001			<	0.005	<	0.001		0.001	<	0.0005	0.02			<	2	<	0.0010		7.71		3.3		
18-Oct-06				0.02	<	0.005	<	0.0001			<	0.005	<	0.001		0.001	<	0.0005	0.018			<	2		0.0010						
17-May-07				0.02							<	0.005		0.001		0.001	<	0.0005	0.036			<	2		0.0020		7.32		13.5		
23-Aug-07				0.05							<	0.005	<	0.001	<	0.001	<	0.0005	0.13			<	2	<	0.0010						
17-Oct-07				0.008							<	0.005		0.023		0.011	<	0.0005	0.016			<	2	<	0.0010		7.81		9.2		
15-May-08				0.03							<	0.005		0.002		0.002	<	0.0005	0.014			<	2	<	0.0010		7.98		14.5		123
21-Aug-08				0.03							<	0.005	<	0.001		0.001	<	0.0005	0.057			<	2	<	0.0010		7.5		22		168
23-Oct-08				0.03							<	0.005		0.002		0.001	<	0.0005	0.017			<	2	<	0.0010		7.54		7.9		171
22-May-09				0.02							<	0.005		0.001	<	0.001	<	0.0005	0.006			<	2	<	0.0010		8.3				127
01-Sep-09				0.02							<	0.005	<	0.001	<	0.001	<	0.0005	0.31			<	2	<	0.0010		7.43		10.2		159
21-Oct-09				0.02							<	0.005	<	0.001		0.001	<	0.0005	0.023			<	2	<	0.0010		7.68		5.4		153
20-May-10				0.01							<	0.005		0.001		0.001	<	0.0005	0.037			<	2	<	0.0010		7.38		19.3		
27-Aug-10				0.03							<	0.005	<	0.001		0.001	<	0.0005	0.19			<	2	<	0.0010						
20-Oct-10											<	0.005	<	0.001		0.001	<	0.0005	0.052			<	2	<	0.0010		7.83		7.3		
02-Jun-11				0.02							<	0.005		0.001		0.001	<	0.0005	0.036			<	2	<	0.0010		7.11		19.2		
24-Aug-11				0.02							<	0.005	<	0.001		0.001	<	0.0005	0.05			<	2	<	0.0010		7.98		18.8		
27-Oct-11				0.01							<	0.005	<	0.001		0.001	<	0.0005	0.013			<	2		0.0040		7.35		6.7		
17-May-12				0.02							<	0.005	<	0.001	<	0.001	<	0.0005	0.49			<	2		0.0060		7.53		22.2		
25-Oct-12				0.02							<	0.005		0.0017		0.0012	<	0.0005	0.069			<	2		0.0020		7.35		4.9		
23-May-13				0.02							<	0.005		0.0016		0.001	<	0.0005	0.14			<	2		0.0015		7.22		13		131
16-Oct-13				0.01							<	0.005		0.0012	<	0.001	<	0.0005	0.024				2		0.0079		7.51		8.3		129
22-May-14											<	0.005		0.0065		0.001	<	0.0005	0.024			<	2	<	0.0010		7.95		13.2		96
20-Aug-14				0.06							<	0.005		0.001		0.0011	<	0.0005	0.051				4		0.0020		8.33		24.8		157
08-Oct-14											<	0.005		0.0012		0.0013	<	0.0005	0.086			<	2		0.0040		7.8		6.8		155

SUMMARY OF MONITORING DATA - MINOR PARAMETERS

22-May-15		0.03				<	0.005	<	0.001	<	0.001	<	0.0005	0.027		<	2	<	0.0010	6.69	14.6	103
19-Aug-15						<	0.005	<	0.001		0.0011	<	0.0005	0.077		<	2	<	0.0010	8.97	14.9	162
22-Oct-15						<	0.005		0.0011	<	0.001	<	0.0005	0.057		<	2	<	0.0010	7.32	6.8	125
30-May-16		0.19				<	0.001		0.018		0.0011	<	0.0002	0.074					0.0040	7.94	7.2	105
07-Sep-16		0.02		<	1E-05	<	0.001		0.00033			<	0.0002	0.0019		<	6		0.0020			
27-Oct-16		0.02				<	0.001		0.00064		0.001	<	0.0002	0.0111			4	<	0.0010	7.44	7.8	101
18-May-17		0.04				<	0.001	<	0.001		0.0011	<	0.0002	0.1			5		0.0030	8.03	12.3	110
30-Aug-17		0.02				<	0.001		0.0004	<	0.0005	<	0.0002	0.026		<	3	<	0.0020	7.74	19.6	150
30-Aug-17		0.03				<	0.001		0.00061	<	0.0005	<	0.0002	0.022		<	3	<	0.0020	7.74	19.6	150
25-Oct-17		0.009				<	0.001		0.00037		0.0008		0.00038	0.011		<	3	<	0.0020	7.35	4.9	69

SUMMARY OF MONITORING DATA - MAJOR PARAMETERS

SW Stations A4

Date	pH	Ca	Mg	Na	K	alkalinity	Cl	SO4	Fe	Zn	NO3	NO2	NH3	TKN	hardness	TDS	Sp. Cond.
28-May-92	6.65	10.8	1.8	11.9	2		22.60	3.05	0.34	< 0.01	< 0.02	< 0.2	0.03	0.81	34.40	125	129.2
10-Jun-92	6.96	12	1.97	12.4	2		20.70	1.45	0.58	0.03	< 0.02	0.01	0.06	1.02	38.30	112	122
25-Jun-92	6.41	11.3	1.88	11.6	2		21.30	0.9	0.94	< 0.01	< 0.02	< 0.2	0.10	1.02	36.20	133	128.4
14-Jul-92	6.40	9.3	1.5	12			19.00		0.42	< 0.01	0.01	0.006	0.02	0.86	42.00		109
15-Jul-92	6.48	9.21	1.45	10.9	1		18.30	1.84	0.41	< 0.01	< 0.02	< 0.2	0.03	0.89	29.00	110	106
29-Jul-92	6.59	9.06	1.44	10.5	< 1		17.90	1.43	0.35	< 0.01	< 0.02	< 0.2	0.05	0.89	28.60	140	107
19-Aug-92	6.55	10.2	1.58		< 1		20.40	1.21	0.42	< 0.01	< 0.02	< 0.2	0.04	1.02	32.00	143	90
24-Sep-92	6.57	10.3	1.71	11.8	1		24.20	1.71	0.22	< 0.01	0.04	< 0.2	0.07	0.83	33.00	79	128
16-Oct-92	6.59	10.1	1.69	12.3	2		23.23	1.74	0.21	< 0.01	0.066	< 0.02	0.02	0.73	32.20	70	129
20-Apr-93																	
20-Apr-93																	
03-May-93	6.60	11	1.9	14	3		30.00	4.22	0.12	< 0.01	0.07		0.02	0.58	35.00		142
26-May-93	6.50	10	1.8	14	2.9		29.00	2.62	0.13	< 0.01	0.08		0.01	0.62	32.00		139
15-Jun-93	6.70	10	1.7	14	2.5		27.00	1.96	0.17	< 0.01	0.04	0.005	< 0.01	0.74	31.00		132
15-Jun-93	6.70	9.7	1.7	14	2.3		28.00	1.98	0.17	< 0.01	0.04	0.005	< 0.01	0.76	31.00		133
23-Jul-93	6.60	12	1.9	15	1.9		30.00	1.32	0.26	< 0.01	< 0.01		0.01	0.96	38.00		139
24-Aug-93	6.60	14	2.2	16	2.3		31.00	1	0.24	0.011	< 0.01		0.02	0.84	44.00		154
07-Sep-93	6.60	11	2	15	2.2		36.00	1	0.10	< 0.01	0.03	0.004	< 0.01	0.74	36.00		142
05-Oct-93	6.70	11	1.9	14	2.3		29.00	1.7	0.15	< 0.01	0.1		< 0.01	0.62	35.00		142
05-Oct-93	6.70	11	1.9	14	2.3		28.00	1.6	0.14	< 0.01	0.1		< 0.01	0.62	35.00		142
03-May-94	6.50	12	2.2	14	3.6		33.00	1.7	0.34	< 0.01	0.05	0.004	0.23	1.00	39.00		153
03-May-94	6.40	12	2.2	15	3.7		32.00	1.6	0.24	< 0.01	0.05	0.005	0.23	1.00	39.00		151
14-Jun-94											0.015	0.005					
26-Jul-94	6.60	11	1.9	15	2.7		29.00	1.5	0.72	< 0.01	0.05		< 0.01	0.77	35.00		140
24-Aug-94	6.60	12	2.1	16	2.8		30.00	1.3	0.22	0.004	0.03		0.01	0.84	39.00		143
13-Sep-94	6.60	11	2	14	3.2		28.00	1.9	0.33	< 0.01	0.06		0.01	0.82	36.00		139
18-Oct-94	6.60	12	2.1	15	2.9		34.00	1.8	0.14	< 0.01	0.15		0.01	0.70	39.00		303
18-Oct-94	6.70	12	2.1	15	2.8		34.00	1.7	0.14	< 0.01	0.15		< 0.01	0.69	39.00		145
09-May-95	6.60	11	1.8	13	2.8	19.0	25.00	2.39	0.16	< 0.01	0.084	0.003	0.04	0.64	35.00	117	132
09-May-95	6.60	9.7	1.8	13	2.9	19.0	26.00	2.37	0.13	< 0.01	0.084	0.003	0.04	0.65	32.00	113	132
26-Jun-95	6.70	13	2.2	15	3	26.0	32.00	1	0.29	< 0.01	0.09	0.01	0.10	0.97	42.00	155	156
26-Jun-95	6.80	13	2.2	16	3.1	26.0	33.00	0.988	0.29	< 0.01	0.09	0.01	0.10	0.98	42.00	155	156
11-Jul-95	7.10	27	4.2	25	4.7	69.0	47.00	1.04	0.61	< 0.01	0.09	0.01	0.10	0.95	85.00	261	278
19-Jul-95	6.30	12	2	15	2.6	22.0	31.00	1.11	0.24	< 0.01	0.09	0.01	0.10	0.90	38.00	181	146
23-Aug-95	6.70	13	2.2	15	2	23.0	28.00	0.955	0.22	< 0.01	< 0.01	0.005	0.01	0.82	42.00	159	142
12-Sep-95	6.70	15	2.4	17	2.3	27.0	32.00	< 0.5	0.24	< 0.01	< 0.01	0.005	0.02	0.85	47.00	170	164
16-Oct-95	6.70	14	2.3	16	2	20.0	36.00	0.8	0.18	< 0.01	0.065	0.004	0.01	0.69	44.00	146	165
04-Jun-96	6.20	10.4	1.89	14.6	2.2	20.0	24.50	2.26	0.15	< 0.005	< 0.05	< 0.03	< 0.05	0.42	34.00	76	
08-Jul-96	7.10	11.3	2.22	14.1	0.8	25.0		< 2	0.21	< 0.029	< 0.05	< 0.03	< 0.05	0.59	37.00	76	
22-Aug-96	7.10	14.4	2.4	15.9	2.3	30.0	25.00	< 2	0.20	< 0.005	< 0.05	< 0.01	0.10	1.92	45.90	83	
17-Sep-96	7.00	14.2	2.5	17.7	2.8	37.0	28.00	<	0.13	< 0.002	< 0.05	< 0.01	0.07	0.83	45.60	98	0.0001
27-May-97	6.60	10.2	1.9	14.2	3.3	20.0	21.00	2	0.11	< 0.001	< 0.05	< 0.01	< 0.05	1.10	33.20	68	137
27-May-97	6.60	10.2	1.9	14.2	3.3	20.0	21.00	2	0.11	< 0.002	< 0.05	< 0.01	< 0.05	1.10	33.20	68	137
24-Jun-97	7.30	12.2	2.1	15.1	2.1	37.0	22.00	< 2	0.21	0.002	< 0.05	< 0.01	0.05	0.86	39.00	80	150

SUMMARY OF MONITORING DATA - MAJOR PARAMETERS

12-Aug-97	7.30	16	2.7	16.9	3	21.0	24.00	<	2		0.32	<	0.002	<	0.05	<	0.01	<	0.05	1.12	51.20	83	187
08-Oct-97	6.95	14.8	2.31	15.4	1.9	33.0	23.20		1		0.20	<	0.002	<	0.1	<	0.1		0.06		46.40	79	
06-May-98	6.65	10.8	2.14	17.7	2.6	20.0	34.90		1.66		0.18		0.006		0.16	<	0.02		0.07	0.66	35.70		
27-Oct-98	6.60	14	2.58	19.5	1.6	21.0	37.70		8.9		0.19		0.115		0.2	<	0.2		0.04	0.83	45.50		
21-May-99	7.56	9.7	1.72	14.9	2.4	18.0	27.50		4.6		0.11	<	0.002	<	0.2	<	0.2	<	0.02	0.76	29.40		
22-Oct-99	7.07	10.9	2.05	15.6	1.6	25.0	26.70	<	0.5		0.11		0.004	<	0.2	<	0.2		0.03	0.61	38.60		
07-Jun-00	7.54	10.9	1.94	18.4	2.8	26.0	33.20		0.8		0.15	<	0.005	<	0.2	<	0.2		0.03	0.71	39.40		
19-Oct-00	6.86	11	1.99	15.4	1.6	31.0	29.00	<	0.5		0.11	<	0.005	<	0.2	<	0.2	<	0.03	0.51	37.40		
05-May-01	7.41	8.884	1.824	14.4	3.1	21.0	4.90		58		0.19		0.001		0.3	<	0.1	<	0.10	0.63		103	139
01-Jul-01	7.39	9.95	1.776	9.4	2.1		13.30		1.6		0.36		0.003	<	0.1	<	0.1	<	0.10	0.37			105
05-Nov-01	6.95	10.45	2.25	17.8	3.2	33.0	33.10		1.4		0.13	<	0.001		0.1	<	0.1	<	0.10	0.52		134	176
13-May-02		10.78	2.306	19.6	3.55	26.0	30.60		2.1		0.16	<	0.005	<	0.1	<	0.1		0.04	0.70		130	
12-Aug-02	7.60	19.63	3.748	20.3	3.58	60.0	28.00	<	0.1		0.39		0.006	<	0.1	<	0.1		0.07	0.95			215
09-Oct-02	7.21	14.13	2.828				22.00	<	2		0.28		0.004	<	1	<	0.5		0.06	0.79			
20-May-03	6.92	10.5	2.13	18.9	3.4	24.0	38.50		1		0.15	<	0.005	<	0.2	<	0.2		0.14	0.84		110	193
27-Aug-03		25.5	2.57	15.3	2.8	33.0	25.50		2		0.21		0.053	<	0.2	<	0.2		0.17	0.92		86	163
27-Oct-03		11.6	2.06	15.9	2.6	30.0	29.20		2.2		0.23	<	0.005	<	0.2	<	0.2	<	0.03	0.67			
25-May-04	6.92	9.4	1.77	13.6	2.7	29.0	22.40		6.3		0.13	<	0.005	<	0.2	<	0.2	<	0.03	0.60		112	
19-Aug-04	7.31	13.7	2.59	17.9	2.2	40.0	31.70		0.5		0.31	<	0.005	<	0.2	<	0.2	<	0.03	0.74		158	
14-Oct-04	7.27	11.3	2.17	17.5	2.3	34.0	27.60	<	0.5		0.14	<	0.005	<	0.2	<	0.2	<	0.03	0.73		138	
03-Aug-05	7.79		2.5	13	2.1	36.0	16.60	<	1		0.36		0.007	<	0.2	<	0.03	<	0.05	0.80		110	125
02-Sep-05	7.64	14	2.8	16	1.9	41.8	20.80		9		0.29	<	0.005		1.7	<	0.03	<	0.05	0.90		202	149
21-Oct-05	7.63					30.0	13.00		1		0.19	<	0.005	<	0.1	<	0.03	<	0.05	0.60		62	95
17-May-06	7.20	13	2.6	19	2.9	37.0	30.00	<	1	<	0.05	<	0.005	<	0.1	<	0.01		0.06	0.90		116	164
30-Aug-06	7.80	19	3.8	20	2.8	56.0	32.00	<	1		0.26	<	0.005	<	0.1	<	0.01	<	0.05	0.90		123	210
18-Oct-06	7.50	17	3.8	21	2.3	41.0	34.00	<	1		0.29		0.006		0.2	<	0.01	<	0.05	0.70		167	208
17-May-07	6.80	11	2.3	13	2.6	30.0	20.00		3		0.16		0.005	<	0.1	<	0.01	<	0.05	1.00		88	138
23-Aug-07	7.80	14	2.9	12	1.8	46.0	20.00	<	1		0.51	<	0.005	<	0.1	<	0.01		0.07	1.40		124	154
23-Aug-07	7.70	13	2.7	12	1.7	41.0	19.00	<	1		0.44	<	0.005	<	0.1	<	0.01		0.06	1.80		122	140
17-Oct-07	7.50	11	2.3	16	1.4	32.0	34.00	<	1	<	0.10	<	0.005	<	0.1	<	0.01	<	0.05	0.80		120	180
17-Oct-07	7.30	12	2.7	18	1.6	32.0	33.00	<	1	<	0.10	<	0.005	<	0.1	<	0.01	<	0.05	0.80		116	177
15-May-08	7.30	10	2.2	13	2.3	26.0	21.00		1		0.27		0.008	<	0.1	<	0.01	<	0.05	0.80		90	128
15-May-08	7.30	11	2.2	14	2.4	25.0	22.00		1		0.25		0.006	<	0.1	<	0.01	<	0.05	0.90		90	129
21-Aug-08	7.70	15	2.9	18	1.4	45.0	28.00	<	1		0.24	<	0.005	<	0.1	<	0.01		0.23	0.90		120	181
21-Aug-08	7.80	15	2.8	18	1.4	45.0	28.00	<	1		0.24	<	0.005	<	0.1	<	0.01	<	0.05	0.90		122	182
23-Oct-08	7.20	13	2.7	20	2.3	30.0	38.00	<	1	<	0.10	<	0.005	<	0.1	<	0.01	<	0.05	0.90		120	194
23-Oct-08	7.20	13	2.6	20	2.3	30.0	38.00	<	1	<	0.10	<	0.005	<	0.1		0.01	<	0.05	1.00		125	195
22-May-09	6.40	9.4	1.9	15	2.6	27.0	25.00	<	2		0.15	<	0.005	<	0.1	<	0.01	<	0.05	0.90		94	146
22-May-09	6.70	9.8	1.9	16	2.8	30.0	26.00	<	2		0.14	<	0.005	<	0.1	<	0.01	<	0.05	0.80		95	152
01-Sep-09	7.30	9.6	2	11	1.8	29.0	18.00	<	5		0.11		0.008	<	0.1	<	0.01	<	0.05	1.00		80	123
01-Sep-09	6.90	10	2.1	11	1.8	30.0	20.00	<	5		0.15	<	0.005	<	0.1	<	0.01	<	0.05	0.90		81	126
21-Oct-09	7.20	12	2.5	17	2.4	40.0	33.00	<	1		0.11	<	0.005	<	0.1	<	0.01	<	0.05	0.70		120	188
21-Oct-09	7.10	13	2.7	19	2.4	40.0	33.00	<	1		0.12	<	0.005	<	0.1	<	0.01	<	0.05	0.70		127	194
20-May-10	7.60	9.8	2.1	11	2.3	27.0	18.00	<	1		0.21	<	0.005	<	0.1	<	0.01	<	0.05	0.90		76	116
20-May-10	7.50	9.5	2	11	2.2	27.0	18.00	<	1		0.16	<	0.005	<	0.1	<	0.01	<	0.05	0.80		72	117
20-Oct-10	7.30	13	2.5	16	2.2	35.0	25.00	<	1		0.15	<	0.005	<	0.1	<	0.01	<	0.05	0.70		104	158
02-Jun-11	7.49	12	2.3	19	2.9	31.0	28.00	<	1		0.15	<	0.005	<	0.1	<	0.01	<	0.05	0.80		96	161
24-Aug-11	7.20	11	2.4	14	2	35.0	21.00	<	1		0.15	<	0.005	<	0.1	<	0.01	<	0.05	0.90		98	146

SUMMARY OF MONITORING DATA - MAJOR PARAMETERS

27-Oct-11	7.63	12	2.3	15	2	33.0	25.00	<	1		0.15	<	0.005	<	0.1	<	0.01		0.07	0.60		84	155
17-May-12	6.97	11	2.3	14	2.3	29.0	23.00		1	<	0.10	<	0.005	<	0.1	<	0.01	<	0.05	0.38		86	140
25-Oct-12	6.75	14	2.9	23	3.1	34.0	33.00		1		0.16	<	0.005	<	0.1	<	0.01		0.13	1.10		174	200
23-May-13	7.45	10	2.1	12	2.1	28.0	20.00	<	1		0.16	<	0.005	<	0.1	<	0.01		0.08	0.66		56	130
16-Oct-13	7.31	14	2.8	21	2.2	37.0	33.00	<	1		0.11	<	0.005	<	0.01	<	0.01	<	0.05	0.70		200	200
22-May-14	6.84	9.7	2	11	2	27.0	18.00	<	1		0.61	<	0.005	<	0.5	<	0.05	<	0.05	0.80		80	120
20-Aug-14	7.26	11	2.2	12	17	30.0	17.00	<	1		0.49	<	0.005	<	0.1	<	0.01	<	0.05	1.00		102	130
08-Oct-14	7.07	14	2.8	22	1.6	36.0	34.00	<	1		0.15		0.006	<	0.1	<	0.01		0.08	1.30		146	190
22-May-15	7.36	9.9	2.1	15	2.1	28.0	28.00		1		0.71	<	0.005	<	0.5	<	0.5	<	0.05	0.56		120	150
19-Aug-15	7.09	11	2.2	13	1.6	33.0	22.00	<	1		0.38	<	0.005	<	0.1	<	0.01	<	0.05	0.59		126	140
22-Oct-15	7.21	11	2.3	19	1.8	37.0	26.00	<	1		1.40	<	0.005	<	0.1	<	0.01	<	0.05	4.60		138	160
30-May-16	7.27	10.6	2.15	20.7	2.67	29.9	29.00	<	0.5		0.10	<	0.005		0.031				0.03	0.55		114	166
07-Sep-16	7.57	9.95	1.93	11.8	1.56	29.9	17.00		0.82		0.15	<	0.005		0.029	<	0.002		0.52	0.67		74	120
27-Oct-16	7.51	10.3	2.32	17	2.32	34.3	26.00		5.53		0.09	<	0.005	<	0.2	<	0.002		0.02	0.60		74	160
18-May-17	7.28	9.62	1.89	17.2	2.47	30.6	27.00		3.9		0.07	<	0.005		0.46	<	0.01	<	0.02	0.47		104	154
30-Aug-17	7.50	13	2.4	14	1.7	36.3	18.00		0.8		0.09	<	0.003	<	0.044	<	0.014	<	0.02	0.55		84	141
25-Oct-17	7.33	13	2.4	21	2.4	35.7	27.00		0.79		0.11	<	0.003		0.096	<	0.033	<	0.02	0.58		110	164

SUMMARY OF MONITORING DATA - MINOR PARAMETERS

SW Stations: A4

Date	PO4	P	Al	Cd	Co	Cr	Cu	Ni	Pb	Mn	Mo	BOD	phenols	field pH	field T	field cond
28-May-92	< 0.1	< 0.1		< 0.005			< 0.01	< 0.05	< 0.05			0.6				
10-Jun-92	< 0.1	< 0.1		< 0.005			< 0.01	< 0.05	< 0.05			1				
25-Jun-92	< 0.1	< 0.1		< 0.005			< 0.01	< 0.05	< 0.05			0.8				
14-Jul-92		0.008		0.0021			< 0.005	< 0.01	< 0.02	0.027		1				
15-Jul-92	< 0.1	< 0.1		< 0.005			< 0.01	< 0.05	< 0.05			0.7				
29-Jul-92	< 0.1	< 0.1		< 0.005			< 0.01	< 0.05	< 0.05			0.9				
19-Aug-92	< 0.1	< 0.1		< 0.005			< 0.01	< 0.05	< 0.05			1.1				
24-Sep-92	< 0.1	< 0.1		< 0.005			< 0.01	< 0.05	< 0.05			1				
16-Oct-92	< 0.05	< 0.1		< 0.005			< 0.01	< 0.05	< 0.05			1.7				
20-Apr-93																
20-Apr-93																
03-May-93	< 0.001	0.02		< 0.002			< 0.005	< 0.01	< 0.02			0.8				
26-May-93	< 0.001	0.005		< 0.002			< 0.005	< 0.01	< 0.02			0.6				
15-Jun-93	< 0.001	0.01		< 0.002			< 0.005	< 0.01	< 0.02			1.3				
15-Jun-93	< 0.001	0.01		< 0.002			< 0.005	< 0.01	< 0.02			0.9				
23-Jul-93	0.002	0.02		< 0.002			< 0.005	< 0.01	< 0.02			1.6				
24-Aug-93	0.002	0.008		< 0.002			< 0.005	< 0.005	< 0.02			1.2				
07-Sep-93	0.002	0.006		< 0.002			< 0.005	0.007	< 0.02			0.4				
05-Oct-93	< 0.001	0.006		< 0.002			< 0.005	< 0.005	< 0.02			0.5				
05-Oct-93	< 0.001	0.005		< 0.002			< 0.005	< 0.005	< 0.02			0.7				
03-May-94	< 0.001	0.02		< 0.002			< 0.005	< 0.005	< 0.02			1.1				
03-May-94	< 0.001	0.02		< 0.002			< 0.005	< 0.005	< 0.02			1				
14-Jun-94	< 0.001			< 0.002				0.006				0.8				
26-Jul-94	0.002	0.007		< 0.002			< 0.005	< 0.005	< 0.02			1				
24-Aug-94	0.002	0.01		0.0002			0.0011	< 0.001	< 0.002			1.7				
13-Sep-94		0.008		< 0.002			< 0.005	< 0.005	< 0.02			0.9				
18-Oct-94	< 0.001	0.006		< 0.002			< 0.005	< 0.01	< 0.02			0.2				
18-Oct-94	< 0.001	0.006		< 0.002			< 0.005	< 0.01	< 0.02			0.6				
09-May-95	< 0.001	0.008	0.078	< 0.002	0.0036	< 0.005	< 0.005	< 0.005	< 0.02	0.0096	< 0.005	0.9	0.0008	6.58	11.9	88
09-May-95	< 0.001	0.009	0.094	< 0.002	0.0021	< 0.005	< 0.005	< 0.005	< 0.02	0.0098	< 0.005	0.8	0.0008	6.58	2.3	88
26-Jun-95	0.01	0.02	0.1	< 0.002	< 0.002	< 0.005	< 0.005	< 0.05	< 0.02	0.032	< 0.005	1.4	0.0004	6.9	21.1	181.4
26-Jun-95	0.01	0.02	0.12	< 0.002	< 0.002	< 0.005	< 0.005	< 0.005	< 0.02	0.03	< 0.005	1.6	0.0010	6.9	21.1	181.4
11-Jul-95	0.01	0.03	0.12	< 0.002	< 0.002	< 0.005	< 0.005	< 0.005	< 0.02	0.087	< 0.005	0.7	0.0008	7.15	18.4	290
19-Jul-95	0.01	0.01	0.24	< 0.002	< 0.002	< 0.005	< 0.005	< 0.005	< 0.02	0.014	< 0.005	2.5	0.0002	6.38	18.6	170.8
23-Aug-95	0.003	0.008	0.13	< 0.002	< 0.002	< 0.005	< 0.005	< 0.005	< 0.02	0.0079	< 0.005	0.4	< 0.0002	8	19.2	136
12-Sep-95	0.002	0.01	0.083	< 0.002	< 0.002	< 0.005	< 0.005	< 0.005	< 0.02	0.015	< 0.005	0.9	< 0.0002	6.75	16.9	149
16-Oct-95	< 0.001	0.007	0.11	< 0.002	< 0.002	< 0.005	< 0.005	< 0.005	< 0.02	0.0098	< 0.005	0.6	0.0004	6.45	6.3	245
04-Jun-96		< 0.004	0.11	< 0.003	< 0.005	< 0.005	< 0.005		< 0.025	< 0.005	< 0.01	2	< 0.0010			
08-Jul-96	< 0.1	< 0.004	0.146	< 0.003	< 0.005	< 0.005	< 0.003	< 0.01	< 0.025	0.006	< 0.01	< 2	< 0.0010			
22-Aug-96	0.012	< 0.01	0.129	< 0.003	< 0.005	< 0.005	< 0.003	< 0.01	< 0.002	0.006	< 0.01	28	< 0.0010			
17-Sep-96		< 0.02	0.06	< 0.0005	< 0.001	< 0.002	< 0.002	< 0.002	< 0.0001	< 0.002		< 2	< 0.0010			
27-May-97		< 0.01	0.09	< 0.003	< 0.0002	< 0.005	< 0.0005	< 0.01	< 0.0001	0.003	< 0.001	< 0.1				
27-May-97		< 0.01	0.09	< 5E-05	< 0.0002	< 0.005	< 0.0005	< 0.001	< 0.0001	0.003	< 0.01	< 0.1				
24-Jun-97		< 0.01	0.07	< 0.003	< 0.0002	< 0.005	0.0007	< 0.01	< 0.0001	0.006	< 0.001	1.1				

SUMMARY OF MONITORING DATA - MINOR PARAMETERS

12-Aug-97		< 0.01	0.1	< 5E-05	0.0003	< 0.005	0.003	< 0.001	0.0002	0.032	< 0.01	1.3				
08-Oct-97	< 1	< 0.002	0.096	< 0.0001	0.0002	< 0.005	< 0.0005	< 0.001	< 0.0005	0.012	< 0.001	0.5				
06-May-98	< 0.2	0.008	0.083	< 0.0001	< 0.0001	< 0.005	0.001	< 0.001	< 0.0005	0.005	< 0.001	2.7	< 0.0010			
27-Oct-98	< 1	0.15	0.12	< 0.0001	0.0001	< 0.005	0.0043	< 0.001	0.0016	0.014	< 0.001	1.1	< 0.0010			
21-May-99	< 1	0.03	0.135	< 0.0001	0.0001	< 0.005	0.0011	0.001	< 0.005	< 0.005	< 0.001	1.3	< 0.0010			
22-Oct-99	< 1	0.02	0.069	< 0.0001	0.0001	< 0.005	0.0005	< 0.001	< 0.005	< 0.005	< 0.001	1.3	< 0.0010			
07-Jun-00	< 1	0.01	0.08	< 0.0001	< 0.0001	< 0.005	0.0007	< 0.001	< 0.0005	< 0.005	< 0.001	2.4	< 0.0010	6.92	17.1	170.5
19-Oct-00	< 1	0.005	0.051	< 0.0001	< 0.0001	< 0.005	0.0007	< 0.001	< 0.0005	< 0.005	< 0.001	0.5	< 0.0010	6.83	7.9	161.1
05-May-01	< 0.1	0.10				< 0.001	< 0.001		< 0.001	0.003				6.6	11	120
01-Jul-01	< 0.1	< 0.02				< 0.001	< 0.001	0.001	< 0.001	0.006		< 1	0.0030			
05-Nov-01	< 0.1	< 0.005				< 0.001	< 0.005		< 0.001	0.002		< 1				
13-May-02	< 0.01					< 0.002	< 0.005	< 0.003	< 0.002	0.004		< 1	< 0.0010	6.6	0.5	100
12-Aug-02	< 0.01					< 0.002	0.002	0.003	< 0.002	0.019		< 1	< 0.0010	7.1	23.1	170
09-Oct-02	< 0.02					< 0.001	< 0.001	< 0.001	< 0.001	0.026		2		7	5	160
20-May-03	< 1					< 0.005	0.0006	< 0.001	< 0.0005	0.007		1.3	< 0.0010	7.5	10	
27-Aug-03	< 1					< 0.005	0.0147	< 0.001	< 0.0005	0.015		2.5	< 0.0010	18	16	
27-Oct-03	< 1					< 0.005	0.001	< 0.001	< 0.0005	< 0.005		0.9	< 0.0010	6.2	1	
25-May-04	< 1	0.01	0.095	< 0.0001	0.0001	< 0.005	0.13	< 0.001	< 0.0005	< 0.005	< 0.001	0.8	< 0.0010	6	2	
19-Aug-04	< 1	0.03				< 0.005	0.0008	< 0.001	< 0.00005	0.02		1	0.0020	6	2	
14-Oct-04	< 1	0.005		< 0.0001	0.0002	< 0.005	< 0.0005	< 0.001	< 0.0005	< 0.005	< 0.001	1.2	< 0.0010	6.5	5	170
03-Aug-05	< 1			< 0.0001		< 0.005	0.0012	< 0.001	< 0.0002	0.033		< 2	0.0010	7.9	22.4	
02-Sep-05	2					< 0.005	0.0012	< 0.001	< 0.0002	0.021		< 2	< 0.0010	5.8	21.8	
21-Oct-05		0.02				< 0.005	< 0.001		< 0.0005			< 2	< 0.0010	5.2	7.7	
17-May-06		0.02	< 0.005	< 0.0001		< 0.005	< 0.001	< 0.001	< 0.0005	0.012		< 2	< 0.0010	7.1	12.9	130
30-Aug-06		0.02	< 0.005	< 0.0001		< 0.005	< 0.001	< 0.001	< 0.0005	0.02		< 2	< 0.0010			
18-Oct-06		0.007	< 0.005	< 0.0001		< 0.005	0.003	< 0.001	< 0.0005	0.019		< 2	< 0.0010	7.59	3	
17-May-07		0.01				< 0.005	< 0.001	< 0.001	< 0.0005	0.012		< 2	0.0120	7.73	18.6	
23-Aug-07		0.03				< 0.005	< 0.001	< 0.001	< 0.0005	0.031		< 2	< 0.0010			
23-Aug-07		0.02				< 0.005	< 0.001	< 0.001	< 0.0005	0.034		3	< 0.0010			
17-Oct-07		0.01				< 0.005	< 0.001	0.003	< 0.0005	0.004		< 2	< 0.0010	6.77	6.8	
17-Oct-07		0.007				< 0.005	< 0.001	< 0.001	< 0.0005	0.004		< 2	< 0.0010			
15-May-08		0.03				< 0.005	< 0.001	< 0.001	< 0.0005	0.011		< 2	< 0.0010	7.7	11.5	60
15-May-08		0.03				< 0.005	0.001	< 0.001	< 0.0005	0.01		< 2	< 0.0010	7.7	11.5	60
21-Aug-08		0.03				< 0.005	< 0.001	< 0.001	< 0.0005	0.015		< 2	< 0.0010	7.27	23	85
21-Aug-08		0.02				< 0.005	< 0.001	< 0.001	< 0.0005	0.014		< 2	< 0.0010	7.27	23	85
23-Oct-08		0.02				< 0.005	< 0.001	< 0.001	< 0.0005	0.002		< 2	< 0.0010	7.59	10.1	91
23-Oct-08		0.02				< 0.005	< 0.001	< 0.001	< 0.0005	0.003		< 2	< 0.0010	7.59	10.1	91
22-May-09		0.01				< 0.005	< 0.001	< 0.001	< 0.0005	0.003		< 2	< 0.0010	8.31		98
22-May-09		0.01				< 0.005	< 0.001	< 0.001	< 0.0005	0.003		< 2	< 0.0010	8.31		98
01-Sep-09		0.02				< 0.005	< 0.001	< 0.001	< 0.0005	0.012		< 2	< 0.0010	7.87	23.9	64
01-Sep-09		0.02				< 0.005	< 0.001	< 0.001	< 0.0005	0.017		< 2	< 0.0010	7.87	23.9	64
21-Oct-09		0.003				< 0.005	< 0.001	< 0.001	< 0.0005	0.007		< 2	< 0.0010	8.1	5.9	89
21-Oct-09		< 0.002				< 0.005	< 0.001	< 0.001	< 0.0005	0.007		< 2	< 0.0010	8.1	5.9	89
20-May-10		0.01				< 0.005	< 0.001	< 0.001	< 0.0005	0.012		< 2	< 0.0010	7.61	24.6	
20-May-10		0.01				< 0.005	< 0.001	< 0.001	< 0.0005	0.011		< 2	< 0.0010			
20-Oct-10						< 0.005	< 0.001	< 0.001	< 0.0005	0.01		< 2	< 0.0010	8.06	6.5	
02-Jun-11		0.01				< 0.005	< 0.001	< 0.001	< 0.0005	0.004		< 2	< 0.0010	7.26	14.1	
24-Aug-11		0.02				< 0.005	< 0.001	0.001	< 0.0005	0.018		< 2	< 0.0010	8.22	19.1	

SUMMARY OF MONITORING DATA - MINOR PARAMETERS

27-Oct-11		0.01				<	0.005	<	0.001	<	0.001	<	0.0005	0.01		<	2		0.0020	7.78	7.3			
17-May-12		0.01				<	0.005	<	0.001	<	0.001	<	0.0005	0.072		<	2		0.0036	7.42	19.6			
25-Oct-12		0.002				<	0.005	<	0.001		0.001	<	0.0005	0.0023		<	2		0.0013	7.62	4.8			
23-May-13		0.01				<	0.005	<	0.001	<	0.001	<	0.0005	0.064		<	2	<	0.0010	7.56	14.5		164	
16-Oct-13		< 0.002				<	0.005	<	0.001	<	0.001	<	0.0005	0.005		<	2		0.0057	7.5	7.1		97	
22-May-14						<	0.005		0.001	<	0.001	<	0.0005	0.028		<	2	<	0.0010	7.86	17.1		76	
20-Aug-14		0.02				<	0.005	<	0.001	<	0.001	<	0.0005	0.037			2		0.0020	8.3	26.1		98	
08-Oct-14						<	0.005		0.0011		0.0012	<	0.0005	0.0042		<	2		0.0040	8.14	8		91	
22-May-15		0.01				<	0.005	<	0.001	<	0.001	<	0.0005	0.0063		<	2	<	0.0010	8.77	15.9		78	
19-Aug-15						<	0.005	<	0.001	<	0.001	<	0.0005	0.059		<	2	<	0.0010	9.99	17.4		69	
22-Oct-15						<	0.005		0.0047	<	0.001	<	0.0005	0.0094		<	2	<	0.0010	6.67	8		79	
30-May-16		0.007				<	0.001	<	0.0005	<	0.001	<	0.0002	0.0013					0.0030	8.18	5.8		73	
07-Sep-16		0.02		< 1E-05		<	0.001		0.00062			<	0.0002	< 0.001		<	6		0.0019					
27-Oct-16		0.004				<	0.001		0.00021	<	0.001	<	0.0002	< 0.001			2	<	0.0010	7.68	6.1		65	
18-May-17		0.003				<	0.001	<	0.001	<	0.001	<	0.0002	< 0.001		<	3	<	0.0020	8.25	14.5		67	
30-Aug-17		0.01				<	0.001		0.0005	<	0.0005	<	0.0002	< 0.0004		<	3	<	0.0020	5.37	19.7		81	
25-Oct-17		0.004				<	0.001	<	0.0002		0.0005	<	0.0002	< 0.004		<	3	<	0.0020	7.3	5.5		64	

SUMMARY OF MONITORING DATA - MAJOR PARAMETERS

SW Stations D2

Date	pH	Ca	Mg	Na	K	alkalinity	Cl		SO4		Fe		Zn		NO3		NO2		NH3	TKN	hardness	TDS	Sp. Cond.
25-Jun-97	7.30	12.8	2	15.9	1.2	34.0	23.00	<	2		1.00	<	0.001		0.08	<	0.01		0.08	1.01	40.10	93	150
08-Oct-97	6.39	18.1	2.66	17.9	2.7	16.0	30.10		19.5		0.26		0.002	<	0.1	<	0.1		0.06		56.20	100	
05-May-01	7.50	8.309	1.801	8.4	2	21.0	12.00		2.1		0.52	<	0.001		0.122	<	0.1	<	0.10	0.62		78	101
01-Jul-01	7.30	9.74	2.161	9	2.4		22.10		6.2		0.38		0.005	<	0.1	<	0.1		0.10	0.78			100
05-Nov-01	7.40	7.74	1.81	8	1.9	23.0	10.20		2.2		0.31	<	0.001	<	0.1	<	0.1	<	0.10	0.86		81	98
13-May-02		6.591	1.165	7.2	1.42	10.0	10.30		3.2		0.26	<	0.005		0.3	<	0.1		0.01	0.64		106	
12-Aug-02																							
09-Oct-02	7.13	12.18	2.343				16.00		9		0.30		0.004	<	1	<	0.5		0.05	0.68			
20-May-03	6.53	9.3	1.35	8.2	1.2	12.0	15.40		5.2		0.18	<	0.005	<	0.2	<	0.2	<	0.03	0.68		72	103
27-Aug-03																							
27-Oct-03		10.3	1.6	10.4	1	16.0	28.20		4.7		0.30		0.005	<	0.2	<	0.2	<	0.03	0.52			
27-Oct-03		12.1	1.71	10.3	1.1	13.0	27.80		4		0.33		0.029	<	0.2	<	0.2	<	0.03	0.57			
25-May-04	6.50	7.4	1.3	9.9	1.3	15.0	19.60		6.4		0.48	<	0.005	<	0.2	<	0.2	<	0.03	0.52		112	
19-Aug-04	6.89	10.6	1.73	12.6	0.8	18.0	29.40		1		0.81	<	0.005	<	0.2	<	0.2	<	0.03	0.86		158	
15-Oct-04	7.04	12.5	2.03	12.3	1.6	24.0	26.10	<	0.5		0.44	<	0.005	<	0.2	<	0.2	<	0.03	0.72		130	
03-Aug-05	7.37		2.9	180	1.6	35.0	30.80	<	1		1.50		0.008	<	0.2	<	0.03	<	0.05	1.30		150	171
03-Aug-05	7.39		2.7	180	1.7	34.7	28.50	<	1		0.97		0.009	<	0.2	<	0.03		0.05	1.20		186	170
02-Sep-05	7.44	15	2.6	16	1.6	33.3	28.40		9		0.65	<	0.005	<	0.2	<	0.03	<	0.05	0.60		194	160
02-Sep-05	7.45	15	2.5	16	1.6	32.5	27.20		9		0.65		0.006		1.6	<	0.03	<	0.05	0.70		248	161
21-Oct-05	7.33	13	2.5		1.6	26.0	37.00		2		0.30	<	0.005	<	0.1	<	0.03		0.08	0.50		92	151
21-Oct-05																							
17-May-06	7.80	11	1.8	12	1.5	26.0	19.00		1	<	0.05	<	0.005	<	0.1	<	0.01		0.06	0.70		81	115
17-May-07	6.60	10	1.8	12	1.5	12.0	20.00		8		0.43	<	0.005	<	0.1	<	0.01	<	0.05	0.80		73	120
17-May-07	6.60	9.4	1.8	12	1.4	12.0	20.00		8		0.32	<	0.005	<	0.1	<	0.01	<	0.05	2.00		77	120
17-Oct-07	7.10	12	2.1	17	1.6	15.0	39.00	<	1		0.30	<	0.005	<	0.1	<	0.01	<	0.05	0.70		110	174
15-May-08	7.20	7.8	1.3	11	1.5	11.0	17.00		1		0.23		0.005	<	0.1	<	0.01	<	0.05	0.70		70	96
23-Oct-08	6.80	11	1.9	14	1.5	14.0	30.00	<	1		0.32	<	0.005	<	0.1	<	0.01	<	0.05	1.10		90	150
22-May-09	6.20	8.1	1.4	11	1.6	13.0	18.00		5		0.22	<	0.005	<	0.1	<	0.01	<	0.05	1.00		70	111
01-Sep-09	7.00	13	2.1	16	1.1	33.0	29.00	<	5		0.51	<	0.005	<	0.1	<	0.01	<	0.05	0.90		102	159
21-Oct-09	6.90	13	2.3	14	1.8	30.0	32.00	<	1		0.28	<	0.005	<	0.1	<	0.01	<	0.05	0.60		110	172
20-May-10	7.40	10	1.9	11	1.8	22.0	19.00	<	1		0.66	<	0.005	<	0.1	<	0.01	<	0.05	0.90		72	115
27-Aug-10	7.50	21	3.7	18	2.2	60.0	31.00	<	1		0.62	<	0.005	<	0.1	<	0.01	<	0.05	1.10		150	227
20-Oct-10	7.10	15	2.5	18	1.9	33.0	33.00	<	1		0.28	<	0.005	<	0.1	<	0.01	<	0.05	0.60		112	181
02-Jun-11	7.35	11	1.9	14	1.6	24.0	22.00	<	1		0.47	<	0.005	<	0.1	<	0.01		0.47	0.90		80	125
24-Aug-11	6.78	13	2.4	12	1.5	30.0	17.00		1		1.30	<	0.005	<	0.1	<	0.01	<	0.05	1.10		90	127
27-Oct-11	6.83	15	2.7	15	1.4	26.0	30.00		4		1.90		0.006	<	0.1	<	0.01	<	0.05	0.80		106	173
17-May-12	6.55	13	2.5	16	1.8	17.0	27.00		3		4.50	<	0.005	<	0.1	<	0.01	<	0.05	0.45		120	160
25-Oct-12	6.44	9.9	1.7	8.8	1.6	11.0	15.00		1		0.56		0.007	<	0.1	<	0.01		0.13	1.10		128	100
23-May-13	6.80	7.9	1.4	9.5	1.4	10.0	19.00	<	1		0.14	<	0.005	<	0.1	<	0.01		0.06	0.93		80	100
16-Oct-13	6.92	14	2.4	16	1.6	16.0	34.00	<	1		0.29	<	0.005	<	0.01	<	0.01	<	0.05	0.89		180	180
22-May-14	6.61	11	1.9	20	1.9	12.0	39.00	<	1		0.20	<	0.005	<	0.5	<	0.05	<	0.05	0.61		140	180
20-Aug-14	7.29	19	3.1	24	1.3	43.0	39.00	<	1		2.10		0.006	<	0.1	<	0.01	<	0.05	1.40		152	230
08-Oct-14	6.83	14	2.4	23	1.6	25.0	41.00	<	1		0.32	<	0.005	<	0.1	<	0.01	<	0.05	0.63		122	200
22-May-15	6.93	7.5	1.3	12	1.1	20.0	20.00		1		0.21	<	0.005	<	0.5	<	0.5	<	0.05	0.60		116	110

SUMMARY OF MONITORING DATA - MAJOR PARAMETERS

22-Oct-15	7.04	13	2.3	18	1.6	26.0	32.00	<	1	0.30	<	0.005	<	0.1	<	0.01	<	0.05	0.41	140	180
30-May-16	7.00	11.2	1.92	19.8	1.55	15.0	36.00	<	0.5	0.24	<	0.005		0.02				0.04	0.50	114	169
07-Sep-16	7.61	16.4	2.67	19.5	2.08	44.6	29.00	<	0.5	0.27	<	0.005	<	0.02	<	0.002		0.69	0.92	104	194
27-Oct-16	7.51	8.87	1.18	14.9	1.18	29.7	21.00	<	0.5	0.13	<	0.005	<	0.02		0.003		0.02	0.49	94	140
27-Oct-16	7.49	9.34	1.26	14.8	1.26	29.8	21.00	<	0.5	0.16	<	0.005		0.03		0.003		0.02	0.49	100	138
18-May-17	7.41	8.86	1.51	14.1	1.28	22.3	23.00		2.3	0.21	<	0.005	<	0.01	<	0.01	<	0.02	0.42	100	130
25-Oct-17	7.09	10	1.7	15	1.4	24.3	20.00		2.6	0.30	<	0.003	<	0.044	<	0.033	<	0.02	0.45	88	124

SUMMARY OF MONITORING DATA - MAJOR PARAMETERS

SW Stations D2

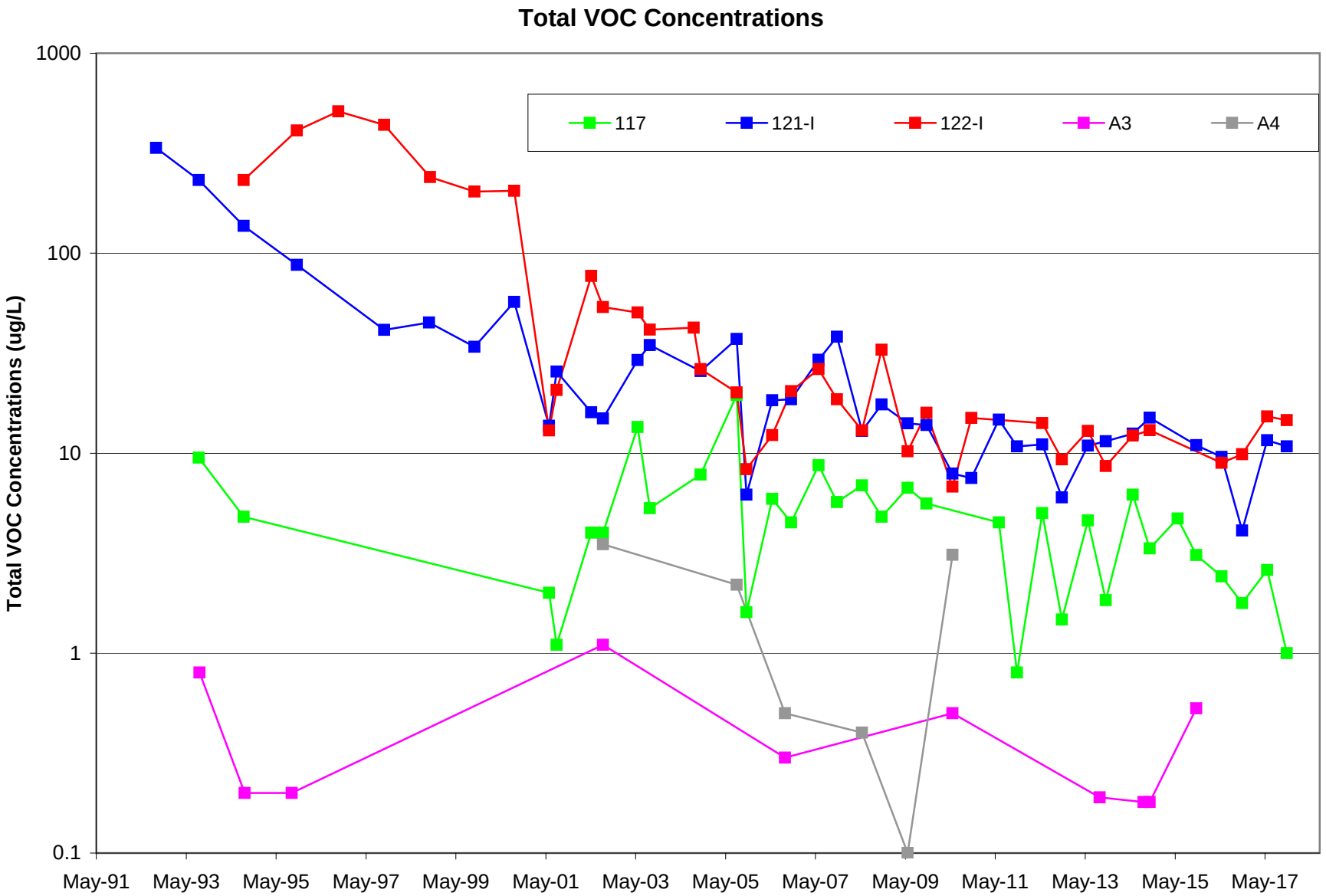
Date	pH	Ca	Mg	Na	K	alkalinity	Cl		SO4		Fe		Zn		NO3		NO2		NH3	TKN	hardness	TDS	Sp. Cond.
25-Jun-97	7.30	12.8	2	15.9	1.2	34.0	23.00	<	2		1.00	<	0.001		0.08	<	0.01		0.08	1.01	40.10	93	150
08-Oct-97	6.39	18.1	2.66	17.9	2.7	16.0	30.10		19.5		0.26		0.002	<	0.1	<	0.1		0.06		56.20	100	
05-May-01	7.50	8.309	1.801	8.4	2	21.0	12.00		2.1		0.52	<	0.001		0.122	<	0.1	<	0.10	0.62		78	101
01-Jul-01	7.30	9.74	2.161	9	2.4		22.10		6.2		0.38		0.005	<	0.1	<	0.1		0.10	0.78			100
05-Nov-01	7.40	7.74	1.81	8	1.9	23.0	10.20		2.2		0.31	<	0.001	<	0.1	<	0.1	<	0.10	0.86		81	98
13-May-02		6.591	1.165	7.2	1.42	10.0	10.30		3.2		0.26	<	0.005		0.3	<	0.1		0.01	0.64		106	
12-Aug-02																							
09-Oct-02	7.13	12.18	2.343				16.00		9		0.30		0.004	<	1	<	0.5		0.05	0.68			
20-May-03	6.53	9.3	1.35	8.2	1.2	12.0	15.40		5.2		0.18	<	0.005	<	0.2	<	0.2	<	0.03	0.68		72	103
27-Aug-03																							
27-Oct-03		10.3	1.6	10.4	1	16.0	28.20		4.7		0.30		0.005	<	0.2	<	0.2	<	0.03	0.52			
27-Oct-03		12.1	1.71	10.3	1.1	13.0	27.80		4		0.33		0.029	<	0.2	<	0.2	<	0.03	0.57			
25-May-04	6.50	7.4	1.3	9.9	1.3	15.0	19.60		6.4		0.48	<	0.005	<	0.2	<	0.2	<	0.03	0.52		112	
19-Aug-04	6.89	10.6	1.73	12.6	0.8	18.0	29.40		1		0.81	<	0.005	<	0.2	<	0.2	<	0.03	0.86		158	
15-Oct-04	7.04	12.5	2.03	12.3	1.6	24.0	26.10	<	0.5		0.44	<	0.005	<	0.2	<	0.2	<	0.03	0.72		130	
03-Aug-05	7.37		2.9	180	1.6	35.0	30.80	<	1		1.50		0.008	<	0.2	<	0.03	<	0.05	1.30		150	171
03-Aug-05	7.39		2.7	180	1.7	34.7	28.50	<	1		0.97		0.009	<	0.2	<	0.03		0.05	1.20		186	170
02-Sep-05	7.44	15	2.6	16	1.6	33.3	28.40		9		0.65	<	0.005	<	0.2	<	0.03	<	0.05	0.60		194	160
02-Sep-05	7.45	15	2.5	16	1.6	32.5	27.20		9		0.65		0.006		1.6	<	0.03	<	0.05	0.70		248	161
21-Oct-05	7.33	13	2.5		1.6	26.0	37.00		2		0.30	<	0.005	<	0.1	<	0.03		0.08	0.50		92	151
21-Oct-05																							
17-May-06	7.80	11	1.8	12	1.5	26.0	19.00		1	<	0.05	<	0.005	<	0.1	<	0.01		0.06	0.70		81	115
17-May-07	6.60	10	1.8	12	1.5	12.0	20.00		8		0.43	<	0.005	<	0.1	<	0.01	<	0.05	0.80		73	120
17-May-07	6.60	9.4	1.8	12	1.4	12.0	20.00		8		0.32	<	0.005	<	0.1	<	0.01	<	0.05	2.00		77	120
17-Oct-07	7.10	12	2.1	17	1.6	15.0	39.00	<	1		0.30	<	0.005	<	0.1	<	0.01	<	0.05	0.70		110	174
15-May-08	7.20	7.8	1.3	11	1.5	11.0	17.00		1		0.23		0.005	<	0.1	<	0.01	<	0.05	0.70		70	96
23-Oct-08	6.80	11	1.9	14	1.5	14.0	30.00	<	1		0.32	<	0.005	<	0.1	<	0.01	<	0.05	1.10		90	150
22-May-09	6.20	8.1	1.4	11	1.6	13.0	18.00		5		0.22	<	0.005	<	0.1	<	0.01	<	0.05	1.00		70	111
01-Sep-09	7.00	13	2.1	16	1.1	33.0	29.00	<	5		0.51	<	0.005	<	0.1	<	0.01	<	0.05	0.90		102	159
21-Oct-09	6.90	13	2.3	14	1.8	30.0	32.00	<	1		0.28	<	0.005	<	0.1	<	0.01	<	0.05	0.60		110	172
20-May-10	7.40	10	1.9	11	1.8	22.0	19.00	<	1		0.66	<	0.005	<	0.1	<	0.01	<	0.05	0.90		72	115
27-Aug-10	7.50	21	3.7	18	2.2	60.0	31.00	<	1		0.62	<	0.005	<	0.1	<	0.01	<	0.05	1.10		150	227
20-Oct-10	7.10	15	2.5	18	1.9	33.0	33.00	<	1		0.28	<	0.005	<	0.1	<	0.01	<	0.05	0.60		112	181
02-Jun-11	7.35	11	1.9	14	1.6	24.0	22.00	<	1		0.47	<	0.005	<	0.1	<	0.01		0.47	0.90		80	125
24-Aug-11	6.78	13	2.4	12	1.5	30.0	17.00		1		1.30	<	0.005	<	0.1	<	0.01	<	0.05	1.10		90	127
27-Oct-11	6.83	15	2.7	15	1.4	26.0	30.00		4		1.90		0.006	<	0.1	<	0.01	<	0.05	0.80		106	173
17-May-12	6.55	13	2.5	16	1.8	17.0	27.00		3		4.50	<	0.005	<	0.1	<	0.01	<	0.05	0.45		120	160
25-Oct-12	6.44	9.9	1.7	8.8	1.6	11.0	15.00		1		0.56		0.007	<	0.1	<	0.01		0.13	1.10		128	100
23-May-13	6.80	7.9	1.4	9.5	1.4	10.0	19.00	<	1		0.14	<	0.005	<	0.1	<	0.01		0.06	0.93		80	100
16-Oct-13	6.92	14	2.4	16	1.6	16.0	34.00	<	1		0.29	<	0.005	<	0.01	<	0.01	<	0.05	0.89		180	180
22-May-14	6.61	11	1.9	20	1.9	12.0	39.00	<	1		0.20	<	0.005	<	0.5	<	0.05	<	0.05	0.61		140	180
20-Aug-14	7.29	19	3.1	24	1.3	43.0	39.00	<	1		2.10		0.006	<	0.1	<	0.01	<	0.05	1.40		152	230
08-Oct-14	6.83	14	2.4	23	1.6	25.0	41.00	<	1		0.32	<	0.005	<	0.1	<	0.01	<	0.05	0.63		122	200
22-May-15	6.93	7.5	1.3	12	1.1	20.0	20.00		1		0.21	<	0.005	<	0.5	<	0.5	<	0.05	0.60		116	110

SUMMARY OF MONITORING DATA - MINOR PARAMETERS

22-Oct-15						<	0.005	0.0014	<	0.001	<	0.0005	0.0065		<	2	<	0.0010	6.95	5.4	85
30-May-16		0.007				<	0.001	0.002	<	0.001	<	0.0002	0.004		<	6		0.0020	7.87	6.3	75
07-Sep-16		0.05		<	1E-05	<	0.001	0.00154			<	0.0002	0.0024					0.0018			
27-Oct-16		0.009				<	0.001	0.0009	<	0.001	<	0.0002	0.0033		<	2		0.0018	6.95	4.8	49
27-Oct-16		0.01				<	0.001	0.00095	<	0.001	<	0.0002	0.0026		<	2		0.0015	6.95	4.8	49
18-May-17		< 0.003				<	0.001	0.00149	<	0.001	<	0.0002	0.0053		<	3		0.0020	8.31	10.2	63
25-Oct-17		0.01				<	0.001	0.0012		0.0009	<	0.0002	0.0084		<	3	<	0.0020	7.97	5.1	56

APPENDIX E

VOC Summary


Total VOC Concentrations
Total VOC Concentrations (ug/L)
1000
100
10
1
0.1
117
121-I
122-I
A3
A4
May-91
May-93
May-95
May-97
May-99
May-01
May-03
May-05
May-07
May-09
May-11
May-13
May-15
May-17

Summary Table of Detected Volatile Organic Compounds

Sample	Date	vinyl chloride	chloro-ethane	acetone	dichloro-methane	dibromo-methane	trans-1,2-dichloroethylene	methyl-t-butyl ether	1,1-di-chloroethane	1,2-dichloroethane	1,1,1-Trichloroethane	cis-1,2-dichloroethylene	chloroform	benzene	trichloro-ethylene	toluene	tetrachloro-ethylene	chloro-benzene	ethyl-benzene	m-xylene & p-xylene	o-xylene	1,3-dichloro-benzene	1,4-dichloro-benzene	1,2-dichloro-benzene	Freon 12	Dibromochloro-methane	Bromodichloro-methane	solvent extractables	Total VOCs
107-II	6/1/2001													3.6															3.6
	3-Aug-05	0.3							0.8			0.2	0.2	0.7	1.6		1.1												4.9
	29-May-07																0.1												0.1
	21-Oct-09														0.1														0.1
117	17-Aug-93														6		3.5											2000	9.5
	17-Aug-94												1.4			0.4	3												4.8
	1-Jun-01														1.3		0.7												2
	1-Aug-01															1.1													1.1
	9-May-02								1						2		1												4
	12-Aug-02								1						1		1								1				4
	20-May-03	1.1	3		1.5		0.1	0.3	1.8		0.1	0.4	0.4	1.2	2.2		1.4												13.5
	27-Aug-03								0.4				0.2	0.2	0.8	3	0.6			0.1									5.3
	14-Oct-04	0.4	1.5		0.8			0.2				0.3	0.3	0.8	2.1		1.4												7.8
	3-Aug-05	0.4					0.1		0.7					3.2		1.1			1.9	8.9	1.4		1.7	0.1					19.5
	21-Oct-05	0.2			0.8									0.6															1.6
	17-May-06	0.5							1			0.3	0.2	1.1	1.7		1.1												5.9
	18-Oct-06								0.6			0.2		0.3	2.3		1.1												4.5
	29-May-07	0.7			1			0.3	1.3			0.3	0.2	1.7	1.8		1.2	0.2											8.7
	26-Oct-07				0.6				0.7			0.3		0.7	2.2		1.2												5.7
	15-May-08	0.6			0.9			0.3	1.1			0.3	0.1	1.5	1.3		0.7	0.1											6.9
	23-Oct-08								0.6			0.4		0.8	2		1												4.8
	22-May-09	0.5			0.9			0.4	0.9			0.4		1.6	1.2		0.6	0.2											6.7
	21-Oct-09								0.9			0.3		1.9	1.4		0.8	0.3											5.6
	2-Jun-11	0.5			0.8			0.3	0.8					1.8				0.3											4.5
	26-Oct-11								0.4					0.4															0.8
	18-May-12								0.79			0.51		1.5	1.5		0.72												5.02
	25-Oct-12											0.34		0.19	0.94														1.47
	24-May-13											0.52		1.7	1.4		0.73	0.25											4.6
	16-Oct-13								0.23			0.35			0.88		0.38												1.84
	23-May-14	0.28			0.53			0.32	0.7	0.7		0.34		1.6	0.94		0.44	0.34											6.19
	8-Oct-14								0.35			0.6		0.57	1.3		0.4	0.12											3.34
	22-May-15	0.29			0.5			0.33				0.33		1.6	0.88		0.37	0.41											4.71
	22-Oct-15								0.71					1.5	0.88														3.09
	13-May-16								0.54					1.3	0.58														2.42
	27-Oct-16													1.1	0.68														1.78
	18-May-17		1.3											1.3															2.6
	25-Oct-17													1															1
121-I	4-Sep-92	1.7	7.9		8.5		0.6		2.5			0.3		2.5	0.3	289		0.2	7.5	9.2	4.6		1.6	0.1					336.5
	17-Aug-93													4		210		8	10										232
	17-Aug-94				13									3		115			3	2	1								137
	23-Oct-95				5		1							2.8		54			8.4	8.5	2.8	2.5	2	0.5					87.5
	2-Oct-97		5.6											3.9		5.6			11.1	10.6	2.3		2.2						41.3
	1-Oct-98	0.7	2.4	21.8			0.3	0.2	0.5					2.8		1.4		0.3	7	5.4	0.6		1.6						45
	4-Oct-99		0.6	16.6			0.4	0.4	0.6					3.2		0.8		0.4	4	5	0.6		1.4						34
	22-Aug-00													3.2		34.8			4	11.4	2		1.7						57.1
	1-Jun-01	0.7	0.7											2.3		0.9			0.6	8.5									13.7
	1-Aug-01													2.7		0.8			11.8	8.8	1.5								25.6
	9-May-02													3				1		11	1								16
	12-Aug-02								0.8					2.8						8.9	0.9		1.5						14.9
	20-May-03	0.4	1.5				0.3		0.8					3.9		0.8		1.5	0.1	16.4	1.5		1.8	0.2					29.2
	27-Aug-03	0.2	1.5	17.8				0.3	0.7					3.1		0.5		0.7	0.2	8.1	1.2		0.4						34.7
	14-Oct-04	0.4	2.2				0.2	0.4	0.9			0.2		3.8		0.4		1.8	0.2	12.3	1.1			1.8					25.7
	3-Aug-05	0.4		16	2.5		0.2	0.2	0.2					2.6		1.2		0.3	4.3	6.4	1.9		1						37.2
	21-Oct-05													3.3		1.2							1.7						6.2
	17-May-06								0.7					3.3		1		2.3		7.7	1.4		2						18.4
	18-Oct-06	0.4							0.7					3.1		0.7		2.2		8	1.6		1.9						18.6
	29-May-07	0.4		15				0.2	0.7					3		0.5		1.9		5.1	1.1		1.4						29.3
	26-Oct-07			22					0.7					3.1		0.5		2.6		6.3	1.3		1.7						38.2
	15-May-08								1.1					3.9				2.5		3.6	0.8		1						12.9
	23-Oct-08	0.4					0.1	0.3	0.9					3.9		0.4		3.3	0.2	4.9	1		2.1						17.5
	22-May-09								0.8					3.7				3.5		3.5	0.6		2						14.1
	21-Oct-09								0.7					3.7	0.2	0.6		3.3		2.9	0.5		1.9						13.8
	20-May-10													3.1				3.2					1.6						7.9
	20-Oct-10				0.5									3				4											7.5
	2-Jun-11	0.3							0.6					3.8		0.3		4.5		2.4	0.5		2.1	0.2					14.7
	26-Oct-11													3.3				3.9		1.6			2						10.8
	18-May-12								0.51					3.4				3.9		1.2	0.26		1.8						11.07
	25-Oct-12													3				3											6
	24-May-13													3.8				4.3		1			1.8						10.9
	16-Oct-13								0.68					3.6				4.7		0.78			1.7						11.46
	23-May-14									0.67				3.6		0.54		5.1		0.72			1.9						12.53
	8-Oct-14	0.2						0.29	0.72					4.2		0.24		5.9	0.14	0.69			2.4	0.25					15.03
	22-Oct-15								0.55					3.4				5.2					1.8						10.95
	13-May-16													2.8				4.8		0.46			1.5						9.56
	27-Oct-16													2.8									1.3						4.1
	18-May-17													3.7				5.8					2.1						11.6
	25-Oct-17													3.5				5.3					2						10.8

Summary Table of Detected Volatile Organic Compounds

Sample	Date	vinyl chloride	chloro-ethane	acetone	dichloro-methane	dibromo-methane	trans-1,2-dichloroethylene	methyl-t-butyl ether	1,1-di-chloroethane	1,2-dichloroethane	1,1,1-Trichloroethane	cis-1,2-dichloroethylene	chloroform	benzene	trichloro-ethylene	toluene	tetrachloro-ethylene	chloro-benzene	ethyl-benzene	m-xylene & p-xylene	o-xylene	1,3-dichloro-benzene	1,4-dichloro-benzene	1,2-dichloro-benzene	Freon 12	Dibromochloro-methane	Bromodichloro-methane	solvent extractables	Total VOCs
122-I	17-Aug-94				25										4	200			1	1	1								232
	23-Oct-95				13				3					1.4	2	380			3	4	3.6	1							411
	24-Sep-96															507				5.3									512.3
	2-Oct-97															422			5.4	7.1	3.7								438.2
	9-Oct-98															240													240
	4-Oct-99															198			D	5.6	D								203.6
	22-Aug-00															185			8.2	12.1									205.3
	1-Jun-01	0.6												2.5					0.6	8.2			1.1						13
	1-Aug-01		7.3			1.5								2.5		7.5				0.8			1.1						20.7
	9-May-02	2					1							2		58			6	6	2								77
	12-Aug-02												1.3	2.2		40			5	4	1.3								53.8
	20-May-03	0.9	6.3		2.4		0.4							2.6	0.1	21.2		0.2	6.6	6.8	1.9		1	0.1					50.5
	27-Aug-03	0.5	5	18	2.1		0.2	0.4				0.1		2.2		3.5		0.1	3.6	3.8	1.8		0.2						41.5
	19-Aug-04	0.5	4.7	16.1	2.5		0.3	0.3						2.5	0.1	1.2		0.2	5.4	5.6	2.1		0.9						42.4
	14-Oct-04	0.5	4.3		2.6		0.3	0.4				0.1		2.7		1.2		0.2	5.3	5.6	2.2		0.9						26.3
	3-Aug-05	0.5							0.7					3.1		1		1.9		9.4	1.6		1.8	0.1					20.1
	21-Oct-05				3									3.1		1.2							1						8.3
	17-May-06								0.5					2.4		1			3.4	3.8	1.2								12.3
	18-Oct-06	0.3			2.3		0.2	0.3	0.7					2.6		1		0.3	3.6	5.6	1.8	0.8	0.9						20.4
	29-May-07	0.4		12	2		0.2	0.3	0.8					2.5		0.7		0.3	2.3	3.1	1.2		0.5						26.3
	26-Oct-07				2				0.7					2.7		1		0.5	2.5	6.6	1.7		0.9						18.6
	15-May-08				2				0.8					2.6		0.5		0.3	2	3	1.2		0.6						13
	23-Oct-08	0.3		12	1.6		0.2	0.3	0.8					3.2		1		0.7	2	7.7	1.9		1.2						32.9
	22-May-09				1				0.6					2.9		0.4		0.3	1.4	2.3	0.9		0.4						10.2
	21-Oct-09				1				0.7					2.2	0.2	0.7		0.6	1.8	5.4	1.4		1.9						15.9
	20-May-10				0.1			0.3						3				0.9	1.3				1.2						6.8
	20-Oct-10													3						6	6								15
	18-May-12								0.72					3.3		0.78		1.3	0.72	5.7	1.6								14.12
	25-Oct-12													3.4						4.7			1.2						9.3
	24-May-13													3.4		0.66		1.5	0.46	4.4	1.3		1.2						12.92
	16-Oct-13								0.82					3.3				1.7		0.41	1.2		1.2						8.63
	23-May-14									0.78				3.1				1.6	0.46	3.6	1.2		1.5						12.24
	8-Oct-14								0.82					3.5				2	0.51	4.7	1.5								13.03
	13-May-16								0.66					2.7		0.54		1.3	0.44	2.1			1.2						8.94
	27-Oct-16								0.71					3.5		0.47				2.6	1.2		1.4						9.88
	18-May-17		1.4											4		0.72		2.5	0.55	3.5	1.3		1.3						15.27
	25-Oct-17		1.2						0.77					3.9		0.62		2.4	0.44	2.9	1.1		1.3						14.63
A3	24-Aug-93												0.4			0.4												800	0.8
	24-Aug-94												0.2																0.2
	12-Sep-95															0.2													0.2
	12-Aug-02												1.1																1.1
	30-Aug-06												0.3																0.3
	20-May-10															0.5													0.5
	28-Aug-13												0.19																0.19
	20-Aug-14												0.18																0.18
	8-Oct-14												0.18																0.18
	22-Oct-15								0.53																				0.53
A4	12-Aug-02												3.5																3.5
	3-Aug-05												1			0.4												0.2	0.6	2.2
	30-Aug-06												0.2			0.3														0.5
	15-May-08															0.2				0.2										0.4
	22-May-09																			0.1										0.1
	20-May-10															0.9				1.9	0.3									3.1
D2	20-May-10															0.5				6.6	1.5									8.6
	26-Oct-11															0.3														0.3

All results for other samples or parameters are below laboratory detection limits.

Samples collected from 2012 to 2017 included 107-II, 117, 121-I, 122-I, A3, A4, & D2

APPENDIX F

Land use By-Law and Agreement

THE CORPORATION OF THE CITY OF KENORA

BY-LAW NUMBER 166 – 2008

A BY-LAW TO AMEND BY-LAW NUMBER 86 - 2005 BEING A BY-LAW TO AUTHORIZE THE EXECUTION OF AGREEMENTS BETWEEN THE CORPORATION OF THE CITY OF KENORA, THE LAKE OF THE WOODS AERO MODELERS AND THE CROWN WITH RESPECT TO PREMISES KNOWN AS THE TRI-MUNICIPAL LANDFILL SITE

WHEREAS the Council of the Corporation of the City of Kenora adopted By-law Number 86-2005 on the 13th day of June 2005 to authorize agreements with the Lake of the Woods Aero Modelers for use of municipal lands known as the Tri-Municipal Landfill Site; and

WHEREAS it is deemed necessary and expedient to amend Agreement No. 1 to By-law Number 86-2005 in order to accommodate the extension of said agreement for a twenty (20) year period;

NOW THEREFORE the Council of the Corporation of the City of Kenora enacts as follows:

1. **THAT** Clause 1. of Agreement No. 1 to By-law Number 86-2005 is hereby amended by changing the "term ending date" from the 31st day of December 2008 to the 31st of December 2028.

2. **THAT** the Mayor and Clerk of the Corporation of the City of Kenora are hereby authorized to execute the attached amended Agreement No. 1, with the Lake of the Woods Aero Modelers, in accordance with the terms and conditions therein and affix the seal of the Corporation hereto.

3. **THAT** this by-law shall take effect and come into force upon third and final reading thereof.

BY-LAW read a FIRST and SECOND Time this 10th day of November 2008.
BY-LAW read a THIRD and FINAL Time this 10th day of November 2008.

THE CORPORATION OF THE CITY OF KENORA:

Per: _____ **MAYOR**
Leonard P. Compton

Per: _____ **CITY CLERK**
Joanne L. McMillin

COW ITEM ☑ DATE: Nov. 17/08 ☐ COMM: _____ M. Mostow FD

AGREEMENT "1"

THIS AGREEMENT made this 10th day of November, 2008.

B E T W E E N :

The Corporation of the City of Kenora
(hereinafter called **"the City"**)

OF THE FIRST PART

- and -

Lake of the Woods Aero Modelers,
a corporation incorporated pursuant to the
Corporations Act of Ontario
(hereinafter called **"the Club"**

OF THE SECOND PART

WHEREAS the City is the owner of the said lands and premises known as the Tri-Municipal Landfill Site, which lands are more particularly described on Schedule A attached hereto, and hereinafter referred to as the Lands;

WHEREAS the Club is desirous of using the said Lands as a flying field for model aeroplanes; and

WHEREAS the City has agreed to permit access to the Lands and usage by the Club;

NOW THEREFORE THIS AGREEMENT WITNESSETH that in consideration of the premises and the sum of One Dollar ($1.00) now paid by the Purchasers to the Vendor, the parties hereto covenant and agree as follows:

1. The City hereby grants to the Club, non-exclusive use of the Lands for a term ending on the 31st day of December, 2028, in consideration of rent in the amount of $10.00.

2. The Club agrees that the use of the Lands shall be a flying field for model aeroplanes only.

3. The Club agrees that there shall be no site modification without prior written approval from the City.

4. The Club shall maintain the Lands used as a flying site in a clean and neat condition.

5. There is a locked access gate adjacent to Highway 17 which is used to enter onto the Lands. The Club shall utilize the said gate in a controlled manner to prevent unauthorized access to the Lands.

6. The Club hereby releases, and undertakes to indemnify and save harmless the City from

any claims, suits, or cause of action of any kind, by whomsoever made, including claims for damages, personal injury or death or otherwise, including costs, relating to the approval, or the use of the Lands by the Club, or any of its members, or anyone else with its consent or knowledge. The Club further undertakes not to make any claim for indemnity, or otherwise against any other person to the extent that such person may claim over against the City.

7. The Club agrees that it shall at all times maintain a policy of public liability insurance with limits of not less than Five Million ($5,000,000.00) Dollars, and that it shall on demand, and at least once each year, provide to the City proof of such insurance. The Club shall ensure that the City is described as a named insured on the said policy of insurance.

8. This agreement may be terminated by the City, as follows:

   A. Immediately and with no notice,

      (i) in the event of a breach of this agreement by the Club, or
      (ii) in the event of a Ministry of Environment Order, or
      (iii) in the event that the City, in its own opinion, has safety, site control, or liability concerns pertaining to the Lands or its use.

   B. At any time, upon 90 days written notice.

9. This agreement is conditional upon the Ministry of Environment granting approval for the use of the Lands pursuant to Section 46 of the Environmental Protection Act R.S.O. 1990,c.E.19 as amended (for Agreement #2 only of Parent By-law #86-2005).

10. Notice may be given to the Club by delivering or mailing same to:

    c/o Peter Schaffer, President – LOW Aero Modelers
    1256 Heenan Place
    Kenora, ON P9N 2Y8

    In the event that notice is mailed, it shall be deemed to have been received three days following the date it was mailed.

11. Notice may be given to the City by delivering or mailing same to:

    City of Kenora
    Attn.: Richard Perchuk
    1 Main Street South
    Kenora, Ontario
    P9N 3X2

    In the event that notice is mailed, it shall be deemed to have been received three days following the date it was mailed.

12. This Agreement shall enure to the benefit of and be binding upon the Parties hereto, their respective successors and assigns.

IN WITNESS WHEREOF the Parties have hereunto affixed their hands and seals the day and year first above written.

SIGNED, SEALED AND DELIVERED)

)

) **The Corporation of the City of Kenora**

)

)

) Per:_____

) **L. P. Compton - Mayor**

)

)

) Per:_____

) **J. L. McMillin – City Clerk**

)

)

)

)

) **Lake of the Woods Aero Modelers**

)

)

) Per:_____

) P. Schaffer - President

)

)

) Per:_____

) J. Wedel – Recording Secretary

)

SCHEDULE "A"

Attached to and forming part of the within Agreement

Part of Parcel 32504, being part of Mining Location 357P., designated as Part 3 on Plan 23R-4718, Township of Haycock, District of Kenora

and

Parcel 28600, being parts of Mining Location 357P., designated as Parts 2 and 3 on Plan 23R-2263, Township of Haycock, District of Kenora, being all of the parcel.

APPENDIX G

Certificate of Approval & MOECC Correspondence

Ontario

Ministry of the Environment
Ministère de l'Environnement

APPROVALS BRANCH
3rd Floor
Tel. (416) 440-3544
Fax (416) 440-6973

250 Davisville Avenue
Toronto, Ontario
M4S 1H2

250, avenue Davisville
Toronto (Ontario)
M4S 1H2

December 10, 1991

Mr. Rick Perchuk
Town Engineer
The Corporation of the Town of Kenora
P.O. Box 1110
1 Main St. South
Kenora, Ontario
P9N 1S6

Dear Sir:

Re: Tri-Municipal Landfill Site
Provisional Certificate of Approval No. A 7068504

Please find attached the Provisional Certificate of Approval No. A 7068504 respecting the Kenora Tri-Municipal Landfill Site.

The Director of the Approvals Branch has been directed by the Environmental Assessment Board to issue this Certificate of Approval and conditions.

Should you have any questions, please contact Ernst Zaltsberg of my office at (416) 440-3752.

Sincerely,

D.J. Andrijiw, Supervisor
Waste Sites & Systems Approvals Unit
Industrial Approvals Section

Encl.
EZ/nb

A4 to A4

Ministry of the Environment / Ministère de l'Environnement

Ontario

PROVISIONAL CERTIFICATE OF APPROVAL
FOR A WASTE DISPOSAL SITE
NO. A 7068504

Under the Environmental Protection Act and the regulations and subject to the limitations thereof, this Provisional Certificate of Approval is issued to:

The Corporation of the Town of Kenora
P.O. Box 1110
1 Main St. South
Kenora, Ontario
P9N 1S6

for the use and operation a 4.7 hectare landfilling area within a total disposal site area of 24.3 hectares

all in accordance with the following plans and specifications:

As listed in the attached Schedule "A"

Located: Unorganized Township of Haycock
Parcel No. P-357

which includes the use of the site only for the following categories of waste (Note: Use of the site or additional categories of wastes requires a new application and amendments to the Provisional Certificate of Approval) domestic, commercial, processed organic and non-hazardous solid industrial waste

and subject to the following conditions:

1. No waste shall be received at the site after January 31, 1996 under the authority of this Provisional Certificate of Approval. The parties will use their best efforts to have an alternative site selected, approved and constructed prior to that date.

2. No operation shall be carried out at the site after sixty days from this condition becoming enforceable unless this Certificate, including the reasons for this condition, has been registered by the applicant as an instrument in the appropriate Land Registry Office against title to the site and a duplicate registered copy thereof has been returned by the applicant to the Director of the Approvals Branch of the Ministry of the Environment ("the Director").

3. Except as otherwise provided by these conditions, the waste disposal site shall be operated and closed in accordance with the report entitled "Town of Kenora, Supporting Documentation to an Application for a Certificate of Approval for Waste Disposal Site (Landfill) under the Environmental Protection Act for the Interim Expansion of the Existing Tri-Municipal Landfill" prepared by Proctor & Redfern Limited and dated July 1990, (the "P&R Report").

4. Notwithstanding condition 1, no waste shall be received for disposal at the site once the final contours illustrated in Figure 7 of the P&R Report have been achieved. If the final contours in Figure 7 have not been reached by January 31, 1996, the site shall be closed out with contours that promote run-off, but minimize the potential for erosion.

5. No liquid industrial wastes or hazardous wastes shall be disposed of at the site. The Town of Kenora ("Kenora") shall report to the Kenora District Office of the Ministry of the Environment ("MOE") on any refusal to accept such waste at the site.

6. No wastes are to be burned at the site.

7. By May 31, 1992, Kenora shall construct a low berm on the south side of the site, approximately parallel to Highway No. 17. The berm shall be vegetated using a standard seed mix for coverage on disturbed sites i the area and indigenous tree species.

8. At least 15 cm of cover material shall be placed on exposed waste at the end of each working day.

9. Kenora shall ensure that a properly-trained person is in attendance at the site during the hours that waste is received and to keep records of all activities at the site, including waste quantities and characteristics.

10. Kenora shall make all reasonable efforts to divert recyclable materials from the landfill. In particular, Kenora shall divert materials from the landfill site by:

- encouraging and expanding the diversion of reusable, recyclable and compostable materials from the landfill through participation in waste reduction and diversion programs and initiatives of the Northwest Ontario Recycle Association;

- providing well-advertised community recycling containers at the landfill site and other strategic locations within the landfill service area;

- circulating educational material to residents within the service area of the landfill site that encourages waste reduction, reuse, recycling and composting;

- utilizing advertisements in newspapers having general circulation within the landfill area to provide twice yearly summaries of the waste reduction and diversion programs in place and the progress being made towards stated waste reduction goals.

11. Kenora shall make all reasonable efforts to divert household hazardous waste from the site. Kenora shall organize a well-advertised household hazardous waste pick-up and drop-off day at least once a year for residents within the service area of the Kenora Landfill Site.

12. Kenora shall carry out the groundwater monitoring program as described in Schedule "B". The groundwater monitoring network shall consist of:
    a) existing monitoring wells 2,4, old 5,6,7 and 102 through 113;
    b) new monitoring wells to be established in the wetland between the property boundary and the northern limit of Mining Location P409;
    c) new monitoring wells to be established in the bedrock and in the overburden in the old MNR pit area;
    d) one new monitoring well in the bedrock and one new monitoring well in the overburden (if any) to the west of the existing fill area.

13. Kenora shall carry out the surface water monitoring program as described in Schedule "C". The surface water monitoring network shall consist of stations 8, A2, A3, A4, B1, B2, D1, D2, D4 and E1 as shown on Figure 2 of the report entitled "Town of Kenora, Tri-Municipal Landfill, Surface Water Impact Assessment" prepared by Gartner Lee Limited and dated October 1990.

14. Both groundwater and surface water monitoring programs shall be standardized to provide consistent, quality-assured sampling and analytical protocols. Each year during the last two weeks of July a surface water sample shall be collected and analyzed by the MOE for stations 8, A-2, A-3, A-4 and B-2. This sample shall be analyzed for the following parameters: copper, iron, cadmium, lead, nickel, phosphorus, alkalinity, pH, hardness, chloride, phenolics, ammonia, and TKN. The data from this sampling shall be included in the annual report outlined in condition 22.

15. During the interim expansion period and afterwards, Kenora shall make any necessary changes and/or amendments to the groundwater or surface water monitoring programs as are required by the MOE.

16. The site will operate for 302 days per year, as follows:
    a) on Monday to Friday of each week, from 9:30 a.m. to 5:30 p.m.;
    b) on Saturdays from 9:00 a.m. to 5:00 p.m.;
    c) closed on Sundays and 11 statutory holidays each year.

17. Kenora shall make the necessary efforts to acquire from the Crown lands described as Parts 2 and 3 on Plan 23R-2263.

18. The post-closure maintenance and inspection program shall be implemented in accordance with the P&R Report.

19. By December 31, 1991 Kenora shall submit to the Director a contingency plan for the installation of a leachate collection system. The plan shall outline in detail an engineered system(s) that could be installed to mitigate any unacceptable impact from landfilling operations on groundwater and/or surface water resources.

20. If surface water sampling at station A-3, A-4, or B-2 reveals a significant exceedance of any of the established PWQO and that parameter is also present in landfill leachate at concentrations that exceed either the Maximum Acceptable or Maximum Desirable Concentrations specified by the Ontario Drinking Water Objectives, then a leachate collection system must be promptly installed and operated. A significant exceedance occurs if any sampled surface water quality parameter at station A-3, A-4, or B-2 is greater than double the PWQO for more than half the samples measured at any of the aforementioned stations during a given sampling year.

21. Kenora shall establish, maintain and support a public advisory committee. The committee shall encourage the participation of resident surrounding the landfill site, particularly residents at Breakneck Lake. Kenora shall seek the advice of the committee on matters relating to the management, operation, closing, rehabilitation and monitoring of the landfill site, and on matters of waste reduction and diversion. The committee shall be provided with a reasonable budget and such additional resources as are required for its effective operation.

22. The public advisory committee shall be required to produce and circulate a newsletter twice yearly to residents within the service area of the landfill, and shall be provided with sufficient additional funds for this purpose. This newsletter should encourage community education and involvement in waste diversion and reduction activities.

23. By April 15 of each year, Kenora shall submit to the Director of the Northwestern Region of the MOE, the public advisory committee, and any residents on Breakneck Lake, an annual report for the previous calendar year. Each report shall include:
    a) the groundwater and surface water monitoring results and a thorough interpretation thereof;

    b) any recommendation(s) to change the monitoring program;

    c) a description of any deviations from the operations and development plan described in Sections 4 and 5 of the P&R Report;

d) a breakdown of the quantity and composition of waste received at the site;

e) a breakdown of the quantity and composition of waste diverted from the site;

f) a report on the status of the waste management master plan;

g) a simple graphical analysis of surface water and groundwater sampling data to determine if any exceedances of the Provincial Water Quality Objectives or the Ontario Drinking Water Objectives have occurred, and

h) a determination of whether a significant exceedance of any of the PWQO has occurred, and if so, a statement of the need to install a leachate collection system and a description of the proposed leachate collection and treatment plan.

Copies of the annual report shall be made available for public review in the municipal offices and library of Kenora.

SCHEDULE "A"

This Schedule "A" forms part of the Provisional Certificate of Approval No. A 7068504 dated December 10, 1991.

1. An application for a Certificate of Approval for a Waste Disposal Site (Landfill) dated August 28, 1990.

2. "Supplementary Hydrogeological Study for the Interim Expansion Application for the Towns of Kenora, Keewatin and Jaffray-Melick" prepared by Gartner Lee Limited and dated March, 1990.

3. The Gartner Lee's letter to the Proctor and Redfern Group dated July 19, 1990 regarding the Ministry's comments on the above Gartner Lee Report.

4. "Town of Kenora Supporting Documentation to an Application for a Certificate of Approval for a Waste Disposal Site (Landfill) under the Environmental Protection Act for the Interim Expansion of the Existing Tri-Municipal Landfill" prepared by Proctor and Redfern Limited and dated July, 1990.

5. The Proctor and Redfern's letter to the Ministry of the Environment of August 17, 1990 regarding the Ministry's comments on the above P & R Report.

6. The Proctor and Redfern's letter to the Ministry of the Environment dated August 27, 1990, regarding the hours of operation and the landfill - close for statutory holidays (total of 11).

7. "Town of Kenora Tri-Municipal Landfill Surface Water Impact Assessment" prepared by Gartner Lee Limited and dated October, 1990.

8. "Response to Questions from the Environmental Assessment Board Regarding the Interim Expansion Application Kenora Tri-Municipal Landfill" prepared by Gartner Lee Limited and dated August, 1991.

SCHEDULE "B"

This Schedule "B" forms part of this Provisional Certificate of Approval:

TRI-MUNICIPAL LANDFILL 1991 GROUNDWATER MONITORING PROGRAM

Sampling Location	Task	Frequency Per Annum	Analytical Parameters
All monitors except 102-108	Develop, sample and deliver samples to laboratory	4	Conductivity, suspended solids, hardness, alkalinity, pH, BOD, chloride, sulphate, TKN, ammonia, nitrate, nitrite, sodium, iron, copper, lead, magnesium, zinc, nickel, potassium, phenolics, TDS, phosphate, phosphorous, calcium, cadmium
Monitors 1,4,6, 104 and 107	develop, sample and deliver samples to laboratory	1	extractable and volatile organic compounds
All monitors	measure water levels	4	

SCHEDULE "C"

This Schedule "B" forms part of this Provisional Certificate of Approval:

TRI-MUNICIPAL LANDFILL 1991 SURFACE WATER MONITORING PROGRAM

Sampling Location	Task	Frequency Per Annum	Analytical Parameters
Stations #8, A-2, A-3, A-4 B-1, B-2, D-1 D-2, D-4, E-1	Sample and deliver samples to laboratory. Measure flows at time of sampling where possible.	Approximately monthly during non-frozen conditions (at least 8 times per year). At least one sampling event in each of the spring and fall will be collected under precipitation or melt conditions as follows: April-2 sets (high flow) May-1 set (flow recession) June-1 set (dry weather) August-1 set (dry weather) September-1 set (high flow, wet weather) October-1 set (high flow, wet weather)	Conductivity, suspended solids, hardness, alkalinity, pH, BOD, chloride, sulphate, TKN, ammonia, nitrate, nitrite, sodium, iron, copper, lead, zinc, nickel, potassium, TDS, phosphate, phosphorous, magnesium, calcium, cadmium
Stations #8, A-3	Sample and deliver samples to laboratory	once in August	extractable and volatile organic compounds
	Survey elevation of staff gauge	1 following spring thaw	
Old 4, Old 5 113	Measure conductivity	At the time of surface water sampling	
Station #8, A-2	Sample and deliver samples to the laboratory if high conductivity values are found at these locations from the April and May samples	1-2 dependant upon April and May conductivity measurements to reflect spring melt conditions	total phosphorus, alkalinity, hardness and metals scan
Station #8, A-2	Sample and deliver samples to the laboratory if elevated levels are found in extra spring samples taken at these locations	1-2 dependant upon extra spring sample results to reflect fall conditions	total phosphorous, alkalinity, hardness and metal scan

The reasons for the imposition of these conditions are as follows:

1. The reason for condition numbers 1 through 23 is that a hearing was held before members of the Environmental Assessment Board under the Environmental Protection Act, 1980 and these conditions were proposed by the Board as listed in the Board's report entitled "Reasons for Decision and Decision" and dated November 8, 1991. I have been directed by the Environmental Assessment Board to issue this Certificate of Approval and conditions.

You may by written notice served upon me and the Environmental Appeal Board within 15 days after receipt of this Notice, require a hearing by the Board. Section 122a of the Environmental Protection Act, as amended in 1983, provides that the Notice requiring the hearing shall state:

1. *The portions of the approval or each term or condition in the approval in respect of which the hearing is required, and;*
2. *The grounds on which you intend to rely at the hearing in relation to each portion appealed.*

In addition to these legal requirements, the Notice should also include:

3. *The name of the appellant;*
4. *The address of the appellant;*
5. *The Certificate of Approval number;*
6. *The date of the Certificate of Approval;*
7. *The name of the Director;*
8. *The municipality within which the waste disposal site is located;*

And the Notice should be signed and dated by the appellant.

This Notice must be served upon:

The Secretary,
Environmental Appeal Board
112 St. Clair Ave. West
5th Floor
Toronto, Ontario
M4V 1N3

AND

The Director,
Section 38, Environmental Protection Act
Ministry of the Environment
250 Davisville Avenue, 3rd Floor
Toronto, Ontario
M4S 1H2

DATED AT TORONTO this 10th day of December, 1991.

P. DeAngelis, P. Eng.,
Director,
Section 38,
Environmental Protection Act

Ontario

Ministry of Environment and Energy
Ministère de l'Environnement et de l'Énergie

250 Davisville Avenue
Toronto ON M4S 1H2

250, avenue Davisville
Toronto ON M4S 1H2

APPROVALS BRANCH
3rd Floor
Tel. (416) 440-3544
Fax (416) 440-6973

January 31, 1996

Mr. R. Perchuk, P. Eng.
Municipal Engineer
The Corporation of the Town of Kenora
P.O. Box 1110
1 Main Street South
Kenora, Ontario
P9N 3X7

Dear Mr. Perchuk:

Re: Provisional Certificate of Approval
No. A 7068504 for the
Kenora Tri-Municipal Landfill Site

Please find attached a Notice which amends the above Certificate of Approval for the Kenora Tri-Municipal Landfill Site.

This amendment is issued pursuant to your letter of November 20, 1995 and authorizes the use of the site on an emergency basis till February 28, 1998.

If you have any questions with regards to this matter, please call Mr. E. Zaltsberg of my staff at (416) 440-3752.

Yours truly,

A. Dominski, P. Eng., Supervisor
Waste Unit

Encl.
EZ/es
cc: P. Fox, MOEE Kenora District Office

TO: The Corporation of the Town of Kenora
P. O. Box 1110
1 Main Street South
Kenora, Ontario
P9N 3X7

You are hereby notified that Provisional Certificate of Approval No. A 7068504 dated)ecember 10, 1991 *is hereby amended as follows:*

a) The Application for an Emergency Certificate of Approval for a Waste Disposal Site (Landfill) dated November 20, 1995 is included in Schedule "A" of the Provisional Certificate of Approval as Item 9; and

b) Conditions 1, 2, 3, 4, 7, 14, 15, 17, 18, 19 and 20 of the same Certificate of Approval are revoked and replaced by the following new conditions:

24. The waste disposal site shall be operated on an emergency basis from February 1, 1996 till February 28, 1998.

25. By the end of each year Kenora shall submit to the Director of the Ministry of the Environment and Energy's ("the Ministry") Approvals Branch a progress report on the Kenora Area Waste Management Master Plan implementation. This report shall also include evaluation of any alternative waste disposal site available prior to completion of the above-mentioned Plan.

26. During an emergency period, the waste disposal site shall be operated in accordance with Items 4, 6 and 9 of Schedule "A".

27. During an emergency period and afterwards, Kenora shall make necessary changes and/or amendments to the groundwater or surface water monitoring programs as are required by the District Manager of the Ministry's Northern Ontario Region.

28. If the trigger mechanism identified in Schedule "D" of the Certificate, indicates unacceptable deterioration of surface water quality at station A-3 in Breakneck Creek due to landfilling operations, then the leachate collection system must be installed and operated.

29. Five to seven monitoring wells, in total, shall be installed upgradient and downgradient of the proposed leachate collection system if its construction is required by the trigger mechanism implementation described in Schedule "D".

30. By March 31, 1997 Kenora shall submit for the Approvals Director's approval the detailed and updated closure plan. This plan shall address the following subjects:

    (a) Changes to the final contour plan that may have been previously identified in the annual reports or recommended from the development of the closure plan;

    (b) Fencing and access control;

    (c) Details of any additional cover which may be necessary;

    (d) Details of any additional vegetative plantings which may be necessary;

    (e) Post-closure and end-use plans;

    (f) Plans and schedules for the continued monitoring of surface water and groundwater after the site closure;

    (g) Plans and schedules for the routine maintenance of the surface water drainage ditches and swales;

    (h) The updated contingency plan if necessary.

The reason for the imposition of these conditions are as follows:

1. The reason for condition 24 is to allow the use of the site on an emergency basis for twenty-five months in order to provide Kenora with sufficient time for completion of the Waste Management Master Plan.

2. The reason for condition 25 is to ensure that Kenora makes progress in the Kenora Area Waste Management Master Plan implementation and evaluates any alternative landfill site available prior to completion of this Plan.

3. The reason for condition 26 is to ensure that during an emergency period the site is operated in accordance with supporting documentations submitted.

4. The reason for condition 27 is to ensure that necessary changes to the existing monitoring programs are being made upon request by the Ministry.

5. The reason for condition 28 is to ensure that the leachate collection system is installed if the trigger mechanism indicates unacceptable deterioration of surface water quality at station A-3 due to landfilling operations.

6. The reason for condition 29 is to ensure that five to seven monitoring wells are installed upgradient and downgradient of the leachate collection system if its construction is required by the trigger mechanism implementation.

7. The reason for condition 30 is to ensure that the detailed and updated closure plan is in place prior to the site closure.

In accordance with Section 139 of the Environmental Protection Act, R.S.O. 1990 c. E-19, you may by written notice served upon me and the Environmental Appeal Board within 15 days after receipt of this Notice, require a hearing by the Board. Section 142 of the Environmental Protection Act, as amended provides that the Notice requiring a hearing shall state:

1. *The portions of the approval or each term or condition in the approval in respect of which the hearing is required, and;*
2. *The grounds on which you intend to rely at the hearing in relation to <u>each</u> portion appealed.*

In addition to these legal requirements the Notice should also include:

3. *The name of the appellant;*
4. *The address of the appellant;*
5. *The Certificate of Approval number;*
6. *The date of the Certificate of Approval;*
7. *The name of the Director;*
8. *The municipality within which the waste disposal site is located;*

And the Notice should be signed and dated by the appellant.

This Notice must be served upon:

The Secretary,
Environmental Appeal Board,
12 St. Clair Avenue West,
Suite 502,
Toronto, Ontario,
M4V 1N3

AND

The Director,
Section 39, Environmental Protection Act,
Ministry of Environment and Energy,
250 Davisville Avenue, 3rd Floor,
Toronto, Ontario.
M4S 1H2

DATED AT TORONTO this 31st *day of* January, 1996.

A. Dominski, P. Eng.
Director
Section 39
Environmental Protection Act

Ontario

Ministry of the Environment
Ministere de l'Environnement

APPROVALS BRANCH
3rd Floor
Tel. (416) 440-3544
Fax (416) 440-6973

250 Davisville Avenue
Toronto, Ontario
M4S 1H2

250, avenue Davisville
Toronto (Ontario)
M4S 1H2

February 10, 1992

ENGINEERING
DATE FEB 20
FILE
ACTION

Mr. Marco Vogrig, P. Eng.
Project Engineer
P.O. Box 1110
Kenora, Ontario
P9N 3X7

Dear Mr. Vogrig:

Re: Amendment to the Provisional Certificate of Approval No. A 7068504 for the Kenora Tri-Municipal Landfill Site

Please find attached a notice which amends the Provisional Certificate of Approval respecting the Kenora Tri-Municipal Landfill Site.

This notice is issued pursuant to your letter of January 20, 1992 to the Approvals Branch of the Ministry of the Environment.

I hope that this amendment will satisfy your current requirement. If you have any questions regarding the Provisional Certificate of Approval, please call Mr. E. Zaltsberg of my staff at 440-3752.

Yours truly

D.J. Andrijiw, Supervisor
Waste Sites & Systems Approvals Unit
Industrial Approvals Section

Encl.
EZ/am
c.c. P. Fox, Kenora Office

You are hereby notified that the terms and conditions of Provisional Certificate of Approval No. [illegible]368504 dated December [illegible], 19[illegible] which has been issued to you, are being amended as follows:

Condition No. 16 is revoked and replaced by the following new condition:

16. The site will operate for 302 days per year as follows:

(a) On Monday to Saturday of each week, from 9:00 a.m. to 5:00 p.m.

(b) Closed on Sundays and 11 statutory holidays each year.

The reason for this new condition is the Town of Kenora request to change the landfill hours of operation signed by Mr. M. Vogrig, Project Engineer and dated January 20, 1992.

You may by written notice served upon me and the Environmental Appeal Board within 15 days after receipt of this Notice, require a hearing by the Board. Section 122a of the Environmental Protection Act, as amended in 1983, provides that the Notice requiring the hearing shall state:

1. *The portions of the approval or each term or condition in the approval in respect of which the hearing is required, and;*
2. *The grounds on which you intend to rely at the hearing in relation to <u>each</u> portion appealed.*

In addition to these legal requirements the Notice should also include:

3. *The name of the appellant;*
4. *The address of the appellant;*
5. *The Certificate of Approval number;*
6. *The date of the Certificate of Approval;*
7. *The name of the Director;*
8. *The municipality within which the waste disposal site is located;*

And the Notice should be signed and dated by the appellant.

This Notice must be served upon:

The Secretary,
Environmental Appeal Board,
112 St. Clair Avenue West,
5th Floor,
Toronto, Ontario,
M4V 1N3

AND

The Director,
Section 38, Environmental Protection Act,
Ministry of the Environment,
250 Davisville Avenue, 3rd Floor,
Toronto, Ontario.
M4S 1H2

DATED AT TORONTO this 4th *day of* February, 1992.

P. DeAngelis, P. Eng.,
Director,
Section 38,
Environmental Protection Act

Ministry of the Environment
808 Robertson Street, 2nd Floor
KENORA, ON P9N 1X9

Ministère de l'Environnement
808 rue Robertson 2e étage
KENORA ON P9N 1X9

Ontario

Kenora Area Office

Telephone: (807) 468-2718
Fax: (807) 468-2735

January 28, 2013

Mr. M. Pokharel, Environmental Supervisor
City of Kenora
60 Fourteenth Street North
Kenora, Ontario
P9N 4M9

Dear Mr. Pokharel:

Re: Review Comments for 2010/2011 Monitoring
Tri-Municipal Landfill Site 7068504

The Ministry of the Environment Northern Region Technical Support Section's review of the 2010 and 2011 monitoring reports for the Tri-Municipal Landfill Site (7068504) has been completed. A copy of the review comments is enclosed.

The reviewer has stated that there are no significant concerns with the sampling and monitoring results presented in the report. The reviewer has also made five recommendations:

1. Continue groundwater monitoring as completed in 2011.

2. Reduce the reporting frequency to once every six years with the next report due by April 15, 2018.

3. The next report should contain an expanded summary of the trigger mechanisms contained in Schedule "D" of Certificate of Approval 7068504 and comparison of the trigger mechanisms with the analytical results at surface water station A-3.

4. The next report should include an expanded discussion of the temporal and areal variations of the groundwater elevations at the site.

5. The next report should include a map of the contaminant attenuation zone.

Reporting for this site is currently being done on an annual basis. With this letter, I am changing the reporting frequency to once every six years. The next report is due on April 15, 2018. In addition to the historical data, this report should include data from 2012 - 2017.

Please provide a written response, by February 28, 2013, confirming receipt of this letter and commenting on each of the recommendations.

I can be reached at 468-2728 if you would like to discuss the contents of this letter or the requirements of Ontario's environmental legislation.

Yours truly,

Ray Boivin
Senior Environmental Officer
Kenora Area

/RB
Enclosure

c. Rick Perchuk, Operations Manager City of Kenora

Ministry of the Environment
435 James Street South
Suite 331
Thunder Bay, ON P7E 6S7

Tel.: 807 475-1546
Fax: 807 475 -1754

Ministère de l'Environnement
435 rue James sud
Bureau 331
Thunder Bay, ON P7E 6S7

Tél. : 807 475-1546
Téléc. : 807 475 -1754

Ontario

November 6, 2012

MEMORANDUM

To: Ray Boivin
Senior Environmental Officer
Kenora Area Office

From: Ghulam Sarwar
Regional Hydrogeologist
Technical Support Section, Northern Region

Re: 2010 & 2011 Annual Report – Closure Monitoring Programs
City of Kenora – Tri-Municipal Landfill Site (C of A # A7068504)

1.0 INTRODUCTION

As requested, I have reviewed the groundwater related part of the monitoring report prepared by Azimuth Environmental Consulting Inc., (the consultants) entitled "2011 Annual Report – Closure Monitoring Programs, City of Kenora – Tri-Municipal Landfill Site", dated April 2, 2012. The report provides the results of water monitoring & sampling completed during 2010 and 2011.

The site was closed in 2000 and capping completed later in 2003. The leachate impacts decrease with distance from the fill area and the site meets the Reasonable Use Guidelines. The consultants concluded that no remediation is required under the present conditions.

The report meets the monitoring requirements. Continue groundwater monitoring twice a year as completed in the previous year. Submit a comprehensive report to the MOE every six years. The next report should include in an appendix the trigger mechanism and contingency plan to mange off-site leachate impacts if necessary. This is to ensure that if any unexpected off-site water quality impacts are detected, they will be managed quickly to prevent the adverse impacts.

2.0 HYDROGEOLOGICAL SETTING

The Tri-Municipal Landfill Site is located in Haycock Township along the Highway 17 (TransCanada Hwy) about ten (10) KM east of the Kenora City. The landfill was operated by the City of Kenora under the CofA # A7068504 issued by the Ministry of Environment (MOE). The landfill was in operation between 1980 and 2000. At present the site is closed and capped.

Based on the information provided by the consultants, the hydro-stratigraphy is summarized as follows:

- Topography of the site is characterized of sub-parallel bedrock ridges and valleys;
- The overburden in the area is reported less than 7.0 meters and it overlies greenstone bedrock. Bedrock is exposed along the ridges;
- Groundwater is flowing, generally, in the northward direction with estimated flow rates that varies from 50 to 120 m/year (Azimuth, 2012); and
- The surface drainage at site flows northward to a small beaver pond, which is located about 700 meters downgradient of the site. The beaver pond forms headwaters of Breakneck Creek which, further in north (about 2.4 Km), eventually enters to Breakneck Lake.

3.0 DISCUSSIONS AND RECOMMENDATIONS

Groundwater and leachate sampling was completed by the City of kenora's staff twice a year during the months of May and October in 2010 and June & October in 2011.

The conclusions presented by the consultant's are given as below:

- The groundwater monitoring results (2010 & 2011) shows the compliance with the objectives established in the CofA issued by the MOE with exception of few acceptable impacts (Azimuth, 2012);
- The leachate impacts are reported within the contaminant attenuation zone (CAZ);
- The impacts were continuing to reduce with distance from the site witnessing the noticeable performance of natural attenuation through the processes of dilution and leachate degradation;
- It is predicted that the contaminant's concentrations will continue to decrease with time, as the site is already closed and not accepting refuse anymore;
- Vegetation cover in 2011 and 2012 is continuing to establish over the entire site;
- Groundwater flow is mainly in the overburden and it showed persistent behaviour over the historical monitoring since 1987 to date. Groundwater is, generally moving northward towards a small beaver pond that finally drains into the Breakneck Lake;
- The background groundwater quality shows higher concentrations of iron, copper and manganese and these are most likely due to soil mineral dissolved in natural waters;
- Road salt impacts are reported in the near vicinity of Highway 17 (MWs 103, 105, 106, and 119); and
- Volatile organic compounds (VOC) were detected with low levels of solvents;

Attenuation is effectively reducing leachate concentrations through dilution and natural degradation and no remediation is required under the present conditions.

In general, the report satisfies the monitoring requirements. Following recommendations are given for the future monitoring reporting:

1. Continue groundwater monitoring as completed in the previous year. It is important to study the temporal behaviour of groundwater flow system & water chemistry and to assess the performance of natural attenuation;
2. Submit a comprehensive monitoring report to the MOE every six years. More frequent submission is only required if the leachate concentrations unexpectedly increase;
3. Include in future reports the trigger mechanism and contingency plan to mange off-site leachate impacts, if necessary. This is to ensure that if any unexpected off-site water quality impacts are detected, they will be managed quickly to prevent adverse impacts;

4. As reported, depth to water tables data were recorded in the field as part of the monitoring program but were not presented/discussed in the report. It is recommended to discuss the depth to water table temporal and areal variations in the area. This is important to better understand the hydrogeology at site; and
5. Present a map showing the boundaries of Contaminant Attenuation Zone (CAZ) along with the locations of monitoring wells in future reporting.

4.0 CLOSURE

If you have any question regarding the above comments and recommendations, do not hesitate to contact the undersigned.

The purpose of the preceding review is to provide advice to the Ministry of Environment regarding groundwater conditions based on the information provided in the above referenced documents. The conclusions, opinions and recommendations of the reviewer are based on the information provided by others, except where otherwise specifically noted. The Ministry can not guarantee that the information that has been provided by others is accurate or complete. A lack of specific comment by the reviewer is not to be construed as an endorsing the content or views expressed in the reviewed material.

Ghulam Sarwar, P.Geo
Regional Hydrogeologist

c.c. Regional File: (CA (A7068504)
S:\GWATER\Staff Reviews\Ghulam Sarwar\Landfills\ Tri-Municipal LF-Kenora\Review_Tri-Municipal–kenora_2010&2011 Closure Monitoring_GS _Nov 6-2012

APPENDIX H

MOECC Landfill Submission Forms

Appendix D-Monitoring and Screening Checklist
General Information and Instructions

General Information: The checklist is to be completed, and submitted with the Monitoring Report.
Instructions: A complete checklist consists of:
(a) a completed and signed checklist, including any additional pages of information which can be attached as needed to provide further details where indicated.
(b) completed contact information for the Competent Environmental Practitioner (CEP)
(c) self-declaration that CEP(s) meet(s) the qualifications as set out below and in Section 1.2 of the Technical Guidance Document.

Definition of Groundwater CEP:
For groundwater, the CEP must have expertise in hydrogeology and meet one of the following:
(a) the person holds a licence, limited licence or temporary licence under the *Professional Engineers Act*; or
(b) the person holds a certificate of registration under the *Professional Geoscientists Act, 2000* and is a practicing member, temporary, member or limited member of the Association of Professional Geoscientists of Ontario. O. Reg. 66/08, s. 2..
Definition of Surface water CEP:
A CEP for surface water assessments is a scientist, professional engineer or professional geoscientist as described in (a) and (b) above with demonstrated experience and post-secondary education, either a diploma or degree, in hydrology, aquatic ecology, limnology, aquatic biology, physical geography with specialization in surface water, and/or water resource management.

The type of scientific work that a CEP performs must be consistent with that person's education and experience. If an individual has appropriate training and credentials in both groundwater and surface water and is responsible for both areas of expertise, the CEP may then complete and validate both sections of the checklist.

Monitoring Report and Site Information	
Waste Disposal Site Name	Tri-Municipal Landfill Site
Location (e.g. street address, lot, concession)	Highway 17, 10 km east of Kenora
GPS Location (taken within the property boundary at front gate/ front entry)	15 U 403197 5510764
Municipality	City of Kenora
Client and/or Site Owner	City of Kenora
Monitoring Period (Year)	2012-2017
This Monitoring Report is being submitted under the following:	
Certificate of Approval No.:	A7068504
Director's Order No.:	Type Here
Provincial Officer's Order No.:	Type Here
Other:	Type Here

Report Submission Frequency	◯ **Annual** ◉ **Other**	Specify (Type Here): Every 5 years
The site is:	◯ **Active** ◯ **Inactive** ◉ **Closed**	
If closed, specify C of A, control or authorizing document closure date:		September 1, 2000
Has the nature of the operations at the site changed during this monitoring period?	◯ **Yes** ◉ **No**	
If yes, provide details:	Type Here	
Have any measurements been taken since the last reporting period that indicate landfill gas volumes have exceeded the MOE limits for subsurface or adjacent buildings? (i. e. exceeded the LEL for methane)	◯ Yes ◉ No	

Groundwater WDS Verification:

Based on all available information about the site and site knowledge, it is my opinion that:

Sampling and Monitoring Program Status:

1) The monitoring program continues to effectively characterize site conditions and any groundwater discharges from the site. All monitoring wells are confirmed to be in good condition and are secure:	◉ **Yes** ○ **No**	
2) All groundwater, leachate and WDS gas sampling and monitoring for the monitoring period being reported on was successfully completed as required by Certificate(s) of Approval or other relevant authorizing/control document(s):	◉ **Yes** ○ **No** ○ **Not Applicable**	If no, list exceptions below or attach information.

Groundwater Sampling Location	**Description/Explanation for change (change in name or location, additions, deletions)**	**Date**
		Select Date
		Select Date
		Select Date
		Select Date

3) a) Some or all groundwater, leachate and WDS gas sampling and monitoring requirements have been established or defined outside of a ministry C of A, authorizing, or control document.	◯ **Yes** ◯ **No** ◉ **Not Applicable**	
b) If yes, the sampling and monitoring identified under 3(a) for the monitoring period being reported on was successfully completed in accordance with established protocols, frequencies, locations, and parameters developed as per the Technical Guidance Document:	◯ **Yes** ◯ **No** ◉ **Not Applicable**	If no, list exceptions below or attach additional information.

Groundwater Sampling Location	**Description/Explanation for change (change in name or location, additions, deletions)**	**Date**
Type Here	Type Here	Select Date
Type Here	Type Here	Select Date
Type Here	Type Here	Select Date

4) All field work for groundwater investigations was done in accordance with standard operating procedures as established/outlined per the Technical Guidance Document (including internal/external QA/QC requirements) (Note: A SOP can be from a published source, developed internally by the site owner's consultant, or adopted by the consultant from another organization):	◉ **Yes** ◯ **No**	If no, specify (Type Here):

Sampling and Monitoring Program Results/WDS Conditions and Assessment:

5) The site has an adequate buffer, Contaminant Attenuation Zone (CAZ) and/or contingency plan in place. Design and operational measures, including the size and configuration of any CAZ, are adequate to prevent potential human health impacts and impairment of the environment.	◉ **Yes** ○ **No**	If no, the potential design and operational concerns/ exceptions are as follows (Type Here):	
6) The site meets compliance and assessment criteria.	◉ **Yes** ○ **No**	If no, list and explain exceptions (Type Here):	
7) The site continues to perform as anticipated. There have been no unusual trends/ changes in measured leachate and groundwater levels or concentrations.	◉ **Yes** ○ **No**	If no, list exceptions and explain reason for increase/change (Type Here):	
1) Is one or more of the following risk reduction practices in place at the site: ***(a)*** **There is minimal reliance on natural attenuation of leachate due to the presence of an effective waste liner and active leachate collection/treatment; or** ***(b)*** **There is a predictive monitoring program in-place (modeled indicator concentrations projected over time for key locations); or** ***(c)*** **The site meets the following two conditions (typically achieved after 15 years or longer of site operation):** ***i.*** **The site has developed stable leachate mound(s) and stable leachate plume geometry/concentrations; and** ***ii.*** **Seasonal and annual water levels and water quality fluctuations are well understood.**	◉ **Yes** ○ **No**	**Note which practice(s):**	☐ **(a)** ☒ **(b)** ☒ **(c)**
9) Have trigger values for contingency plans or site remedial actions been exceeded (where they exist):	○ **Yes** ◉ **No** ○ **Not Applicable**	If yes, list value(s) that are/have been exceeded and follow-up action taken (Type Here):	

Groundwater CEP Declaration:

I am a licensed professional Engineer or a registered professional geoscientist in Ontario with expertise in hydrogeology, as defined in Appendix D under Instructions. Where additional expertise was needed to evaluate the site monitoring data, I have relied on individuals who I believe to be experts in the relevant discipline, who have co-signed the compliance monitoring report or monitoring program status report, and who have provided evidence to me of their credentials.

I have examined the applicable Certificate of Approval and any other environmental authorizing or control documents that apply to the site. I have read and followed the Monitoring and Reporting for Waste Disposal Sites Groundwater and Surface Water Technical Guidance Document (MOE, 2010, or as amended), and associated monitoring and sampling guidance documents, as amended from time to time. I have reviewed all of the data collected for the above-referenced site for the monitoring period(s) identified in this checklist. Except as otherwise agreed with the ministry for certain parameters, all of the analytical work has been undertaken by a laboratory which is accredited for the parameters analysed to *ISO/IEC 17025:2005 (E)- General requirements for the competence of testing and calibration laboratories,* or as amended from time to time by the ministry.

If any exceptions or potential concerns have been noted in the questions in the checklist attached to this declaration, it is my opinion that these exceptions and concerns are minor in nature and will be rectified for the next monitoring/reporting period. Where this is not the case, the circumstances concerning the exception or potential concern and my client's proposed action have been documented in writing to the Ministry of the Environment District Manager in a letter from me dated:

6-Mar-2018

Recommendations:

Based on my technical review of the monitoring results for the waste disposal site:

○ **No changes to the monitoring program are recommended**	
◉ **The following change(s) to the monitoring program is/are recommended:**	See Section 3.0 of report
◉ **No Changes to site design and operation are recommended**	
○ **The following change(s) to the site design and operation is/ are recommended:**	Type Here

Name:	Colin Ross		
Seal:	Add Image 		
Signature:		**Date:**	6-Mar-2018
CEP Contact Information:	Colin Ross		
Company:	Azimuth Environmental Consulting Inc.		
Address:	642 Welham Road Barrie, ON L4N 9A1		
Telephone No.:	705-721-8451 x 205	Fax No. :	705-795-7107
E-mail Address:	colin@azimuthenvironmental.com		
Co-signers for additional expertise provided:			
Signature:		**Date:**	Select Date
Signature:		**Date:**	Select Date

Surface Water WDS Verification:

Provide the name of surface water body/bodies potentially receiving the WDS effluent and the approximate distance to the waterbody (including the nearest surface water body/bodies to the site):

Name (s)	Breakneck Creek
Distance(s)	- 700m

Based on all available information and site knowledge, it is my opinion that:

Sampling and Monitoring Program Status:

1) The current surface water monitoring program continues to effectively characterize the surface water conditions, and includes data that relates upstream/background and downstream receiving water conditions:	(●) Yes ( ) No	If no, identify issues (Type Here):
2) All surface water sampling for the monitoring period being reported was successfully completed in accordance with the Certificate(s) of Approval or relevant authorizing/control document(s) (if applicable):	(●) Yes ( ) No ( ) **Not applicable (No C of A, authorizing / control document applies)**	If no, specify below or provide details in an attachment.

Surface Water Sampling Location	**Description/Explanation for change (change in name or location, additions, deletions)**	**Date**
Type Here	Type Here	Select Date
Type Here	Type Here	Select Date
Type Here	Type Here	Select Date
Type Here	Type Here	Select Date

3) a) Some or all surface water sampling and monitoring program requirements for the monitoring period have been established outside of a ministry C of A or authorizing/control document.	◯ **Yes** ◉ **No** ◯ **Not Applicable**	
b) If yes, all surface water sampling and monitoring identified under 3 (a) was successfully completed in accordance with the established program from the site, including sampling protocols, frequencies, locations and parameters) as developed per the Technical Guidance Document:	◯ **Yes** ◯ **No** ◉ **Not Applicable**	If no, specify below or provide details in an attachment.

Surface Water Sampling Location	**Description/Explanation for change (change in name or location, additions, deletions)**	**Date**
Type Here	Type Here	Select Date
Type Here	Type Here	Select Date
Type Here	Type Here	Select Date
Type Here	Type Here	Select Date

4) All field work for surface water investigations was done in accordance with standard operating procedures, including internal/external QA/QC requirements, as established/ outlined as per the Technical Guidance Document, MOE 2010, or as amended. (Note: A SOP can be from a published source, developed internally by the site owner's consultant, or adopted by the consultant from another organization):	◉ **Yes** ◯ **No**	If no, specify (Type Here):

Sampling and Monitoring Program Results/WDS Conditions and Assessment:

5) The receiving water body meets surface water-related compliance criteria and assessment criteria: i.e., there are no exceedances of criteria, based on MOE legislation, regulations, Water Management Policies, Guidelines and Provincial Water Quality Objectives and other assessment criteria (e.g., CWQGs, APVs), as noted in Table A or Table B in the Technical Guidance Document (Section 4.6):	○ **Yes** ◉ **No**

If no, list parameters that exceed criteria outlined above and the amount/percentage of the exceedance as per the table below or provide details in an attachment:

Parameter	Compliance or Assessment Criteria or Background	Amount by which Compliance or Assessment Criteria or Background Exceeded
e.g. Nickel	e.g. C of A limit, PWQO, background	e.g. X% above PWQO
Iron	0.3mg/L - PWQO	0.53 mg/L maximum
Total Phosphorus	0.03mg/L - PWQO	0.186 mg/Lmaximum
Copper	0.005mg/L - PWQO	0.018 mg/L maximum
Phenols	0.001mg/L - PWQO	0.004 mg/L maximum
6) In my opinion, any exceedances listed in Question 5 are the result of non-WDS related influences (such as background, road salting, sampling site conditions)?	◉ **Yes** ○ **No**	All these exceedances have been observed in the background surface water historically at or exceeding these concentrations.

7) All monitoring program surface water parameter concentrations fall within a stable or decreasing trend. The site is not characterized by historical ranges of concentrations above assessment and compliance criteria.	(●) **Yes** ( ) **No**	If no, list parameters and stations that is outside the expected range. Identify whether parameter concentrations show an increasing trend or are within a high historical range (Type Here)
8) For the monitoring program parameters, does the water quality in the groundwater zones adjacent to surface water receivers exceed assessment or compliance criteria (e.g. , PWQOs, CWQGs, or toxicity values for aquatic biota (APVs)):	(●) Yes ( ) No ( ) Not Known ( ) Not Applicable	No remedial measures are recommended given the large size of the CAZ and the fact the downstream locations have indicated attenuation processes are active.
9) Have trigger values for contingency plans or site remedial actions been exceeded (where they exist):	( ) **Yes** (●) **No** ( ) **Not Applicable**	If yes, list value(s) that are/have been exceeded and follow-up action taken (Type Here)

Surface Water CEP Declaration:

I, the undersigned hereby declare that I am a Competent Environmental Practitioner as defined in Appendix D under Instructions, holding the necessary level of experience and education to design surface water monitoring and sampling programs, conduct appropriate surface water investigations and interpret the related data as it pertains to the site for this monitoring period.

I have examined the applicable Certificate of Approval and any other environmental authorizing or control documents that apply to the site. I have read and followed the Monitoring and Reporting for Waste Disposal Sites Groundwater and Surface Water Technical Guidance Document (MOE, 2010, or as amended) and associated monitoring and sampling guidance documents, as amended from time to time. I have reviewed all of the data collected for the above-referenced site for the monitoring period(s) identified in this checklist. Except as otherwise agreed with the ministry for certain parameters, all of the analytical work has been undertaken by a laboratory which is accredited for the parameters analysed to *ISO/IEC 17025:2005 (E)- General requirements for the competence of testing and calibration laboratories,* or as amended from time to time by the ministry.

If any exceptions or potential concerns have been noted in the questions in the checklist attached to this declaration, it is my opinion that these exceptions and concerns are minor in nature or will be rectified for future monitoring events. Where this is not the case, the circumstances concerning the exception or potential concern and my client's proposed action have been documented in writing to the Ministry of the Environment District Manager in a letter from me dated:

6-Mar-2018

Recommendations:

Based on my technical review of the monitoring results for the waste disposal site:

○ **No Changes to the monitoring program are recommended**	See Section 3.0 of report
◉ **The following change(s) to the monitoring program is/are recommended:**	
◉ **No changes to the site design and operation are recommended**	Type Here
○ **The following change(s) to the site design and operation is/are recommended:**	

CEP Signature	
Relevant Discipline	Water Quality Assessor
Date:	6-Mar-2018
CEP Contact Information:	Colin Ross, B.Sc., P.Geo.
Company:	Azimuth Environmental Consulting Inc.
Address:	642 Welham Road Barrie, ON L4N 9A1
Telephone No.:	705-721-8451 x 205
Fax No. :	705-721-8926
E-mail Address:	colin@azimuthenvironmental.com

Save As **Print Form**