

**ANNUAL GROUNDWATER
MONITORING REPORT
DEZURIK LAGOON NO. 3
(MND985668342)
SARTELL, MINNESOTA**

**PREPARED FOR
DEZURIK
SARTELL, MINNESOTA**

**PREPARED BY
RMT, INC**

December 1997

Robert E. Hafemeister

Robert E. Hafemeister
Project Hydrogeologist

M. Carol McCartney
M. Carol McCartney, Ph.D., C.P.G.
Consulting Hydrogeologist

Marianne Duner

Marianne Duner
Project Manager

RECEIVED

DEC 01 1997

PCA, HAZAR



Table of Contents

1.	Introduction	1-1
2.	Groundwater Sampling	2-1
3.	Statistical Analysis	3-1
4.	Proposed Future Statistical Method	4-1
5.	Groundwater Elevations and Flow Rates	5-1
6.	Conclusions	6-1
7.	References	7-1

List of Tables

Table 1	Groundwater Monitoring Parameters.....	1-1
Table 2	Summary of Analytical and Statistical Analysis Results.....	2-1
Table 3	Summary of Groundwater Elevation Data.....	5-1

List of Figures

Figure 1	Water Table Configuration, Lagoon No. 3 - October 1997	5-2
----------	--	-----

List of Appendices

Appendix A	MPCA Approval Letter of the Semiannual Report Dated July 1997
Appendix B	Field Notes, October 1997 Sampling Event
Appendix C	Laboratory Analytical Reports, October 1997 Sampling Event
Appendix D	Statistical Worksheet
Appendix E	Graph of Dissolved Barium and Cadmium
Appendix F	Graphs of Groundwater Elevations

Section 1

Introduction

This Annual Report is submitted to the Minnesota Pollution Control Agency (MPCA) in accordance with the provisions of the Part B Permit reissued on September 29, 1994, for post-closure monitoring and reporting of DeZurik Lagoon No. 3 (USEPA MND985668342). This report includes the monitoring data and statistical analysis results of the October 1997 sampling event.

The annual sampling event took place in October of 1997. In accordance with the Part B Permit, groundwater samples were collected from the three downgradient wells (P-5R, P-9R, and P-12R) and from the upgradient well (P-13). Four replicate groundwater samples were collected from upgradient well P-13. The samples were analyzed for the parameters designated in the Part B Permit (Table 1). According to the requirements of the permit, the results of the laboratory analysis for arsenic, barium, cadmium, lead, and selenium were statistically analyzed for the assessment of significant changes in groundwater quality. The results of the sampling event are provided in this report.

The semiannual sampling event took place in April 1997. The results of the sampling event were presented to the MPCA in the Semiannual Report dated June 1997. A copy of the MPCA approval letter for that report is in Appendix A.

Table 1
Groundwater Monitoring Parameters
DeZurik Lagoon Number 3 - Sartell, Minnesota

PARAMETER	TEST METHOD (1)	METHOD DETECTION LIMIT	GROUNDWATER PROTECTION STANDARDS MAXIMUM CONCENTRATION LIMITS
Arsenic	206.2	3 µg/L	50 µg/L
Barium	200.7	5 µg/L	1,500 µg/L
Boron	200.7	200 µg/L	(2)
Cadmium	213.2	0.3 µg/L	5 µg/L
Calcium	215.2	500 µg/L	(2)
Chloride	325.1	2.0 mg/L	250 mg/L
Chromium	200.7	10 µg/L	50 µg/L
COD	SM 5220B	5 mg/L	(3)
Cyanide, total	335.2	10 µg/L	154 µg/L
Fluoride	SM 4500F	0.1 mg/L	4,000 µg/L
Iron	200.7	100 µg/L	(2)
Lead	239.2	3 µg/L	20 µg/L
Magnesium	200.7	500 µg/L	(2)
Manganese	200.7	5 µg/L	100 µg/L
Nitrate, nitrogen	352.1	0.1 mg/L	10 mg/L
Phenols	420.1, 420.2, 420.3	5 µg/L	280 µg/L
Selenium	270.2	3 µg/L	45 µg/L
Sodium	200.7	500 µg/L	(2)
Sulfate	SW-846-9036	10 mg/L	250 mg/L
TOC	415.1	0.25 mg/L	(3)
TDS	160.1	20 mg/L	(3)
Zinc	200.7	20 µg/L	(2)
pH	Field	0.01 pH units	(2)
Conductivity	Field	+/- Temp. Corrected Reading	(2)
Temperature	Field	+/- 0.5°C.	(2)

NOTE:

- (1) These methods are from EPA 6004-79/020 *Methods for Chemical Analysis of Water and Waste*, except those marked with "SM" or "SW", which are from *Standard Methods for the Analysis of Water and Wastewater, 17 Ed.*, and Reference SW846 - *Test Methods for Evaluating Solid Waste, Physical/Chemical Methods*.
- (2) These parameters are to be used only as indicators of possible plume migration and do not have health-based concentration limits associated with them.
- (3) Maximum Concentration Limits for these constituents are equal to 200 percent of the background values or 200 percent of the detection limits, whichever is less, which will be established during the first three rounds of sampling as described in the permit application.

Section 2

Groundwater Sampling

Groundwater samples were collected from downgradient wells P-5R, P-9R, and P-12R on October 15 and 16, 1997. Four replicate groundwater samples were collected from upgradient well P-13 on October 15 and 16, 1997. Groundwater samples were collected according to the procedures outlined in the Part B Permit. One field blank was submitted for quality control. All samples were analyzed by EnChem Laboratories in Madison, Wisconsin. Field notes are provided in Appendix B. Laboratory analytical results are provided in Appendix C and summarized for the statistical parameters in Table 2.

The analytical method for barium was changed in October 1996, resulting in the detection limit for this analyte being lowered from 50 µg/L to 5 µg/L.

Table 2

Summary of Analytical and Statistical Analysis Results¹
DeZurik Lagoon No. 3
 (units = $\mu\text{g/L}$, dissolved)

WELL NUMBER	DATE	ARSENIC	BARIUM	CADMIUM	LEAD	SELENIUM
P-5A	12/27/89	ND	50	ND	ND	ND
P-5A	6/28/90	ND	ND	0.50	5	ND
P-5A	10/4/90	ND	110	ND	ND	ND
P-5A	12/18/90	ND	80	ND	ND	ND
P-5A	4/4/91	ND	60	0.40	ND	ND
P-5A	8/01/91	ND	67	ND	ND	ND
P-5A-1	10/31/91	ND	63	0.32	ND	ND
P-5A-2	10/31/91	ND	60	0.43	ND	ND
P-5A-3	10/31/91	ND	62	0.38	ND	ND
P-5A-4	10/31/91	ND	62	0.55	ND	ND
P-5A	4/23/92	ND	56	ND	ND	ND
P-5A	9/30/92	ND	ND	ND	ND	ND
P-5A	4/20/93	ND	ND	ND	ND	ND
P-5R	10/27/93	ND	78	1.4	ND	ND
P-5R	1/10/94	--	ND	--	--	--
P-5R	4/20/94	ND	ND	ND	ND	<6.0 ²
P-5R	10/17/94	ND	ND	ND	ND	ND
P-5R	4/11/95	ND	ND	ND	ND	ND
P-5R	10/11/95	ND	52	ND	ND	ND
P-5R	4/17/96	ND	ND	ND	ND	ND
P-5R	10/16/96	< 3.0	47	0.36	< 3.0	< 3.0
P-5R	4/17/97	< 3.0	50 ³	< 0.30	< 3.0	< 3.0
P-5R	10/16/97	<3.0	44	<0.30	<3.0	<3.0
P-9R	4/04/91	ND	ND	ND	ND	ND
P-9R	8/01/91	ND	ND	ND	ND	ND
P-9R-1	10/31/91	ND	ND	ND	ND	ND
P-9R-2	10/31/91	ND	ND	ND	ND	ND
P-9R-3	10/31/91	ND	ND	0.30	ND	ND
P-9R-4	10/31/91	ND	ND	ND	ND	ND
P-9R	4/23/92	ND	ND	0.19	ND	ND
P-9R	9/30/92	ND	ND	ND	ND	ND
P-9R	4/20/93	ND	ND	ND	ND	ND
P-9R	10/27/93	ND	ND	0.70	ND	ND
P-9R	4/20/94	ND	ND	ND	ND	<6.0 ²
P-9R	10/17/94	ND	ND	ND	ND	ND
P-9R	4/11/95	ND	ND	ND	ND	ND
P-9R	10/10/95	ND	ND	ND	ND	ND
P-9R	4/17/96	ND	ND	ND	ND	ND
P-9R	10/16/96	< 3.0	48	< 0.30	< 3.0	< 3.0
P-9R	4/16/97	< 3.0	53 ³	< 0.30	< 3.0	< 3.0
P-9R	10/15/97	<3.0	61	1.4	<3.0	<3.0

Table 2 (cont.)

Summary of Analytical and Statistical Analysis Results¹
 DeZurik Lagoon No. 3
 (units = $\mu\text{g/L}$, dissolved)

WELL NUMBER	DATE	ARSENIC	BARIUM	CADMIUM	LEAD	SELENIUM
P-12	4/04/91	ND	ND	ND	ND	ND
P-12	8/01/91	ND	ND	0.32	ND	ND
P-12-1	10/31/91	ND	ND	0.31	ND	ND
P-12-2	10/31/91	ND	ND	0.33	ND	ND
P-12-3	10/31/91	ND	ND	ND	ND	ND
P-12-4	10/31/91	ND	ND	ND	ND	ND
P-12	4/23/92	ND	ND	ND	ND	ND
P-12	9/30/92	ND	ND	ND	ND	ND
P-12	4/20/93	ND	ND	ND	ND	ND
P-12R	10/27/93	ND	ND	13	ND	ND
P-12R	1/10/94	--	--	ND	--	--
P-12R	4/20/94	ND	ND	ND	ND	<6.0 ²
P-12R	10/17/94	ND	ND	ND	ND	ND
P-12R	4/11/95	ND	ND	ND	ND	ND
P-12R	10/10/95	ND	ND	ND	5.2	ND
P-12R	4/17/96	ND	ND	ND	ND	ND
P-12R	10/16/96	< 3.0	41	0.63	< 3.0	< 3.0
P-12R	4/17/97	< 3.0	44 ³	< 0.30	< 3.0	< 3.0
P-12R	10/16/97	<3.0	44	<0.30	<3.0	<3.0
P-13	6/28/90	< 3.0	< 50	< 0.3	< 3.0	< 3.0
P-13A	6/28/90	< 3.0	< 50	< 0.3	< 3.0	< 3.0
P-13B	6/28/90	< 3.0	< 50	< 0.3	< 3.0	< 3.0
P-13C	6/28/90	< 3.0	< 50	< 0.3	< 3.0	< 3.0
P-13	10/4/90	< 3.0	< 50	< 0.3	< 3.0	< 3.0
P-13A	10/4/90	< 3.0	60	< 0.3	< 3.0	< 3.0
P-13B	10/4/90	< 3.0	< 50	< 0.3	< 3.0	< 3.0
P-13C	10/4/90	< 3.0	< 50	< 0.3	< 3.0	< 3.0
P-13A	12/18/90	< 3.0	< 50	< 0.3	< 3.0	< 3.0
P-13B	12/18/90	< 3.0	< 50	< 0.3	< 3.0	< 3.0
P-13C	12/18/90	< 3.0	< 50	< 0.3	< 3.0	< 3.0
P-13D	12/18/90	< 3.0	< 50	< 0.3	< 3.0	< 3.0
P-13	4/4/91	< 3.0	< 50	< 0.3	< 3.0	< 3.0
P-13	8/1/91	< 3.0	< 50	< 0.3	< 3.0	< 3.0
P-13-1	10/31/91	< 3.0	< 50	< 0.3	< 3.0	< 3.0
P-13-2	10/31/91	< 3.0	< 50	0.88	< 3.0	< 3.0
P-13-3	10/31/91	< 3.0	< 50	< 0.3	< 3.0	< 3.0
P-13-4	10/31/91	< 3.0	< 50	< 0.3	< 3.0	< 3.0
P-13-1	4/23/92	< 3.0	< 50	< 0.3	< 3.0	< 3.0
P-13-2	4/23/92	< 3.0	< 50	< 0.3	< 3.0	< 3.0
P-13-3	4/23/92	< 3.0	< 50	< 0.3	< 3.0	< 3.0

Table 2 (cont.)

Summary of Analytical and Statistical Analysis Results¹DeZurik Lagoon No. 3
(units = µg/L, dissolved)

WELL NUMBER	DATE	ARSENIC	BARIIUM	CADMIUM	LEAD	SELENIUM
P-13-4	4/23/92	< 3.0	< 50	< 0.3	< 3.0	< 3.0
P-13	9/30/92	< 3.0	< 50	< 0.3	< 3.0	< 3.0
P-13-1	10/8-9/92	< 3.0	< 50	< 0.3	< 3.0	< 3.0
P-13-2	10/8-9/92	< 3.0	< 50	< 0.3	< 3.0	< 3.0
P-13-3	10/8-9/92	< 3.0	< 50	< 0.3	< 3.0	< 3.0
P-13A	4/20/93	< 3.0	< 50	< 0.3	< 3.0	< 3.0
P-13B	4/20/93	< 3.0	< 50	< 0.3	< 3.0	< 3.0
P-13C	4/20/93	< 3.0	< 50	< 0.3	< 3.0	< 3.0
P-13D	4/20/93	< 3.0	< 50	< 0.3	< 3.0	< 3.0
P-13A	10/29/93	< 3.0	< 50	3.3	< 3.0	< 3.0
P-13B	10/29/93	< 3.0	< 50	5.5	< 3.0	< 3.0
P-13C	10/29/93	< 3.0	< 50	3.9	< 3.0	< 3.0
P-13D	10/29/93	< 3.0	< 50	17	< 3.0	< 3.0
P-13	4/20/94	< 3.0	< 50	< 0.3	< 3.0	< 6.0 ²
P-13A	4/20/94	< 3.0	< 50	< 0.3	< 3.0	< 6.0 ²
P-13B	4/20/94	< 3.0	< 50	0.31	< 3.0	< 6.0 ²
P-13C	4/20/94	< 3.0	< 50	< 0.3	< 3.0	< 6.0 ²
P-13	10/17/94	< 3.0	54	< 0.3	< 3.0	< 3.0
P-13A	10/18/94	< 3.0	< 50	< 0.3	< 3.0	< 3.0
P-13B	10/18/94	< 3.0	< 50	< 0.3	< 3.0	< 3.0
P-13C	10/18/94	< 3.0	< 50	< 0.3	< 3.0	< 3.0
P-13	4/11/95	< 3.0	< 50	< 0.3	< 3.0	< 3.0
P-13A	4/11/95	< 3.0	< 50	< 0.3	< 3.0	< 3.0
P-13B	4/11/95	< 3.0	< 50	< 0.3	< 3.0	< 3.0
P-13C	4/12/95	< 3.0	< 50	< 0.3	< 3.0	< 3.0
P-13	10/11/95	< 3.0	< 50	< 0.3	< 3.0	< 3.0
P-13A	10/11/95	< 3.0	< 50	< 0.3	< 3.0	< 3.0
P-13B	10/11/95	< 3.0	< 50	< 0.3	< 3.0	< 3.0
P-13C	10/11/95	< 3.0	< 50	< 0.3	< 3.0	< 3.0
P-13	4/17/96	< 3.0	< 50	< 0.3	< 3.0	< 3.0
P-13A	4/17/96	< 3.0	< 50	< 0.3	< 3.0	< 3.0
P-13B	4/17/96	< 3.0	< 50	< 0.3	< 3.0	< 3.0
P-13C	4/17/96	< 3.0	< 50	< 0.3	< 3.0	< 3.0
P-13	10/16/96	< 3.0	32 ³	< 0.30	< 3.0	< 3.0
P-13A	10/16/96	< 3.0	31 ³	< 0.30	< 3.0	< 3.0
P-13B	10/17/96	< 3.0	31 ³	< 0.30	< 3.0	< 3.0
P-13C	10/17/96	< 3.0	31 ³	< 0.30	< 3.0	< 3.0
P-13	4/16/97	< 3.0	35 ³	< 0.30	< 3.0	< 3.0
P-13A	4/17/97	< 3.0	34 ³	< 0.30	< 3.0	< 3.0

Table 2 (Cont.)

Summary of Analytical and Statistical Analysis Results¹
DeZurik Lagoon No. 3
 (units = µg/L dissolved)

WELL NUMBER	DATE	ARSENIC	BARIUM	CADMIUM	LEAD	SELENIUM
P-13B	4/17/97	< 3.0	35 ³	< 0.30	< 3.0	< 3.0
P-13C	4/17/97	<3.0	35 ³	<0.30	<3.0	<3.0
P-13	10/15/97	< 3.0	33	< 0.30	< 3.0	< 3.0
P-13A	10/16/97	< 3.0	34	< 0.30	< 3.0	< 3.0
P-13B	10/16/97	< 3.0	34	< 0.30	< 3.0	< 3.0
P-13C	10/16/97	< 3.0	34	< 0.30	< 3.0	< 3.0
Detection limit		3.0	50 ³ , 5 ³	0.3	3.0	3.0
Mean ⁴		3.0	NA	0.3	3.0	3.0
Standard deviation ⁴		0.0	NA	0.0	0.0	0.0
Tolerance level ⁴		7.4#	60 ⁵ /83 ⁶	1.7#	7.4#	7.4#

NOTES:

ND Not detected.

-- Not measured.

The Poisson Distribution method was used for calculating tolerance intervals. The laboratory detection limits were used in the statistical analysis if the laboratory result was below the detection limit.

¹ Concentrations of dissolved barium and dissolved cadmium relative to the tolerance interval are shown graphically in Appendix C.² Raised detection limits due to possible matrix interferences.³ Detection limit lowered to 5 µg/L in October 1996.⁴ Mean, standard deviation, and tolerance level were calculated for arsenic, cadmium, lead, and selenium based on historical analytical data (n = 16) for groundwater samples collected from well P-13 (upgradient sampling location).⁵ Tolerance level for barium was calculated using a nonparametric upper tolerance limit and n = 66 sample points. The worksheet for Tolerance Limit calculations is included in Appendix D.⁶ Tolerance level for barium was calculated using normal parametric upper tolerance limits on the mean concentrations of detectable sample rounds (n=5). Computations are included in Appendix D.

NA Mean and standard deviation not applicable with nonparametric upper tolerance limit calculations.

Section 3

Statistical Analysis

A statistical analysis for the October 1997 sampling event was conducted in accordance with the requirements outlined in the Part B Permit reissued in September 1994. The statistical analysis was conducted for the following parameters at wells P-5R, P-9R, and P-12R (downgradient sampling locations):

- Dissolved arsenic
- Dissolved barium
- Dissolved cadmium
- Dissolved lead
- Dissolved selenium

A tolerance interval (T) was calculated for each of the five parameters based on historical analytical data for groundwater samples collected from well P-13 (upgradient sampling location). The tolerance interval for arsenic, cadmium, lead, and selenium was calculated using the following formula:

$$T = U + (k * s),$$

where

T = tolerance interval,

U = population mean,

k = tolerance factor, and

s = standard deviation.

The Poisson Distribution approach was used to estimate the population mean and variance for arsenic, cadmium, lead, and selenium. A tolerance factor of 2.532 was used assuming a confidence factor of 95 percent with a typical set of background data (n=16) (USEPA, 1989). The laboratory detection limits were used in the Poisson Distribution approach if the laboratory result was below the Detection Limit.

The laboratory analytical method for barium was changed in the October 1996 sampling round, resulting in a lowering of the Detection Limit from 50 µg/L to 5 µg/L and in the creation of

detects in the October 1996 sampling round that would not have been detected in the past. This change in the laboratory analytical method has necessitated a change in the statistical analysis for barium. After reviewing the revised USEPA RCRA guidance on statistics for groundwater monitoring, a tolerance interval for barium was calculated using the nonparametric tolerance limit. This method was selected after determining that

- more than 50, but less than 90, percent of all past dissolved barium results were nondetect;
- Cohen's adjustment is not appropriate to analyze the data because it depends on the detection limit, which has changed; and
- Aitchison's adjustment is also inappropriate for the analysis because it assumes that all nondetect data are equivalent to zero (USEPA, 1992).

All of the background data ($n = 66$) were used to determine the maximum detected barium concentration of $60 \mu\text{g/L}$. The 95 percent confidence upper nonparametric tolerance limit was then set to $60 \mu\text{g/L}$, with a minimum coverage equal to 95.1 percent and an expected coverage of 98.3 percent.

The barium data were also evaluated using only the rounds with detected data and assuming the replicate data are not independent. In that case, the means of the replicates are used for only 5 rounds with detectable barium. The result is a tolerance limit of $83 \mu\text{g/L}$.

The statistical analysis and the Detection Limits are summarized in Table 2. The worksheets used to calculate the statistical results are presented in Appendix D.

Using the calculated tolerance intervals, no exceedences were identified during the October 1997 sampling event for the five parameters at downgradient sampling locations P-5R and P-12R, and for arsenic, cadmium, lead, and selenium at P-9R. The dissolved concentrations of the five parameters were all below the Detection Limit in the October 1997 sampling event at P-5R and P-12R, except for barium and cadmium at P-9R (see Table 1). Dissolved barium ($61 \mu\text{g/L}$) was detected above its nonparametric tolerance level ($60 \mu\text{g/L}$) but below its normal tolerance level at P-9R during the 1997 sampling event. A graphical presentation of analytical data for dissolved barium and dissolved cadmium in selected wells is included in Appendix E.

According to the Part B Permit, "if the concentration of any parameter [arsenic, barium, cadmium, lead, and selenium] from the downgradient well exceeds the tolerance limit, then a statistically significant evidence of impact to groundwater has occurred." The Part B Permit requires DeZurik to notify the MPCA in writing within 7 days of the noted exceedence, and resample the impacted well "within 14 days following the determination of significant impact to groundwater by statistical analysis." Because barium exceeds its nonparametric tolerance interval but is below its normal tolerance level at P-9R, DeZurik concludes notification and resampling is not required.

Section 4

Proposed Future Statistical Method

DeZurik proposes to continue to use tolerance limits, per the Part B permit, but recommends discontinuing the practice of sampling the background well 4 times in every sampling event because those samples are not independent. DeZurik proposes to amend the Part B permit for this closed site to eliminate the quadruplicate sampling per sampling event.

Section 5

Groundwater Elevations and Flow Rates

Groundwater elevations were measured and recorded for the on-site monitoring wells during the October 1997 sampling round. The water table elevations are presented in Table 3, and a water table contour map is presented on Figure 1. Graphical presentations of the data for wells P-5R, P-9R, P-12R, and P-13 are included in Appendix F.

The data from the October 1997 sampling round indicate that the pattern of groundwater flow at the site is consistent with recent years. Water levels measured in the wells at the site in the October 1997 sampling round ranged from 0.73 to 1.64 feet higher than those measured in April 1997. The groundwater, as determined from the October 1997 water level data, generally flows in a southeasterly direction, which is consistent with historical data.

Average linear groundwater flow rates within the aquifer may be calculated with the following equation:

$$V = (Ki/Ne),$$

where

V = groundwater velocity,

K = hydraulic conductivity,

i = hydraulic gradient, and

Ne = effective porosity.

The average calculated hydraulic gradient in the vicinity of Lagoon No. 3 for October 1997 is 0.005 ft/ft. If the hydraulic conductivity of the aquifer is assumed to be 3.9×10^{-1} feet per minute (ft/min) and the effective porosity is assumed to be 25 percent, then the calculated horizontal groundwater velocity using the above formula with the assumptions and the calculated hydraulic gradient is approximately 11 feet/day. This velocity is consistent with the 11 feet/day previously calculated at the site.

Table 3

Summary of Groundwater Elevation Data
October 1997

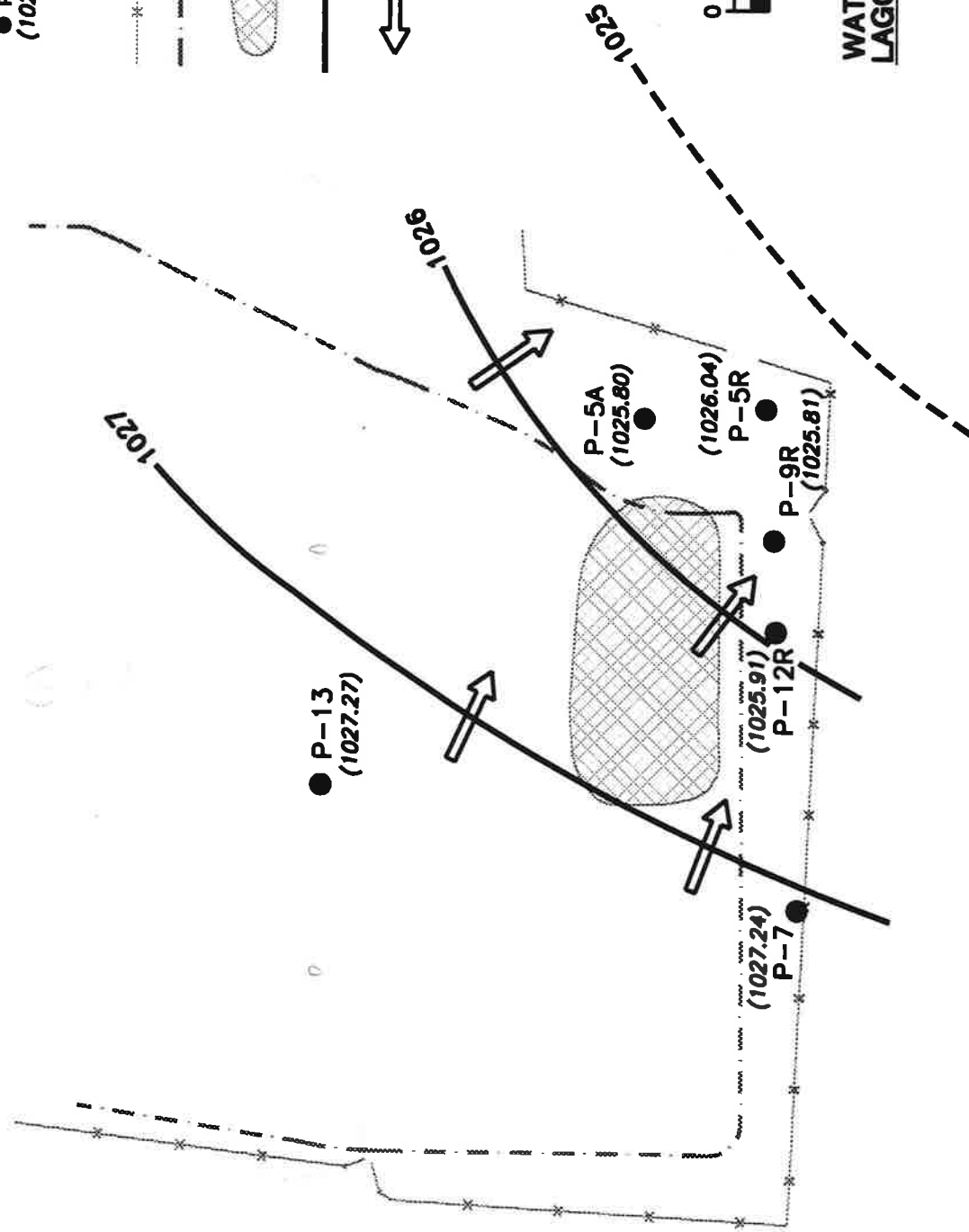
WELL I.D.	TOP OF CASING ELEVATION (FEET ABOVE M.S.L.)	DEPTH TO GROUNDWATER (FEET)	GROUNDWATER ELEVATION (FEET ABOVE M.S.L.)
P-5R	1099.04	73.00	1026.04
P-5A	1098.89	73.09	1025.80
P-7	1094.55	67.31	1027.24
P-9R	1102.09	76.28	1025.81
P-12R	1101.33	75.42	1025.91
P-13	1105.12	77.85	1027.27

NOTE:

M.S.L. Mean sea level, used as a vertical datum.

LEGEND

- P-13
(1026.98)
- FENCE
- - - APPROXIMATE LIMIT
OF LANDFILL WASTE
- ▨ APPROXIMATE LIMIT
OF LAGOON
- 1024
- WATER TABLE CONTOUR
(DASHED WHERE INFERRED)
- ⇨ GROUNDWATER FLOW
DIRECTION



**WATER TABLE CONFIGURATION
LAGOON NO. 3 - OCTOBER 1997**

**DEZURIK
SARTELL, MINNESOTA**



DRAWN BY: BSI
APPROVED BY:
DATE: DECEMBER 1997
PROJ. / 101.24
FILE / 1012402.DWG

FIGURE 1

Section 6

Conclusions

The water quality analytical results and the statistical analysis results do not indicate a statistically significant release from Lagoon No. 3 during the October 1997 sampling event. However, the nonparametric concentration of dissolved barium in P-9R for the October 1997 sampling event was above the nonparametric tolerance limit but below the normal tolerance limit. DeZurik concludes that this result indicates notification and resampling are not required.

DeZurik proposes to use normal tolerance limits for barium but without the quadruplicate sampling per round for future analyses.

According to the October 1997 groundwater elevation data, groundwater in the vicinity of the former lagoon generally flows toward the southeast at a velocity of approximately 11 ft/day. This is consistent with the flow direction and gradients of historical data.

An evaluation of the October 1997 groundwater elevation data indicates that the groundwater monitoring network at the site is adequate to monitor changes in both groundwater quality and groundwater flow. Therefore, wells P-5R, P-9R, and P-12R are appropriately located as monitoring points to evaluate water quality at the downgradient edge of Lagoon No. 3.

Section 7

References

USEPA. 1989. Statistical analysis of groundwater monitoring data at RCRA facilities, interim guidance. Office of Solid Waste Management Division, USEPA, April 1989.

USEPA. 1992. Statistical analysis of groundwater monitoring data at RCRA facilities, Addendum to interim guidance. Office of Solid Waste, Permits & State Programs Division, USEPA, July 1992.

Appendix A
MPCA Approval Letter of the Semiannual
Report Dated July 1997



Minnesota Pollution Control Agency

August 19, 1997

Mr. Lee Walz
DeZurik
250 Riverside Avenue North
Sartell, Minnesota 56377-1743

RE: Semiannual Ground Water Monitoring Report, Dated June 1997, for the
DeZurik/City of Sartell, Lagoon Number 3, MND985668342, Sartell, Minnesota

Dear Mr. Walz:

Thank you for submitting the above referenced report which was received in this office on June 26, 1997. Minnesota Pollution Control Agency (MPCA) staff have completed its review of the report and find it to be complete with respect to the Part B permit application dated August 1994 and the Post Closure Permit dated September 1994 for DeZurik's lagoon number 3, and the MPCA letter to you dated April 24, 1997.

As was discussed in the report, the change in the detection limit for barium necessitated a change in the statistical analysis for barium. MPCA staff agree that the use of a nonparametric tolerance limit for the calculation of a tolerance interval for barium for the last two (2) semiannual reports was appropriate and can be used for the next semiannual statistical determination for barium. In the next semiannual report, please propose the statistical method that will be used for the data to be collected during the April 1998 sampling event. After the April 1998 sampling event, DeZurik should have enough barium background data points using the new detection limit to return to using parametric tolerance limits with a sample size of 16 ($n = 16$). If DeZurik intends not to return to the parametric tolerance limit, it should explain the reasons why in detail and request a permit modification.

Mr. Lee Walz

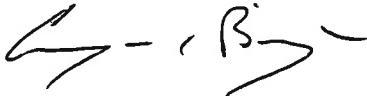
Page 2

August 19, 1997

Also, on the inspection check list it was noted that slumping is occurring on the northeast corner of the landfill and that there are lawnmower ruts by monitoring well P-12. During a site visit by MPCA staff, the slumping and lawnmower ruts were confirmed, however the slumping is occurring on the southwest corner of the landfill not the northeast corner. Also, across the cap there are many bare areas where the vegetation needs to be re-seeded to prevent erosion. Please take the appropriate steps necessary to repair these areas and report the actions taken either to myself or to Fred Jenness.

If you have any questions, please contact me at 612/297-8377, or Fred Jenness at 612/297-8470.

Sincerely,



Crague C. Biglow
Senior Hydrogeologist
Permit and Review Unit
Regulatory Compliance Section
Hazardous Waste Division

CCB:mln

cc: The Honorable Robert Pogatshnik, Mayor, City of Sartell
James Vondracek, RMT, Madison, WI
Carol McCartney, RMT, Madison, WI
Bob Egan, U.S. Environmental Protection Agency, Region V, Chicago
Matthew Ohl, U.S. Environmental Protection Agency, Region V, Chicago

**Appendix B
Field Notes,
October 1997 Sampling Event**

10.23
Title



PROJECT NAME:	<u>Dezurik</u>
PROJECT NUMBER:	<u>101.23</u>
LOCATION:	<u>Sartell, MN.</u>
DATES OF FIELD WORK:	<u>10/15/97 - 10/16/97</u>
PURPOSE OF FIELD WORK:	<u>GW Sample Collection</u>
	<u> </u>
	<u> </u>
	<u> </u>
WORK PERFORMED BY:	<u>Hafemeister</u>
	<u>O/son</u>
	<u> </u>
	<u> </u>

Hafemeister 10/20/97 Laurie Dunn 10/24/97
Signed Date QC'd By Date



GENERAL NOTES

PROJECT NAME: Dezuril

DATE: 10/15/97

PROJECT NUMBER: 101.23

AUTHOR: Hafemeister

TIME ARRIVED ON-SITE: _____

TIME LEFT SITE: 5:30 pm

WEATHER: Sunny 60°F

WORK/SAMPLING PERFORMED: Sampled P-9R, P-13, Field Blank

PROBLEMS ENCOUNTERED/CORRECTIVE ACTIONS TAKEN: None

COMMUNICATIONS:

Name/Representing: None

Subject/Comments: None

QC'd By: Laurie Dunner



GENERAL NOTES

PROJECT NAME: Dezurik

DATE: 10/16/197

PROJECT NUMBER: 101.23

AUTHOR: Hafemeister

TIME ARRIVED ON-SITE: 8:00 am

TIME LEFT SITE: ~~4~~ 5 pm

WEATHER: Sunny 60°F

WORK/SAMPLING PERFORMED: Samples collected at P-12R, 5R, *13A, B, & C

PROBLEMS ENCOUNTERED/CORRECTIVE ACTIONS TAKEN: Told City ^{about} Missing lock @ P-9R + Gate Lock. City replaced lock on P-9R

COMMUNICATIONS:

Name/Representing: Lee Walz/Dezurik, Keith Sowada/Champion
Subject/Comments: Bob Theves/City of Sartell, Craig Bigelow/MPCA

MPCA oversight of monitoring

QC'd By: Laurie Dunn



**pH AND CONDUCTIVITY METER
CALIBRATION LOG**

PROJECT NAME: City of Saultell

DATE: 10/14

PROJECT NUMBER: 123.506/101.23

SAMPLER: E. Olson & R. HAFENSCHEIN

pH METER

MODEL: Omnion 250A

SERIAL NO.: 4065

Meter Check	Buffer Check	Slope Reading	Time
OK	4.7	97.1	1412
OK	4.7	99.6	1435
OK	4.7	99.9	0805
✓	4.7	100.9	11:25
	7=6.99 4=3.99		1605
OK	4.7	99.4	0815
OK	4.7	99.2	1615

10/15
10/16
10/16

Buffer Lot Numbers: pH 4: 97327324 pH 7: 973333-24

CONDUCTIVITY METER

MODEL: YSI 33

SERIAL NO.: 4057

Instrument Zero	Red Line	Reading of Calibration Soln	Temp. of Calibration Soln	Corrected* Cond. @ 25°C	Time
<u>Slightly above 0</u>	OK	100 x 10	16°	1402	1410
"	OK	120 x 10	17°	1476	0805
✓	✓	110 x 10	11	1501	11:25
"	OK	110 x 10	14	1392	1605
"	✓	110 x 10	13	1427	0810
"	✓	120 x 10	18	1380	1615

10/14
10/15
10/16

Conductivity Calibration Solution Lot Number: 6132

Problems/Corrective Actions: No temp, changed probe, plus were bent

* FORMULA FOR TEMPERATURE NORMALIZING CONDUCTIVITY: $SC + \{1 + [0.0191 \times (T - 25)]\} = \text{Cond @ } 25^{\circ}\text{C}$
 NOTE: METER CHECKS AND CALIBRATIONS MUST BE PERFORMED A MINIMUM OF 4X/DAY.

[Signature] 10/14/97
 Signed Date

[Signature] 10/24/97
 QC'd By Date



pH AND CONDUCTIVITY METER CALIBRATION LOG

PROJECT NAME: SARTEL

DATE: 10/14

PROJECT NUMBER: 123-586/101.23

SAMPLER: E. Olson / R. Mcemote

pH METER eh

MODEL: Orion 2SD A

SERIAL NO.: 4038

Meter Check	Buffer Check	Slope Reading	Time
<u>OK</u>	<u>So1 A= 236.3 B=308.4</u>	<u>N.A</u>	<u>1415</u>
<u>OK</u>	<u>A=229.1 B=304.1</u>	<u>N.A</u>	<u>0810</u>
<u>✓</u>	<u>A=239.9 B=311.8</u>	<u>N.A.</u>	
<u>✓</u>	<u>A=235.2 B=305.3</u>	<u>N.A</u>	<u>1450</u>
<u>✓</u>	<u>A=234.9 B=307.8</u>	<u>N.A</u>	<u>1615</u>
<u>✓</u>	<u>A=238.8 B=309.5</u>	<u>N.A</u>	<u>5500</u>
<u>✓</u>	<u>A=236.5 B=305.7</u>	<u>N.A</u>	<u>1618</u>

10/14
10/15
10/16

Buffer Lot Numbers: pH 4: N.A pH 7: N.A

CONDUCTIVITY METER

MODEL: _____

SERIAL NO.: _____

Instrument Zero	Red Line	Reading of Calibration Soln	Temp. of Calibration Soln	Corrected* Cond. @ 25°C	Time

Conductivity Calibration Solution Lot Number: _____

Problems/Corrective Actions: _____

* FORMULA FOR TEMPERATURE NORMALIZING CONDUCTIVITY: $SC \div \{1 + [0.0191 \times (T - 25)]\} = \text{Cond @ } 25^\circ\text{C}$

NOTE: METER CHECKS AND CALIBRATIONS MUST BE PERFORMED A MINIMUM OF 4X/DAY.

Signed [Signature]

Date 10/14/97

QC'd By [Signature]

Date 10/24/97



WATER LEVEL DATA

PROJECT NAME: Dezurik

DATE: 10/15/97

PROJECT NUMBER: 101. 23

SAMPLER: Hafemeister/Olson
Twell

Well Location	Time	Reference Elev. (M.S.L.)	Depth to Water (feet)*	Depth to Bottom (feet)	Water Elev. (M.S.L.)
P-5R	^{10/16} 1015	1099.04	73.00+0.00	81.08+0.21	1026.04 ✓
P-9R	^{10/15} 1400	1102.09	76.28+0.00	85.84+0.21	1025.81 ✓
P-12R	^{10/16} 845	1101.33	75.42+0.00	86.50+0.21	1025.91 ✓
P-13	^{10/15} 1535	1105.12	77.85+0.00	86.63+0.21	1027.27 ✓

* All Water Levels Must Include Reference Point and Tape Correction factor, i.e., 1.1 + 0.00 T/PVC.

Hafemeister 10/20/97
Signed Date

Laurie Burn 10/24/97
QC'd By Date

Reference elevations last confirmed on:



WATER SAMPLE LOG

Sheet 7 of 19

744 Heartland Trail Madison, WI 53717-8923 P. O. Box 8923 (Zip: 53708-8923) (608) 831-4444 FAX: (608) 831-3334

PROJECT NAME <u>Dezurik</u>	PREPARED		CHECKED		PROJECT NO. <u>101.23</u>
	By: <u>RET/GO</u>	Date: <u>10/16/97</u>	By: <u>J. Dunn</u>	Date: <u>10/24/97</u>	

SAMPLE NO.: P-5R WELL DIAMETER: 2" 4" Other _____

WELL MATERIAL: PVC SS Iron Other _____

SAMPLE TYPE: GW WW SW DW Leachate Other _____

PURGING TIME: 1015 DEPTH TO WATER: 73.00 + 0.0 TI OC

WELL VOLUME: 5 1/2 gallons DEPTH TO BOTTOM: 81.08 + 0.21 TI OC

TOTAL VOLUME REMOVED: 27 1/2 gallons METHOD: Bailer, _____ Pump, 2" Kool

ODOR: None Other _____ COLOR: clear TURBIDITY: None Slight Moderate Very

DISPOSAL METHOD: Ground POTW Drum Other _____

SAMPLE TIME: 1050 DATE: 10/16/97

ODOR: None Other _____ COLOR: clear TURBIDITY: None Slight Moderate Very

pH: 7.36 CONDUCTIVITY: 70 x 10 umhos/cm TEMPERATURE: 11.6 °C

COMMENTS: _____ CORRECTED CONDUCTIVITY: $SC + \{1 + [0.0191 \times (T - 25)]\}$: 940

Eh = 151.5 mv

FILTRATE (0.45 µm) NOT APPLICABLE

ODOR: None Other _____ COLOR: clear COMMENTS: _____

BOTTLES FILLED			PRESERVATIVE CODES: A - None B - HNO3 C - H2SO4 D - NaOH E - HCL F - <u>CN Kit</u>						
Number	Size	Type	Preservative	Filtered	Number	Size	Type	Preservative	Filtered
<u>1</u>	<u>1L</u>	<u>PI.</u>	<u>B</u>	<u>Y (N)</u>	<u>1</u>	<u>250ml</u>	<u>Amber</u>	<u>C</u>	<u>(Y) N</u>
<u>1</u>	<u>1L</u>	<u>PI.</u>	<u>B</u>	<u>(Y) N</u>	<u>1</u>	<u>250ml</u>	<u>Amber</u>	<u>C</u>	<u>Y (N)</u>
<u>1</u>	<u>250ml</u>	<u>PI.</u>	<u>F</u>	<u>Y (N)</u>	<u>1</u>	<u>1L</u>	<u>GL.</u>	<u>C</u>	<u>Y (N)</u>
<u>1</u>	<u>500ml</u>	<u>PI.</u>	<u>A</u>	<u>(Y) N</u>					<u>Y N</u>

CHAIN-OF-CUSTODY NUMBER: 9279 DATE SHIPPED: 10/17/97 METHOD: Cont Vehicle

AIRBILL NUMBER: _____ SIGNED: [Signature] DATE: 10/16/97



STABILIZATION TEST

PROJECT NAME: Dezurik WELL NUMBER: P-5R
 PROJECT NUMBER: 101.23 WELL DIAMETER: 4"
 DATE: 10/16/97 SAMPLER: REH/ERO
 Type of pump or bailer used 2" Keck
 Pumping rate (gallons/minute) 1.1 gpm
 Water level before purging (nearest 0.01 ft. below reference point) 73.00 + 0.0 T/O
 Depth to bottom of well 81.08 + 0.21 T/O
 Calculated volume of water in casing 5 1/2
 Weather conditions Sunny, clear sky, 50°, no wind

Time	pH (units)	Conductivity		Temperature (°C)	Water Level (nearest 0.01 ft.)	Cumulative Volume of Water Removed From Well (measured in gallons)
		Uncorrected	Corrected			
1017	7.01	70 x 10	970	10.4	—	0 (initial readings)
1024	7.20	70 x 10	430 960	11.3	73.06	11
1031	7.20	70 x 10	440 950	11.5	73.20	16 1/2
1036	7.33	70 x 10	940	11.7	73.20	22
1042	7.36	70 x 10	940	11.6	73.20	27 1/2

NOTE: STABILIZATION TEST IS COMPLETE WHEN **3 SUCCESSIVE WELL VOLUMES** AGREE WITHIN THE FOLLOWING LIMITS: pH - ±0.1 pH UNIT; COND. - ±5% (TEMP CORRECTED); TEMP. - ±0.5°C.

Signed [Signature] Date 10/16/97 QC'd By Jawrie Dunn Date 10/24/97



WATER SAMPLE LOG

Sheet 9 of 19

744 Heartland Trail Madison, WI 53717-8923 P. O. Box 8923 (Zip: 53708-8923) (608) 831-4444

FAX: (608) 831-3334

PROJECT NAME <u>Dezurik</u>	PREPARED	CHECKED	PROJECT NO. <u>101.23</u>
	By: <u>RETT</u> <u>ERO</u>	Date: <u>10/15/97</u>	

SAMPLE NO.: P-9R WELL DIAMETER: 2" 4" Other _____

WELL MATERIAL: PVC SS Iron Other _____

SAMPLE TYPE: GW WW SW DW Leachate Other _____

PURGING	TIME: <u>1405</u>	DEPTH TO WATER: <u>76.28 + 0.0</u> TI OC
	WELL VOLUME: <u>6.4</u> gallons	DEPTH TO BOTTOM: <u>85.84 + 0.21</u> TI OC
	TOTAL VOLUME REMOVED: <u>33</u> gallons	METHOD: <input type="checkbox"/> Bailor, _____ <input checked="" type="checkbox"/> Pump, <u>Keck</u>
	ODOR: <input checked="" type="checkbox"/> None <input type="checkbox"/> Other _____	COLOR: <u>clear</u> TURBIDITY: <input checked="" type="checkbox"/> None <input type="checkbox"/> Slight <input type="checkbox"/> Moderate <input type="checkbox"/> Very
DISPOSAL METHOD: <input checked="" type="checkbox"/> Ground <input type="checkbox"/> POTW <input type="checkbox"/> Drum <input type="checkbox"/> Other _____		

SAMPLE	TIME: <u>1450</u>	DATE: <u>10/15/97</u>	
	ODOR: <input checked="" type="checkbox"/> None <input type="checkbox"/> Other _____	COLOR: <u>clear</u>	TURBIDITY: <input checked="" type="checkbox"/> None <input type="checkbox"/> Slight <input type="checkbox"/> Moderate <input type="checkbox"/> Very
	pH: <u>7.4</u>	CONDUCTIVITY: <u>60 x 10</u> umhos/cm	TEMPERATURE: <u>11.6</u> °C
	COMMENTS: _____	CORRECTED CONDUCTIVITY: $SC + \{1 + [0.0191 \times (T - 25)]\}$: <u>810</u>	

Eh = -40.5 mV

FILTRATE (0.45 µm)	<input type="checkbox"/> NOT APPLICABLE
	ODOR: <input checked="" type="checkbox"/> None <input type="checkbox"/> Other _____

BOTTLES FILLED			PRESERVATIVE CODES: A - None B - HNO3 C - H2SO4 D - NaOH E - HCL F - _____						
Number	Size	Type	Preservative	Filtered	Number	Size	Type	Preservative	Filtered
1	1L	Pl.	B	Y (N)	1	250ml	Amber	C	(Y) N
1	1L	Pl.	B	(Y) N	1	250ml	Amber	C	Y (N)
1	250ml	Pl.	F	Y (N)	1	1L	Gl.	C	Y (N)
1	500ml	Pl.	A	(Y) N					Y N

CHAIN-OF-CUSTODY NUMBER: 9279 DATE SHIPPED: 10/17/97 METHOD: RMT Vehicle

AIRBILL NUMBER: _____ SIGNED: Bob Hoffmeister DATE: 10/20/97



STABILIZATION TEST

PROJECT NAME: Dezurik WELL NUMBER: P-9R
 PROJECT NUMBER: 101.23 WELL DIAMETER: 4"
 DATE: 10/15/97 SAMPLER: REH/gw
 Type of pump or bailer used 2" Keck
 Pumping rate (gallons/minute) 0.9
 Water level before purging (nearest 0.01 ft. below reference point) 76.28 + 00 TI TOL
 Depth to bottom of well 85.84 + 0.21 TI TOL
 Calculated volume of water in casing 6.4
 Weather conditions Sunny 55°F

Time	pH (units)	Conductivity		Temperature (°C)	Water Level (nearest 0.01 ft.)	Cumulative Volume of Water Removed From Well (measured in gallons)
		Uncorrected	Corrected			
1405	7.6	50 x 10	650	13.1	—	0 (initial readings)
1418	7.4	60 x 10	800	12.0	70.95	13
1428	7.4	60 x 10	810	11.6	70.95	19 1/2
1435	7.3	60 x 10	810	11.5	70.95	26
1442	7.4	60 x 10	810	11.6	70.95	33

NOTE: STABILIZATION TEST IS COMPLETE WHEN **3 SUCCESSIVE WELL VOLUMES** AGREE WITHIN THE FOLLOWING LIMITS: pH - ±0.1 pH UNIT; COND. - ±5% (TEMP CORRECTED); TEMP. - ±0.5°C.

Signed [Signature] Date 10/15/97 QC'd By Laurie Dunn Date 10/24/97



WATER SAMPLE LOG

Sheet 11 of 19

744 Heartland Trail Madison, WI 53717-8923 P. O. Box 8923 (Zip: 53708-8923) (608) 831-4444

FAX: (608) 831-3334

PROJECT NAME <u>Dezurik</u>	PREPARED By: <u>REH/SM</u> Date: <u>10/16/97</u>	CHECKED By: <u>J. Dunn</u> Date: <u>10/24/97</u>	PROJECT NO. <u>101.23</u>
--------------------------------	---	---	------------------------------

SAMPLE NO.: F-12R WELL DIAMETER: 2" 4" Other _____
 WELL MATERIAL: PVC SS Iron Other _____
 SAMPLE TYPE: GW WW SW DW Leachate Other _____

PURGING TIME: 0847 DEPTH TO WATER: 75.42 + 0.00 TI OC
 WELL VOLUME: 7 1/2 gallons DEPTH TO BOTTOM: 86.50 + 0.21 TI OC
 TOTAL VOLUME REMOVED: 30 gallons METHOD: Bailer, Pump, Keic 2"
 ODOR: None COLOR: clean TURBIDITY: None Slight Very Moderate Very
 DISPOSAL METHOD: Ground POTW Drum Other _____

SAMPLE TIME: 0925 DATE: 10/16/97
 ODOR: None COLOR: clean TURBIDITY: None Slight Very Moderate Very
 pH: 7.44 CONDUCTIVITY: 55 x 10 umhos/cm TEMPERATURE: 10.2 °C
 COMMENTS: _____ CORRECTED CONDUCTIVITY: $SC + \{1 + [0.0191 \times (T - 25)]\}$: 770

Ek = 10.8 m

FILTRATE (0.45 μm) NOT APPLICABLE
 ODOR: None COLOR: clean COMMENTS: _____
 Other _____

BOTTLES FILLED			PRESERVATIVE CODES: A - None B - HNO3 C - H2SO4 D - NaOH E - HCL F - <u>NaOH pH > 12</u>						
Number	Size	Type	Preservative	Filtered	Number	Size	Type	Preservative	Filtered
1	1L	Pl.	B	Y (N)	1	250ml	Amber	C	(Y) N
1	1L	Pl.	B	(Y) N	1	250ml	Amber	C	Y (N)
1	250ml	Pl.	F	Y (N)	1	1L	Gl.	C	Y (N)
1	500ml	Pl.	A	(Y) N					Y N

CHAIN-OF-CUSTODY NUMBER: 9279 DATE SHIPPED: 10/17/97 METHOD: RMT Vehicle
 AIRBILL NUMBER: _____ SIGNED: [Signature] DATE: 10/16/97



STABILIZATION TEST

PROJECT NAME: Dezurik WELL NUMBER: P-12R
 PROJECT NUMBER: 101.23 WELL DIAMETER: 4"
 DATE: 10/16/97 SAMPLER: REIT/epw
 Type of pump or bailer used 2" Keck
 Pumping rate (gallons/minute) 1 gpm
 Water level before purging (nearest 0.01 ft. below reference point) 75.42 + 0.0 T10c
 Depth to bottom of well 86.50 + 0.21 T10c
 Calculated volume of water in casing 7.4 ⇒ 7 1/2
 Weather conditions Clear, sunny, 40°F

Time	pH (units)	Conductivity		Temperature (°C)	Water Level (nearest 0.01 ft.)	Cumulative Volume of Water Removed From Well (measured in gallons)
		Uncorrected	Corrected			
0851	7.67	420 x 1	620	8.0	—	0 (initial readings)
0904	7.47	55 x 10	780	9.7	75.40	15
0915	7.45	55 x 10	770	10.1	75.40	2 1/2
0920	7.44	55 x 10	770	10.2	75.40	30

NOTE: STABILIZATION TEST IS COMPLETE WHEN **3 SUCCESSIVE WELL VOLUMES** AGREE WITHIN THE FOLLOWING LIMITS: pH - ±0.1 pH UNIT; COND. - ±5% (TEMP CORRECTED); TEMP. - ±0.5°C.

Signed [Signature] Date 10/16/97 QC'd By [Signature] Date 10/24/97



WATER SAMPLE LOG

Sheet 13 of 19

744 Heartland Trail

Madison, WI 53717-8923

P. O. Box 8923 (Zip: 53708-8923)

(608) 831-4444

FAX: (608) 831-3334

PROJECT NAME <u>Dezwik</u>	PREPARED By <u>REH/ero</u> Date: <u>10/15/97</u>	CHECKED By <u>J. Dunn</u> Date: <u>10/21/97</u>	PROJECT NO. <u>101.23</u>
-------------------------------	---	--	------------------------------

SAMPLE NO.: A-13 WELL DIAMETER: 2" 4" Other _____

WELL MATERIAL: PVC SS Iron Other _____

SAMPLE TYPE: GW WW SW DW Leachate Other _____

PURGING TIME: 1540 DEPTH TO WATER: 77.85 + 0.0 TI oc

WELL VOLUME: 6 gallons DEPTH TO BOTTOM: 86.63 + 0.21 TI oc

TOTAL VOLUME REMOVED: 24 gallons METHOD: Bailer, _____ Pump, Keck

ODOR: None Other _____ COLOR: clear TURBIDITY: None Moderate Slight Very

DISPOSAL METHOD: Ground POTW Drum Other _____

SAMPLE TIME: 1600 1615 DATE: 10/15/97

ODOR: None Other _____ COLOR: clear TURBIDITY: None Moderate Slight Very

pH: 7.38 CONDUCTIVITY: 440 x 1 umhos/cm TEMPERATURE: 11.9 °C

COMMENTS: _____ CORRECTED CONDUCTIVITY: $SC + \{1 + [0.0191 \times (T - 25)]\}$: 590

Fh = 214.6

FILTRATE (0.45 μm) NOT APPLICABLE

ODOR: None Other _____ COLOR: clear COMMENTS: _____

BOTTLES FILLED					PRESERVATIVE CODES: A - None B - HNO3 C - H2SO4 D - NaOH E - HCL F - _____				
Number	Size	Type	Preservative	Filtered	Number	Size	Type	Preservative	Filtered
1	1L	Pl.	B	Y (N)	1	250ml	Amber	C	Y (N)
1	1L	Pl.	B	Y (N)	1	250ml	Amber	C	Y (N)
1	250ml	Pl.	F	Y (N)	1	1L	Gl.	C	Y (N)
1	500ml	Pl.	A	Y (N)					Y (N)

CHAIN-OF-CUSTODY NUMBER: 9279 DATE SHIPPED: 10/17/97 METHOD: amb vehicle

AIRBILL NUMBER: _____ SIGNED: [Signature] DATE: 10/15/97



STABILIZATION TEST

PROJECT NAME: Dezurik WELL NUMBER: P-13
 PROJECT NUMBER: 101.23 WELL DIAMETER: 4"
 DATE: 10/15/97 SAMPLER: REH/ERO
 Type of pump or bailer used Keck, 2"
 Pumping rate (gallons/minute) 1 1/4 gpm
 Water level before purging (nearest 0.01 ft. below reference point) 77.85 + 0.0 T/O
 Depth to bottom of well 86.63 + 0.21 T/O
 Calculated volume of water in casing 6
 Weather conditions Sunny 50°

Time	pH (units)	Conductivity		Temperature (°C)	Water Level (nearest 0.01 ft.)	Cumulative Volume of Water Removed From Well (measured in gallons)
		Uncorrected	Corrected			
1541	7.21	410 x 1	530	13.4	—	0 (initial readings)
1551	7.35	430 x 1	570	12.2	79.20	12
1556	7.37	440 x 1	580	12.0	79.20	18
1600	7.38	440 x 1	580	11.9	79.20	24

NOTE: STABILIZATION TEST IS COMPLETE WHEN **3 SUCCESSIVE WELL VOLUMES** AGREE WITHIN THE FOLLOWING LIMITS: pH - ±0.1 pH UNIT; COND. - ±5% (TEMP CORRECTED); TEMP. - ±0.5°C.

Bob Hoffmeister Signed 10/21/97 Date J. Dunn QC'd By 10/24/97 Date



WATER SAMPLE LOG

Sheet 15 of 19

744 Heartland Trail Madison, WI 53717-8923 P. O. Box 8923 (Zip: 53708-8923) (608) 831-4444

FAX: (608) 831-3334

PROJECT NAME <u>Dezurik</u>	PREPARED	CHECKED	PROJECT NO. <u>101.23</u>
	By: <u>REH/ERO</u> Date: <u>10/16/97</u>	By: <u>J. Dunn</u> Date: <u>10/24/97</u>	

SAMPLE NO.: P-13A WELL DIAMETER: 2" 4" Other _____

WELL MATERIAL: PVC SS Iron Other _____

SAMPLE TYPE: GW WW SW DW Leachate Other _____

PURGING TIME: NA DEPTH TO WATER: _____ + _____ TI

WELL VOLUME: 1.1A gallons DEPTH TO BOTTOM: _____ + _____ TI

TOTAL VOLUME REMOVED: _____ gallons METHOD: Bailer, _____ Pump, _____

ODOR: None Other _____ COLOR: _____ TURBIDITY: None Moderate Slight Very

DISPOSAL METHOD: Ground POTW Drum Other _____

SAMPLE TIME: 0825 DATE: 10/16/97

ODOR: None Other _____ COLOR: clear TURBIDITY: None Moderate Slight Very

pH: 7.23 CONDUCTIVITY: 405 x 1 umhos/cm TEMPERATURE: 10.2 °C

COMMENTS: _____ CORRECTED CONDUCTIVITY: $SC + \{1 + [0.0191 \times (T - 25)]\}$: 560

Eh = 266.7

FILTRATE (0.45 µm) NOT APPLICABLE

ODOR: None Other _____ COLOR: clear COMMENTS: _____

BOTTLES FILLED			PRESERVATIVE CODES: A - None B - HNO3 C - H2SO4 D - NaOH E - HCL F - _____						
Number	Size	Type	Preservative	Filtered	Number	Size	Type	Preservative	Filtered
<u>1</u>	<u>500ml</u>	<u>PI-</u>	<u>B</u>	<u>(Y) N</u>					<u>Y N</u>
				<u>Y N</u>					<u>Y N</u>
				<u>Y N</u>					<u>Y N</u>
				<u>Y N</u>					<u>Y N</u>

CHAIN-OF-CUSTODY NUMBER: 9279 DATE SHIPPED: 10/17/97 METHOD: RMT Vehicle

AIRBILL NUMBER: _____ SIGNED: [Signature] DATE: 10/16/97



WATER SAMPLE LOG

Sheet 16 of 19

744 Heartland Trail Madison, WI 53717-8923 P. O. Box 8923 (Zip: 53708-8923) (608) 831-4444 FAX: (608) 831-3334

PROJECT NAME <u>Dezunik</u>	PREPARED	CHECKED		PROJECT NO. <u>101.23</u>
	By: <u>RFT/ERO</u> Date: <u>10/16/97</u>	By: <u>J. Almon</u>	Date: <u>10/24/97</u>	

SAMPLE NO.: P-13C WELL DIAMETER: 2" 4" Other _____

WELL MATERIAL: PVC SS Iron Other _____

SAMPLE TYPE: GW WW SW DW Leachate Other _____

PURGING	TIME: <u>N.A.</u>	DEPTH TO WATER: _____ + _____ T/
	WELL VOLUME: _____ gallons	DEPTH TO BOTTOM: _____ + _____ T/
	TOTAL VOLUME REMOVED: _____ gallons	METHOD: <input type="checkbox"/> Bailer, _____ <input type="checkbox"/> Pump, _____
	ODOR: <input type="checkbox"/> None <input type="checkbox"/> Other _____	COLOR: _____
	TURBIDITY: <input type="checkbox"/> None <input type="checkbox"/> Slight <input type="checkbox"/> Moderate <input type="checkbox"/> Very	
DISPOSAL METHOD: <input checked="" type="checkbox"/> Ground <input type="checkbox"/> POTW <input type="checkbox"/> Drum <input type="checkbox"/> Other _____		

SAMPLE	TIME: <u>1635</u>	DATE: <u>10/16/97</u>	
	ODOR: <input checked="" type="checkbox"/> None <input type="checkbox"/> Other _____	COLOR: <u>clay</u>	TURBIDITY: <input checked="" type="checkbox"/> None <input type="checkbox"/> Slight <input type="checkbox"/> Moderate <input type="checkbox"/> Very <u>12.7</u>
	pH: <u>7.53</u>	CONDUCTIVITY: <u>460 x 1</u> umhos/cm	TEMPERATURE: <u>13.2</u> °C
	COMMENTS: _____	CORRECTED CONDUCTIVITY: SC + {[1 + (0.0191 x (T - 25))]}: <u>600</u>	

EA = 230.8

FILTRATE (0.45 μm)	<input type="checkbox"/> NOT APPLICABLE
	ODOR: <input checked="" type="checkbox"/> None <input type="checkbox"/> Other _____
COLOR: <u>clay</u>	COMMENTS: _____

BOTTLES FILLED			PRESERVATIVE CODES: A - None B - HNO3 C - H2SO4 D - NaOH E - HCL F - _____						
Number	Size	Type	Preservative	Filtered	Number	Size	Type	Preservative	Filtered
<u>1</u>	<u>500ml</u>	<u>PI.</u>	<u>B</u>	<u>(Y) N</u>					<u>Y N</u>
				<u>Y N</u>					<u>Y N</u>
				<u>Y N</u>					<u>Y N</u>
				<u>Y N</u>					<u>Y N</u>

CHAIN-OF-CUSTODY NUMBER: 9279 DATE SHIPPED: 10/17/97 METHOD: RMT / phule

AIRBILL NUMBER: _____ SIGNED: [Signature] DATE: 10/14/97



WATER SAMPLE LOG

Sheet 17 of 19

744 Heartland Trail Madison, WI 53717-8923 P. O. Box 8923 (Zip: 53708-8923) (608) 831-4444 FAX: (608) 831-3334

PROJECT NAME <u>Dezurik</u>	PREPARED	CHECKED	PROJECT NO.
	By: <u>REH/ERO</u> Date: <u>10/16/97</u>	By: <u>J. Dunn</u> Date: <u>10/24/97</u>	<u>101.23</u>

SAMPLE NO.: P-13B WELL DIAMETER: 2" 4" Other _____

WELL MATERIAL: PVC SS Iron Other _____

SAMPLE TYPE: GW WW SW DW Leachate Other _____

PURGING TIME: N/A DEPTH TO WATER: EW 10/16/97
73.00 + 0.0 T1 OC

WELL VOLUME: _____ gallons DEPTH TO BOTTOM: + 0.2 T1 OC

TOTAL VOLUME REMOVED: _____ gallons METHOD: Bailer, PVC Pump, 2" Keck

ODOR: None Other _____ COLOR: _____ TURBIDITY: None Moderate Slight Very EW 10/16/97

DISPOSAL METHOD: Ground POTW Drum Other _____

SAMPLE TIME: 1230 DATE: 10/15/97

ODOR: None Other _____ COLOR: clear TURBIDITY: None Moderate Slight Very

pH: 7.16 CONDUCTIVITY: 440 X1 $\mu\text{mhos/cm}$ TEMPERATURE: 12.4 °C

COMMENTS: _____ CORRECTED CONDUCTIVITY: $SC + \{1 + [0.0191 \times (T - 25)]\}$: 580

Eh = 191.2 mV

FILTRATE (0.45 μm) NOT APPLICABLE

ODOR: None Other _____ COLOR: clear COMMENTS: _____

BOTTLES FILLED			PRESERVATIVE CODES: A - None B - HNO3 C - H2SO4 D - NaOH E - HCL F - _____						
Number	Size	Type	Preservative	Filtered	Number	Size	Type	Preservative	Filtered
<u>1</u>	<u>500ml</u>	<u>PI.</u>	<u>B</u>	<u>(Y) N</u>					<u>Y N</u>
				<u>Y N</u>					<u>Y N</u>
				<u>Y N</u>					<u>Y N</u>
				<u>Y N</u>					<u>Y N</u>

CHAIN-OF-CUSTODY NUMBER: 9279 DATE SHIPPED: 10/17/97 METHOD: RMT Vehicle

AIRBILL NUMBER: _____ SIGNED: [Signature] DATE: 10/14/97



WATER SAMPLE LOG

Sheet 18 of 19

744 Heartland Trail Madison, WI 53717-8923 P. O. Box 8923 (Zip: 53708-8923) (608) 831-4444 FAX: (608) 831-3334

PROJECT NAME <u>DEZORIC</u>	PREPARED		CHECKED		PROJECT NO. <u>101.23</u>
	By: <u>BEH/epo</u>	Date: <u>10/15/97</u>	By:	Date:	

SAMPLE NO.: Field Blank WELL DIAMETER: 2" 4" Other N.A.
 WELL MATERIAL: PVC SS Iron Other N.A.
 SAMPLE TYPE: GW WW SW DW Leachate Other

PURGING	TIME: <u>N.A.</u>	DEPTH TO WATER: _____ + _____ T/
	WELL VOLUME: _____ gallons	DEPTH TO BOTTOM: _____ + _____ T/
	TOTAL VOLUME REMOVED: _____ gallons	METHOD: <input type="checkbox"/> Bailer, _____ <input type="checkbox"/> Pump, _____
	ODOR: <input type="checkbox"/> None <input type="checkbox"/> Other _____	COLOR: _____
		TURBIDITY: <input type="checkbox"/> None <input type="checkbox"/> Slight <input type="checkbox"/> Moderate <input type="checkbox"/> Very
DISPOSAL METHOD: <input type="checkbox"/> Ground <input type="checkbox"/> POTW <input type="checkbox"/> Drum <input type="checkbox"/> Other _____		

SAMPLE	TIME: <u>1525</u>	DATE: <u>10/15/97</u>	
	ODOR: <input checked="" type="checkbox"/> None <input type="checkbox"/> Other _____	COLOR: <u>clear</u>	TURBIDITY: <input checked="" type="checkbox"/> None <input type="checkbox"/> Slight <input type="checkbox"/> Moderate <input type="checkbox"/> Very
	pH: <u>6.88</u>	CONDUCTIVITY: <u>5 x 1</u> $\mu\text{mhos/cm}$	TEMPERATURE: <u>18.6</u> °C
	COMMENTS: _____		
	CORRECTED CONDUCTIVITY: $SC + \{1 + [0.0191 \times (T - 25)]\}$: <u>< 10</u>		

EL = 159.3 mV

FILTRATE (0.45 μm)	<input type="checkbox"/> NOT APPLICABLE
ODOR: <input checked="" type="checkbox"/> None <input type="checkbox"/> Other _____	COLOR: <u>clear</u> COMMENTS: _____

BOTTLES FILLED					PRESERVATIVE CODES: A - None B - HNO3 C - H2SO4 D - NaOH E - HCL F - _____				
Number	Size	Type	Preservative	Filtered	Number	Size	Type	Preservative	Filtered
1	1L	pl	B	Y <input checked="" type="checkbox"/>	1	250ml	A-G1	C	<input checked="" type="checkbox"/> N
1	1L	pl	B	<input checked="" type="checkbox"/> N	1	250ml	A-G1	C	Y <input checked="" type="checkbox"/>
1	250ml	pl	F	Y <input checked="" type="checkbox"/>	1	1L	A-G1	C	Y <input checked="" type="checkbox"/>
1	500ml	pl	A	<input checked="" type="checkbox"/> N					Y N

CHAIN-OF-CUSTODY NUMBER: 9279 DATE SHIPPED: 10/17/97 METHOD: RMT Vehicle
 AIRBILL NUMBER: _____ SIGNED: [Signature] DATE: 10/21/97

190519

Company Name: EMT
 Branch or Location: MADISON
 Project Contact: Rob MacIntyre
 Telephone: _____
 Project Number: 10122
 Project Name: VEZURIK
 Project Location: ARIZONA, IIR
 Sampled By (Print): Rob MacIntyre / E. Olson
 Regulatory Program (circle): UST RCRA CLP SDWA
 NPDES/WPDES CAA NR _____
 Other: _____
 NR720 Confirmation Analysis (required? (circle): Y N
 (En Chem will not confirm unless otherwise instructed.)



E-CHEM
INC.

1241 Bellevue St., Suite 9
 Green Bay, WI 54302
 920-469-2436 • 1-800-736-2436
 FAX 920-469-8927

802 Deming Way
 Madison, WI 53717
 608-827-5501 • 1-888-536-2436
 Fax: 608-827-5503

1423 N. 8th Street., Suite 122
 Superior, WI 54880
 715-392-5844 • 1-800-837-8238
 FAX 715-392-5943

CHAIN OF CUSTODY

9279

ANALYSES REQUESTED

Total Metals
Disolved Metals
Filtered Metals
CN
CLF TDS 101
COD, NO2+NO3
TOC
Phenol total

FILTERED? (YES/NO) NO

PRESERVATION (CODE) NO

Mail Invoice To: ERIS Milk fresh
 Address: _____
 Company: _____
 Invoice To: ERIS Milk fresh
 Address: _____
 Company: _____

FIELD ID	SAMPLE DESCRIPTION	COLLECTION		FIELD SCREEN	MATRIX	GOOD COND.	TOTAL BOTTLES	COMMENTS	LABORATORY NUMBER
		DATE	TIME						
	P-9R	10/16/97	1450		GW				
	Field Blank	10/16/97	1525		GW				
	P-13	10/16/97	1615		GW				
	P-13A	10/16/97	0825		GW				
	P-12R	10/16/97	0925		GW				
	P-5R	10/16/97	1050		GW				
	P-13B	10/16/97	1230		GW				
	P-13C	10/16/97	1635		GW				

Relinquished By: _____ **Date/Time:** 10/16/97 1355
Received By: _____ **Date/Time:** 11/11/97 1353
Relinquished By: _____ **Date/Time:** _____
Received By: _____ **Date/Time:** _____
Relinquished By: _____ **Date/Time:** _____
Received By: _____ **Date/Time:** _____
Relinquished By: _____ **Date/Time:** _____
Received By: _____ **Date/Time:** _____

En Chem Project No. _____
 Sample Receipt Temp. _____
 Sample Receipt pH (wet/dry) ND

Preservation Code
 A=None B=HCL C=H2SO4
 D=HI03 E=EnCore F=Methanol**
 G=NaOH O=Other (Indicate)

**If not using En Chem's methanol, indicate volume of methanol added and mark the appropriate samples.

SHADED AREA FOR LABORATORY USE ONLY

INSPECTION CHECKLIST - LAGOON NO. 3

This checklist is to be used during the spring and autumn inspections of Lagoon No. 3. The general conditioning of the listed items should be noted in the space provided. Any items requiring replacement, repair, etc., should be explained in the comments section and immediately brought to the attention of the City Administrative Officer.

Perimeter Fencing OK, SE gate needs new lock

Condition of final Cover

- ♦ Cracking None noticed
- ♦ Settlement none noticed / MPCA says some noticed @ SW corner, I couldn't tell
- ♦ Erosion Tire Ruts near R-12R (Lagoon cover)
- ♦ Vegetation Scattered spots on soccer field need thickening of grass

Groundwater Monitoring Wells

- ♦ Protective Casings Good
- ♦ Locks Good
- ♦ Grout Seals Good

Comments:

C. Bigelow / MPCA walked site with me during inspection.

Inspected by: Hafemeister

Date: 10/16/97

REH 11/19/97

Time: ~ 10 am

Corrective Action: _____

Appendix C

Laboratory Analytical Reports, October 1997 Sampling Event



- Analytical Report -

Project Name : DEZURIK

Submitter : RMT - MADISON

Project Number : 101.22

Report Date : 11/4/97

Field ID : P-5R

Collection Date : 10/16/97

Lab Sample Number : 974013-006

Matrix Type : GROUNDWATER

Lab Project Number : 974013

WI DNR LAB ID : 113138520

Inorganic Results

Test	Result	EQL	Units	Code	Analysis Date	Prep Method	Analysis Method
Arsenic	< 3.0	3.0	ug/L		10/30/97	SW846 7060A	SW846 7060A
Arsenic - Dissolved	< 3.0	3.0	ug/L		10/30/97	SW846 7060A	SW846 7060A
Barium	46	5.0	ug/L		10/28/97	SW846 3010A	SW846 6010A
Barium - Dissolved	44	5.0	ug/L		10/31/97	SW846 3005A	SW846 6010A
Boron	680	100	ug/L		10/28/97	SW846 3010A	SW846 6010A
Boron - Dissolved	710	100	ug/L	DA	10/31/97	SW846 3005A	SW846 6010A
Cadmium	< 0.30	0.30	ug/L		10/28/97	SW846 3020A	SW846 7131A
Cadmium - Dissolved	< 0.30	0.30	ug/L		10/27/97	SW846 3020A	SW846 7131A
Calcium	140000	100	ug/L		10/28/97	SW846 3010A	SW846 6010A
Calcium - Dissolved	130000	100	ug/L		10/31/97	SW846 3005A	SW846 6010A
Chromium	6.8	3.0	ug/L		10/28/97	SW846 3020A	SW846 7191
Chromium - Dissolved	4.5	2.0	ug/L		10/28/97	SW846 3020A	SW846 7191
Iron	240	30	ug/L		10/28/97	SW846 3010A	SW846 6010A
Iron - Dissolved	< 30	30	ug/L	R	11/4/97	SW846 3005A	SW846 6010A
Lead	< 3.0	3.0	ug/L		10/28/97	SW846 3020A	SW846 7421
Lead - Dissolved	< 3.0	3.0	ug/L		10/28/97	SW846 3020A	SW846 7421
Magnesium	37000	30	ug/L		10/28/97	SW846 3010A	SW846 6010A
Magnesium - Dissolved	37000	30	ug/L		10/31/97	SW846 3005A	SW846 6010A
Manganese	6.7	2.0	ug/L		10/28/97	SW846 3010A	SW846 6010A
Manganese - Dissolved	< 2.0	2.0	ug/L		10/31/97	SW846 3005A	SW846 6010A
Selenium	< 3.0	3.0	ug/L		10/31/97	SW846 7740	SW846 7740
Selenium - Dissolved	< 3.0	3.0	ug/L		10/31/97	SW846 7740	SW846 7740
Sodium	20000	300	ug/L		10/28/97	SW846 3010A	SW846 6010A
Sodium - Dissolved	20000	300	ug/L		10/31/97	SW846 3005A	SW846 6010A
Zinc	< 10	10	ug/L	R	10/28/97	SW846 3010A	SW846 6010A
Zinc - Dissolved	< 10	10	ug/L	R	10/31/97	SW846 3005A	SW846 6010A
Chloride	18	2.0	mg/L		10/23/97	EPA 325.1	EPA 325.1
COD	< 5.0	5.0	mg/L	R	10/27/97	EPA 410.4	EPA 410.4
Cyanide, total	< 0.010	0.010	mg/L		10/24/97	EPA 335.4	EPA 335.4
Fluoride	< 0.10	0.10	mg/L		10/27/97	SM 4500F-C	SM 4500F-C
Nitrogen, NO3 + NO2	4.8	0.25	mg/L		10/21/97	EPA 353.2	EPA 353.2
Phenolics, total recoverable	< 0.0085	0.0085	mg/L	R	10/30/97	EPA 420.2	EPA 420.2
Solids, total dissolved	670	20	mg/L		10/20/97	EPA 160.1	EPA 160.1

Madison Office & Laboratory
802 Deming Way
Madison, WI 53717
608-827-5501 • Fax: 608-827-5503
1-888-5-ENCHEM



Corporate Office & Laboratory
1795 Industrial Drive
Green Bay, WI 54302
414-469-2436 • Fax: 414-469-8827
1-800-7-ENCHEM

- Analytical Report -

Project Name : DEZURIK
Project Number : 101.22
Field ID : P-5R
Lab Sample Number : 974013-006
Lab Project Number : 974013

Submitter : RMT - MADISON
Report Date : 11/4/97
Collection Date : 10/16/97
Matrix Type : GROUNDWATER
WI DNR LAB ID : 113138520

Sulfate	150	10	mg/L	11/4/97	EPA 375.2	EPA 375.2
TOC as NPOC	1.1	1.0	mg/L	10/21/97	EPA 415.1	EPA 415.1

Madison Office & Laboratory
 802 Deming Way
 Madison, WI 53717
 608-827-5501 • Fax: 608-827-5503
 1-888-5-ENCHEM



Corporate Office & Laboratory
 1795 Industrial Drive
 Green Bay, WI 54302
 414-469-2436 • Fax: 414-469-8827
 1-800-7-ENCHEM

- Analytical Report -

Project Name : DEZURIK
Project Number : 101.22
Field ID : P-9R
Lab Sample Number : 974013-001
Lab Project Number : 974013

Submitter : RMT - MADISON
Report Date : 11/4/97
Collection Date : 10/15/97
Matrix Type : GROUNDWATER
WI DNR LAB ID : 113138520

Inorganic Results

Test	Result	EQL	Units	Code	Analysis Date	Prep Method	Analysis Method
Arsenic	< 3.0	3.0	ug/L		10/30/97	SW846 7060A	SW846 7060A
Arsenic - Dissolved	< 3.0	3.0	ug/L		10/30/97	SW846 7060A	SW846 7060A
Barium	62	5.0	ug/L		10/28/97	SW846 3010A	SW846 6010A
Barium - Dissolved	61	5.0	ug/L		10/31/97	SW846 3005A	SW846 6010A
Boron	< 100	100	ug/L		10/28/97	SW846 3010A	SW846 6010A
Boron - Dissolved	< 100	100	ug/L		10/31/97	SW846 3005A	SW846 6010A
Cadmium	1.4	0.30	ug/L		10/28/97	SW846 3020A	SW846 7131A
Cadmium - Dissolved	1.4	0.30	ug/L		10/27/97	SW846 3020A	SW846 7131A
Calcium	140000	100	ug/L		10/28/97	SW846 3010A	SW846 6010A
Calcium - Dissolved	130000	100	ug/L		10/31/97	SW846 3005A	SW846 6010A
Chromium	5.2	2.0	ug/L		10/28/97	SW846 3020A	SW846 7191
Chromium - Dissolved	2.1	2.0	ug/L		10/28/97	SW846 3020A	SW846 7191
Iron	560	30	ug/L		10/28/97	SW846 3010A	SW846 6010A
Iron - Dissolved	350	30	ug/L		11/4/97	SW846 3005A	SW846 6010A
Lead	< 3.0	3.0	ug/L		10/28/97	SW846 3020A	SW846 7421
Lead - Dissolved	< 3.0	3.0	ug/L		10/28/97	SW846 3020A	SW846 7421
Magnesium	36000	30	ug/L		10/28/97	SW846 3010A	SW846 6010A
Magnesium - Dissolved	36000	30	ug/L		10/31/97	SW846 3005A	SW846 6010A
Manganese	96	2.0	ug/L		10/28/97	SW846 3010A	SW846 6010A
Manganese - Dissolved	93	2.0	ug/L		10/31/97	SW846 3005A	SW846 6010A
Selenium	< 3.0	3.0	ug/L		10/31/97	SW846 7740	SW846 7740
Selenium - Dissolved	< 3.0	3.0	ug/L		10/31/97	SW846 7740	SW846 7740
Sodium	8300	300	ug/L		10/28/97	SW846 3010A	SW846 6010A
Sodium - Dissolved	8400	300	ug/L	DA	10/31/97	SW846 3005A	SW846 6010A
Zinc	< 10	10	ug/L	R	10/28/97	SW846 3010A	SW846 6010A
Zinc - Dissolved	< 10	10	ug/L	R	10/31/97	SW846 3005A	SW846 6010A
Chloride	18	2.0	mg/L		10/23/97	EPA 325.1	EPA 325.1
COD	< 5.0	5.0	mg/L	R	10/27/97	EPA 410.4	EPA 410.4
Cyanide, total	< 0.010	0.010	mg/L		10/24/97	EPA 335.4	EPA 335.4
Fluoride	< 0.10	0.10	mg/L		10/27/97	SM 4500F-C	SM 4500F-C
Nitrogen, NO3 + NO2	4.8	0.10	mg/L		10/31/97	EPA 353.2	EPA 353.2
Phenolics, total recoverable	< 0.0085	0.0085	mg/L	R	10/30/97	EPA 420.2	EPA 420.2
Solids, total dissolved	590	20	mg/L		10/20/97	EPA 160.1	EPA 160.1

Madison Office & Laboratory
802 Deming Way
Madison, WI 53717
608-827-5501 • Fax: 608-827-5503
1-888-5-ENCHEM



Corporate Office & Laboratory
1795 Industrial Drive
Green Bay, WI 54302
414-469-2436 • Fax: 414-469-8827
1-800-7-ENCHEM

- Analytical Report -

Project Name : DEZURIK
Project Number : 101.22
Field ID : P-9R
Lab Sample Number : 974013-001
Lab Project Number : 974013

Submitter : RMT - MADISON
Report Date : 11/4/97
Collection Date : 10/15/97
Matrix Type : GROUNDWATER
WI DNR LAB ID : 113138520

Sulfate	130	10	mg/L	11/4/97	EPA 375.2	EPA 375.2
TOC as NPOC	2.0	1.0	mg/L	10/21/97	EPA 415.1	EPA 415.1

Madison Office & Laboratory
 802 Deming Way
 Madison, WI 53717
 608-827-5501 • Fax: 608-827-5503
 1-888-5-ENCHEM



Corporate Office & Laboratory
 1795 Industrial Drive
 Green Bay, WI 54302
 414-469-2436 • Fax: 414-469-8827
 1-800-7-ENCHEM

- Analytical Report -

Project Name : DEZURIK

Submitter : RMT - MADISON

Project Number : 101.22

Report Date : 11/4/97

Field ID : P-12R

Collection Date : 10/16/97

Lab Sample Number : 974013-005

Matrix Type : GROUNDWATER

Lab Project Number : 974013

WI DNR LAB ID : 113138520

Inorganic Results

Test	Result	EQL	Units	Code	Analysis Date	Prep Method	Analysis Method
Arsenic	< 3.0	3.0	ug/L		10/30/97	SW846 7060A	SW846 7060A
Arsenic - Dissolved	< 3.0	3.0	ug/L		10/30/97	SW846 7060A	SW846 7060A
Barium	48	5.0	ug/L		10/28/97	SW846 3010A	SW846 6010A
Barium - Dissolved	44	5.0	ug/L		10/31/97	SW846 3005A	SW846 6010A
Boron	< 100	100	ug/L		10/28/97	SW846 3010A	SW846 6010A
Boron - Dissolved	< 100	100	ug/L		10/31/97	SW846 3005A	SW846 6010A
Cadmium	< 0.30	0.30	ug/L		10/28/97	SW846 3020A	SW846 7131A
Cadmium - Dissolved	< 0.30	0.30	ug/L		10/27/97	SW846 3020A	SW846 7131A
Calcium	110000	100	ug/L		10/28/97	SW846 3010A	SW846 6010A
Calcium - Dissolved	100000	100	ug/L		10/31/97	SW846 3005A	SW846 6010A
Chromium	4.9	3.0	ug/L		10/28/97	SW846 3020A	SW846 7191
Chromium - Dissolved	2.8	2.0	ug/L		10/28/97	SW846 3020A	SW846 7191
Iron	850	30	ug/L		10/28/97	SW846 3010A	SW846 6010A
Iron - Dissolved	140	30	ug/L		11/4/97	SW846 3005A	SW846 6010A
Lead	< 3.0	3.0	ug/L		10/28/97	SW846 3020A	SW846 7421
Lead - Dissolved	< 3.0	3.0	ug/L		10/28/97	SW846 3020A	SW846 7421
Magnesium	27000	30	ug/L		10/28/97	SW846 3010A	SW846 6010A
Magnesium - Dissolved	25000	30	ug/L		10/31/97	SW846 3005A	SW846 6010A
Manganese	16	2.0	ug/L		10/28/97	SW846 3010A	SW846 6010A
Manganese - Dissolved	7.2	2.0	ug/L		10/31/97	SW846 3005A	SW846 6010A
Selenium	< 3.0	3.0	ug/L		10/31/97	SW846 7740	SW846 7740
Selenium - Dissolved	< 3.0	3.0	ug/L		10/31/97	SW846 7740	SW846 7740
Sodium	18000	300	ug/L		10/28/97	SW846 3010A	SW846 6010A
Sodium - Dissolved	17000	300	ug/L		10/31/97	SW846 3005A	SW846 6010A
Zinc	< 10	10	ug/L	R	10/28/97	SW846 3010A	SW846 6010A
Zinc - Dissolved	< 10	10	ug/L	R	10/31/97	SW846 3005A	SW846 6010A
Chloride	13	2.0	mg/L		10/23/97	EPA 325.1	EPA 325.1
COD	< 5.0	5.0	mg/L	R	10/27/97	EPA 410.4	EPA 410.4
Cyanide, total	< 0.010	0.010	mg/L		10/24/97	EPA 335.4	EPA 335.4
Fluoride	< 0.10	0.10	mg/L		10/27/97	SM 4500F-C	SM 4500F-C
Nitrogen, NO3 + NO2	3.6	0.10	mg/L		10/21/97	EPA 353.2	EPA 353.2
Phenolics, total recoverable	< 0.0085	0.0085	mg/L	R	10/30/97	EPA 420.2	EPA 420.2
Solids, total dissolved	530	20	mg/L		10/20/97	EPA 160.1	EPA 160.1

Madison Office & Laboratory
802 Deming Way
Madison, WI 53717
608-827-5501 • Fax: 608-827-5503
1-888-5-ENCHEM



Corporate Office & Laboratory
1795 Industrial Drive
Green Bay, WI 54302
414-469-2436 • Fax: 414-469-8827
1-800-7-ENCHEM

- Analytical Report -

Project Name : DEZURIK
Project Number : 101.22
Field ID : P-12R
Lab Sample Number : 974013-005
Lab Project Number : 974013

Submitter : RMT - MADISON
Report Date : 11/4/97
Collection Date : 10/16/97
Matrix Type : GROUNDWATER
WI DNR LAB ID : 113138520

Sulfate	99	10	mg/L	11/4/97	EPA 375.2	EPA 375.2
TOC as NPOC	1.6	1.0	mg/L	10/21/97	EPA 415.1	EPA 415.1

Madison Office & Laboratory
 802 Deming Way
 Madison, WI 53717
 608-827-5501 • Fax: 608-827-5503
 1-888-5-ENCHEM



Corporate Office & Laboratory
 1795 Industrial Drive
 Green Bay, WI 54302
 414-469-2436 • Fax: 414-469-8827
 1-800-7-ENCHEM

- Analytical Report -

Project Name : DEZURIK

Submitter : RMT - MADISON

Project Number : 101.22

Report Date : 11/4/97

Field ID : p-13

Collection Date : 10/15/97

Lab Sample Number : 974013-003

Matrix Type : GROUNDWATER

Lab Project Number : 974013

WI DNR LAB ID : 113138520

Inorganic Results

Test	Result	EQL	Units	Code	Analysis Date	Prep Method	Analysis Method
Arsenic	< 3.0	3.0	ug/L		10/30/97	SW846 7060A	SW846 7060A
Arsenic - Dissolved	< 3.0	3.0	ug/L		10/30/97	SW846 7060A	SW846 7060A
Barium	37	5.0	ug/L		10/28/97	SW846 3010A	SW846 6010A
Barium - Dissolved	33	5.0	ug/L		10/31/97	SW846 3005A	SW846 6010A
Boron	100	100	ug/L		10/28/97	SW846 3010A	SW846 6010A
Boron - Dissolved	120	100	ug/L	DA	10/31/97	SW846 3005A	SW846 6010A
Cadmium	< 0.30	0.30	ug/L		10/28/97	SW846 3020A	SW846 7131A
Cadmium - Dissolved	< 0.30	0.30	ug/L		10/27/97	SW846 3020A	SW846 7131A
Calcium	98000	100	ug/L		10/28/97	SW846 3010A	SW846 6010A
Calcium - Dissolved	91000	100	ug/L		10/31/97	SW846 3005A	SW846 6010A
Chromium	2.5	2.0	ug/L		10/28/97	SW846 3020A	SW846 7191
Chromium - Dissolved	< 2.0	2.0	ug/L		10/28/97	SW846 3020A	SW846 7191
Iron	2200	30	ug/L		10/28/97	SW846 3010A	SW846 6010A
Iron - Dissolved	< 30	30	ug/L	R	11/4/97	SW846 3005A	SW846 6010A
Lead	< 3.0	3.0	ug/L		10/28/97	SW846 3020A	SW846 7421
Lead - Dissolved	< 3.0	3.0	ug/L		10/28/97	SW846 3020A	SW846 7421
Magnesium	22000	30	ug/L		10/28/97	SW846 3010A	SW846 6010A
Magnesium - Dissolved	21000	30	ug/L		10/31/97	SW846 3005A	SW846 6010A
Manganese	46	2.0	ug/L		10/28/97	SW846 3010A	SW846 6010A
Manganese - Dissolved	< 2.0	2.0	ug/L		10/31/97	SW846 3005A	SW846 6010A
Selenium	< 3.0	3.0	ug/L		10/31/97	SW846 7740	SW846 7740
Selenium - Dissolved	< 3.0	3.0	ug/L		10/31/97	SW846 7740	SW846 7740
Sodium	4600	300	ug/L		10/28/97	SW846 3010A	SW846 6010A
Sodium - Dissolved	4500	300	ug/L		10/31/97	SW846 3005A	SW846 6010A
Zinc	< 10	10	ug/L	R	10/28/97	SW846 3010A	SW846 6010A
Zinc - Dissolved	< 10	10	ug/L	R	10/31/97	SW846 3005A	SW846 6010A
Chloride	11	2.0	mg/L		10/23/97	EPA 325.1	EPA 325.1
COD	< 5.0	5.0	mg/L	R	10/27/97	EPA 410.4	EPA 410.4
Cyanide, total	< 0.010	0.010	mg/L		10/24/97	EPA 335.4	EPA 335.4
Fluoride	< 0.10	0.10	mg/L		10/27/97	SM 4500F-C	SM 4500F-C
Nitrogen, NO3 + NO2	5.5	0.25	mg/L		10/21/97	EPA 353.2	EPA 353.2
Phenolics, total recoverable	< 0.0085	0.0085	mg/L	R	10/30/97	EPA 420.2	EPA 420.2
Solids, total dissolved	400	20	mg/L		10/20/97	EPA 160.1	EPA 160.1

Madison Office & Laboratory
802 Deming Way
Madison, WI 53717
608-827-5501 • Fax: 608-827-5503
1-888-5-ENCHEM



Corporate Office & Laboratory
1795 Industrial Drive
Green Bay, WI 54302
414-469-2436 • Fax: 414-469-8827
1-800-7-ENCHEM

- Analytical Report -

Project Name : DEZURIK

Project Number : 101.22

Field ID : p-13

Lab Sample Number : 974013-003

Lab Project Number : 974013

Submitter : RMT - MADISON

Report Date : 11/4/97

Collection Date : 10/15/97

Matrix Type : GROUNDWATER

WI DNR LAB ID : 113138520

Sulfate	33	10	mg/L	11/4/97	EPA 375.2	EPA 375.2
TOC as NPOC	2.2	1.0	mg/L	10/21/97	EPA 415.1	EPA 415.1

Madison Office & Laboratory
802 Deming Way
Madison, WI 53717
608-827-5501 • Fax: 608-827-5503
1-888-5-ENCHEM



Corporate Office & Laboratory
1795 Industrial Drive
Green Bay, WI 54302
414-469-2436 • Fax: 414-469-8827
1-800-7-ENCHEM

- Analytical Report -

Project Name : DEZURIK

Project Number : 101.22

Field ID : P-13A

Lab Sample Number : 974013-004

Lab Project Number : 974013

Submitter : RMT - MADISON

Report Date : 11/4/97

Collection Date : 10/16/97

Matrix Type : GROUNDWATER

WI DNR LAB ID : 113138520

Inorganic Results

Test	Result	EQL	Units	Code	Analysis Date	Prep Method	Analysis Method
Arsenic - Dissolved	< 3.0	3.0	ug/L		10/24/97	SW846 7060A	SW846 7060A
Barium - Dissolved	34	5.0	ug/L		10/24/97	SW846 6010A	SW846 6010A
Cadmium - Dissolved	< 0.30	0.30	ug/L		10/27/97	SW846 7131A	SW846 7131A
Lead - Dissolved	< 3.0	3.0	ug/L		10/23/97	SW846 7421	SW846 7421
Selenium - Dissolved	< 3.0	3.0	ug/L		10/31/97	SW846 7740	SW846 7740

Madison Office & Laboratory
802 Deming Way
Madison, WI 53717
608-827-5501 • Fax: 608-827-5503
1-888-5-ENCHEM



Corporate Office & Laboratory
1795 Industrial Drive
Green Bay, WI 54302
414-469-2436 • Fax: 414-469-8827
1-800-7-ENCHEM

- Analytical Report -

Project Name : DEZURIK
Project Number : 101.22
Field ID : P-13B
Lab Sample Number : 974013-007
Lab Project Number : 974013

Submitter : RMT - MADISON
Report Date : 11/4/97
Collection Date : 10/16/97
Matrix Type : GROUNDWATER
WI DNR LAB ID : 113138520

Inorganic Results

Test	Result	EQL	Units	Code	Analysis Date	Prep Method	Analysis Method
Arsenic - Dissolved	< 3.0	3.0	ug/L		10/24/97	SW846 7060A	SW846 7060A
Barium - Dissolved	34	5.0	ug/L		10/24/97	SW846 6010A	SW846 6010A
Cadmium - Dissolved	< 0.30	0.30	ug/L		10/27/97	SW846 7131A	SW846 7131A
Lead - Dissolved	< 3.0	3.0	ug/L		10/23/97	SW846 7421	SW846 7421
Selenium - Dissolved	< 3.0	3.0	ug/L		10/31/97	SW846 7740	SW846 7740

Madison Office & Laboratory
802 Deming Way
Madison, WI 53717
608-827-5501 • Fax: 608-827-5503
1-888-5-ENCHEM



Corporate Office & Laboratory
1795 Industrial Drive
Green Bay, WI 54302
414-469-2436 • Fax: 414-469-8827
1-800-7-ENCHEM

- Analytical Report -

Project Name : DEZURIK

Project Number : 101.22

Field ID : P-13C

Lab Sample Number : 974013-008

Lab Project Number : 974013

Submitter : RMT - MADISON

Report Date : 11/4/97

Collection Date : 10/16/97

Matrix Type : GROUNDWATER

WI DNR LAB ID : 113138520

Inorganic Results

Test	Result	EQL	Units	Code	Analysis Date	Prep Method	Analysis Method
Arsenic - Dissolved	< 3.0	3.0	ug/L		10/24/97	SW846 7060A	SW846 7060A
Barium - Dissolved	34	5.0	ug/L		10/24/97	SW846 6010A	SW846 6010A
Cadmium - Dissolved	< 0.30	0.30	ug/L		10/27/97	SW846 7131A	SW846 7131A
Lead - Dissolved	< 3.0	3.0	ug/L		10/23/97	SW846 7421	SW846 7421
Selenium - Dissolved	< 3.0	3.0	ug/L		10/31/97	SW846 7740	SW846 7740

Madison Office & Laboratory
 802 Deming Way
 Madison, WI 53717
 608-827-5501 • Fax: 608-827-5503
 1-888-5-ENCHEM



Corporate Office & Laboratory
 1795 Industrial Drive
 Green Bay, WI 54302
 414-469-2436 • Fax: 414-469-8827
 1-800-7-ENCHEM

- Analytical Report -

Project Name : DEZURIK

Submitter : RMT - MADISON

Project Number : 101.22

Report Date : 11/4/97

Field ID : FIELD BLANK

Collection Date : 10/15/97

Lab Sample Number : 974013-002

Matrix Type : GROUNDWATER

Lab Project Number : 974013

WI DNR LAB ID : 113138520

Inorganic Results

Test	Result	EQL	Units	Code	Analysis Date	Prep Method	Analysis Method
Arsenic	< 3.0	3.0	ug/L		10/30/97	SW846 7060A	SW846 7060A
Arsenic - Dissolved	< 3.0	3.0	ug/L		10/30/97	SW846 7060A	SW846 7060A
Barium	< 5.0	5.0	ug/L		10/28/97	SW846 3010A	SW846 6010A
Barium - Dissolved	< 5.0	5.0	ug/L		10/31/97	SW846 3005A	SW846 6010A
Boron	< 100	100	ug/L		10/28/97	SW846 3010A	SW846 6010A
Boron - Dissolved	< 100	100	ug/L		10/31/97	SW846 3005A	SW846 6010A
Cadmium	< 0.30	0.30	ug/L		10/28/97	SW846 3020A	SW846 7131A
Cadmium - Dissolved	< 0.30	0.30	ug/L		10/27/97	SW846 3020A	SW846 7131A
Calcium	2300	100	ug/L		10/28/97	SW846 3010A	SW846 6010A
Calcium - Dissolved	2700	100	ug/L	DA	10/31/97	SW846 3005A	SW846 6010A
Chromium	4.1	2.0	ug/L		10/28/97	SW846 3020A	SW846 7191
Chromium - Dissolved	< 2.0	2.0	ug/L		10/28/97	SW846 3020A	SW846 7191
Iron	130	30	ug/L		10/28/97	SW846 3010A	SW846 6010A
Iron - Dissolved	< 30	30	ug/L	R	11/4/97	SW846 3005A	SW846 6010A
Lead	< 3.0	3.0	ug/L		10/28/97	SW846 3020A	SW846 7421
Lead - Dissolved	< 3.0	3.0	ug/L		10/28/97	SW846 3020A	SW846 7421
Magnesium	75	30	ug/L		10/28/97	SW846 3010A	SW846 6010A
Magnesium - Dissolved	110	30	ug/L	DF	10/31/97	SW846 3005A	SW846 6010A
Manganese	2.2	2.0	ug/L		10/28/97	SW846 3010A	SW846 6010A
Manganese - Dissolved	2.2	2.0	ug/L		10/31/97	SW846 3005A	SW846 6010A
Selenium	< 3.0	3.0	ug/L		10/31/97	SW846 7740	SW846 7740
Selenium - Dissolved	< 3.0	3.0	ug/L		10/31/97	SW846 7740	SW846 7740
Sodium	< 300	300	ug/L		10/28/97	SW846 3010A	SW846 6010A
Sodium - Dissolved	< 300	300	ug/L		10/31/97	SW846 3005A	SW846 6010A
Zinc	< 10	10	ug/L	R	10/28/97	SW846 3010A	SW846 6010A
Zinc - Dissolved	< 10	10	ug/L	R	10/31/97	SW846 3005A	SW846 6010A
Chloride	< 2.0	2.0	mg/L		10/23/97	EPA 325.1	EPA 325.1
COD	< 5.0	5.0	mg/L	R	10/27/97	EPA 410.4	EPA 410.4
Cyanide, total	< 0.010	0.010	mg/L		10/24/97	EPA 335.4	EPA 335.4
Fluoride	< 0.10	0.10	mg/L		10/27/97	SM 4500F-C	SM 4500F-C
Nitrogen, NO3 + NO2	< 0.050	0.050	mg/L		10/21/97	EPA 353.2	EPA 353.2
Phenolics, total recoverable	< 0.0085	0.0085	mg/L	R	10/30/97	EPA 420.2	EPA 420.2
Solids, total dissolved	< 20	20	mg/L		10/20/97	EPA 160.1	EPA 160.1

Madison Office & Laboratory
802 Deming Way
Madison, WI 53717
608-827-5501 • Fax: 608-827-5503
1-888-5-ENCHEM



Corporate Office & Laboratory
1795 Industrial Drive
Green Bay, WI 54302
414-469-2436 • Fax: 414-469-8827
1-800-7-ENCHEM

- Analytical Report -

Project Name : DEZURIK
Project Number : 101.22
Field ID : FIELD BLANK
Lab Sample Number : 974013-002
Lab Project Number : 974013

Submitter : RMT - MADISON
Report Date : 11/4/97
Collection Date : 10/15/97
Matrix Type : GROUNDWATER
WI DNR LAB ID : 113138520

Sulfate	< 10	10	mg/L	11/4/97	EPA 375.2	EPA 375.2
TOC as NPOC	1.3	1.0	mg/L	10/21/97	EPA 415.1	EPA 415.1

Madison Office & Laboratory
802 Deming Way
Madison, WI 53717
608-827-5501 • Fax: 608-827-5503
1-888-5-ENCHEM



Corporate Office & Laboratory
1795 Industrial Drive
Green Bay, WI 54302
414-469-2436 • Fax: 414-469-8827
1-800-7-ENCHEM

Data Qualifier Sheet

- DA Dissolved analyte greater than total analyte; analyses passed QC based on precision criteria.
- DF Dissolved analyte greater than total analyte; analyses failed QC based on precision criteria. (See Sample Narrative).
- R Data reported are based on the Method Detection Limit (MDL). The value in the EQL column is the client request reporting limit.

Madison Office & Laboratory
802 Deming Way
Madison, WI 53717
608-827-5501 • Fax: 608-827-5503
1-888-5-ENCHEM



Corporate Office & Laboratory
1795 Industrial Drive
Green Bay, WI 54302
414-469-2436 • Fax: 414-469-8827
1-800-7-ENCHEM

**SAMPLE NARRATIVE
INORGANIC ANALYSIS**

PROJECT NAME: DEZURIK
WORKORDER NUMBER: 974013
DATE: 11/4/97

The dissolved magnesium result for LIMS sample number 974013-002 was greater than the total magnesium value. The difference between the two values was outside of the laboratory control limits for precision. The analyst confirmed the results. The dissolved magnesium result has been flagged with a DF qualifier.

Madison Office & Laboratory
802 Deming Way
Madison, WI 53717
608-827-5501 • Fax: 608-827-5503
1-888-5-ENCHEM



Corporate Office & Laboratory
1795 Industrial Drive
Green Bay, WI 54302
414-469-2436 • Fax: 414-469-8827
1-800-7-ENCHEM

- Analytical Report -

Project Name : DEZURIK

Client : RMT - MADISON

Project Number : 101.22

Report Date : 11/4/97

WI DNR LAB ID : 113138520

Lab Sample No.	Field ID	Collection Date	Lab Sample No.	Field ID	Collection Date
974013-001	P-9R	10/15/97			
974013-002	FIELD BLANK	10/15/97			
974013-003	P-13	10/15/97			
974013-004	P-13A	10/16/97			
974013-005	P-12R	10/16/97			
974013-006	P-5R	10/16/97			
974013-007	P-13B	10/16/97			
974013-008	P-13C	10/16/97			

I certify that the data contained in this Final Report has been generated and reviewed in accordance with approved methods and Laboratory Standard Operating Procedure. Exceptions, if any, are discussed in the accompanying sample narrative. Release of this final report is authorized by Laboratory management, as is verified by the following signature.

Ken Oastme

11-4-97

Approval Signature

Date



EN CHEM INC.

1241 Bellevue St., Suite 9
Green Bay, WI 54302
920-489-2436 • 1-800-736-2436
FAX 920-469-8927

802 Deming Way
Madison, WI 53717
608-827-5601 • 1-888-536-2436
Fax: 608-827-5503

1423 N. 8th Street., Suite 122
Superior, WI 54880
715-392-5644 • 1-800-837-8238
FAX 715-392-5843

CHAIN OF CUSTODY

9279

Page 1 of 1

Quote #

Mail Report To: R. HAFEMEISTER

Company: Rmt

Address: _____

Invoice To: Kris McIntosh

Company: _____

Address: _____

Mail Invoice To: Kris McIntosh

Company: _____

Address: _____

FILTERED? (YES/NO) N Y Y N Y Y N A N
PRESERVATION (CODE) O P D O A C C C

ANALYSES REQUESTED
Total Metals
Discrete Metals 500-ML
Discrete Metals 1L
CL, F, TDS 50-L
CPD, NO₃-N
CPD, NO₂-N
CPD, TDC
Phenol, 400

FIELD ID	SAMPLE DESCRIPTION	COLLECTION DATE	TIME	SHADED AREA FOR LABORATORY USE ONLY											
				MATRIX	GOOD COND.	TOTAL BOTTLES	COMMENTS								
P-9R	P-9R	10/15/97	1525	GW	K	7									974013-001
FIELD BLANK	FIELD BLANK	10/15/97	1525	GW		↓									-002
P-13	P-13	10/15/97	1615	GW		↓									-003
P-13A	P-13A	10/16/97	0925	GW		↓									-004
P-12R	P-12R	10/16/97	0925	GW		↓									-005
P-5R	P-5R	10/16/97	1050	GW		↓									-006
P-13B	P-13B	10/16/97	1230	GW		↓									-007
P-13C	P-13C	10/16/97	1635	GW		↓									-008

Relinquished By: _____ Date/Time: 10/17/97 1355

Relinquished By: _____ Date/Time: 10/17/97

Relinquished By: _____ Date/Time: _____

Relinquished By: _____ Date/Time: _____

En Chem Project No. _____

Sample Receipt Temp. NOI

Sample Receipt pH (Weu/Metals) _____

Received By: [Signature] Date/Time: 10/17/97 1355

Received By: _____ Date/Time: _____

Received By: _____ Date/Time: _____

Received By: _____ Date/Time: _____

Company Name: RMT

Branch or Location: MADISON

Project Contact: BOB HAFEMEISTER

Telephone: _____

Project Number: 10122

Project Name: DEZURIK

Project Location: SATELL, MN

Sampled By (Print): R. HAFEMEISTER / E. OLSON

Regulatory Program (circle): UST RCRA CLP SDWA
NPDES/WPDES CAA NR _____

Other: _____

NR720 Confirmation Analysis Required? (circle): Y N
(En Chem will not confirm unless otherwise instructed.)

*Preservation Code:
A=None B=HCL C=H2SO4
D=HNO3 E=EnCore F=Methanol**
G=NaOH O=Other (Indicate)

**If not using En Chem's methanol, indicate volume of methanol added and mark the appropriate samples.

Appendix D

Statistical Worksheet



COMPUTATION SHEET

744 Heartland Trail P.O. Box 8923 Madison, WI 53708-8923 (608) 831-4444 FAX: (608) 831-3334 VOICE: (608) 831-1989

PROJECT / PROPOSAL NAME DEZURIK LAGOON #3	PREPARED By: REH Date: 11/97	CHECKED By: AM Date: 11/97	PROJECT / PROPOSAL NO. 101.20
---	---	---	---

Background Statistical Analysis for Barium

Nonparametric Upper Tolerance Limit Calculation
for Background Well P-13

$n = 66$ data points for Barium -

- ① Maximum Historical Barium Detection = $60 \mu\text{g}/\text{kg}^{\text{L}}$ -
- ② From Table A-6 of USEPA ⁽¹⁹⁹²⁾ ~~40 CFR Part 264~~, ^{MCM}
minimum coverage for 66 background samples = 95.5% -
- ③ Expected Coverage = $n/(n+1) = 66/(66+1) = 98.5\%$ -
- ④ Set Tolerance Limit for Barium at maximum historical
Barium Detection = $60 \mu\text{g}/\text{kg}$ -

1997 Annual Report-- Statistical Analysis
DeZURIK Landfill, Lagoon No. 3

Groundwater Statistical Analysis-- Monitoring Well P-13 (Background)
n = 16 (includes replicates as individual samples)

n	Arsenic (µg/L)	Selenium (µg/L)	Cadmium (µg/L)	Lead (µg/L)
1	3.0	3.0	0.3	3.0
2	3.0	3.0	0.3	3.0
3	3.0	3.0	0.3	3.0
4	3.0	3.0	0.3	3.0
5	3.0	3.0	0.3	3.0
6	3.0	3.0	0.3	3.0
7	3.0	3.0	0.3	3.0
8	3.0	3.0	0.3	3.0
9	3.0	3.0	0.3	3.0
10	3.0	3.0	0.3	3.0
11	3.0	3.0	0.3	3.0
12	3.0	3.0	0.3	3.0
13	3.0	3.0	0.3	3.0
14	3.0	3.0	0.3	3.0
15	3.0	3.0	0.3	3.0
16	3.0	3.0	0.3	3.0
Sum	48.0	48.0	4.8	48.0
Arithmetic mean	3.0	3.0	0.3	3.0
Variance	0.0	0.0	0.0	0.0
Standard deviation	0.0	0.0	0.0	0.0
Poisson tolerance interval	7.4	7.4	1.7	7.4
Arithmetic tolerance interval	3.0	3.0	0.3	3.0

Notes:

1. In the Poisson distribution, the population mean is equal to the variance (i.e. $\mu = s^2$).
2. When 2 or less results are above the detection limit, use Poisson tolerance interval.
3. When 3 or more results are above the detection limit, use arithmetic tolerance interval.
4. Tolerance interval = $\mu + (k*s)$.
5. $k = 2.523$ for $n = 16$



COMPUTATION SHEET

744 Heartland Trail P.O. Box 8923 Madison, WI 53708-8923 (608) 831-4444 FAX: (608) 831-3334 VOICE: (608) 831-1989

SHEET _____ OF _____

PROJECT / PROPOSAL NAME <i>DeZurik Lagoon No. 3</i>	PREPARED By: <i>mam</i> Date: <i>11/20/97</i>	CHECKED By: <i>UD</i> Date: <i>11/24/97</i>	PROJECT / PROPOSAL NO.
--	--	--	------------------------

1. Assume replicates are NOT independent because:

- ground water flow rate = 11.98 ft/yr
- sample interval = 4 hrs.
- well diameter = 4 inches

\therefore gw travel distance in 4 hrs = D

$$D = 11.98 \text{ ft/yr} \times 4 \text{ hrs} \times (1 \text{ d} / 24 \text{ hrs}) \times (1 \text{ yr} / 365 \text{ d}) = 5.02 \text{ E-3 ft} = 0.06 \text{ in}$$

OR

travel time to cross 4-inch well = T

$$T = \frac{4 \text{ inches}}{12 \text{ inches/ft}} \div \frac{11.98 \text{ ft/yr}}{365 \text{ d/yr}} = 0.3 \text{ yrs} = 11 \text{ days}$$

2. use means of replicates for each sample event as one data pt

3. sample size $n = 19$

$n_{\text{det}} = 14$

"detected" samples = 5

4. substituted DL on ND for sample round with some hits
(10/4/90 and 10/18/94)

Then dataset is as follows:

	date:
52	10/4/90
51	10/17-18/94
31	10/16-17/96
35	4/16-17/97
<u>34</u>	10/15-16/97

$$\bar{X} = 40.6 \quad s = 10.065 \quad \text{ok}$$

$$TL = \bar{X} + k S \quad \text{where } k = 4.202 \quad \text{ok}$$

$n = 5$

$$T_1 = 40.6 + 4.202(10.065) = 82.89 \quad \text{ok}$$

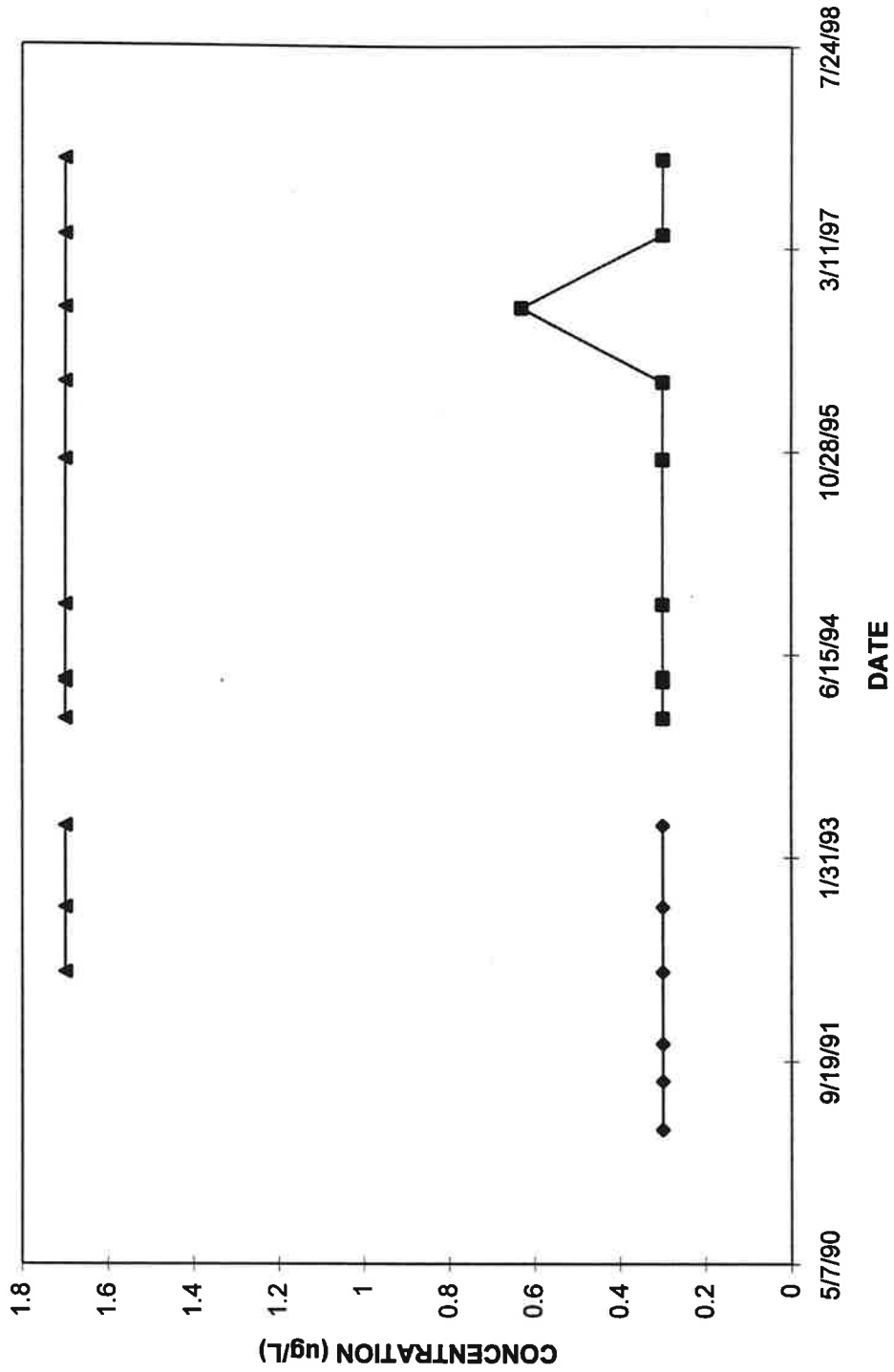
use 8 >

Appendix E

Graph of Dissolved Barium and Cadmium

DEZURIK GROUNDWATER ANALYTICAL RESULTS

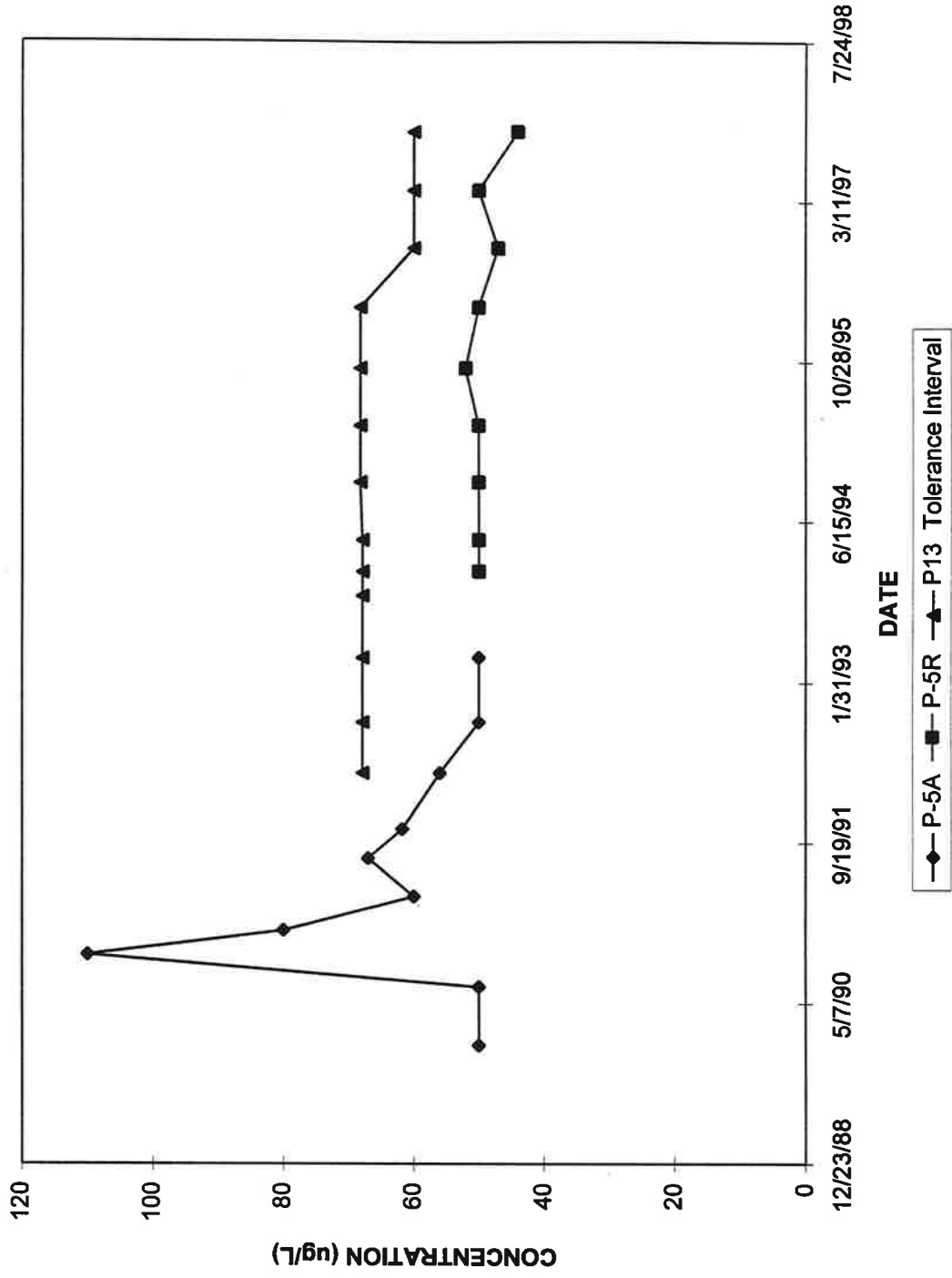
Dissolved Cadmium



—◆— P-12 —■— P-12R —▲— P-13 Cd Tol Interval

DEZURIK GROUNDWATER ANALYTICAL RESULTS

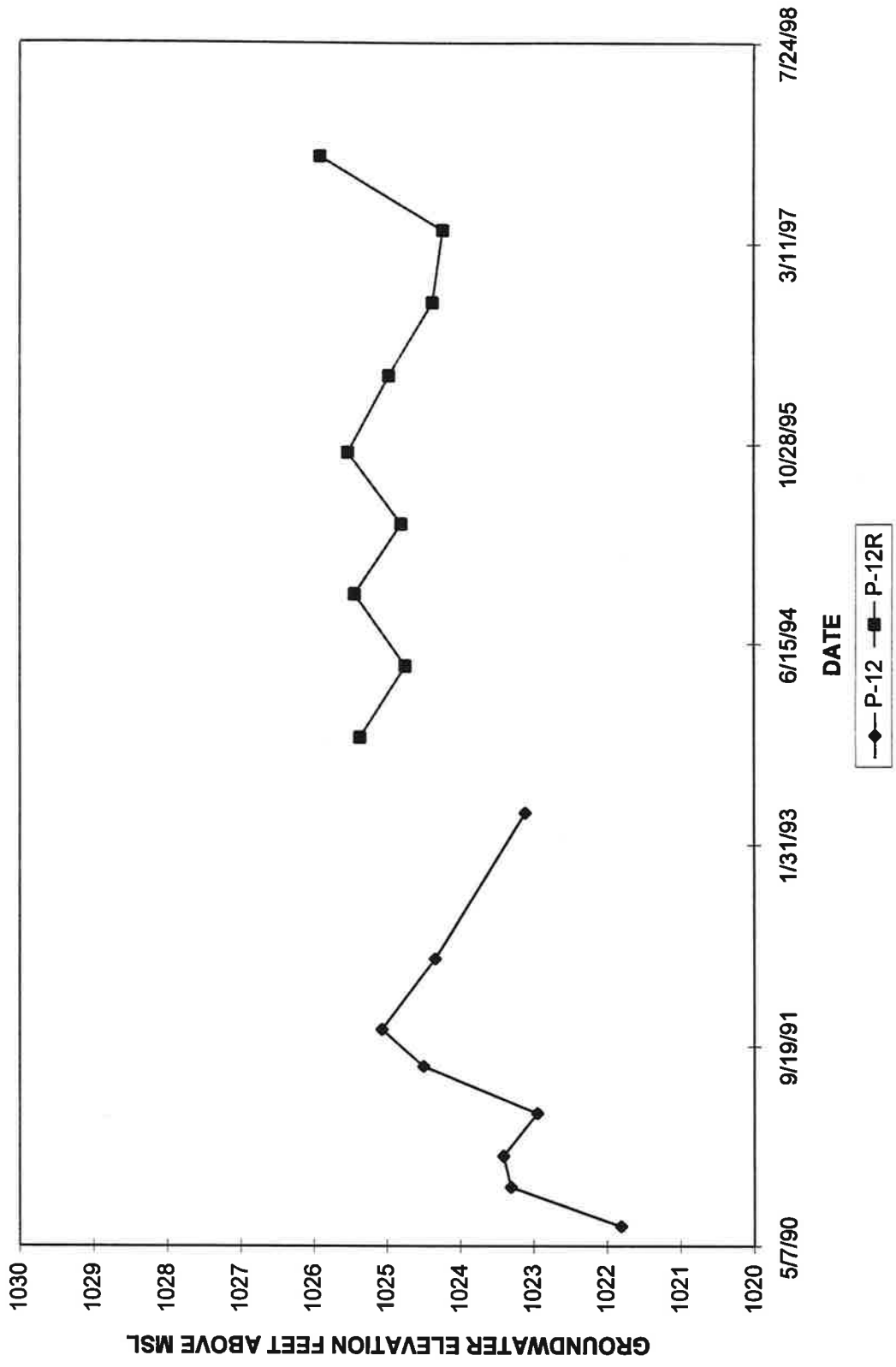
Dissolved Barium



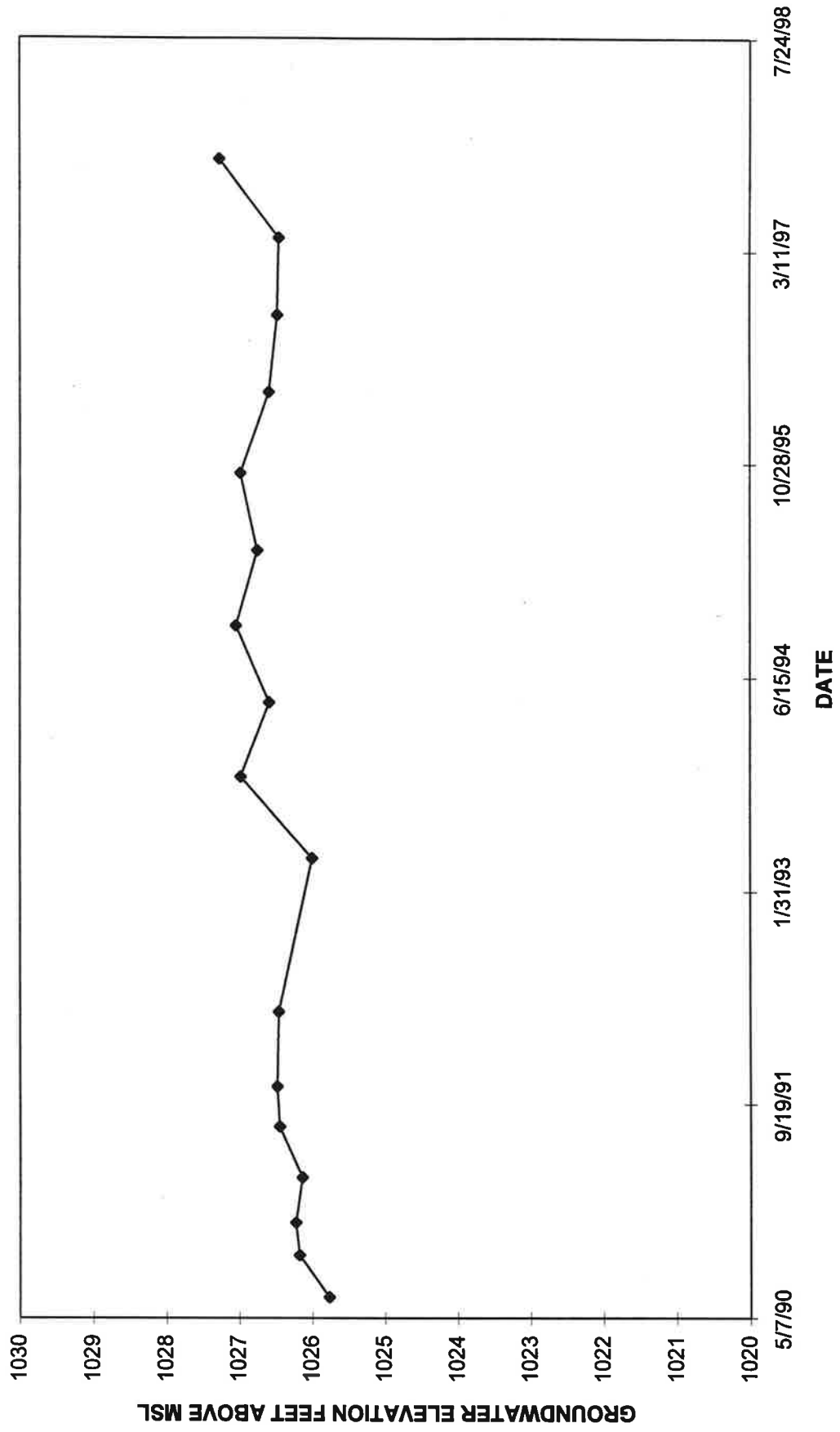
Appendix F

Graphs of Groundwater Elevations

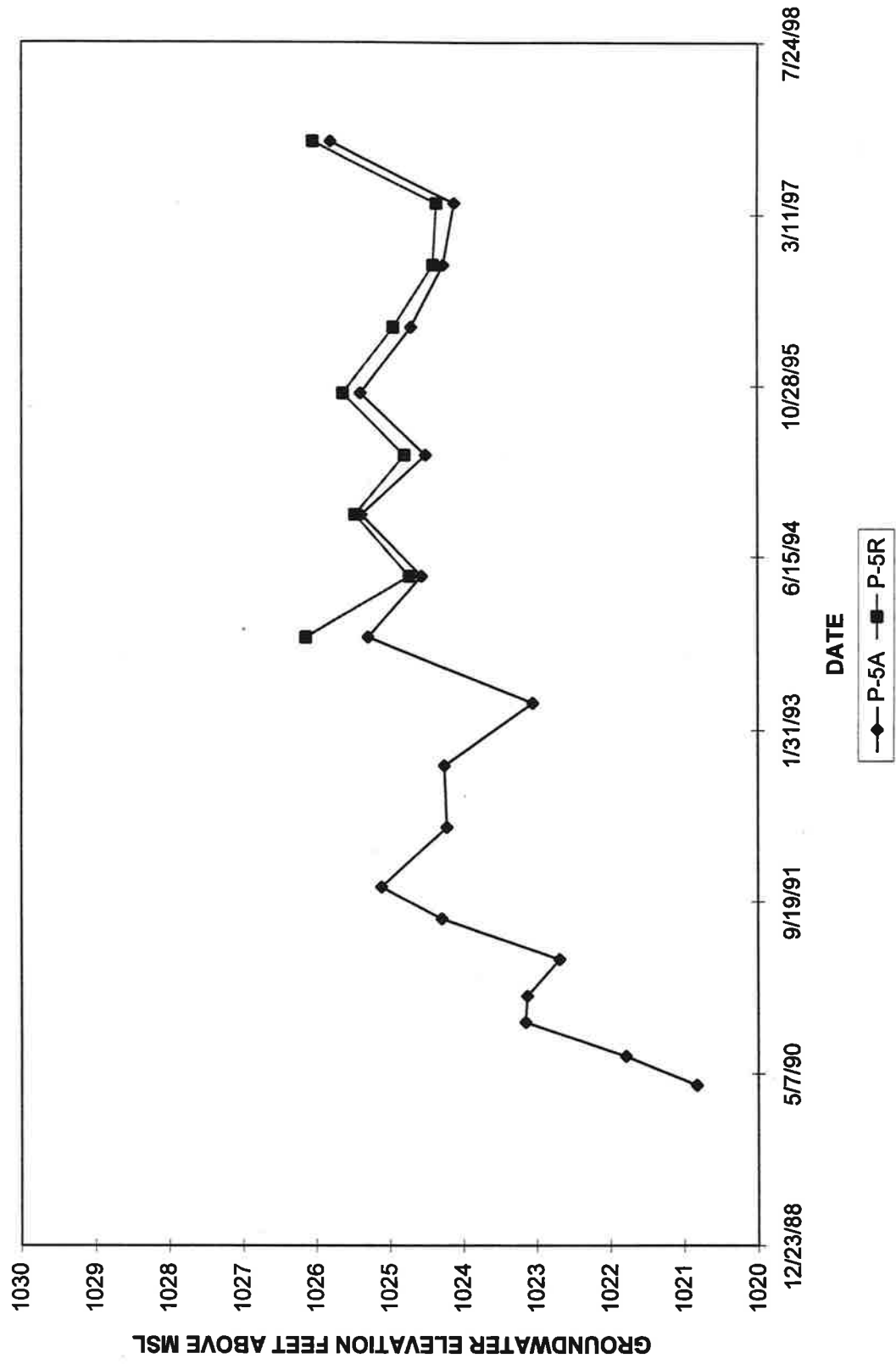
DEZURIK GROUNDWATER ELEVATION DATA WELL P-12/12R



DEZURIK GROUNDWATER ELEVATION DATA WELL P-13



DEZURIK GROUNDWATER ELEVATION DATA WELLS P-5A/5R



DEZURIK GROUNDWATER ELEVATION DATA WELL P-9R

