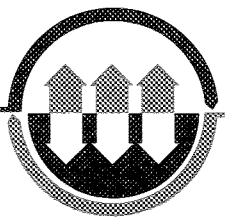
Summary Report
Groundwater Sampling Results
1992
J.H. Baxter South Woodwaste Landfill



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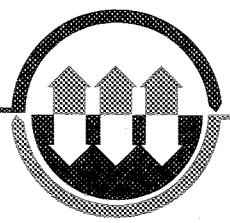
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Summary Report
Groundwater Sampling Results
1992
J.H. Baxter South Woodwaste Landfill

Prepared for

J.H.Baxter

August 31, 1993

Prepared by

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Project 0191-001.02

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INTRODUCTION

This report presents groundwater sampling and laboratory testing results for the South Woodwaste Landfill facility operated by J.H. Baxter in Arlington, Washington. Groundwater samples were collected quarterly by EMCON Northwest, Inc. (EMCON), in 1992. A full description of the site and well locations is presented in the hydrogeologic report prepared for J.H. Baxter in 1989. Previous reports summarize groundwater sampling results from 1988 through 1989 (EMCON, 1990) and from 1990 through 1991 (EMCON, 1992).

The purpose of this investigation was to collect groundwater samples and take quarterly water level measurements from one upgradient and three downgradient monitoring wells at the site from March 1992 to December 1992. Statistical analyses were performed on the 1992 data to determine whether parameter concentrations measured in the downgradient monitoring wells were significantly higher than concentrations measured in the upgradient background well.

Groundwater Levels

Groundwater elevations in each of four monitoring wells were measured at each quarterly sampling event. Two groundwater flow maps were prepared using data collected in June and December 1992 (Figures 1 and 2). The gradient present in these two figures indicates well BXS-4 is located upgradient. Chemistry from this well represents background conditions. Wells BXS-1, BXS-2, and BXS-3, are all downgradient of the woodwaste.

Groundwater flow directions and gradients appear to be consistent over a 6-month period from June to December 1992. Flow is toward the northwest at a gradient of 0.024 for June 1992 and 0.028 for December 1992. Changes in groundwater level elevations, averaging 3.3 feet, caused the change in gradient observed over the 6-month period.

Groundwater Velocity

Groundwater velocities were estimated for June and December 1992. Based on hydraulic conductivity measurements that range from $2x10^{-3}$ to $3x10^{3}$ cm/sec (EMCON 1989), and

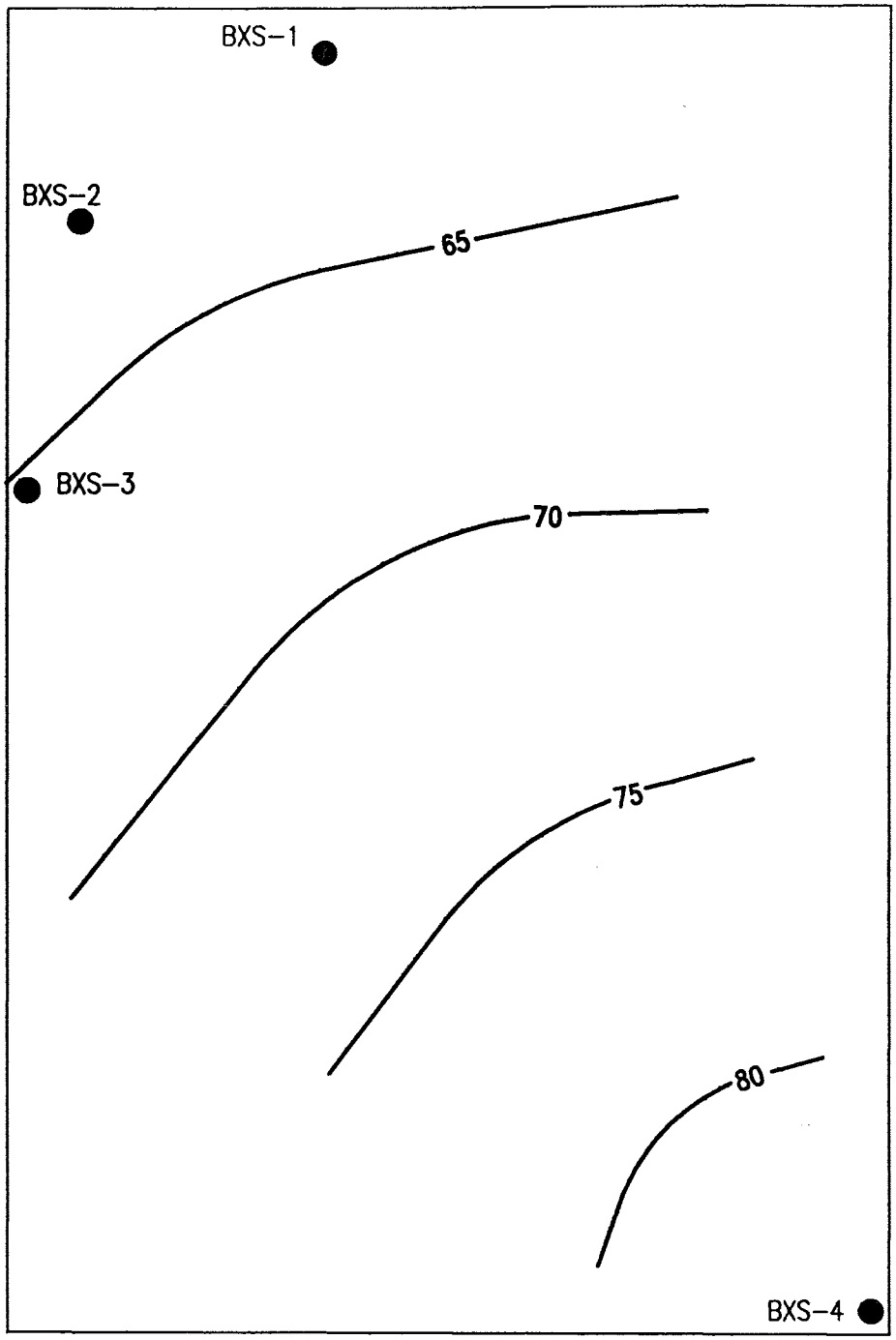

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Figure 1
J. H. BAXTER SOUTH
WOODWASTE LANDFILL
WATER LEVEL ELEVATIONS
JUNE 1992

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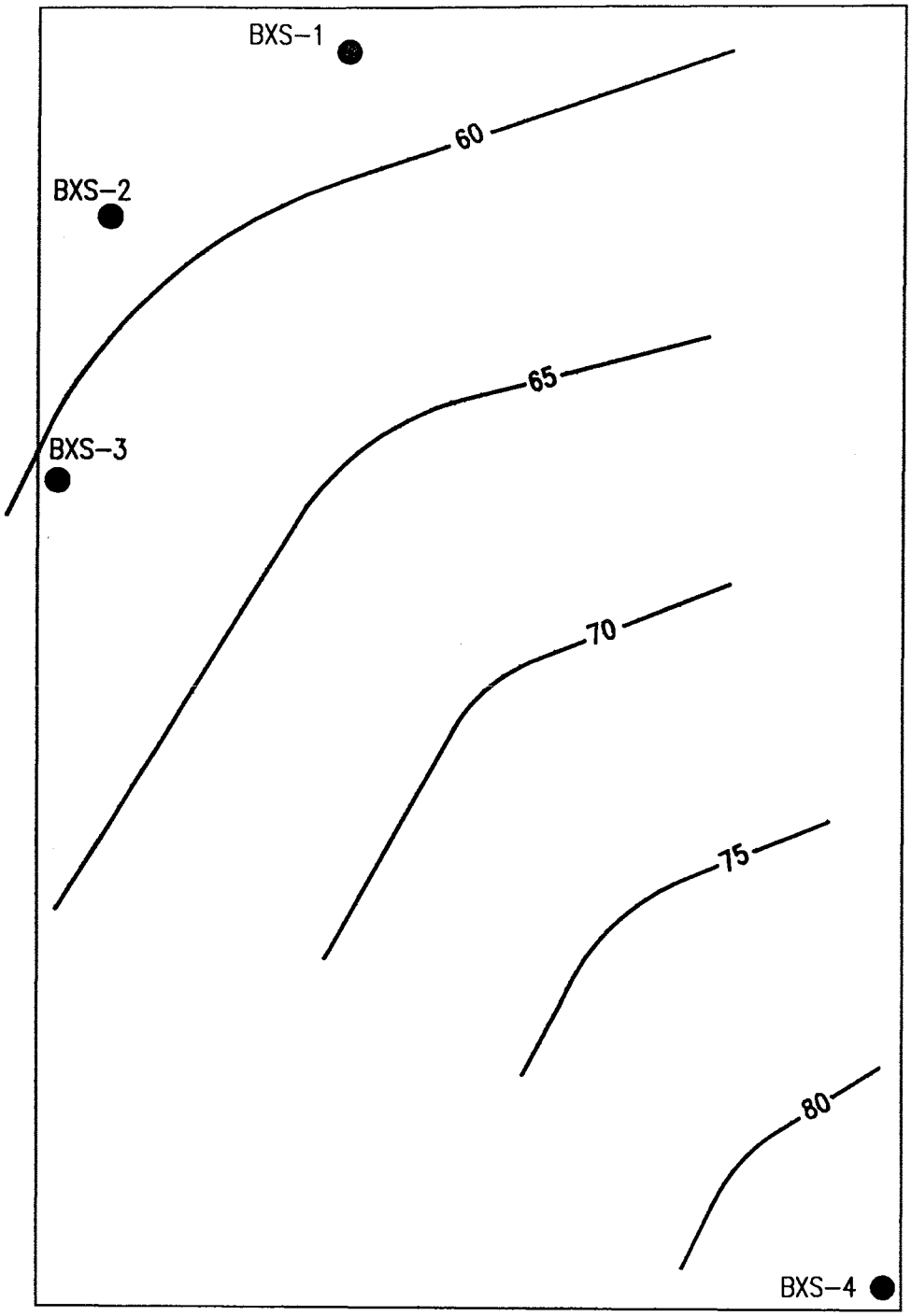

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Figure 2
J. H. BAXTER SOUTH
WOODWASTE LANDFILL
WATER LEVEL ELEVATIONS
DECEMBER 1992

measured groundwater levels for June and December, groundwater flow velocities ranged from .45 to .79 ft/day for the South Landfill in 1992.

Groundwater Sampling

A complete description of the procedures for groundwater chemistry sampling and evaluation is presented in Appendix C of the *Hydrogeologic Report*, 1989, prepared by EMCON. All procedures outlined in the 1989 report were followed during sampling collection and analysis. Copies of the Field Sampling Data sheets and the Chain-of-Custody forms are included in Appendix A.

Groundwater quality samples were analyzed by Columbia Analytical Services of Kelso, Washington. The laboratory results are enclosed with this report (Appendix B). Table 1 summarizes the water quality results of both field and laboratory analyses.

Statistical Analysis

Groundwater analysis laboratory results were evaluated to determine if statistically significant increases in groundwater quality exist between samples from the upgradient background well (BXS-4) and the downgradient wells (BXS-1, BXS-2, and BXS-3).

Parameters reported as ND (none detected at or above the method reporting limit), were treated using a simple substitution method. To perform statistical calculations, a value of one half the method reporting limit was substituted for ND values. During each sampling event, a sample and duplicate sample were collected at one well. The results for the sample and the duplicate were averaged to obtain a single value for the sampling event. This simple average value was then used in the statistical calculation.

The statistical method used to evaluate the data was Cochran's approximation to the Behrens-Fisher Student t-test, as presented in 40 CFR CH. 1, part 264, Appendix IV. One basic assumption in using the t-statistic is that the data are normally distributed. The statistical means and sample variances of monitoring well parameters were computed and compared with those of the background well to determine the significance between the parameters measured in the sample wells. A t-statistic (t*) and comparison statistic (tc) were computed from the means and variances. A statistically significant increase in the parameter above background values can be determined by comparing the two statistics. The mean, variance, t*, and comparison statistic for each parameter are presented in Table 2.

If the t* is equal to or larger than the tc, then a significant increase has occurred in this parameter. If t* is less than tc, then no significant increase has occurred between the

Table 1

Summary of Groundwater Quality Results 1992
J.H. Baxter South Woodwaste Landfill
Monitoring Well Number BXS-1

Constituents:	First Quarter 3/24/92	1st Qtr Duplicate 3/24/92	Second Quarter 6/23/91	2nd Qtr Duplicate 6/23/91	Third Quarter 9/25/92	3rd Qtr Duplicate 9/25/92	Fourth Quarter 12/9/92	4th Qtr Duplicate 12/9/92
Field Parameters:								
pH	6.20	6.20	6.78	6.78	5.97	5.97	5.95	5.95
Conductvity (uS/cm)	296	296	450	450	250	250	50	50
Temperature (C)	11.5	11.5	12	12	12.5	12.5	10.7	10.7
Depth to Water (ft)	35.42	35.42	38.40	38.40	40.70	40.70	42.01	42.01
Laboratory Results:								
Chloride	20	22	---	---	14	15	15	14
Sulfate	7.9	8.1	---	---	9.7	10	9.4	9.3
Tannin-Lignin	ND	ND	---	---	0.1	0.1	0.4	0.3
Nitrate+Nitrite-N	1.2	0.9	---	---	0.4	0.4	0.5	0.6
Ammonia-N	ND	0.06	ND	0.06	ND	ND	ND	ND
Iron	0.021	ND	ND	ND	ND	0.025	ND	ND
Manganese	0.156	0.152	0.214	0.216	---	---	0.177	0.198
Zinc	ND	ND	0.014	ND	---	---	ND	ND
pH -Lab	6.15	6.09	6.29	6.19	6.04	6.10	6.03	6.12
Conductivity (uS/cm)-lab	338	294	356	338	245	249	254	259
COD	29	29	23	26	21	27	35	83
TOC	1.7	2.1	4.7	2.4	3.8	4.3	4.8	4.6
Total Coliforms	140	130	ND	ND	240	240	ND	ND
Fluoride	ND	ND	ND	ND	ND	ND	ND	ND
Total Dissolved Solids	209	198	239	222	176	167	149	169
Arsenic	ND	ND	ND	ND	ND	ND	ND	ND
Barium	0.014	0.015	0.02	0.02	0.013	0.011	0.012	0.014
Cadmium	0.009	0.013	ND	0.004	ND	ND	ND	ND
Chromium	ND	ND	ND	ND	ND	ND	ND	ND
Copper	ND	ND	ND	0.031	ND	ND	ND	ND
Lead	ND	ND	ND	ND	ND	ND	ND	ND
Mercury	ND	ND	ND	ND	ND	ND	ND	ND
Nickel	ND	ND	---	---	---	---	ND	ND
Selenium	ND	ND	ND	ND	ND	ND	ND	ND
Silver	ND	ND	ND	ND	ND	ND	ND	ND

Note: -ND indicates none detected at or above the Method Reporting Limit.
-Results of inorganic compounds are reported in mg/L.
-(---) Indicates analyte not analyzed.
-Laboratory analysis provided by Columbia Analytical Services, Inc.

Table 1

Summary of Groundwater Quality Results 1992
J.H. Baxter South Woodwaste Landfill
Monitoring Well Number BXS-2

Constituents:	First Quarter 3/23/92	Second Quarter 6/23/92	Third Quarter 9/25/92	Fourth Quarter 12/9/91
Field Parameters:				
pH	6.31	6.69	6.09	6.21
Conductvity (uS/cm)	655	709	591	120
Temperature (C)	14	17	14.4	12.9
Depth to Water (ft)	34.68	37.18	39.77	41.31
Laboratory Results:				
Chloride	8.1	---	5.9	6.2
Sulfate	ND	---	ND	0.3
Tannin-Lignin	0.4	---	0.3	0.5
Nitrate+Nitrite-N	ND	---	ND	ND
Ammonia-N	ND	0.05	ND	ND
Iron	0.289	0.247	ND	0.228
Manganese	0.616	0.656	---	0.669
Zinc	ND	ND	---	ND
pH -Lab	6.25	6.34	6.2	6.26
Conductivity (uS/cm)-lab	592	592	580	580
COD	49	34	35	40
TOC	3.1	3.6	6.6	6.8
Total Coliforms	17	ND	50	50
Fluoride	ND	ND	ND	ND
Total Dissolved Solids	387	365	311	345
Arsenic	ND	ND	ND	ND
Barium	0.042	0.04	0.04	0.042
Cadmium	ND	ND	ND	ND
Chromium	ND	ND	ND	ND
Copper	ND	ND	ND	ND
Lead	ND	ND	ND	ND
Mercury	ND	ND	ND	ND
Nickel	0.021	---	---	0.022
Selenium	ND	ND	ND	ND
Silver	ND	ND	ND	ND

Note: -ND indicates none detected at or above the Method Reporting Limit.
-Results of inorganic compounds are reported in mg/L.
-(---) Indicates analyte not analyzed.
-Laboratory analysis provided by Columbia Analytical Services, Inc.

Table 1

Summary of Groundwater Quality Results 1992
J.H. Baxter South Woodwaste Landfill
Monitoring Well Number BXS-3

Constituents:	First Quarter 3/23/92	Second Quarter 6/23/92	Third Quarter 9/25/92	Fourth Quarter 12/9/92
Field Parameters:				
pH	6.52	6.6	6.56	6.26
Conductvity (uS/cm)	550	582	557	124
Temperature (C)	16.5	19	17	15.2
Depth to Water (ft)	30.58	33.73	36.79	38.77
Laboratory Results:				
Chloride	7.7	---	7.2	8.2
Sulfate	ND	---	ND	ND
Tannin-Lignin	3.5	---	1.5	1.1
Nitrate+Nitrite-N	ND	---	ND	ND
Ammonia-N	0.16	0.07	0.09	ND
Iron	6.04	0.877	0.02	0.039
Manganese	2.56	1.76	---	0.661
Zinc	ND	ND	---	ND
pH -Lab	6.28	6.4	6.36	6.6
Conductivity (uS/cm)-lab	480	504	560	586
COD	93	87	144	101
TOC	20	16	21.9	16.8
Total Coliforms	280	7	130	ND
Fluoride	ND	ND	ND	ND
Total Dissolved Solids	346	373	324	360
Arsenic	ND	ND	ND	ND
Barium	0.038	0.035	0.031	0.038
Cadmium	0.005	ND	ND	ND
Chromium	ND	ND	ND	ND
Copper	ND	ND	0.012	ND
Lead	ND	ND	ND	ND
Mercury	ND	ND	ND	ND
Nickel	ND	---	---	ND
Selenium	ND	ND	ND	ND
Silver	ND	ND	ND	ND

Note: -ND indicates none detected at or above the Method Reporting Limit.
-Results of inorganic compounds are reported in mg/L.
-(---) Indicates analyte not analyzed.
-Laboratory analysis provided by Columbia Analytical Services, Inc.

Table 1

Summary of Groundwater Quality Results 1992
J.H. Baxter South Woodwaste Landfill
Monitoring Well Number BXS-4

Constituents:	First Quarter 3/23/92	Second Quarter 6/23/92	Third Quarter 9/25/92	Fourth Quarter 12/9/92
Field Parameters:				
pH	8.50	7.4	7.11	7.88
Conductvity (uS/cm)	201	340	206	33
Temperature (C)	10	14	10	8.6
Depth to Water (ft)	13.00	15.96	17.85	16.54
Laboratory Results:				
Chloride	2.1	---	2.1	2.3
Sulfate	2.3	---	1.9	1.7
Tannin-Lignin	0.3	---	0.2	0.5
Nitrate+Nitrite-N	ND	---	ND	ND
Ammonia-N	0.7	0.62	0.54	0.83
Iron	0.049	0.06	4.87	0.039
Manganese	0.109	0.118	---	0.112
Zinc	ND	ND	---	ND
pH -Lab	8	7.86	7.71	7.88
Conductivity (uS/cm)-lab	189	184	189	192
COD	171	273	58	420
TOC	1.1	2	0.8	2.2
Total Coliforms	ND	ND	ND	4
Fluoride	ND	ND	ND	ND
Total Dissolved Solids	151	147	152	136
Arsenic	0.006	0.005	0.006	0.006
Barium	0.022	0.018	0.061	0.026
Cadmium	ND	ND	ND	ND
Chromium	ND	ND	0.018	ND
Copper	ND	ND	0.012	ND
Lead	ND	ND	ND	ND
Mercury	ND	ND	ND	ND
Nickel	ND	---	---	ND
Selenium	ND	ND	ND	ND
Silver	ND	ND	ND	ND

Note: -ND indicates none detected at or above the Method Reporting Limit.
-Results of inorganic compounds are reported in mg/L.
-(---) Indicates analyte not analyzed.
-Laboratory analysis provided by Columbia Analytical Services, Inc.

Table 2

Annual (1992) Groundwater Statistical Results
J.H. Baxter South Woodwaste Landfill
Monitoring Well Number BXS-1

Constituents:	Mean	Variance	t*	tc
Statistical Results				
Chloride	16.67	1.4E+01	6.69	2.92
Sulfate	9.07	9.2E-01	12.24	2.92
Tannin-Lignin	0.18	2.1E-02	-1.24	2.92
Nitrate+Nitrite-N	0.67	1.2E-01	2.88	2.92
Ammonia-N	0.03	1.0E-04	-10.30	2.353
Iron	0.01	1.5E-05	-1.03	2.353
Manganese	0.186	9.3E-04	4.07	2.92
Zinc	0.007	6.7E-06	1.00	2.92
pH -Lab	6.13	6.3E-03	24.30	3.182
Conductivity (uS/cm)-lab	292	2.3E+03	4.29	2.353
COD	34	2.8E+02	-2.54	2.353
TOC	3.55	1.4E+00	2.94	2.353
Total Coliforms	94.25	1.3E+04	1.60	2.353
Fluoride	0.1	0.0E+00	ERR	2.353
Total Dissolved Solids	191	1.0E+03	2.70	2.353
Arsenic	0.003	0.0E+00	-13.00	2.353
Barium	0.015	1.3E-05	-1.68	2.353
Cadmium	0.004	2.1E-05	1.17	2.353
Chromium	0.0025	0.0E+00	-1	2.353
Copper	0.008	4.2E-05	0.41	2.353
Lead	0.001	0.0E+00	ERR	2.353
Mercury	0.0003	0.0E+00	ERR	2.353
Nickel	0.01	0.0E+00	ERR	6.314
Selenium	0.0025	0.0E+00	ERR	2.353
Silver	0.005	0.0E+00	ERR	2.353

Note: -A value of 0.5 times the method detection limit was used in place of 'ND' for statistical evaluation.
-Duplicate sample analytical results were averaged.
-A negative t* value indicates no significant difference between monitoring and background well data.
-Results of inorganic compounds are reported in mg/L.
-ERR is result of zero variance for both the upgradient and downgradient data.

Table 2

Annual (1992) Groundwater Statistical Results
J.H. Baxter South Woodwaste Landfill
Monitoring Well Number BXS-2

Constituents:	Mean	Variance	t*	tc
Statistical Results				
Chloride	6.73	1.4E+00	6.60	2.92
Sulfate	0.17	1.3E-02	-9.55	2.92
Tannin-Lignin	0.40	1.0E-02	0.63	2.92
Nitrate+Nitrite-N	0.10	8.5E-22	0.00	2.92
Ammonia-N	0.03	1.6E-04	-10.32	2.353
Iron	0.194	1.6E-02	-0.88	2.353
Manganese	0.647	7.6E-04	33.03	2.92
Zinc	0.005	0.0E+00	ERR	2.92
pH -Lab	6.26	3.4E-03	-24.18	3.182
Conductivity (uS/cm)-lab	586	4.8E+01	103.50	2.353
COD	40	4.7E+01	-2.48	2.353
TOC	5.03	3.8E+00	3.39	2.353
Total Coliforms	29.50	6.0E+02	2.26	2.353
Fluoride	0.1	0.0E+00	ERR	2.353
Total Dissolved Solids	352	1.0E+03	12.42	2.353
Arsenic	0.003	0.0E+00	-13.00	2.353
Barium	0.041	1.3E-06	0.93	2.353
Cadmium	0.002	0.0E+00	ERR	2.353
Chromium	0.0025	0.0E+00	ERR	2.353
Copper	0.005	0.0E+00	-1.00	2.353
Lead	0.001	0.0E+00	ERR	2.353
Mercury	0.0003	0.0E+00	ERR	2.353
Nickel	0.0215	0.0E+00	ERR	6.314
Selenium	0.0025	0.0E+00	ERR	2.353
Silver	0.005	0.0E+00	ERR	2.353

Note: -A value of 0.5 times the method detection limit was used in place of 'ND' for statistical evaluation.
-Duplicate sample analytical results were averaged.
-A negative t* value indicates no significant difference between monitoring and background well data.
-Results of inorganic compounds are reported in mg/L.
-ERR is result of zero variance for both the upgradient and downgradient data.

Table 2

Annual (1992) Groundwater Statistical Results
J.H. Baxter South Woodwaste Landfill
Monitoring Well Number BXS-3

Constituents:	Mean	Variance	t*	tc
Statistical Results				
Chloride	7.70	2.5E-01	18.68	2.92
Sulfate	0.10	8.5E-22	-10.58	2.92
Tannin-Lignin	2.03	1.7E+00	2.27	2.92
Nitrate+Nitrite-N	0.40	2.7E-01	1.00	2.92
Ammonia-N	0.09	3.2E-03	-8.63	2.353
Iron	1.744	8.4E+00	0.26	2.353
Manganese	1.660	9.1E-01	2.81	2.92
Zinc	0.005	0.0E+00	ERR	2.92
pH -Lab	6.41	1.9E-02	16.07	3.182
Conductivity (uS/cm)-lab	533	2.4E+03	14.02	2.353
COD	106	6.7E+02	-1.59	2.353
TOC	18.68	7.6E+00	12.07	2.353
Total Coliforms	104.50	1.7E+04	1.57	2.353
Fluoride	0.1	0.0E+00	ERR	2.353
Total Dissolved Solids	351	4.4E+02	18.39	2.353
Arsenic	0.003	0.0E+00	-13.00	2.353
Barium	0.036	1.1E-05	0.37	2.353
Cadmium	0.002	3.1E-06	1.00	2.353
Chromium	0.0025	0.0E+00	-1	2.353
Copper	0.007	1.2E-05	0.00	2.353
Lead	0.1	0.0E+00	ERR	2.353
Mercury	0.0003	0.0E+00	ERR	2.353
Nickel	0.01	0.0E+00	ERR	2.353
Selenium	0.0025	0.0E+00	ERR	2.353
Silver	0.005	0.0E+00	ERR	2.353

Note: -A value of 0.5 times the method detection limit was used in place of 'ND' for statistical evaluation.
-Duplicate sample analytical results were averaged.
-A negative t* value indicates no significant difference between monitoring and background well data.
-Results of inorganic compounds are reported in mg/L.
-ERR is result of zero variance for both the upgradient and downgradient data.

Table 2

Annual (1992) Groundwater Statistical Results
J.H. Baxter South Woodwaste Landfill
Monitoring Well Number BXS-4

Constituents:	Mean	Variance	t*	tc
Statistical Results				
Chloride	2.17	1.3E-02		
Sulfate	1.97	9.3E-02		
Tannin-Lignin	0.33	2.3E-02		
Nitrate+Nitrite-N	0.10	8.5E-22		
Ammonia-N	0.67	1.5E-02		
Iron	1.255	5.8E+00		
Manganese	0.113	2.1E-05		
Zinc	0.005	0.0E+00		
pH -Lab	7.86	1.4E-02		
Conductivity (uS/cm)-lab	189	1.1E+01		
COD	231	2.4E+04		
TOC	1.53	4.6E-01		
Total Coliforms	1.75	2.3E+00		
Fluoride	0.1	0.0E+00		
Total Dissolved Solids	147	5.4E+01		
Arsenic	0.006	2.5E-07		
Barium	0.032	3.9E-04		
Cadmium	0.002	0.0E+00		
Chromium	0.0064	6.0E-05		
Copper	0.007	1.2E-05		
Lead	0.001	0.0E+00		
Mercury	0.0003	0.0E+00		
Nickel	0.01	0.0E+00		
Selenium	0.0025	0.0E+00		
Silver	0.005	0.0E+00		

Note: -A value of 0.5 times the method detection limit was used in place of 'ND' for statistical evaluation.
-Duplicate sample analytical results were averaged.
-A negative t* value indicates no significant difference between monitoring and background well data.
-Results of inorganic compounds are reported in mg/L.
-ERR is result of zero variance for both the upgradient and downgradient data.

background and monitoring well parameter. A negative t-statistic implies that there is no significant difference between a background and monitoring well parameter. Criteria for comparing t* and tc are outlined in 4O CFR "performance."

Time Series Plots

Time Series Plots (concentration versus time) were constructed based on results for chloride, Sulfate, tannin-lignin, nitrate-plus nitrite, ammonia, iron, manganese, COD, and TOC (Figures 3 through 12). The data were collected between August 18, 1987, and December 9, 1992. Results reported below detection limit were plotted as zero. Table 3 summarizes comments on the time series plots.

Discussion of Results

Statistical Analysis

Table 4 lists parameters having a t-statistic greater than or equal to the comparison statistic. These parameters are considered to have statistically increased downgradient from the background levels during the 1992 monitoring period. The mean values of the parameters in the background and the monitoring wells are listed for comparison.

Groundwater collected at BXS-1 has statistically increased in chloride, sulfate, pH-laboratory, conductivity-laboratory, and total organic carbon (TOC). Waters collected at BXS-2 and BXS-3 have statistically increased in chloride, laboratory pH and conductivity, TOC, and total dissolved solids.

Tables 5 and 6 list the parameters statistically higher than background for the 1990-1991 and 1988-1989 sampling periods, respectively. Comparing 1992 results to 1990-1991 results shows that chloride, sulfate, conductivity, and TDS have exceeded background values in the past. 1988-1989 results also showed an increase over background in the concentration of chloride, sulfate, and conductivity.

Volatile Organic Compound Results

J.H. Baxter was required to collect one sample for VOC analysis from each well. Wells BXS-1, BXS-2, and BXS-3 were sampled in December 1991. Results for these three analyses were discussed in EMCON's 1992 report. At that time, only trichloro-fluorethane (Freon 11) was detected near the method reporting limit at BXS-1.

In December 1991, BXS-4 was sampled along with the other three wells, but the laboratory accidently froze the sample. Resampling could not be completed until the first

Table 3

Summary of Time Series Plot Comments

Constituent	Comment
Chloride	Chloride results show a significant decrease. BXS-4, upgradient well, was significantly lower than BXS-1, BXS-2, and BXS-3.
Sulfate	Results from BXS-1 show the highest values. Results for BXS-4, an upgradient well, show the second highest values.
Tannin-Lignin	Plots are variable.
Nitrate plus Nitrite as Nitrogen	Generally is below detection limits except for BXS-1.
Ammonia as Nitrogen	Results for BXS-4, upgradient well, are the highest concentrations.
Iron	Results are generally low. Highest values are found at BXS-3.
Manganese	Results are generally constant except for BXS-3 which shows a slight increase.
Conductivity	Results for BXS-1, BXS-2, and BXS-3 are all higher than BXS-4, an upgradient well.
COD	Results are generally constant. Highest values are found at BXS-4, upgradient well.
TOC	Results are generally constant with wells BXS-1, BXS-2, and BXS-3 and all are higher than BXS-4, an upgradient well.

Table 4

Summary of Parameters Statistically Higher than Background Values 1992 (mg/L)

South Site

	BXS-1 Mean Value Downgradient	BXS-2 Mean Value Downgradient	BXS-3 Mean Value Downgradient	BXS-4 Mean Value Upgradient
Chloride	16.67	6.73	7.7	2.17
Sulfate	9.07	*	*	1.97
Conductivity (μs/cm)-Lab	292	586	533	189
Total Dissolved Solids	*	352	351	147
pH-Lab	6.13	6.26	6.41	7.86
TOC	3.55	5.03	18.7	1.53

* Not statistically higher than background.

Table 5

Summary of Parameters Statistically Higher than Background Values 1990-1991 (mg/L)

South Site

	BXS-1 Mean Value Downgradient	BXS-2 Mean Value Downgradient	BXS-3 Mean Value Downgradient	BXS-4 Mean Value Upgradient
Chloride	22.5	14.5	6.78	2.2
Sulfate	6.58	*	*	1.93
Conductivity	366	624	500	214.67
Manganese	*	0.65	1.82	0.099
Dissolved Solids	*	397	436	228.33
Nitrate	0.72	*	*	0.1
COD	27.92	41.2	97.8	2.2
Iron	*	0.14	1.95	0.048
Tannin-Lignin	*	*	3.08	1.36

* Not statistically higher than background.

Table 6

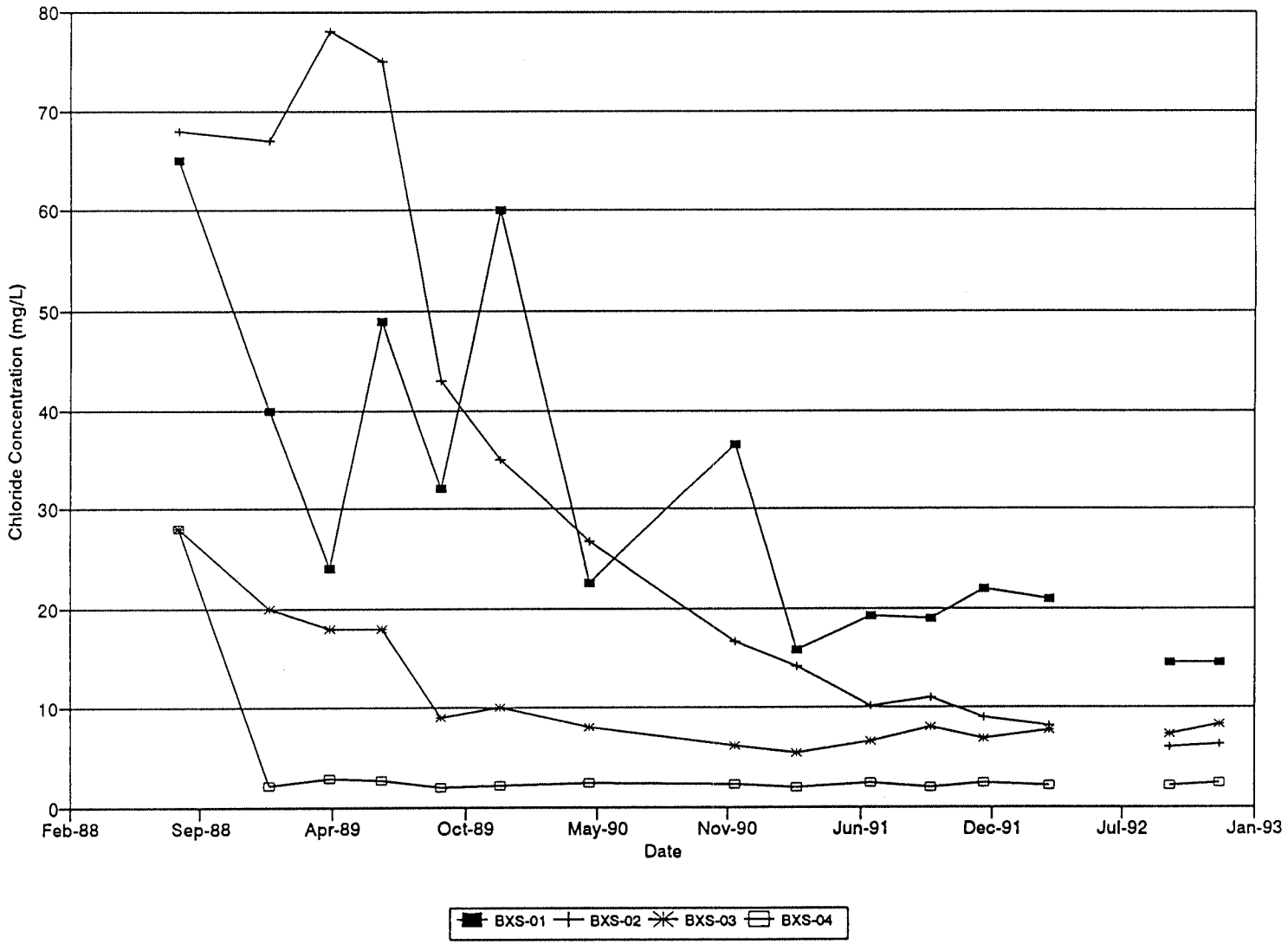
Summary of Parameters Statistically Higher than Background Values 1988-1989 (mg/L)

South Site

	BXS-1 Mean Value Downgradient	BXS-2 Mean Value Downgradient	BXS-3 Mean Value Downgradient	BXS-4 Mean Value Upgradient
Chloride	45	61	17.2	6.6
Sulfate	5.9	*	*	2.28
Conductivity	351	607	514	180
Manganese	0.21	0.58	1.12	0.12

* Not statistically higher than background.

quarter sampling event in 1992. BXS-4 was resampled during the first sampling round, and no VOCs were detected.



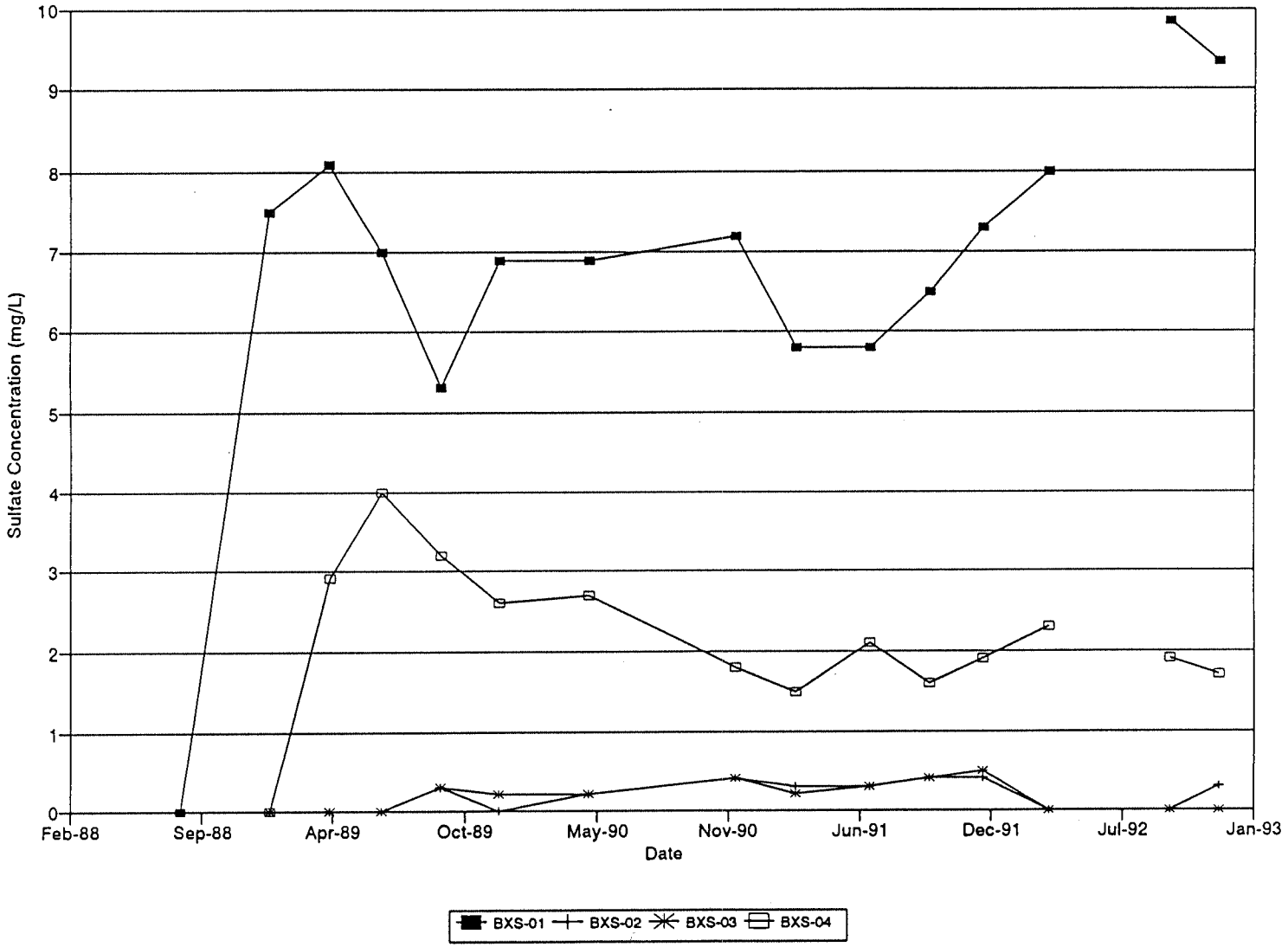
EMCON Northwest, Inc.

DATE 4-93
DWN. MLP
APPR.
REVIS.
PROJECT NO. 0191-001.03

Figure 3
J.H. BAXTER SOUTH WOODWASTE LANDFILL

TIME SERIES PLOT - CHLORIDE vs. TIME

KUKER-RANKEN,INC./106857



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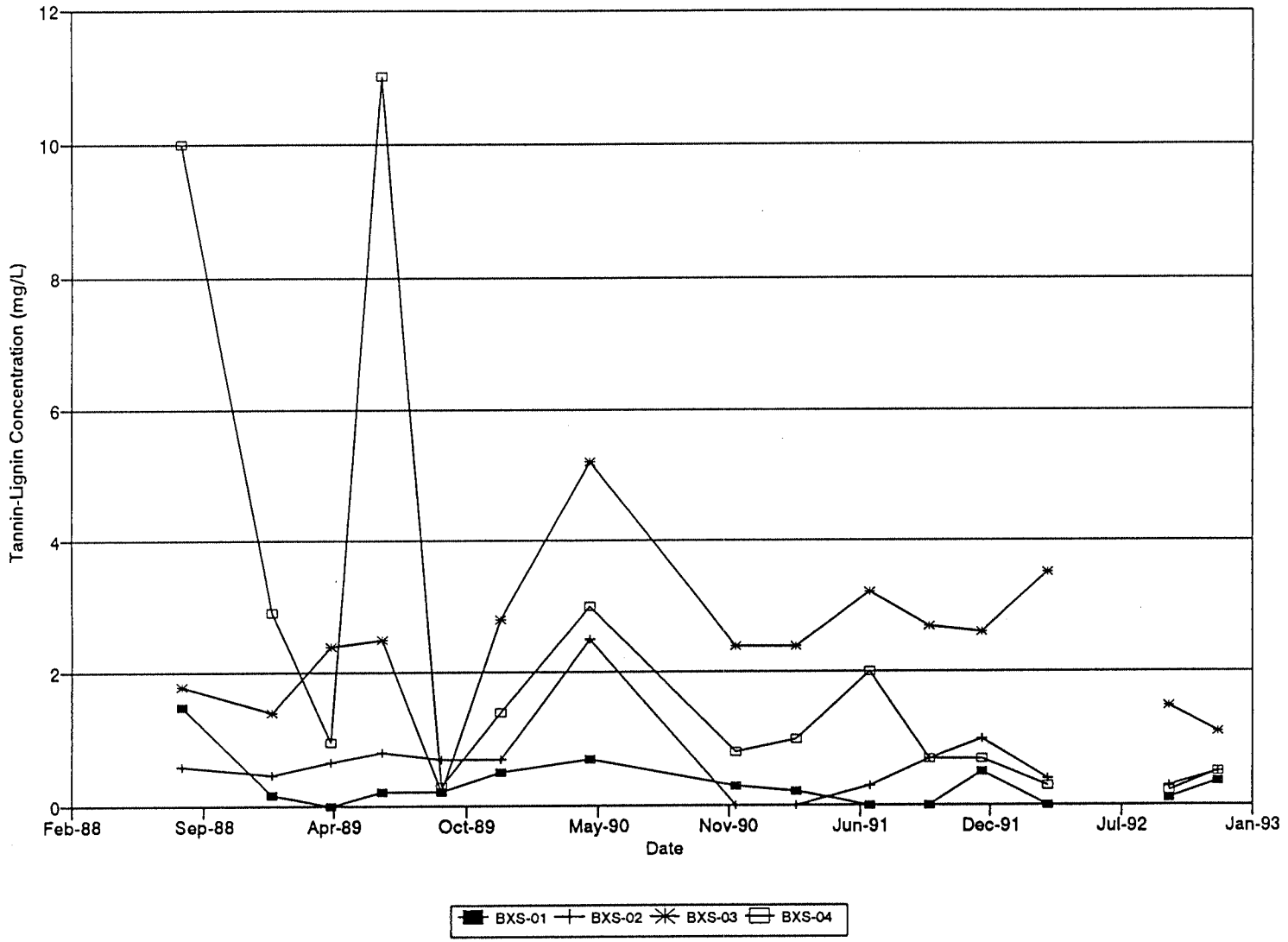
REVIS.
PROJECT NO. 0191-001.03

Figure 4
J.H. BAXTER SOUTH WOODWASTE LANDFILL

TIME SERIES PLOT - SULFATE vs. TIME

KUKER-RANKEN,INC./106857



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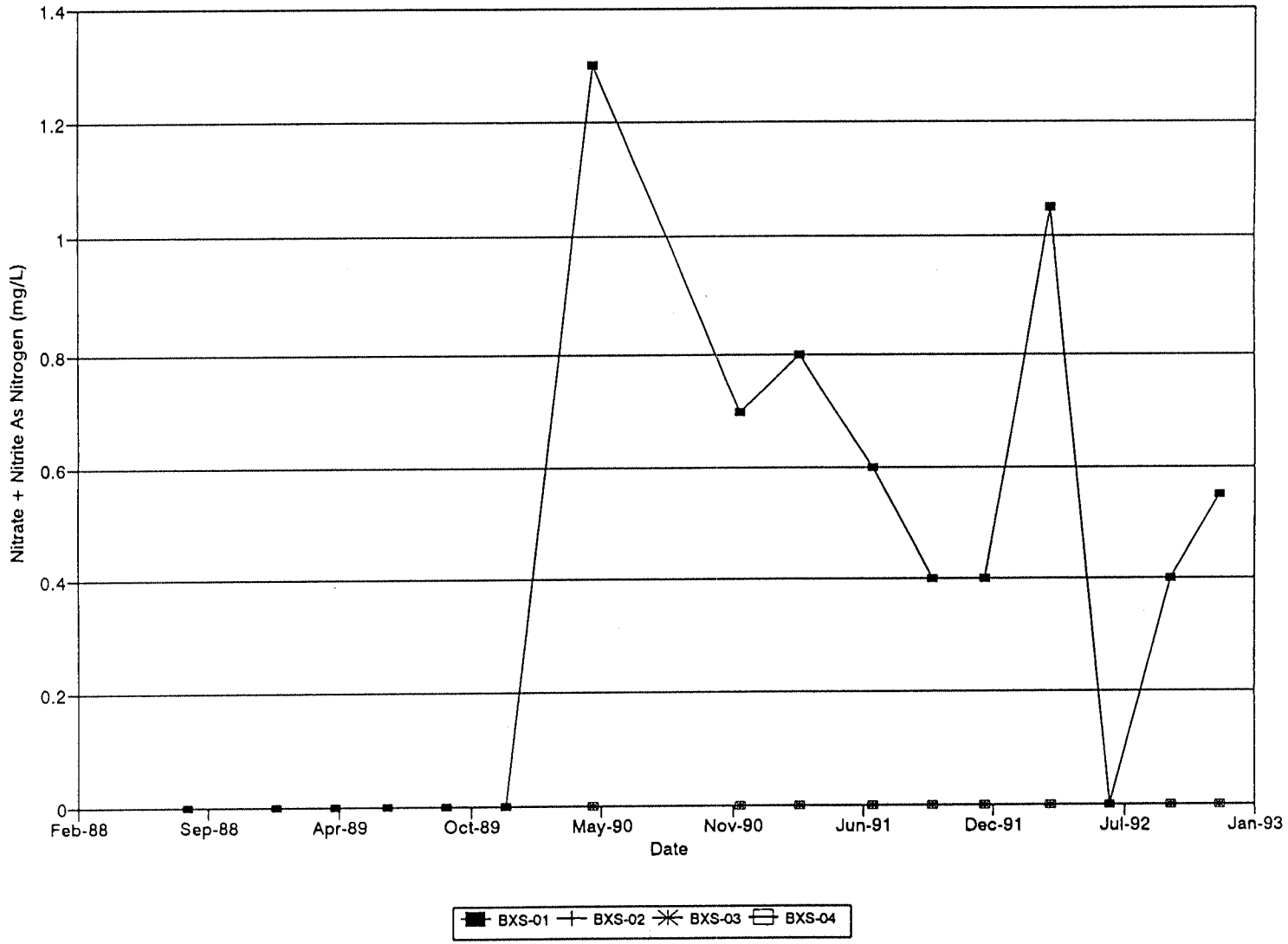
PROJECT NO. 0191-001.03

Figure 5
J.H. BAXTER SOUTH WOODWASTE LANDFILL

TIME SERIES PLOT - TANNIN-LIGNIN vs. TIME

KUKER-RANKEN,INC./106857



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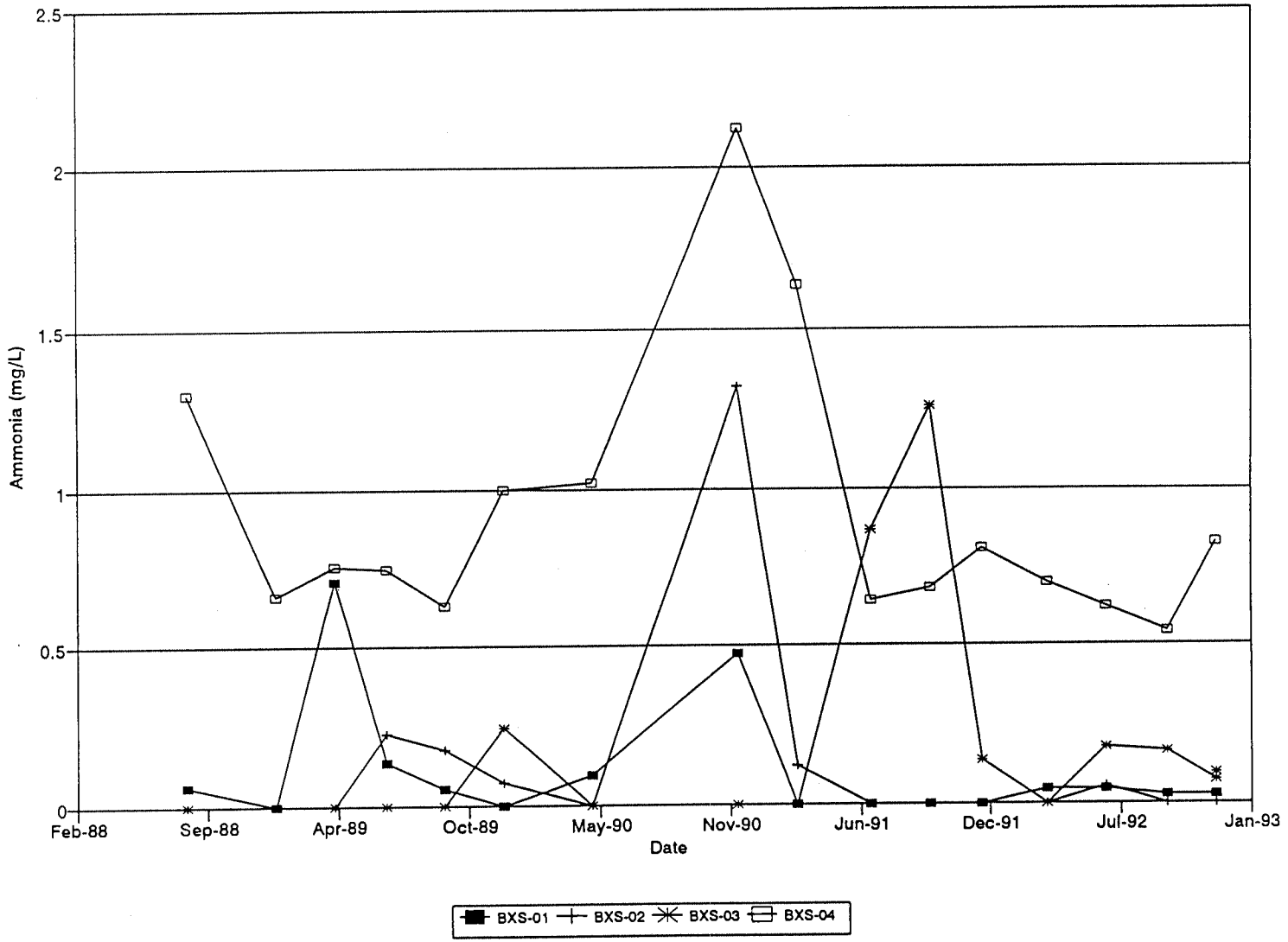
PROJECT NO. 0191-001.02

Figure 6
J.H. BAXTER SOUTH WOODWASTE LANDFILL

TIME SERIES PLOT - NITRATE PLUS NITRITE vs. TIME

KUKER-RANKEN INC. / 106857



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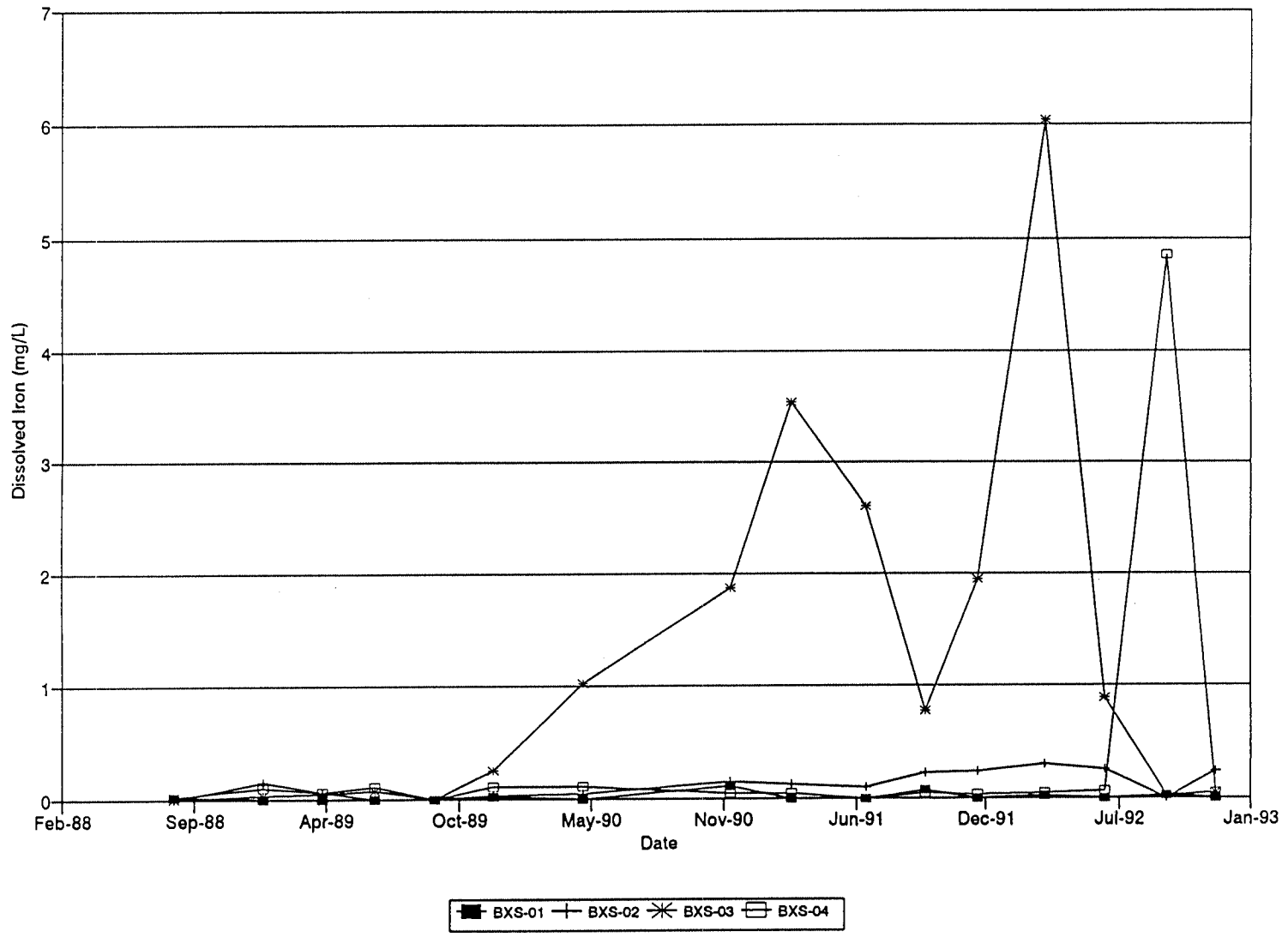
PROJECT NO. 0191-001.02

Figure 7
J.H. BAXTER SOUTH WOODWASTE LANDFILL

TIME SERIES PLOT - AMMONIA AS NITROGEN vs. TIME



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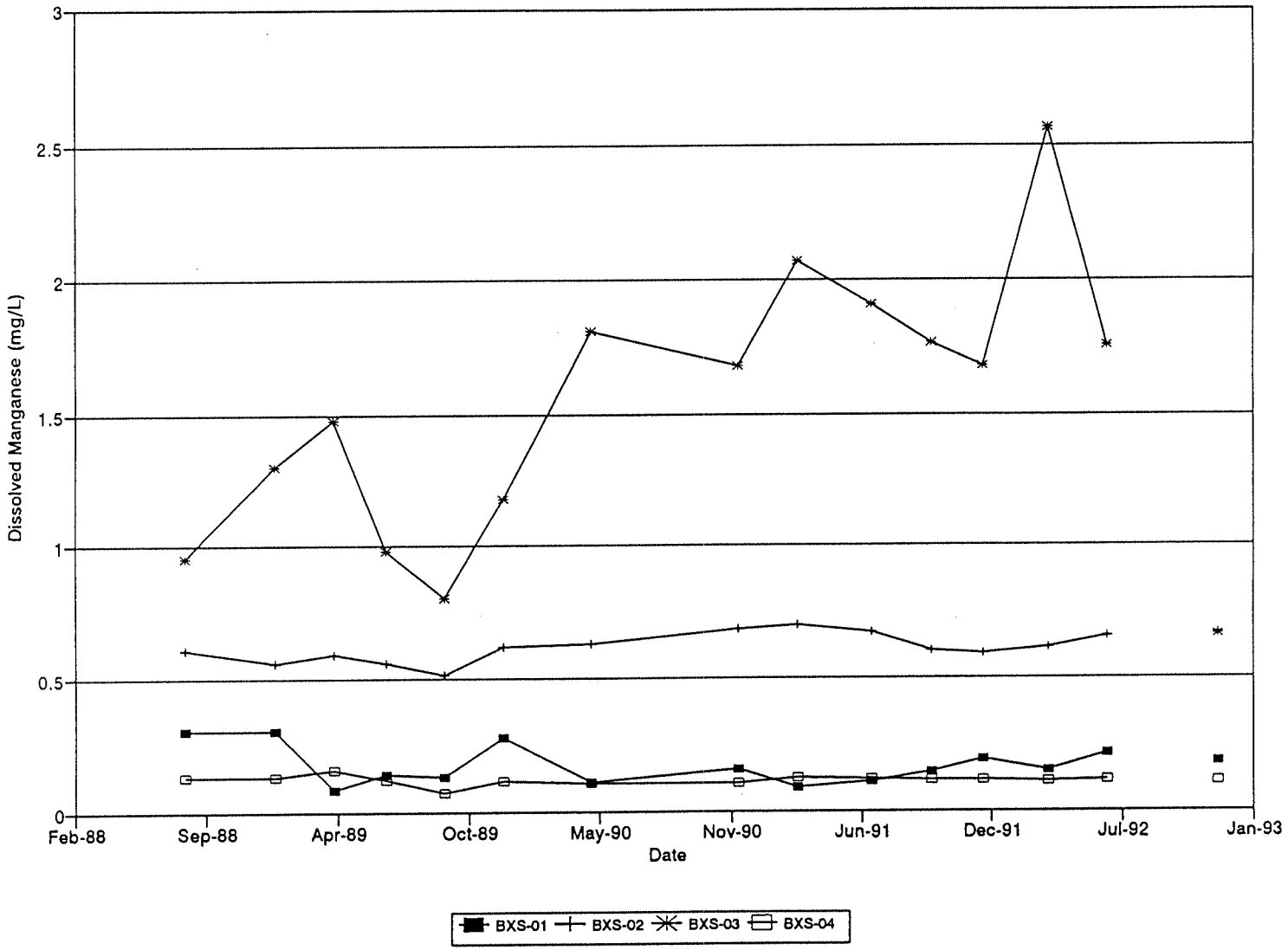
PROJECT NO. 0191-001.02

Figure 8
J.H. BAXTER SOUTH WOODWASTE LANDFILL

TIME SERIES PLOT - IRON vs. TIME

KUKER-RANKEN,INC./106857



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PROJECT NO. 0191-001.02

Figure 9
J.H. BAXTER SOUTH WOODWASTE LANDFILL

TIME SERIES PLOT - MANGANESE vs. TIME

KUKER-RANKEN,INC./106857

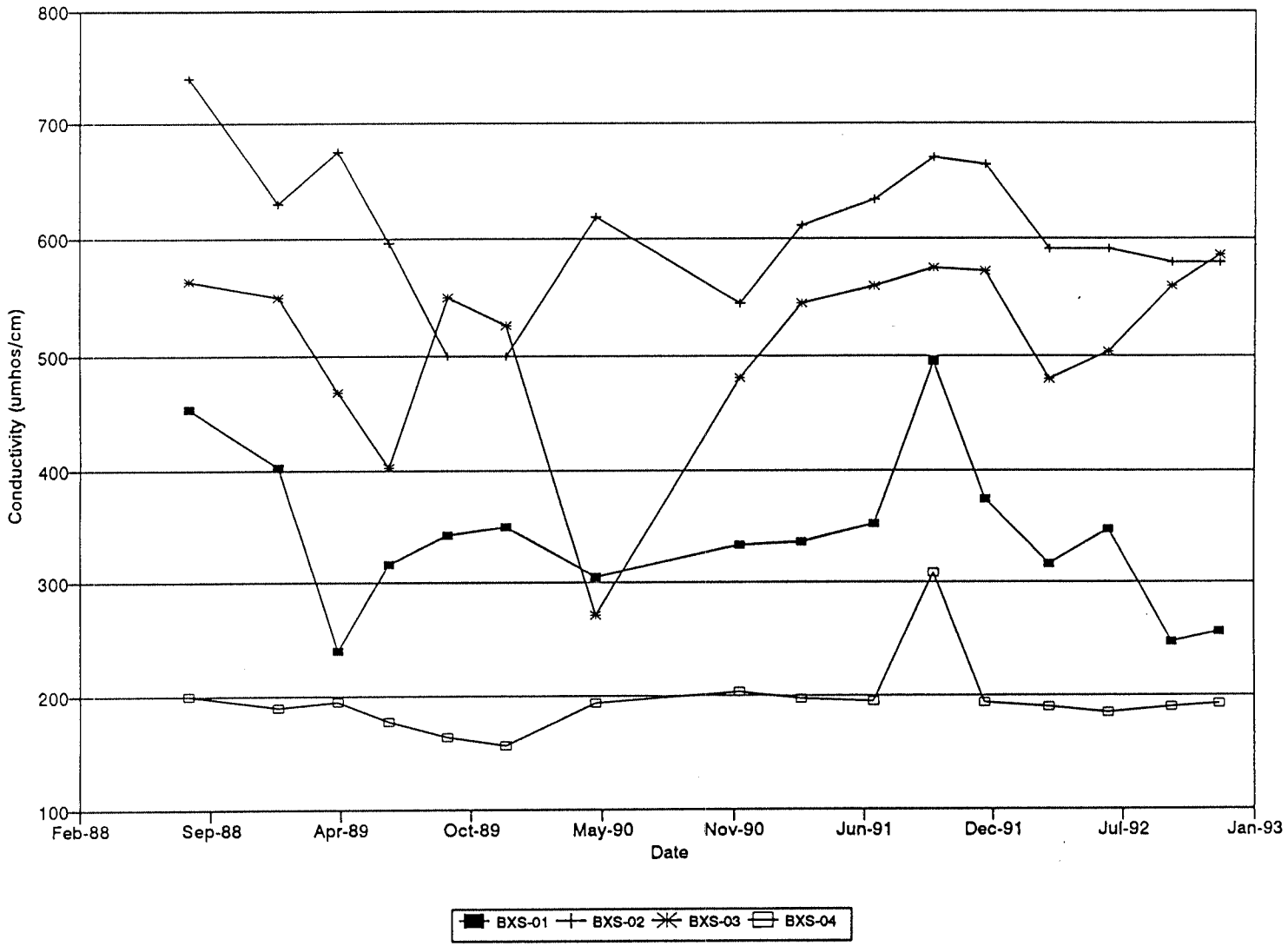

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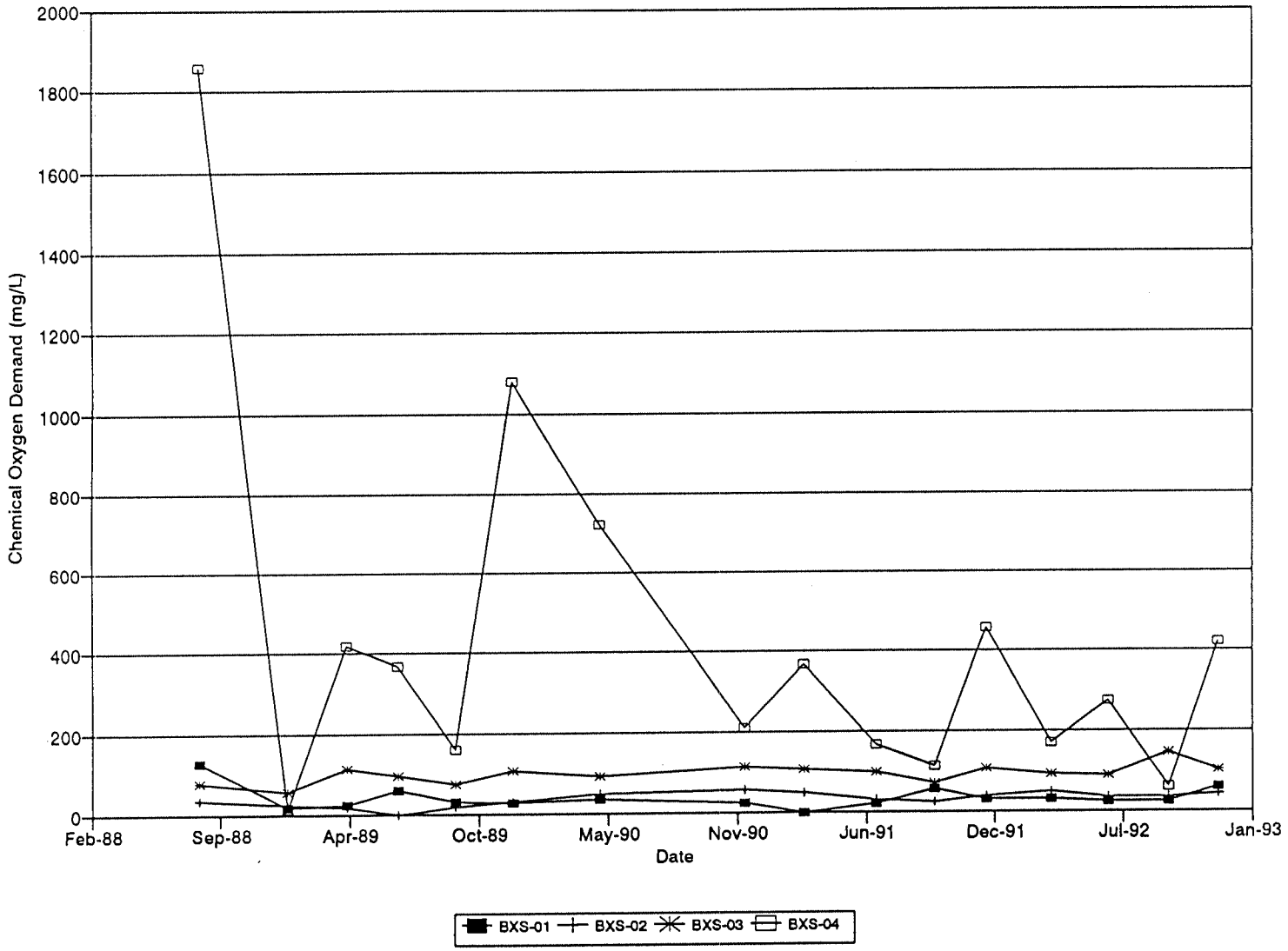
Figure 10
J.H. BAXTER SOUTH WOODWASTE LANDFILL

TIME SERIES PLOT- LABORATORY CONDUCTIVITY vs. TIME

KUKER-RANKEN,INC./106857



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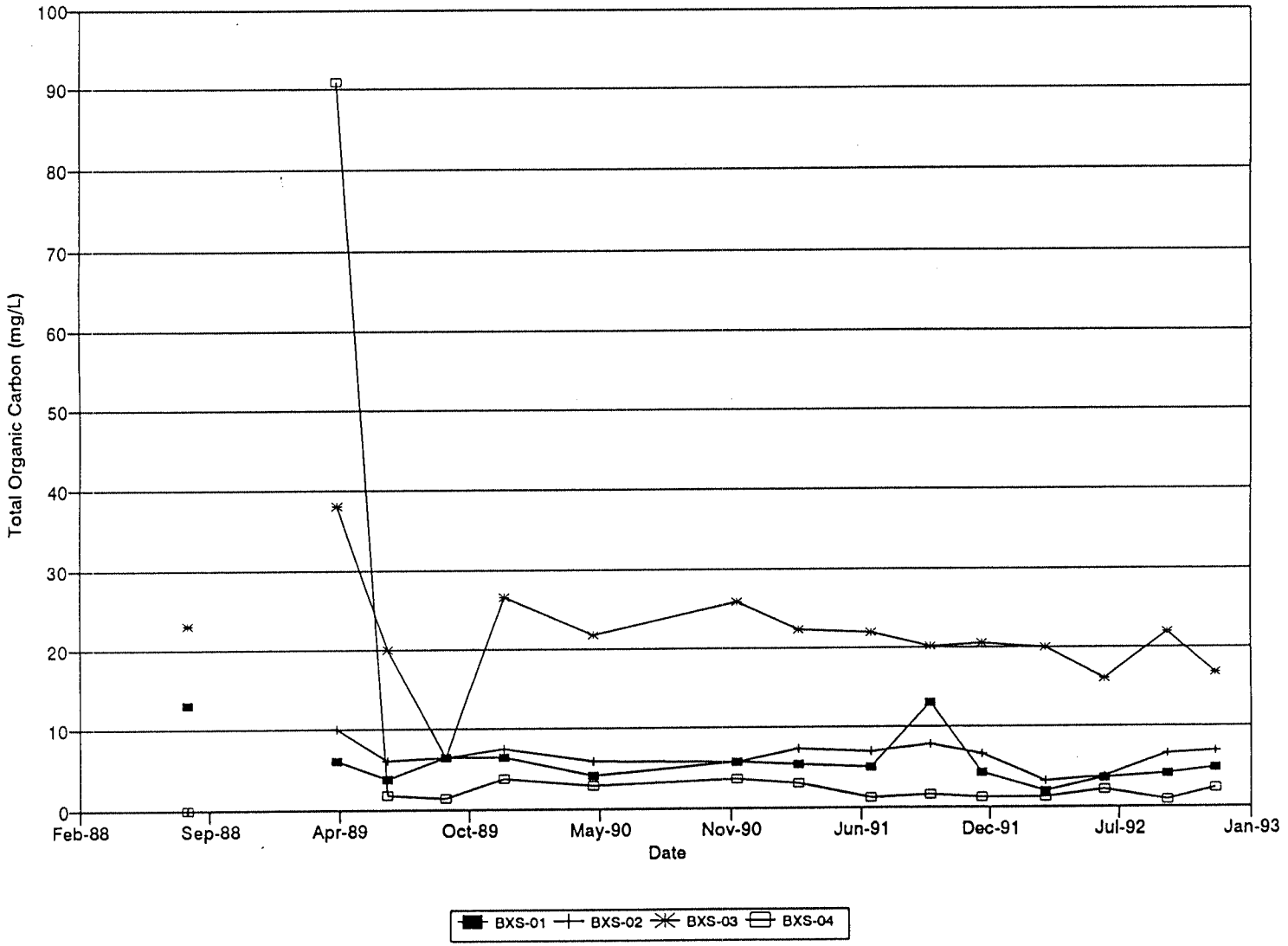
PROJECT NO. 0191-001.02

Figure 11
J.H. BAXTER SOUTH WOODWASTE LANDFILL

TIME SERIES PLOT - COD vs. TIME

KUKER-RANKEN,INC./106857



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DATE 4-93
DWN. MLP
APPR.
REVIS.
PROJECT NO. 0191-001.02

Figure 12
J.H. BAXTER SOUTH WOODWASTE LANDFILL

TIME SERIES PLOT - TOC vs. TIME

KUKER-RANKEN,INC./106857

REFERENCES

EMCON (formerly Sweet-Edwards/EMCON). 1989. *Hydrogeologic Report, J.H. Baxter South Woodwaste Landfill, Arlington, Washington.* Prepared for J.H. Baxter by EMCON Northwest, Bothell, Washington, January.

EMCON (formerly Sweet-Edwards/EMCON). 1990. *Summary Report, Quarterly Ground Water, Sampling Results 1988 through 1989. J.H. Baxter South Woodwaste Landfill.* Prepared for J.H. Baxter by EMCON Northwest, Bothell, Washington, March 5.

EMCON. 1992. *Draft Summary Report, Quarterly Ground Water Sampling Results, 1990 through 1991, J.H. Baxter South Woodwaste Landfill.* Prepared for J.H. Baxter by EMCON Northwest, Inc., Bothell, Washington, April 22.

APPENDIX A

FIELD DATA SHEETS

Sweet-Edwards/EMCON, Inc.
18912 North Creek Parkway, Suite 210 • Bothell, WA 98011
Office (206) 485-5000 • FAX (206) 486-9766

Field Sampling Data

* Duplicate *

LOCATION/ADDRESS ARLINGTON, WA
PROJECT NAME BAXTER SOUTH #910102
CLIENT/CONTACT Steve Sagstad

Well or Surface Site Number BXS-1
Sample Designation BXS-0392-1
Date, Time 3-24-92 1030
Weather Cloudy 50°

HYDROLOGY MEASUREMENTS:

(Nearest .01 ft.)	Elevation	Date, Time	Method Used (M-Scope Number or Other)
35.42		3-24-92 1030	Actat

WELL EVACUATION:

Gallons	Pore Volumes	Method Used	Rinse Method	Date, Time
7+	3+	bailer	as below	3-24-92 1030

Surface Water Flow Speed _____ Measurement Method _____ Date, Time _____

SAMPLING:

Sample	Date, Time	Method	Volume (ml)	Container Type	Depth Taken (feet)	Field Filtered (yes,no)	Preservative	Iced (yes,no)	Sampler Cleaning Method
Diss Metal	3-2-92	Bailer	500	poly		yes	HNO_3	Y	Non-Phosphatic detergent wash
TOC, COD, NH_3			1000			No	H_2SO_4		H_2O rinse
Cl, Cl^-			1000						MeOH rinse
NO_2/NO_3			500	↓					Distilled H_2O rinse
Tot. Coli.		↓	50	polybag				↓	

FIELD WATER QUALITY TESTS:

Pore Vol. Number	pH	Conductivity	Temp	Final gal
1	6.49	433	11.5	2.25
2	6.37	323	11.5	4.5
3	6.20	296	11.5	6.75

NOTES:

well depth: 49' - 35.5 = 13.5 ÷ 6 = 2.25
Duplicate: BXS-0392-2 1045
light brown, cloudy, no odor

Total # of Bottles: 5 + 5 = 10

Signature: Sharon Burkett

SEA-400-01

Sweet-Edwards/EMCON, Inc.
18912 North Creek Parkway, Suite 210 • Bothell, WA 98011
Office (206) 485-5000 • FAX (206) 486-9766

Field Sampling Data

Well or Surface Site Number BXS-2
LOCATION/ADDRESS ARLINGTON, WA
Sample Designation BXS-0392-5
PROJECT NAME BAXTER South #910102
Date, Time 3-24-92 1220
CLIENT/CONTACT Steve Sagstad
Weather 50°, Cloudy

HYDROLOGY MEASUREMENTS:

(Nearest .01 ft)	Elevation	Date, Time	Method Used (M-Scope Number or Other)
34.08		3-24-92	Actat

WELL EVACUATION:

Gallons	Pore Volumes	Method Used	Rinse Method	Date, Time
9	3+	bailer	As below	3-24-92

Surface Water Flow Speed _____ Measurement Method _____ Date, Time _____

SAMPLING:

Sample	Date, Time	Method	Volume (ml)	Container Type	Depth Taken (feet)	Field Filtered (yes,no)	Preservative	Iced (yes,no)	Sampler Cleaning Method
Diss Metal	3-24-92	Bailer	500	poly		yes	HNO_3	Y	Non-Phosphate detergent wash, H2O rinse, MeOH rinse, Distilled H2O rinse
TOC, COD, NH_3			1000			no	H_2SO_4		
Cl⁻,			1000						
SO_4/NO_3	1220		500						
Tot. Coli:			50	polybag					

FIELD WATER QUALITY TESTS:

Pore Vol. Number	pH	Conductivity	Temp	Est. gal
1	6.50	727	14	3
2	6.46	649	14	6
3	6.31	655	14	9

NOTES:

well depth: 54' - 35 = 19 ÷ 6 ≅ 3 gal PV
gray-brown, cloudy, no odor

Total # of Bottles: 5

Signature: Sharon Burkett

SEA-400-01

Sweet-Edwards/EMCON, Inc.
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Office (206) 485-5000 • FAX (206) 486-9766

Field Sampling Data

LOCATION/ADDRESS ARLINGTON, WA
PROJECT NAME BAXTER SOUTH #910102
CLIENT/CONTACT Steve Sagstad

Well or Surface Site Number BXS-3
Sample Designation BXS-032492-1140
Date, Time 3-24-92 1140
Weather Cloudy 50°

HYDROLOGY MEASUREMENTS:

(Nearest .01 ft.)	Elevation	Date, Time	Method Used (M-Scope Number or Other)
30.58		3-24-92	Actat

WELL EVACUATION:

Gallons	Pore Volumes	Method Used	Rinse Method	Date, Time
6+	3+	bailer	As Below	3-24-92 1140

Surface Water Flow Speed _____ Measurement Method _____ Date, Time _____

SAMPLING:

Sample	Date, Time	Method	Volume (ml)	Container Type	Depth Taken (feet)	Field Filtered (yes,no)	Preservative	Iced (yes,no)	Sampler Cleaning Method
Diss Metal	3-24-92	Bailer	500	poly		yes	HNO_3	Y	Non-Phosphatic detergent wash, H2O rinse, MeOH rinse, Distilled H2O rinse
TOC, COD, NH_3	1140		1000			no	H_2SO_4		
Cl, Cl⁻			1000						
SO_2/NO_3			500						
Tot. Coli.			50	poly bag				Y	

FIELD WATER QUALITY TESTS:

Pore Vol. Number	pH	Conductivity	Temp	Fr gal
1	6.56	569	16	2
2	6.59	562	16	4
3	6.52	550	16.5	6

NOTES:

well depth: 43' - 30.58 = 12.42 ÷ 6 = 2 gal PV
gray, cloudy; cedar-like odor

Total # of Bottles: 5

Signature: Sharon Burkett

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Field Sampling Data

LOCATION/ADDRESS Arlington, WA
PROJECT NAME Bassett South #S910102
CLIENT/CONTACT Steve Sagstad

Well or Surface Site Number BXS-4
Sample Designation BXS-0392-6
Date, Time 3-24-92 1315
Weather cloudy, 50°

HYDROLOGY MEASUREMENTS:

(Nearest .01 ft.)	Elevation	Date, Time	Method Used (M-Scope Number or Other)
13.00		3-24-92 1235	Actat

WELL EVACUATION:

Gallons	Pore Volumes	Method Used	Rinse Method	Date, Time
18+	3+	bailer	As below	3-24-92 1315

Surface Water Flow Speed _____, Measurement Method _____, Date, Time _____

SAMPLING:

Sample	Date, Time	Method	Volume (ml)	Container Type	Depth Taken (feet)	Field Filtered (yes,no)	Preservative	Iced (yes,no)	Sampler Cleaning Method
1. Metal	3-24-92	bailer		poly		Y	HNO_3	Y	Non-Phosphatic detergent wash, H_2O rinse, MeOH rinse, Distilled H_2O rinse
2. COD, NH_3	1315					N	H_2SO_4		
3. Cond, Cl									
4. NO_2/NO_3									
5. Oil				Poly bag					
VOC		~~3~~	3x40	glass					

FIELD WATER QUALITY TESTS:

Pore Vol. Number	pH	Conductivity	Temp	Eh				
1	8.65	228	9.5	6 gal				
2	8.61	204	9.5	12				
3	8.50	201	10	18				

NOTES:

Depth: 47' - 13 = ~~34~~ 34 ÷ 6 = 5 2/3 gal PV
brown, cloudy, no odor

Total # of Bottles: 8

Signature: Sharon Burkett

Sweet-Edwards/EMCON, Inc.
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Office (206) 485-5000 • FAX (206) 486-9766

Field Sampling Data

FIELD BLANK

LOCATION/ADDRESS Arlington, Wa
PROJECT NAME Paxter South, 910102
CLIENT/CONTACT Steve Sagstad

Well or Surface Site Number Field Blank
Sample Designation BXS-0392-3
Date, Time 3-24-92 1055
Weather Cloudy, 50°

HYDROLOGY MEASUREMENTS:

(Nearest .01 ft.)	Elevation	Date, Time	Method Used (M-Scope Number or Other)

WELL EVACUATION:

Gallons	Pore Volumes	Method Used	Rinse Method	Date, Time
				3-24-92 1055

Surface Water Flow Speed _____, Measurement Method _____, Date, Time _____

SAMPLING:

Sample	Date, Time	Method	Volume (ml)	Container Type	Depth Taken (feet)	Field Filtered (yes,no)	Preservative	Iced (yes,no)	Sampler Cleaning Method
Metal	3-24-92	Bailer	500	Poly		Y	HNO_3	Y	Non-Phosphatic detergent wash H2O rinse MeOH rinse Distilled H2O rinse
D, NH_3	1055		1000			N	H_2SO_4		
tand Cl			1000						
NO_2/NO_3			500						
Coli			50	polybag					

FIELD WATER QUALITY TESTS:

Pore Vol. Number	pH	Conductivity	Temp	Eh
1	6.99	62.9	10.5	

NOTES:

Field Blank Taken with CAS DI water through a decontaminated Teflon bailer.

Total # of Bottles: 5

Signature: Sharon Burkett

SEA-400-01

Sweet-Edwards / EMCON, Inc.
Kelso, WA (206) 423-3580
Bothell, WA (206) 485-5000

Chain of Custody / Laboratory Analysis Request

DATE 3-24-92 PAGE 1 OF 1

PROJECT [illegible] # [illegible]
CLIENT INFO. CONTACT [illegible], Sagstad
ADDRESS MCCAJ NW
TELEPHONE# 485-5000
SAMPLERS NAME [illegible] PHONE# 485-5000
SAMPLERS SIGNATURE [illegible]

ANALYSIS REQUESTED — GENERAL CHEMISTRY (Specify) — OTHER (Specify)

SAMPLE I.D.	DATE	TIME	LAB I.D.	TYPE	BASE/NEU/ACID ORGAN. GC/MS/625/8270	VOLATILE ORGANICS GC/MS/624/8240	HALOGENATED VOLATILE ORGANICS 601/8010	PHENOLICS 604/8040	POLYNUCLEAR AROMATIC 610/8310	TOTAL ORGANIC CARBON (TOC) 415/9060	TOTAL ORGANIC HALIDE (TOX) 9020	EP TOX/TCLP METALS (Circle One)	METALS (TOTAL) Dissolved (See Special Inst.)	TCLP ORGANICS	pH, COND ALK	NO_3/NO_2, Cl SO_4	Ca, Mg, Na, K	COD	Total Coliform	NH_3	tannin/lignin	TDS	Fl-	NUMBER OF CONTAINERS
1. BXS 0392-1	3/24/92	1000		Water						X			X		X	X		X	X	X	X	X	X	5
2. BXS-0392-2	↓	1015		↓						X			X		X	X		X	X	X	X	X	X	5
3. BXS-0392-3	↓	1055		↓						X			X		X	X		X	X	X	X	X	X	5
4. BXS-0392-4	↓	1140		↓						X			X		X	X		X	X	X	X	X	X	5
5. BXS-0392-5	↓	1220		↓						X			X		X	X		X	X	X	X	X	X	5
6. BXS-0392-6	↓	1315		↓		X				X			X		X	X		X	X	X	X	X	X	8
7. Trip Blank						X																		
8.																								

Relinquished By Sweet, Edwards & Assoc.	Relinquished By	Relinquished By	PROJECT INFORMATION	SAMPLE RECEIPT
[illegible]				
Signature [illegible]	Signature	Signature	Shipping I.D. No.	Total No. of Containers
Printed Name [illegible]	Printed Name	Printed Name	VIA	Chain of Custody Seals
Firm 3-24-92 1450	Firm	Firm		Received in good condition
Date/Time	Date/Time	Date/Time	Project	LAB NO.

Received By	Received By	Received By	SPECIAL INSTRUCTIONS/COMMENTS
[illegible]			
Signature Stan Spurgeon	Signature	Signature	
Printed Name CAS	Printed Name	Printed Name	
Firm 3-24-92 1450	Firm	Firm	
Date/Time	Date/Time	Date/Time	

DISTRIBUTION: WHITE - return to originator; YELLOW - lab; PINK - retained by originator.

S-E/E 400-05

Sweet-Edwards/EMCON, Inc.
18912 North Creek Parkway, Suite 210 • Bothell, WA 98011
Office (206) 485-5000 • FAX (206) 486-9766

Field Sampling Data

★ Duplicate

LOCATION/ADDRESS Baxter - South
PROJECT NAME Arlington, Wa. # 591-01.02
CLIENT/CONTACT Steve Sagstad

Well or Surface Site Number MW-1
Sample Designation BxS-0692-1
Date, Time 6-23-92 12:30
Weather Sunny, 90°

HYDROLOGY MEASUREMENTS:

(Nearest .01 ft.)	Elevation	Date, Time	Method Used (M-Scope Number or Other)
38.40		6-23-92 1200	slope

WELL EVACUATION:

Gallons	Pore Volumes	Method Used	Rinse Method	Date, Time
4+	3+	Bailer	As Below	6-23-92 12:30

Surface Water Flow Speed _____ Measurement Method _____ Date, Time _____

SAMPLING:

Sample	Date, Time	Method	Volume (ml)	Container Type	Depth Taken (feet)	Field Filtered (yes,no)	Preservative	Iced (yes,no)
Diss. Metals	6-23-92 1215	Bailer	500	Poly		Yes	HNO_3	Yes
TOC, COD, NH_3	6-23-92 12	(teflon)	1000	"		NO	H_2SO_4	
pH, cond, Cl^-,	12		1000	"				
SO_4, NO_2/NO_3								
Hal coliform			50	Poly Bag				
~~TOC~~			~~2 x 40~~	~~Glass~~			~~HCl~~	

Sample Cleaning Method: Non-Phosphatic detergent wash, H2O rinse, MeOH rinse, Distilled H2O rinse

FIELD WATER QUALITY TESTS:

Pore Vol. Number	pH	Conductivity	Temp	Bail 2
1	6.98	568	14	
2	6.75	494	13	4
3	6.78	450	12	6

NOTES:

Depth = 49' - 38.4 ≈ 11 ÷ 6 = 1.83 pV

*Duplicate sample: BxS-0692-~~0~~2 1215

Total # of Bottles: 4 + 4 = 8

Signature: _____

Sweet-Edwards/EMCON, Inc.
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Office (206) 485-5000 • FAX (206) 486-9766

Field Sampling Data

LOCATION/ADDRESS Baxter - South
PROJECT NAME Arlington, Wa. # S91-01.02
CLIENT/CONTACT Steve Sagstad

Well or Surface Site Number MW-2
Sample Designation BxS-0692-5
Date, Time 6/23/92 13:55
Weather Sunny HOT!!!

HYDROLOGY MEASUREMENTS:

(Nearest .01 ft.)	Elevation	Date, Time	Method Used (M-Scope Number or Other)
37.18		6/23/92	Slope Indicator

WELL EVACUATION:

Gallons	Pore Volumes	Method Used	Rinse Method	Date, Time
10.5+ [redacted]	3+	Bailer		

Surface Water Flow Speed _____ Measurement Method _____ Date, Time _____

SAMPLING:

Sample	Date, Time	Method	Volume (ml)	Container Type	Depth Taken (feet)	Field Filtered (yes,no)	Preservative	Iced (yes,no)
Diss. Metals		Bailer	500	Poly		Yes	HNO_3	Yes
TOC, COD, NH_3		(teflon)	1000	"		no	H_2SO_4	
pH, cond, Cl^-,	6/23/92		1000	"				
SO_4, NO_2/NO_3								
Hal coliform	13:55		50	Poly Bag			Het	
~~TOC~~			~~2 x 40~~	~~Glass~~				

Sampler Cleaning Method: Non-Phosphatic detergent wash, H2O rinse, MeOH rinse, Distilled H2O rinse

FIELD WATER QUALITY TESTS:

Pore Vol. Number	pH	Conductivity	Temp	Eh
1	7.57	580.0 µS	17	
2	7.01	779.0 µS	18	
3	6.69	709.0	17	

NOTES:

Well Depth = 54' - 37.18 = 17 ÷ 6 = ~ 3.5 gal pore volume
water is tan, slightly cloudy, no noticeable odor

Total # of Bottles: 4 Signature: _____

Sweet-Edwards/EMCON, Inc.
18912 North Creek Parkway, Suite 210 • Bothell, WA 98011
Office (206) 485-5000 • FAX (206) 486-9766

Field Sampling Data

LOCATION/ADDRESS Baxter - South
PROJECT NAME Arlington, wa. # 591-01.02
CLIENT/CONTACT Steve Sagstad

Well or Surface Site Number MW-3
Sample Designation BXS-0692-3
Date, Time 6/23/92 13:10
Weather Sunny, Hot

HYDROLOGY MEASUREMENTS:

(Nearest .01 ft.)	Elevation	Date, Time	Method Used (M-Scope Number or Other)
33.73		6/23/92 12:47	Slope Indicator

WELL EVACUATION:

Gallons	Pore Volumes	Method Used	Rinse Method	Date, Time
		Bailer		

Surface Water Flow Speed _____ Measurement Method _____ Date, Time _____

SAMPLING:

Sample	Date, Time	Method	Volume (ml)	Container Type	Depth Taken (feet)	Field Filtered (yes,no)	Preservative	Iced (yes,no)
Diss. Metals		Bailer	500	Poly		Yes	HNO_3	Yes
TOC, COD, NH_3	6/23/92	(teflon)	1000	"		NO	H_2SO_4	
pH, cond, Cl^-,			1000	"				
SO_4, NO_2/NO_3								
Total coliform	13:10		50	Poly Bag				
~~TOC~~			~~same~~	~~Glass~~			~~HCl~~	

Sampler Cleaning Method: Non-Phosphatic detergent wash, H2O rinse, MeOH rinse, Distilled H2O rinse

FIELD WATER QUALITY TESTS:

Pore Vol. Number	pH	Conductivity	Temp	Eh
1	6.5	605 µS	19	
2	6.82	598 µS	19	
3	6.60	582 µS		

NOTES:

Well Depth = 47' - 33.73 = 7 ÷ 6 = ~1 gal PV

Water is tan, slightly cloudy, no noticeable odor

Total # of Bottles: 4 Signature: _____

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Field Sampling Data

Well or Surface Site Number: MW-4
Sample Designation: BXS - 0692 - 4
Date, Time: 6/23/92 14:45
Weather: Clear, Hot

LOCATION/ADDRESS: Baxter - South
PROJECT NAME: Arlington, Wa. # S91-01.02
CLIENT/CONTACT: Steve Sagstad

HYDROLOGY MEASUREMENTS:

(Nearest .01 ft.)	Elevation	Date, Time	Method Used (M-Scope Number or Other)
15.95		6/23/92 14:20	Slope Indicator

WELL EVACUATION:

Gallons	Pore Volumes	Method Used	Rinse Method	Date, Time
12 +	3 +	Bailer		6/23/92 14:45

Surface Water Flow Speed ______, Measurement Method ______, Date, Time ______

SAMPLING:

Sample	Date, Time	Method	Volume (ml)	Container Type	Depth Taken (feet)	Field Filtered (yes,no)	Preservative	Iced (yes,no)
Diss. metals		Bailer	500	Poly		Yes	HNO_3	Yes
TOC, COD, NH_3		(teflon)	1000	"		NO	H_2SO_4	↓
pH, cond, Cl⁻,		↓	1000	"		↓		↓
SO_4, NO_2/NO_3	6/23/92	↓				↓		↓
fecal coliform		↓	50	Poly Bag		↓		↓
~~[illegible]~~	14:45		~~[illegible]~~	~~Glass~~		↓	~~HCl~~	

Sample Cleaning Method: Non-Phosphatic detergent wash, H2O rinse, MeOH rinse, Distilled H2O rinse

FIELD WATER QUALITY TESTS:

Pore Vol. Number	pH	Conductivity	Temp	~~Eh~~ gal
1	7.44	324 µS	13	4
2	7.59	345	13	8
3	7.40	340	14	12

NOTES:

Well Depth = 43' − 15.95 = 27 ~~gal per vol~~ = 4 gal per vol

Water is tan, cloudy, no noticeable odor

Total # of Bottles: 4 Signature: ______

SEA-400-

Sweet-Edwards / EMCON, Inc.
Kelso, WA (206) 423-3580
Bothell, WA (206) 485-5000

Chain of Custody / Laboratory Analysis Request

DATE 6-23-92 PAGE 1 OF 1

PROJECT Baxter North #5910103
CLIENT INFO.
CONTACT Steve Saunstad
ADDRESS EMCON NW
TELEPHONE# 485-5000
SAMPLERS NAME Butch Kaiser PHONE# 485-5000
SAMPLERS SIGNATURE Sharon Burkett

ANALYSIS REQUESTED

SAMPLE I.D.	DATE	TIME	LAB I.D.	TYPE
1. BXN-0692-1	6/23/92			Water
2. BXN-0692-2				
3. BXN-0692-3				
4. BXN-0692-4				
5. BXN-0692-5				
6. BXN-0692-6				
7.				
8.				

BASE/NEU/ACID ORGAN. GC/MS/625/8270	VOLATILE ORGANICS GC/MS/624/8240	HALOGENATED VOLATILE ORGANICS 601/8010	PHENOLICS 604/8040	POLYNUCLEAR AROMATIC 610/8310	TOTAL ORGANIC CARBON (TOC) 415/9060	TOTAL ORGANIC HALIDE (TOX) 9020	EP TOX/TCLP METALS (Circle One)	METALS (TOTAL) (See Special Inst.)	TCLP ORGANICS	GENERAL CHEMISTRY (Specify) pH, COND, ALK	NO_3/NO_2, Cl, SO_4	Ca, Mg, Na, K	COD	OTHER (Specify)				NUMBER OF CONTAINERS
					X			X		X	X		X	X	X	X	X	
					X			X		X	X		X	X	X	X	X	1
					X			X		X	X		X	X	X	X	X	1
					X			X		X	X		X	X	X	X	X	1
					X			X		X	X		X	X	X	X	X	1
					X			X		X	X		X	X	X	X	X	1

Relinquished By Sweet, Edwards & Assoc.	Relinquished By	Relinquished By	PROJECT INFORMATION	SAMPLE RECEIPT
Signature: Sharon Burkett	Signature	Signature		
Printed Name: SHARON BURKETT	Printed Name	Printed Name	Shipping I.D. No.	Total No. of Containers
Firm: EMCON NW	Firm	Firm	VIA	Chain of Custody Seals
Date/Time: 6-23-92 1620	Date/Time	Date/Time	Project	Received in good condition
				LAB NO.
Received By: [signature]	Received By	Received By	SPECIAL INSTRUCTIONS/COMMENTS	
Signature	Signature	Signature	Hold until notified	
Printed Name: CTD	Printed Name	Printed Name	As, Ba, Cd, Cr, Cu, Fe, Pb, Mn, Se, Ag, Zn.	
Firm: 6-23-92 1625	Firm	Firm		
Date/Time	Date/Time	Date/Time		

DISTRIBUTION: WHITE - return to originator; YELLOW - lab; PINK - retained by originator.

S-E/E 400-05

Sweet-Edwards / EMCON, Inc.
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Bothell, WA (206) 485-5000

Chain of Custody / Laboratory Analysis Request

DATE _____ PAGE _____ OF _____

PROJECT Baxter Bourn #5910102
CLIENT INFO.
CONTACT Steve Sargent
ADDRESS Emcon NW
TELEPHONE# 485 5000
SAMPLERS NAME Barker/Clinton PHONE# 485-5000
SAMPLERS SIGNATURE [signature]

SAMPLE I.D.	DATE	TIME	LAB I.D.	TYPE	BASE/NEU/ACID ORGAN. GC/MS/625/8270	VOLATILE ORGANICS GC/MS/624/8240	HALOGENATED VOLATILE ORGANICS 601/8010	PHENOLICS 604/8040	POLYNUCLEAR AROMATIC 610/8310	TOTAL ORGANIC CARBON (TOC) 415/9060	TOTAL ORGANIC HALIDE (TOX) 9020	EP TOX/TCLP METALS (Circle One)	METALS (TOTAL) (See Special Inst.)	TCLP ORGANICS	pH, COND ALK	NO_3/NO_2, Cl SO_4	Ca, Mg, Na, K	COD					NUMBER OF CONTAINERS
1. Bx-0692-1	6/23/92	12:30		Water						X			X		X			X	X	X			4
2. Bx-0692-2		12:45								X			X		X								4
3. Bx-0692-3		13:00								X			X		X								4
4. Bx-0692-4		13:45											X										4
5. Bx-0692-5		13:55											X		X								4
6.																							
7.																							
8.																							

Relinquished By Sweet, Edwards & Assoc.	Relinquished By	Relinquished By	PROJECT INFORMATION	SAMPLE RECEIPT
Signature [signature]	Signature	Signature		Total No. of Containers
Printed Name [illegible]	Printed Name	Printed Name	Shipping I.D. No.	Chain of Custody Seals
Firm [illegible]	Firm	Firm	VIA	Received in good condition
Date/Time	Date/Time	Date/Time	Project	LAB NO.

Received By	Received By	Received By	SPECIAL INSTRUCTIONS/COMMENTS
Signature [signature]	Signature	Signature	[illegible]
Printed Name [illegible]	Printed Name	Printed Name	
Firm [illegible]	Firm	Firm	
Date/Time	Date/Time	Date/Time	

DISTRIBUTION: WHITE - return to originator; YELLOW - lab; PINK - retained by originator.

S-E/E 400-05

Sweet-Edwards/EMCON, Inc.
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Office (206) 485-5000 • FAX (206) 486-9766

Field Sampling Data

★ Duplicate ★

LOCATION/ADDRESS Arlington, WA
PROJECT NAME Baxter South # 0191001.02
CLIENT/CONTACT Steve Sagstad

Well or Surface Site Number MW-1
Sample Designation BXS-0992-1
Date, Time 9/25/92 1015
Weather Partly cloudy, warm

HYDROLOGY MEASUREMENTS:

(Nearest .01 ft.)	Elevation	Date, Time	Method Used (M-Scope Number or Other)
40.70		9/25/92	~~ACTAT~~ 952
			Solinst

WELL EVACUATION:

Gallons	Pore Volumes	Method Used	Rinse Method	Date, Time
	3+	Bailer	See Below	1015

Surface Water Flow Speed _____ Measurement Method _____ Date, Time _____

SAMPLING:

Sample	Date, Time	Method	Volume (ml)	Container Type	Depth Taken (feet)	Field Filtered (yes,no)	Preservative	Iced (yes,no)
Diss. metal	9/25/92	Bailer	500	Poly		yes	HNO_3	yes
Total metal	1015		500			no	H_2SO_4	
TOC, COD, NO_2/NO_3			1000				none	
F^-, $SO_4^{=}$, pH			1000					
cond., TDS, Turbidity			"					
Total Coli			50	Poly Bag				

Sampler Cleaning Method: Non-Phosphatic detergent wash; H2O rinse; MeOH rinse; Distilled H2O rinse

FIELD WATER QUALITY TESTS:

Pore Vol. Number	pH	Conductivity ~~mS~~/cm	Temp °C	gallons ~~Eh~~
1	5.93	0.273	12.5	1.5
2	5.97	0.241	12.5	3.0
3	5.97	0.250	12.5	4.5

NOTES:

well depth: 49 − 40.70 = 8.3 ÷ 6 = 1.38 gal pv

Water is cloudy, brown, no odor

Duplicate: BXS-0992-2 @ 1000

Total # of Bottles: 5 + 5 = 10

Signature: Russell Stoke

SEA-400-01

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Field Sampling Data

LOCATION/ADDRESS Arlington, WA
PROJECT NAME Baxter South # 019001.02
CLIENT/CONTACT Steve Sagstad

Well or Surface Site Number MW-2
Sample Designation BXS-0992-5
Date, Time 9/25/92 1100
Weather P. cloudy WARM

HYDROLOGY MEASUREMENTS:

(Nearest .01 ft.)	Elevation	Date, Time	Method Used (M-Scope Number or Other)
39.77		9/25/92	ACTAT 10.33
			Solinst 122

WELL EVACUATION:

Gallons	Pore Volumes	Method Used	Rinse Method	Date, Time
	3+	Bailer		1100

Surface Water Flow Speed _____ Measurement Method _____ Date, Time _____

SAMPLING:

Sample	Date, Time	Method	Volume (ml)	Container Type	Depth Taken (feet)	Field Filtered (yes,no)	Preservative	Iced (yes,no)
Diss. metal	9/25/92	Bailer	500	poly		yes	HNO_3	yes
Total metal			500			no	H_2SO_4	
NH_3 TOC, COD, NO_3/NO_2			1000				none	
SO_4, pH	1100		1000					
Alk., TDS, Turbidity			11					
Total Coli			50	poly Bag				

Sampler Cleaning Method: Non-Phosphatic detergent wash, H2O rinse, MeOH rinse, Distilled H2O rinse

FIELD WATER QUALITY TESTS:

Pore Vol. Number	pH	Conductivity (µS/cm)	Temp (°C)	Eh (gallons)
1	6.10	0.567	14.7	2.2
2	6.10	0.586	15.0	4.4
3	6.09	0.591	14.4	6.6

NOTES:

well depth: 54 − 39.77 ≈ 14 ÷ 6 ≈ 2.2 gal pv

water is cloudy, silty, brown, no odor

Total # of Bottles: 5

Signature: J. Russell Stoke

SEA-400-01

Sweet-Edwards/EMCON, Inc.
18912 North Creek Parkway, Suite 210 • Bothell, WA 98011
Office (206) 485-5000 • FAX (206) 486-9766

Field Sampling Data

Field Blank

LOCATION/ADDRESS Arlington, WA
PROJECT NAME Baxter South # 0191001.02
CLIENT/CONTACT Steve Sagstad

Well or Surface Site Number MW-Blank
Sample Designation BXS-0992-3
Date, Time 9/25/92 1115
Weather

HYDROLOGY MEASUREMENTS:

(Nearest .01 ft.)	Elevation	Date, Time	Method Used (M-Scope Number or Other)
		9/25/92	ACTAT

WELL EVACUATION:

Gallons	Pore Volumes	Method Used	Rinse Method	Date, Time
	3+	Bailer		

Surface Water Flow Speed _____ Measurement Method _____ Date, Time _____

SAMPLING:

Sample	Date, Time	Method	Volume (ml)	Container Type	Depth Taken (feet)	Field Filtered (yes,no)	Preservative	Iced (yes,no)	Sampler Cleaning Method
Diss. metal	9/25/92	Bailer	500	poly		yes	HNO_3	yes	Non-Phosphatic detergent wash, H2O rinse, MeOH rinse, Distilled H2O rinse
Total metal			500			no	H_2SO_4		
TOC, COD, NO_3/NO_3			1000				none		
SO_4, pH	1115		1000						
Cond., TDS, Turbidity			1L						
Total Coli.			50	poly Bag					

FIELD WATER QUALITY TESTS:

Pore Vol. Number	pH	Conductivity (µS/cm)	Temp (°C)	Eh (gallons)				
1								
2								
3								

NOTES:

well depth: – = ÷ 6 =

Field Blank taken w/D.I. WATER

Total # of Bottles: 5

Signature: Russell Stokes

Sweet-Edwards / EMCON, Inc.

Kelso, WA (206) 423-3580
Bothell, WA (206) 485-5000

Chain of Custody / Laboratory Analysis Request

DATE 9/25/92 PAGE 1 OF 1

PROJECT [illegible] # 0191001.03
CLIENT INFO. CONTACT [illegible]
ADDRESS [illegible]
TELEPHONE# [illegible]
SAMPLERS NAME [illegible] PHONE# [illegible]
SAMPLERS SIGNATURE [illegible]

ANALYSIS REQUESTED — GENERAL CHEMISTRY (Specify) — OTHER (Specify)

	SAMPLE I.D.	DATE	TIME	LAB I.D.	TYPE	BASE/NEU/ACID ORGAN. GC/MS/625/8270	VOLATILE ORGANICS GC/MS/624/8240	HALOGENATED VOLATILE ORGANICS 601/8010	PHENOLICS 604/8040	POLYNUCLEAR AROMATIC 610/8310	TOTAL ORGANIC CARBON (TOC) 415/9060	TOTAL ORGANIC HALIDE (TOX) 9020	EP TOX/TCLP METALS (Circle One)	METALS (TOTAL) dissolved (See Special Inst.)	TCLP ORGANICS	pH, COND ALK	NO_3/NO_2, Cl SO_4	Ca, Mg, Na, K	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	NUMBER OF CONTAINERS
1.	[illegible]-0092-1	9/25/92	1200		H_2O						X			X		X	X		X	X	X	X	X	X	5
2.	-2	↓	1300		↓						X			X		X	X		X	X	X	X	X	X	5
3.	-3	↓	1315		↓						X			X		X	X		X	X	X	X	X	X	5
4.	-4	↓	1245		↓						X			X		X	X		X	X	X	X	X	X	5
5.	-5	↓	1230		↓						X			X		X	X		X	X	X	X	X	X	5
6.	-6	↓	1135		↓						X			X		X	X		X	X	X	X	X	X	5
7.																									30
8.																									

Relinquished By Sweet, Edwards & Assoc.	Relinquished By	Relinquished By	PROJECT INFORMATION	SAMPLE RECEIPT
Signature: [illegible signature]	Signature	Signature	Shipping I.D. No.	Total No. of Containers
Printed Name: [illegible]	Printed Name	Printed Name	VIA	Chain of Custody Seals
Firm: EMCON [illegible]	Firm	Firm	Project	Received in good condition
Date/Time: 9/25/92 1555	Date/Time	Date/Time		LAB NO.

Received By	Received By	Received By	SPECIAL INSTRUCTIONS/COMMENTS
Signature: [illegible signature]	Signature: [illegible signature]	Signature	(1) Dissolved metals [illegible] NOT [illegible] filtered: Ag, As, [illegible] Cu, Fe, [illegible]
Printed Name: CAS	Printed Name: CAS	Printed Name	
Firm: 9-25-92 15:55	Firm: 9-25-92 15:55	Firm	
Date/Time	Date/Time	Date/Time	

DISTRIBUTION: WHITE - return to originator; YELLOW - lab; PINK - retained by originator.

S-E/E 400-05

Sweet-Edwards / EMCON, Inc.
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Bothell, WA (206) 485-5000

Chain of Custody / Laboratory Analysis Request

DATE 9/25/92 PAGE 1 OF 1

PROJECT [illegible] # 0191001.02
CLIENT INFO. CONTACT Steve [illegible]
ADDRESS Emcon [illegible]
TELEPHONE# 485-5000
SAMPLERS NAME J. Russell [illegible] PHONE# 485-5000
SAMPLERS SIGNATURE [illegible]

ANALYSIS REQUESTED — GENERAL CHEMISTRY (Specify) — OTHER (Specify)

SAMPLE I.D.	DATE	TIME	LAB I.D.	TYPE	BASE/NEU/ACID ORGAN. GC/MS/625/8270	VOLATILE ORGANICS GC/MS/624/8240	HALOGENATED VOLATILE ORGANICS 601/8010	PHENOLICS 604/8040	POLYNUCLEAR AROMATIC 610/8310	TOTAL ORGANIC CARBON (TOC) 415/9060	TOTAL ORGANIC HALIDE (TOX) 9020	EP TOX/TCLP METALS (Circle One)	METALS (TOTAL) (See Special Inst.)	TCLP ORGANICS	pH, COND ALK	NO_3/NO_2, Cl SO_4	~~Ca, Mg, Na, K~~	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	NUMBER OF CONTAINERS
1. BXS-0992-1	9/25/92	1015		H_2O						X			X		X	X		X	X	X	X	X	X	5
2. -2		1000								X			X		X	X		X	X	X	X	X	X	5
3. -3		1115								X			X		X	X		X	X	X	X	X	X	5
4. -4		1045								X			X		X	X		X	X	X	X	X	X	5
5. -5		1100								X			X		X	X		X	X	X	X	X	X	5
6. -6		0930								X			X		X	X		X	X	X	X	X	X	5
7. [illegible, crossed out]	[crossed out]			[crossed out]																				
8.																								

Relinquished By Sweet/Edwards & Assoc.	Relinquished By	Relinquished By
Signature: [signature]	Signature: [signature]	Signature:
Printed Name: J. Russell Stohon	Printed Name: CMS	Printed Name:
Firm: EMCON Bothell	Firm:	Firm:
Date/Time: 9/25/92 1555	Date/Time: 9-25-92 15:55	Date/Time:

Received By	Received By	Received By
Signature: [signature]	Signature:	Signature:
Printed Name: CMS	Printed Name:	Printed Name:
Firm:	Firm:	Firm:
Date/Time: [illegible]92 15:55	Date/Time:	Date/Time:

PROJECT INFORMATION

Shipping I.D. No.

VIA

Project

SAMPLE RECEIPT

Total No. of Containers

Chain of Custody Seals

Received in good condition

LAB NO.

SPECIAL INSTRUCTIONS/COMMENTS

(1) Dissolved metals NOT ~~[illegible]~~ field filtered: As, Ba, Cd, Cr, Cu, Fe, Pb, Hg, Se, Ag

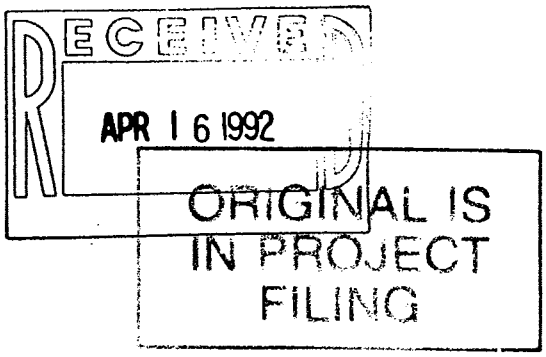
**Except BXS-0992-1 and [illegible] field [illegible]

APPENDIX B

LABORATORY RESULTS

Columbia Analytical Services, Inc.

April 14, 1992



Steven Sagstad
EMCON Northwest
18912 N Creek Parkway, Suite 210
Bothell, WA 98011

Re: **Baxter South/Project #S9101.02**

Dear Steven:

Enclosed are the results of the samples submitted to our lab on March 25, 1992. Preliminary results were transmitted via facsimile on April 10, 1992. For your reference, these analyses have been assigned our work order number K921875.

All analyses were performed in accordance with our laboratory's quality assurance program.

Please call if you have any questions.

Respectfully submitted,

Columbia Analytical Services, Inc.

Charles Morrow
Charles R. Morrow
Project Chemist

CRM/tlt

1317 South 13th Avenue • P.O. Box 479 • Kelso, Washington 98626 • Telephone 206/577-7222 • Fax 206/636-1068

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client:	EMCON Northwest	**Date Received:**	03/25/92
Project:	Baxter South/#S9101.02	**Work Order No.:**	K921875
Sample Matrix:	Water		

Inorganic Parameters
mg/L (ppm)

			BXS-1	BXS-1DUP	Field Blank
Sample Name:			**BXS-0392-1**	**BXS-0392-2**	**BXS-0392-3**
Lab Code:			**K1875-1**	**K1875-2**	**K1875-3**
Analyte	**EPA Method**	**MRL**			
pH (units)	150.1	--	6.15	6.09	6.42
Conductivity (μmhos/cm)	120.1	2	338	294	ND
Ammonia as Nitrogen	350.3	0.05	ND	0.06	ND
Chemical Oxygen Demand (COD)	410.2	5	29	29	ND
Chloride	300.0	0.2	20	22	ND
Fluoride	300.0	0.2	ND	ND	ND
Nitrate + Nitrite as Nitrogen	353.2	0.2	1.2	0.9	ND
Solids, Total Dissolved (TDS)	160.1	5	209	198	8
Sulfate	300.0	0.2	7.9	8.1	ND
Tannin and Lignin	*SM*5550B	0.2	ND	ND	ND
Total Organic Carbon (TOC)	415.1	0.5	1.7	2.1	ND

MRL Method Reporting Limit
ND None Detected at or above the method reporting limit
SM *Standard Methods for the Examination of Water and Wastewater*, 17th Ed., 1989

Approved by Charles Morrow Date 4/14/92

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client:	EMCON Northwest	**Date Received:**	03/25/92
Project:	Baxter South/#S9101.02	**Work Order No.:**	K921875
Sample Matrix:	Water		

Inorganic Parameters
mg/L (ppm)

Sample Name:			BXS-0392-4	BXS-0392-5	BXS-0392-6
Lab Code:			K1875-4	K1875-5	K1875-6
Analyte	**EPA Method**	**MRL**			
pH (units)	150.1	--	6.28	6.25	8.00
Conductivity (μmhos/cm)	120.1	2	480	592	189
Ammonia as Nitrogen	350.3	0.05	0.16	ND	0.70
Chemical Oxygen Demand (COD)	410.2	5	93	49	171
Chloride	300.0	0.2	7.7	8.1	2.1
Fluoride	300.0	0.2	ND	ND	ND
Nitrate + Nitrite as Nitrogen	353.2	0.2	ND	ND	ND
Solids, Total Dissolved (TDS)	160.1	5	346	387	151
Sulfate	300.0	0.2	ND	ND	2.3
Tannin and Lignin	*SM*5550B	0.2	3.5	0.4	0.3
Total Organic Carbon (TOC)	415.1	0.5	20	3.1	1.1

MRL Method Reporting Limit
ND None Detected at or above the method reporting limit
SM *Standard Methods for the Examination of Water and Wastewater*, 17th Ed., 1989

Approved by Charles Morrow Date 4/14/92

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: EMCON Northwest
Project: Baxter South/#S9101.02
Sample Matrix: Water

Work Order No.: K921875

Inorganic Parameters
mg/L (ppm)

Sample Name: **Method Blank**
Lab Code: **K1875-MB**

Analyte	EPA Method	MRL	
Conductivity (μmhos/cm)	120.1	2	ND
Ammonia as Nitrogen	350.3	0.05	ND
Chemical Oxygen Demand (COD)	410.2	5	ND
Chloride	300.0	0.2	ND
Fluoride	300.0	0.2	ND
Nitrate + Nitrite as Nitrogen	353.2	0.2	ND
Solids, Total Dissolved (TDS)	160.1	5	ND
Sulfate	300.0	0.2	ND
Tannin and Lignin	*SM*5550B	0.2	ND
Total Organic Carbon (TOC)	415.1	0.5	ND

MRL Method Reporting Limit
ND None Detected at or above the method reporting limit
SM *Standard Methods for the Examination of Water and Wastewater*, 17th Ed., 1989

Approved by Charles Morrow Date 4/14/92

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client:	EMCON Northwest	**Date Received:**	03/25/92
Project:	Baxter South/#S9101.02	**Work Order No.:**	K921875
Sample Matrix:	Water		

Dissolved Metals
µg/L (ppb)

			BXS-1	BXS-1 DUP	Field Blank
		Sample Name:	**BXS-0392-1**	**BXS-0392-2**	**BXS-0392-3**
		Lab Code:	**K1875-1**	**K1875-2**	**K1875-3**
Analyte	**EPA Method**	**MRL**			
Arsenic	7060	5	ND	ND	ND
Barium	6010	5	14	15	ND
Cadmium	6010	3	9	13	ND
Chromium	6010	5	ND	ND	ND
Copper	6010	10	ND	ND	ND
Iron	6010	20	21	ND	27
Lead	7421	2	ND	ND	ND
Manganese	6010	5	156	152	ND
Mercury	7470	0.5	ND	ND	ND
Nickel	6010	20	ND	ND	ND
Selenium	7740	5	ND	ND	ND
Silver	6010	10	ND	ND	ND
Zinc	6010	10	ND	ND	ND

MRL Method Reporting Limit
ND None Detected at or above the method reporting limit

Approved by Charles Morrow Date 4/14/92

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client:	EMCON Northwest	**Date Received:**	03/25/92
Project:	Baxter South/#S9101.02	**Work Order No.:**	K921875
Sample Matrix:	Water		

Dissolved Metals
µg/L (ppb)

		BXS-3	BXS-2	BXS-4
	Sample Name:	**BXS-0392-4**	**BXS-0392-5**	**BXS-0392-6**
	Lab Code:	**K1875-4**	**K1875-5**	**K1875-6**
Analyte	**EPA Method**	**MRL**		
Arsenic	7060	5	ND	ND	6
Barium	6010	5	38	42	22
Cadmium	6010	3	5	ND	ND
Chromium	6010	5	ND	ND	ND
Copper	6010	10	ND	ND	ND
Iron	6010	20	6,040	289	49
Lead	7421	2	ND	ND	ND
Manganese	6010	5	2,560	616	109
Mercury	7470	0.5	ND	ND	ND
Nickel	6010	20	ND	21	ND
Selenium	7740	5	ND	ND	ND
Silver	6010	10	ND	ND	ND
Zinc	6010	10	ND	ND	ND

MRL Method Reporting Limit
ND None Detected at or above the method reporting limit

Approved by Charles Morrow Date 4/14/92

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: EMCON Northwest
Project: Baxter South/#S9101.02
Sample Matrix: Water

Work Order No.: K921875

Dissolved Metals
µg/L (ppb)

	Sample Name:	Method Blank
	Lab Code:	K1875-MB

Analyte	EPA Method	MRL	
Arsenic	7060	5	ND
Barium	6010	5	ND
Cadmium	6010	3	ND
Chromium	6010	5	ND
Copper	6010	10	ND
Iron	6010	20	ND
Lead	7421	2	ND
Manganese	6010	5	ND
Mercury	7470	0.5	ND
Nickel	6010	20	ND
Selenium	7740	5	ND
Silver	6010	10	ND
Zinc	6010	10	ND

MRL Method Reporting Limit
ND None Detected at or above the method reporting limit

Approved by Charles Morrow Date 4/14/92

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client:	EMCON Northwest	**Date Received:**	03/25/92
Project:	Baxter South/#S9101.02	**Date Test Started:**	03/26/92
Sample Matrix:	Water	**Date Test Ended:**	03/30/92
		Work Order No.:	K921875

Total Coliform Bacteria
SM Method 9221B
organisms/100 mL

Sample Name	Lab Code	MRL	Result
BXS-0392-1 BXS-1	K1875-1	2	*140
BXS-0392-2 BXS-1 DUP	K1875-2	2	*130
BXS-0392-3 Field Blank	K1875-3	2	*ND
BXS-0392-4 BXS-3	K1875-4	2	*280
BXS-0392-5 BXS-2	K1875-5	2	*17
BXS-0392-6 BXS-4	K1875-6	2	*ND
Method Blank	K1875-MB	2	ND

SM *Standard Methods for the Examination of Water and Wastewater*, 17th Ed., 1989
MRL Method Reporting Limit
***** Sample was received past the end of the recommended maximum holding time.
ND None Detected at or above the method reporting limit

Approved by Charles Morrow Date 4/14/92

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client:	EMCON Northwest	Date Received:	03/25/92
Project:	Baxter South/#S9101.02	Work Order No.:	K921875
Sample Matrix:	Water		

Volatile Organic Compounds
EPA Method 8240
µg/L (ppb)

BXS -4

Sample Name:		BXS-0392-6	Trip Blank
Lab Code:		K1875-6	K1875-7
Date Analyzed:		03/29/92	03/29/92
Analyte	**MRL**		
Chloromethane	1	ND	ND
Vinyl Chloride	1	ND	ND
Bromomethane	1	ND	ND
Chloroethane	1	ND	ND
Trichlorofluoromethane (Freon 11)	1	ND	ND
Trichlorotrifluoroethane (Freon 113)	10	ND	ND
1,1-Dichloroethene	1	ND	ND
Acetone	20	ND	ND
Carbon Disulfide	1	ND	ND
Methylene Chloride	10	ND	ND
trans-1,2-Dichloroethene	1	ND	ND
cis-1,2-Dichloroethene	1	ND	ND
2-Butanone (MEK)	10	ND	ND
1,1-Dichloroethane	1	ND	ND
Chloroform	1	ND	ND
1,1,1-Trichloroethane (TCA)	1	ND	ND
Carbon Tetrachloride	1	ND	ND
Benzene	1	ND	ND
1,2-Dichloroethane	1	ND	ND
Vinyl Acetate	10	ND	ND
Trichloroethene (TCE)	1	ND	ND
1,2-Dichloropropane	1	ND	ND
Bromodichloromethane	1	ND	ND
2-Chloroethyl Vinyl Ether	10	ND	ND
trans-1,3-Dichloropropene	1	ND	ND
2-Hexanone	10	ND	ND
4-Methyl-2-pentanone (MIBK)	10	ND	ND
Toluene	1	ND	ND
cis-1,3-Dichloropropene	1	ND	ND
1,1,2-Trichloroethane	1	ND	ND
Tetrachloroethene (PCE)	1	ND	ND
Dibromochloromethane	1	ND	ND
Chlorobenzene	1	ND	ND
Ethylbenzene	1	ND	ND
Styrene	1	ND	ND
Total Xylenes	1	ND	ND
Bromoform	1	ND	ND
1,1,2,2-Tetrachloroethane	1	ND	ND
1,3-Dichlorobenzene	1	ND	ND
1,4-Dichlorobenzene	1	ND	ND
1,2-Dichlorobenzene	1	ND	ND

MRL Method Reporting Limit
ND None Detected at or above the method reporting limit

Approved by Charles Morrow Date 4/14/92

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client:	EMCON Northwest	**Work Order No.:**	K921875
Project:	Baxter South/#S9101.02		
Sample Matrix:	Water		

Volatile Organic Compounds
EPA Method 8240
µg/L (ppb)

Sample Name:		**Method Blank**
Lab Code:		**K1875-MB**
Date Analyzed:		**03/29/92**

Analyte	**MRL**	
Chloromethane	1	ND
Vinyl Chloride	1	ND
Bromomethane	1	ND
Chloroethane	1	ND
Trichlorofluoromethane (Freon 11)	1	ND
Trichlorotrifluoroethane (Freon 113)	10	ND
1,1-Dichloroethene	1	ND
Acetone	20	ND
Carbon Disulfide	1	ND
Methylene Chloride	10	ND
trans-1,2-Dichloroethene	1	ND
cis-1,2-Dichloroethene	1	ND
2-Butanone (MEK)	10	ND
1,1-Dichloroethane	1	ND
Chloroform	1	ND
1,1,1-Trichloroethane (TCA)	1	ND
Carbon Tetrachloride	1	ND
Benzene	1	ND
1,2-Dichloroethane	1	ND
Vinyl Acetate	10	ND
Trichloroethene (TCE)	1	ND
1,2-Dichloropropane	1	ND
Bromodichloromethane	1	ND
2-Chloroethyl Vinyl Ether	10	ND
trans-1,3-Dichloropropene	1	ND
2-Hexanone	10	ND
4-Methyl-2-pentanone (MIBK)	10	ND
Toluene	1	ND
cis-1,3-Dichloropropene	1	ND
1,1,2-Trichloroethane	1	ND
Tetrachloroethene (PCE)	1	ND
Dibromochloromethane	1	ND
Chlorobenzene	1	ND
Ethylbenzene	1	ND
Styrene	1	ND
Total Xylenes	1	ND
Bromoform	1	ND
1,1,2,2-Tetrachloroethane	1	ND
1,3-Dichlorobenzene	1	ND
1,4-Dichlorobenzene	1	ND
1,2-Dichlorobenzene	1	ND

MRL Method Reporting Limit
ND None Detected at or above the method reporting limit

Approved by Charles Morrow Date 4/14/92

APPENDIX A

LABORATORY QC RESULTS

COLUMBIA ANALYTICAL SERVICES, INC.

Laboratory Chronicle

Client: EMCON Northwest
Project: Baxter South/#S9101.02

Date Received: 03/25/92
Work Order No.: K921875

Inorganic Parameters

Analyte	EPA Method	Date Analyzed
pH	150.1	03/26/92
Conductivity	120.1	03/26/92
Ammonia as Nitrogen	350.3	04/02/92
Chemical Oxygen Demand (COD)	410.2	03/27/92
Chloride	300.0	03/28,30/92
Fluoride	300.0	03/28/92
Nitrate + Nitrite as Nitrogen	353.2	03/27/92
Solids, Total Dissolved (TDS)	160.1	03/26/92
Sulfate	300.0	03/28/92
Tannin and Lignin	*SM*5550B	04/04/92
Total Organic Carbon (TOC)	415.1	04/01/92

SM *Standard Methods for the Examination of Water and Wastewater*, 17th Ed., 1989

Approved by Charles Morrow Date 4/14/92

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client:	EMCON Northwest	**Date Received:**	03/25/92
Project:	Baxter South/#S9101.02	**Date Analyzed:**	03/29/92
Sample Matrix:	Water	**Work Order No.:**	K921875

Surrogate Recovery Summary
Volatile Organic Compounds
EPA Method 8240

Sample Name	Lab Code	Percent Recovery		
		1,2-Dichloroethane - D_4	Toluene - D_8	4-Bromofluorobenzene
XS-0392-6	K1875-6	111	99	100
Trip Blank	K1875-7	109	94	100
Method Blank	K1875-MB	103	94	101
	EPA Acceptance Criteria	76-114	88-110	86-115

Approved by Charles Morrow Date 4/14/92

APPENDIX B

CHAIN OF CUSTODY INFORMATION

Sweet-Edwards / EMCON, Inc.
Kelso, WA (206) 423-3580
Bothell, WA (206) 485-5000

Laboratory Analysis Request

DATE 3-24-92 PAGE 1 OF 1

PROJECT Baxter South # 5910102
CLIENT INFO. CONTACT Steve Sagstad
ADDRESS EMCON NW
TELEPHONE# 485-5000
SAMPLERS NAME S. BURKETT PHONE# 485-5000
SAMPLERS SIGNATURE Sharon Burkett

SAMPLE I.D.	DATE	TIME	LAB I.D.	TYPE	BASE/NEU/ACID ORGAN. GC/MS/625/8270	~~VOLATILE ORGANICS~~ GC/MS/624/8240	HALOGENATED VOLATILE ORGANICS 601/8010	PHENOLICS 604/8040	POLYNUCLEAR AROMATIC 610/8310	TOTAL ORGANIC CARBON (TOC) 415/9060	TOTAL ORGANIC HALIDE (TOX) 9020	EP TOX/TCLP METALS (Circle One)	METALS (TOTAL) Dissolved (See Special Inst.)	TCLP ORGANICS	~~OIL~~ COND ~~GREASE~~	NO_3/NO_2 Cl SO_4	Ca, Mg, Na, K	COD	Total Coliform	NH_3	Tannin/Lignin	TDS	Fl-	NUMBER OF CONTAINERS
1. BXS-0392-1	3/24/92	1030	K1875-1	Water						X			X		X	X		X	X	X	X	X	X	5
2. BXS-0392-2		1045	-2							X			X		X	X		X	X	X	X	X	X	5
3. BXS-0392-3		1055	-3							X			X		X	X		X	X	X	X	X	X	5
4. BXS-0392-4		1140	-4							X			X		X	X		X	X	X	X	X	X	5
5. BXS-0392-5		1220	-5							X			X		X	X		X	X	X	X	X	X	5
6. BXS-0392-6	↓	1315	-6	↓		X				X			X		X	X		X	X	X	X	X	X	8
7. Trip Blank			-7			X																		
8.																								

ANALYSIS REQUESTED — GENERAL CHEMISTRY (Specify) — OTHER (Specify)

Relinquished By Sweet, Edwards & Assoc.	Relinquished By	Relinquished By	PROJECT INFORMATION	SAMPLE RECEIPT
Signature: Sharon Burkett	Signature: Stan Spurgeon	Signature		
Printed Name: SHARON BURKETT	Printed Name: Stan Spurgeon	Printed Name	Shipping I.D. No.	Total No. of Containers
Firm: EMCON, NW	Firm: CTS	Firm	VIA	Chain of Custody Seals
Date/Time: 3-24-92 1450	Date/Time: 3-24-92 1451	Date/Time	Project	Received in good condition
				LAB NO.

Received By	Received By	Received By	SPECIAL INSTRUCTIONS/COMMENTS
Signature: Stan Spurgeon	Signature: Laura Jordan	Signature	
Printed Name: Stan Spurgeon	Printed Name: Laura Jordan	Printed Name	
Firm: CTS	Firm: CA 3-25-92	Firm	
Date/Time: 3-24-92 1450	Date/Time: 0800	Date/Time	

0001

DISTRIBUTION: WHITE - return to originator; YELLOW - lab; PINK - retained by originator.

S-E/E 400-05

Columbia Analytical Services, Inc.

RECEIVED
JUL 13 1992

July 10, 1992

Steven Sagstad
EMCON Northwest
18912 N Creek Parkway
Suite 210
Bothell, WA 98011

Re: **Baxter South/Project #S9101.02**

Dear Steven:

Enclosed are the results of the samples submitted to our lab on June 24, 1992. Preliminary results were transmitted via facsimile on July 9, 1992. For your reference, these analyses have been assigned our work order number K923961B.

All analyses were performed in accordance with our laboratory's quality assurance program. Reproduction of reports is allowed only in whole, not in part. Results apply only to the samples analyzed.

Please call if you have any questions.

Respectfully submitted,

Columbia Analytical Services, Inc.

Charles Morrow

Charles R. Morrow
Project Chemist

CRM/krh

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client:	EMCON Northwest	**Date Received:**	06/24/92
Project:	Baxter South/#S9101.02	**Work Order No.:**	K923961B
Sample Matrix:	Water		

Inorganic Parameters
mg/L (ppm)

BXS-1 BXS-1 DUP BXS-3

Sample Name:		BXS-0692-1	BXS-0692-2	BXS-0692-3
Lab Code:		K3961-1	K3961-2	K3961-3
Analyte	**EPA Method**	**MRL**		
pH (units)	150.1	--	6.29	6.19	6.40
Conductivity (μmhos/cm)	120.1	2	356	338	504
Ammonia as Nitrogen	350.3	0.05	ND	0.06	0.07
Chemical Oxygen Demand (COD)	410.2	5	23	26	87
Fluoride	340.2	0.2	ND	ND	ND
Solids, Total Dissolved (TDS)	160.1	5	239	222	373
Total Organic Carbon (TOC)	415.1	0.5	4.7	2.4	16.0

MRL Method Reporting Limit
ND None Detected at or above the method reporting limit

Approved by Charles Morrow Date 7/10/92

1317 South 13th Avenue • P.O. Box 479 • Kelso, Washington 98626 • Telephone 206/577-7222 • Fax 206/636-10

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: EMCON Northwest
Project: Baxter South/#S9101.02
Sample Matrix: Water

Date Received: 06/24/92
Work Order No.: K923961B

Inorganic Parameters
mg/L (ppm)

BXS-01 BXS-2

Sample Name:			BXS-0692-4	BXS-0692-5	Method Blank
Lab Code:			K3961-4	K3961-5	K3961-MB
Analyte	**EPA Method**	**MRL**			
pH (units)	150.1	--	7.86	6.34	--
Conductivity (μmhos/cm)	120.1	2	184	592	ND
Ammonia as Nitrogen	350.3	0.05	0.62	0.05	ND
Chemical Oxygen Demand (COD)	410.2	5	273	34	ND
Fluoride	340.2	0.2	ND	ND	ND
Solids, Total Dissolved (TDS)	160.1	5	147	365	ND
Total Organic Carbon (TOC)	415.1	0.5	2.0	3.6	ND

MRL Method Reporting Limit
ND None Detected at or above the method reporting limit

Approved by Charles Morrison Date 7/10/92

00092

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client:	EMCON Northwest	**Date Received:**	06/24/92
Project:	Baxter South/#S9101.02	**Work Order No.:**	K923961B
Sample Matrix:	Water		

Dissolved Metals
µg/L (ppb)

Analyte	EPA Method	MRL	BXS-0692-1 K3961-1	BXS-0692-2 K3961-2	BXS-0692-3 K3961-3
Arsenic	7060	5	ND	ND	ND
Barium	6010	5	20	20	35
Cadmium	6010	3	ND	4	ND
Chromium	6010	5	ND	ND	ND
Copper	6010	10	ND	31	ND
Iron	6010	20	ND	ND	877
Lead	7421	2	ND	ND	ND
Manganese	6010	5	214	216	1,760
Mercury	7470	0.5	ND	ND	ND
Selenium	7740	5	ND	ND	ND
Silver	6010	10	ND	ND	ND
Zinc	6010	10	14	ND	ND

MRL Method Reporting Limit
ND None Detected at or above the method reporting limit

Approved by Charles Morris Date 7/10/92

00003

COLUMBIA ANALYTICAL SERVICES, INC.

Laboratory Chronicle

Client: EMCON Northwest
Project: Baxter South/#S9101.02

Date Received: 06/24/92
Work Order No.: K923961B

Inorganic Parameters

Analyte	EPA Method	Date Analyzed
pH	150.1	06/24/92
Conductivity	120.1	06/24/92
Ammonia as Nitrogen	350.3	07/01/92
Chemical Oxygen Demand (COD)	410.2	06/24/92
Fluoride	340.2	06/25/92
Solids, Total Dissolved (TDS)	160.1	06/25/92
Total Organic Carbon (TOC)	415.1	07/06/92

Approved by Charles Mosson Date 7/10/92

00096

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client:	EMCON Northwest	**Date Received:**	06/24/92
Project:	Baxter South/#S9101.02	**Date Test Started:**	06/24/92
Sample Matrix:	Water	**Date Test Ended:**	06/28/92
		Work Order No.:	K923961B

Total Coliform Bacteria
SM Method 9221B
organisms/100 mL

Sample Name	Lab Code	MRL	Result
BXS-0692-1	K3961-1	2	*ND
BXS-0692-2	K3961-2	2	*ND
BXS-0692-3	K3961-3	2	*7
BXS-0692-4	K3961-4	2	ND
BXS-0692-5	K3961-5	2	*ND
Method Blank	K3961-MB	2	ND

SM *Standard Methods for the Examination of Water and Wastewater*, 17th Ed., 1989
MRL Method Reporting Limit
* Sample was analyzed less than two hours past the end of the recommended maximum holding time.
ND None Detected at or above the method reporting limit

Approved by Charles Morrow Date

00005

Columbia Analytical Services, Inc.

...L IS
IN ...JECT
FILING
RECEIVED
OCT 19 1992

October 15, 1992

Steven Sagstad
EMCON Northwest, Inc.
18912 N Creek Parkway, Suite 210
Bothell, WA 98011

Re: **Baxter - South/Project #0191001.02**

Dear Steven:

Enclosed are the results of the samples submitted to our laboratory on September 26, 1992. For your reference, these analyses have been assigned our work order number K925982B.

The samples were collected on Friday, September 25, 1992, between 9:30 A.M. and 11:15 A.M. The analyses did not begin until Saturday, September 26, 1992 at 1:10 P.M. The analysis has a 24-hour holding time.

All analyses were performed in accordance with our laboratory's quality assurance program. Reproduction of reports is allowed only in whole, not in part. Results apply only to the samples analyzed.

Please call if you have any questions.

Respectfully submitted,

Columbia Analytical Services, Inc.

Charles Morrow

Charles R. Morrow
Project Chemist

CRM/sam

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client:	EMCON Northwest, Inc.	**Date Received:**	09/26/92
Project:	Baxter - South/#0191001.02	**Date Test Started:**	09/26/92
Sample Matrix:	Water	**Date Test Ended:**	09/30/92
		Work Order No.:	K925982B

Total Coliform Bacteria
SM Method 9221B
organisms/100 mL

Sample Name	Lab Code	MRL	Result
BXS-0992-1	K5982-1	2	*240
BXS-0992-2	K5982-2	2	*240
BXS-0992-3	K5982-3	2	*ND
BXS-0992-4	K5982-4	2	*130
BXS-0992-5	K5982-5	2	*50
BXS-0992-6	K5982-6	2	*ND
Method Blank	K5982-MB	2	*ND

SM *Standard Methods for the Examination of Water and Wastewater*, 17th Ed., 1989
MRL Method Reporting Limit
***** Sample was received past the end of the recommended maximum holding time.
ND None Detected at or above the method reporting limit

Approved by Charles Morrow Date 10/5/92

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client:	EMCON Northwest, Inc.	**Date Received:**	09/26/92
Project:	Baxter - South/#0191001.02	**Work Order No.:**	K925982B
Sample Matrix:	Water		

Inorganic Parameters
mg/L (ppm)

BXS-1 BXS-1 Dup Field Blank

Sample Name:		BXS-0992-1	BXS-0992-2	BXS-0992-3
Lab Code:		K5982-1	K5982-2	K5982-3
Analyte	**EPA Method**	**MRL**		
pH (units)	150.1	--	6.04	6.10	6.32
Conductivity (µmhos/cm)	120.1	2	245	249	ND
Ammonia as Nitrogen	350.3	0.05	ND	ND	ND
Chemical Oxygen Demand (COD)	410.2	5	21	27	5
Chloride	300.0	0.2	14	15	ND
Fluoride	340.2	0.2	ND	ND	ND
Nitrate + Nitrite as Nitrogen	353.2	0.2	0.4	0.4	ND
Solids, Total Dissolved (TDS)	160.1	5	176	167	ND
Sulfate	300.0	0.2	9.7	10.0	ND
Tannin and Lignin	*SM*5550B	0.2	ND	ND	ND
Total Organic Carbon (TOC)	415.1	0.5	3.8	4.3	ND

MRL Method Reporting Limit
ND None Detected at or above the method reporting limit
SM *Standard Methods for the Examination of Water and Wastewater*, 17th Ed., 1989

Approved by Charles Morrow Date 10/15/92

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client:	EMCON Northwest, Inc.	**Work Order No.:**	K925982B
Project:	Baxter - South/#0191001.02		
Sample Matrix:	Water		

Inorganic Parameters
mg/L (ppm)

Sample Name:			**Method Blank**
Lab Code:			**K5982-MB**
Analyte	**EPA Method**	**MRL**	
pH (units)	150.1	--	--
Conductivity (μmhos/cm)	120.1	2	ND
Ammonia as Nitrogen	350.3	0.05	ND
Chemical Oxygen Demand (COD)	410.2	5	ND
Chloride	300.0	0.2	ND
Fluoride	340.2	0.2	ND
Nitrate + Nitrite as Nitrogen	353.2	0.2	ND
Solids, Total Dissolved (TDS)	160.1	5	ND
Sulfate	300.0	0.2	ND
Tannin and Lignin	*SM*5550B	0.2	ND
Total Organic Carbon (TOC)	415.1	0.5	ND

MRL Method Reporting Limit
ND None Detected at or above the method reporting limit
SM *Standard Methods for the Examination of Water and Wastewater*, 17th Ed., 1989

Approved by Charles Mosrow Date 10/15/92

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client:	EMCON Northwest, Inc.	**Date Received:**	09/26/92
Project:	Baxter - South/#0191001.02	**Work Order No.:**	K925982B
Sample Matrix:	Water		

Dissolved Metals
µg/L (ppb)

BXS-1 BXS-1 Dup F. Blank

Sample Name:		BXS-0992-1	BXS-0992-2	BXS-0992-3
Lab Code:		K5982-1	K5982-2	K5982-3
Analyte	**EPA Method**	**MRL**		
Arsenic	7060	5	ND	ND	ND
Barium	6010	5	13	11	ND
Cadmium	6010	3	ND	ND	ND
Chromium	6010	5	ND	ND	ND
Copper	6010	10	ND	ND	ND
Iron	6010	20	ND	25	ND
Lead	7421	2	ND	ND	ND
Mercury	7470	0.5	ND	ND	ND
Selenium	7740	5	ND	ND	ND
Silver	6010	10	ND	ND	ND

MRL Method Reporting Limit
ND None Detected at or above the method reporting limit

Approved by Charles Morrow Date 10/15/92

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client:	EMCON Northwest, Inc.	**Date Received:**	09/26/92
Project:	Baxter - South/#0191001.02	**Work Order No.:**	K925982B
Sample Matrix:	Water		

Inorganic Parameters
mg/L (ppm)

BXS-3 BXS-2 BXS-4

Sample Name:	BXS-0992-4	BXS-0992-5	BXS-0992-6
Lab Code:	K5982-4	K5982-5	K5982-6

Analyte	EPA Method	MRL			
pH (units)	150.1	--	6.36	6.20	7.71
Conductivity (µmhos/cm)	120.1	2	560	580	189
Ammonia as Nitrogen	350.3	0.05	0.09	ND	0.54
Chemical Oxygen Demand (COD)	410.2	5	144	35	58
Chloride	300.0	0.2	7.2	5.9	2.1
Fluoride	340.2	0.2	ND	ND	0.2
Nitrate + Nitrite as Nitrogen	353.2	0.2	*<2.0	ND	ND
Solids, Total Dissolved (TDS)	160.1	5	324	311	152
Sulfate	300.0	0.2	ND	ND	1.9
Tannin and Lignin	*SM*5550B	0.2	1.5	0.3	0.2
Total Organic Carbon (TOC)	415.1	0.5	21.9	6.6	0.8

MRL Method Reporting Limit
ND None Detected at or above the method reporting limit
* MRL is elevated because of matrix interferences.
SM *Standard Methods for the Examination of Water and Wastewater*, 17th Ed., 1989

Approved by Charles Morrow Date 10/15/92

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client:	EMCON Northwest, Inc.	**Date Received:**	09/26/92
Project:	Baxter - South/#0191001.02	**Work Order No.:**	K925982B
Sample Matrix:	Water		

Dissolved Metals
µg/L (ppb)

	Sample Name:		BXS-0992-4	BXS-0992-5	BXS-0992-6
	Lab Code:		K5982-4	K5982-5	K5982-6
Analyte	**EPA Method**	**MRL**			
Arsenic	7060	5	ND	ND	6
Barium	6010	5	31	40	61
Cadmium	6010	3	ND	ND	ND
Chromium	6010	5	ND	ND	18
Copper	6010	10	12	ND	12
Iron	6010	20	20	ND	4,870
Lead	7421	2	ND	ND	ND
Mercury	7470	0.5	ND	ND	ND
Selenium	7740	5	ND	ND	ND
Silver	6010	10	ND	ND	ND

MRL Method Reporting Limit
ND None Detected at or above the method reporting limit

Approved by Charles Mosher Date 10/15/92

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client:	EMCON Northwest, Inc.	**Work Order No.:**	K925982B
Project:	Baxter - South/#0191001.02		
Sample Matrix:	Water		

Dissolved Metals
µg/L (ppb)

	Sample Name:	Method Blank
	Lab Code:	K5982-MB
Analyte	**EPA Method**	**MRL**	
Arsenic	7060	5	ND
Barium	6010	5	ND
Cadmium	6010	3	ND
Chromium	6010	5	ND
Copper	6010	10	ND
Iron	6010	20	ND
Lead	7421	2	ND
Mercury	7470	0.5	ND
Selenium	7740	5	ND
Silver	6010	10	ND

MRL Method Reporting Limit
ND None Detected at or above the method reporting limit

Approved by Charles Morrow Date 10/15/92

COLUMBIA ANALYTICAL SERVICES, INC.

Laboratory Chronicle

Client:	EMCON Northwest, Inc.	**Date Received:**	09/26/92
Project:	Baxter - South/#0191001.02	**Work Order No.:**	K925982B

Inorganic Parameters

Analyte	EPA Method	Date Analyzed
pH	150.1	09/26/92
Conductivity	120.1	09/26/92
Ammonia as Nitrogen	350.3	10/09/92
Chemical Oxygen Demand (COD)	410.2	10/03/92
Chloride	300.0	09/27,28/92
Fluoride	340.2	09/30/92
Nitrate + Nitrite as Nitrogen	353.2	10/05/92
Solids, Total Dissolved (TDS)	160.1	09/30/92
Sulfate	300.0	09/27/92
Tannin and Lignin	*SM*5550B	10/09/92
Total Organic Carbon (TOC)	415.1	10/01,02/92

SM *Standard Methods for the Examination of Water and Wastewater*, 17th Ed., 1989

Approved by Charles Morse Date 10/15/92

Sweet-Edwards / EMCON, Inc.
Kelso, WA (206) 423-3580
Bothell, WA (206) 485-5000

Chain of Custody / Laboratory Analysis Request

DATE 9/25/92 PAGE 1 OF 1

PROJECT Baxter - South #019001.02
CLIENT INFO. CONTACT Steve Sagstad
ADDRESS EMCON Bothell
TELEPHONE# 485-5000
SAMPLERS NAME J. Russell Stolsan PHONE# 485-5000
SAMPLERS SIGNATURE J. Russell Stolsan

SAMPLE I.D.	DATE	TIME	LAB I.D.	TYPE
1. BXS-0992-1	9/25/92	1015		H2O
2. -2		1020		
3. -3		1115		
4. -4		1045		
5. -5		1100		
6. -6		0930		
7. T/R Blank				
8.				

ANALYSIS REQUESTED

BASE/NEU/ACID ORGAN. GC/MS/625/8270	VOLATILE ORGANICS GC/MS/624/8240	HALOGENATED VOLATILE ORGANICS 601/8010	PHENOLICS 604/8040	POLYNUCLEAR AROMATIC 610/8310	GENERAL CHEMISTRY (Specify) TOTAL ORGANIC CARBON (TOC) 415/9060	TOTAL ORGANIC HALIDE (TOX) 9020	EP TOX/TCLP METALS (Circle One)	METALS (TOTAL) DISS. (1) (See Special Inst.)	TCLP ORGANICS	pH, COND Alk	NO_3/NO_2, Cl SO_4	Ca, Mg, Na, K Total Metals	COD	Total Col.	NH_3	Tan / Lign	F-	TDS	NUMBER OF CONTAINERS
					X			X		X	X		X	X	X	X	X	X	5
					X			X		X	X		X	X	X	X	X	X	5
					X			X		X	X		X	X	X	X	X	X	5
					X			X		X	X		X	X	X	X	X	X	5
					X			X		X	X		X	X	X	X	X	X	5
					X			X		X	X		X	X	X	X	X	X	5

Relinquished By Sweet-Edwards & Assoc.
Signature J. Russell Stolsan
Printed Name EMCON Bothell
Firm 9/25/92 1555
Date/Time

Relinquished By
Signature
Printed Name CAS
Firm 9-25-92 15:55
Date/Time

Relinquished By
Signature
Printed Name
Firm
Date/Time

Received By
Signature
Printed Name CAS
Firm 9-25-92 15:55
Date/Time

Received By Ruth Allison
Signature Ruth Allison
Printed Name CAS
Firm 9/26/92 1000
Date/Time

Received By
Signature
Printed Name
Firm
Date/Time

PROJECT INFORMATION
Shipping I.D. No.
VIA
Project

SAMPLE RECEIPT
Total No. of Containers
Chain of Custody Seals
Received in good condition
LAB NO.

SPECIAL INSTRUCTIONS/COMMENTS
(1) Dissolved metals ~~were~~ NOT field filtered: As, Ba, Cd, Cr, Cu, Fe, Pb, Hg, Se, Ag
~~XX~~Except BXS-0992-1 and BXS-0992-2 were field

DISTRIBUTION: WHITE - return to originator; YELLOW - lab; PINK - retained by originator.

S-E/E 400-05

Columbia Analytical Services, Inc.

January 4, 1993

Service Request No.: K927705B

Nick Garsen
EMCON Northwest, Inc.
18912 North Creek Parkway, Suite 210
Bothell, WA 98011

Re: **J. H. Baxter/Project #BXN-019100103 BXS-01**

Dear Nick:

Enclosed are the results of the samples submitted to our laboratory on December 10, 1992. For your reference, these analyses have been assigned our service request number K927705B.

All analyses were performed consistent with our laboratory's quality assurance program. All results are intended to be considered in their entirety, and Columbia Analytical Services, Inc. (CAS) is not responsible for use of less than the complete report. Results apply only to the samples analyzed.

Please call if you have any questions.

Respectfully submitted,

Columbia Analytical Services, Inc.

Janice M. Sedlak
Project Chemist

JMS/akn

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client:	EMCON Northwest, Inc.	**Date Received:**	12/10/92
Project:	J. H. Baxter/#BXN-019100103 BXS-01	**Date Test Started:**	12/10/92
Sample Matrix:	Water	**Date Test Ended:**	12/14/92
		Work Order No.:	K927705B

Total Coliform Bacteria
SM Method 9221B
MPN/100 ml

Sample Name	Lab Code	MRL	Result
BXN-1292-1	[a]K7705-1	2	13
BXN-1292-2	[a]K7705-2	2	33
BXN-1292-3	[a]K7705-3	2	ND
BXN-1292-4	[a]K7705-4	2	ND
BXN-1292-5	[a]K7705-5	2	8
BXN-1292-6	[a]K7705-6	2	ND
BXS-1292-1	[a]K7705-7	2	ND 1
BXS-1292-2	[a]K7705-8	2	50 2
BXS-1292-3	[a]K7705-9	2	ND 3
BXS-1292-4	[a]K7705-10	2	4 4
BXS-1292-5	[a]K7705-11	2	ND 5
BXS-1292-6	[a]K7705-12	2	ND 6
Method Blank	K7705-MB	2	ND MB

SM	*Standard Methods for the Examination of Water and Wastewater*, 17th Ed., 1989
MPN	Most Probable Number
MRL	Method Reporting Limit
ND	None Detected at or above the method reporting limit
a	Samples received past the eight hour recommended holding time, but were analyzed within 24 hours of the sampling time.

00002

Approved by _____ Date 1/4/93

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: EMCON Northwest, Inc. **Work Order No.:** K927705B
Project: J. H. Baxter/#BXN-019100103 BXS-01
Sample Matrix: Water

Inorganic Parameters
mg/L (ppm)

		Sample Name:	Method Blank
		Lab Code:	K7705-MB
Analyte	**EPA Method**	**MRL**	
pH (units)	150.1	--	--
Conductivity (μmhos/cm)	120.1	2	ND
Ammonia as Nitrogen	350.3	0.05	ND
Chemical Oxygen Demand (COD)	410.2	5	ND
Chloride	300.0	0.2	ND
Fluoride	300.0	0.2	ND
Nitrate + Nitrite as Nitrogen	353.2	0.2	ND
Solids, Total Dissolved (TDS)	160.1	5	ND
Sulfate	300.0	0.2	ND
Tannin and Lignin	*SM*5550B	0.2	ND
Total Organic Carbon (TOC)	415.1	0.5	ND

MRL Method Reporting Limit
ND None Detected at or above the method reporting limit
SM *Standard Methods for the Examination of Water and Wastewater*, 17th Ed., 1989

Approved by _____ Date 1/4/93

COLUMBIA ANALYTICAL SERVICES, INC.

Laboratory Chronicle

Client: EMCON Northwest, Inc.
Project: J. H. Baxter/#BXN-019100103 BXS-01

Date Received: 12/10/92
Work Order No.: K927705B

Inorganic Parameters

Analyte	EPA Method	Date Analyzed
pH	150.1	12/10/92
Conductivity	120.1	12/10/92
Ammonia as Nitrogen	350.3	12/18/92
Chemical Oxygen Demand (COD)	410.2	12/21/92
Chloride	300.0	12/10,11/92
Fluoride	300.0	12/10/92
Nitrate + Nitrite as Nitrogen	353.2	12/11/92
Solids, Total Dissolved (TDS)	160.1	12/15,28/92
Sulfate	300.0	12/10,11/92
Tannin and Lignin	*SM*5550B	12/23/92
Total Organic Carbon (TOC)	415.1	12/17,18/92

SM *Standard Methods for the Examination of Water and Wastewater*, 17th Ed., 1989

Approved by _____ Date 12/4/93

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client:	EMCON Northwest, Inc.	**Date Received:**	12/10/92
Project:	J. H. Baxter/#BXN-019100103 BXS-01	**Work Order No.:**	K927705B
Sample Matrix:	Water		

Inorganic Parameters
mg/L (ppm)

			BXS-4	BXS-1 Dup	F. Blank
		Sample Name:	**BXS-1292-4**	**BXS-1292-5**	**BXS-1292-6**
		Lab Code:	**K7705-10**	**K7705-11**	**K7705-12**
Analyte	**EPA Method**	**MRL**			
pH (units)	150.1	--	7.88	6.12	6.58
Conductivity (μmhos/cm)	120.1	2	192	259	ND
Ammonia as Nitrogen	350.3	0.05	0.83	ND	ND
Chemical Oxygen Demand (COD)	410.2	5	420	83	ND
Chloride	300.0	0.2	2.3	14	ND
Fluoride	300.0	0.2	ND	ND	ND
Nitrate + Nitrite as Nitrogen	353.2	0.2	ND	0.6	ND
Solids, Total Dissolved (TDS)	160.1	5	136	169	ND
Sulfate	300.0	0.2	1.7	9.3	ND
Tannin and Lignin	*SM*5550B	0.2	0.5	0.3	0.2
Total Organic Carbon (TOC)	415.1	0.5	2.2	4.6	ND

MRL Method Reporting Limit
ND None Detected at or above the method reporting limit
SM *Standard Methods for the Examination of Water and Wastewater*, 17th Ed., 1989

Approved by ____________________ Date 1/4/93

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client:	EMCON Northwest, Inc.	**Date Received:**	12/10/92
Project:	J. H. Baxter/#BXN-019100103 BXS-01	**Work Order No.:**	K927705B
Sample Matrix:	Water		

Inorganic Parameters
mg/L (ppm)

BXS-1 BXS-2 BXS-3

Sample Name:	BXS-1292-1	BXS-1292-2	BXS-1292-3
Lab Code:	K7705-7	K7705-8	K7705-9

Analyte	EPA Method	MRL			
pH (units)	150.1	--	6.03	6.26	6.60
Conductivity (μmhos/cm)	120.1	2	254	580	586
Ammonia as Nitrogen	350.3	0.05	ND	ND	ND
Chemical Oxygen Demand (COD)	410.2	5	35	40	101
Chloride	300.0	0.2	15	6.2	8.2
Fluoride	300.0	0.2	ND	ND	ND
Nitrate + Nitrite as Nitrogen	353.2	0.2	0.5	ND	ND
Solids, Total Dissolved (TDS)	160.1	5	149	345	360
Sulfate	300.0	0.2	9.4	0.3	ND
Tannin and Lignin	*SM*5550B	0.2	0.4	0.5	1.1
Total Organic Carbon (TOC)	415.1	0.5	4.8	6.8	16.8

MRL Method Reporting Limit
ND None Detected at or above the method reporting limit
SM *Standard Methods for the Examination of Water and Wastewater*, 17th Ed., 1989

Approved by _____ Date 1/4/93

00005

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client:	EMCON Northwest, Inc.	**Date Received:**	12/10/92
Project:	J. H. Baxter/#BXN-019100103 BXS-01	**Work Order No.:**	K927705B
Sample Matrix:	Water		

Dissolved Metals
µg/L (ppb)

	Sample Name:	BXS-1292-1	BXS-1292-2	BXS-1292-3
	Lab Code:	K7705-7	K7705-8	K7705-9
Analyte	**EPA Method**	**MRL**		
Arsenic	7060	5	ND	ND	ND
Barium	6010	5	12	42	38
Cadmium	6010	3	ND	ND	ND
Chromium	6010	5	ND	ND	ND
Copper	6010	10	ND	ND	ND
Iron	6010	20	ND	228	39
Lead	7421	2	ND	ND	ND
Manganese	6010	5	177	669	661
Mercury	7470	0.5	ND	ND	ND
Nickel	6010	20	ND	22	ND
Selenium	7740	5	ND	ND	ND
Silver	6010	10	ND	ND	ND
Zinc	6010	10	ND	ND	ND

MRL Method Reporting Limit
ND None Detected at or above the method reporting limit

Approved by _____ Date 1/4/93

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client:	EMCON Northwest, Inc.	**Date Received:**	12/10/92
Project:	J. H. Baxter/#BXN-019100103 BXS-01	**Work Order No.:**	K927705B
Sample Matrix:	Water		

Dissolved Metals
µg/L (ppb)

	Sample Name:		BXS-1292-4	BXS-1292-5	BXS-1292-6
	Lab Code:		K7705-10	K7705-11	K7705-12
Analyte	**EPA Method**	**MRL**			
Arsenic	7060	5	6	ND	ND
Barium	6010	5	26	14	ND
Cadmium	6010	3	ND	ND	ND
Chromium	6010	5	ND	ND	ND
Copper	6010	10	ND	ND	ND
Iron	6010	20	39	ND	28
Lead	7421	2	ND	ND	ND
Manganese	6010	5	112	198	ND
Mercury	7470	0.5	ND	ND	ND
Nickel	6010	20	ND	ND	ND
Selenium	7740	5	ND	ND	ND
Silver	6010	10	ND	ND	ND
Zinc	6010	10	ND	ND	ND

MRL Method Reporting Limit
ND None Detected at or above the method reporting limit

Approved by _____ Date 1/4/93

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client:	EMCON Northwest, Inc.	**Work Order No.:**	K927705B
Project:	J. H. Baxter/#BXN-019100103 BXS-01		
Sample Matrix:	Water		

Dissolved Metals
µg/L (ppb)

	Sample Name:	Method Blank
	Lab Code:	K7705-MB

Analyte	EPA Method	MRL	
Arsenic	7060	5	ND
Barium	6010	5	ND
Cadmium	6010	3	ND
Chromium	6010	5	ND
Copper	6010	10	ND
Iron	6010	20	ND
Lead	7421	2	ND
Manganese	6010	5	ND
Mercury	7470	0.5	ND
Nickel	6010	20	ND
Selenium	7740	5	ND
Silver	6010	10	ND
Zinc	6010	10	ND

MRL Method Reporting Limit
ND None Detected at or above the method reporting limit

Approved by _____ Date 11/4/93

RECEIVED
SEP - 7 1993
Snohomish
Health District
Environmental Health