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# 2005 Groundwater Monitoring Report
# South Woodwaste Landfill
## J.H. Baxter & Company
## Arlington, Washington

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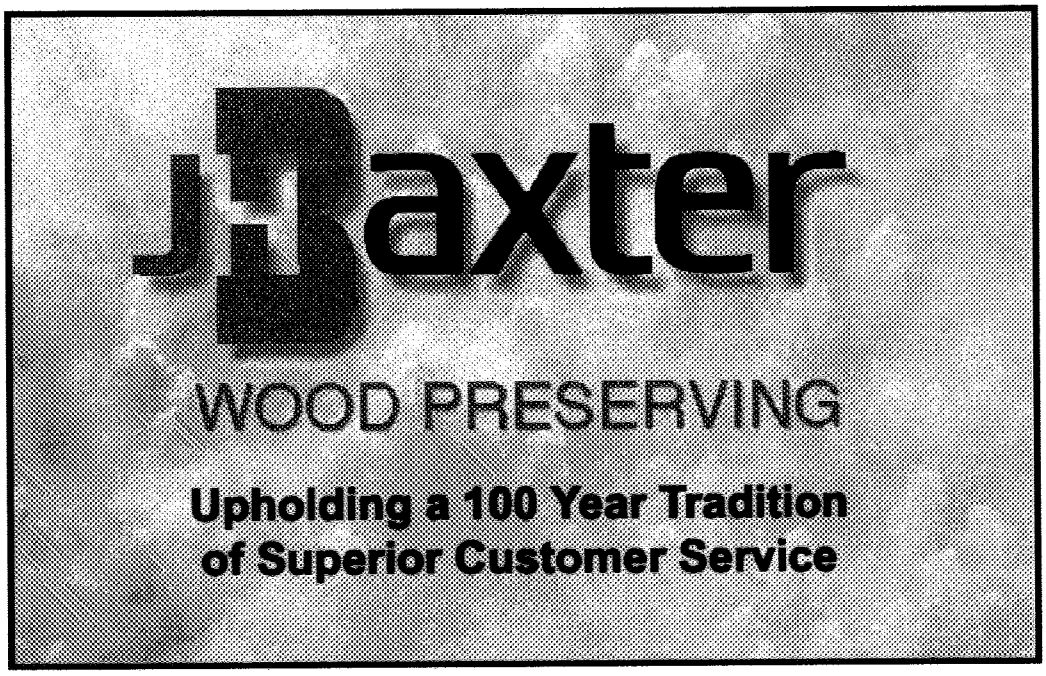


Prepared for:

**Snohomish Health District**
**3020 Rucker Avenue, Suite 104**
**Everett, Washington 98201**

Prepared by:

**J. H. Baxter & Company**
**P.O. Box 10797**
**Eugene, Oregon 97440**

**June 2006**

JHBaxter

PREMIER
ENVIRONMENTAL SERVICES, INC

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J.H. BAXTER & CO., a California Limited Partnership

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June 12, 2006

Melissa Spencer
Environmental Health Specialist
Snohomish Health District
3020 Rucker Avenue, Suite 104
Everett, Washington 98201

Re: 2005 Groundwater Monitoring Reports, North and South Woodwaste Landfills
J.H. Baxter & Co. Facility, Arlington, Washington

Dear Ms. Spencer:

Please find enclosed copies of the *2005 Groundwater Monitoring Report – North Woodwaste Landfill* and the *2005 Groundwater Monitoring Report – South Woodwaste Landfill* for J.H. Baxter & Company's (Baxter) two closed woodwaste landfills in Arlington, Washington. These reports are being submitted to you in accordance with Washington Administrative Code (WAC) 173-304-490. A copy has also been sent directly to the Washington Department of Ecology.

If you have any questions or comments regarding these reports, please do not hesitate to contact me at (541) 689-3801.

Sincerely,

RueAnn Thomas
Environmental Programs Director

cc: Krystyna Kowalik, Ecology
Mary Larson, J.H. Baxter & Co.
J. Stephen Barnett, Premier Environmental Services, Inc.

85 N. Baxter Road P.O. Box 10797 Eugene, OR 97440-2797 Phone 541 689 3801 Fax 541 689 8303

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J. Stephen Barnett, Premier Environmental Services, Inc.

# 2005 Groundwater Monitoring Report
# Arlington, Washington

## June 2006

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DEPT. OF ECOLOGY

The J. H. Baxter & Co. (Baxter) Project Team (Baxter and Premier Environmental Services, Inc.) is submitting this Groundwater Monitoring Report for Baxter's South Woodwaste Landfill in Arlington, Washington. This report was prepared by or performed under the direction of a State of Washington Licensed Hydrogeologist. If you have any questions or comments concerning the report, please contact the individuals listed below.


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# Appendices

Appendix A. Field Groundwater Sampling Records

Appendix B. Laboratory Results and Chain of Custody Records

Appendix C. Statistical Analysis of Groundwater Quality Results (BXS-1 through BXS-4)

# Acronyms and Abbreviations

| | |
|---|---|
| AVD | absolute value difference |
| Baxter | J. H. Baxter & Company |
| COD | chemical oxygen demand |
| CAS | Columbia Analytical Services, Inc. |
| EPA | Environmental Protection Agency |
| MCL | maximum contaminant level |
| MRL | method reporting limit |
| PQL | practical quantitation limit |
| QA | quality assurance |
| QC | quality control |
| RPD | relative percent difference |
| SMCL | secondary maximum contaminant level |
| TDS | total dissolved solids |
| TOC | total organic carbon |
| WAC | Washington Administrative Code |

# 1 Introduction

This report presents quarterly groundwater data collected from January to December 2005 for the J. H. Baxter & Company's (Baxter) closed South Woodwaste Landfill (South Landfill), located at 6520 188th Street NE in the City of Arlington, Snohomish County, Washington (Figure 1). The South Landfill is closed and covered with a vegetated soil cap.

Groundwater sampling was performed on monitoring wells BXS-1, BXS-2, BXS-3, and BXS-4 during quarterly monitoring events conducted in January, April, August, and December 2005.

All of the monitoring wells were installed in 1988. Monitoring wells BXS-1, BXS-2, and BXS-3 are located hydraulically downgradient of the South Landfill. Monitoring well BXS-4 is located hydraulically upgradient of the South Landfill (Figure 2). Monitoring well BXS-4 is the source of background groundwater analytical data to which the analytical data from the downgradient wells are compared. Boring logs, groundwater monitoring procedures, and a summary of site conditions encountered during the installation of the monitoring wells are included in the hydrogeologic report prepared by Sweet-Edwards/EMCON, Inc. (EMCON 1989) in 1989.

# 2 Hydrogeology

As discussed, quarterly groundwater monitoring events were performed during January, April, August, and December 2005 for the South Landfill. Monitoring activities included well purging, groundwater sampling, laboratory analysis, and water level measurement. Groundwater samples were collected from monitoring well locations BXS-1, BXS-2, BXS-3, and BXS-4 during each quarterly sampling event.

## *2.1 Groundwater Elevations*

Groundwater levels were measured in each well during each of the four monitoring events. The elevation of the groundwater surface was calculated relative to the Baxter plant datum by subtracting the depth to water from the surveyed top of casing elevation. Measured groundwater levels throughout the 2005 monitoring period are summarized in Table 1.

Groundwater elevations were generally highest during the January and April events, and were lowest during the August and December events. The static groundwater level in wells BXS-1, BXS-2, BXS-3, and BXS-4 fluctuated throughout the year by 0.22 feet, 2.33 feet, 3.04 feet, and 6.07 feet, respectively. Groundwater surface elevations measured in January 2005 (Figure 2) and the December 2005 (Figure 3) are provided for reference.

The groundwater flow direction throughout the year was toward the northwest and is consistent with the regional groundwater flow in the aquifer (Figure 4). The average gradient varied between 0.025 and 0.024 ft/ft in January and December to 0.023 and 0.002 ft/ft in April and July 2005 (Table 2).

## 2.2 Groundwater Velocities

Groundwater velocities ($v_x$) for each monitoring event were estimated using Darcy's Law.

$$v_x = -Ki / n_e$$

Hydraulic conductivity (**K**) in the fine sand unit beneath the landfill was estimated at 3 x $10^{-2}$ to 6 x $10^{-2}$ centimeters per second (cm/sec) based on slug tests performed in BXS-2 and BXS-4 (EMCON 1989). Porosity ($n_e$) was assumed to be 0.3 (i.e., 30%).

The average gradient (*i*) ranged from 0.002 ft/ft to 0.025 ft/ft, resulting in velocity estimates of 0.510 to 14.060 ft/day.

Table 2 shows the calculated hydraulic gradients and groundwater velocities during the monitoring events in 2005.

# 3 Groundwater Quality

Groundwater samples were collected on January 13 for the first quarter, April 12-13 for the second quarter, August 9-10 for the third quarter, and November 30 and December 1 for the fourth quarter of 2005 using sampling procedures originally described in Appendix C of EMCON's Hydrogeologic Report (EMCON 1989). Field sampling records are located in Appendix A. All groundwater samples were submitted to Columbia Analytical Services, Inc. (CAS) in Kelso, Washington for analyses. Groundwater levels were measured in each well immediately prior to purging the wells.

## *3.1 Groundwater Sampling*

Groundwater sampling was performed using dedicated submersible pumps (bladder pumps) in the downgradient wells BXS-1, BXS-2, and BXS-3. Well BXS-4, the upgradient well, was sampled using a portable submersible (bladder) pump. A field duplicate, labeled BXS-6, was collected from well BXS-4 during each sampling event. Additionally, a field blank of deionized water, labeled BXS-5, was collected during each sampling event.

The analytical data for the groundwater samples are summarized in Table 3. Laboratory analytical reports and chain-of-custody forms for the 2005 groundwater monitoring events are presented in Appendix B.

# 4 Data Review

This section describes the data review process that was performed to evaluate the adequacy and quality of the analytical data from the 2005 groundwater monitoring events. The objective of the data review was to identify estimated, unreliable, or invalid measurements. Information on the reliability of the data is critical to the interpretation of the results. The review was performed according to guidelines prepared by the United States Environmental Protection Agency (EPA) (EPA 1994).

## *4.1 Field Quality Assurance/Quality Control (QA/QC)*

During the quarterly groundwater sampling events, deionized water blanks and field duplicates were prepared and containerized by Baxter field personnel in accordance with standard practice. During each of the quarterly 2005 groundwater monitoring events, field duplicate samples were collected from BXS-1 and labeled BXS-6, and field blank samples were collected and labeled BXS-5.

Field duplicate results aid in the assessment of sampling and analytical precision. Analytical results for the original and duplicate samples collected from each sampling event were evaluated using the relative percent difference (RPD). The RPD between the two samples was calculated when both the natural/duplicate pair had positive results. If the RPD was greater than 35 percent, the reported values are considered estimated concentrations.

The precision of the field duplicate samples collected in 2005 is acceptable, with the following exceptions.

- It appears the metals aliquots of sample BXS-4 and the field blank were switched during the sampling or analysis of the November samples. As a result, the metals results of sample BXS-4 and the field blank are unreliable and should not be used.

Field blank results (deionized water blanks) aid in evaluating the validity of the reported concentrations in the collected samples. All results greater than or equal to the method detection limit (MDL) but less than five times the concentration of the associated field blank are considered nondetected.

The field blanks are free of target analytes above the MDLs with few exceptions. Conductivity, TOC, chloride, COD, nitrate + nitrite, tannin and lignin, dissolved manganese and dissolved iron were detected at low levels in one or more field blank. The field blank concentrations are below the MCL or SMCL and indicate that field and laboratory contamination was minimal.

## 4.2 Laboratory QA/QC

Collected groundwater samples were received by the laboratory with the proper chain-of-custody (COC) documentation, were properly preserved, and at the proper temperature. The groundwater samples were analyzed by CAS. The analyses were performed within the required holding time for the parameters of interest.

The laboratory reports are complete and contain the results for all samples and corresponding analyses requested on the COC forms.

## 4.3 Statistical Analysis of Data

Groundwater sample chemical analysis results were statistically evaluated to assess if there was a significant difference between the downgradient wells and the upgradient background well. The following approach was used for performing the statistical analysis:

- **Non-Detects.** Non-detect results were replaced with a value of half of the laboratory method reporting limit (MRL).

- **Data Distribution.** A key assumption of Student's t-test was that the data are normally distributed.

- **Parametric hypothesis testing.** Parametric hypothesis testing was performed using Student's t-test for all parameters in both the upgradient and downgradient well. For each comparison the null hypothesis was that there was no difference between the downgradient and upgradient concentrations. The null hypothesis was tested using a two-tailed test at a significance level of 0.025. The t-test statistic ($t_{stat}$) was calculated from the average and variance of quarterly sampling results in a downgradient well and the upgradient well. Each quarterly sample was compared to the previous three quarterly samples to provide a four sample running average. The average concentration in the downgradient well was significantly higher than the upgradient well if $t_{stat}$ was greater than the critical test statistic ($t_c$). The critical test statistic was computed using the percent point function. The percent point function (ppf) is the inverse of the cumulative distribution function.

Statistically significant detections above background (BXS-4) well concentrations are shown in **bold** in the tables presented in Appendix C. Statistically significant detections

below background concentrations are shown in ***gray italics*** in the tables presented in Appendix C.

# 5 Discussion of Results

## 5.1 Statistical Results

Appendix C presents the results of the statistical analyses for each individual parameter tested in the groundwater samples from BXS-1 through BXS-4. These include average concentration, variance, standard deviation, and Student's t-test statistic. The parameters detected at statistically higher concentrations in specific downgradient wells compared to the upgradient well are listed below:

- Total dissolved solids, total organic carbon, chloride, conductivity: BXS-1, BXS-2, and BXS-3
- Barium, iron, chemical oxygen demand, manganese, tannin and lignin: BXS-2 and BXS-3
- Nitrate and nitrite as nitrogen, sulfate: BXS-1
- Nickel, zinc: BXS-1, BXS-2

## 5.2 Concentration Trends over Time

Figures 5 through 18 show the concentration trends from 2002 through 2005 for each parameter discussed below.

**Ammonia as Nitrogen** (Figure 5) – The samples collected from BXS-3 during the April and August events were slightly higher than the concentrations in the background well. However, the concentrations detected in BXS-3 during the other two events and in BXS-1 and BXS-2, were considerably lower than the concentrations in the background well, BXS-4.

**Arsenic** (Figure 6) – Arsenic was not detected above the maximum contaminant level (MCL) of 10 µg/L for arsenic during the 2005 monitoring events. The concentrations of arsenic in the downgradient wells were statistically the same as the concentration in the background well. Concentrations in all wells were relatively stable during the past two years.

**Barium** (Figure 7) – The concentrations of barium in the downgradient wells, BXS-2 and BXS-3 was statistically higher than the concentrations in the background well, BXS-4 in all sampling events. The concentrations of barium in the most downgradient well, BXS-1, were statistically the same as the concentrations in the background well. The concentrations of barium in all of the groundwater samples were well below the MCL of 2,000 µg/L. Concentrations of barium have been relatively stable in all four wells during the last three years.

**Chemical Oxygen Demand** (COD) (Figure 8) – The COD in wells BXS-2 and BXS-3 were statistically higher than the COD in the background well, BXS-4. The COD in BXS-1 is statistically equal to that in the background well. There is no current MCL or secondary MCL (SMCL) established for COD. COD concentrations have been relatively stable over the last two years.

**Chloride** (see Figure 9) – The concentrations of chloride in BXS-1 and BXS-2 for all sampling events and BXS-3 for the November event were statistically higher than the concentrations in the background well. All of the groundwater samples collected from all

wells showed chloride at concentrations considerably below the SMCL of 250 mg/L for chloride. Concentrations of chloride have been relatively stable over the last three years.

**Conductivity (Field)** (Figure 10) – Conductivity of the groundwater samples from all of the downgradient wells, BXS-1, BXS-2 and BXS-3 were statistically higher than the background well. Groundwater collected from wells BXS-2 and BXS-3 had conductivity values consistently above the SMCL of 700 micromhos/centimeter (µmhos/cm). The conductivity of the samples from BXS-1 were below the SMCL. Conductivity values have been relatively stable over the last two years.

**Iron** (Figure 11) – Iron concentrations in wells BXS-2 and BXS-3 were statistically higher than the background well, and were above the SMCL of 300 µg/L for iron. The iron concentration in well BXS-1 was statistically equal to that of the upgradient well and below the SMCL. Concentrations of iron in groundwater samples collected from wells BXS-1 and BXS-4 have remained stable and were below the 300 µg/L SMCL.

**Manganese** (Figure 12) – The concentrations of manganese in the downgradient wells BXS-2 and BXS-3 were statistically higher than the levels in the background well. All four monitoring wells, including the background well, showed concentrations of manganese that were above the manganese SMCL of 50 µg/L. Manganese concentrations have been relatively stable over the last three years.

**Nickel** (Figure 13) – The concentration of nickel in the downgradient well BXS-2 for all four sampling events and BXS-1 for the April event were statistically higher than the concentration in the background well, BXS-4. However, the concentrations of nickel in all of the monitoring wells did not exceed the MCL of 100 µg/L.

**Sulfate** (Figure 14) – During all four sampling events the sulfate concentration in the downgradient well BXS-1 was statistically higher than the background well, BXS-4. The sulfate concentrations in wells BXS-2 and BXS-3 were statistically lower than the

concentrations in the background well. The concentrations of sulfate in all the wells were below the SMCL of 250 mg/L for sulfate and have remained relatively stable over the last two years.

**Tannin and Lignin** (Figure 15) – Concentrations of tannin and lignin detected in BXS-2 during the August and November sampling events and BXS-3 for all four sampling events were statistically higher than the concentrations in the background well. There is no MCL or SMCL for tannin and lignin.

**Total Organic Carbon** (TOC) (Figure 16) – Concentrations of TOC in the groundwater samples collected from the downgradient wells were statistically higher than the TOC detected in background well BXS-4. Concentrations of TOC have remained relatively stable over the last three years. There is no MCL or SMCL for TOC.

**Field pH** (Figure 17) – Field pH concentrations in the background well BXS-4 varied widely from acidic to slightly basic (i.e., 5.37 to 8.00). All of the downgradient wells were statistically lower or equivalent to the background well with results ranging from 5.03 to 6.47. For each sampling event the wells showed similar consistent results but from event to event the results alternated from readings in the mid 5's to readings in the mid 6's. The laboratory pH range of the downgradient wells is 6.28 to 8.1. The laboratory pH values of the background well are very consistent ranging from 7.95 to 8.06. For the most part the downgradient wells were within the SMCL range on the laboratory pH measurements with BXS-1 being on the slightly acidic side

**Total Dissolved Solids** (TDS) (Figure 18) – TDS measured in the downgradient wells were statistically higher than the TDS in the background well. However, only the TDS levels in BXS-2 for the January and November events were slightly over the SMCL.

## 5.3 Comparison to Standards

MCLs for groundwater are established in WAC 173-304-9901 as equal to the primary drinking water standards set forth in WAC 246-290-310. MCLs are the maximum permissible concentration of a contaminant in drinking water supplies, whereas SMCLs are guidelines related to criteria other than adverse health effects. MCLs and SMCLs are shown on the time series plots on Figures 5 through 18 for reference.

### 5.3.1 Comparison to MCLs

Of the monitored parameters, MCLs apply to arsenic, barium, cadmium, copper, nickel, and nitrate and nitrite as nitrogen. The concentrations in all of the groundwater samples were lower than the MCLs for arsenic, barium, copper, nickel, nitrate and nitrite as nitrogen during the 2005 monitoring events.

The MCL for total coliform is a drinking water criteria used to alert treatment system operators of potential bacterial contamination. This criterion does not apply to groundwater and the MCL is provided for information purposes only. The low levels of total coliform found in the monitoring well samples indicates that the potential for bacterial contamination is minimal.

### 5.3.2 Comparison to SMCLs

Among the monitored parameters, SMCLs apply to pH, conductivity, chloride, TDS, sulfate, iron, manganese, and zinc. The data from the 2005 monitoring events indicated that the groundwater concentrations from all the monitoring wells were lower than the SMCLs for chloride, sulfate, and zinc. However, some samples exceeded the SMCLs for conductivity, TDS, iron, and manganese, and some samples were below the SMCL for pH, as described below:

- Conductivity values were higher than the SMCL of 700 µmhos/cm for groundwater collected from wells BXS-2 and BXS-3 and lower than the SMCL in the background well (BXS-4) and in the most downgradient well (BXS-1). Concentration trends for conductivity have remained relatively stable.

- TDS levels were higher than the SMCL in BXS-2 in the January and November events, but were lower than the SMCL in the background well (BXS-4) and in BXS-1 and BXS-2. Concentration trends for TDS have remained relatively stable.

- Iron concentrations detected in groundwater samples from wells BXS-2 and BXS-3 were higher than the SMCL of 300 µg/L. However, iron was not detected in the most downgradient well, BXS-1. Concentration trends for iron have remained relatively stable.

- Manganese concentrations detected in all four wells exceeded the 50 µg/L SMCL during the 2005 monitoring period. Concentrations detected in BXS-2 and BXS-3 are statistically higher than those in the downgradient well, but trends have remained stable over the last three years.

- Field pH measurements ranged from 5.03 to 6.47 in the downgradient wells and 5.37 to 8.0 in the background well during the 2005 monitoring period. Measurements were consistent from well to well in a specific sampling event but varied from the low 5's to the low 6's from event to event in a cyclic fashion. Field pH's were more acidic than the corresponding laboratory measurements. The laboratory measurements were consistently within the SMCL range.

# 6 Summary

The groundwater samples collected during the 2005 monitoring events did not exceed the MCLs for any of the monitored parameters. There were no exceedences of the SMCLs for chloride, sulfate, and zinc in the groundwater samples collected during the quarterly 2005 groundwater monitoring events.

The parameters that exceeded the SMCLs in the groundwater samples collected during the 2005 monitoring events include conductivity, TDS, iron, and manganese. However, the groundwater samples from the most downgradient well, BXS-1, were below the SMCLs for conductivity, TDS, and iron. All wells, including the background well, showed concentrations of manganese that were higher than the SMCL of 50 µg/L. Concentration trends for all parameters have remained stable over the last several years.

# 7 Limitations

Work for this project was performed, and this report prepared, in accordance with generally accepted professional practices for the nature and conditions of the work completed in the same or similar localities, at the time the work was performed. It is intended for the exclusive use of J. H. Baxter & Co. for specific application to the referenced property. This report is not meant to represent a legal opinion. No other warranty, express or implied, is made.

# 8 References

Baxter 2002. 2001 Groundwater Monitoring Report, North Woodwaste Landfill, J.H. Baxter & Company, Arlington, Washington. August.

Baxter 2003. 2002 Groundwater Monitoring Report, North Woodwaste Landfill, J.H. Baxter & Company, Arlington, Washington. June.

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EPA 1994. USEPA Contract Laboratory Program National Functional Guidelines for Inorganic Data Review. EPA-540/R-94-013.

WAC-173-304-490, Washington Administrative Code. Ground Water Monitoring Requirements. Olympia, Washington.

WAC 246-290-310, Washington Administrative Code. Maximum contaminant levels (MCLs) and maximum residual disinfectant levels (MRDLs). Olympia, Washington.

# Figures

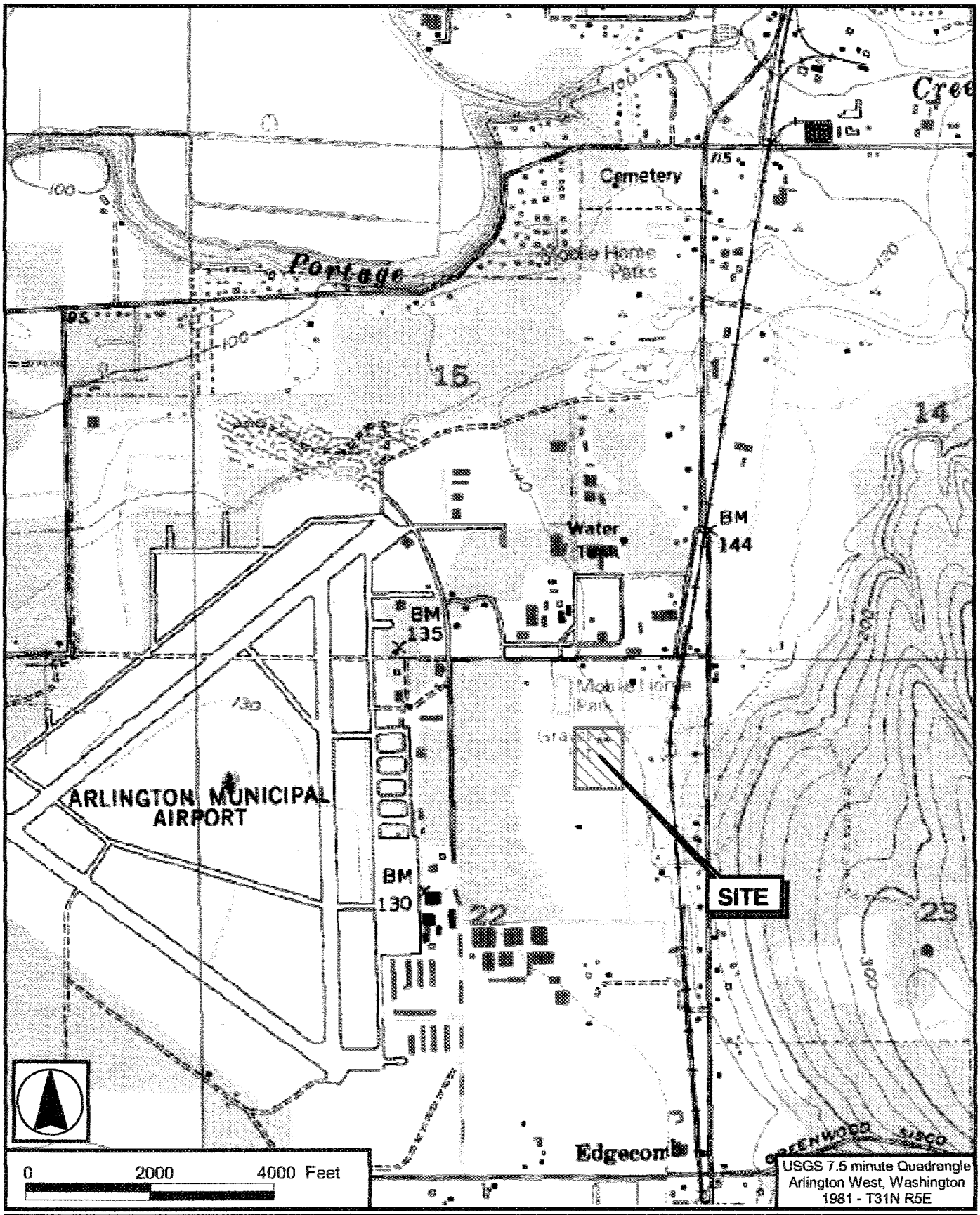
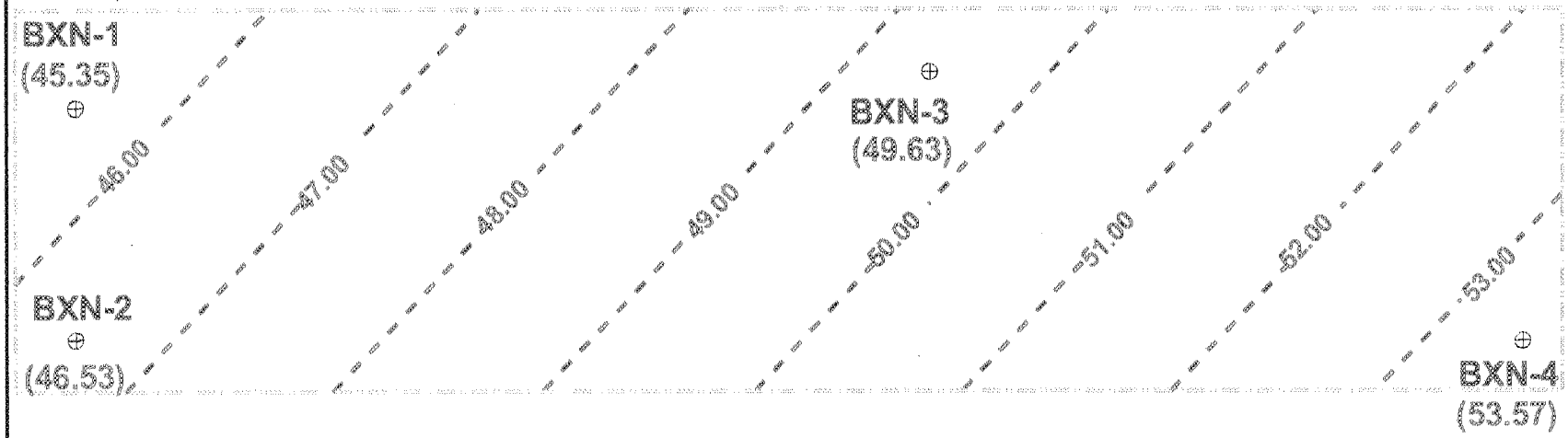



**Figure 1. Site Location Map - South Landfill**

PREMIER Baxter



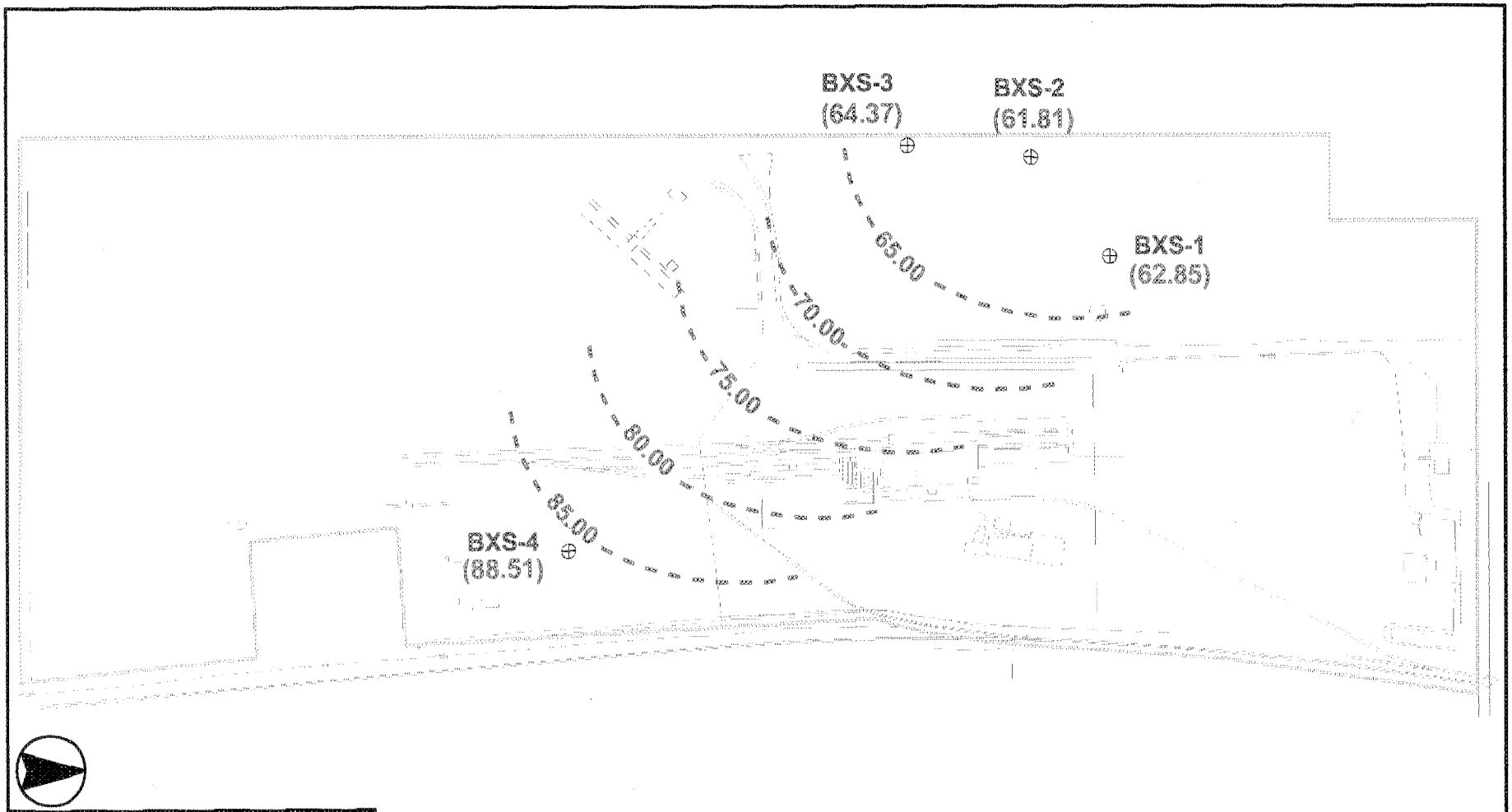

**LEGEND**

- ⊕ Monitoring Well
- (44.50) Groundwater Elevation (feet above mean sea level)
- Inferred Elevation Contour
- Site Boundary

0 100 200 Feet

**Figure 2. Groundwater Elevation Contour Map - January 2005 - North Landfill**

PREMIER Baxter



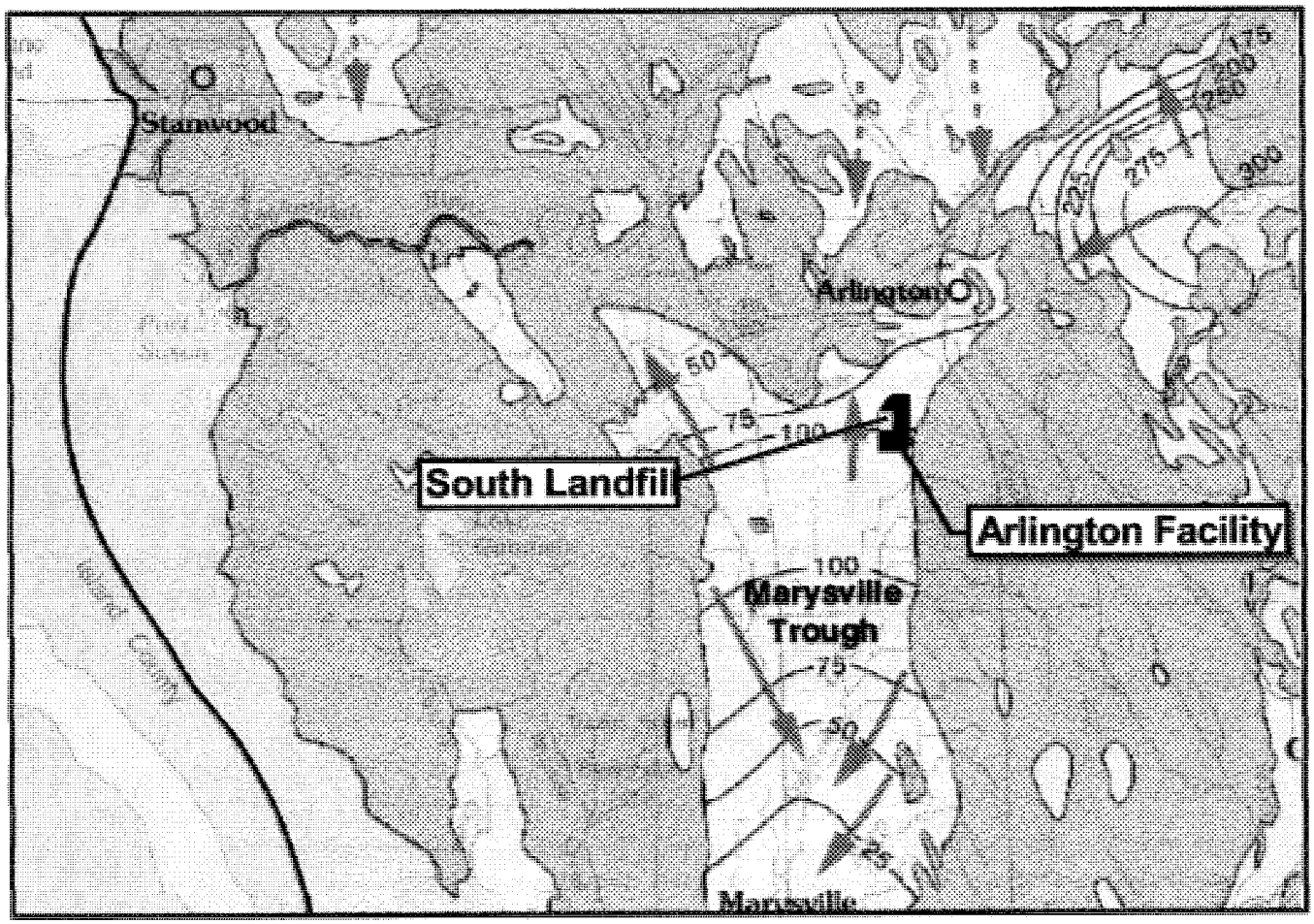

**LEGEND**

- ⊕ Monitoring Well
- (63.14) Groundwater Elevation (feet above mean sea level)
- Inferred Elevation Contour
- Site Boundary

0 200 400 Feet

**Figure 3. Groundwater Elevation Contour Map - December 2005 - South Landfill**

PREMIER Baxter




Note:
Map created by base map by B.E. Thomas, J.M. Wilkinson, and S.S. Embrey, entitled "Plate 6. Areal Recharge From Precipitation and Potentiometric Surfaces of Prinicpal Auqifers, Western Snohomish County, Washington," dated 1997

0 4 8 Miles

***LEGEND***

50 Groundwater Elevation

Groundwater Elevation Contour

Inferred Groundwater Flow Direction

**Figure 4. Regional Groundwater Flow Directions**

PREMIER Baxter

**Figure 5. Concentration Trends for Ammonia**
**South Woodwaste Landfill Monitoring Well Data**

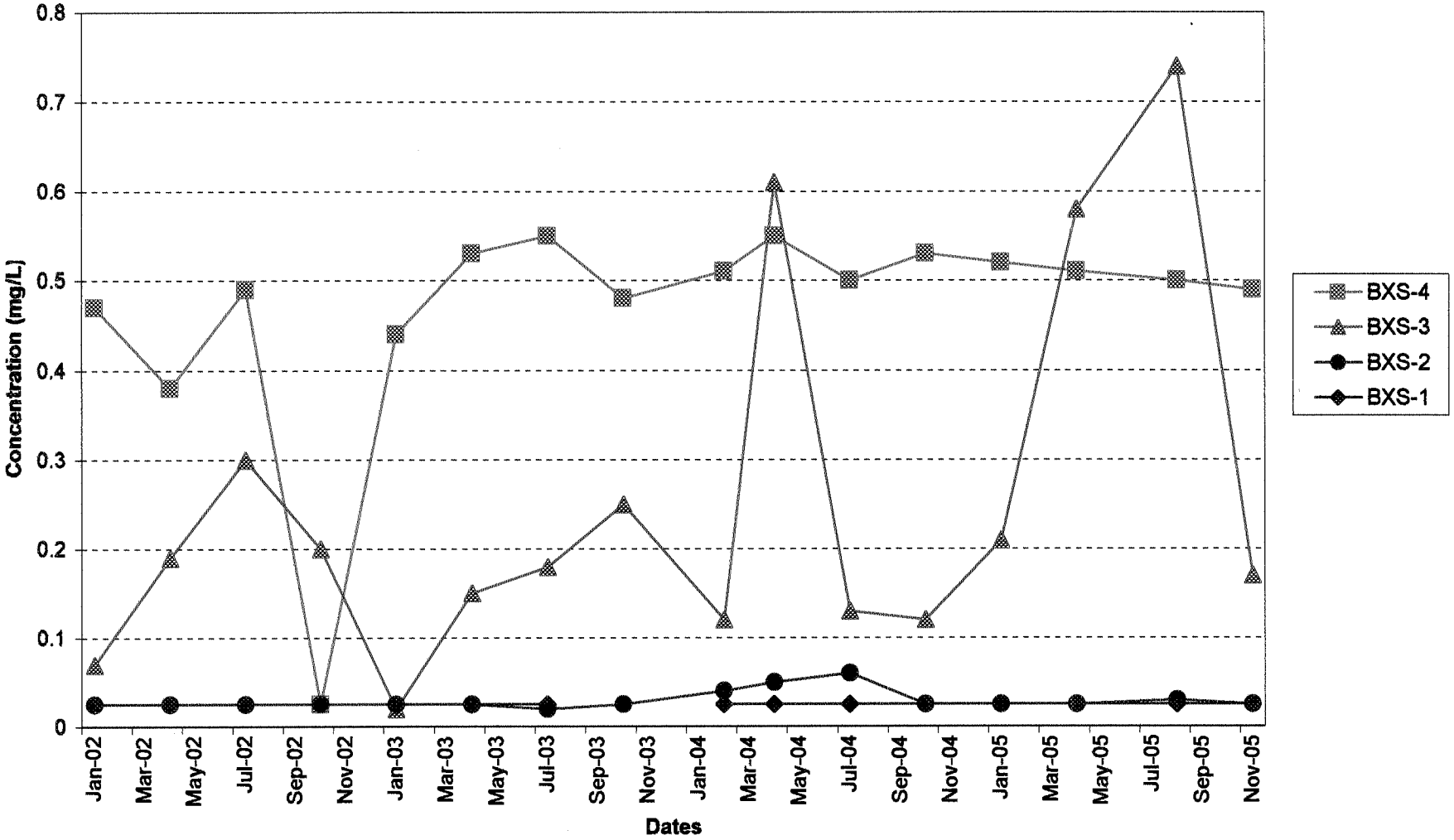


**Figure 6. Concentration Trends for Arsenic**
**South Woodwaste Landfill Monitoring Well Data**

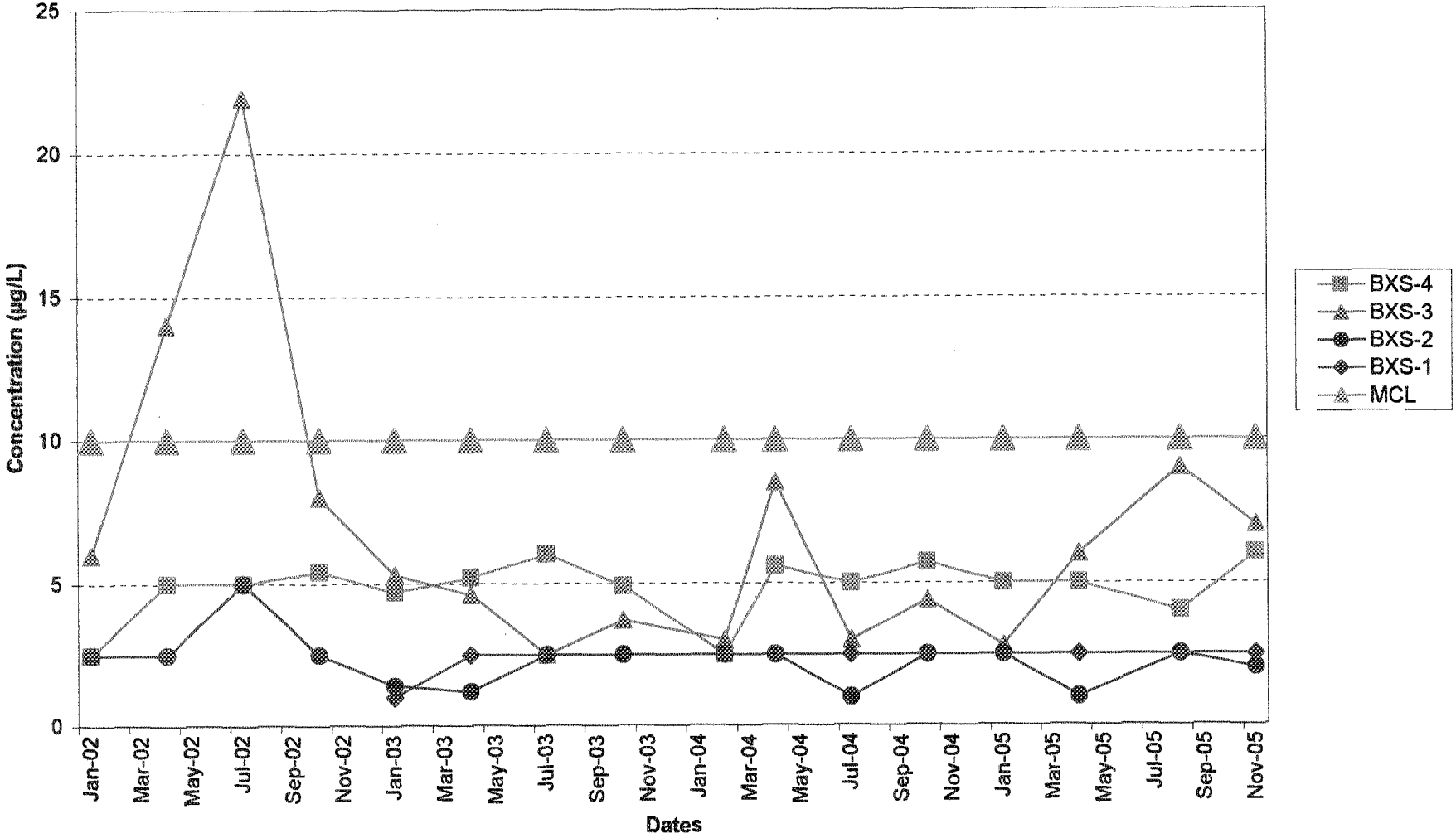


**Figure 7. Concentration Trends for Barium**
**South Woodwaste Landfill Monitoring Well Data**

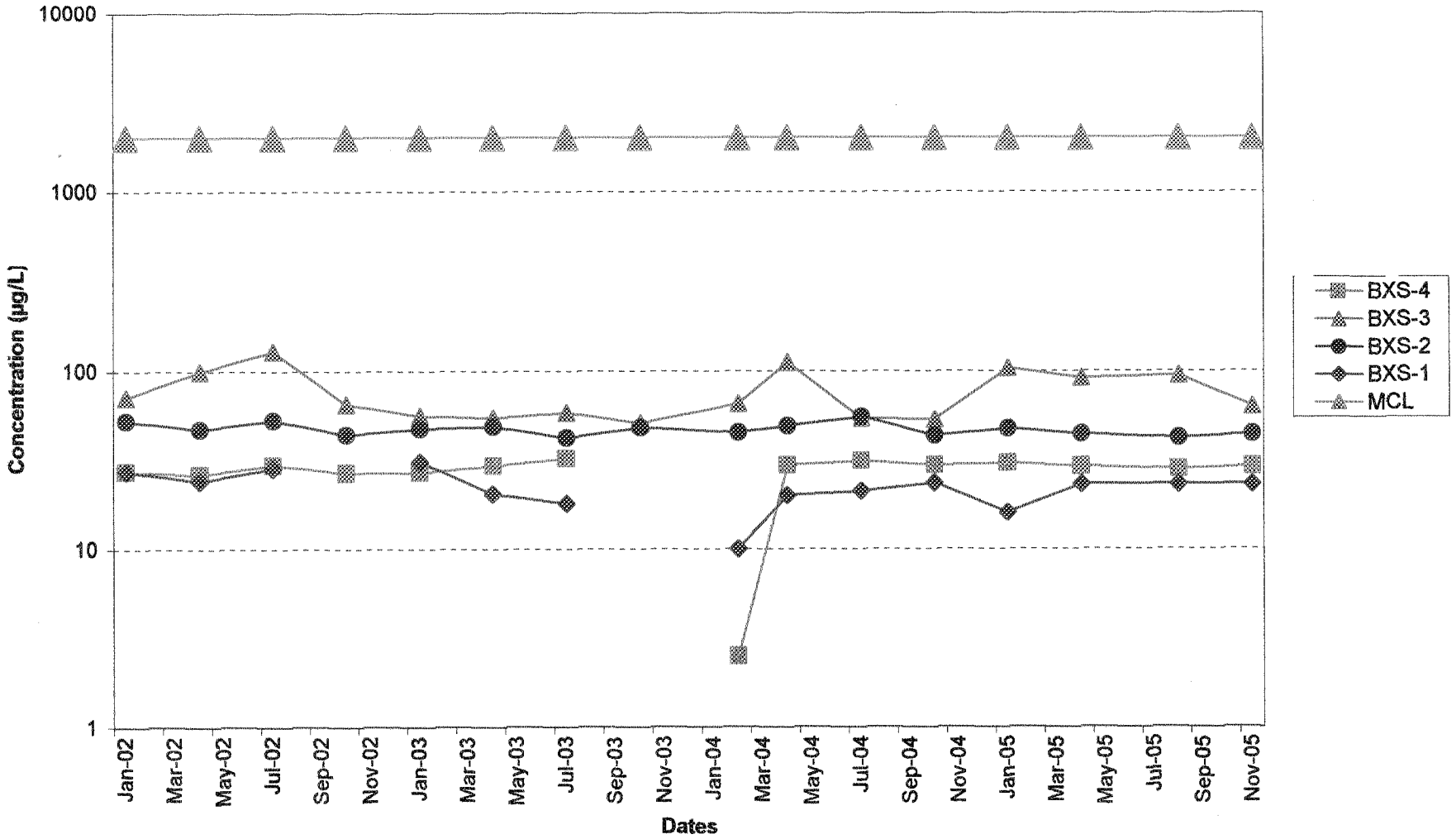


**Figure 8. Concentration Trends for Chemical Oxygen Demand**
**South Woodwaste Landfill Monitoring Well Data**

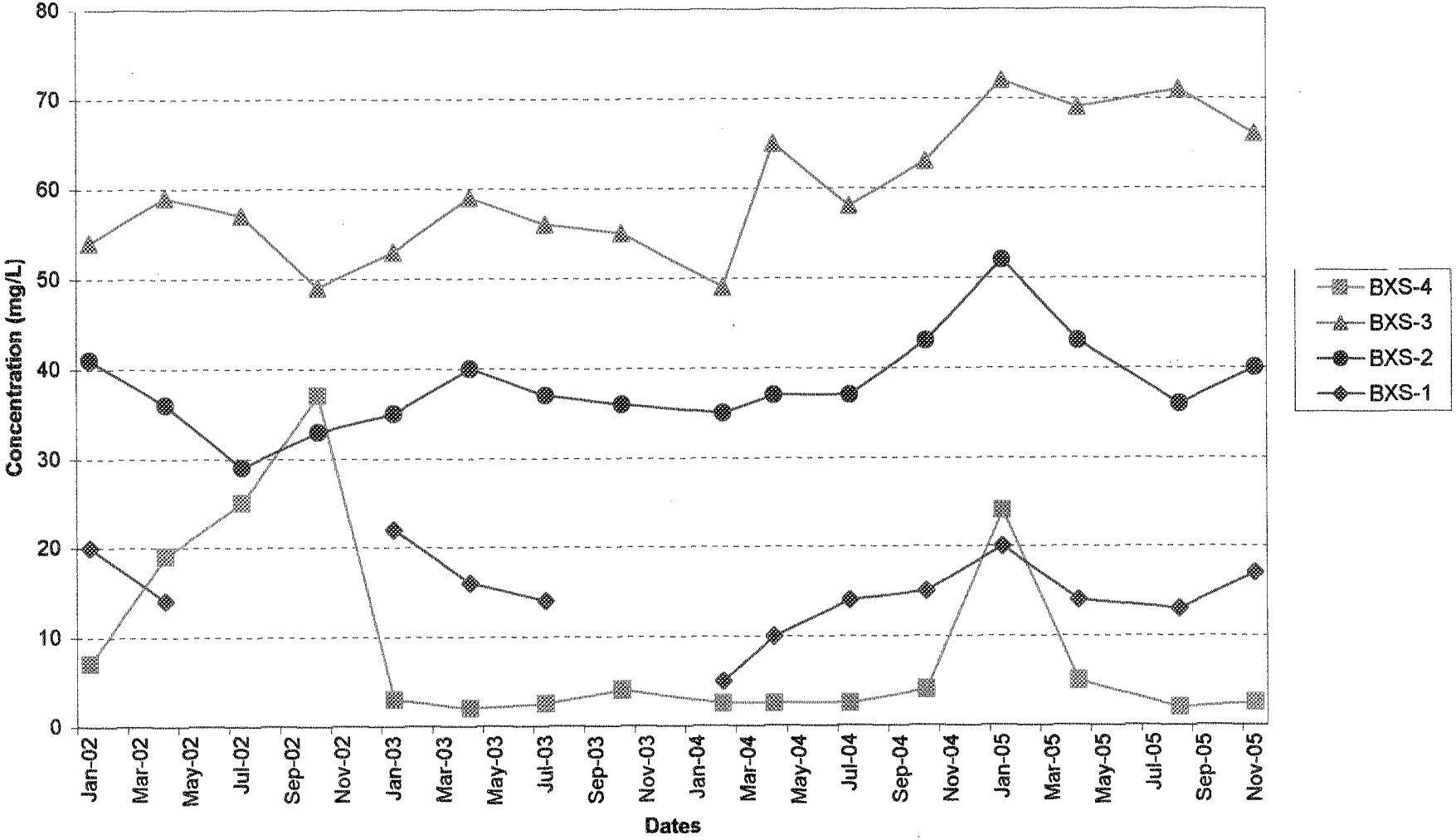


**Figure 9. Concentration Trends for Chloride**
**South Woodwaste Landfill Monitoring Well Data**

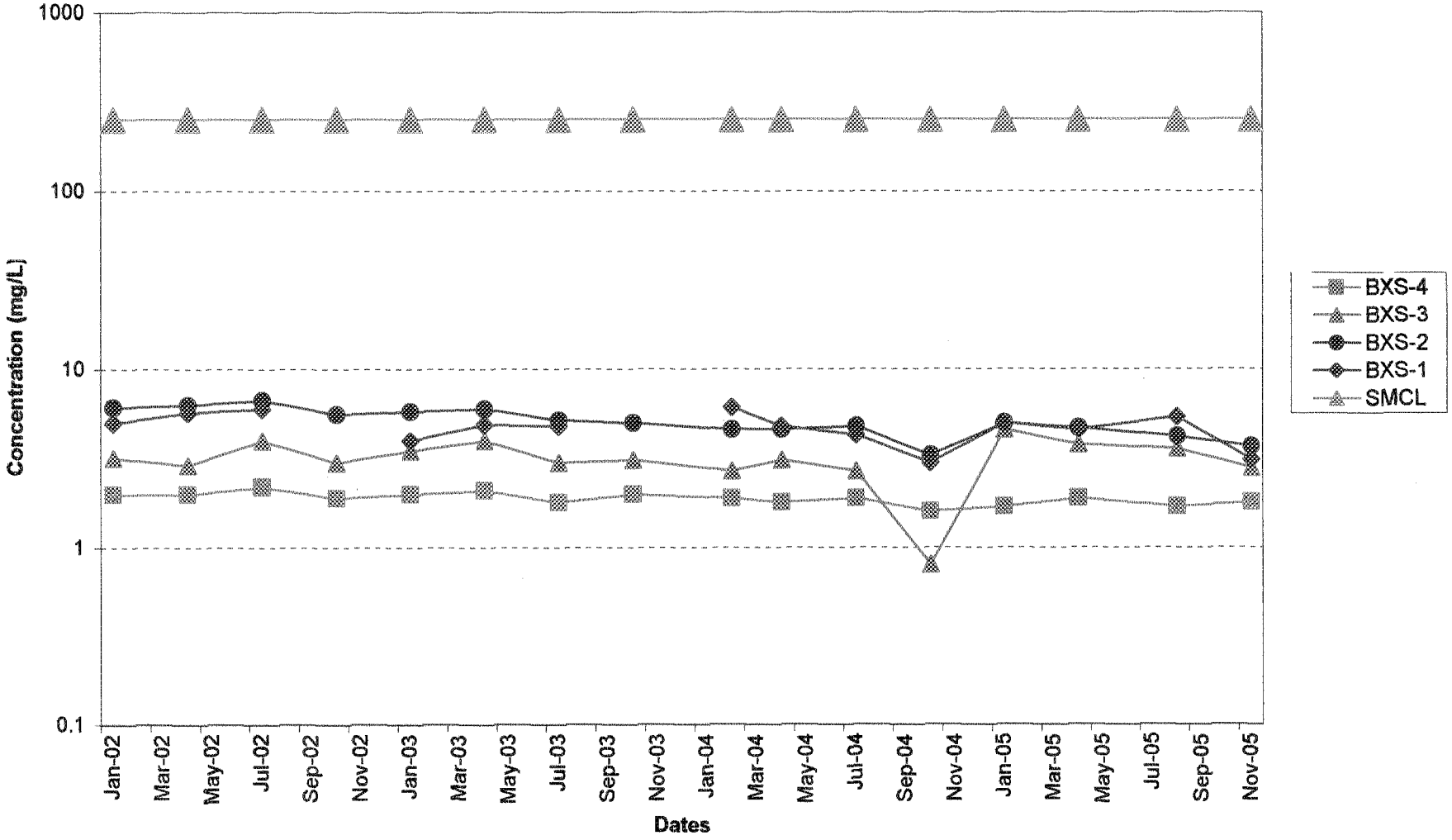


**Figure 10. Concentration Trends for Field Conductivity**
**South Woodwaste Landfill Monitoring Well Data**

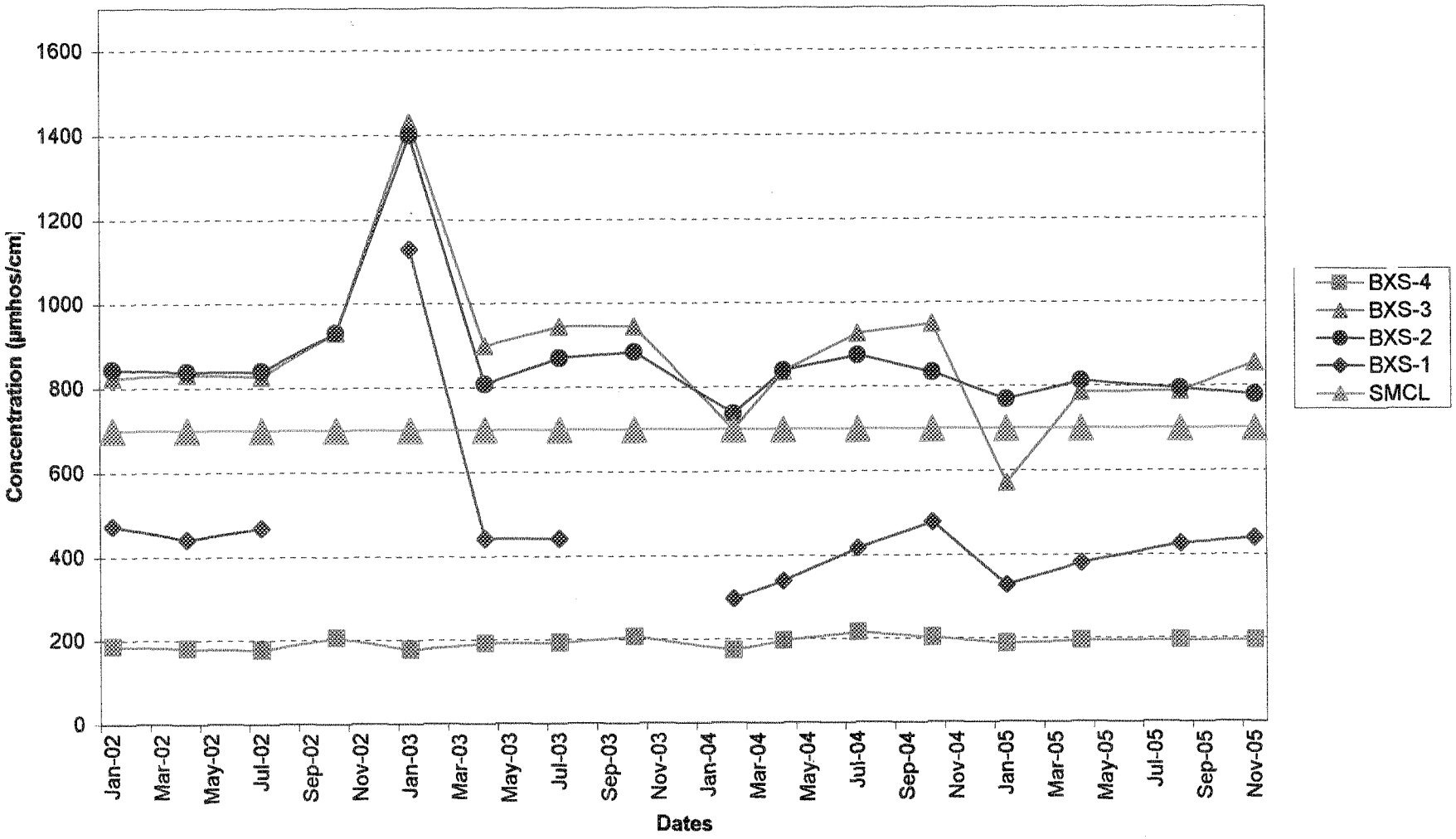


**Figure 11. Concentration Trends for Iron**
**South Woodwaste Landfill Monitoring Well Data**

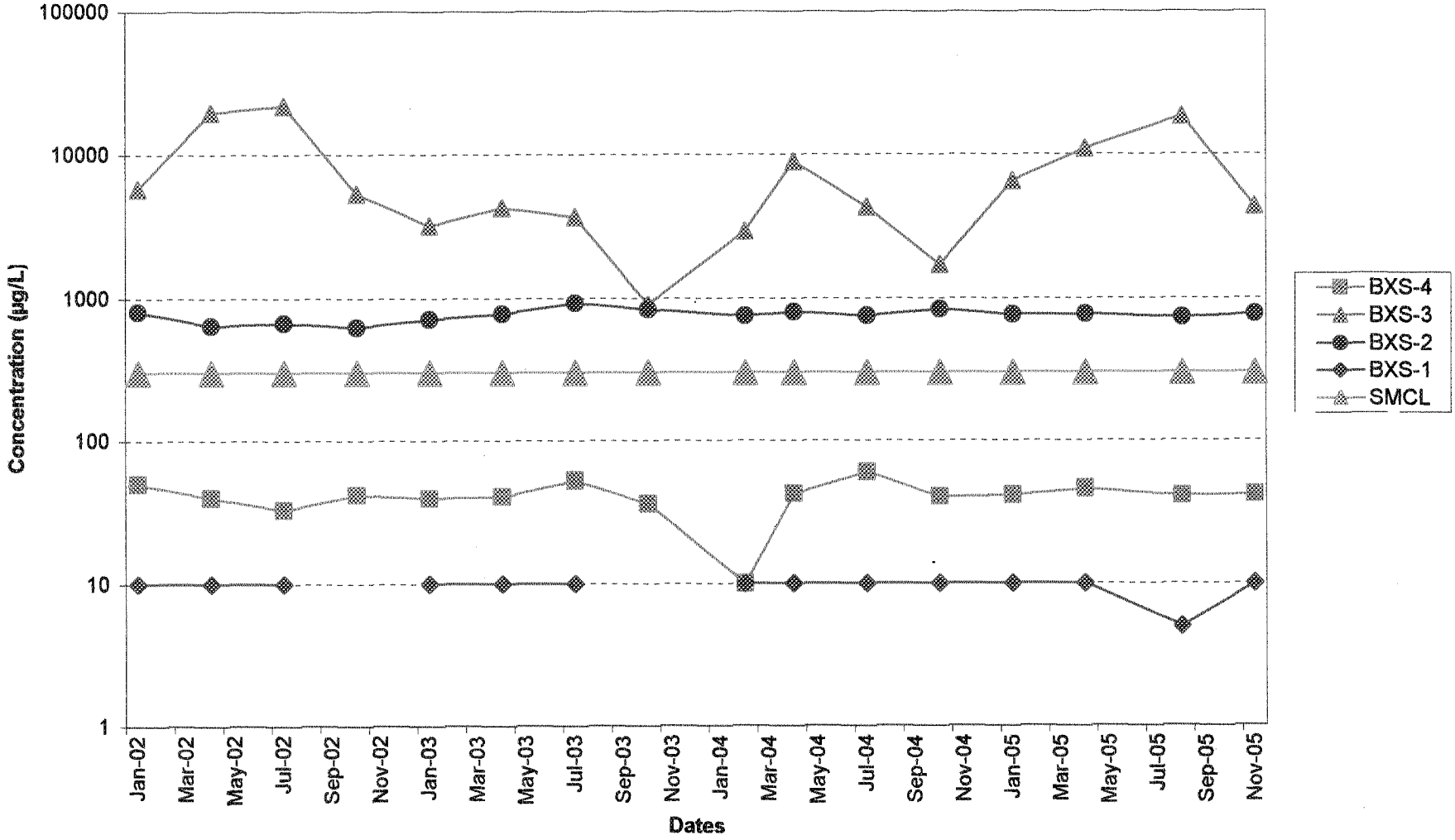


**Figure 12. Concentration Trends for Manganese**
**South Woodwaste Landfill Monitoring Well Data**

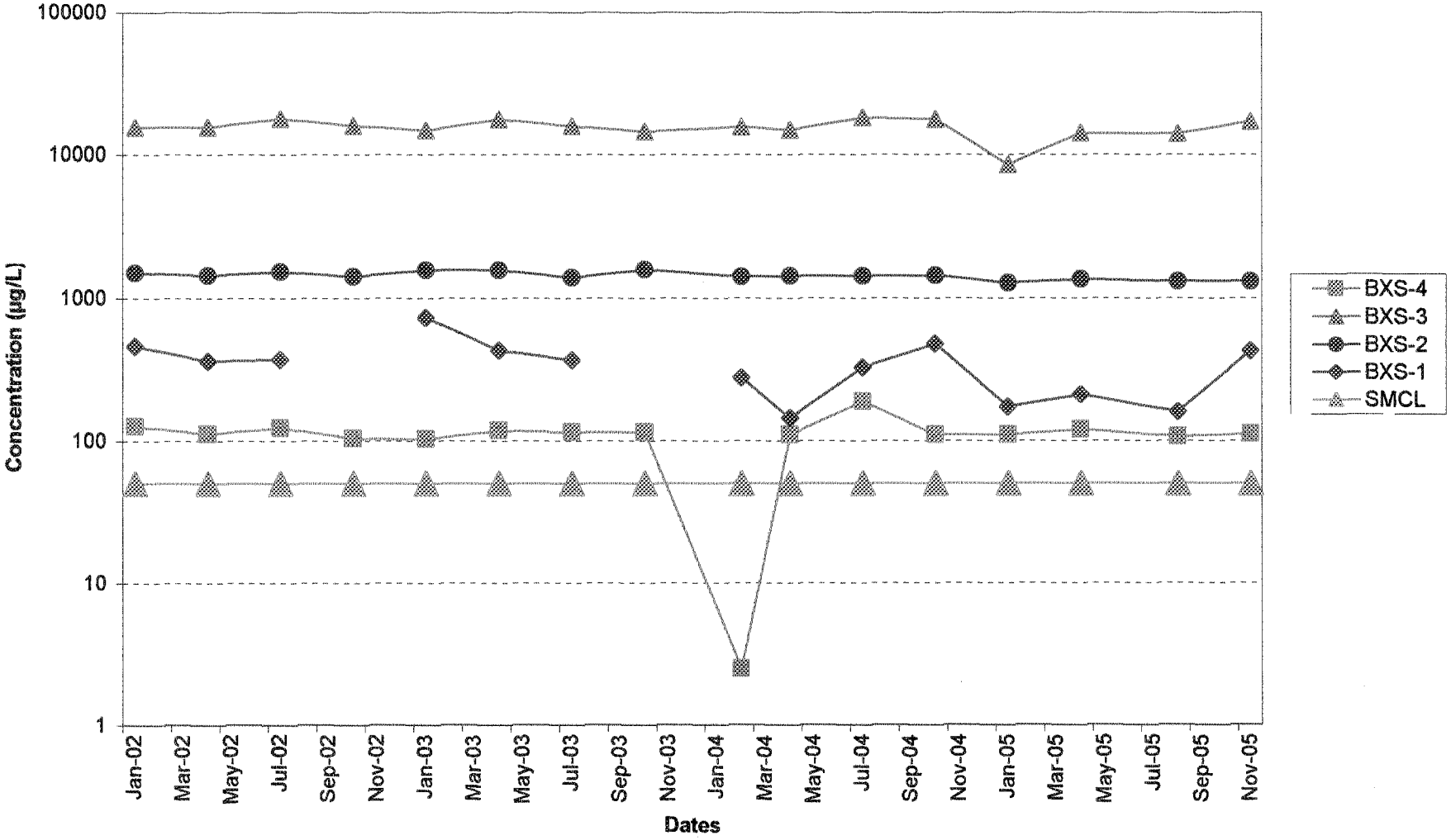


**Figure 13. Concentration Trends for Nickel**
**South Woodwaste Landfill Monitoring Well Data**

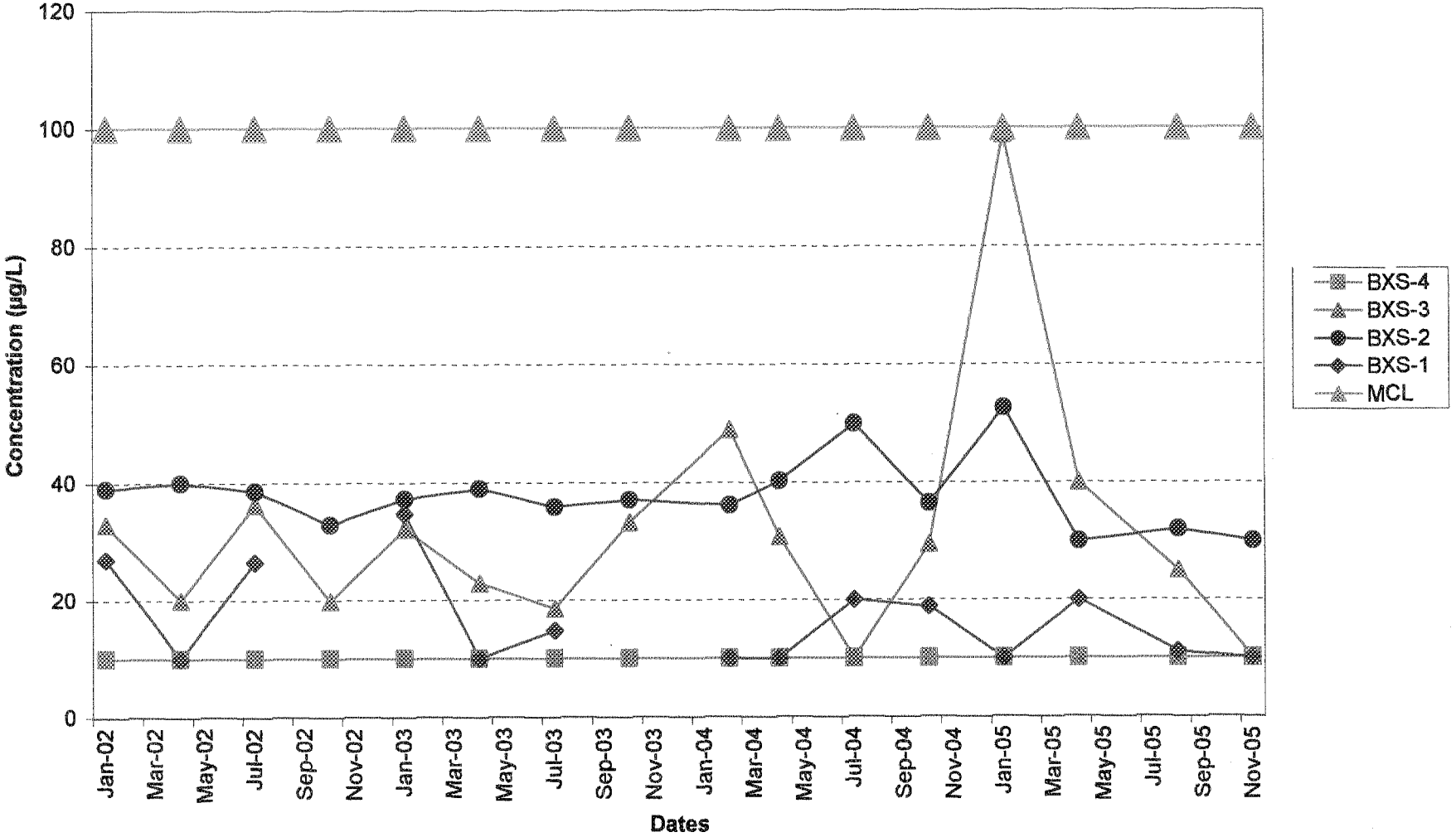


**Figure 14. Concentration Trends for Sulfate**
**South Woodwaste Landfill Monitoring Well Data**

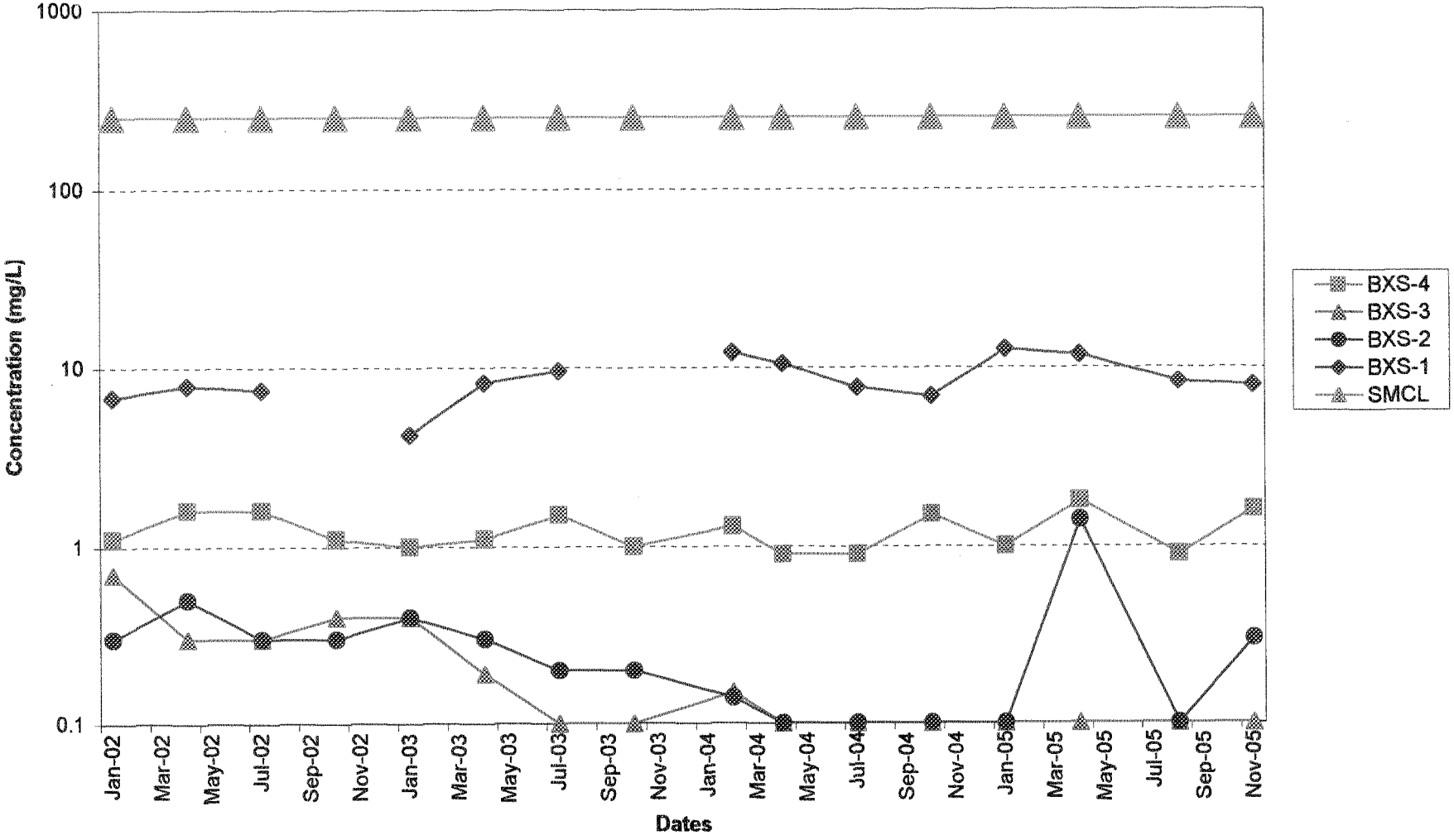


**Figure 15. Concentration Trends for Tannin and Lignin**
**South Woodwaste Landfill Monitoring Well Data**

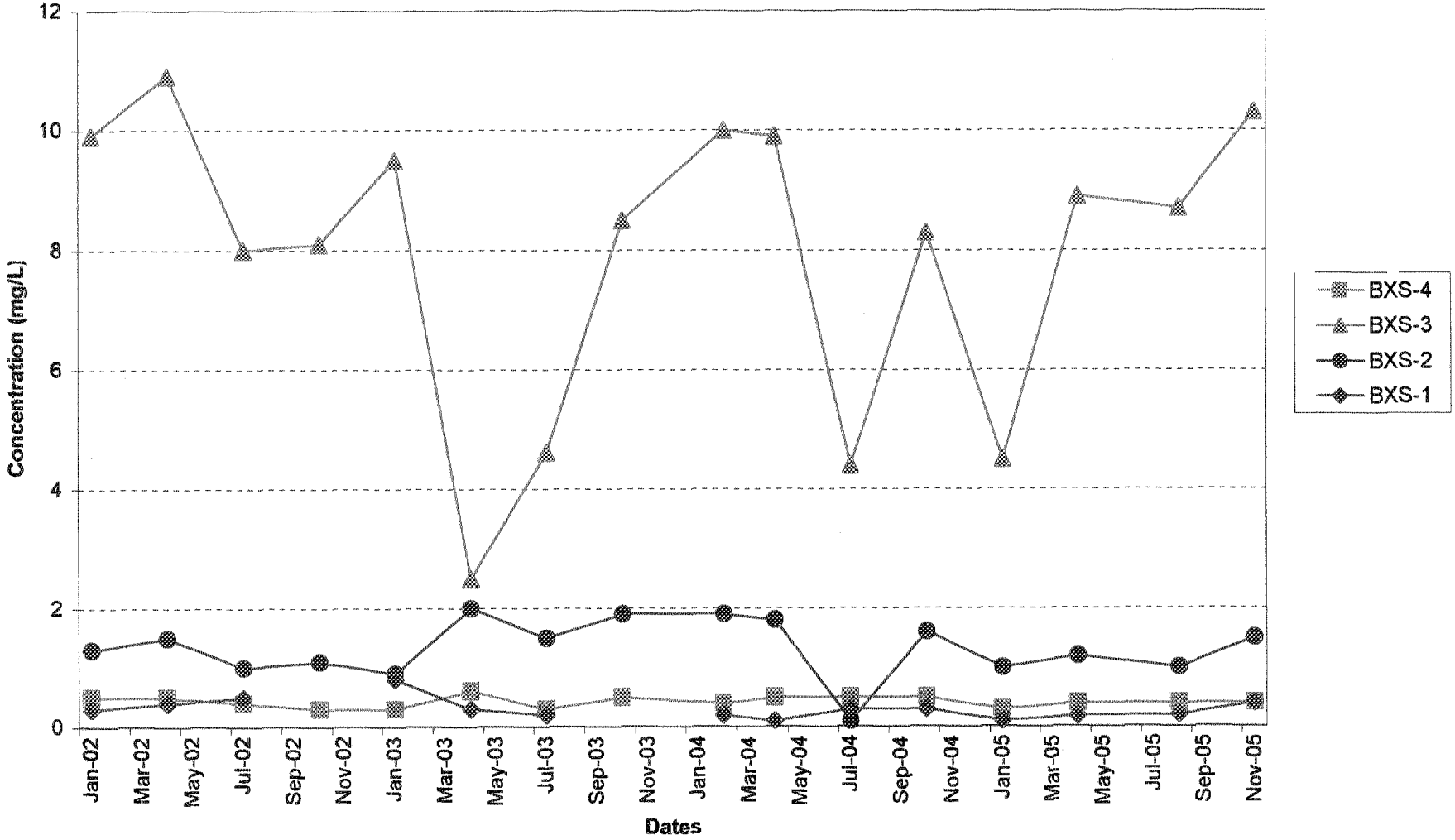


**Figure 17. Concentration Trends for Field pH**
**South Woodwaste Landfill Monitoring Well Data**

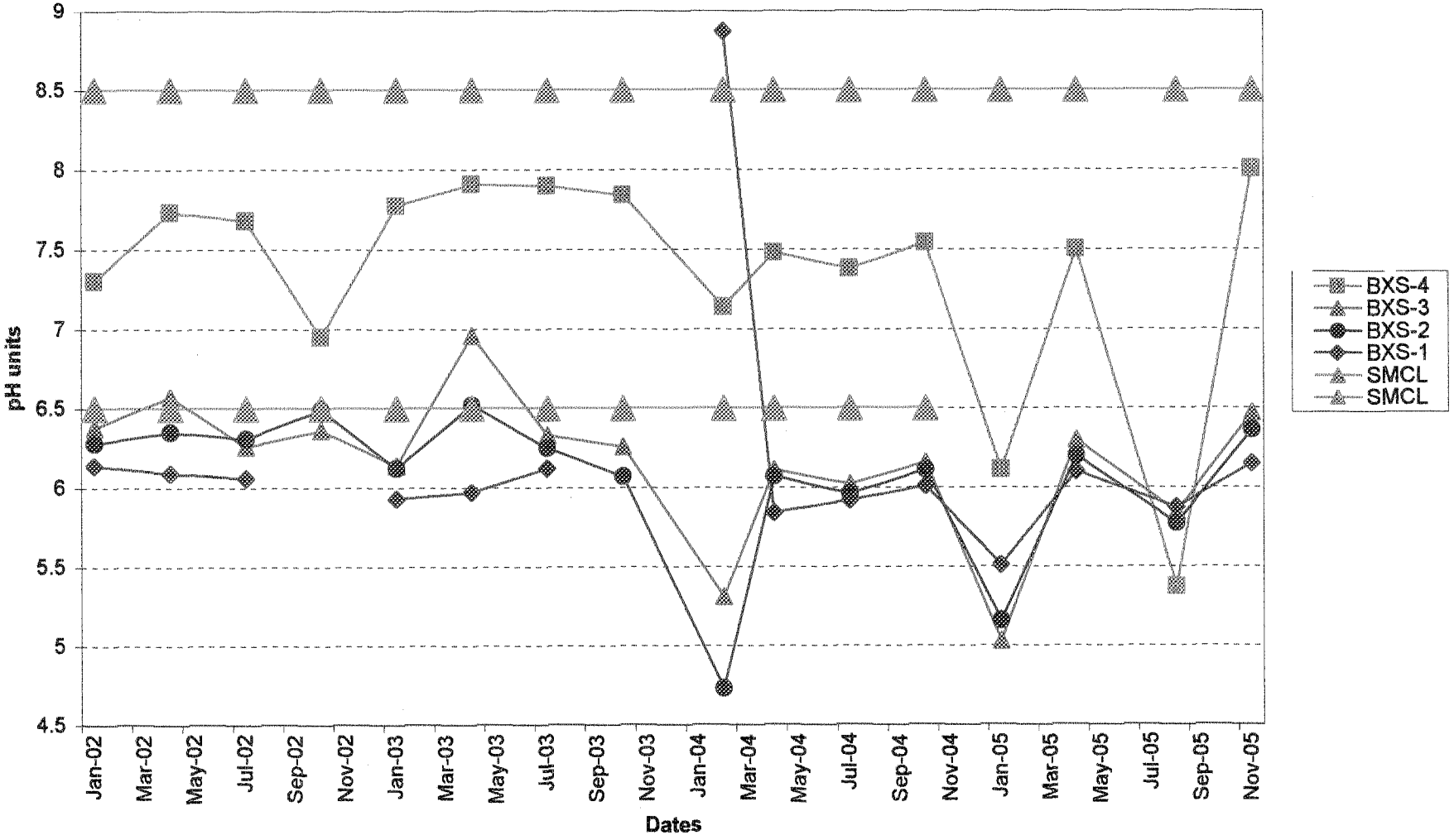
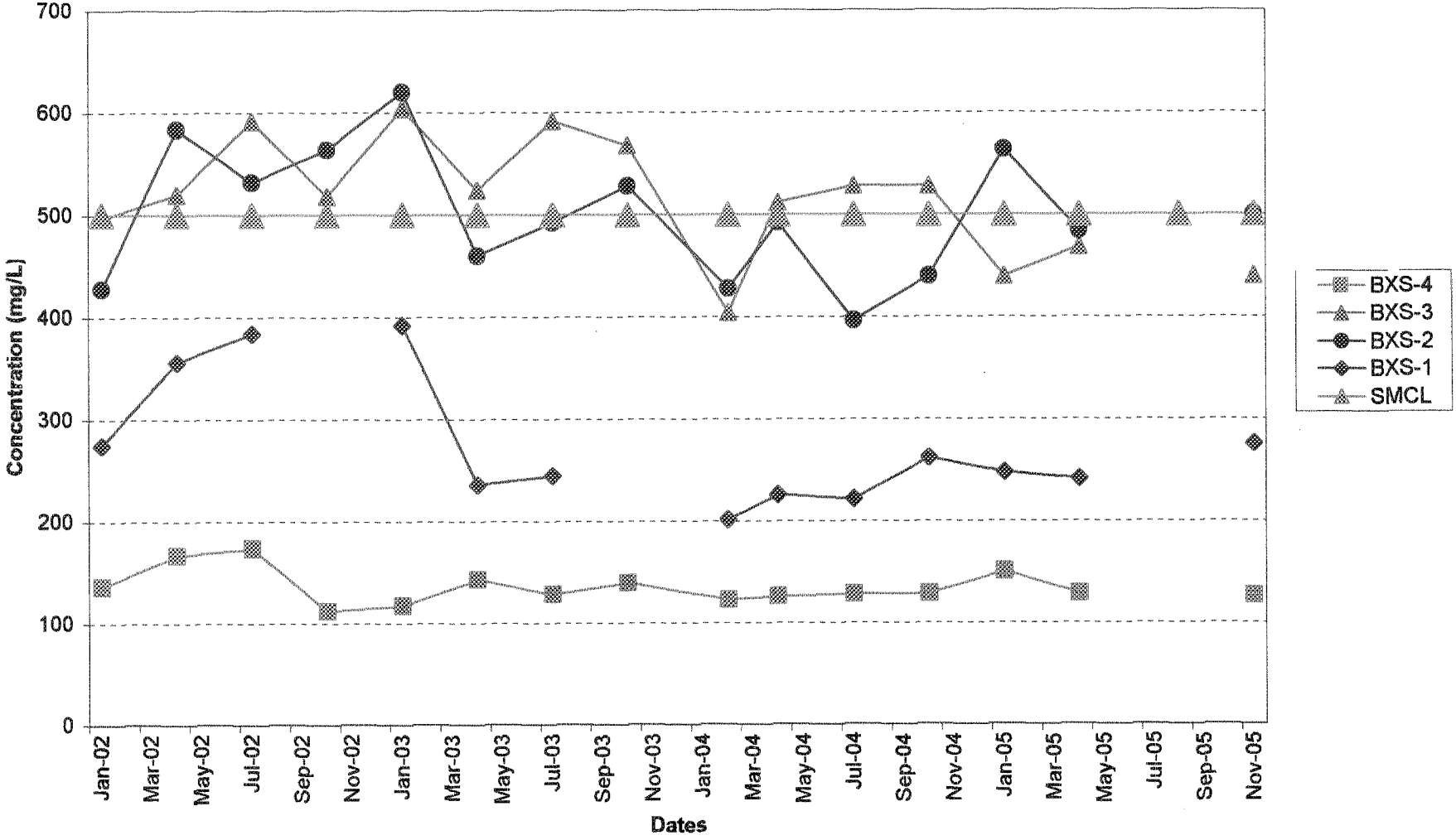


**Figure 18. Concentration Trends for Total Dissolved Solids**
**South Woodwaste Landfill Monitoring Well Data**



# Tables

## Table 1. Summary of Groundwater Elevations in 2005 (South Landfill)

| | Inner Casing (inches) | Depth of Well (ft bgs) | Length of Screen (ft) | TOC Elevation (ft asd) | TOC Elevation 10/2002[a] (ft msl) | Screened Interval (ft bgs) | | Date | Depth to GW from TOC (ft) | Groundwater Elevation (ft asd) |
|---|---|---|---|---|---|---|---|---|---|---|
| BXS-1 | 2 | 47.90 | 10 | 99.59 | 142.90 | 37.90 | 47.90 | 1/03/05 | 36.68 | 62.91 |
| | | | | | | | | 4/11/05 | 36.52 | 63.07 |
| | | | | | | | | 8/08/05 | 36.73 | 62.86 |
| | | | | | | | | 12/01/05 | 36.74 | 62.85 |
| BXS-2 | 2 | 45.40 | 10 | 99.77 | 143.02 | 35.40 | 45.40 | 1/03/05 | 36.92 | 62.85 |
| | | | | | | | | 4/11/05 | 35.63 | 64.14 |
| | | | | | | | | 8/08/05 | 35.82 | 63.95 |
| | | | | | | | | 12/01/05 | 37.96 | 61.81 |
| BXS-3 | 2 | 44.15 | 10 | 98.99 | 142.07 | 34.15 | 44.15 | 1/03/05 | 33.15 | 65.84 |
| | | | | | | | | 4/11/05 | 34.00 | 64.99 |
| | | | | | | | | 8/08/05 | 31.58 | 67.41 |
| | | | | | | | | 12/01/05 | 34.62 | 64.37 |
| BXS-4 | 2 | 47.40 | 10 | 100.34 | 143.42 | 37.40 | 47.40 | 1/03/05 | 9.95 | 90.39 |
| | | | | | | | | 4/11/05 | 10.71 | 89.63 |
| | | | | | | | | 8/08/05 | 16.02 | 84.32 |
| | | | | | | | | 12/01/05 | 11.83 | 88.51 |

**Notes:**

a) Wells were resurveyed in October 2002. Groundwater elevations are based on the earlier survey.

bgs - below ground surface

ft msl - feet above mean sea level.

ft asd - feet above assumed site datum

TOC - top of casing

## Table 2. Hydraulic Gradient and Groundwater Velocity Calculations(South Landfill)

| Date | Average Gradient ( $i$ ) (cm/cm) | K (cm/sec) | $n_e$ | v (cm/sec) | v (ft/day) |
|---|---|---|---|---|---|
| 1/03/05 | 0.025 | 3.00E-02 to 6.00E-02 | 0.300 | 0.002 to 0.005 | 7.030 to 14.060 |
| 4/11/05 | 0.023 | | | 0.002 to 0.005 | 6.491 to 12.983 |
| 8/08/05 | 0.002 | | | 0.000 to 0.000 | 0.510 to 1.020 |
| 12/01/05 | 0.024 | | | 0.002 to 0.005 | 6.803 to 13.606 |

## Table 3a. Field Parameters from Groundwater Sampling, April 2000 to November 2005 (South Landfill)

| Number of Samples 4<br>Critical Statistic 2.353 | pH (s.u.) | | | | Conductivity (µS/cm) | | | | Temperature (°C) | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Primary MCL [a]<br>Secondary MCL [a] | 6.5 - 8.5 | | | | 700 | | | | | | | |
| | **BXS-4** | **BXS-3** | **BXS-2** | **BXS-1** | **BXS-4** | **BXS-3** | **BXS-2** | **BXS-1** | **BXS-4** | **BXS-3** | **BXS-2** | **BXS-1** |
| Apr-00 | 7.59 | 7.51 | 7.53 | 7.5 | 187 | 831 | 875 | 431 | 10.8 | 15.30 | 16.10 | 15.2 |
| Jul-00 | 7.74 | 6.58 | 6.52 | 6.18 | 182 | 822 | 905 | 464 | 13.5 | 19.90 | 15.90 | 14.4 |
| Oct-00 | 7.92 | 6.39 | 6.5 | 6.22 | 185 | 855 | 833 | 502 | 9.9 | 16.2 | 19.40 | 12.6 |
| Jan-01 | 8.07 | 7.11 | 6.73 | 6.55 | 182 | 925 | 893 | 522 | 8 | 11.4 | 10.60 | 9.6 |
| Apr-01 | 7.52 | 6.49 | 6.47 | 6.07 | 184 | 860 | 860 | 476 | 9.4 | 14.9 | 15.30 | 14 |
| Jul-01 | 6.89 | 7.87 | 8.37 | 7.26 | 183 | 833 | 850 | 477 | 8.6 | 17.3 | 14.10 | 13.8 |
| Oct-01 | 6.91 | 6.7 | 6.05 | 5.71 | 203 | 872 | 847 | 495 | 11.5 | 15.4 | 15.50 | 14 |
| Jan-02 | 7.3 | 6.38 | 6.28 | 6.14 | 186 | 825 | 844 | 474 | 7.1 | 10.6 | 10.80 | 9.3 |
| Apr-02 | 7.73 | 6.57 | 6.35 | 6.09 | 181 | 832 | 838 | 441 | 10.4 | 14.9 | 13.40 | 11.9 |
| Jul-02 | 7.68 | 6.26 | 6.31 | 6.06 | 178 | 827 | 840 | 469 | 11.9 | 16.4 | 14.40 | 13.1 |
| Oct-02 | 6.95 | 6.36 | 6.49 | | 205 | 930 | 930 | | 9.8 | 13.2 | 13.20 | |
| Jan-03 | 7.77 | 6.14 | 6.12 | 5.93 | 178 | 1430 | 1400 | 1130 | 9.8 | 13.4 | 13.3 | 11.6 |
| Apr-03 | 7.91 | 6.96 | 6.52 | 5.97 | 191 | 899 | 808 | 442 | 9.6 | 13.6 | 13.4 | 11.7 |
| Jul-03 | 7.9 | 6.33 | 6.25 | 6.12 | 193 | 945 | 869 | 441 | 10.91 | 13.58 | 13.37 | 16.19 |
| Oct-03 | 7.84 | 6.26 | 6.07 | | 207 | 945 | 883 | | 10.16 | 13.76 | 13.92 | |
| Feb-04 | 7.140 | 5.310 | 4.730 | 8.87 | 174 | 699 | 737 | 297 | 9.58 | 13.13 | 12.79 | 12.54 |
| Apr-04 | 7.48 | 6.11 | 6.07 | 5.84 | 197 | 836 | 838 | 339 | 9.69 | 13.42 | 12.89 | 13.71 |
| Jul-04 | 7.38 | 6.02 | 5.96 | 5.92 | 216 | 926 | 874 | 417 | 10.27 | 13.76 | 13.51 | 13.66 |
| Oct-04 | 7.54 | 6.16 | 6.11 | 6.01 | 203 | 949 | 834 | 478 | 10.81 | 13.82 | 14.48 | 13.14 |
| Jan-05 | 6.110 | 5.030 | 5.160 | 5.51 | 187 | 571 | 768 | 328 | 9.88 | 13.52 | 12.9 | 11.92 |
| Apr-05 | 7.5 | 6.3 | 6.20 | 6.1 | 194 | 785 | 812 | 380 | 9.6 | 13.5 | 13 | 11.9 |
| Aug-05 | 5.37 | 5.84 | 5.77 | 5.87 | 195 | 788 | 794 | 426 | 10.51 | 13.16 | 12.84 | 12.61 |
| Dec-05 | 8 | 6.47 | 6.36 | 6.15 | 194 | 854 | 778 | 439 | 9.7 | 12.2 | 12.5 | 11.7 |

## Table 3a. Field Parameters from Groundwater Sampling, April 2000 to November 2005 (South Landfill)

| Number of Samples 4<br>Critical Statistic 2.353 | Eh (mV) | | | | DO (mg/L) | | | |
|---|---|---|---|---|---|---|---|---|
| Primary MCL [a]<br>Secondary MCL [a] | | | | | | | | |
| | **BXS-4** | **BXS-3** | **BXS-2** | **BXS-1** | **BXS-4** | **BXS-3** | **BXS-2** | **BXS-1** |
| Apr-00 | -80 | -70 | 80 | 120 | 0 | 0.8 | 0.00 | 0 |
| Jul-00 | -70 | -45 | 120 | 135 | 2.22 | 1.62 | 2.33 | 0.76 |
| Oct-00 | -1 | 0 | 0 | 130 | 4.99 | 5.24 | 5.22 | 5.89 |
| Jan-01 | | -20 | 90 | 110 | 4.3 | 2.54 | 1.28 | 6.98 |
| Apr-01 | -65 | 45 | 105 | 100 | 0.75 | 1.37 | 1.11 | 1.22 |
| Jul-01 | -1 | 1 | 0 | 120 | 1.46 | 0.99 | 1.32 | 0.33 |
| Oct-01 | 180 | 20 | 50 | 115 | 0.99 | 0.83 | 0.93 | 0.86 |
| Jan-02 | -65 | -5 | 80 | 160 | 1.37 | 1.39 | 1.01 | 1.96 |
| Apr-02 | -45 | 0.5 | 135 | 180 | 0.87 | 2.17 | 0.79 | 0.49 |
| Jul-02 | -55 | -5 | 90 | 180 | 1.24 | 0.84 | 1.01 | 0.4 |
| Oct-02 | 60 | 57 | 166 | | 7.97 | 1.72 | 1.37 | |
| Jan-03 | -3 | 183 | 217 | 258 | 3.92 | 2.04 | 2.74 | 3.4 |
| Apr-03 | -31 | 43 | 126 | 366 | 7.8 | 5.5 | 3.64 | 5.56 |
| Jul-03 | -253 | -57 | -9 | 202 | 0.82 | 2.28 | 0.44 | 2.79 |
| Oct-03 | -162 | 35 | 59 | | 1.53 | 2.82 | 3.31 | |
| Feb-04 | -110 | -6 | 35 | 143 | 11.24 | 4.81 | 8.84 | 7.39 |
| Apr-04 | -174 | -28 | 51 | 212 | 0.35 | 1.27 | 1.28 | 3.18 |
| Jul-04 | -92 | 6 | 30 | 182 | 0.41 | 0.46 | 1.52 | 2.73 |
| Oct-04 | -198 | -39 | 11 | 148 | 4.57 | 3.06 | 10.92 | 3.36 |
| Jan-05 | 5 | 3 | 3 | 4 | 7.10 | 4.66 | 3.80 | 4.46 |
| Apr-05 | -171 | -1 | 67 | 317 | 1.1 | 4.4 | 1.7 | 6.4 |
| Aug-05 | -86 | -1 | 84 | 84 | 4.13 | 9.66 | 4.74 | 3.98 |
| Dec-05 | -120 | -25 | 51 | 177 | 8 | 1.9 | 6.5 | 0.7 |

Notes:

(a) Primary and secondary MCLs (maximum contaminant levels) per WAC 246-290-310.

## Table 3b. Conventional Parameters from Groundwater Sampling, April 2000 to November 2005 (South Landfill)

| Number of Samples 4<br>Critical Statistic 2.353 | pH (s.u.) | | | | | | | Conductivity (umhos/cm) | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Primary MCL [a]<br>Secondary MCL [a] | 6.5 - 8.5 | | | | | | | 700 | | | | | | |
| | BXS-4 | BXS-4 Dup [c] | BXS-3 | BXS-2 | BXS-1 | BXS-1 Dup [c] | Field blk [d] | BXS-4 | BXS-4 Dup [c] | BXS-3 | BXS-2 | BXS-1 | BXS-1 Dup [c] | Field blk [d] |
| Apr-00 | 7.97 | | 6.47 | 6.39 | 6.15 | 6.08 | 6.01 | 150 | | 568 | 685 | 342 | 344 | 2 U |
| Jul-00 | 7.78 | | 6.34 | 6.31 | 5.96 | 5.93 | 5.16 | 165 | | 589 | 767 | 401 | 429 | 2 U |
| Oct-00 | 7.99 | | 6.47 | 6.37 | 6.15 | 6.12 | 5.72 | 159 | | 614 | 719 | 414 | 436 | 2 U |
| Jan-01 | 8.03 | | 6.83 | 6.48 | 6.06 | 6.1 | 5.52 | 189 | | 872 | 878 | 473 | 494 | 2 |
| Apr-01 | 7.87 | | 6.9 | 6.36 | 6.33 | 6.01 | 5.4 | 193 | | 901 | 884 | 506 | 474 | 3 |
| Jul-01 | 7.96 | | 6.64 | 6.44 | 6.09 | 6.12 | 5.53 | 193 | | 885 | 890 | 489 | 490 | 1 |
| Oct-01 | 7.58 | | 6.36 | 6.27 | 6.07 | 5.96 | 5.92 | 195 | | 887 | 861 | 504 | 500 | 6 |
| Jan-02 | 8.03 | | 6.45 | 6.34 | 6.17 | 6.14 | 5.77 | 192 | | 806 | 842 | 471 | 474 | 2 U |
| Apr-02 | 8.02 J | | 6.6 J | 6.32 J | 6 J | 6.06 J | 5.9 J | 192 | | 804 | 863 | 443 | 445 | 2 |
| Jul-02 | 8 | | 6.4 | 6.51 | 6.21 | 6.2 | 5.9 | 176 | | 710 | 794 | 434 | 425 | 2 U |
| Oct-02 | | | 6.51 | 6.57 | | | | | | 817 | 785 | | | |
| Jan-03 | | | | | | | | | | | | | | |
| Apr-03 | | | | | | | | | | | | | | |
| Jul-03 | | | | | | | 5.86 | | | | | | | 2 U |
| Oct-03 | 8.04 | 7.99 | 6.56 | 6.41 | | | 7.05 | 182 | 182 | 851 | 789 | | | 2 U |
| Feb-04 | 8 | 8 | 6.37 | 6.39 | 6.22 | | 5.76 | 182 | 179 | 692 | 736 | 286 | | 0.6 J |
| Apr-04 | 7.91 | 7.92 | 6.41 | 6.38 | 6.14 | | 5.65 | 172 | 175 | 696 | 716 | 295 | | 2 U |
| Jul-04 | 8 | 8.01 | 6.52 | 6.5 | 6.28 | | 5.78 | 171 | 168 | 739 | 681 | 347 | | 2 U |
| Oct-04 | 7.96 | 7.97 | 6.57 | 6.67 | 6.26 | | 6.5 | 179 | 178 | 933 | 819 | 395 | | 0.2 J |
| Jan-05 | 7.95 | 7.97 | 6.28 | 6.55 | 6.29 | | 5.63 | 194 | 195 | 526 | 813 | 334 | | 1.8 J |
| Apr-05 | 8.06 | 8.1 | 6.82 | 6.6 | 6.42 | | 6.06 | 191 | 188 | 749 | 803 | 370 | | 1.4 J |
| Aug-05 | 7.98 | 8.02 | 6.67 | 6.54 | 6.28 | | 5.95 | 190 | 192 | 741 | 799 | 418 | | 2 U |
| Nov-05 | 8 | 7.91 | 6.73 | 6.63 | 6.33 | | 5.78 | 194 | 194 | 793 | 778 | 442 | | 1.4 J |

**Table 3b. Conventional Parameters from Groundwater Sampling, April 2000 to November 2005 (South Landfill)**

| Number of Samples 4<br>Critical Statistic 2.353 | Ammonia as N (mg/L) | | | | | | | COD (mg/L) | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Primary MCL [a]<br>Secondary MCL [a] | | | | | | | | | | | | | | |
| | BXS-4 | BXS-4 Dup [c] | BXS-3 | BXS-2 | BXS-1 | BXS-1 Dup [c] | Field blk [d] | BXS-4 | BXS-4 Dup [c] | BXS-3 | BXS-2 | BXS-1 | BXS-1 Dup [c] | Field blk [d] |
| Apr-00 | 0.51 | | 0.3 | 0.05 U | 0.05 U | 0.05 U | 0.05 U | 16 | | 91 | 44 | 24 | 21 | 5 U |
| Jul-00 | 0.54 | | 0.31 | 0.05 | 0.05 U | 0.05 | 0.05 U | 5 U | | 49 | 49 | 29 | 14 | 5 U |
| Oct-00 | 0.46 | | 0.16 | 0.05 U | 0.05 U | 0.05 U | 0.05 U | 29 | | 77 | 41 | 26 | 27 | 5 U |
| Jan-01 | 0.63 | | 0.12 | 0.05 U | 0.1 | 0.07 | 0.06 | 7 | | 68 | 40 | 21 | 23 | 5 U |
| Apr-01 | 0.48 | | 0.14 | 0.05 U | 0.05 U | 0.05 U | 0.05 U | 14 | | 79 | 47 | 27 | 27 | 5 U |
| Jul-01 | 0.53 | | 0.11 | 0.05 U | 0.05 U | 0.05 U | 0.05 U | 38 | | 71 | 46 | 23 | 24 | 5 U |
| Oct-01 | 0.37 | | 0.05 U | 0.05 U | 0.05 U | 0.05 U | 0.05 U | 10 | | 60 | 37 | 18 | 19 | 5 U |
| Jan-02 | 0.47 | | 0.07 | 0.05 U | 0.05 U | 0.05 U | 0.05 U | 7 | | 54 | 41 | 20 | 17 | 5 U |
| Apr-02 | 0.38 | | 0.19 | 0.05 U | 0.05 UJ | 0.05 U | 0.05 U | 19 | | 59 | 36 | 14 | 16 | 5 U |
| Jul-02 | 0.49 | | 0.3 | 0.05 UJ | 0.05 U | 0.05 U | 0.05 U | 25 | | 57 | 29 | | 14 J | 5 U |
| Oct-02 | 0.05 U | | 0.2 | 0.05 U | | | | 37 | | 49 | 33 | | | |
| Jan-03 | 0.44 | | 0.02 J | 0.05 U | 0.05 UJ | 0.46 | 0.025 | 3 | | 53 | 35 | 22 | 3 | 5 U |
| Apr-03 | 0.53 | | 0.15 | 0.05 U | 0.05 U | 0.05 U | 0.025 | 2 J | | 59 | 40 | 16 | 16 | 5 U |
| Jul-03 | 0.55 | | 0.18 | 0.02 J | 0.05 U | 0.05 U | | 5 U | | 56 | 37 | 14 | 14 | |
| Oct-03 | 0.48 | 0.53 | 0.25 | 0.05 U | | | 0.05 U | 4 J | 3 J | 55 | 36 | | | 5 U |
| Feb-04 | 0.51 | 0.51 | 0.12 | 0.04 J | 0.05 U | | 0.05 U | 5 U | 5 U | 49 | 35 | 5 | | 5 |
| Apr-04 | 0.55 | 0.55 | 0.61 | 0.05 | 0.05 U | | 0.05 U | 5 U | 5 U | 65 | 37 | 10 | | 5 U |
| Jul-04 | 0.5 | 0.47 | 0.13 | 0.06 | 0.05 U | | 0.05 U | 5 U | 5 U | 58 | 37 | 14 | | 5 U |
| Oct-04 | 0.53 | 0.51 | 0.12 | 0.05 U | 0.05 U | | 0.05 U | 4 J | 3 J | 63 | 43 | 15 | | 5 U |
| Jan-05 | 0.52 | 0.51 | 0.21 | 0.05 U | 0.05 U | | 0.05 U | 24 | 16 | 72 | 52 | 20 | | 2 J |
| Apr-05 | 0.51 | 0.53 | 0.58 | 0.05 U | 0.05 U | | 0.05 U | 5 | 6 | 69 | 43 | 14 | | 5 |
| Aug-05 | 0.5 | 0.5 | 0.74 | 0.03 J | 0.05 U | | 0.05 U | 2 J | 5 U | 71 | 36 | 13 | | 5 U |
| Nov-05 | 0.49 | 0.48 | 0.17 | 0.05 U | 0.05 U | | 0.05 U | 5 U | 3 J | 66 | 40 | 17 | | 5 U |

**Table 3b. Conventional Parameters from Groundwater Sampling, April 2000 to November 2005 (South Landfill)**

| Number of Samples 4<br>Critical Statistic 2.4 | Chloride (mg/L) | | | | | | | Nitrate + Nitrite as N (mg/L) | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Primary MCL [a]<br>Secondary MCL [a] | 250 | | | | | | | 10 | | | | | | |
| | BXS-4 | BXS-4 Dup [c] | BXS-3 | BXS-2 | BXS-1 | BXS-1 Dup [c] | Field blk [d] | BXS-4 | BXS-4 Dup [c] | BXS-3 | BXS-2 | BXS-1 | BXS-1 Dup [c] | Field blk [d] |
| Apr-00 | 2 | | 3.9 | 7.4 | 8.2 | 8.2 | 0.2 U | 0.2 U | | 0.2 U | 0.2 U | 0.4 | 0.4 | 0.2 U |
| Jul-00 | 2 | | 5.5 | 8.8 | 8.3 | 8.2 | 0.2 U | 0.1 | | 0.2 U | 0.2 U | 0.5 | 0.5 | |
| Oct-00 | 2 | | 5 | 8.1 | 6.7 | 7 | 0.2 U | 0.2 U | | 0.2 U | 0.2 U | 0.2 U | 0.2 U | 0.2 U |
| Jan-01 | 2.2 | | 5.5 | 8.7 | 7.7 | 7.7 | 0.2 U | 0.2 U | | 0.2 U | 0.2 U | 0.3 | 0.3 | 0.2 U |
| Apr-01 | 2 | | 4.8 | 7.6 | 5.9 | 5.8 | 0.2 U | 0.2 U | | 0.2 U | 0.2 U | 0.2 | 0.4 | 0.2 U |
| Jul-01 | 2 | | 4.4 | 6.7 | 5.6 | 5.5 | 0.2 U | 0.2 U | | 0.2 U | 0.2 U | 0.4 | 0.4 | 0.2 U |
| Oct-01 | 2 | | 4.1 | 6.7 | 4.3 | 4.3 | 0.2 U | | | | | | | |
| Jan-02 | 2 | | 3.2 | 6.1 | 5 | 4.9 | 0.2 U | 0.2 U | | 0.2 U | 0.2 U | 0.2 | 0.3 | 0.2 U |
| Apr-02 | 2 | | 2.9 | 6.3 | 5.7 | 5.9 | 0.2 U | 0.2 U | | 0.2 U | 0.2 U | 1.1 | 1.1 | 0.2 U |
| Jul-02 | 2.2 | | 4 | 6.7 | 6 | 6.4 | 0.2 U | 0.2 U | | 0.2 U | 0.2 U | 0.7 | 0.6 | 0.2 U |
| Oct-02 | 1.9 | | 3 | 5.6 | | | | 0.9 | | | 0.2 U | | | |
| Jan-03 | 2 | | 3.5 | 5.8 | 4 | 2.2 | 0.2 U | | | | | | | |
| Apr-03 | 2.1 | | 4 | 6 | 4.9 | 4.7 | 0.2 U | 0.2 U | | 0.2 U | 0.2 U | 0.9 | 0.8 | 0.2 U |
| Jul-03 | 1.8 | | 3 | 5.2 | 4.8 | 5 | 0.2 U | 0.2 U | | 0.2 U | 0.2 U | 1.5 | 1.5 | 0.02 J |
| Oct-03 | 2 | 1.8 | 3.1 | 5 | | | 0.2 U | 0.2 U | 0.2 U | 0.2 U | 0.2 U | | | 0.2 U |
| Feb-04 | 1.9 | 1.9 | 2.7 | 4.6 | 6.1 | | 0.2 U | 0.06 J | 0.06 J | 0.08 J | 0.1 J | 1.1 | | 0.2 U |
| Apr-04 | 1.8 | 1.8 | 3.1 | 4.6 | 4.8 | | 0.2 U | 0.2 U | 0.2 U | 0.2 U | 0.2 U | 1.4 | | 0.2 U |
| Jul-04 | 1.9 | 1.8 | 2.7 | 4.8 | 4.3 | | 0.2 U | 0.05 J | 0.05 J | 0.2 U | 0.2 U | 0.6 | | 0.04 J |
| Oct-04 | 1.6 | 1.6 | 0.8 | 3.3 | 3 | | 0.2 U | 0.05 U | 0.05 U | 0.01 J | 0.01 J | 0.3 | | 0.2 U |
| Jan-05 | 1.7 | 1.7 | 4.6 | 5 | 5 | | 0.2 U | 0.01 J | 0.02 J | 0.03 J | 0.01 J | 0.75 | | 0.01 J |
| Apr-05 | 1.9 | 1.9 | 3.8 | 4.7 | 4.6 | | 0.2 U | 0.2 U | 0.2 U | 0.2 U | 0.2 U | 1 | | 0.2 U |
| Aug-05 | 1.7 | 1.7 | 3.6 | 4.2 | 5.4 | | 0.2 U | 0.05 U | 0.05 U | 0.02 J | 0.01 J | 0.95 | | 0.05 U |
| Nov-05 | 1.8 | 1.9 | 2.8 | 3.7 | 3.1 | | 0.04 J | 0.1 J | 0.09 J | 0.08 J | 0.11 J | 0.3 | | 0.1 J |

**Table 3b. Conventional Parameters from Groundwater Sampling, April 2000 to November 2005 (South Landfill)**

| Number of Samples 4<br>Critical Statistic 2.4 | Nitrate as N (mg/L) | | | | | | | Nitrite as N (mg/L) | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Primary MCL [a]<br>Secondary MCL [a] | | | | | | | | | | | | | | |
| | BXS-4 | BXS-4 Dup [c] | BXS-3 | BXS-2 | BXS-1 | BXS-1 Dup [c] | Field blk [d] | BXS-4 | BXS-4 Dup [c] | BXS-3 | BXS-2 | BXS-1 | BXS-1 Dup [c] | Field blk [d] |
| Apr-00 | | | | | | | | | | | | | | |
| Jul-00 | | | | | | | 0.05 U | | | | | | | 0.1 U |
| Oct-00 | | | | | | | | | | | | | | |
| Jan-01 | | | | | | | | | | | | | | |
| Apr-01 | | | | | | | | | | | | | | |
| Jul-01 | | | | | | | | | | | | | | |
| Oct-01 | 0.2 UJ | | 0.3 UJ | 0.3 UJ | 0.3 UJ | 0.3 UJ | 0.3 | 0.1 U | | 0.2 | 0.1 J | 0.1 UJ | 0.1 U | 0.1 U |
| Jan-02 | | | | | | | | | | | | | | |
| Apr-02 | | | | | | | | | | | | | | |
| Jul-02 | | | | | | | | | | | | | | |
| Oct-02 | | | 0.003 | | | | | | | 0.004 | | | | |
| Jan-03 | 0.003 | | 0.1 UJ | 0.1 UJ | 0.3 J | 0.3 | 0.05 | 0.007 | | 0.1 UJ | 0.1 UJ | 0.1 UJ | 0.007 | 0.1 UJ |
| Apr-03 | | | | | | | | | | | | | | |
| Jul-03 | | | | | | | | | | | | | | |
| Oct-03 | | | | | | | | | | | | | | |
| Feb-04 | | | | | | | | | | | | | | |
| Apr-04 | | | | | | | | | | | | | | |
| Jul-04 | | | | | | | | | | | | | | |
| Oct-04 | | | | | | | | | | | | | | |
| Jan-05 | | | | | | | | | | | | | | |
| Apr-05 | | | | | | | | | | | | | | |
| Aug-05 | | | | | | | | | | | | | | |
| Nov-05 | | | | | | | | | | | | | | |

**Table 3b. Conventional Parameters from Groundwater Sampling, April 2000 to November 2005 (South Landfill)**

| Number of Samples 4<br>Critical Statistic 2.4 | Solids, total dissolved (mg/L) | | | | | | | Sulfate (mg/L) | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Primary MCL [a]<br>Secondary MCL [a] | 500 | | | | | | | 250 | | | | | | |
| | BXS-4 | BXS-4 Dup [c] | BXS-3 | BXS-2 | BXS-1 | BXS-1 Dup [c] | Field blk [d] | BXS-4 | BXS-4 Dup [c] | BXS-3 | BXS-2 | BXS-1 | BXS-1 Dup [c] | Field blk [d] |
| Apr-00 | 180 | | 561 | 598 | 330 | 318 | 27 | 1.6 | | 0.3 | 0.3 | 7.7 | 7.6 | 0.2 U |
| Jul-00 | 156 | | 517 | 532 | 323 | 291 | 5 U | 1.7 | | 0.2 | 0.2 | 7.8 | 7.2 | 0.2 U |
| Oct-00 | 94 | | 503 | 501 | 281 | 275 | 5 U | 1.6 | | 0.2 U | 0.3 | 6.1 | 6.1 | 0.2 U |
| Jan-01 | 131 | | | | 286 | 272 | 5 U | 1.2 | | 0.2 | 0.4 | 7.7 | 7.8 | 0.2 U |
| Apr-01 | 134 | | 556 | 456 | 284 | 258 | 5 U | 1.6 | | 0.4 | 0.4 | 8.3 | 8 | 0.3 |
| Jul-01 | 134 | | 420 | 320 | 212 | 262 | 5 U | 1.6 | | 0.2 | 0.3 | 7.2 | 7.1 | 0.2 U |
| Oct-01 | 140 | | 408 | 420 | 262 | 274 | 8 | 1.2 | | 0.2 | 0.3 | 6.7 | 6.5 | 0.2 U |
| Jan-02 | 136 | | 496 | 428 | 275 | 246 | 5 U | 1.1 | | 0.7 | 0.3 | 6.8 | 7 | 0.2 U |
| Apr-02 | 167 | | 520 | 584 | 356 | 302 | 5 U | 1.6 | | 0.3 | 0.5 | 7.9 | 8.1 | 0.2 U |
| Jul-02 | 174 | | 592 | 532 | 384 | 352 | 10 | 1.6 | | 0.3 | 0.3 | 7.5 | 7.6 | 0.2 U |
| Oct-02 | 112 | | 518 | 564 | | | | 1.1 | | 0.4 | 0.3 | | | |
| Jan-03 | 117 | | 604 | 620 | 392 | 168 | 5 U | 1 | | 0.4 | 0.4 | 4.2 | 1.1 | 0.2 U |
| Apr-03 | 143 | | 524 | 460 | 236 | 252 | 5 U | 1.1 | | 0.19 J | 0.3 | 8.2 | 7.6 | 0.2 U |
| Jul-03 | 128 | | 592 | 492 | 245 | 250 | 5 U | 1.5 | | 0.2 U | 0.2 | 9.6 | 9.7 | 0.2 U |
| Oct-03 | 140 | 137 | 568 | 528 | | | 5 | 1 | 0.7 | 0.2 U | 0.2 | | | 0.2 U |
| Feb-04 | 123 | 113 | 404 | 428 | 202 | | 5 U | 1.3 | 1.3 | 0.15 J | 0.14 J | 12.1 | | 0.2 U |
| Apr-04 | 126 | 138 | 512 | 492 | 226 | | 5 U | 0.9 | 1 | 0.2 U | 0.2 U | 10.5 | | 0.2 U |
| Jul-04 | 128 | 123 | 528 | 396 | 222 | | 5 U | 0.9 | 0.9 | 0.2 U | 0.2 U | 7.7 | | 0.2 U |
| Oct-04 | 129 | 132 | 528 | 440 | 262 | | 5 U | 1.5 | 1.4 | 0.2 U | 0.2 U | 6.9 | | 0.2 U |
| Jan-05 | 151 | 150 | 440 | 564 | 248 | | 5 UX | 1 | 0.9 | 0.2 U | 0.2 U | 12.6 | | 0.2 U |
| Apr-05 | 129 | 128 | 468 | 484 | 242 | | 5 U | 1.8 | 1.6 | 0.2 U | 1.4 | 11.7 | | 0.2 U |
| Aug-05 | | | | | | | | 0.9 | 1 | 0.2 U | 0.2 U | 8.3 | | 0.2 U |
| Nov-05 | 126 | 127 | 440 | 500 | 276 | | 5 U | 1.6 | 1.6 | 0.2 U | 0.3 | 7.9 | | 0.2 U |

**Table 3b. Conventional Parameters from Groundwater Sampling, April 2000 to November 2005 (South Landfill)**

| Number of Samples 4<br>Critical Statistic 2.4<br>Primary MCL [a]<br>Secondary MCL [a] | Tannin & Lignin (mg/L) | | | | | | | Total Organic Carbon (mg/L) | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | BXS-4 | BXS-4 Dup [c] | BXS-3 | BXS-2 | BXS-1 | BXS-1 Dup [c] | Field blk [d] | BXS-4 | BXS-4 Dup [c] | BXS-3 | BXS-2 | BXS-1 | BXS-1 Dup [c] | Field blk [d] |
| Apr-00 | 0.3 | | 9.1 | 1.1 | 0.3 | 0.3 | 0.2 U | 0.7 | | 28.8 | 13.5 | 6.6 | 6.6 | 0.5 U |
| Jul-00 | 0.3 | | 7.1 | 1.1 | 0.3 | 0.4 | 0.2 U | 1.1 | | 29.2 | 16.8 | 7.7 | 7.1 | 0.5 U |
| Oct-00 | 0.4 | | 8.2 | 1 | 0.5 | 0.5 | 0.2 U | 1.3 | | 0.5 U | 15.5 | 9.7 | 9.7 | 0.5 U |
| Jan-01 | 0.6 | | 12.2 | 1.7 | 0.6 | 0.7 | 0.2 U | 1 | | 27.1 | 14.8 | 8.6 | 8.6 | 0.5 U |
| Apr-01 | 0.2 | | 3.2 | 0.9 | 0.4 | 0.4 | 0.2 U | 1.2 | | 26.1 | 14.6 | 7.5 | 7.5 | 0.5 U |
| Jul-01 | 0.4 | | 6.4 | 1.4 | 0.5 | 0.5 | 0.2 U | 9.3 | | 25.9 | 15.1 | 6.8 | 7.3 | 0.5 U |
| Oct-01 | 0.5 | | 21.6 | 2.8 | 0.6 | 0.8 | 0.2 U | 0.9 | | 21.6 | 13.7 | 7.1 | 7.1 | 0.5 U |
| Jan-02 | 0.5 | | 9.9 | 1.3 | 0.3 | 0.4 | 0.2 U | 1 | | 19.1 | 13.5 | 5.9 | 5.8 | 0.5 U |
| Apr-02 | 0.5 | | 10.9 | 1.5 | 0.4 | 0.6 | 0.2 U | 1 | | 23 | 14.2 | 6.4 | 6.4 | 0.5 U |
| Jul-02 | 0.4 | | 8 | 1 | 0.5 | 0.3 | 0.2 U | 0.8 | | 21.8 | 11.9 | 6 | 5.7 | 0.5 U |
| Oct-02 | 0.3 | | 8.1 | 1.1 | | | | | | 23.1 | 15 | | | |
| Jan-03 | 0.3 | | 9.5 | 0.9 | 0.8 | 0.3 | 0.2 U | 1.1 | | 21 | 13.2 | 8.4 | 0.9 | 0.4 J |
| Apr-03 | 0.6 | | 2.5 | 2 | 0.3 | 0.3 | 0.2 U | 1 | | 22.2 | 14.1 | 5.9 | 6 | 0.5 U |
| Jul-03 | 0.3 | | 4.6 | 1.5 | 0.2 | 0.2 | 0.2 U | 0.7 | | | | | | |
| Oct-03 | 0.5 | 0.5 | 8.5 | 1.9 | | | 0.2 U | 0.25 U | 10.4 | 21.2 | 14.6 | | | 0.4 J |
| Feb-04 | 0.4 | 0.5 | 10 | 1.9 | 0.2 | | 0.08 J | 1 | 0.9 | 19.7 | 14 | 3.7 | | 1 |
| Apr-04 | 0.5 | 0.5 | 9.9 | 1.8 | 0.2 U | | 0.2 U | 0.8 | 0.9 | 24.8 | 15 | 4.6 | | 0.5 U |
| Jul-04 | 0.5 | 0.5 | 4.4 | 0.2 U | 0.3 | | 0.14 J | 0.9 | 1 | 23.6 | 15 | 6.1 | | 0.17 J |
| Oct-04 | 0.5 | 0.4 | 8.3 | 1.6 | 0.3 | | 0.08 J | 1 | 0.9 | 24.4 | 14.7 | 5.8 | | 0.5 U |
| Jan-05 | 0.3 | 0.3 | 4.5 | 1 | 0.1 J | | 0.2 U | 1 | 0.9 | 18.6 | | 4.1 | | 0.5 U |
| Apr-05 | 0.4 | 0.5 | 8.9 | 1.2 | 0.18 J | | 0.18 J | 1.2 | 1 | 26.7 | 16 | 6 | | 0.6 |
| Aug-05 | 0.4 | 0.4 | 8.7 | 1 | 0.2 | | 0.05 J | 1.1 | 1 | 29.9 | 17 | 6.5 | | 0.2 J |
| Nov-05 | 0.4 | 0.4 | 10.3 | 1.5 | 0.4 | | 0.09 J | 1.1 | 0.9 | 25.2 | 14.5 | 6 | | 0.1 J |

**Table 3b. Conventional Parameters from Groundwater Sampling, April 2000 to November 2005 (South Landfill)**

| Number of Samples 4<br>Critical Statistic 2.4 | Total Coliforms (MPN/100 ml) | | | | | | |
|---|---|---|---|---|---|---|---|
| Primary MCL [a]<br>Secondary MCL [a] | <5% [b] | | | | | | |
| | BXS-4 | BXS-4 Dup [c] | BXS-3 | BXS-2 | BXS-1 | BXS-1 Dup [c] | Field blk [d] |
| Apr-00 | 2 U | | 2 U | 2 U | 11 | 7 | |
| Jul-00 | 2 U | | 110 | 6 | 2 U | 2 U | 2 U |
| Oct-00 | 4 J | | 80 J | 11 J | 2 UJ | 2 J | 2 UJ |
| Jan-01 | 2 UJ | | 14 J | 4 J | 2 UJ | 2 UJ | 2 UJ |
| Apr-01 | 2 UJ | | 2 UJ | 17 J | 2 UJ | 2 UJ | 2 UJ |
| Jul-01 | 2 UJ | | 2 UJ | 500 J | 2 UJ | 2 UJ | 2 UJ |
| Oct-01 | 2 UJ | | 900 J | 2 UJ | 2 U | 2 UJ | 2 UJ |
| Jan-02 | 2 U | | 2 UJ | 2 UJ | 2 UJ | 2 UJ | 2 UJ |
| Apr-02 | 2 UJ | | | 2 UJ | 2 UJ | 2 UJ | 2 UJ |
| Jul-02 | 2 UX | | 1600 E | 8 | 2 U | 2 UX | 2 UX |
| Oct-02 | 2 U | | 2 | | | | |
| Jan-03 | 2 | | 2 U | 2 U | 2 U | 2 | 2 U |
| Apr-03 | 2 U | | 2 U | 2 U | 2 UJ | 2 UJ | 2 UJ |
| Jul-03 | 23 J | | 2 UJ | 1600 J | 30 J | 300 J | |
| Oct-03 | 900 J | 300 J | 2 UJ | 2 UJ | | | 2 UJ |
| Feb-04 | 1 | 1 U | 2 UX | 2 UX | 25 X | | 1 U |
| Apr-04 | 2 UX | 2 UX | 2 UX | 2 UX | 2 UX | | 2 UX |
| Jul-04 | 23 | 23 | 14 | 4 | 2 U | | 2 U |
| Oct-04 | 2 U | 2 | 12 | 2 U | 4 | | 2 U |
| Jan-05 | 2 U | 2 U | 27 | 2 U | 2 U | | 2 U |
| Apr-05 | 2 U | 2 U | 2 U | 220 | 2 U | | 2 U |
| Aug-05 | 2 U | 2 U | 2 U | 2 U | 2 U | | 2 U |
| Nov-05 | 2 U | 2 U | 170 | 17 | 2 U | | 2 U |

**Notes:**

(a) Primary and secondary MCLs (maximum contaminant levels) per WAC 246-290-310.

(b) <5% criteria indicates less than 5 percent of total coliform samples can be positive in a month.

(c) Samples collected as BXS-6

(d) Samples collected as BXS-5

J Estimated Value

U Not detected. Reporting limit shown.

X Analysis performed past method holding time

## Table 3c. Metals from Groundwater Sampling, April 2000 to November 2005 (South Landfill)

| | Arsenic, dissolved (µg/L) | | | | | | | Barium, dissolved (µg/L) | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Primary MCL [a] Secondary MCL [a] | 10 | | | | | | | 2000 | | | | | | |
| | BXS-4 | BXS-4 Dup [b] | BXS-3 | BXS-2 | BXS-1 | BXS-1 Dup [b] | Field blk [c] | BXS-4 | BXS-4 Dup [b] | BXS-3 | BXS-2 | BXS-1 | BXS-1 Dup [b] | Field blk [c] |
| Apr-00 | 5 | | 46 | 5 U | 5 U | 5 U | 5 U | 26 | | 83 | 56 | 29 | 27 | 5 U |
| Jul-00 | 6 | | 49 | 5 U | 5 U | 5 U | 5 U | 26 | | 105 | 51 | 28 | 27 | 5 U |
| Oct-00 | 5 | | 6 U | 5 U | 5 U | 5 U | 5 U | 29 | | 103 | 56 | 34 | 33 | 5 U |
| Jan-01 | 5 U | | 8 | 5 U | 5 U | 5 U | 5 U | 25 | | 60 | 51 | 30 | 30 | 5 U |
| Apr-01 | 5 | | 16 | 5 U | 5 U | 5 U | 5 U | 26 | | 67 | 50 | 25 | 25 | 5 U |
| Jul-01 | 5 | | 9 | 5 U | 5 U | 5 U | 5 U | 32 | | 64 | 53 | 27 | 27 | 5 U |
| Oct-01 | 5 | | 5 | 5 U | 5 U | 5 U | 5 U | 26 | | 49 | 50 | 31 | 28 | 5 U |
| Jan-02 | 5 U | | 6 | 5 U | 5 U | 5 U | 5 U | 27.1 | | 71.2 | 52.3 | 27.1 | 27.2 | 5 U |
| Apr-02 | 5 | | 14 | 5 U | 5 U | 5 U | 5 U | 26 | | 99 | 47 | 24 | 23 | 5 U |
| Jul-02 | 10 U | | 21.9 | 10 U | 10 U | 10 U | 10 U | 29.6 | | 129 | 52.8 | 28.4 | 28.1 | 5 U |
| Oct-02 | 5.4 | | 8 | 5 U | | | | 26.6 | | 64.9 | 43.8 | | | |
| Jan-03 | 4.7 B | | 5.3 | 1.4 B | 1 B | 4.9 B | 5 U | 26.8 | | 55.7 | 47.2 | 30.8 | 28 | 5 U |
| Apr-03 | 5.2 | | 4.6 B | 1.2 B | 5 U | 5 U | 5 U | 29.1 | | 54.4 | 48.7 | 20.3 | 20.1 | 5 U |
| Jul-03 | 6 | | 5 U | 5 U | 5 U | 5 U | 5 U | 32 | | 58.1 | 42.1 | 18 | 18.9 | 5 U |
| Oct-03 | 4.9 B | 5.3 | 3.7 B | 5 U | | | 5 U | | 28.8 | 50.7 | 47.8 | | | 5 U |
| Feb-04 | 5 U | 5 B | 3 B | 5 U | 5 U | | 4.9 B | 5 U | 28.3 | 65.3 | 45 | 10 | | 29.1 |
| Apr-04 | 5.6 | 5.5 | 8.5 | 5 U | 5 U | | 5 U | 29.3 | 29.1 | 111 | 48.8 | 19.9 | | 5 U |
| Jul-04 | 5 | 5 | 3 B | 1 B | 5 U | | 5 U | 31 | 29 | 54 | 55 | 21 | | 5 U |
| Oct-04 | 5.7 | 5.3 | 4.4 B | 5 U | 5 U | | 5 U | 29.4 | 28.3 | 53.3 | 43.3 | 23.4 | | 5 U |
| Jan-05 | 5 | 5.1 | 2.8 B | 5 U | 5 U | | 5 U | 30.2 | 30.2 | 103 | 47.2 | 16 | | 5 U |
| Apr-05 | 5 | 5 B | 6 | 1 B | 5 U | | 5 U | 29 | 28 | 91 | 44 | 23 | | 5 U |
| Aug-05 | 4 B | 5 B | 9 | 5 U | 5 U | | 5 U | 28 | 28.4 | 94.4 | 41.9 | 23 | | 5 U |
| Nov-05 | 6 | 5 U | 7 | 2 B | 5 U | | 5 U | 29 | 5 U | 63 | 44 | 23 | | 5 U |

**Table 3c. Metals from Groundwater Sampling, April 2000 to November 2005 (South Landfill)**

| | Cadmium, dissolved (µg/L) | | | | | | | Copper, dissolved (µg/L) | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Primary MCL [a] / Secondary MCL [a] | 5 | | | | | | | 1300 | | | | | | |
| | BXS-4 | BXS-4 Dup [b] | BXS-3 | BXS-2 | BXS-1 | BXS-1 Dup [b] | Field blk [c] | BXS-4 | BXS-4 Dup [b] | BXS-3 | BXS-2 | BXS-1 | BXS-1 Dup [b] | Field blk [c] |
| Apr-00 | 4 U | | 4 U | 4 U | 4 U | 4 U | 4 U | 10 U | | 10 U | 10 U | 10 U | 10 U | 10 U |
| Jul-00 | 4 U | | 4 U | 4 U | 4 U | 4 U | 4 U | 10 U | | 10 U | 10 U | 10 U | 10 U | 10 U |
| Oct-00 | 4 U | | 4 U | 4 U | 4 U | 4 U | 4 U | 10 U | | 10 U | 10 U | 10 U | 10 U | 10 U |
| Jan-01 | 4 U | | 4 U | 4 U | 4 U | 4 U | 4 U | 10 U | | 10 U | 10 U | 10 U | 10 U | 10 U |
| Apr-01 | 4 U | | 4 U | 4 U | 4 U | 4 U | 4 U | 10 U | | 10 U | 10 U | 10 U | 10 U | 10 U |
| Jul-01 | 4 U | | 4 U | 4 U | 4 U | 4 U | 4 U | 10 U | | 10 U | 10 U | 10 U | 10 U | 10 U |
| Oct-01 | 5 U | | 5 U | 5 U | 5 U | 5 U | 5 U | 10 U | | 10 U | 10 U | 10 U | 10 U | 10 U |
| Jan-02 | 5 U | | 5 U | 5 U | 5 U | 5 U | 5 U | 10 U | | 10 U | 10 U | 10 U | 10 U | 10 U |
| Apr-02 | 5 U | | 5 U | 5 U | 5 U | 5 U | 5 U | 10 U | | 10 U | 10 U | 10 U | 10 | 10 U |
| Jul-02 | 5 U | | 5 U | 5 U | 5 U | 5 U | 5 U | 10 U | | 10 U | 10 U | 10 U | 10 U | 10 U |
| Oct-02 | 5 U | | 1.1 B | 1.1 B | | | | 10 U | | 10 U | 10 U | | | |
| Jan-03 | 0.5 B | | 3.6 B | 5 U | 5 U | 5 U | 5 U | 10 U | | 10 U | 10 U | 5.1 B | 10 U | 10 U |
| Apr-03 | 2 R | | 2 R | 2 R | 2 R | 2 R | 2 R | 10 U | | 10 U | 10 U | 16.8 J | 9.2 J | 5.4 B |
| Jul-03 | 5 UJ | | 5 U | 5 U | 5 U | 5 U | 5 U | 10 U | | 10 U | 10 U | 10 U | 10 U | 10 U |
| Oct-03 | 5 U | 5 U | 5 B | 5 U | | | 5 U | 10 U | 10 U | 10 U | 10 U | | | 10 U |
| Feb-04 | 5 U | 5 U | 5 U | 5 U | 5 U | | 5 U | 10 U | 10 U | 10 U | 10 U | 10 U | | 10 U |
| Apr-04 | 5 U | 5 U | 5 U | 5 U | 5 U | | 5 U | 10 U | 10 U | 10 U | 10 U | 10 U | | 10 U |
| Jul-04 | 5 U | 5 U | 6 | 5 U | 5 U | | 5 U | 5 B | 6 B | 5 B | 10 U | 11 | | 10 U |
| Oct-04 | 5 U | 5 U | 5 U | 5 U | 5 U | | 5 U | 10 U | 10 U | 10 U | 10 U | 10 U | | 10 U |
| Jan-05 | 5 U | 5 U | 5 U | 5 U | 5 U | | 5 U | 10 U | 10 U | 10 U | 10 U | 6.1 B | | 10 U |
| Apr-05 | 5 U | 5 U | 5 U | 5 U | 5 U | | 5 U | 10 U | 10 U | 10 U | 8 B | 9 B | | 10 U |
| Aug-05 | 0.8 B | 0.3 B | 1.4 B | 0.3 B | 5 U | | 5 U | 10 U | 10 U | 10 U | 10 U | 10 U | | 10 U |
| Nov-05 | 5 U | 5 U | 5 U | 5 U | 5 U | | 5 U | 10 U | 10 U | 10 U | 10 U | 10 U | | 10 U |

## Table 3c. Metals from Groundwater Sampling, April 2000 to November 2005 (South Landfill)

| | Iron, dissolved (µg/L) | | | | | | | Manganese, dissolved (µg/L) | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Primary MCL [a] Secondary MCL [a] | 300 | | | | | | | 50 | | | | | | |
| | BXS-4 | BXS-4 Dup [b] | BXS-3 | BXS-2 | BXS-1 | BXS-1 Dup [b] | Field blk [c] | BXS-4 | BXS-4 Dup [b] | BXS-3 | BXS-2 | BXS-1 | BXS-1 Dup [b] | Field blk [c] |
| Apr-00 | 40 | | 56600 | 690 | 20 U | 20 U | 20 U | 123 | | 15900 | 1450 | 264 | 272 | 5 U |
| Jul-00 | 40 | | 52600 | 720 | 20 U | 20 U | 20 U | 120 | | 13900 | 1500 | 307 | 308 | 5 U |
| Oct-00 | 60 | | 34200 | 630 | 20 U | 20 U | 20 U | 129 | | 15800 | 1390 | 346 | 348 | 5 U |
| Jan-01 | 50 | | 7560 | 620 | 20 U | 30 | 20 U | 123 | | 14500 | 1460 | 409 | 397 | 5 U |
| Apr-01 | 50 | | 5530 | 780 | 20 U | 20 U | 20 U | 116 | | 16200 | 1470 | 341 | 345 | 5 U |
| Jul-01 | 43.8 | | 8530 | 736 | 20 U | 20 U | 20 U | 123 | | 17100 | 1540 | 396 | 400 | 5 U |
| Oct-01 | 35 | | 4740 | 789 | 20 U | 20 U | 20 U | 114 | | 13600 | 1580 | 556 | 534 | 5 U |
| Jan-02 | 50 | | 5760 | 806 | 20 U | 20 U | 20 U | 127 | | 15600 | 1500 | 464 | 470 | 5 U |
| Apr-02 | 40 | | 19600 | 640 | 20 U | 20 U | 20 U | 112 | | 15600 | 1430 | 362 | 353 | 5 U |
| Jul-02 | 32.9 | | 21900 | 670 | 20 U | 20 U | 20 U | 123 | | 17900 | 1520 | 373 | 384 | 5 U |
| Oct-02 | 41.8 | | 5340 | 628 | | | | 105 | | 16000 | 1410 | | | |
| Jan-03 | 39.9 J | | 3220 | 714 | 20 U | 126 | 20 U | 103 | | 14800 | 1560 | 733 | 107 | 5 U |
| Apr-03 | 40.8 | | 4280 | 780 | 20 U | 20 U | 20 U | 118 | | 17800 | 1560 | 431 | 451 | 5 U |
| Jul-03 | 53 | | 3680 | 926 | 20 U | 20 U | 20 U | 115 | | 15900 | 1390 | 370 | 377 | 5 U |
| Oct-03 | 36.1 | 36.9 | 903 | 836 | | | 20 U | 115 | 110 | 14500 | 1580 | | | 5 U |
| Feb-04 | 20 U | 41.4 | 2950 | 753 | 20 U | | 48.1 | 5 U | 113 | 15700 | 1410 | 277 | | 115 |
| Apr-04 | 42.4 | 90.6 | 8890 | 796 | 20 U | | 20 U | 110 | 111 | 14900 | 1420 | 144 | | 5 U |
| Jul-04 | 60 | 50 | 4290 | 750 | 20 U | | 20 U | 189 | 114 | 18200 | 1420 | 326 | | 5 U |
| Oct-04 | 40.3 | 39.3 | 1710 | 836 | 20 U | | 20 U | 110 | 107 | 17700 | 1430 | 478 | | 5 U |
| Jan-05 | 41.6 | 42.4 | 6520 | 761 | 20 U | | 20 U | 110 | 112 | 8510 | 1270 | 172 | | 2.8 B |
| Apr-05 | 46 | 48 | 10900 | 769 | 20 U | | 20 U | 120 | 120 | 14200 | 1350 | 210 | | 5 U |
| Aug-05 | 41 | 40 | 18300 | 732 | 5 B | | 20 U | 107 | 107 | 14100 | 1300 | 160 | | 0.3 B |
| Nov-05 | 42 | 20 U | 4330 | 770 | 20 U | | 4 B | 112 | 5 U | 17200 | 1300 | 429 | | 5 U |

## Table 3c. Metals from Groundwater Sampling, April 2000 to November 2005 (South Landfill)

| | Nickel, dissolved (µg/L) | | | | | | | Zinc, dissolved (µg/L) | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Primary MCL [a] Secondary MCL [a] | 100 | | | | | | | 5000 | | | | | | |
| | BXS-4 | BXS-4 Dup [b] | BXS-3 | BXS-2 | BXS-1 | BXS-1 Dup [b] | Field blk [c] | BXS-4 | BXS-4 Dup [b] | BXS-3 | BXS-2 | BXS-1 | BXS-1 Dup [b] | Field blk [c] |
| Apr-00 | 20 U | | 20 U | 40 | 20 U | 20 U | 20 U | 10 U | | 10 U | 10 U | 10 U | 10 U | 10 U |
| Jul-00 | 20 U | | 20 U | 38 | 20 | 20 | 20 U | 10 U | | 15 | 10 U | 10 U | 10 U | 10 U |
| Oct-00 | 20 U | | 20 U | 30 | 20 U | 20 U | 20 U | 10 U | | 10 U | 10 U | 10 | 10 U | 10 U |
| Jan-01 | 20 U | | 20 U | 40 | 20 U | 20 | 20 U | 10 U | | 10 U | 10 U | 10 U | 10 | 10 U |
| Apr-01 | 20 U | | 20 U | 30 | 20 U | 20 U | 20 U | 10 U | | 20 | 10 | 10 U | 10 | 10 U |
| Jul-01 | 20 U | | 38 | 41 | 27 | 26 | 20 U | 10 U | | 10 U | 10 U | 10 U | 10 U | 10 U |
| Oct-01 | 20 U | | 20 U | 39 | 24 | 21 | 20 U | 10 U | | 10 U | 11 | 13 | 12 | 10 U |
| Jan-02 | 20 U | | 33 | 39 | 27 | 22 | 20 U | 10 U | | 10 U | 11 | 14 | 10 U | 10 U |
| Apr-02 | 20 U | | 20 | 40 | 20 U | 20 U | 20 U | 10 U | | 10 U | 10 U | 10 U | 10 U | 10 U |
| Jul-02 | 20 U | | 36.3 | 38.7 | 26.5 | 26.6 | 20 U | 10 U | | 10.2 | 10 U | 10 U | 10 U | 10 U |
| Oct-02 | 20 U | | 19.8 B | 32.9 | | | | 10 U | | 8.8 B | 6.5 B | | | |
| Jan-03 | 20 U | | 32.2 | 37.3 | 34.7 | 20 U | 20 U | 10 U | | 10 U | 14.7 | 16.8 | 10 U | 10 U |
| Apr-03 | 20 U | | 22.9 | 39 | 20 U | 20 U | 20 U | 10 U | | 14.5 | 10 U | 36.1 | 32.2 | 10 U |
| Jul-03 | 20 U | | 18.5 B | 35.9 | 14.8 B | 15.3 B | 20 U | 6 B | | 5.8 B | 9.9 B | 26.2 | 29.4 | 10 U |
| Oct-03 | 20 U | 20 U | 33.3 | 37.1 | | | 20 U | 10 U | 10 U | 10 U | 12.7 | | | 10 U |
| Feb-04 | 20 U | 20 U | 49 | 36.2 | 20 U | | 20 U | 10 U | 10 U | 10.6 | 6.1 B | 10 U | | 10 U |
| Apr-04 | 20 U | 20 U | 30.8 | 40.3 | 20 U | | 20 U | 10 U | 10 U | 10 U | 10 U | 33 | | 10 U |
| Jul-04 | 20 U | 20 U | 20 U | 50 | 20 | | 20 U | 4 B | 7 B | 21 | 8 B | 24 | | 9 B |
| Oct-04 | 20 U | 20 U | 29.5 | 36.5 | 18.8 B | | 20 U | 10 U | 10 U | 8 B | 12.8 | 9.9 B | | 10 U |
| Jan-05 | 20 U | 20 U | 98.9 | 52.6 | 20 U | | 20 U | 10 U | 10 U | 11.2 | 7.9 B | 15.1 | | 10 U |
| Apr-05 | 20 U | 20 U | 40 | 30 | 20 | | 20 U | 10 U | 10 U | 63 | 10 | 13 | | 10 U |
| Aug-05 | 20 U | 20 U | 25 | 32 | 11 B | | 20 U | 10 U | 10 U | 5 B | 15 | 5 B | | 10 U |
| Nov-05 | 20 U | 20 U | 20 U | 30 | 20 U | | 20 U | 10 U | 10 U | 7 B | 51 | 7 B | | 10 U |

**Notes:**

(a) Primary and secondary MCLs (maximum contaminant levels) per WAC 246-290-310.

(b) Samples collected as BXS-6

(c) Samples collected as BXS-5

B Estimated. Result is below reporting limit

J Estimated Value

R Rejected Sample

U Not detected. Reporting limit shown.

**Table 4. Parameters Statistically Higher than Background (1988-2005), South Landfill**

| | | | Mean Value Downgradient | | | Mean Value Upgradient |
|---|---|---|---|---|---|---|
| Test Type | Parameter | Monitoring Period | BXS-1 | BXS-2 | BXS-3 | BXS-4 |
| Conventionals | Ammonia as Nitrogen | 2001 | | | 0.10 | 0.50 |
| Conventionals | Carbon, Total Organic | 1992 | 3.6 | 5.0 | 18.7 | 1.5 |
| Conventionals | Carbon, Total Organic | 1993 | | 7.3 | 20.0 | 2.0 |
| Conventionals | Carbon, Total Organic | 1994 | | 8.6 | 21.9 | 2.3 |
| Conventionals | Carbon, Total Organic | 1995 | | 10.7 | 30.6 | 3.4 |
| Conventionals | Carbon, Total Organic | 1996 | 4.9 | 12.7 | 38.5 | 2.3 |
| Conventionals | Carbon, Total Organic | 1997 | | 15.0 | | 3.8 |
| Conventionals | Carbon, Total Organic | 1998 | | | 32.1 | 10.8 |
| Conventionals | Carbon, Total Organic | 1999 | | 15.8 | 31.8 | 6.6 |
| Conventionals | Carbon, Total Organic | 2000 | 8.1 | 15.2 | | 1.0 |
| Conventionals | Carbon, Total Organic | 2001 | 7.5 | 14.6 | 25.2 | 3.1 |
| Conventionals | Carbon, Total Organic | 2002 | 6.4 | 13.8 | 22.2 | 2.0 |
| Conventionals | Carbon, Total Organic | 2003 | | 14.0 | 21.5 | 0.7 |
| Conventionals | Carbon, Total Organic | 2004 | 5.1 | 14.7 | 23.1 | 0.9 |
| Conventionals | Carbon, Total Organic | 2005 | 5.7 | 15.8 | 25.1 | 1.1 |
| Conventionals | Chemical Oxygen Demand | 1990 | 27.9 | 41.2 | 97.8 | 2.2 |
| Conventionals | Chemical Oxygen Demand | 1993 | | | 106.0 | 30.5 |
| Conventionals | Chemical Oxygen Demand | 1994 | | 30.0 | 83.0 | 22.0 |
| Conventionals | Chemical Oxygen Demand | 1995 | | | 90.0 | 32.0 |
| Conventionals | Chemical Oxygen Demand | 1996 | | 41.0 | 98.0 | 16.0 |
| Conventionals | Chemical Oxygen Demand | 1997 | | 43.0 | 87.0 | 19.0 |
| Conventionals | Chemical Oxygen Demand | 1998 | | 51.0 | 98.0 | 20.1 |
| Conventionals | Chemical Oxygen Demand | 1999 | | | 92.0 | 40.5 |
| Conventionals | Chemical Oxygen Demand | 2000 | | 43.5 | 71.3 | 13.6 |
| Conventionals | Chemical Oxygen Demand | 2001 | 22.3 | 42.5 | 69.5 | 17.3 |
| Conventionals | Chemical Oxygen Demand | 2002 | 19 | 38 | 60 | 18 |
| Conventionals | Chemical Oxygen Demand | 2003 | | 37 | 56 | 3 |
| Conventionals | Chemical Oxygen Demand | 2004 | | 38 | 59 | 3 |
| Conventionals | Chemical Oxygen Demand | 2005 | | 43 | 70 | 9 |
| Conventionals | Chloride | 1989 | 45.0 | 61.0 | 17.0 | 6.6 |
| Conventionals | Chloride | 1990 | 22.5 | 14.5 | 6.8 | 2.2 |
| Conventionals | Chloride | 1992 | 16.7 | 6.7 | 7.7 | 2.2 |
| Conventionals | Chloride | 1993 | 12.1 | 6.6 | 12.8 | 2.3 |
| Conventionals | Chloride | 1994 | 13.0 | 7.4 | 7.4 | 2.1 |
| Conventionals | Chloride | 1995 | 14.0 | 10.0 | 9.6 | 1.9 |
| Conventionals | Chloride | 1996 | 14.6 | 17.3 | 9.1 | 2.0 |
| Conventionals | Chloride | 1997 | 12.6 | 14.8 | 35.0 | 2.0 |
| Conventionals | Chloride | 1998 | 11.6 | 11.0 | 6.3 | 2.1 |
| Conventionals | Chloride | 1999 | 10.0 | | 6.1 | 2.2 |
| Conventionals | Chloride | 2000 | 7.8 | 8.3 | 5.0 | 2.1 |
| Conventionals | Chloride | 2001 | 5.9 | 7.4 | 4.7 | 2.1 |

**Table 4. Parameters Statistically Higher than Background (1988-2005), South Landfill**

| | | | Mean Value Downgradient | | | Mean Value Upgradient |
|---|---|---|---|---|---|---|
| Test Type | Parameter | Monitoring Period | BXS-1 | BXS-2 | BXS-3 | BXS-4 |
| Conventionals | Chloride | 2002 | 5.3 | 6.5 | 3.8 | 2.0 |
| Conventionals | Chloride | 2003 | 4.6 | 5.5 | | 2.0 |
| Conventionals | Chloride | 2004 | | 4.3 | 2.3 | 1.8 |
| Conventionals | Chloride | 2005 | 4.5 | 4.4 | 3.7 | 1.8 |
| Conventionals | Conductivity (umhos/cm) | 1989 | 351 | 607 | 514 | 180 |
| Conventionals | Conductivity (umhos/cm) | 1990 | 366 | 624 | 500 | 214 |
| Conventionals | Conductivity (umhos/cm) | 1992 | 292 | 586 | 533 | 189 |
| Conventionals | Conductivity (umhos/cm) | 1993 | | 487 | 526 | 173 |
| Conventionals | Conductivity (umhos/cm) | 1994 | 214 | 479 | 602 | 169 |
| Conventionals | Conductivity (umhos/cm) | 1995 | 333 | 623 | | 149 |
| Conventionals | Conductivity (umhos/cm) | 1996 | 290 | 602 | 787 | 161 |
| Conventionals | Conductivity (umhos/cm) | 1997 | 326 | | 765 | 169 |
| Conventionals | Conductivity (umhos/cm) | 1998 | 393 | 678 | 738 | 177 |
| Conventionals | Conductivity (umhos/cm) | 1999 | 406 | 786 | 748 | 177 |
| Conventionals | Conductivity (umhos/cm) | 2000 | 417 | 762 | 651 | 166 |
| Conventionals | Conductivity (umhos/cm) | 2001 | 493 | 878 | 886 | 193 |
| Conventionals | Conductivity (umhos/cm) | 2002 | 470 | 849 | 825 | 187 |
| Conventionals | Conductivity (umhos/cm) | 2004 | | 821 | 853 | 198 |
| Conventionals | Conductivity (umhos/cm) | 2005 | 391 | 798 | 702 | 192 |
| Conventionals | Nitrate + Nitrite as Nitrogen | 1990 | 0.7 | | | 0.1 |
| Conventionals | Nitrate + Nitrite as Nitrogen | 1993 | 0.8 | | | 0.2 |
| Conventionals | Nitrate + Nitrite as Nitrogen | 1994 | 0.5 | | | ND |
| Conventionals | Nitrate + Nitrite as Nitrogen | 1996 | 1.7 | | | ND |
| Conventionals | Nitrate + Nitrite as Nitrogen | 1997 | 0.8 | | | ND |
| Conventionals | Nitrate + Nitrite as Nitrogen | 1999 | 0.4 | | | ND |
| Conventionals | Nitrate + Nitrite as Nitrogen | 2000 | 0.3 | | | 0.1 |
| Conventionals | Nitrate + Nitrite as Nitrogen | 2001 | | | | |
| Conventionals | Nitrate + Nitrite as Nitrogen | 2002 | 0.5 | | | 0.2 |
| Conventionals | Nitrate + Nitrite as Nitrogen | 2004 | 0.9 | | | 0.1 |
| Conventionals | Nitrate + Nitrite as Nitrogen | 2005 | 0.8 | | | |
| Conventionals | pH | 1992 | 6.1 | 6.3 | 6.4 | 7.9 |
| Conventionals | pH | 2000 | 6.1 | 6.4 | 6.5 | 7.9 |
| Conventionals | pH | 2001 | 6.1 | 6.4 | 6.7 | 7.9 |
| Conventionals | Solids, Total Dissolved | 1990 | | 397 | 436 | 228 |
| Conventionals | Solids, Total Dissolved | 1992 | | 352 | 351 | 147 |
| Conventionals | Solids, Total Dissolved | 1993 | | 330 | | 141 |
| Conventionals | Solids, Total Dissolved | 1994 | 161 | 330 | 418 | 134 |
| Conventionals | Solids, Total Dissolved | 1995 | 188 | 361 | 492 | 141 |
| Conventionals | Solids, Total Dissolved | 1996 | 224 | 423 | 604 | 153 |
| Conventionals | Solids, Total Dissolved | 1997 | 236 | 456 | 613 | 150 |
| Conventionals | Solids, Total Dissolved | 1998 | 273 | 473 | 562 | 137 |
| Conventionals | Solids, Total Dissolved | 1999 | 256 | 524 | 517 | 156 |
| Conventionals | Solids, Total Dissolved | 2000 | 297 | 544 | 527 | 140 |
| Conventionals | Solids, Total Dissolved | 2001 | 261 | 299 | 346 | 135 |

**Table 4. Parameters Statistically Higher than Background (1988-2005), South Landfill**

| | | | Mean Value Downgradient | | | Mean Value Upgradient |
|---|---|---|---|---|---|---|
| Test Type | Parameter | Monitoring Period | BXS-1 | BXS-2 | BXS-3 | BXS-4 |
| Conventionals | Solids, Total Dissolved | 2002 | 298 | 466 | 518 | 145 |
| Conventionals | Solids, Total Dissolved | 2003 | 291 | 525 | 572 | 132 |
| Conventionals | Solids, Total Dissolved | 2004 | 228 | 439 | 493 | 127 |
| Conventionals | Solids, Total Dissolved | 2005 | 255 | 516 | 449 | 135 |
| Conventionals | Sulfate | 1989 | 5.9 | | | 2.3 |
| Conventionals | Sulfate | 1990 | 6.6 | | | 1.9 |
| Conventionals | Sulfate | 1992 | 9.1 | | | 2.0 |
| Conventionals | Sulfate | 1993 | 10.0 | | | 2.0 |
| Conventionals | Sulfate | 1994 | 11.8 | | | 1.9 |
| Conventionals | Sulfate | 1995 | 12.0 | | | 1.8 |
| Conventionals | Sulfate | 1996 | 10.70 | | | 1.7 |
| Conventionals | Sulfate | 1997 | 11.8 | | | 1.6 |
| Conventionals | Sulfate | 1998 | 9.5 | | | 1.3 |
| Conventionals | Sulfate | 1999 | 7.8 | | | 1.4 |
| Conventionals | Sulfate | 2001 | 7.5 | | | 1.4 |
| Conventionals | Sulfate | 2002 | 7.3 | | | 1.4 |
| Conventionals | Sulfate | 2005 | 10.1 | | | |
| Conventionals | Tannin and Lignin | 1990 | | | 3.1 | 1.4 |
| Conventionals | Tannin and Lignin | 1993 | | 0.5 | | 0.3 |
| Conventionals | Tannin and Lignin | 1994 | | 0.5 | 1.0 | 0.2 |
| Conventionals | Tannin and Lignin | 1995 | | | 3.1 | 0.6 |
| Conventionals | Tannin and Lignin | 1996 | | 0.7 | 5.6 | 0.3 |
| Conventionals | Tannin and Lignin | 1998 | | | 8.1 | 0.7 |
| Conventionals | Tannin and Lignin | 1999 | | | 12.2 | 0.5 |
| Conventionals | Tannin and Lignin | 2000 | | 9.1 | 9.2 | 0.4 |
| Conventionals | Tannin and Lignin | 2001 | | | | |
| Conventionals | Tannin and Lignin | 2002 | | 1.6 | 11.1 | 0.4 |
| Conventionals | Tannin and Lignin | 2003 | | | 6.3 | 0.4 |
| Conventionals | Tannin and Lignin | 2004 | | 1.4 | | 0.5 |
| Conventionals | Tannin and Lignin | 2005 | | 1.2 | 8.1 | 0.4 |
| Metals | Arsenic | 1996 | | | 9 | 4 |
| Metals | Arsenic | 1997 | | | 15 | 5 |
| Metals | Arsenic | 1998 | | | 20 | 4.6 |
| Metals | Arsenic | 1999 | | | 34 | 5.8 |
| Metals | Arsenic | 2002 | | | 10.4 | 3.8 |
| Metals | Barium | 1993 | | 36 | 38 | 28 |
| Metals | Barium | 1994 | | 38 | 51 | 25 |
| Metals | Barium | 1995 | | 45 | 58 | 27 |
| Metals | Barium | 1996 | | 48 | 74 | 26 |
| Metals | Barium | 1997 | | 50 | 58 | 21 |
| Metals | Barium | 1998 | | 51 | 65 | 26 |
| Metals | Barium | 1999 | | 51 | 58 | 27 |
| Metals | Barium | 2000 | | | 87.8 | 26.5 |
| Metals | Barium | 2001 | 28.3 | 51.0 | 60.0 | 27.3 |
| Metals | Barium | 2002 | | 50 | 78 | 28 |

**Table 4. Parameters Statistically Higher than Background (1988-2005), South Landfill**

| | | | Mean Value Downgradient | | | Mean Value Upgradient |
|---|---|---|---|---|---|---|
| Test Type | Parameter | Monitoring Period | BXS-1 | BXS-2 | BXS-3 | BXS-4 |
| Metals | Barium | 2003 | | 46 | 55 | 29 |
| Metals | Barium | 2004 | | 48 | 71 | 23 |
| Metals | Barium | 2005 | | 44 | 88 | 29 |
| Metals | Cadmium | 2002 | | 1.1 | 1.1 | <1.1 |
| Metals | Copper | 1993 | | | 8 | 5 |
| Metals | Copper | 2001 | | | | |
| Metals | Copper | 2002 | | <2.5 | | <1.1 |
| Metals | Iron | 1990 | | 140 | 1950 | 48 |
| Metals | Iron | 1994 | | 748 | 1950 | 45 |
| Metals | Iron | 1995 | | 1120 | 341 | 50 |
| Metals | Iron | 1996 | | 1520 | 9490 | 46 |
| Metals | Iron | 1997 | | 1220 | 17800 | 50 |
| Metals | Iron | 1998 | | 1130 | 20700 | 56 |
| Metals | Iron | 1999 | | 950 | 34500 | 30 |
| Metals | Iron | 2000 | | 665 | 37740 | 47.5 |
| Metals | Iron | 2001 | 10 | 714.75 | 6537.5 | 42.5 |
| Metals | Iron | 2002 | | 729 | 10474 | 42 |
| Metals | Iron | 2003 | | 814 | | 42.45 |
| Metals | Iron | 2004 | | 784 | | 38.18 |
| Metals | Iron | 2005 | | 758 | 10012.5 | 42.65 |
| Metals | Lead | 1993 | | | 2 | 1 |
| Metals | Manganese | 1989 | 210 | 580 | 1100 | 120 |
| Metals | Manganese | 1990 | | 650 | 1820 | 99 |
| Metals | Manganese | 1993 | | 570 | | 110 |
| Metals | Manganese | 1994 | | 670 | 1110 | 120 |
| Metals | Manganese | 1995 | | 834 | 3780 | 122 |
| Metals | Manganese | 1996 | | 1120 | 10800 | 121 |
| Metals | Manganese | 1997 | | 1510 | 13000 | 90 |
| Metals | Manganese | 1998 | 175 | 1650 | 13800 | 126 |
| Metals | Manganese | 1999 | 200 | 1420 | 14800 | 116 |
| Metals | Manganese | 2000 | 331 | 1450 | 15025 | 124 |
| Metals | Manganese | 2001 | 425.5 | 1512.5 | 15350.0 | 119.0 |
| Metals | Manganese | 2002 | 430 | 1502 | 15763 | 119 |
| Metals | Manganese | 2003 | | 1523 | 15750 | 113 |
| Metals | Manganese | 2004 | | 1420 | 16625 | 103 |
| Metals | Manganese | 2005 | | 1305 | 13503 | 112 |
| Metals | Nickel | 1993 | | 18 | | 1 |
| Metals | Nickel | 1994 | | 18 | | ND |
| Metals | Nickel | 1995 | | 21 | 30 | ND |
| Metals | Nickel | 1996 | | | 25 | ND |
| Metals | Nickel | 1997 | | 34 | 20 | ND |
| Metals | Nickel | 1998 | | 43 | 29 | ND |
| Metals | Nickel | 1999 | | 36 | 22 | ND |
| Metals | Nickel | 2000 | | 37 | | ND |
| Metals | Nickel | 2001 | 20.25 | 37.5 | 17.5 | 10.0 |
| Metals | Nickel | 2002 | 21 | 39 | 24 | 5 |

**Table 4. Parameters Statistically Higher than Background (1988-2005), South Landfill**

| | | | Mean Value Downgradient | | | Mean Value Upgradient |
|---|---|---|---|---|---|---|
| Test Type | Parameter | Monitoring Period | BXS-1 | BXS-2 | BXS-3 | BXS-4 |
| Metals | Nickel | 2003 | | 37 | | 10 |
| Metals | Nickel | 2004 | | 41 | | 10 |
| Metals | Nickel | 2005 | 18 | 36 | | 20 |
| Metals | Zinc | 2002 | 8 | 6.8 | | <2.4 |
| Metals | Zinc | 2005 | 10.1 | 20.975 | | 10 |

# Appendix A

Field Groundwater Sampling Records

| Case | Well Number | Water Level | Bottom | Comments | Pump |
|---|---|---|---|---|---|
| 2" | BXN-1 | 50.15' | 58.18' | | |
| 2" | BXN-2 | 46.48' | 57.24' | | |
| 2" | BXN-3 | 47.60' | 58.66' | | |
| 2" | BXN-4 | 45.19' | 51.74' | | |
| | BXN-5 | | Dup BXN-1 | Landfill Reqiuirements | |
| | BXN-6 | | Blank | | |
| 2" | BXS-1 | 36.68' | 47.90' | Top of Pump | X |
| 2" | BXS-2 | 36.92 | 45.40' | Pump raised out of ground 1 1/2' | X |
| 2" | BXS-3 | 33.15' | 44.15' | | X |
| 2" | BXS-4 | 9.95' | 47.40' | | |
| | BXS-5 | | Blank | | |
| | BXS-6 | | Dup BXS-4 | Landfill Requirements | |
| 4" | MW-1 | 21.92' | 41.02' | | |
| 4" | MW-2 | 42.67' | 51.23' | | X |
| 4" | MW-3 | 39.53' | 51.96' | | X |
| 2" | MW-4 | 7.79' | 41.92' | | |
| 2" | HCMW-5 | 30.92' | 35.43' | | X |
| 2" | HCMW-6 | 39.70' | 51.10' | | X |
| 2" | HCMW-7 | 42.66' | 55.08' | | |
| | MW-A | | Dup MW-15 | Permit Requirements | |
| | MW-B | | Blank | | |
| 2" | MW-10 | 29.15' | 45.58' | | |
| 2" | MW-11 | 19.19' | 38' | | |
| 4" | MW-12 | | 39.85' | NAPL | |
| 4" | MW-13 | | 37.19' | NAPL | |
| 2" | MW-14 | 23.69' | 38' | | |
| 2" | MW-15 | 38.18' | 50.30' | | |
| 2" | MW-16 | 41.20' | 52.65' | | |
| 2" | MW-17 | 39.71' | 55.00' | | |
| 2" | MW-18 | 41.23' | 53.83' | | |

**Depths Taken** 1-3-05

# JH Baxter & Co.

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Arlington, WA 98223
(360) 435-2146 FAX (360) 435-3035

## Groundwater Sampling Field Form

| | | |
|---|---|---|
| Well No. BXS-1 | Location Arlington | Date 1-13-05 |
| Sample No. | Field Personnel/Company Jim Clawson / Mary Larson J.H. Baxter | |
| Sample Time (2400 hours) 10:30 | Instrument Calibration Date 1-13-05 | |

Well Condition Poor (Satisfactory) New (If poor, explain)

Field Conditions/Weather 36° cloudy / Light snow

Equipment Decontamination Liquinox, Hexane, Methanol, and D.I. Water Rinse.

Casing Diameter: (Circle One) (2) 4" 6" Other____

Casing Volume (gallons/ft) for: 2"=0.163; 4"=0.653; 6"=1.47
Multiply Water Column Height by appropriate number above to get proper purge volume.

Depth of Well (feet): 47.90
Depth to Water (feet): 36.68
Water Column (feet): 11.22
Casing Volume (gallons): 1.82
Calculated Purge Volume (gallons): 5.48
Actual Purge Volume (gallons):

Sheen / LNAPL / DNAPL present:
Other remarks: Top of Pump

| Time 2400 hrs | Cumulative Volume (gal) | TEMP (°C) | pH | Conductivity ms/cm 25°C | Dissolved Oxygen (mg/L) | EH MV | Turbidity (NTU) | Odor/Color/ Remarks |
|---|---|---|---|---|---|---|---|---|
| 9:45 | 0 | | | | | | | Purge Start |
| 9:55 | 1 | 11.85 | 5.59 | 0.393 | 4.26 | 5 | 0 | Clear |
| 10:00 | 2 | 11.85 | 5.50 | 0.346 | 5.31 | 4 | 1 | |
| 10:05 | 3 | 11.87 | 5.58 | 0.334 | 4.90 | 4 | 0 | |
| 10:10 | 4 | 11.92 | 5.56 | 0.326 | 4.46 | 4 | -6 | |
| 10:15 | 5 | 11.92 | 5.53 | 0.326 | 4.46 | 4 | -6 | |
| 10:20 | 5½ | 11.92 | 5.51 | 0.328 | 4.46 | 4 | -6 | |

Purging Equipment: Port. / (Ded.) Bladder Pump Sampling Equipment Horiba U22 Sample Intake Depth:____

Remarks: Error on Horiba U22.

Revised 02/06/03

# JH Baxter & Co.

PO Box 305

## Arlington, WA 98223

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## Groundwater Sampling Field Form

| | | |
|---|---|---|
| Well No. BXS-2 | Location Arlington | Date 1-13-05 |
| Sample No. | Field Personnel/Company Jim Clawson / Mary Larson J.H. Baxter | |
| Sample Time (2400 hours) 12:10 | Instrument Calibration Date 1-13-05 | |

Well Condition Poor (Satisfactory) New (If poor, explain) ____

Field Conditions/Weather 40° cloudy

Equipment Decontamination Liquinox, Hexane, Methanol, and D.I. Water Rinse.

Casing Diameter: (Circle One) (2") 4" 6" Other____

Casing Volume (gallons/ft) for: 2"=0.163; 4"=0.653; 6"=1.47
Multiply Water Column Height by appropriate number above to get proper purge volume.

| | |
|---|---|
| Depth of Well (feet): | 45.40 |
| Depth to Water (feet): | 36.92 |
| Water Column (feet): | 8.48 |
| Casing Volume (gallons): | 1.38 |
| Calculated Purge Volume (gallons): | 4.14 |
| Actual Purge Volume (gallons): | |

Sheen / LNAPL / DNAPL present: ____

Other remarks: ____

| Time 2400 hrs | Cumulative Volume (gal) | TEMP (°C) | pH | Conductivity ms/cm 25°C | Dissolved Oxygen (mg/L) | EH MV | Turbidity (NTU) | Odor/Color/ Remarks |
|---|---|---|---|---|---|---|---|---|
| 11:45 | 0 | | | | | | | Purge Start |
| 11:50 | 1 | 13.01 | 5.29 | .752 | 5.06 | 3 | 0 | CLEAR |
| 11:55 | 2 | 12.98 | 5.24 | .759 | 4.65 | 3 | 0 | |
| 12:00 | 3 | 12.95 | 5.19 | .764 | 4.21 | 3 | -10. | |
| 12:05 | 4 | 12.92 | 5.16 | .768 | 3.93 | 2 | -10. | |
| 12:10 | 4¼ | 12.90 | 5.16 | .768 | 3.80 | 3 | -10. | |

Purging Equipment: Port. / (Ded.) Bladder Pump Sampling Equipment Horiba U22 Sample Intake Depth: ____

Remarks: Recalibrated Horiba U22 before this well.

Revised 02/06/03

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## Groundwater Sampling Field Form

| | | |
|---|---|---|
| Well No. BXS-3 | Location Arlington | Date 1-13-05 |
| Sample No. | Field Personnel/Company Jim Clawson / Mary Larson J.H. Baxter | |
| Sample Time (2400 hours) 13:40 | Instrument Calibration Date 1-13-05 | |

Well Condition Poor (Satisfactory) New (If poor, explain) _____

Field Conditions/Weather 35° cloudy.

Equipment Decontamination Liquinox, Hexane, Methanol, and D.I. Water Rinse.

Casing Diameter: (Circle One) (2") 4" 6" Other____

Casing Volume (gallons/ft) for: 2"=0.163; 4"=0.653; 6"=1.47
Multiply Water Column Height by appropriate number above to get proper purge volume.

Depth of Well (feet): 44.15
Depth to Water (feet): 33.15
Water Column (feet): 11.0
Casing Volume (gallons): 1.79
Calculated Purge Volume (gallons): 5.37
Actual Purge Volume (gallons): _____

Sheen / LNAPL / DNAPL present: _____
Other remarks: _____

| Time 2400 hrs | Cumulative Volume (gal) | TEMP (°C) | pH | Conductivity ms/cm 25°C | Dissolved Oxygen (mg/L) | EH MV | Turbidity (NTU) | Odor/Color/ Remarks |
|---|---|---|---|---|---|---|---|---|
| | | | | | | | | Purge Start |
| 13:00 | 0 | | | | | | | |
| 13:10 | 1 | 13.45 | 5.19 | 0.407 | 5.98 | 4 | -10 | Clear |
| 13:15 | 2 | 13.54 | 5.09 | 0.462 | 5.34 | 3 | -10 | Sandy |
| 13:20 | 3 | 13.55 | 5.01 | 0.515 | 4.51a | 3 | -10 | |
| 13:26 | 4 | 13.54 | 5.03 | 0.553 | 4.82 | 3 | -10 | |
| 13:35 | 5½ | 13.57 | 5.03 | 0.571 | 4.10a | 3 | -10 | |
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Purging Equipment: Port. / Ded. Bladder Pump Sampling Equipment Horiba U22 Sample Intake Depth: _____

Remarks: _____

Revised 02/06/03

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Arlington, WA 98223
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## Groundwater Sampling Field Form

| | | |
|---|---|---|
| Well No. BX5-4 (8) | Location Arlington | Date 1-12-05 |
| Sample No. | Field Personnel/Company Jim Clawson / Mary Larson J.H. Baxter | |
| Sample Time (2400 hours) 11:00 | Instrument Calibration Date 1-12-05 | |
| Well Condition Poor (Satisfactory) New | (If poor, explain) | |
| Field Conditions/Weather 38° Cloudy/Windy | | |
| Equipment Decontamination Liquinox, Hexane, Methanol, and D.I. Water Rinse. | | |

Casing Diameter: (Circle One) (2") 4" 6" Other____

Casing Volume (gallons/ft) for: 2"=0.163; 4"=0.653; 6"=1.47
Multiply Water Column Height by appropriate number above to get proper purge volume.

Depth of Well (feet): 47.40
Depth to Water (feet): 9.95
Water Column (feet): 37.45
Casing Volume (gallons): 6.10
Calculated Purge Volume (gallons): 18.31
Actual Purge Volume (gallons):

Sheen / LNAPL / DNAPL present:
Other remarks:

| Time 2400 hrs | Cumulative Volume (gal) | TEMP (°C) | pH | Conductivity ms/cm 25°C | Dissolved Oxygen (mg/L) | EH MV | Turbidity (NTU) | Odor/Color/ Remarks |
|---|---|---|---|---|---|---|---|---|
| 9:07 | 0 | | | | | | | Purge Start |
| 9:13 | 1 | 9.96 | 5.41 | 0.185 | 6.11 | 7 | 2.7 | Clear |
| 9:42 | 5 | 9.58 | 6.11 | 0.182 | 7.68 | 6 | -10 | odor |
| 10:03 | 9 | 9.91 | 6.17 | 0.187 | 7.45 | 5 | -10 | |
| 10:20 | 13 | 9.93 | 6.11 | 0.187 | 7.06 | 5 | -10 | |
| 10:40 | 17 | 9.92 | 6.17 | 0.187 | 7.10 | 5 | -10 | |
| 10:55 | 18.6 | 9.88 | 6.11 | 0.187 | 7.10 | 5 | -10 | |

Purging Equipment: (Port.) / Ded. Bladder Pump Sampling Equipment Horiba U22 Sample Intake Depth:____

Remarks: BX5-6 Dup (Landfill) 10:30
Horiba U22 malfunctioning, re-calibrated.

Revised 02/06/03

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## Groundwater Sampling Field Form

| | | |
|---|---|---|
| Well No. BXS-5 | Location Arlington | Date 1-13-05 |
| Sample No. | Field Personnel/Company Jim Clawson / Mary Larson J.H. Baxter | |
| Sample Time (2400 hours) 9:10 | Instrument Calibration Date | |

Well Condition Poor Satisfactory New (If poor, explain) _____

Field Conditions/Weather _____

Equipment Decontamination Liquinox, Hexane, Methanol, and D.I. Water Rinse.

Casing Diameter:
(Circle One)
2" 4"
6" Other____

Casing Volume (gallons/ft) for: 2"=0.163; 4"=0.653; 6"=1.47
Multiply Water Column Height by appropriate number above to get proper purge volume.

Depth of Well (feet): _____
Depth to Water (feet): _____
Water Column (feet): _____
Casing Volume (gallons): _____
Calculated Purge Volume (gallons): _____
Actual Purge Volume (gallons): _____

Sheen / LNAPL / DNAPL present: _____
Other remarks: _____

Field Blank

| Time 2400 hrs | Cumulative Volume (gal) | TEMP (°C) | pH | Conductivity ms/cm 25°C | Dissolved Oxygen (mg/L) | EH MV | Turbidity (NTU) | Odor/Color/ Remarks |
|---|---|---|---|---|---|---|---|---|
| | 0 | | | | | | | Purge Start |
| | | | | | | | | |
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Purging Equipment: Port. / Ded. Bladder Pump Sampling Equipment Horiba U22 Sample Intake Depth: _____

Remarks: _____

Revised 02/06/03

| Case | Well Number | Water Level | Bottom | Comments | Pump |
|---|---|---|---|---|---|
| 2" | BXN-1 | 49.38 | 58.18' | | |
| 2" | BXN-2 | 45.58 | 57.24' | | |
| 2" | BXN-3 | 46.64 | 58.66' | | |
| 2" | BXN-4 | 44.13 | 51.74' | | |
| | BXN-5 | | Dup BXN-1 | Landfill Reqiuirements | |
| | BXN-6 | | Blank | | |
| | | | | | |
| 2" | BXS-1 | 36.52 | 47.90' | | X |
| 2" | BXS-2 | 35.63 | 45.40' | Pump raised out of ground 1 1/2' | X |
| 2" | BXS-3 | 34.00 | 44.15' | | X |
| 2" | BXS-4 | 10.71 | 47.40' | | |
| | BXS-5 | | Blank | | |
| | BXS-6 | | Dup BXS-4 | Landfill Requirements | |
| | | | | | |
| 4" | MW-1 | 24.96 | 41.02' | | |
| 4" | MW-2 | 41.85 | 51.23' | | X |
| 4" | MW-3 | 39.22 | 51.96' | | X |
| 2" | MW-4 | 1.65 | 41.92' | | |
| 2" | HCMW-5 | 26.02 | 35.43' | | X |
| 2" | HCMW-6 | 39.75 | 51.10' | | X |
| 2" | HCMW-7 | 41.49 | 55.08' | | |
| | MW-A | | Dup MW-15 | Permit Requirements | |
| | MW-B | | Blank | | |
| | | | | | |
| 2" | MW-10 | 32.87 | 45.58' | | |
| 2" | MW-11 | 21.64 | 38' | | |
| 4" | MW-12 | | 39.85' | NAPL | |
| 4" | MW-13 | | 37.19' | NAPL | |
| 2" | MW-14 | 20.54 | 38' | | |
| 2" | MW-15 | 37.12 | 50.30' | | |
| | | | | | |
| 2" | MW-16 | 39.94 | 52.65' | | |
| 2" | MW-17 | 38.56 | 55.00' | | |
| 2" | MW-18 | 39.77 | 53.83' | | |

Depths Taken 4-11-05

# JH Baxter & Co.

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## Groundwater Sampling Field Form

| | | |
|---|---|---|
| Well No. BXS-1 | Location Arlington | Date 4-13-05 |
| Sample No. | Field Personnel/Company Jim Clawson / Mary Larson J.H. Baxter | |
| Sample Time (2400 hours) 11:30 | Instrument Calibration Date 4-13-05 | |

Well Condition Poor (Satisfactory) New (If poor, explain)

Field Conditions/Weather 42° clear

Equipment Decontamination Liquinox, Hexane, Methanol, and D.I. Water Rinse.

Casing Diameter: (Circle One) (2") 4" 6" Other____

Casing Volume (gallons/ft) for: 2"=0.163; 4"=0.653; 6"=1.47
Multiply Water Column Height by appropriate number above to get proper purge volume.

| | |
|---|---|
| Depth of Well (feet): 47.90 | Sheen / LNAPL / DNAPL present: |
| Depth to Water (feet): 36.52 | Other remarks: |
| Water Column (feet): 11.38 | |
| Casing Volume (gallons): 1.85 | Methane 0.0% |
| Calculated Purge Volume (gallons): 5.54 | |
| Actual Purge Volume (gallons): | |

| Time 2400 hrs | Cumulative Volume (gal) | TEMP (°C) | pH | Conductivity ms/cm 25°C | Dissolved Oxygen (mg/L) | EH MV | Turbidity (NTU) | Odor/Color/ Remarks |
|---|---|---|---|---|---|---|---|---|
| 9:26 | 0 | | | | | | | Purge Start |
| 9:50 | 1 | 12.1 | 6.2 | 39.9 | 5.4 | 296 | 0 | clear |
| 10:05 | 2 | 12.0 | 6.1 | 39.6 | 5.2 | 298 | 0 | |
| 10:20 | 3 | 12.1 | 6.2 | 38.9 | 5.1 | 300 | 0 | |
| 10:45 | 4 | 12.1 | 6.1 | 39.2 | 5.0 | 302 | 0 | |
| 11:05 | 5 | 11.9 | 6.1 | 38.0 | 5.8 | 307 | 0 | |
| 11:30 | 6 | 11.9 | 6.1 | 38.0 | 6.4 | 317 | 0 | |

Purging Equipment: Port. / Ded. Bladder Pump Sampling Equipment Horiba U22 Sample Intake Depth:____

Remarks:

Revised 02/06/03

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## Groundwater Sampling Field Form

| | | |
|---|---|---|
| Well No. BXS-2 | Location Arlington | Date 4-13-05 |
| Sample No. | Field Personnel/Company Jim Clawson / Mary Larson J.H. Baxter | |
| Sample Time (2400 hours) 13:30 | Instrument Calibration Date 4-13-05 | |

Well Condition Poor (Satisfactory) New (If poor, explain) _____

Field Conditions/Weather 46° clear

Equipment Decontamination **Liquinox, Hexane, Methanol, and D.I. Water Rinse.**

Casing Diameter: (Circle One) (2") 4" 6" Other____

Casing Volume (gallons/ft) for: 2"=0.163; 4"=0.653; 6"=1.47
Multiply Water Column Height by appropriate number above to get proper purge volume.

| | |
|---|---|
| Depth of Well (feet): 45.40 | Sheen / LNAPL / DNAPL present: _____ |
| Depth to Water (feet): 35.63 | Other remarks: _____ |
| Water Column (feet): 9.77 | |
| Casing Volume (gallons): 1.59 | No Hexane 0.0% |
| Calculated Purge Volume (gallons): 4.77 | |
| Actual Purge Volume (gallons): | |

| Time 2400 hrs | Cumulative Volume (gal) | TEMP (°C) | pH | Conductivity ms/cm 25°C | Dissolved Oxygen (mg/L) | EH MV | Turbidity (NTU) | Odor/Color/ Remarks |
|---|---|---|---|---|---|---|---|---|
| 13:00 | 0 | | | | | | | Purge Start |
| 13:05 | 1 | 13.0 | 6.1 | 78.4 | 2.2 | 68 | 240 | clear |
| 13:10 | 2 | 12.9 | 6.0 | 80.5 | 1.5 | 78 | 50 | |
| 13:15 | 3 | 13.0 | 6.1 | 80.4 | 1.4 | 70 | 0 | |
| 13:20 | 4 | 13.0 | 6.2 | 81.2 | 1.5 | 64 | 0 | |
| 13:28 | 5 | 13.0 | 6.2 | 81.2 | 1.7 | 67 | 0 | |

Purging Equipment: Port. / (Ded.) **Bladder Pump** Sampling Equipment **Horiba U22** Sample Intake Depth: _____

Remarks: _____

Revised 02/06/03

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## Groundwater Sampling Field Form

| | | |
|---|---|---|
| Well No. BXS-3 | Location Arlington | Date 4-13-06 |
| Sample No. | Field Personnel/Company Jim Clawson / Mary Larson J.H. Baxter | |
| Sample Time (2400 hours) 14:15 | Instrument Calibration Date 4-13-06 | |

Well Condition Poor (Satisfactory) New (If poor, explain) _____

Field Conditions/Weather 46° partly cloudy

Equipment Decontamination Liquinox, Hexane, Methanol, and D.I. Water Rinse.

Casing Diameter: (Circle One) (2") 4" 6" Other____

Casing Volume (gallons/ft) for: 2"=0.163; 4"=0.653; 6"=1.47
Multiply Water Column Height by appropriate number above to get proper purge volume.

| | | | |
|---|---|---|---|
| Depth of Well (feet): | 44.15 | Sheen / LNAPL / DNAPL present: | |
| Depth to Water (feet): | 34.00 | Other remarks: | |
| Water Column (feet): | 10.15 | | |
| Casing Volume (gallons): | 1.65 | Methane 0.0% | |
| Calculated Purge Volume (gallons): | 4.96 | | |
| Actual Purge Volume (gallons): | | | |

| Time 2400 hrs | Cumulative Volume (gal) | TEMP (°C) | pH | Conductivity ms/cm 25°C | Dissolved Oxygen (mg/L) | EH MV | Turbidity (NTU) | Odor/Color/ Remarks |
|---|---|---|---|---|---|---|---|---|
| 13:40 | 0 | | | | | | | Purge Start |
| 13:45 | 1 | 13.5 | 5.9 | 68.9 | 2.0 | 9 | 0 | clear |
| 13:50 | 2 | 13.5 | 5.9 | 67.8 | 4.1 | 17 | 0 | |
| 13:55 | 3 | 13.5 | 6.1 | 94.1 | 5.1 | 13 | 0 | |
| 14:00 | 4 | 13.5 | 6.3 | 96.6 | 4.8 | -4 | 0 | |
| 14:10 | 5 | 13.5 | 6.3 | 78.5 | 4.4 | -1 | 1 | |

Purging Equipment: Port. / Ded. Bladder Pump Sampling Equipment Horiba U22 Sample Intake Depth: _____

Remarks: _____

Revised 02/06/03

# JH Baxter & Co.

PO Box 305

## Arlington, WA 98223

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## Groundwater Sampling Field Form

| | | |
|---|---|---|
| Well No. BXS-4 * | Location **Arlington** | Date 4-12-05 |
| Sample No. | Field Personnel/Company **Jim Clawson / Mary Larson J.H. Baxter** | |
| Sample Time (2400 hours) 11:30 | Instrument Calibration Date 4-12-05 | |

Well Condition Poor (Satisfactory) New (If poor, explain) _____

Field Conditions/Weather 40° Overcast

Equipment Decontamination **Liquinox, Hexane, Methanol, and D.I. Water Rinse.**

Casing Diameter: (Circle One) (2") 4" 6" Other_____

Casing Volume (gallons/ft) for: 2"=0.163; 4"=0.653; 6"=1.47
Multiply Water Column Height by appropriate number above to get proper purge volume.

Depth of Well (feet): 47.40
Depth to Water (feet): 10.71
Water Column (feet): 36.69
Casing Volume (gallons): 5.98
Calculated Purge Volume (gallons): 17.94
Actual Purge Volume (gallons): _____

Sheen / LNAPL / DNAPL present: _____
Other remarks: Methane, 0.0%

| Time 2400 hrs | Cumulative Volume (gal) | TEMP (°C) | pH | Conductivity ms/cm 25°C | Dissolved Oxygen (mg/L) | EH MV | Turbidity (NTU) | Odor/Color/ Remarks |
|---|---|---|---|---|---|---|---|---|
| 9:00 | 0 | | | | | | | Purge Start |
| 9:05 | 1 | 9.4 | 7.2 | 19.5 | 1.2 | -38 | 0 | odor |
| 9:15 | 5 | 9.5 | 7.2 | 19.3 | 1.1 | -92 | 0 | |
| 9:30 | 9 | 9.6 | 7.7 | 19.3 | 1.1 | -149 | 0 | |
| 9:45 | 13 | 9.6 | 7.6 | 19.4 | 1.1 | -162 | 0 | |
| 10:05 | 18 | 9.6 | 7.5 | 19.4 | 1.1 | -171 | 0 | |

Purging Equipment: (Port.) / Ded. **Bladder Pump** Sampling Equipment **Horiba U22** Sample Intake Depth: _____

Remarks: Had to stop for 1 hour to help in treating Plant. Purged an extra 5 gallons before taking samples.

* Dup BXS-6 11:00

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## Groundwater Sampling Field Form

| | | |
|---|---|---|
| Well No. BXS-5 | Location Arlington | Date 4-13-05 |
| Sample No. | Field Personnel/Company Jim Clawson / Mary Larson J.H. Baxter | |
| Sample Time (2400 hours) 14:30 | Instrument Calibration Date | |

Well Condition Poor Satisfactory New (If poor, explain) _____

Field Conditions/Weather _____

Equipment Decontamination Liquinox, Hexane, Methanol, and D.I. Water Rinse.

Casing Diameter:
(Circle One)
2" 4"
6" Other____

Casing Volume (gallons/ft) for: 2"=0.163; 4"=0.653; 6"=1.47
Multiply Water Column Height by appropriate number above to get proper purge volume.

Depth of Well (feet): _____
Depth to Water (feet): _____
Water Column (feet): _____
Casing Volume (gallons): _____
Calculated Purge Volume (gallons): _____
Actual Purge Volume (gallons): _____

Sheen / LNAPL / DNAPL present: _____
Other remarks: _____
Field Blanks

| Time 2400 hrs | Cumulative Volume (gal) | TEMP ( °C ) | pH | Conductivity ms/cm 25°C | Dissolved Oxygen (mg/L) | EH MV | Turbidity (NTU) | Odor/Color/ Remarks |
|---|---|---|---|---|---|---|---|---|
| | 0 | | | | | | | Purge Start |
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Purging Equipment: Port. / Ded. Bladder Pump Sampling Equipment Horiba U22 Sample Intake Depth: _____

Remarks: _____

Revised 02/06/03

| Case | Well Number | Water Level | Bottom | Comments | Pump |
|---|---|---|---|---|---|
| 2" | BXN-1 | 49.52' | 58.18' | | |
| 2" | BXN-2 | 45.75' | 57.24' | | |
| 2" | BXN-3 | 46.99' | 58.66' | | |
| 2" | BXN-4 | 44.56' | 51.74' | | |
| | BXN-5 | | Dup BXN-1 | Landfill Reqiuirements | |
| | BXN-6 | | Blank | | |
| | | | | | |
| 2" | BXS-1 | 36.73' | 47.90' | Top of Pump. | X |
| 2" | BXS-2 | 35.82' | 45.40' | Pump raised out of ground 1 1/2' | X |
| 2" | BXS-3 | 31.58' | 44.15' | | X |
| 2" | BXS-4 | 16.02' | 47.40' | | |
| | BXS-5 | | Blank | | |
| | BXS-6 | | Dup BXS-4 | Landfill Requirements | |
| | | | | | |
| 4" | MW-1 | 28.98' | 41.02' | | |
| 4" | MW-2 | 40.00' | 51.23' | | X |
| 4" | MW-3 | 39.60' | 51.96' | | X |
| 2" | MW-4 | 14.19' | 41.92' | | |
| 2" | HCMW-5 | 29.17' | 35.43' | Top of Pump. | X |
| 2" | HCMW-6 | 40.00' | 51.10' | | X |
| 2" | HCMW-7 | 41.69' | 55.08' | | |
| | MW-A | | Dup MW-15 | ~~Permit Requirements~~ | |
| | MW-B | | Blank | | |
| | | | | | |
| 2" | MW-10 | 34.21' | 45.58' | | |
| 2" | MW-11 | 24.76' | 38' | | |
| 4" | MW-12 | | 39.85' | NAPL | |
| 4" | MW-13 | | 37.19' | NAPL | |
| 2" | MW-14 | 26.24' | 38' | | |
| 2" | MW-15 | 37.26' | 50.30' | | |
| | | | | | |
| 2" | MW-16 | 40.01' | 52.65' | | |
| 2" | MW-17 | 38.70' | 55.00' | | |
| 2" | MW-18 | 39.93' | 53.83' | | |

**Depths Taken** 8-8-05

# JH Baxter & Co.

PO Box 305
Arlington, WA 98223
(360) 435-2146 FAX (360) 435-3035

## Groundwater Sampling Field Form

| | | |
|---|---|---|
| Well No. BKS-1 | Location Arlington | Date 8-9-05 |
| Sample No. | Field Personnel/Company Jim Clawson / Mary Larson J.H. Baxter | |
| Sample Time (2400 hours) 11:50 | Instrument Calibration Date 8-9-05 | |

Well Condition Poor (Satisfactory) New (If poor, explain)

Field Conditions/Weather 70° clear

Equipment Decontamination Liquinox, Hexane, Methanol, and D.I. Water Rinse.

Casing Diameter: (Circle One) (2") 4" 6" Other____

Casing Volume (gallons/ft) for: 2"=0.163; 4"=0.653; 6"=1.47
Multiply Water Column Height by appropriate number above to get proper purge volume.

Depth of Well (feet): 47.90'
Depth to Water (feet): 36.73
Water Column (feet): 11.17
Casing Volume (gallons): 1.82
Calculated Purge Volume (gallons): 5.46
Actual Purge Volume (gallons):

Sheen / LNAPL / DNAPL present:
Other remarks: (Top of Pump)

| Time 2400 hrs | Cumulative Volume (gal) | TEMP (°C) | pH | Conductivity ms/cm 25°C | Dissolved Oxygen (mg/L) | EH MV | Turbidity (NTU) | Odor/Color/ Remarks |
|---|---|---|---|---|---|---|---|---|
| 11:15 | 0 | | | | | | | Purge Start |
| 11:21 | 1 | 12.67 | 5.84 | 46.8 | 5.04 | 84 | 43 | clear |
| 11:27 | 2 | 12.64 | 5.86 | 44.9 | 4.46 | 86 | 28 | |
| 11:32 | 3 | 12.59 | 5.81 | 43.6 | 4.26 | 84 | 21 | |
| 11:37 | 4 | 12.62 | 5.87 | 42.6 | 4.10 | 84 | 17 | |
| 11:46 | 5.42 | 12.61 | 5.87 | 42.6 | 3.98 | 84 | 14 | |

Purging Equipment: Port. (Ded. Bladder Pump) Sampling Equipment: (Horiba U22) Sample Intake Depth:____

Remarks:

Revised 02/06/03

# JH Baxter & Co.

PO Box 305
Arlington, WA 98223
(360) 435-2146 FAX (360) 435-3035

## Groundwater Sampling Field Form

| | | |
|---|---|---|
| Well No. BXS-2 | Location Arlington | Date 8-10-05 |
| Sample No. | Field Personnel/Company Jim Clawson / Mary Larson J.H. Baxter | |
| Sample Time (2400 hours) 10:00 | Instrument Calibration Date 8-10-05 | |

Well Condition Poor (Satisfactory) New (If poor, explain)

Field Conditions/Weather 60° Drizzle

Equipment Decontamination Liquinox, Hexane, Methanol, and D.I. Water Rinse.

Casing Diameter: (Circle One) (2) 4" 6" Other____

Casing Volume (gallons/ft) for: 2"=0.163; 4"=0.653; 6"=1.47
Multiply Water Column Height by appropriate number above to get proper purge volume.

| | |
|---|---|
| Depth of Well (feet): 45.40 | Sheen / LNAPL / DNAPL present: |
| Depth to Water (feet): 35.82 | Other remarks: |
| Water Column (feet): 9.58 | |
| Casing Volume (gallons): 1.56 | |
| Calculated Purge Volume (gallons): 4.68 | |
| Actual Purge Volume (gallons): | |

| Time 2400 hrs | Cumulative Volume (gal) | TEMP (°C) | pH | Conductivity ms/cm 25°C | Dissolved Oxygen (mg/L) | EH MV | Turbidity (NTU) | Odor/Color/ Remarks |
|---|---|---|---|---|---|---|---|---|
| 9:36 | 0 | | | | | | | Purge Start |
| 9:46 | 1 | 12.99 | 5.75 | 78.6 | 4.94 | 76 | 44 | |
| 9:48 | 2 | 12.89 | 5.75 | 79.5 | 4.85 | 80 | 45 | |
| 9:52 | 3 | 12.86 | 5.75 | 80.3 | 4.67 | 83 | 45 | |
| 9:56 | 4 | 12.84 | 5.76 | 79.4 | 4.61 | 84 | 45 | |
| 10:00 | 4 3/4 | 12.84 | 5.77 | 79.4 | 4.74 | 84 | 44 | |

Purging Equipment: Port. / Ded. Bladder Pump Sampling Equipment: Horiba U22 Sample Intake Depth:____

Remarks:

Revised 02/06/03

# JH Baxter & Co.

PO Box 305
Arlington, WA 98223
(360) 435-2146 FAX (360) 435-3035

## Groundwater Sampling Field Form

| | | |
|---|---|---|
| Well No. BXS-3 | Location Arlington | Date 8-10-05 |
| Sample No. | Field Personnel/Company Jim Clawson / Mary Larson J.H. Baxter | |
| Sample Time (2400 hours) 11:15 | Instrument Calibration Date 8-10-05 | |

Well Condition Poor (Satisfactory) New (If poor, explain) _____

Field Conditions/Weather _____

Equipment Decontamination Liquinox, Hexane, Methanol, and D.I. Water Rinse.

Casing Diameter: (Circle One) (2") 4" 6" Other____

Casing Volume (gallons/ft) for: 2"=0.163; 4"=0.653; 6"=1.47
Multiply Water Column Height by appropriate number above to get proper purge volume.

Depth of Well (feet): 44.15'
Depth to Water (feet): 31.58'
Water Column (feet): 12.57'
Casing Volume (gallons): 2.04'
Calculated Purge Volume (gallons): 6.14'
Actual Purge Volume (gallons): _____

Sheen / LNAPL / DNAPL present: _____
Other remarks: _____

| Time 2400 hrs | Cumulative Volume (gal) | TEMP (°C) | pH | Conductivity ms/cm 25°C | Dissolved Oxygen (mg/L) | EH MV | Turbidity (NTU) | Odor/Color/ Remarks |
|---|---|---|---|---|---|---|---|---|
| 10:46 | 0 | | | | | | | Purge Start |
| 10:49 | 1 | 13.21 | 5.75 | 72.2 | 8.83 | 14 | 83 | clear |
| 10:52 | 2 | 13.18 | 5.75 | 73.4 | 10.17 | 11 | 43 | |
| 10:54 | 3 | 13.17 | 5.77 | 74.2 | 10.05 | 9 | 42 | |
| 10:58 | 4 | 13.17 | 5.79 | 52.2 | 9.70 | 8 | 36 | |
| 11:00 | 5 | 13.16 | 5.81 | 77.8 | 9.61 | 5 | 29 | |
| 11:06 | 6'14 | 13.16 | 5.84 | 78.8 | 9.66 | -1 | 25 | |
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Purging Equipment: Port. Ded. Bladder Pump Sampling Equipment: Horiba U22 Sample Intake Depth: _____

Remarks: _____

Revised 02/06/03

# JH Baxter & Co.

PO Box 305

## Arlington, WA 98223

(360) 435-2146 FAX (360) 435-3035

## Groundwater Sampling Field Form

| | | |
|---|---|---|
| Well No. BXS-4 ⊗ | Location **Arlington** | Date 8-9-05 |
| Sample No. | Field Personnel/Company **Jim Clawson / Mary Larson J.H. Baxter** | |
| Sample Time (2400 hours) 10:30 | Instrument Calibration Date 8-9-05 | |

Well Condition Poor (Satisfactory) New (If poor, explain)

Field Conditions/Weather 60° cloudy

Equipment Decontamination **Liquinox, Hexane, Methanol, and D.I. Water Rinse.**

Casing Diameter: (Circle One) (2") 4" 6" Other____

Casing Volume (gallons/ft) for: 2"=0.163; 4"=0.653; 6"=1.47
Multiply Water Column Height by appropriate number above to get proper purge volume.

Depth of Well (feet): 47.40'
Depth to Water (feet): 16.02'
Water Column (feet): 31.38
Casing Volume (gallons): 5.11
Calculated Purge Volume (gallons): 15.34
Actual Purge Volume (gallons):

Sheen / LNAPL / DNAPL present:
Other remarks:

| Time 2400 hrs | Cumulative Volume (gal) | TEMP (°C) | pH | Conductivity ms/cm 25°C | Dissolved Oxygen (mg/L) | EH MV | Turbidity (NTU) | Odor/Color/ Remarks |
|---|---|---|---|---|---|---|---|---|
| 9:17 | 0 | | | | | | | Purge Start |
| 9:28 | 2 | 10.23 | 5.64 | 19.6 | 4.49 | -19 | 41 | clear |
| 9:38 | 5 | 10.24 | 5.63 | 19.5 | 4.04 | -5 | 12 | slight |
| 9:55 | 9 | 10.27 | 5.63 | 19.4 | 3.94 | -49 | 6 | odor |
| 10:25 | 15½ | 10.51 | 6.37 | 19.5 | 4.13 | ~86 | 4 | |

Purging Equipment: Port / Ded. Bladder Pump Sampling Equipment: Horiba U22 Sample Intake Depth:____

Remarks: ⊗ BXS-6 Dup. 1100

Revised 02/06/03

# JH Baxter & Co.

PO Box 305
Arlington, WA 98223
(360) 435-2146 FAX (360) 435-3035

## Groundwater Sampling Field Form

| | | |
|---|---|---|
| Well No. BXS-5 | Location **Arlington** | Date 5-10-05 |
| Sample No. | Field Personnel/Company **Jim Clawson / Mary Larson J.H. Baxter** | |
| Sample Time (2400 hours) 12:00 | Instrument Calibration Date | |

Well Condition Poor Satisfactory New (If poor, explain) _____

Field Conditions/Weather _____

Equipment Decontamination **Liquinox, Hexane, Methanol, and D.I. Water Rinse.**

Casing Diameter:
(Circle One)
2" 4"
6" Other_____

Casing Volume (gallons/ft) for: 2"=0.163; 4"=0.653; 6"=1.47
Multiply Water Column Height by appropriate number above to get proper purge volume.

Depth of Well (feet): _____
Depth to Water (feet): _____
Water Column (feet): _____
Casing Volume (gallons): _____
Calculated Purge Volume (gallons): _____
Actual Purge Volume (gallons): _____

Sheen / LNAPL / DNAPL present: _____
Other remarks: _____
Field Blank

| Time 2400 hrs | Cumulative Volume (gal) | TEMP (°C) | pH | Conductivity ms/cm 25°C | Dissolved Oxygen (mg/L) | EH MV | Turbidity (NTU) | Odor/Color/ Remarks |
|---|---|---|---|---|---|---|---|---|
| | 0 | | | | | | | Purge Start |
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Purging Equipment: **Port. / Ded. Bladder Pump** Sampling Equipment **Horiba U22** Sample Intake Depth: _____

Remarks: _____

Revised 02/06/03

| Case | Well Number | Water Level | Bottom | Comments | Pump |
|---|---|---|---|---|---|
| 2" | BXN-1 | 50.70 | 58.18' | | |
| 2" | BXN-2 | 46.99 | 57.24' | | |
| 2" | BXN-3 | 48.47 | 58.66' | | |
| 2" | BXN-4 | 46.00 | 51.74' | | |
| | BXN-5 | | Dup BXN-1 | Landfill Reqiuirements | |
| | BXN-6 | | Blank | | |
| | | | | | |
| 2" | BXS-1 | 36.74' | 47.90' | Top of Pump | X |
| 2" | BXS-2 | 37.96' | 45.40' | Pump raised out of ground 1 1/2' | X |
| 2" | BXS-3 | 34.62 | 44.15' | | X |
| 2" | BXS-4 | 11.83' | 47.40' | | |
| | BXS-5 | | Blank | | |
| | BXS-6 | | Dup BXS-4 | Landfill Requirements | |
| | | | | | |
| 4" | MW-1 | 24.51' | 41.02' | | |
| 4" | MW-2 | 44.22' | 51.23' | | X |
| 4" | MW-3 | 41.75' | 51.96' | | X |
| 2" | MW-4 | 8.98' | 41.92' | | |
| 2" | HCMW-5 | 27.17' | 35.43' | | X |
| 2" | HCMW-6 | 42.37' | 51.10' | | X |
| 2" | HCMW-7 | 43.77' | 55.08' | | |
| | MW-A | | Dup MW-15 | Permit Requirements | |
| | MW-B | | Blank | | |
| | | | | | |
| 2" | MW-10 | 36.73' | 45.58' | | |
| 2" | MW-11 | 21.60' | 38' | | |
| 4" | MW-12 | | 39.85' | NAPL | |
| 4" | MW-13 | | 37.19' | NAPL | |
| 2" | MW-14 | 31.89' | 38' | | |
| 2" | MW-15 | 39.64 | 50.30' | | |
| | | | | | |
| 2" | MW-16 | 42.30' | 52.65' | | |
| 2" | MW-17 | 41.94' | 55.00' | | |
| 2" | MW-18 | 41.99' | 53.83' | | |

**Depths Taken** 12-1-05

# JH Baxter & Co.

PO Box 305
Arlington, WA 98223
(360) 435-2146 FAX (360) 435-3035

## Groundwater Sampling Field Form

| | | |
|---|---|---|
| Well No. BXS-1 | Location Arlington | Date 11-30-05 |
| Sample No. | Field Personnel/Company Jim Clawson / Mary Larson J.H. Baxter | |
| Sample Time (2400 hours) 1450 | Instrument Calibration Date 11-30-05 | |

Well Condition Poor (Satisfactory) New (If poor, explain)

Field Conditions/Weather 45° cloudy

Equipment Decontamination Liquinox, Hexane, Methanol, and D.I. Water Rinse.

Casing Diameter: (Circle One) (2") 4" 6" Other____

Casing Volume (gallons/ft) for: 2"=0.163; 4"=0.653; 6"=1.47
Multiply Water Column Height by appropriate number above to get proper purge volume.

Depth of Well (feet): 47.90
Depth to Water (feet): 31.74 Top of Pump
Water Column (feet): 16.16
Casing Volume (gallons): 1.87
Calculated Purge Volume (gallons): 5.62
Actual Purge Volume (gallons):

Sheen / LNAPL / DNAPL present:
Other remarks: Methane 0.0% 12-13-05

| Time 2400 hrs | Cumulative Volume (gal) | TEMP (°C) | pH | Conductivity ms/cm 25°C | Dissolved Oxygen (mg/L) | EH MV | Turbidity (NTU) | Odor/Color/ Remarks |
|---|---|---|---|---|---|---|---|---|
| 14:10 | 0 | | | | | | | Purge Start |
| 14:24 | 1.87 | 11.7 | 6.22 | 49.5 | 0.9 | 164 | 2 | clear |
| 14:39 | 3.74 | 11.7 | 6.18 | 45.2 | 0.7 | 173 | 1 | |
| 14:47 | 5.62 | 11.7 | 6.15 | 43.9 | 0.7 | 177 | 1 | |

Purging Equipment: Port. / (Ded.) Bladder Pump Sampling Equipment Horiba U22 Sample Intake Depth:

Remarks:

Revised 02/06/03

# JH Baxter & Co.

PO Box 305
Arlington, WA 98223
(360) 435-2146 FAX (360) 435-3035

## Groundwater Sampling Field Form

| | | |
|---|---|---|
| Well No. BX5-2 | Location Arlington | Da 05 |
| Sample No. | Field Personnel/Company Jim Clawson / Mary Larson | |
| Sample Time (2400 hours) 12:16 | Instrument Calibration Date 11.30.05 | |

Well Condition Poor (Satisfactory) New (If poor, explain)

Field Conditions/Weather 39° Snowing

Equipment Decontamination Liquinox, Hexane, Methanol, and D.I. Water Rinse.

Casing Diameter: (Circle One) (2") 4" 6" Other____

Casing Volume (gallons/ft) for: 2"=0.163; 4"=0.653; 6"
Multiply Water Column Height by appropriate number
get proper purge volume.

Depth of Well (feet): 46.40
Depth to Water (feet): 39.96
Water Column (feet): 7.44
Casing Volume (gallons): 1.21
Calculated Purge Volume (gallons): 3.63
Actual Purge Volume (gallons):

Sheen / LNAPL / DNAPL pres
Other remarks:
Methane 0.0% L

| Time 2400 hrs | Cumulative Volume (gal) | TEMP (°C) | pH | Conductivity ms/cm 25°C | Dissolved Oxygen (mg/L) | EH MV | Tu/Color/ (marks |
|---|---|---|---|---|---|---|---|
| 11:30 | 0 | | | | | | e Start |
| 11:46 | 1.21 | 12.4 | 6.34 | 71.8 | 4.2 | 63 | Clear |
| 11:55 | 2.42 | 12.3 | 6.36 | 73.2 | 3.9 | 52 | |
| 12:15 | 3.63 | 12.5 | 6.36 | 77.8 | 10.5 | 51 | |

Purging Equipment: Port / Ded Bladder Pump Sampling Equipment Horiba U22 Sample Intake De

Remarks:

# JH Baxter & Co.

PO Box 305
Arlington, WA 98223
(360) 435-2146 FAX (360) 435-3035

## Groundwater Sampling Field Form

| | | |
|---|---|---|
| Well No. BXS-3 | Location Arlington | Date 12-1-05 |
| Sample No. | Field Personnel/Company Jim Clawson / Mary Larson J.H. Baxter | |
| Sample Time (2400 hours) 13:05 | Instrument Calibration Date 11-30-05 | |

Well Condition Poor (Satisfactory) New (If poor, explain)

Field Conditions/Weather 34° Rain/snow

Equipment Decontamination Liquinox, Hexane, Methanol, and D.I. Water Rinse.

Casing Diameter: (Circle One) (2") 4" 6" Other____

Casing Volume (gallons/ft) for: 2"=0.163; 4"=0.653; 6"=1.47
Multiply Water Column Height by appropriate number above to get proper purge volume.

Depth of Well (feet): 44.15
Depth to Water (feet): 34.62
Water Column (feet): 9.53
Casing Volume (gallons): 1.55
Calculated Purge Volume (gallons): 4.66
Actual Purge Volume (gallons):

Sheen / LNAPL / DNAPL present:
Other remarks:
Methanol 0.0% 12-13-05

| Time 2400 hrs | Cumulative Volume (gal) | TEMP (°C) | pH | Conductivity ms/cm 25°C | Dissolved Oxygen (mg/L) | EH MV | Turbidity (NTU) | Odor/Color/ Remarks |
|---|---|---|---|---|---|---|---|---|
| 12:44 | 0 | | | | | | | Purge Start |
| 12:49 | 4.55 | 12.7 | 6.94 | 82.8 | 5.4 | 4 | 7 | clear |
| 12:55 | 3.10 | 12.5 | 6.93 | 94.5 | 5.4 | 2 | 2 | clear |
| 13:05 | 4.66 | 12.2 | 6.47 | 85.4 | 1.9 | -35 | 6 | |

Purging Equipment: Port. / Ded. Bladder Pump Sampling Equipment Horiba U22 Sample Intake Depth:____

Remarks:

# JH Baxter & Co.

PO Box 305
Arlington, WA 98223
(360) 435-2146 FAX (360) 435-3035

## Groundwater Sampling Field Form

| | | |
|---|---|---|
| Well No. BXS-4 * | Location **Arlington** | Date 11-30-05 |
| Sample No. | Field Personnel/Company **Jim Clawson / Mary Larson J.H. Baxter** | |
| Sample Time (2400 hours) 10:46 | Instrument Calibration Date 11-29-05 | |

Well Condition Poor (Satisfactory) New (If poor, explain)

Field Conditions/Weather 38° cloudy.

Equipment Decontamination **Liquinox, Hexane, Methanol, and D.I. Water Rinse.**

Casing Diameter: (Circle One) (2") 4" 6" Other____

Casing Volume (gallons/ft) for: 2"=0.163; 4"=0.653; 6"=1.47
Multiply Water Column Height by appropriate number above to get proper purge volume.

| | |
|---|---|
| Depth of Well (feet): 47.40 | Sheen / LNAPL / DNAPL present: |
| Depth to Water (feet): 11.83 | Other remarks: |
| Water Column (feet): 35.57 | |
| Casing Volume (gallons): 5.79 | Methane 0.0% 12-13-05 |
| Calculated Purge Volume (gallons): 17.39 | |
| Actual Purge Volume (gallons): | |

| Time 2400 hrs | Cumulative Volume (gal) | TEMP (°C) | pH | Conductivity ms/cm 25°C | Dissolved Oxygen (mg/L) | EH MV | Turbidity (NTU) | Odor/Color/ Remarks |
|---|---|---|---|---|---|---|---|---|
| 9:33 | 0 | | | | | | | Purge Start |
| 10:03 | 5.79 | 9.9 | 7.9 | 19.4 | 8.0 | -94 | 9 | Clear |
| 10:22 | 11.58 | 9.7 | 7.9 | 19.4 | 7.7 | -135 | 4 | odor |
| 10:46 | 17.39 | 9.7 | 8.0 | 19.4 | 8.0 | -120 | 4 | |

Purging Equipment: Port. / Ded. Bladder Pump Sampling Equipment Horiba U22 Sample Intake Depth:____

Remarks: * Dup BXS-16 11:00

# JH Baxter & Co.

PO Box 305

Arlington, WA 98223

(360) 435-2146 FAX (360) 435-3035


## Groundwater Sampling Field Form

| | | |
|---|---|---|
| Well No. BWS-5 | Location **Arlington** | Date 12-4-05 |
| Sample No. | Field Personnel/Company **Jim Clawson / Mary Larson J.H. Baxter** | |
| Sample Time (2400 hours) 10:30 | Instrument Calibration Date | |

Well Condition Poor Satisfactory New (If poor, explain)

Field Conditions/Weather

Equipment Decontamination **Liquinox, Hexane, Methanol, and D.I. Water Rinse.**

Casing Diameter:
(Circle One)
2" 4"
6" Other____

Casing Volume (gallons/ft) for: 2"=0.163; 4"=0.653; 6"=1.47
Multiply Water Column Height by appropriate number above to get proper purge volume.

Depth of Well (feet):
Depth to Water (feet):
Water Column (feet):
Casing Volume (gallons):
Calculated Purge Volume (gallons):
Actual Purge Volume (gallons):

Sheen / LNAPL / DNAPL present:
Other remarks:

| Time 2400 hrs | Cumulative Volume (gal) | TEMP (°C) | pH | Conductivity ms/cm 25°C | Dissolved Oxygen (mg/L) | EH MV | Turbidity (NTU) | Odor/Color/ Remarks |
|---|---|---|---|---|---|---|---|---|
| | 0 | | | | | | | Purge Start |
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Purging Equipment: **Port. / Ded. Bladder Pump** Sampling Equipment **Horiba U22** Sample Intake Depth:

Remarks: Field Blank

Revised 02/06/03

# Appendix B

Chain of Custody Records
and Laboratory Reports

1317 South 13th Avenue P.O. Box 479 Kelso, Washington 98626 (360) 577-7222 ph (360) 636-1068 fax

Columbia Analytical Services INC.
An Employee - Owned Company

RECEIVED
2-4-05 KJ

January 31, 2005

Service Request No: K2500327

Mary Larson
J. H. Baxter Company
6520 188th St. NE
Arlington, WA 98223

**RE: Landfill Wells / BXS-WELLS**

Dear Mary:

Enclosed are the results of the sample(s) submitted to our laboratory on January 13, 2005. For your reference, these analyses have been assigned our service request number K2500327.

All analyses were performed according to our laboratory's quality assurance program. The test results meet requirements of the NELAC standards except as noted in the case narrative report. 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 items submitted to the laboratory for analysis and individual items (samples) analyzed, as listed in the report.

Please call if you have any questions. My extension is 3291.

Respectfully submitted,

**Columbia Analytical Services, Inc.**

Ed Wallace

Ed Wallace
Project Chemist

EW/jeb

# CHAIN OF CUSTODY

SH#: LC50032.1

Columbia Analytical Services INC.
An Employee - Owned Company

1317 South 13th Ave. • Kelso, WA 98626 • (360) 577-7222 • (800) 695-7222x07 • FAX (360) 636-1068

PAGE 1 OF 3 COC #

PROJECT NAME: JH Baxter Co
PROJECT NUMBER: Landfill Wells
PROJECT MANAGER: Marj Lee Larson
COMPANY/ADDRESS: 6650 185th Ave SE, PO Box 305
CITY/STATE/ZIP: Milton, WA 98223
E-MAIL ADDRESS:
PHONE#: 360 435-2146 FAX#: 360 435-3085
SAMPLER'S SIGNATURE:

| SAMPLE I.D. | DATE | TIME | LAB I.D. | MATRIX | NUMBER OF CONTAINERS | Semivolatile Organics by GC/MS 625☐ 8270☐ 8270LL☐ | Volatile Organics 624☐ 8260☐ | Hydrocarbons 8021☐ BTEX☐ Gas☐ (*see below) Diesel☐ Oil☐ | ☐ Fuel Fingerprint (FIQ) ☐ NW-HCID Screen | Oil & Grease/TRPH 1664 SGT☐ 1664 HEM☐ | PCB's Aroclors☐ Congeners☐ | Pesticides/Herbicides 608☐ 8081A☐ 8141A☐ 8151A☐ | Chlorophenolics - 8151M PCP☐ Tri☐ Tetra☐ | PAHS 8310☐ SIM☐ | Metals (See list below) Total or Dissolved | Cyanide☐ | pH Cond (circle) Hex-Chrom☐ $NO_3$ $SO_4$ $PO_4$ F ($NO_2$) $NH_3$-N BOD TSS (TDS) (circle) DOC (circle) Total-P TKN ($NO_2$+$NO_3$) TOC | TOX 9020☐ AOX 1650☐ 506☐ | Tannin/Lignin | | | | REMARKS |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| BxS-4 | 1-12-05 | 11:00 | 1 | Water | 3 | | | | | | | | | | X | | X | X | | X | | | | |
| BxS-6 | 1-12-05 | 10:30 | 2 | Water | 3 | | | | | | | | | | X | | X | X | | X | | | | |

**REPORT REQUIREMENTS**

- X I. Routine Report: Method Blank, Surrogate, as required
- ___ II. Report Dup., MS, MSD as required
- ___ III. Data Validation Report (includes all raw data)
- ___ IV. CLP Deliverable Report
- ___ V. EDD

**INVOICE INFORMATION**

P.O. #
Bill To: JH Baxter Co
PO Box 10777
Eugene, OR 97440

**TURNAROUND REQUIREMENTS**

___ 24 hr. ___ 48 hr.
___ 5 Day
X Standard (10-15 working days)
___ Provide FAX Results

Requested Report Date

Circle which metals are to be analyzed:

Total Metals: Al As Sb Ba Be B Ca Cd Co Cr Cu Fe Pb Mg Mn Mo Ni K Ag Na Se Sr Tl Sn V Zn Hg

Dissolved Metals: Al (As) Sb (Ba) Be B Ca (Cd) Co Cr (Cu) (Fe) Pb Mg (Mn) Mo (Ni) K Ag Na Se Sr Tl Sn V (Zn) Hg

*INDICATE STATE HYDROCARBON PROCEDURE: AK CA WI NORTHWEST OTHER: ___ (CIRCLE ONE)

SPECIAL INSTRUCTIONS/COMMENTS:

Attn: Roetan Thomas
Marj Lee Larson

Samples in 2 coolers

| RELINQUISHED BY: | RECEIVED BY: | RELINQUISHED BY: | RECEIVED BY: |
|---|---|---|---|
| Signature: 1-12-05 16:30 | Signature: 1/13/05 1400 | Signature | Signature |
| Printed Name: Marj Lee Larson | Printed Name: Al Aymon | Printed Name | Printed Name |
| Firm: JH Baxter | Firm: OAS | Firm | Firm |
| Date/Time | Date/Time | Date/Time | Date/Time |

RCOC #1 06/03

## Acronyms

| | |
|---|---|
| ASTM | American Society for Testing and Materials |
| A2LA | American Association for Laboratory Accreditation |
| CARB | California Air Resources Board |
| CAS Number | Chemical Abstract Service registry Number |
| CFC | Chlorofluorocarbon |
| CFU | Colony-Forming Unit |
| DEC | Department of Environmental Conservation |
| DEQ | Department of Environmental Quality |
| DHS | Department of Health Services |
| DOE | Department of Ecology |
| DOH | Department of Health |
| EPA | U. S. Environmental Protection Agency |
| ELAP | Environmental Laboratory Accreditation Program |
| GC | Gas Chromatography |
| GC/MS | Gas Chromatography/Mass Spectrometry |
| LUFT | Leaking Underground Fuel Tank |
| M | Modified |
| MCL | Maximum Contaminant Level is the highest permissible concentration of a substance allowed in drinking water as established by the USEPA. |
| MDL | Method Detection Limit |
| MPN | Most Probable Number |
| MRL | Method Reporting Limit |
| NA | Not Applicable |
| NC | Not Calculated |
| NCASI | National Council of the Paper Industry for Air and Stream Improvement |
| ND | Not Detected |
| NIOSH | National Institute for Occupational Safety and Health |
| PQL | Practical Quantitation Limit |
| RCRA | Resource Conservation and Recovery Act |
| SIM | Selected Ion Monitoring |
| TPH | Total Petroleum Hydrocarbons |
| tr | Trace level is the concentration of an analyte that is less than the PQL but greater than or equal to the MDL. |

## Inorganic Data Qualifiers

| | |
|---|---|
| * | The result is an outlier. See case narrative. |
| # | The control limit criteria is not applicable. See case narrative. |
| B | The analyte was found in the associated method blank at a level that is significant relative to the sample result. |
| E | The result is an estimate amount because the value exceeded the instrument calibration range. |
| J | The result is an estimated concentration that is less than the MRL but greater than or equal to the MDL. |
| U | The compound was analyzed for, but was not detected ("Non-detect") at or above the MRL/MDL. |
| i | The MRL/MDL has been elevated due to a matrix interference. |
| X | See case narrative. |

## Metals Data Qualifiers

| | |
|---|---|
| # | The control limit criteria is not applicable. See case narrative. |
| B | The result is an estimated concentration that is less than the MRL but greater than or equal to the MDL. |
| E | The percent difference for the serial dilution was greater than 10%, indicating a possible matrix interference in the sample. |
| M | The duplicate injection precision was not met. |
| N | The Matrix Spike sample recovery is not within control limits. See case narrative. |
| S | The reported value was determined by the Method of Standard Additions (MSA). |
| U | The compound was analyzed for, but was not detected ("Non-detect") at or above the MRL/MDL. |
| W | The post-digestion spike for furnace AA analysis is out of control limits, while sample absorbance is less than 50% of spike absorbance. |
| i | The MRL/MDL has been elevated due to a matrix interference. |
| X | See case narrative. |
| * | The duplicate analysis not within control limits. See case narrative. |
| + | The correlation coefficient for the MSA is less than 0.995. |

## Organic Data Qualifiers

| | |
|---|---|
| * | The result is an outlier. See case narrative. |
| # | The control limit criteria is not applicable. See case narrative. |
| A | A tentatively identified compound, a suspected aldol-condensation product. |
| B | The analyte was found in the associated method blank at a level that is significant relative to the sample result. |
| C | The analyte was qualitatively confirmed using GC/MS techniques, pattern recognition, or by comparing to historical data. |
| D | The reported result is from a dilution. |
| E | The result is an estimate amount because the value exceeded the instrument calibration range. |
| J | The result is an estimated concentration that is less than the MRL but greater than or equal to the MDL. |
| N | The result is presumptive. The analyte was tentatively identified, but a confirmation analysis was not performed. |
| P | The GC or HPLC confirmation criteria was exceeded. The relative percent difference is greater than 40% between the two analytical results (25% for CLP Pesticides). |
| U | The compound was analyzed for, but was not detected ("Non-detect") at or above the MRL/MDL. |
| i | The MRL/MDL has been elevated due to a chromatographic interference. |
| X | See case narrative. |

## Additional Petroleum Hydrocarbon Specific Qualifiers

| | |
|---|---|
| F | The chromatographic fingerprint of the sample matches the elution pattern of the calibration standard. |
| L | The chromatographic fingerprint of the sample resembles a petroleum product, but the elution pattern indicates the presence of a greater amount of lighter molecular weight constituents than the calibration standard. |
| H | The chromatographic fingerprint of the sample resembles a petroleum product, but the elution pattern indicates the presence of a greater amount of heavier molecular weight constituents than the calibration standard. |
| O | The chromatographic fingerprint of the sample resembles an oil, but does not match the calibration standard. |
| Y | The chromatographic fingerprint of the sample resembles a petroleum product eluting in approximately the correct carbon range, but the elution pattern does not match the calibration standard. |
| Z | The chromatographic fingerprint does not resemble a petroleum product. |

COLUMBIA ANALYTICAL SERVICES, INC.

| | | | |
|---|---|---|---|
| **Client:** | J.H. Baxter & Company | **Service Request No.:** | K2500327 |
| **Project:** | Arlington Landfill Wells | **Date Received:** | 01/13/05 |
| **Sample Matrix:** | Water | | |

## CASE NARRATIVE

All analyses were performed consistent with the quality assurance program of Columbia Analytical Services, Inc. (CAS). This report contains analytical results for samples designated for Tier III validation deliverables including summary forms and all of the associated raw data for each of the analyses. When appropriate to the method, method blank results have been reported with each analytical test.

### Sample Receipt

Two water samples were received for analysis at Columbia Analytical Services on 01/13/05. The samples were received in good condition and consistent with the accompanying chain of custody form. The samples were stored in a refrigerator at 4°C upon receipt at the laboratory.

### General Chemistry Parameters

No anomalies associated with the analysis of these samples were observed

### Dissolved Metals

No anomalies associated with the analysis of these samples were observed

**Approved by** _____ **Date** 2/1/05

PC Ed

**Columbia Analytical Services Inc.**
**Cooler Receipt and Preservation Form**

Project/Client J H Baxter Work Order K250 0327

Cooler received on 1-13-05 and opened on 1-13-05 by KW

| | | | | | | |
|---|---|---|---|---|---|---|
| 1. | Were custody seals on outside of coolers? | | | | | (Y) N |
| | If yes, how many and where? 2 front | | | | | |
| 2. | Were custody seals intact? | | | | | (Y) N |
| 3. | Were signature and date present on the custody seals? | | | | | (Y) N |
| 4. | Is the shipper's airbill available and filed? If no, record airbill number: Greyhound enclosed | | | | | Y N |
| 5. | COC# | | | | | |
| | **Temperature of cooler(s) upon receipt: (°C)** | 3.5 | 5.3 | | | |
| | **Temperature Blank: (°C)** | 4.6 | | | | |
| | Were samples hand delivered on the same day as collection? | | | | | Y (N) |
| 6. | Were custody papers properly filled out (ink, signed, etc.)? | | | | | (Y) N |
| 7. | Type of packing material present ICE, foam insert | | | | | |
| 8. | **Did all bottles arrive in good condition (unbroken)?** | | | | | (Y) N |
| 9. | Were all bottle labels complete (i.e analysis, preservation, etc.)? | | | | | (Y) N |
| 10. | Did all bottle labels and tags agree with custody papers? | | | | | (Y) N |
| 11. | **Were the correct types of bottles used for the tests indicated?** | | | | | (Y) N |
| 12. | Were all of the preserved bottles received at the lab with the appropriate pH? | | | | | (Y) N |
| 13. | Were VOA vials checked for absence of air bubbles, and if present, noted below? | | | | | Y (N) |
| 14. | Did the bottles originate from CAS/K or a branch laboratory? | | | | | (Y) N |
| 15. | **Are CWA Microbiology samples received with >1/2 the 24hr. hold time remaining from collection?** | | | | | Y (N) |
| 16. | Was C12/Res negative? | | | | | Y (N) |

Explain any discrepancies: _____

RESOLUTION: _____

Samples that required preservation or received out of temperature:

| Sample ID | Reagent | Volume | Lot Number | Bottle Type | Rec'd out of Temperature | Initials |
|---|---|---|---|---|---|---|
| | | | | | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |

# COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

**Client :** J.H. Baxter & Company
**Project Name :** Landfill Wells
**Project Number :** BXS-WELLS
**Sample Matrix :** WATER

**Service Request :** K2500327
**Date Collected :** 01/12/05
**Date Received :** 01/13/05

## Chloride

Units : mg/L (ppm)
Basis : NA

Analysis Method 300.0
Test Notes :

| Sample Name | Lab Code | MRL | MDL | Dilution Factor | Date Analyzed | Result | Result Notes |
|---|---|---|---|---|---|---|---|
| BXS-4 | K2500327-001 | 0.2 | 0.06 | 2 | 01/14/05 | 1.7 | |
| BXS-6 | K2500327-002 | 0.2 | 0.06 | 2 | 01/14/05 | 1.7 | |
| Method Blank | K2500327-MB | 0.2 | 0.03 | 1 | 01/14/05 | ND | |

Report By: AYaple

# COLUMBIA ANALYTICAL SERVICES, INC.

## Analytical Report

**Client :** J.H. Baxter & Company
**Project Name :** Landfill Wells
**Project Number :** BXS-WELLS
**Sample Matrix :** WATER

**Service Request :** K2500327
**Date Collected :** 01/12/05
**Date Received :** 01/13/05

### Sulfate

Analysis Method 300.0
Test Notes :

Units : mg/L (ppm)
Basis : NA

| Sample Name | Lab Code | MRL | MDL | Dilution Factor | Date Analyzed | Result | Result Notes |
|---|---|---|---|---|---|---|---|
| BXS-4 | K2500327-001 | 0.2 | 0.18 | 2 | 01/14/05 | 1.0 | |
| BXS-6 | K2500327-002 | 0.2 | 0.18 | 2 | 01/14/05 | 0.9 | |
| Method Blank | K2500327-MB | 0.2 | 0.09 | 1 | 01/14/05 | ND | |

Report By: AYapie

# COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

**Client :** J.H. Baxter & Company
**Project Name :** Landfill Wells
**Project Number :** BXS-WELLS
**Sample Matrix :** WATER

**Service Request :** K2500327
**Date Collected :** 01/12/05
**Date Received :** 01/13/05

## Chemical Oxygen Demand

Units : mg/L (ppm)
Basis : NA

Analysis Method 410.2
Test Notes :

| Sample Name | Lab Code | MRL | MDL | Dilution Factor | Date Analyzed | Result | Result Notes |
|---|---|---|---|---|---|---|---|
| BXS-4 | K2500327-001 | 5 | 2 | 1 | 01/19/05 | 24 | |
| BXS-6 | K2500327-002 | 5 | 2 | 1 | 01/19/05 | 16 | |
| Method Blank | K2500327-MB | 5 | 2 | 1 | 01/19/05 | ND | |

Report By: AYaple

# COLUMBIA ANALYTICAL SERVICES, INC.

## Analytical Report

**Client :** J.H. Baxter & Company
**Project Name :** Landfill Wells
**Project Number :** BXS-WELLS
**Sample Matrix :** WATER

**Service Request :** K2500327
**Date Collected :** 01/12/05
**Date Received :** 01/13/05

## Conductivity

Units : uMhos/cm
Basis : NA

Analysis Method 120.1
Test Notes :

| Sample Name | Lab Code | MRL | MDL | Dilution Factor | Date Analyzed | Result | Result Notes |
|---|---|---|---|---|---|---|---|
| BXS-4 | K2500327-001 | 2 | 0.04 | 1 | 01/20/05 | 194 | |
| BXS-6 | K2500327-002 | 2 | 0.04 | 1 | 01/20/05 | 195 | |
| Method Blank | K2500327-MB | 2 | 0.04 | 1 | 01/20/05 | ND | |

Report By: AYaple

# COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

**Client :** J.H. Baxter & Company
**Project Name :** Landfill Wells
**Project Number :** BXS-WELLS
**Sample Matrix :** WATER

**Service Request :** K2500327
**Date Collected :** 01/12/05
**Date Received :** 01/13/05

## Ammonia as Nitrogen

Analysis Method 350.1
Test Notes :

Units : mg/L (ppm)
Basis : NA

| Sample Name | Lab Code | MRL | MDL | Dilution Factor | Date Analyzed | Result | Result Notes |
|---|---|---|---|---|---|---|---|
| BXS-4 | K2500327-001 | 0.05 | 0.02 | 1 | 01/14/04 | 0.52 | |
| BXS-6 | K2500327-002 | 0.05 | 0.02 | 1 | 01/14/04 | 0.51 | |
| Method Blank | K2500327-MB | 0.05 | 0.02 | 1 | 01/14/04 | 0.03 | J |

Report By: AYaple

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

**Client :** J.H. Baxter & Company
**Project Name :** Landfill Wells
**Project Number :** BXS-WELLS
**Sample Matrix :** WATER

**Service Request :** K2500327
**Date Collected :** 01/12/05
**Date Received :** 01/13/05

Carbon, Total Organic

Units : mg/L (ppm)
Basis : NA

Analysis Method 415.1
Test Notes :

| Sample Name | Lab Code | MRL | MDL | Dilution Factor | Date Analyzed | Result | Result Notes |
|---|---|---|---|---|---|---|---|
| BXS-4 | K2500327-001 | 0.5 | 0.07 | 1 | 01/18/05 | 1.0 | |
| BXS-6 | K2500327-002 | 0.5 | 0.07 | 1 | 01/18/05 | 0.9 | |
| Method Blank | K2500327-MB | 0.5 | 0.07 | 1 | 01/18/05 | ND | |

eport By: AYaple

# DISSOLVED METALS

## - Cover Page -
## INORGANIC ANALYSIS DATA PACKAGE

Client: J.H. Baxter & Company

Service Request: K2500327

Project No.: BXS-WELLS

Project Name: Landfill Wells

| Sample No. | Lab Sample ID. |
|---|---|
| BXS-4 | K2500327-001 DISS |
| BXS-6 | K2500327-002 DISS |
| Method Blank | K2500327-MB |
| Batch QC | K2500347-001D |
| Batch QC | K2500347-001S |

Were ICP interelement corrections applied? Yes/No YES

Were ICP background corrections applied? Yes/No YES

If yes-were raw data generated before application of background corrections? Yes/No NO

Comments:

Signature: [signature]

Date: 1/28/05

# DISSOLVED METALS

-1-

## INORGANIC ANALYSIS DATA SHEET

Client: J.H. Baxter & Company
Project No.: BXS-WELLS
Project Name: Landfill Wells
Matrix: WATER

Service Request: K2500327
Date Collected: 01/12/05
Date Received: 01/13/05
Units: µg/L
Basis: NA

Sample Name: BXS-4
Lab Code: K2500327-001 DISS

| Analyte | Analysis Method | MRL | MDL | Dil. | Date Extracted | Date Analyzed | Result | C | Q |
|---|---|---|---|---|---|---|---|---|---|
| Arsenic | 7060A | 5.0 | 1.0 | 1 | 1/25/05 | 1/26/05 | 5.0 | | |
| Barium | 6010B | 5.0 | 2.0 | 1 | 1/25/05 | 1/26/05 | 30.2 | | |
| Cadmium | 6010B | 5.0 | 5.0 | 1 | 1/25/05 | 1/26/05 | 5.0 | U | |
| Copper | 6010B | 10.0 | 4.0 | 1 | 1/25/05 | 1/26/05 | 4.0 | U | |
| Iron | 6010B | 20 | 20 | 1 | 1/25/05 | 1/26/05 | 41.6 | | |
| Manganese | 6010B | 5.0 | 2.0 | 1 | 1/25/05 | 1/26/05 | 110 | | |
| Nickel | 6010B | 20 | 20 | 1 | 1/25/05 | 1/26/05 | 20 | U | |
| Zinc | 6010B | 10.0 | 2.0 | 1 | 1/25/05 | 1/26/05 | 2.0 | U | |

% Solids: 0.0

Comments:

# DISSOLVED METALS
-1-
## INORGANIC ANALYSIS DATA SHEET

Client: J.H. Baxter & Company
Project No.: BXS-WELLS
Project Name: Landfill Wells
Matrix: WATER

Service Request: K2500327
Date Collected: 01/12/05
Date Received: 01/13/05
Units: µg/L
Basis: NA

Sample Name: BXS-6
Lab Code: K2500327-002 DISS

| Analyte | Analysis Method | MRL | MDL | Dil. | Date Extracted | Date Analyzed | Result | C | Q |
|---|---|---|---|---|---|---|---|---|---|
| Arsenic | 7060A | 5.0 | 1.0 | 1 | 1/25/05 | 1/26/05 | 5.1 | | |
| Barium | 6010B | 5.0 | 2.0 | 1 | 1/25/05 | 1/26/05 | 30.2 | | |
| Cadmium | 6010B | 5.0 | 5.0 | 1 | 1/25/05 | 1/26/05 | 5.0 | U | |
| Copper | 6010B | 10.0 | 4.0 | 1 | 1/25/05 | 1/26/05 | 4.0 | U | |
| Iron | 6010B | 20 | 20 | 1 | 1/25/05 | 1/26/05 | 42.4 | | |
| Manganese | 6010B | 5.0 | 2.0 | 1 | 1/25/05 | 1/26/05 | 112 | | |
| Nickel | 6010B | 20 | 20 | 1 | 1/25/05 | 1/26/05 | 20 | U | |
| Zinc | 6010B | 10.0 | 2.0 | 1 | 1/25/05 | 1/26/05 | 2.0 | U | |

% Solids: 0.0

Comments:

# DISSOLVED METALS

-1-

## INORGANIC ANALYSIS DATA SHEET

Client: J.H. Baxter & Company
Project No.: BXS-WELLS
Project Name: Landfill Wells
Matrix: WATER

Service Request: K2500327
Date Collected: NA
Date Received: NA
Units: µg/L
Basis: NA

Sample Name: Method Blank
Lab Code: K2500327-MB

| Analyte | Analysis Method | MRL | MDL | Dil. | Date Extracted | Date Analyzed | Result | C | Q |
|---|---|---|---|---|---|---|---|---|---|
| Arsenic | 7060A | 5.0 | 1.0 | 1 | 1/25/05 | 1/26/05 | 1.0 | U | |
| Barium | 6010B | 5.0 | 2.0 | 1 | 1/25/05 | 1/26/05 | 2.0 | U | |
| Cadmium | 6010B | 5.0 | 5.0 | 1 | 1/25/05 | 1/26/05 | 5.0 | U | |
| Copper | 6010B | 10.0 | 4.0 | 1 | 1/25/05 | 1/26/05 | 4.0 | U | |
| Iron | 6010B | 20 | 20 | 1 | 1/25/05 | 1/26/05 | 20 | U | |
| Manganese | 6010B | 5.0 | 2.0 | 1 | 1/25/05 | 1/26/05 | 2.0 | U | |
| Nickel | 6010B | 20 | 20 | 1 | 1/25/05 | 1/26/05 | 20 | U | |
| Zinc | 6010B | 10.0 | 2.0 | 1 | 1/25/05 | 1/26/05 | 2.3 | B | |

% Solids: 0.0

Comments:

1317 South 13th Avenue P.O. Box 479 Kelso, Washington 98626 (360) 577-7222 ph (360) 636-1068 fax

Columbia Analytical Services INC.
An Employee - Owned Company

RECEIVED 3/16/05

March 14, 2005 Service Request No: K2500374

Mary Larson
J.H. Baxter & Company
6520 188th Street NE
Arlington, WA 98223

**RE: Landfill Wells / BXS-WELLS**

Dear Mary:

Enclosed are the results of the sample(s) submitted to our laboratory on January 14, 2005. For your reference, these analyses have been assigned our service request number K2500374.

All analyses were performed according to our laboratory's quality assurance program. The test results meet requirements of the NELAC standards except as noted in the case narrative report. 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 items submitted to the laboratory for analysis and individual items (samples) analyzed, as listed in the report.

Please call if you have any questions. My extension is 3291.

Respectfully submitted,

**Columbia Analytical Services, Inc.**

Ed Wallace
Project Chemist

EW/jeb

Columbia Analytical Services, Inc.
An Employee - Owned Company

# CHAIN OF CUSTODY

SR#: K1500374

1317 South 13th Ave. • Kelso, WA 98626 • (360) 577-7222 • (800) 695-7222x07 • FAX (360) 636-1068

PAGE 1 OF 2 COC #

PROJECT NAME: J.H. Baxter Co
PROJECT NUMBER: Landfill Wells
PROJECT MANAGER: Mary Lee Larson
COMPANY/ADDRESS: 16020 185th St NE
PO Box 309
CITY/STATE/ZIP: Arlington, WA 98223
E-MAIL ADDRESS:
PHONE #: 360 435-2146 FAX: 360 435-3035
SAMPLER'S SIGNATURE: Mary Lee Larson

| SAMPLE I.D. | DATE | TIME | LAB I.D. | MATRIX | NUMBER OF CONTAINERS | Semivolatile Organics by GC/MS 625☐ 8270☐ 8270LL☐ | Volatile Organics 624☐ 8260☐ | Hydrocarbons (*see below) Gas☐ Diesel☐ Oil☐ ☐Fuel Fingerprint (FIQ) ☐NW-HCID Screen | Oil & Grease/TRPH 1664 HEM☐ | PCB's Aroclors☐ Congeners☐ | Pesticides/Herbicides 608☐ 8081A☐ 8141A☐ 8151A☐ | Chlorophenolics - 8151M Tri☐ Tetra☐ PCP☐ | PAHS 8310☐ SIM☐ | (Metals) Total & Dissolved (See list below) | Cyanide☐ | pH, Cond. (CaSO4, PO4, F, NO2, NO3) BOD, TSS, (TDS circle) | NH3-N COD, Total-P, TKN (TOC) DOC (circle) NO2+NO3 | TOX 9020☐ AOX 1650☐ 506☐ | Tannin/Lignin | REMARKS |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| BXS-1 | 1-13-05 | 10:30 | 1 | water | 3 | | | | | | | | | X | | X | X | | X | |
| BXS-2 | 1-13-05 | 12:10 | 2 | water | 3 | | | | | | | | | X | | X | X | | X | |
| BXS-3 | 1-13-05 | 13:40 | 3 | water | 3 | | | | | | | | | X | | X | X | | X | |
| BXS-5 | 1-13-05 | 9:10 | 4 | water | 3 | | | | | | | | | X | | X | X | | X | |

**REPORT REQUIREMENTS**

X I. Routine Report: Method Blank, Surrogate, as required
___ II. Report Dup., MS, MSD as required
___ III. Data Validation Report (includes all raw data)
___ IV. CLP Deliverable Report
___ V. EDD

**INVOICE INFORMATION**

P.O. #
Bill To: JH Baxter
PO Box 10777
Eugene, OR 97440

**TURNAROUND REQUIREMENTS**

___ 24 hr. ___ 48 hr.
___ 5 Day
X Standard (10-15 working days)
___ Provide FAX Results

Requested Report Date

Circle which metals are to be analyzed:

Total Metals: Al As Sb Ba Be B Ca Cd Co Cr Cu Fe Pb Mg Mn Mo Ni K Ag Na Se Sr Tl Sn V Zn Hg

Dissolved Metals: Al (As) Sb (Ba) Be B Ca (Cd) Co Cr (Cu) (Fe) Pb Mg (Mn) Mo (Ni) K Ag Na Se Sr Tl Sn V (Zn) Hg

*INDICATE STATE HYDROCARBON PROCEDURE: AK CA WI NORTHWEST OTHER: ___ (CIRCLE ONE)

SPECIAL INSTRUCTIONS/COMMENTS:

Not validated

Attn: RoeAnn Thomas
Margee Larson

Samples in 2 coolers.

| RELINQUISHED BY: | RECEIVED BY: | RELINQUISHED BY: | RECEIVED BY: |
|---|---|---|---|
| Signature: Mary Lee Larson | Signature: | Signature: | Signature: |
| Date/Time: 1-13-05 15:00 | Date/Time: 1/14/05 1500 | Date/Time: | Date/Time: |
| Printed Name: Margee Larson | Printed Name: R. HAYNES | Printed Name: | Printed Name: |
| Firm: JH Baxter | Firm: CAS | Firm: | Firm: |

RCOC #1 06/03

## Acronyms

| | |
|---|---|
| ASTM | American Society for Testing and Materials |
| A2LA | American Association for Laboratory Accreditation |
| CARB | California Air Resources Board |
| CAS Number | Chemical Abstract Service registry Number |
| CFC | Chlorofluorocarbon |
| CFU | Colony-Forming Unit |
| DEC | Department of Environmental Conservation |
| DEQ | Department of Environmental Quality |
| DHS | Department of Health Services |
| DOE | Department of Ecology |
| DOH | Department of Health |
| EPA | U. S. Environmental Protection Agency |
| ELAP | Environmental Laboratory Accreditation Program |
| GC | Gas Chromatography |
| GC/MS | Gas Chromatography/Mass Spectrometry |
| LUFT | Leaking Underground Fuel Tank |
| M | Modified |
| MCL | Maximum Contaminant Level is the highest permissible concentration of a substance allowed in drinking water as established by the USEPA. |
| MDL | Method Detection Limit |
| MPN | Most Probable Number |
| MRL | Method Reporting Limit |
| NA | Not Applicable |
| NC | Not Calculated |
| NCASI | National Council of the Paper Industry for Air and Stream Improvement |
| ND | Not Detected |
| NIOSH | National Institute for Occupational Safety and Health |
| PQL | Practical Quantitation Limit |
| RCRA | Resource Conservation and Recovery Act |
| SIM | Selected Ion Monitoring |
| TPH | Total Petroleum Hydrocarbons |
| tr | Trace level is the concentration of an analyte that is less than the PQL but greater than or equal to the MDL. |

## Inorganic Data Qualifiers

| | |
|---|---|
| * | The result is an outlier. See case narrative. |
| # | The control limit criteria is not applicable. See case narrative. |
| B | The analyte was found in the associated method blank at a level that is significant relative to the sample result. |
| E | The result is an estimate amount because the value exceeded the instrument calibration range. |
| J | The result is an estimated concentration that is less than the MRL but greater than or equal to the MDL. |
| U | The compound was analyzed for, but was not detected ("Non-detect") at or above the MRL/MDL. |
| i | The MRL/MDL has been elevated due to a matrix interference. |
| X | See case narrative. |

## Metals Data Qualifiers

| | |
|---|---|
| # | The control limit criteria is not applicable. See case narrative. |
| B | The result is an estimated concentration that is less than the MRL but greater than or equal to the MDL. |
| E | The percent difference for the serial dilution was greater than 10%, indicating a possible matrix interference in the sample. |
| M | The duplicate injection precision was not met. |
| N | The Matrix Spike sample recovery is not within control limits. See case narrative. |
| S | The reported value was determined by the Method of Standard Additions (MSA). |
| U | The compound was analyzed for, but was not detected ("Non-detect") at or above the MRL/MDL. |
| W | The post-digestion spike for furnace AA analysis is out of control limits, while sample absorbance is less than 50% of spike absorbance. |
| i | The MRL/MDL has been elevated due to a matrix interference. |
| X | See case narrative. |
| * | The duplicate analysis not within control limits. See case narrative. |
| + | The correlation coefficient for the MSA is less than 0.995. |

## Organic Data Qualifiers

| | |
|---|---|
| * | The result is an outlier. See case narrative. |
| # | The control limit criteria is not applicable. See case narrative. |
| A | A tentatively identified compound, a suspected aldol-condensation product. |
| B | The analyte was found in the associated method blank at a level that is significant relative to the sample result. |
| C | The analyte was qualitatively confirmed using GC/MS techniques, pattern recognition, or by comparing to historical data. |
| D | The reported result is from a dilution. |
| E | The result is an estimate amount because the value exceeded the instrument calibration range. |
| J | The result is an estimated concentration that is less than the MRL but greater than or equal to the MDL. |
| N | The result is presumptive. The analyte was tentatively identified, but a confirmation analysis was not performed. |
| P | The GC or HPLC confirmation criteria was exceeded. The relative percent difference is greater than 40% between the two analytical results (25% for CLP Pesticides). |
| U | The compound was analyzed for, but was not detected ("Non-detect") at or above the MRL/MDL. |
| i | The MRL/MDL has been elevated due to a chromatographic interference. |
| X | See case narrative. |

## Additional Petroleum Hydrocarbon Specific Qualifiers

| | |
|---|---|
| F | The chromatographic fingerprint of the sample matches the elution pattern of the calibration standard. |
| L | The chromatographic fingerprint of the sample resembles a petroleum product, but the elution pattern indicates the presence of a greater amount of lighter molecular weight constituents than the calibration standard. |
| H | The chromatographic fingerprint of the sample resembles a petroleum product, but the elution pattern indicates the presence of a greater amount of heavier molecular weight constituents than the calibration standard. |
| O | The chromatographic fingerprint of the sample resembles an oil, but does not match the calibration standard. |
| Y | The chromatographic fingerprint of the sample resembles a petroleum product eluting in approximately the correct carbon range, but the elution pattern does not match the calibration standard. |
| Z | The chromatographic fingerprint does not resemble a petroleum product. |

COLUMBIA ANALYTICAL SERVICES, INC.

| | | | |
|---|---|---|---|
| **Client:** | J.H. Baxter & Company | **Service Request No.:** | K2500374 |
| **Project:** | Arlington Landfill Wells | **Date Received:** | 01/14/05 |
| **Sample Matrix:** | Water | | |

## CASE NARRATIVE

All analyses were performed consistent with the quality assurance program of Columbia Analytical Services, Inc. (CAS). This report contains analytical results for samples designated for Tier III validation deliverables including summary forms and all of the associated raw data for each of the analyses. When appropriate to the method, method blank results have been reported with each analytical test.

### Sample Receipt

Four water samples were received for analysis at Columbia Analytical Services on 01/14/05. The samples were received in good condition and consistent with the accompanying chain of custody form. The samples were stored in a refrigerator at 4°C upon receipt at the laboratory.

### General Chemistry Parameters

No anomalies associated with the analysis of these samples were observed

### Dissolved Metals

No anomalies associated with the analysis of these samples were observed

Approved by Eww Date 3/14/05

**Columbia Analytical Services Inc.**
**Cooler Receipt and Preservation Form**

PC Ecl

Project/Client J+H Berger Work Order K250 0374

Cooler received on 1/14/05 and opened on 1/14/05 by T Blank

| | | | | | | |
|---|---|---|---|---|---|---|
| 1. | Were custody seals on outside of coolers? | | | | (Y) | N |
| | If yes, how many and where? | front | | | | |
| 2. | Were custody seals intact? | | | | (Y) | N |
| 3. | Were signature and date present on the custody seals? | | | | (Y) | N |
| 4. | Is the shipper's airbill available and filed? If no, record airbill number: | Greyhound | | | (Y) | N |
| 5. | COC # | | | | | |
| | **Temperature of cooler(s) upon receipt: (°C)** | 4.5 | 3.3 | | | |
| | **Temperature Blank: (°C)** | 1.4 | 2.1 | | | |
| | Were samples hand delivered on the same day as collection? | | | | Y | (N) |
| 6. | Were custody papers properly filled out (ink, signed, etc.)? | | | | (Y) | N |
| 7. | Type of packing material present | gelpacks - inserts - loose ice | | | | |
| 8. | **Did all bottles arrive in good condition (unbroken)?** | | | | (Y) | N |
| 9. | Were all bottle labels complete (i.e analysis, preservation, etc.)? | | | | (Y) | N |
| 10. | Did all bottle labels and tags agree with custody papers? | | | | (Y) | N |
| 11. | **Were the correct types of bottles used for the tests indicated?** | | | | (Y) | N |
| 12. | Were all of the preserved bottles received at the lab with the appropriate pH? | | | | (Y) | N |
| 13. | Were VOA vials checked for absence of air bubbles, and if present, noted below? | | | | Y | ~~N~~ |
| 14. | Did the bottles originate from CAS/K or a branch laboratory? | | | | (Y) | N |
| 15. | **Are CWA Microbiology samples received with >1/2 the 24hr. hold time remaining from collection?** | | | | ~~Y~~ | ~~N~~ |
| 16. | Was C12/Res negative? | | | | Y | ~~N~~ |

Explain any discrepancies: _____

RESOLUTION: _____

Samples that required preservation or received out of temperature:

| Sample ID | Reagent | Volume | Lot Number | Bottle Type | Rec'd out of Temperature | Initials |
|---|---|---|---|---|---|---|
| | | | | | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |

## COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

**Client :** J.H. Baxter & Company
**Project Name :** Landfill Wells
**Project Number :** BXS-WELLS
**Sample Matrix :** WATER

**Service Request :** K2500374
**Date Collected :** 01/13/05
**Date Received :** 01/14/05

Chloride

Units : mg/L (ppm)
Analysis Method : 300.0
Basis : NA
Test Notes :

| Sample Name | Lab Code | MRL | MDL | Dilution Factor | Date Analyzed | Result | Result Notes |
|---|---|---|---|---|---|---|---|
| BXS-1 | K2500374-001 | 2.0 | 0.3 | 10 | 01/18/05 | 5.0 | |
| BXS-2 | K2500374-002 | 0.2 | 0.06 | 2 | 01/19/05 | 5.0 | |
| BXS-3 | K2500374-003 | 0.2 | 0.06 | 2 | 01/18/05 | 4.6 | |
| BXS-4 | K2500374-004 | 0.2 | 0.03 | 1 | 01/18/05 | ND | |
| Method Blank | K2500374-MB | 0.2 | 0.03 | 1 | 01/18/05 | ND | |
| Method Blank | K2500374-MB | 0.2 | 0.03 | 1 | 01/19/05 | ND | |



Report By:BReller

# COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

**Client :** J.H. Baxter & Company
**Project Name :** Landfill Wells
**Project Number :** BXS-WELLS
**Sample Matrix :** WATER

**Service Request :** K2500374
**Date Collected :** 01/13/05
**Date Received :** 01/14/05

Sulfate

Analysis Method : 300.0
Test Notes :

Units : mg/L (ppm)
Basis : NA

| Sample Name | Lab Code | MRL | MDL | Dilution Factor | Date Analyzed | Result | Result Notes |
|---|---|---|---|---|---|---|---|
| BXS-1 | K2500374-001 | 2.0 | 0.9 | 10 | 01/18/05 | 12.6 | |
| BXS-2 | K2500374-002 | 0.2 | 0.18 | 2 | 01/19/05 | ND | |
| BXS-3 | K2500374-003 | 0.2 | 0.18 | 2 | 01/18/05 | ND | |
| BXS-4 | K2500374-004 | 0.2 | 0.09 | 1 | 01/18/05 | ND | |
| Method Blank | K2500374-MB | 0.2 | 0.09 | 1 | 01/18/05 | ND | |
| Method Blank | K2500374-MB | 0.2 | 0.09 | 1 | 01/19/05 | ND | |

# COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

**Client :** J.H. Baxter & Company
**Project Name :** Landfill Wells
**Project Number :** BXS-WELLS
**Sample Matrix :** WATER

**Service Request :** K2500374
**Date Collected :** 01/13/05
**Date Received :** 01/14/05

## Chemical Oxygen Demand

Analysis Method 410.2
Test Notes :

Units : mg/L (ppm)
Basis : NA

| Sample Name | Lab Code | MRL | MDL | Dilution Factor | Date Analyzed | Result | Result Notes |
|---|---|---|---|---|---|---|---|
| BXS-1 | K2500374-001 | 5 | 2 | 1 | 01/19/05 | 20 | |
| BXS-2 | K2500374-002 | 5 | 2 | 1 | 01/19/05 | 52 | |
| BXS-3 | K2500374-003 | 5 | 2 | 1 | 01/19/05 | 72 | |
| BXS-4 | K2500374-004 | 5 | 2 | 1 | 01/19/05 | 2 | J |
| Method Blank | K2500374-MB | 5 | 2 | 1 | 01/19/05 | ND | |

# COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

**Client :** J.H. Baxter & Company
**Project Name :** Landfill Wells
**Project Number :** BXS-WELLS
**Sample Matrix :** WATER

**Service Request :** K2500374
**Date Collected :** 01/13/05
**Date Received :** 01/14/05

## Conductivity

Units : uMhos/cm
Basis : NA

Analysis Method : 120.1
Test Notes :

| Sample Name | Lab Code | MRL | MDL | Dilution Factor | Date Analyzed | Result | Result Notes |
|---|---|---|---|---|---|---|---|
| BXS-1 | K2500374-001 | 2 | 0.04 | 1 | 01/20/05 | 334 | |
| BXS-2 | K2500374-002 | 2 | 0.04 | 1 | 01/20/05 | 813 | |
| BXS-3 | K2500374-003 | 2 | 0.04 | 1 | 01/20/05 | 526 | |
| BXS-4 | K2500374-004 | 2 | 0.04 | 1 | 01/20/05 | 1.8 | J |
| Method Blank | K2500374-MB | 2 | 0.04 | 1 | 01/20/05 | ND | |

# COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

**Client :** J.H. Baxter & Company
**Project Name :** Landfill Wells
**Project Number :** BXS-WELLS
**Sample Matrix :** WATER

**Service Request :** K2500374
**Date Collected :** 01/13/05
**Date Received :** 01/14/05

Ammonia as Nitrogen

Analysis Method 350.1
Test Notes :

Units : mg/L (ppm)
Basis : NA

| Sample Name | Lab Code | MRL | MDL | Dilution Factor | Date Analyzed | Result | Result Notes |
|---|---|---|---|---|---|---|---|
| BXS-1 | K2500374-001 | 0.05 | 0.02 | 1 | 01/20/05 | ND | |
| BXS-2 | K2500374-002 | 0.05 | 0.02 | 1 | 01/20/05 | ND | |
| BXS-3 | K2500374-003 | 0.05 | 0.02 | 1 | 01/20/05 | 0.21 | |
| BXS-4 | K2500374-004 | 0.05 | 0.02 | 1 | 01/20/05 | ND | |
| Method Blank | K2500374-MB | 0.05 | 0.02 | 1 | 01/20/05 | ND | |

Report By: AYaple

# COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

| | | | |
|---|---|---|---|
| **Client :** | J.H. Baxter & Company | **Service Request :** | K2500374 |
| **Project Name :** | Landfill Wells | **Date Collected :** | 01/13/05 |
| **Project Number :** | BXS-WELLS | **Date Received :** | 01/14/05 |
| **Sample Matrix :** | WATER | | |

Nitrate+Nitrite as Nitrogen

Analysis Method : 353.2
Test Notes :

Units : mg/L (ppm)
Basis : NA

| Sample Name | Lab Code | MRL | MDL | Dilution Factor | Date Analyzed | Result | Result Notes |
|---|---|---|---|---|---|---|---|
| BXS-1 | K2500374-001 | 0.2 | 0.03 | 1 | 01/26/05 | 0.75 | |
| BXS-2 | K2500374-002 | 0.2 | 0.03 | 1 | 01/26/05 | 0.01 | J |
| BXS-3 | K2500374-003 | 0.2 | 0.03 | 1 | 01/26/05 | 0.03 | J |
| BXS-4 | K2500374-004 | 0.2 | 0.03 | 1 | 01/26/05 | 0.01 | J |
| Method Blank | K2500374-MB | 0.2 | 0.03 | 1 | 01/26/05 | ND | |



Report By:BReller

# COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

**Client :** J.H. Baxter & Company
**Project Name :** Landfill Wells
**Project Number :** BXS-WELLS
**Sample Matrix :** WATER

**Service Request :** K2500374
**Date Collected :** 01/13/05
**Date Received :** 01/14/05

pH

Analysis Method 150.1
Test Notes :

Units : pH UNITS
Basis : NA

| Sample Name | Lab Code | MRL | MDL | Dilution Factor | Date Analyzed | Result | Result Notes |
|---|---|---|---|---|---|---|---|
| BXS-1 | K2500374-001 | - | - | 1 | 01/14/05 | 6.29 | |
| BXS-2 | K2500374-002 | - | - | 1 | 01/14/05 | 6.55 | |
| BXS-3 | K2500374-003 | - | - | 1 | 01/14/05 | 6.28 | |
| BXS-4 | K2500374-004 | - | - | 1 | 01/14/05 | 5.63 | |

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

**Client :** J.H. Baxter & Company
**Project Name :** Landfill Wells
**Project Number :** BXS-WELLS
**Sample Matrix :** WATER

**Service Request :** K2500374
**Date Collected :** 01/13/05
**Date Received :** 01/14/05

Carbon, Total Organic

Units : mg/L (ppm)
Basis : NA

Analysis Method 415.1
Test Notes :

| Sample Name | Lab Code | MRL | MDL | Dilution Factor | Date Analyzed | Result | Result Notes |
|---|---|---|---|---|---|---|---|
| BXS-4 | K2500374-004 | 0.5 | 0.07 | 1 | 01/26/05 | ND | |
| Method Blank | K2500374-MB | 0.5 | 0.07 | 1 | 01/26/05 | ND | |

Report By: AYaple

# COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

**Client :** J.H. Baxter & Company
**Project Name :** Landfill Wells
**Project Number :** BXS-WELLS
**Sample Matrix :** WATER

**Service Request :** K2500374
**Date Collected :** 01/13/05
**Date Received :** 01/14/05

## Carbon, Total Organic

Analysis Method 415.1
Test Notes :

Units : mg/L (ppm)
Basis : NA

| Sample Name | Lab Code | MRL | MDL | Dilution Factor | Date Analyzed | Result | Result Notes |
|---|---|---|---|---|---|---|---|
| BXS-1 | K2500374-001 | 0.5 | 0.07 | 1 | 01/18/05 | 4.1 | |
| BXS-3 | K2500374-003 | 0.5 | 0.07 | 1 | 01/18/05 | 18.6 | |
| Method Blank | K2500374-MB | 0.5 | 0.07 | 1 | 01/18/05 | ND | |

Report By: AYaple

# DISSOLVED METALS

## - Cover Page -
## INORGANIC ANALYSIS DATA PACKAGE

Client: J.H. Baxter & Company

Service Request: K2500374

Project No.: BXS-WELLS

Project Name: Landfill Wells

| Sample No. | Lab Sample ID. |
|---|---|
| Batch QC | K2500347-001D |
| Batch QC | K2500347-001S |
| BXS-1 | K2500374-001 DISS |
| BXS-2 | K2500374-002 DISS |
| BXS-3 | K2500374-003 DISS |
| BXS-4 | K2500374-004 DISS |
| Method Blank | K2500374-MB |

Were ICP interelement corrections applied? Yes/No YES

Were ICP background corrections applied? Yes/No YES

If yes-were raw data generated before application of background corrections? Yes/No NO

Comments: _____

Signature: _____ Date: 1/28/05

# DISSOLVED METALS
-1-
## INORGANIC ANALYSIS DATA SHEET

Client: J.H. Baxter & Company
Project No.: BXS-WELLS
Project Name: Landfill Wells
Matrix: WATER

Service Request: K2500374
Date Collected: 01/13/05
Date Received: 01/14/05
Units: µg/L
Basis: NA

Sample Name: BXS-1
Lab Code: K2500374-001 DISS

| Analyte | Analysis Method | MRL | MDL | Dil. | Date Extracted | Date Analyzed | Result | C | Q |
|---|---|---|---|---|---|---|---|---|---|
| Arsenic | 7060A | 5.0 | 1.0 | 1 | 1/25/05 | 1/26/05 | 1.0 | U | |
| Barium | 6010B | 5.0 | 2.0 | 1 | 1/25/05 | 1/26/05 | 16.0 | | |
| Cadmium | 6010B | 5.0 | 5.0 | 1 | 1/25/05 | 1/26/05 | 5.0 | U | |
| Copper | 6010B | 10.0 | 4.0 | 1 | 1/25/05 | 1/26/05 | 6.1 | B | |
| Iron | 6010B | 20 | 20 | 1 | 1/25/05 | 1/26/05 | 20 | U | |
| Manganese | 6010B | 5.0 | 2.0 | 1 | 1/25/05 | 1/26/05 | 172 | | |
| Nickel | 6010B | 20 | 20 | 1 | 1/25/05 | 1/26/05 | 20 | U | |
| Zinc | 6010B | 10.0 | 2.0 | 1 | 1/25/05 | 1/26/05 | 15.1 | | |

% Solids: 0.0

Comments:

# DISSOLVED METALS

-1-

## INORGANIC ANALYSIS DATA SHEET

Client: J.H. Baxter & Company
Project No.: BXS-WELLS
Project Name: Landfill Wells
Matrix: WATER

Service Request: K2500374
Date Collected: 01/13/05
Date Received: 01/14/05
Units: µg/L
Basis: NA

Sample Name: BXS-2
Lab Code: K2500374-002 DISS

| Analyte | Analysis Method | MRL | MDL | Dil. | Date Extracted | Date Analyzed | Result | C | Q |
|---|---|---|---|---|---|---|---|---|---|
| Arsenic | 7060A | 5.0 | 1.0 | 1 | 1/25/05 | 1/26/05 | 1.0 | U | |
| Barium | 6010B | 5.0 | 2.0 | 1 | 1/25/05 | 1/26/05 | 47.2 | | |
| Cadmium | 6010B | 5.0 | 5.0 | 1 | 1/25/05 | 1/26/05 | 5.0 | U | |
| Copper | 6010B | 10.0 | 4.0 | 1 | 1/25/05 | 1/26/05 | 4.0 | U | |
| Iron | 6010B | 20 | 20 | 1 | 1/25/05 | 1/26/05 | 761 | | |
| Manganese | 6010B | 5.0 | 2.0 | 1 | 1/25/05 | 1/26/05 | 1270 | | |
| Nickel | 6010B | 20 | 20 | 1 | 1/25/05 | 1/26/05 | 52.6 | | |
| Zinc | 6010B | 10.0 | 2.0 | 1 | 1/25/05 | 1/26/05 | 7.9 | B | |

% Solids: 0.0

Comments:

# DISSOLVED METALS
-1-
## INORGANIC ANALYSIS DATA SHEET

Client: J.H. Baxter & Company
Project No.: BXS-WELLS
Project Name: Landfill Wells
Matrix: WATER

Service Request: K2500374
Date Collected: 01/13/05
Date Received: 01/14/05
Units: µg/L
Basis: NA

Sample Name: BXS-3
Lab Code: K2500374-003 DISS

| Analyte | Analysis Method | MRL | MDL | Dil. | Date Extracted | Date Analyzed | Result | C | Q |
|---|---|---|---|---|---|---|---|---|---|
| Arsenic | 7060A | 5.0 | 1.0 | 1 | 1/25/05 | 1/26/05 | 2.8 | B | |
| Barium | 6010B | 5.0 | 2.0 | 1 | 1/25/05 | 1/26/05 | 103 | | |
| Cadmium | 6010B | 5.0 | 5.0 | 1 | 1/25/05 | 1/26/05 | 5.0 | U | |
| Copper | 6010B | 10.0 | 4.0 | 1 | 1/25/05 | 1/26/05 | 4.0 | U | |
| Iron | 6010B | 200 | 200 | 10 | 1/25/05 | 1/26/05 | 6520 | | |
| Manganese | 6010B | 50.0 | 20.0 | 10 | 1/25/05 | 1/26/05 | 8510 | | |
| Nickel | 6010B | 20 | 20 | 1 | 1/25/05 | 1/26/05 | 98.9 | | |
| Zinc | 6010B | 10.0 | 2.0 | 1 | 1/25/05 | 1/26/05 | 11.2 | | |

% Solids: 0.0

Comments:

# DISSOLVED METALS

-1-

## INORGANIC ANALYSIS DATA SHEET

Client: J.H. Baxter & Company
Project No.: BXS-WELLS
Project Name: Landfill Wells
Matrix: WATER

Service Request: K2500374
Date Collected: 01/13/05
Date Received: 01/14/05
Units: µg/L
Basis: NA

Sample Name: BXS-4
Lab Code: K2500374-004 DISS

| Analyte | Analysis Method | MRL | MDL | Dil. | Date Extracted | Date Analyzed | Result | C | Q |
|---|---|---|---|---|---|---|---|---|---|
| Arsenic | 7060A | 5.0 | 1.0 | 1 | 1/25/05 | 1/26/05 | 1.0 | U | |
| Barium | 6010B | 5.0 | 2.0 | 1 | 1/25/05 | 1/26/05 | 2.0 | U | |
| Cadmium | 6010B | 5.0 | 5.0 | 1 | 1/25/05 | 1/26/05 | 5.0 | U | |
| Copper | 6010B | 10.0 | 4.0 | 1 | 1/25/05 | 1/26/05 | 4.0 | U | |
| Iron | 6010B | 20 | 20 | 1 | 1/25/05 | 1/26/05 | 20 | U | |
| Manganese | 6010B | 5.0 | 2.0 | 1 | 1/25/05 | 1/26/05 | 2.8 | B | |
| Nickel | 6010B | 20 | 20 | 1 | 1/25/05 | 1/26/05 | 20 | U | |
| Zinc | 6010B | 10.0 | 2.0 | 1 | 1/25/05 | 1/26/05 | 2.0 | U | |

% Solids: 0.0

Comments:

# DISSOLVED METALS
## -1-
## INORGANIC ANALYSIS DATA SHEET

Client: J.H. Baxter & Company
Project No.: BXS-WELLS
Project Name: Landfill Wells
Matrix: WATER

Service Request: K2500374
Date Collected: NA
Date Received: NA
Units: µg/L
Basis: NA

Sample Name: Method Blank
Lab Code: K2500374-MB

| Analyte | Analysis Method | MRL | MDL | Dil. | Date Extracted | Date Analyzed | Result | C | Q |
|---|---|---|---|---|---|---|---|---|---|
| Arsenic | 7060A | 5.0 | 1.0 | 1 | 1/25/05 | 1/26/05 | 1.0 | U | |
| Barium | 6010B | 5.0 | 2.0 | 1 | 1/25/05 | 1/26/05 | 2.0 | U | |
| Cadmium | 6010B | 5.0 | 5.0 | 1 | 1/25/05 | 1/26/05 | 5.0 | U | |
| Copper | 6010B | 10.0 | 4.0 | 1 | 1/25/05 | 1/26/05 | 4.0 | U | |
| Iron | 6010B | 20 | 20 | 1 | 1/25/05 | 1/26/05 | 20 | U | |
| Manganese | 6010B | 5.0 | 2.0 | 1 | 1/25/05 | 1/26/05 | 2.0 | U | |
| Nickel | 6010B | 20 | 20 | 1 | 1/25/05 | 1/26/05 | 20 | U | |
| Zinc | 6010B | 10.0 | 2.0 | 1 | 1/25/05 | 1/26/05 | 2.3 | B | |

% Solids: 0.0

Comments:

1317 South 13th Avenue P.O. Box 479 Kelso, Washington 98626 (360) 577-7222 ph (360) 636-1068 fax

Columbia Analytical Services INC.
An Employee - Owned Company

RECEIVED 5-12-05

May 11, 2005 Service Request No: K2502716

Mary Larson
JH Baxter & Company
P.O. Box 305
Arlington, WA 98223

**RE: BXS-WELLS/-Landfill**

Dear Mary:

Enclosed are the results of the sample(s) submitted to our laboratory on April 14, 2005. For your reference, these analyses have been assigned our service request number K2502716.

All analyses were performed according to our laboratory's quality assurance program. The test results meet requirements of the NELAC standards except as noted in the case narrative report. 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 items submitted to the laboratory for analysis and individual items (samples) analyzed, as listed in the report.

Please call if you have any questions. My extension is 3291.

Respectfully submitted,

**Columbia Analytical Services, Inc.**

Ed Wallace

Ed Wallace
Project Chemist

EW/jeb

Columbia Analytical Services INC.
An Employee - Owned Company

# CHAIN OF CUSTODY

1317 South 13th Ave. • Kelso, WA 98626 • (360) 577-7222 • (800) 695-7222x07 • FAX (360) 636-1068

SR#: 12502716

PAGE 1 OF 1 COC #

PROJECT NAME: J-H Baxter Co
PROJECT NUMBER: Landfill wells
PROJECT MANAGER: Marjolee Larson
COMPANY/ADDRESS: 16620 SE 32nd Ave
PO Box 325
CITY/STATE/ZIP: Arlington, WA 98223
E-MAIL ADDRESS:
PHONE: 360 435-2416 FAX: 360 435-3035
SAMPLER'S SIGNATURE: Marjolee Larson

| SAMPLE I.D. | DATE | TIME | LAB I.D. | MATRIX | NUMBER OF CONTAINERS | REMARKS |
|---|---|---|---|---|---|---|
| BXS-1 | 4-13-05 | 11:30 | | Water | 3 | |
| BXS-2 | 4-13-05 | 13:30 | | | 3 | |
| BXS-3 | 4-13-05 | 14:15 | | | 3 | |
| BXS-4 | 4-12-05 | 11:30 | | | 3 | |
| BXS-5 | 4-13-05 | 14:30 | | | 3 | |
| BXS-6 | 4-12-05 | 11:00 | | | 3 | |

Semivolatile Organics by GC/MS 625 ☐ 8270 ☐ 8270LL ☐
Volatile Organics 624 ☐ 8260 ☐
Hydrocarbons (*see below) Gas ☐ 8021 ☐ BTEX ☐
☐ Fuel Fingerprint (FIQ) Diesel ☐ Oil ☐
☐ NW-HCID Screen
Oil & Grease/TRPH 1664 HEM ☐ 1664 SGT ☐
PCB's Aroclors ☐ Congeners ☐
Pesticides/Herbicides 608 ☐ 8081A ☐ 8141A ☐ 8151A ☐
Chlorophenolics - 8151M
Tri ☐ Tetra ☐ PCP ☐
PAHS 8310 ☐ SIM ☐
Metals (See list below) Total Dissolved
Cyanide ☐
pH Cond. Cl SO4 Hex-Chrom ☐
NO3 BOD TSS PO4 F (NO2)
NH3-N COD TDS (circle) Total-P TKN (TOC)
DOC (circle) NO2+NO3
TOX 9020 ☐ AOX 1650 ☐ 506 ☐
Leaching Liquin

**REPORT REQUIREMENTS**

X I. Routine Report: Method Blank, Surrogate, as required
___ II. Report Dup., MS, MSD as required
___ III. Data Validation Report (includes all raw data)
___ IV. CLP Deliverable Report
___ V. EDD

**INVOICE INFORMATION**

P.O. #
Bill To: J-H Baxter Co
PO Box 10797
Eugene, OR 97440

**TURNAROUND REQUIREMENTS**

___ 24 hr. ___ 48 hr.
___ 5 Day
X Standard (10-15 working days)
___ Provide FAX Results

Requested Report Date

Circle which metals are to be analyzed:

Total Metals: Al As Sb Ba Be B Ca Cd Co Cr Cu Fe Pb Mg Mn Mo Ni K Ag Na Se Sr Tl Sn V Zn Hg

Dissolved Metals: Al As Sb Ba Be B Ca Cd Co Cr Cu Fe Pb Mg Mn Mo Ni K Ag Na Se Sr Tl Sn V Zn Hg

*INDICATE STATE HYDROCARBON PROCEDURE: AK CA WI NORTHWEST OTHER: (CIRCLE ONE)

SPECIAL INSTRUCTIONS/COMMENTS:

Attn: Rob Anthonies
Marjolee Larson

| RELINQUISHED BY: | RECEIVED BY: | RELINQUISHED BY: | RECEIVED BY: |
|---|---|---|---|
| Signature: Marjolee Larson | Signature: Tracy Black | Signature: | Signature: |
| Date/Time: 4-13-05 16:00 | Date/Time: 4/14/05 1110 | Date/Time: | Date/Time: |
| Printed Name: Marjolee Larson | Printed Name: Black | Printed Name: | Printed Name: |
| Firm: J-H Baxter | Firm: CAS | Firm: | Firm: |

## Acronyms

| | |
|---|---|
| ASTM | American Society for Testing and Materials |
| A2LA | American Association for Laboratory Accreditation |
| CARB | California Air Resources Board |
| CAS Number | Chemical Abstract Service registry Number |
| CFC | Chlorofluorocarbon |
| CFU | Colony-Forming Unit |
| DEC | Department of Environmental Conservation |
| DEQ | Department of Environmental Quality |
| DHS | Department of Health Services |
| DOE | Department of Ecology |
| DOH | Department of Health |
| EPA | U. S. Environmental Protection Agency |
| ELAP | Environmental Laboratory Accreditation Program |
| GC | Gas Chromatography |
| GC/MS | Gas Chromatography/Mass Spectrometry |
| LUFT | Leaking Underground Fuel Tank |
| M | Modified |
| MCL | Maximum Contaminant Level is the highest permissible concentration of a substance allowed in drinking water as established by the USEPA. |
| MDL | Method Detection Limit |
| MPN | Most Probable Number |
| MRL | Method Reporting Limit |
| NA | Not Applicable |
| NC | Not Calculated |
| NCASI | National Council of the Paper Industry for Air and Stream Improvement |
| ND | Not Detected |
| NIOSH | National Institute for Occupational Safety and Health |
| PQL | Practical Quantitation Limit |
| RCRA | Resource Conservation and Recovery Act |
| SIM | Selected Ion Monitoring |
| TPH | Total Petroleum Hydrocarbons |
| tr | Trace level is the concentration of an analyte that is less than the PQL but greater than or equal to the MDL. |

## Inorganic Data Qualifiers

| | |
|---|---|
| * | The result is an outlier. See case narrative. |
| # | The control limit criteria is not applicable. See case narrative. |
| B | The analyte was found in the associated method blank at a level that is significant relative to the sample result. |
| E | The result is an estimate amount because the value exceeded the instrument calibration range. |
| J | The result is an estimated concentration that is less than the MRL but greater than or equal to the MDL. |
| U | The compound was analyzed for, but was not detected ("Non-detect") at or above the MRL/MDL. |
| i | The MRL/MDL has been elevated due to a matrix interference. |
| X | See case narrative. |

## Metals Data Qualifiers

| | |
|---|---|
| # | The control limit criteria is not applicable. See case narrative. |
| B | The result is an estimated concentration that is less than the MRL but greater than or equal to the MDL. |
| E | The percent difference for the serial dilution was greater than 10%, indicating a possible matrix interference in the sample. |
| M | The duplicate injection precision was not met. |
| N | The Matrix Spike sample recovery is not within control limits. See case narrative. |
| S | The reported value was determined by the Method of Standard Additions (MSA). |
| U | The compound was analyzed for, but was not detected ("Non-detect") at or above the MRL/MDL. |
| W | The post-digestion spike for furnace AA analysis is out of control limits, while sample absorbance is less than 50% of spike absorbance. |
| i | The MRL/MDL has been elevated due to a matrix interference. |
| X | See case narrative. |
| * | The duplicate analysis not within control limits. See case narrative. |
| + | The correlation coefficient for the MSA is less than 0.995. |

## Organic Data Qualifiers

| | |
|---|---|
| * | The result is an outlier. See case narrative. |
| # | The control limit criteria is not applicable. See case narrative. |
| A | A tentatively identified compound, a suspected aldol-condensation product. |
| B | The analyte was found in the associated method blank at a level that is significant relative to the sample result. |
| C | The analyte was qualitatively confirmed using GC/MS techniques, pattern recognition, or by comparing to historical data. |
| D | The reported result is from a dilution. |
| E | The result is an estimate amount because the value exceeded the instrument calibration range. |
| J | The result is an estimated concentration that is less than the MRL but greater than or equal to the MDL. |
| N | The result is presumptive. The analyte was tentatively identified, but a confirmation analysis was not performed. |
| P | The GC or HPLC confirmation criteria was exceeded. The relative percent difference is greater than 40% between the two analytical results (25% for CLP Pesticides). |
| U | The compound was analyzed for, but was not detected ("Non-detect") at or above the MRL/MDL. |
| i | The MRL/MDL has been elevated due to a chromatographic interference. |
| X | See case narrative. |

## Additional Petroleum Hydrocarbon Specific Qualifiers

| | |
|---|---|
| F | The chromatographic fingerprint of the sample matches the elution pattern of the calibration standard. |
| L | The chromatographic fingerprint of the sample resembles a petroleum product, but the elution pattern indicates the presence of a greater amount of lighter molecular weight constituents than the calibration standard. |
| H | The chromatographic fingerprint of the sample resembles a petroleum product, but the elution pattern indicates the presence of a greater amount of heavier molecular weight constituents than the calibration standard. |
| O | The chromatographic fingerprint of the sample resembles an oil, but does not match the calibration standard. |
| Y | The chromatographic fingerprint of the sample resembles a petroleum product eluting in approximately the correct carbon range, but the elution pattern does not match the calibration standard. |
| Z | The chromatographic fingerprint does not resemble a petroleum product. |

## COLUMBIA ANALYTICAL SERVICES, INC.

| | | | |
|---|---|---|---|
| **Client:** | J.H. Baxter & Company | **Service Request No.:** | K2502716 |
| **Project:** | Arlington Landfill Wells | **Date Received:** | 4/14/05 |
| **Sample Matrix:** | Water | | |

## CASE NARRATIVE

All analyses were performed consistent with the quality assurance program of Columbia Analytical Services, Inc. (CAS). This report contains analytical results for samples designated for Tier III validation deliverables including summary forms and all of the associated raw data for each of the analyses. When appropriate to the method, method blank results have been reported with each analytical test.

### Sample Receipt

Six water samples were received for analysis at Columbia Analytical Services on 4/14/05. The samples were received in good condition and consistent with the accompanying chain of custody form. The samples were stored in a refrigerator at 4°C upon receipt at the laboratory.

### General Chemistry Parameters

No anomalies associated with the analysis of these samples were observed

### Dissolved Metals

No anomalies associated with the analysis of these samples were observed

**Approved by** Ewww **Date** 5/11/05

**Columbia Analytical Services Inc.**
**Cooler Receipt and Preservation Form**

PC Ed

Project/Client JH Baxter Work Order K250 2716

Cooler received on 4/14/05 and opened on 4/14/05 by A. Juell

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 1. | Were custody seals on outside of coolers? | | | | | (Y) | N |
| | If yes, how many and where? 17, 15 | | | | | | |
| 2. | Were custody seals intact? | | | | | (Y) | N |
| 3. | Were signature and date present on the custody seals? | | | | | (Y) | N |
| 4. | Is the shipper's airbill available and filed? If no, record airbill number: Greyhound | | | | | Y | N |
| 5. | COC# | | | | | | |
| | **Temperature of cooler(s) upon receipt: (°C)** | 1.8 | | | | | |
| | **Temperature Blank: (°C)** | 4.9 | | | | | |
| | Were samples hand delivered on the same day as collection? | | | | | ~~Y~~ | ~~N~~ |
| 6. | Were custody papers properly filled out (ink, signed, etc.)? | | | | | (Y) | N |
| 7. | Type of packing material present Ice | | | | | | |
| **8.** | **Did all bottles arrive in good condition (unbroken)?** | | | | | (Y) | N |
| 9. | Were all bottle labels complete (i.e analysis, preservation, etc.)? | | | | | (Y) | N |
| 10. | Did all bottle labels and tags agree with custody papers? | | | | | (Y) | N |
| **11.** | **Were the correct types of bottles used for the tests indicated?** | | | | | (Y) | N |
| 12. | Were all of the preserved bottles received at the lab with the appropriate pH? | | | | | (Y) | N |
| 13. | Were VOA vials checked for absence of air bubbles, and if present, noted below? | | | | | ~~Y~~ | ~~N~~ |
| 14. | Did the bottles originate from CAS/K or a branch laboratory? | | | | | (Y) | N |
| **15.** | **Are CWA Microbiology samples received with >1/2 the 24hr. hold time remaining from collection?** | | | | | ~~Y~~ | ~~N~~ |
| 16. | Was C12/Res negative? | | | | | ~~Y~~ | ~~N~~ |

Explain any discrepancies: _____

RESOLUTION: _____

Samples that required preservation or received out of temperature:

| Sample ID | Reagent | Volume | Lot Number | Bottle Type | Rec'd out of Temperature | Initials |
|---|---|---|---|---|---|---|
| | | | | | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |

# DISSOLVED METALS

## - Cover Page -
## INORGANIC ANALYSIS DATA PACKAGE

Client: J.H. Baxter & Company

Service Request: K2502716

Project No.: BXS-WELLS-Landfill

Project Name: Arlington Plant Groundwater

| Sample No. | Lab Sample ID. |
|---|---|
| BXS-1 | K2502716-001 DISS |
| BXS-1D | K2502716-001D DISS |
| BXS-1S | K2502716-001S DISS |
| BXS-2 | K2502716-002 DISS |
| BXS-3 | K2502716-003 DISS |
| BXS-4 | K2502716-004 DISS |
| BXS-5 | K2502716-005 DISS |
| BXS-6 | K2502716-006 DISS |
| Method Blank | K2502716-MB |

Were ICP interelement corrections applied? Yes/No YES

Were ICP background corrections applied? Yes/No YES

If yes-were raw data generated before application of background corrections? Yes/No NO

Comments:

Signature: [signature] Date: 5/6/05

# DISSOLVED METALS

-1-

## INORGANIC ANALYSIS DATA SHEET

Client: J.H. Baxter & Company
Project No.: BXS-WELLS-Landfill
Project Name: Arlington Plant Groundwater
Matrix: WATER

Service Request: K2502716
Date Collected: 04/13/05
Date Received: 04/14/05
Units: MG/L
Basis: NA

Sample Name: BXS-1

Lab Code: K2502716-001 DISS

| Analyte | Analysis Method | MRL | MDL | Dil. | Date Extracted | Date Analyzed | Result | C | Q |
|---|---|---|---|---|---|---|---|---|---|
| Arsenic | 7060A | 0.005 | 0.001 | 1 | 4/19/05 | 4/21/05 | 0.001 | U | |
| Barium | 6010B | 0.005 | 0.002 | 1 | 4/19/05 | 4/21/05 | 0.023 | | |
| Cadmium | 6010B | 0.005 | 0.003 | 1 | 4/19/05 | 4/21/05 | 0.003 | U | |
| Copper | 6010B | 0.010 | 0.005 | 1 | 4/19/05 | 4/21/05 | 0.009 | B | |
| Iron | 6010B | 0.020 | 0.003 | 1 | 4/19/05 | 4/21/05 | 0.003 | U | |
| Manganese | 6010B | 0.0050 | 0.0008 | 1 | 4/19/05 | 4/21/05 | 0.2100 | | |
| Nickel | 6010B | 0.02 | 0.02 | 1 | 4/19/05 | 4/21/05 | 0.02 | | |
| Zinc | 6010B | 0.010 | 0.006 | 1 | 4/19/05 | 4/21/05 | 0.013 | | |

% Solids: 0.0

Comments:

# DISSOLVED METALS
-1-
## INORGANIC ANALYSIS DATA SHEET

Client: J.H. Baxter & Company
Project No.: BXS-WELLS-Landfill
Project Name: Arlington Plant Groundwater
Matrix: WATER

Service Request: K2502716
Date Collected: 04/13/05
Date Received: 04/14/05
Units: MG/L
Basis: NA

Sample Name: BXS-2
Lab Code: K2502716-002 DISS

| Analyte | Analysis Method | MRL | MDL | Dil. | Date Extracted | Date Analyzed | Result | C | Q |
|---|---|---|---|---|---|---|---|---|---|
| Arsenic | 7060A | 0.005 | 0.001 | 1 | 4/19/05 | 4/21/05 | 0.001 | B | |
| Barium | 6010B | 0.005 | 0.002 | 1 | 4/19/05 | 4/21/05 | 0.044 | | |
| Cadmium | 6010B | 0.005 | 0.003 | 1 | 4/19/05 | 4/21/05 | 0.003 | U | |
| Copper | 6010B | 0.010 | 0.005 | 1 | 4/19/05 | 4/21/05 | 0.008 | B | |
| Iron | 6010B | 0.020 | 0.003 | 1 | 4/19/05 | 4/21/05 | 0.769 | | |
| Manganese | 6010B | 0.0050 | 0.0008 | 1 | 4/19/05 | 4/21/05 | 1.3500 | | |
| Nickel | 6010B | 0.02 | 0.02 | 1 | 4/19/05 | 4/21/05 | 0.03 | | |
| Zinc | 6010B | 0.010 | 0.006 | 1 | 4/19/05 | 4/21/05 | 0.010 | | |

% Solids: 0.0

Comments:

# DISSOLVED METALS

-1-

## INORGANIC ANALYSIS DATA SHEET

Client: J.H. Baxter & Company
Project No.: BXS-WELLS-Landfill
Project Name: Arlington Plant Groundwater
Matrix: WATER

Service Request: K2502716
Date Collected: 04/13/05
Date Received: 04/14/05
Units: mg/L
Basis: NA

Sample Name: BXS-3
Lab Code: K2502716-003 DISS

| Analyte | Analysis Method | MRL | MDL | Dil. | Date Extracted | Date Analyzed | Result | C | Q |
|---|---|---|---|---|---|---|---|---|---|
| Arsenic | 7060A | 0.005 | 0.001 | 1 | 4/19/05 | 04/21/05 | 0.006 | | |
| Barium | 6010B | 0.005 | 0.002 | 1 | 4/19/05 | 04/21/05 | 0.091 | | |
| Cadmium | 6010B | 0.005 | 0.003 | 1 | 4/19/05 | 04/21/05 | 0.003 | U | |
| Copper | 6010B | 0.010 | 0.005 | 1 | 4/19/05 | 04/21/05 | 0.005 | U | |
| Iron | 6010B | 0.100 | 0.015 | 5 | 4/19/05 | 04/21/05 | 10.9 | | |
| Manganese | 6010B | 0.0250 | 0.0040 | 5 | 4/19/05 | 04/21/05 | 14.2 | | |
| Nickel | 6010B | 0.02 | 0.02 | 1 | 4/19/05 | 04/21/05 | 0.04 | | |
| Zinc | 6010B | 0.010 | 0.006 | 1 | 4/19/05 | 04/21/05 | 0.063 | | |

% Solids: 0.0

Comments:

# DISSOLVED METALS
-1-
## INORGANIC ANALYSIS DATA SHEET

Client: J.H. Baxter & Company
Project No.: BXS-WELLS-Landfill
Project Name: Arlington Plant Groundwater
Matrix: WATER

Service Request: K2502716
Date Collected: 04/12/05
Date Received: 04/14/05
Units: MG/L
Basis: NA

Sample Name: BXS-4
Lab Code: K2502716-004 DISS

| Analyte | Analysis Method | MRL | MDL | Dil. | Date Extracted | Date Analyzed | Result | C | Q |
|---|---|---|---|---|---|---|---|---|---|
| Arsenic | 7060A | 0.005 | 0.001 | 1 | 4/19/05 | 4/21/05 | 0.005 | | |
| Barium | 6010B | 0.005 | 0.002 | 1 | 4/19/05 | 4/21/05 | 0.029 | | |
| Cadmium | 6010B | 0.005 | 0.003 | 1 | 4/19/05 | 4/21/05 | 0.003 | U | |
| Copper | 6010B | 0.010 | 0.005 | 1 | 4/19/05 | 4/21/05 | 0.005 | U | |
| Iron | 6010B | 0.020 | 0.003 | 1 | 4/19/05 | 4/21/05 | 0.046 | | |
| Manganese | 6010B | 0.0050 | 0.0008 | 1 | 4/19/05 | 4/21/05 | 0.1200 | | |
| Nickel | 6010B | 0.02 | 0.02 | 1 | 4/19/05 | 4/21/05 | 0.02 | U | |
| Zinc | 6010B | 0.010 | 0.006 | 1 | 4/19/05 | 4/21/05 | 0.006 | U | |

% Solids: 0.0

Comments:

# DISSOLVED METALS

-1-

## INORGANIC ANALYSIS DATA SHEET

Client: J.H. Baxter & Company
Project No.: BXS-WELLS-Landfill
Project Name: Arlington Plant Groundwater
Matrix: WATER

Service Request: K2502716
Date Collected: 04/13/05
Date Received: 04/14/05
Units: MG/L
Basis: NA

Sample Name: BXS-5
Lab Code: K2502716-005 DISS

| Analyte | Analysis Method | MRL | MDL | Dil. | Date Extracted | Date Analyzed | Result | C | Q |
|---|---|---|---|---|---|---|---|---|---|
| Arsenic | 7060A | 0.005 | 0.001 | 1 | 4/19/05 | 4/21/05 | 0.001 | U | |
| Barium | 6010B | 0.005 | 0.002 | 1 | 4/19/05 | 4/21/05 | 0.002 | U | |
| Cadmium | 6010B | 0.005 | 0.003 | 1 | 4/19/05 | 4/21/05 | 0.003 | U | |
| Copper | 6010B | 0.010 | 0.005 | 1 | 4/19/05 | 4/21/05 | 0.005 | U | |
| Iron | 6010B | 0.020 | 0.003 | 1 | 4/19/05 | 4/21/05 | 0.003 | U | |
| Manganese | 6010B | 0.0050 | 0.0008 | 1 | 4/19/05 | 4/21/05 | 0.0008 | U | |
| Nickel | 6010B | 0.02 | 0.02 | 1 | 4/19/05 | 4/21/05 | 0.02 | U | |
| Zinc | 6010B | 0.010 | 0.006 | 1 | 4/19/05 | 4/21/05 | 0.006 | U | |

% Solids: 0.0

Comments:

# DISSOLVED METALS
-1-
## INORGANIC ANALYSIS DATA SHEET

Client: J.H. Baxter & Company
Project No.: BXS-WELLS-Landfill
Project Name: Arlington Plant Groundwater
Matrix: WATER

Service Request: K2502716
Date Collected: 04/12/05
Date Received: 04/14/05
Units: MG/L
Basis: NA

Sample Name: BXS-6
Lab Code: K2502716-006 DISS

| Analyte | Analysis Method | MRL | MDL | Dil. | Date Extracted | Date Analyzed | Result | C | Q |
|---|---|---|---|---|---|---|---|---|---|
| Arsenic | 7060A | 0.005 | 0.001 | 1 | 4/19/05 | 4/21/05 | 0.005 | B | |
| Barium | 6010B | 0.005 | 0.002 | 1 | 4/19/05 | 4/21/05 | 0.028 | | |
| Cadmium | 6010B | 0.005 | 0.003 | 1 | 4/19/05 | 4/21/05 | 0.003 | U | |
| Copper | 6010B | 0.010 | 0.005 | 1 | 4/19/05 | 4/21/05 | 0.005 | U | |
| Iron | 6010B | 0.020 | 0.003 | 1 | 4/19/05 | 4/21/05 | 0.048 | | |
| Manganese | 6010B | 0.0050 | 0.0008 | 1 | 4/19/05 | 4/21/05 | 0.1200 | | |
| Nickel | 6010B | 0.02 | 0.02 | 1 | 4/19/05 | 4/21/05 | 0.02 | U | |
| Zinc | 6010B | 0.010 | 0.006 | 1 | 4/19/05 | 4/21/05 | 0.006 | U | |

% Solids: 0.0

Comments:

# DISSOLVED METALS

-1-

## INORGANIC ANALYSIS DATA SHEET

Client: J.H. Baxter & Company
Project No.: BXS-WELLS-Landfill
Project Name: Arlington Plant Groundwater
Matrix: WATER

Service Request: K2502716
Date Collected:
Date Received:
Units: MG/L
Basis: NA

Sample Name: Method Blank
Lab Code: K2502716-MB

| Analyte | Analysis Method | MRL | MDL | Dil. | Date Extracted | Date Analyzed | Result | C | Q |
|---|---|---|---|---|---|---|---|---|---|
| Arsenic | 7060A | 0.005 | 0.001 | 1 | 4/19/05 | 4/21/05 | 0.001 | U | |
| Barium | 6010B | 0.005 | 0.002 | 1 | 4/19/05 | 4/21/05 | 0.002 | U | |
| Cadmium | 6010B | 0.005 | 0.003 | 1 | 4/19/05 | 4/21/05 | 0.003 | U | |
| Copper | 6010B | 0.010 | 0.005 | 1 | 4/19/05 | 4/21/05 | 0.005 | U | |
| Iron | 6010B | 0.020 | 0.003 | 1 | 4/19/05 | 4/21/05 | 0.003 | U | |
| Manganese | 6010B | 0.0050 | 0.0008 | 1 | 4/19/05 | 4/21/05 | 0.0008 | U | |
| Nickel | 6010B | 0.02 | 0.02 | 1 | 4/19/05 | 4/21/05 | 0.02 | U | |
| Zinc | 6010B | 0.010 | 0.006 | 1 | 4/19/05 | 4/21/05 | 0.006 | U | |

% Solids: 0.0

Comments:

# COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

**Client :** J.H. Baxter & Company
**Project Name :** Arlington Plant Groundwater
**Project Number :** BXS-WELLS-Landfill
**Sample Matrix :** WATER

**Service Request :** K2502716
**Date Collected :** 04/12,13/05
**Date Received :** 04/14/05

## Chloride

Analysis Method 300.0
Test Notes :

Units : mg/L (ppm)
Basis : NA

| Sample Name | Lab Code | MRL | MDL | Dilution Factor | Date Analyzed | Result | Result Notes |
|---|---|---|---|---|---|---|---|
| BXS-1 | K2502716-001 | 0.2 | 0.06 | 2 | 04/23/05 | 4.6 | |
| BXS-2 | K2502716-002 | 0.2 | 0.06 | 2 | 04/23/05 | 4.7 | |
| BXS-3 | K2502716-003 | 0.2 | 0.06 | 2 | 04/23/05 | 3.8 | |
| BXS-4 | K2502716-004 | 0.2 | 0.06 | 2 | 04/23/05 | 1.9 | |
| BXS-5 | K2502716-005 | 0.2 | 0.06 | 2 | 04/23/05 | ND | |
| BXS-6 | K2502716-006 | 0.2 | 0.06 | 2 | 04/23/05 | 1.9 | |
| Method Blank | K2502716-MB | 0.2 | 0.03 | 1 | 04/23/05 | ND | |

Report By: AYaple

Analytical Report

**Client :** J.H. Baxter & Company
**Project Name :** Arlington Plant Groundwater
**Project Number :** BXS-WELLS-Landfill
**Sample Matrix :** WATER

**Service Request :** K2502716
**Date Collected :** 04/12,13/05
**Date Received :** 04/14/05

Sulfate

Units : mg/L (ppm)
Basis : NA

Analysis Method 300.0
Test Notes :

| Sample Name | Lab Code | MRL | MDL | Dilution Factor | Date Analyzed | Result | Result Notes |
|---|---|---|---|---|---|---|---|
| BXS-1 | K2502716-001 | 0.2 | 0.18 | 2 | 04/23/05 | 11.7 | |
| BXS-2 | K2502716-002 | 0.2 | 0.18 | 2 | 04/23/05 | 1.4 | |
| BXS-3 | K2502716-003 | 0.2 | 0.18 | 2 | 04/23/05 | ND | |
| BXS-4 | K2502716-004 | 0.2 | 0.18 | 2 | 04/23/05 | 1.8 | |
| BXS-5 | K2502716-005 | 0.2 | 0.18 | 2 | 04/23/05 | ND | |
| BXS-6 | K2502716-006 | 0.2 | 0.18 | 2 | 04/23/05 | 1.6 | |
| Method Blank | K2502716-MB | 0.2 | 0.09 | 1 | 04/23/05 | ND | |

Report By: AYaple

# COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

**Client :** J.H. Baxter & Company
**Project Name :** Arlington Plant Groundwater
**Project Number :** BXS-WELLS-Landfill
**Sample Matrix :** WATER

**Service Request :** K2502716
**Date Collected :** 04/12,13/05
**Date Received :** 04/14/05

## Chemical Oxygen Demand

Units : mg/L (ppm)
Basis : NA

Analysis Method 410.2
Test Notes :

| Sample Name | Lab Code | MRL | MDL | Dilution Factor | Date Analyzed | Result | Result Notes |
|---|---|---|---|---|---|---|---|
| BXS-1 | K2502716-001 | 5 | 2 | 1 | 04/18/05 | 14 | |
| BXS-2 | K2502716-002 | 5 | 2 | 1 | 04/18/05 | 43 | |
| BXS-3 | K2502716-003 | 5 | 2 | 1 | 04/18/05 | 69 | |
| BXS-4 | K2502716-004 | 5 | 2 | 1 | 04/18/05 | 5 | |
| BXS-5 | K2502716-005 | 5 | 2 | 1 | 04/18/05 | 5 | |
| BXS-6 | K2502716-006 | 5 | 2 | 1 | 04/18/05 | 6 | |
| Method Blank | K2502716-MB | 5 | 2 | 1 | 04/18/05 | ND | |

Report By: AYaple

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

**Client :** J.H. Baxter & Company
**Project Name :** Arlington Plant Groundwater
**Project Number :** BXS-WELLS-Landfill
**Sample Matrix :** WATER

**Service Request :** K2502716
**Date Collected :** 04/12,13/05
**Date Received :** 04/14/05

Conductivity

Units : uMhos/cm
Basis : NA

Analysis Method : 120.1
Test Notes :

| Sample Name | Lab Code | MRL | MDL | Dilution Factor | Date Analyzed | Result | Result Notes |
|---|---|---|---|---|---|---|---|
| BXS-1 | K2502716-001 | 2 | 0.04 | 1 | 04/22/05 | 370 | |
| BXS-2 | K2502716-002 | 2 | 0.04 | 1 | 04/22/05 | 803 | |
| BXS-3 | K2502716-003 | 2 | 0.04 | 1 | 04/22/05 | 749 | |
| BXS-4 | K2502716-004 | 2 | 0.04 | 1 | 04/22/05 | 191 | |
| BXS-5 | K2502716-005 | 2 | 0.04 | 1 | 04/22/05 | 1.4 | J |
| BXS-6 | K2502716-006 | 2 | 0.04 | 1 | 04/22/05 | 188 | |
| Method Blank | K2502716-MB | 2 | 0.04 | 1 | 04/22/05 | 0.5 | J |

# COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

**Client :** J.H. Baxter & Company
**Project Name :** Arlington Plant Groundwater
**Project Number :** BXS-WELLS-Landfill
**Sample Matrix :** WATER

**Service Request :** K2502716
**Date Collected :** 04/12,13/05
**Date Received :** 04/14/05

## Ammonia as Nitrogen

Units : mg/L (ppm)
Basis : NA

Analysis Method 350.1
Test Notes :

| Sample Name | Lab Code | MRL | MDL | Dilution Factor | Date Analyzed | Result | Result Notes |
|---|---|---|---|---|---|---|---|
| BXS-1 | K2502716-001 | 0.05 | 0.02 | 1 | 04/15/05 | ND | |
| BXS-2 | K2502716-002 | 0.05 | 0.02 | 1 | 04/15/05 | ND | |
| BXS-3 | K2502716-003 | 0.05 | 0.02 | 1 | 04/15/05 | 0.58 | |
| BXS-4 | K2502716-004 | 0.05 | 0.02 | 1 | 04/15/05 | 0.51 | |
| BXS-5 | K2502716-005 | 0.05 | 0.02 | 1 | 04/15/05 | ND | |
| BXS-6 | K2502716-006 | 0.05 | 0.02 | 1 | 04/15/05 | 0.53 | |
| Method Blank | K2502716-MB | 0.05 | 0.02 | 1 | 04/15/05 | ND | |

Report By: AYaple

# COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

**Client :** J.H. Baxter & Company
**Project Name :** Arlington Plant Groundwater
**Project Number :** BXS-WELLS-Landfill
**Sample Matrix :** WATER

**Service Request :** K2502716
**Date Collected :** 04/12,13/05
**Date Received :** 04/14/05

Nitrate+Nitrite as Nitrogen

Units : mg/L (ppm)
Basis : NA

Analysis Method 353.2
Test Notes :

| Sample Name | Lab Code | MRL | MDL | Dilution Factor | Date Analyzed | Result | Result Notes |
|---|---|---|---|---|---|---|---|
| BXS-1 | K2502716-001 | 0.2 | 0.03 | 1 | 04/19/05 | 1.0 | |
| BXS-2 | K2502716-002 | 0.2 | 0.03 | 1 | 04/19/05 | ND | |
| BXS-3 | K2502716-003 | 0.2 | 0.03 | 1 | 04/19/05 | ND | |
| BXS-4 | K2502716-004 | 0.2 | 0.03 | 1 | 04/19/05 | ND | |
| BXS-5 | K2502716-005 | 0.2 | 0.03 | 1 | 04/19/05 | ND | |
| BXS-6 | K2502716-006 | 0.2 | 0.03 | 1 | 04/19/05 | ND | |
| Method Blank | K2502716-MB | 0.2 | 0.03 | 1 | 04/19/05 | ND | |

Report By: AYaple

# COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

**Client :** J.H. Baxter & Company
**Project Name :** Arlington Plant Groundwater
**Project Number :** BXS-WELLS-Landfill
**Sample Matrix :** WATER

**Service Request :** K2502716
**Date Collected :** 04/12,13/05
**Date Received :** 04/14/05

pH

Units : pH UNITS
Basis : NA

Analysis Method 150.1
Test Notes :

| Sample Name | Lab Code | MRL | MDL | Dilution Factor | Date Analyzed | Result | Result Notes |
|---|---|---|---|---|---|---|---|
| BXS-1 | K2502716-001 | - | - | 1 | 04/14/05 | 6.42 | |
| BXS-2 | K2502716-002 | - | - | 1 | 04/14/05 | 6.60 | |
| BXS-3 | K2502716-003 | - | - | 1 | 04/14/05 | 6.82 | |
| BXS-4 | K2502716-004 | - | - | 1 | 04/14/05 | 8.06 | |
| BXS-5 | K2502716-005 | - | - | 1 | 04/14/05 | 6.06 | |
| BXS-6 | K2502716-006 | - | - | 1 | 04/14/05 | 8.10 | |

Report By: AYaple

# COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

**Client :** J.H. Baxter & Company
**Project Name :** Arlington Plant Groundwater
**Project Number :** BXS-WELLS-Landfill
**Sample Matrix :** WATER

**Service Request :** K2502716
**Date Collected :** 04/12,13/05
**Date Received :** 04/14/05

## Tannin and Lignin

Units : mg/L (ppm)
Basis : NA

Analysis Method SM 5550 B
Test Notes :

| Sample Name | Lab Code | MRL | MDL | Dilution Factor | Date Analyzed | Result | Result Notes |
|---|---|---|---|---|---|---|---|
| BXS-1 | K2502716-001 | 0.2 | 0.03 | 1 | 04/21/05 | 0.18 | J |
| BXS-2 | K2502716-002 | 0.2 | 0.03 | 1 | 04/21/05 | 1.2 | |
| BXS-3 | K2502716-003 | 0.2 | 0.06 | 2 | 04/21/05 | 8.9 | |
| BXS-4 | K2502716-004 | 0.2 | 0.03 | 1 | 04/21/05 | 0.4 | |
| BXS-5 | K2502716-005 | 0.2 | 0.03 | 1 | 04/21/05 | 0.18 | J |
| BXS-6 | K2502716-006 | 0.2 | 0.03 | 1 | 04/21/05 | 0.5 | |
| Method Blank | K2502716-MB | 0.2 | 0.03 | 1 | 04/21/05 | ND | |

SM Standard Methods for the Examination of Water and Wastewater, 19th Ed., 1995.

Report By: AYaple

# COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

**Client :** J.H. Baxter & Company
**Project Name :** Arlington Plant Groundwater
**Project Number :** BXS-WELLS-Landfill
**Sample Matrix :** WATER

**Service Request :** K2502716
**Date Collected :** 04/12,13/05
**Date Received :** 04/14/05

## Solids, Total Dissolved (TDS)

Units : mg/L (ppm)
Basis : NA

Analysis Method 160.1
Test Notes :

| Sample Name | Lab Code | MRL | MDL | Dilution Factor | Date Analyzed | Result | Result Notes |
|---|---|---|---|---|---|---|---|
| BXS-1 | K2502716-001 | 5 | 5 | 1 | 04/16/05 | 242 | |
| BXS-2 | K2502716-002 | 5 | 5 | 1 | 04/16/05 | 484 | |
| BXS-3 | K2502716-003 | 5 | 5 | 1 | 04/16/05 | 468 | |
| BXS-4 | K2502716-004 | 5 | 5 | 1 | 04/16/05 | 129 | |
| BXS-5 | K2502716-005 | 5 | 5 | 1 | 04/16/05 | ND | |
| BXS-6 | K2502716-006 | 5 | 5 | 1 | 04/16/05 | 128 | |
| Method Blank | K2502716-MB | 5 | 5 | 1 | 04/16/05 | ND | |

Report By: AYaple

# COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

**Client :** J.H. Baxter & Company
**Project Name :** Arlington Plant Groundwater
**Project Number :** BXS-WELLS-Landfill
**Sample Matrix :** WATER

**Service Request :** K2502716
**Date Collected :** 04/12,13/05
**Date Received :** 04/14/05

## Carbon, Total Organic

Analysis Method 415.1
Test Notes :

Units : mg/L (ppm)
Basis : NA

| Sample Name | Lab Code | MRL | MDL | Dilution Factor | Date Analyzed | Result | Result Notes |
|---|---|---|---|---|---|---|---|
| BXS-1 | K2502716-001 | 0.5 | 0.1 | 1 | 04/15/05 | 6.0 | |
| BXS-2 | K2502716-002 | 0.5 | 0.1 | 1 | 04/15/05 | 16.0 | |
| BXS-3 | K2502716-003 | 0.5 | 0.1 | 1 | 04/15/05 | 26.7 | |
| BXS-4 | K2502716-004 | 0.5 | 0.1 | 1 | 04/15/05 | 1.2 | |
| BXS-5 | K2502716-005 | 0.5 | 0.1 | 1 | 04/15/05 | 0.6 | |
| BXS-6 | K2502716-006 | 0.5 | 0.1 | 1 | 04/15/05 | 1.0 | |
| Method Blank | K2502716-MB | 0.5 | 0.1 | 1 | 04/15/05 | ND | |

Report By: AYaple

1317 South 13th Avenue P.O. Box 479 Kelso, Washington 98626 (360) 577-7222 (360) 636-1068 fax

Columbia Analytical Services INC.
An Employee - Owned Company

RECEIVED 9.20.05 KB

September 14, 2005 Service Request No: K0502965

Mary Larson
JH Baxter & Company
6520 188th Northeast
P.O. Box 305
Arlington, WA 98233

**RE: Arlington Landfill Wells/BXS-Wells-Landfill**

Dear Mary:

Enclosed are the results of the sample(s) submitted to our laboratory on August 11, 2005. For your reference, these analyses have been assigned our service request number K0502965.

All analyses were performed according to our laboratory's quality assurance program. The test results meet requirements of the NELAC standards except as noted in the case narrative report. 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 items submitted to the laboratory for analysis and individual items (samples) analyzed, as listed in the report.

Please call if you have any questions. My extension is 3291.

Respectfully submitted,

**Columbia Analytical Services, Inc.**

Ed Wallace

Ed Wallace
Project Chemist

EW/jeb

# CHAIN OF CUSTODY

SR#: K0502965

Columbia Analytical Services INC.
An Employee - Owned Company

1317 South 13th Ave. • Kelso, WA 98626 • (360) 577-7222 • (800) 695-7222x07 • FAX (360) 636-1068

PAGE 1 OF 1 COC #

PROJECT NAME: J.H. Baxter Co
PROJECT NUMBER: Landfill Wells
PROJECT MANAGER: Marylee Larson
COMPANY/ADDRESS: 1520 138th St NE / PO Box 305
CITY/STATE/ZIP: Arlington, WA 98223
E-MAIL ADDRESS:
PHONE #: 360 435-2146 FAX: 360 435 3059
SAMPLER'S SIGNATURE: Mary Larson

| SAMPLE I.D. | DATE | TIME | LAB I.D. | MATRIX | NUMBER OF CONTAINERS | Semivolatile Organics by GC/MS 625 ☐ 8270 ☐ 8270LL ☐ | Volatile Organics 624 ☐ 8260 ☐ | Hydrocarbons (*see below) Gas ☐ 8021 ☐ BTEX ☐ Diesel ☐ Oil ☐ Fuel Fingerprint (FIQ) ☐ NW-HCID Screen ☐ Oil & Grease/TRPH 1664 HEM ☐ 1664 SGT ☐ | PCB's Aroclors ☐ Congeners ☐ | Pesticides/Herbicides 608 ☐ 8081A ☐ 8141A ☐ 6151A ☐ | Chlorophenolics - 8151M Tri ☐ Tetra ☐ PCP ☐ | PAHs 8310 ☐ SIM ☐ | Metals (See list below) Total or Dissolved | Cyanide ☐ | Hex-Chrom ☐ Cl, Cond, SO4 (circle) NO3, BOD, TSS (circle) PO4, F, NO2 Nh3-N COD (circle) Total-P, TKN TOC DOC (circle) NO2+NO3 | TOX 9020 ☐ AOX 1650 ☐ 506 ☐ | Tannin/Lignin | REMARKS |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| BXS-4 | 8-9-05 | 10:30 | 1 | Water | 3 | | | | | | | X | | X | X | | | |
| BXS-6 | 8-9-05 | 11:00 | 2 | Water | 3 | | | | | | | X | | X | X | | | |
| BXS-1 | 8-9-05 | 11:50 | 3 | Water | 3 | | | | | | | X | | X | X | | | |
| BXS-2 | 8-10-05 | 10:00 | 4 | Water | 3 | | | | | | | X | | X | X | | | |
| BXS-3 | 8-10-05 | 11:15 | 5 | Water | 3 | | | | | | | X | | X | X | | | |
| BXS-5 | 8-10-05 | 12:00 | 6 | Water | 3 | | | | | | | X | | X | X | | | |

**REPORT REQUIREMENTS**

X I. Routine Report: Method Blank, Surrogate, as required
___ II. Report Dup., MS, MSD as required
___ III. Data Validation Report (includes all raw data)
___ IV. CLP Deliverable Report
___ V. EDD

**INVOICE INFORMATION**

P.O. #
Bill To: J.H. Baxter Co
PO Box 10797
Eugene, OR 97440

**TURNAROUND REQUIREMENTS**

___ 24 hr. ___ 48 hr.
___ 5 Day
X Standard (10-15 working days)
___ Provide FAX Results

Requested Report Date

Circle which metals are to be analyzed:

Total Metals: Al As Sb Ba Be B Ca Cd Co Cr Cu Fe Pb Mg Mn Mo Ni K Ag Na Se Sr Tl Sn V Zn Hg

Dissolved Metals: Al (As) Sb (Ba) Be B Ca (Cd) Co Cr (Cu) (Fe) Pb Mg (Mn) Mo (Ni) K Ag Na Se Sr Tl Sn V (Zn) Hg

*INDICATE STATE HYDROCARBON PROCEDURE: AK CA WI NORTHWEST OTHER: (CIRCLE ONE)

SPECIAL INSTRUCTIONS/COMMENTS:

Attn: RoAnn Thomas
Marylee Larson

| RELINQUISHED BY: | RECEIVED BY: | RELINQUISHED BY: | RECEIVED BY: |
|---|---|---|---|
| Signature: Mary Larson | Signature: | Signature | Signature |
| Date/Time: 8-10-05 14:30 | Date/Time: 8/11/05 1630 | Date/Time | Date/Time |
| Printed Name: Marylee Larson | Printed Name: | Printed Name | Printed Name |
| Firm: J.H. Baxter | Firm: CAS | Firm | Firm |

## Acronyms

| | |
|---|---|
| ASTM | American Society for Testing and Materials |
| A2LA | American Association for Laboratory Accreditation |
| CARB | California Air Resources Board |
| CAS Number | Chemical Abstract Service registry Number |
| CFC | Chlorofluorocarbon |
| CFU | Colony-Forming Unit |
| DEC | Department of Environmental Conservation |
| DEQ | Department of Environmental Quality |
| DHS | Department of Health Services |
| DOE | Department of Ecology |
| DOH | Department of Health |
| EPA | U. S. Environmental Protection Agency |
| ELAP | Environmental Laboratory Accreditation Program |
| GC | Gas Chromatography |
| GC/MS | Gas Chromatography/Mass Spectrometry |
| LUFT | Leaking Underground Fuel Tank |
| M | Modified |
| MCL | Maximum Contaminant Level is the highest permissible concentration of a substance allowed in drinking water as established by the USEPA. |
| MDL | Method Detection Limit |
| MPN | Most Probable Number |
| MRL | Method Reporting Limit |
| NA | Not Applicable |
| NC | Not Calculated |
| NCASI | National Council of the Paper Industry for Air and Stream Improvement |
| ND | Not Detected |
| NIOSH | National Institute for Occupational Safety and Health |
| PQL | Practical Quantitation Limit |
| RCRA | Resource Conservation and Recovery Act |
| SIM | Selected Ion Monitoring |
| TPH | Total Petroleum Hydrocarbons |
| tr | Trace level is the concentration of an analyte that is less than the PQL but greater than or equal to the MDL. |

## Inorganic Data Qualifiers

| | |
|---|---|
| * | The result is an outlier. See case narrative. |
| # | The control limit criteria is not applicable. See case narrative. |
| B | The analyte was found in the associated method blank at a level that is significant relative to the sample result. |
| E | The result is an estimate amount because the value exceeded the instrument calibration range. |
| J | The result is an estimated concentration that is less than the MRL but greater than or equal to the MDL. |
| U | The compound was analyzed for, but was not detected ("Non-detect") at or above the MRL/MDL. |
| i | The MRL/MDL has been elevated due to a matrix interference. |
| X | See case narrative. |

## Metals Data Qualifiers

| | |
|---|---|
| # | The control limit criteria is not applicable. See case narrative. |
| B | The result is an estimated concentration that is less than the MRL but greater than or equal to the MDL. |
| E | The percent difference for the serial dilution was greater than 10%, indicating a possible matrix interference in the sample. |
| M | The duplicate injection precision was not met. |
| N | The Matrix Spike sample recovery is not within control limits. See case narrative. |
| S | The reported value was determined by the Method of Standard Additions (MSA). |
| U | The compound was analyzed for, but was not detected ("Non-detect") at or above the MRL/MDL. |
| W | The post-digestion spike for furnace AA analysis is out of control limits, while sample absorbance is less than 50% of spike absorbance. |
| i | The MRL/MDL has been elevated due to a matrix interference. |
| X | See case narrative. |
| * | The duplicate analysis not within control limits. See case narrative. |
| + | The correlation coefficient for the MSA is less than 0.995. |

## Organic Data Qualifiers

| | |
|---|---|
| * | The result is an outlier. See case narrative. |
| # | The control limit criteria is not applicable. See case narrative. |
| A | A tentatively identified compound, a suspected aldol-condensation product. |
| B | The analyte was found in the associated method blank at a level that is significant relative to the sample result. |
| C | The analyte was qualitatively confirmed using GC/MS techniques, pattern recognition, or by comparing to historical data. |
| D | The reported result is from a dilution. |
| E | The result is an estimate amount because the value exceeded the instrument calibration range. |
| J | The result is an estimated concentration that is less than the MRL but greater than or equal to the MDL. |
| N | The result is presumptive. The analyte was tentatively identified, but a confirmation analysis was not performed. |
| P | The GC or HPLC confirmation criteria was exceeded. The relative percent difference is greater than 40% between the two analytical results (25% for CLP Pesticides). |
| U | The compound was analyzed for, but was not detected ("Non-detect") at or above the MRL/MDL. |
| i | The MRL/MDL has been elevated due to a chromatographic interference. |
| X | See case narrative. |

## Additional Petroleum Hydrocarbon Specific Qualifiers

| | |
|---|---|
| F | The chromatographic fingerprint of the sample matches the elution pattern of the calibration standard. |
| L | The chromatographic fingerprint of the sample resembles a petroleum product, but the elution pattern indicates the presence of a greater amount of lighter molecular weight constituents than the calibration standard. |
| H | The chromatographic fingerprint of the sample resembles a petroleum product, but the elution pattern indicates the presence of a greater amount of heavier molecular weight constituents than the calibration standard. |
| O | The chromatographic fingerprint of the sample resembles an oil, but does not match the calibration standard. |
| Y | The chromatographic fingerprint of the sample resembles a petroleum product eluting in approximately the correct carbon range, but the elution pattern does not match the calibration standard. |
| Z | The chromatographic fingerprint does not resemble a petroleum product. |

## COLUMBIA ANALYTICAL SERVICES, INC.

| | | | |
|---|---|---|---|
| **Client:** | J.H. Baxter & Company | **Service Request No.:** | K0502965 |
| **Project:** | Arlington Landfill Wells | **Date Received:** | 08/11/05 |
| **Sample Matrix:** | Water | | |

## CASE NARRATIVE

All analyses were performed consistent with the quality assurance program of Columbia Analytical Services, Inc. (CAS). This report contains analytical results for samples designated for Tier III validation deliverables including summary forms and all of the associated raw data for each of the analyses. When appropriate to the method, method blank results have been reported with each analytical test.

### Sample Receipt

Two water samples were received for analysis at Columbia Analytical Services on 08/11//05. The samples were received in good condition and consistent with the accompanying chain of custody form. The samples were stored in a refrigerator at 4°C upon receipt at the laboratory.

### General Chemistry Parameters

**Chemical Oxygen Demand by EPA Method 410.2:**
The Relative Percent Difference (RPD) criterion for the replicate analysis of Chemical Oxygen Demand in sample BXS-4 is not applicable because the analyte concentration was not significantly greater than the Method Reporting Limit (MRL). Analytical values derived from measurements close to the detection limit are not subject to the same accuracy and precision criteria as results derived from measurements higher on the calibration range for the method.

No other anomalies associated with the analysis of these samples were observed

### Dissolved Metals

No anomalies associated with the analysis of these samples were observed

**Approved by** EWW **Date** 9/16/05

**Columbia Analytical Services Inc.**
**Cooler Receipt and Preservation Form**

PC EA

SHORT HOLD TIME

Project/Client J.H. Baxter Work Order K05 [illegible]

Cooler received on 8.11.05 and opened on 8-11-05 by DW

| | | | | | | |
|---|---|---|---|---|---|---|
| 1. | Were custody seals on outside of coolers? If yes, how many and where? 1 front | | | | | Y N |
| 2. | Were custody seals intact? | | | | | Y N |
| 3. | Were signature and date present on the custody seals? | | | | | Y N |
| 4. | Is the shipper's airbill available and filed? If no, record airbill number: CAS courier greyhound | | | | | Y N |
| 5. | COC# | | | | | |
| | **Temperature of cooler(s) upon receipt: (°C)** | 5.8 | | | | |
| | **Temperature Blank: (°C)** | 5.3 | | | | |
| | Were samples hand delivered on the same day as collection? | | | | | Y N |
| 6. | Were custody papers properly filled out (ink, signed, etc.)? | | | | | Y N |
| 7. | Type of packing material present ICE | | | | | |
| **8.** | **Did all bottles arrive in good condition (unbroken)?** | | | | | Y N |
| 9. | Were all bottle labels complete (i.e analysis, preservation, etc.)? | | | | | Y N |
| 10. | Did all bottle labels and tags agree with custody papers? | | | | | Y N |
| **11.** | **Were the correct types of bottles used for the tests indicated?** | | | | | Y N |
| 12. | Were all of the preserved bottles received at the lab with the appropriate pH? | | | | | Y N |
| 13. | Were VOA vials checked for absence of air bubbles, and if present, noted below? | | | | | Y N |
| 14. | Did the bottles originate from CAS/K or a branch laboratory? | | | | | Y N |
| **15.** | **Are CWA Microbiology samples received with >1/2 the 24hr. hold time remaining from collection?** | | | | | Y N |
| 16. | Was C12/Res negative? | | | | | Y N |

Explain any discrepancies: _____

RESOLUTION: _____

Samples that required preservation or received out of temperature:

| Sample ID | Reagent | Volume | Lot Number | Bottle Type | Rec'd out of Temperature | Initials |
|---|---|---|---|---|---|---|
| | | | | | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |

# COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

**Client :** JH Baxter & Company
**Project Name :** Arlington Landfill Wells
**Project Number :** BXS-Wells-Landfill
**Sample Matrix :** WATER

**Service Request :** K0502965
**Date Collected :** 08/09,10/05
**Date Received :** 08/11/05

## Ammonia as Nitrogen

Analysis Method 350.1
Test Notes :

Units : mg/L (ppm)
Basis : NA

| Sample Name | Lab Code | MRL | MDL | Dilution Factor | Date Analyzed | Result | Result Notes |
|---|---|---|---|---|---|---|---|
| BXS-4 | K0502965-001 | 0.05 | 0.02 | 1 | 08/15/05 | 0.50 | |
| BXS-6 | K0502965-002 | 0.05 | 0.02 | 1 | 08/15/05 | 0.50 | |
| BXS-1 | K0502965-003 | 0.05 | 0.02 | 1 | 08/15/05 | ND | |
| BXS-2 | K0502965-004 | 0.05 | 0.02 | 1 | 08/15/05 | 0.03 | J |
| BXS-3 | K0502965-005 | 0.05 | 0.02 | 1 | 08/15/05 | 0.74 | |
| BXS-5 | K0502965-006 | 0.05 | 0.02 | 1 | 08/15/05 | ND | |
| Method Blank | K0502965-MB | 0.05 | 0.02 | 1 | 08/15/05 | ND | |

# COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

| | | | |
|---|---|---|---|
| **Client :** | JH Baxter & Company | **Service Request :** | K0502965 |
| **Project Name :** | Arlington Landfill Wells | **Date Collected :** | 08/09,10/05 |
| **Project Number :** | BXS-Wells-Landfill | **Date Received :** | 08/11/05 |
| **Sample Matrix :** | WATER | | |

## Chloride

Units : mg/L (ppm)
Analysis Method 300.0 Basis : NA
Test Notes :

| Sample Name | Lab Code | MRL | MDL | Dilution Factor | Date Analyzed | Result | Result Notes |
|---|---|---|---|---|---|---|---|
| BXS-4 | K0502965-001 | 0.2 | 0.04 | 2 | 08/15/05 | 1.7 | |
| BXS-6 | K0502965-002 | 0.2 | 0.04 | 2 | 08/15/05 | 1.7 | |
| BXS-1 | K0502965-003 | 0.2 | 0.04 | 2 | 08/15/05 | 5.4 | |
| BXS-2 | K0502965-004 | 0.2 | 0.04 | 2 | 08/15/05 | 4.2 | |
| BXS-3 | K0502965-005 | 0.2 | 0.04 | 2 | 08/15/05 | 3.6 | |
| BXS-5 | K0502965-006 | 0.2 | 0.04 | 2 | 08/15/05 | ND | |
| Method Blank | K0502965-MB | 0.2 | 0.02 | 1 | 08/15/05 | ND | |

# COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

**Client :** JH Baxter & Company
**Project Name :** Arlington Landfill Wells
**Project Number :** BXS-Wells-Landfill
**Sample Matrix :** WATER

**Service Request :** K0502965
**Date Collected :** 08/09,10/05
**Date Received :** 08/11/05

Sulfate

Analysis Method 300.0
Test Notes :

Units : mg/L (ppm)
Basis : NA

| Sample Name | Lab Code | MRL | MDL | Dilution Factor | Date Analyzed | Result | Result Notes |
|---|---|---|---|---|---|---|---|
| BXS-4 | K0502965-001 | 0.2 | 0.1 | 2 | 08/15/05 | 0.9 | |
| BXS-6 | K0502965-002 | 0.2 | 0.1 | 2 | 08/15/05 | 1.0 | |
| BXS-1 | K0502965-003 | 0.2 | 0.1 | 2 | 08/15/05 | 8.3 | |
| BXS-2 | K0502965-004 | 0.2 | 0.1 | 2 | 08/15/05 | ND | |
| BXS-3 | K0502965-005 | 0.2 | 0.1 | 2 | 08/15/05 | ND | |
| BXS-5 | K0502965-006 | 0.2 | 0.1 | 2 | 08/15/05 | ND | |
| Method Blank | K0502965-MB | 0.2 | 0.06 | 1 | 08/15/05 | ND | |

# COLUMBIA ANALYTICAL SERVICES, INC.

## Analytical Report

**Client :** JH Baxter & Company
**Project Name :** Arlington Landfill Wells
**Project Number :** BXS-Wells-Landfill
**Sample Matrix :** WATER

**Service Request :** K0502965
**Date Collected :** 08/09,10/05
**Date Received :** 08/11/05

## Chemical Oxygen Demand

Analysis Method 410.2
Test Notes :

Units : mg/L (ppm)
Basis : NA

| Sample Name | Lab Code | MRL | MDL | Dilution Factor | Date Analyzed | Result | Result Notes |
|---|---|---|---|---|---|---|---|
| BXS-4 | K0502965-001 | 5 | 2 | 1 | 08/19/05 | 2 | J |
| BXS-6 | K0502965-002 | 5 | 2 | 1 | 08/19/05 | ND | |
| BXS-1 | K0502965-003 | 5 | 2 | 1 | 08/19/05 | 13 | |
| BXS-2 | K0502965-004 | 5 | 2 | 1 | 08/19/05 | 36 | |
| BXS-3 | K0502965-005 | 5 | 2 | 1 | 08/19/05 | 71 | |
| BXS-5 | K0502965-006 | 5 | 2 | 1 | 08/19/05 | ND | |
| Method Blank | K0502965-MB | 5 | 2 | 1 | 08/19/05 | ND | |

# COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

**Client :** JH Baxter & Company
**Project Name :** Arlington Landfill Wells
**Project Number :** BXS-Wells-Landfill
**Sample Matrix :** WATER

**Service Request :** K0502965
**Date Collected :** 08/09,10/05
**Date Received :** 08/11/05

## Conductivity

Analysis Method 120.1
Test Notes :

Units : uMhos/cm
Basis : NA

| Sample Name | Lab Code | MRL | MDL | Dilution Factor | Date Analyzed | Result | Result Notes |
|---|---|---|---|---|---|---|---|
| BXS-4 | K0502965-001 | 2 | 0.04 | 1 | 08/25/05 | 190 | |
| BXS-6 | K0502965-002 | 2 | 0.04 | 1 | 08/25/05 | 192 | |
| BXS-1 | K0502965-003 | 2 | 0.04 | 1 | 08/25/05 | 418 | |
| BXS-2 | K0502965-004 | 2 | 0.04 | 1 | 08/25/05 | 799 | |
| BXS-3 | K0502965-005 | 2 | 0.04 | 1 | 08/25/05 | 741 | |
| BXS-5 | K0502965-006 | 2 | 0.04 | 1 | 08/25/05 | ND | |
| Method Blank | K0502965-MB | 2 | 0.04 | 1 | 08/25/05 | ND | |

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

**Client :** JH Baxter & Company
**Project Name :** Arlington Landfill Wells
**Project Number :** BXS-Wells-Landfill
**Sample Matrix :** WATER

**Service Request :** K0502965
**Date Collected :** 08/09,10/05
**Date Received :** 08/11/05

Nitrate+Nitrite as Nitrogen

Analysis Method 353.2
Test Notes :

Units : mg/L (ppm)
Basis : NA

| Sample Name | Lab Code | MRL | MDL | Dilution Factor | Date Analyzed | Result | Result Notes |
|---|---|---|---|---|---|---|---|
| BXS-4 | K0502965-001 | 0.05 | 0.003 | 1 | 08/22/05 | ND | |
| BXS-6 | K0502965-002 | 0.05 | 0.003 | 1 | 08/22/05 | ND | |
| BXS-1 | K0502965-003 | 0.05 | 0.003 | 1 | 08/22/05 | 0.95 | |
| BXS-2 | K0502965-004 | 0.05 | 0.003 | 1 | 08/22/05 | 0.01 | J |
| BXS-3 | K0502965-005 | 0.05 | 0.003 | 1 | 08/22/05 | 0.02 | J |
| BXS-5 | K0502965-006 | 0.05 | 0.003 | 1 | 08/22/05 | ND | |
| Method Blank | K0502965-MB | 0.05 | 0.003 | 1 | 08/22/05 | ND | |

# COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

**Client :** JH Baxter & Company
**Project Name :** Arlington Landfill Wells
**Project Number :** BXS-Wells-Landfill
**Sample Matrix :** WATER

**Service Request :** K0502965
**Date Collected :** 08/09,10/05
**Date Received :** 08/11/05

## pH

Units : pH UNITS
Basis : NA

Analysis Method 150.1
Test Notes :

| Sample Name | Lab Code | MRL | MDL | Dilution Factor | Date Analyzed | Result | Result Notes |
|---|---|---|---|---|---|---|---|
| 3XS-4 | K0502965-001 | - | - | 1 | 08/11/05 | 7.98 | |
| 3XS-6 | K0502965-002 | - | - | 1 | 08/11/05 | 8.02 | |
| BXS-1 | K0502965-003 | - | - | 1 | 08/11/05 | 6.28 | |
| 3XS-2 | K0502965-004 | - | - | 1 | 08/11/05 | 6.54 | |
| 3XS-3 | K0502965-005 | - | - | 1 | 08/11/05 | 6.67 | |
| BXS-5 | K0502965-006 | - | - | 1 | 08/11/05 | 5.95 | |

# COLUMBIA ANALYTICAL SERVICES, INC.

## Analytical Report

**Client :** JH Baxter & Company
**Project Name :** Arlington Landfill Wells
**Project Number :** BXS-Wells-Landfill
**Sample Matrix :** WATER

**Service Request :** K0502965
**Date Collected :** 08/09,10/05
**Date Received :** 08/11/05

## Tannin and Lignin

Analysis Method SM 5550 B
Test Notes :

Units : mg/L (ppm)
Basis : NA

| Sample Name | Lab Code | MRL | MDL | Dilution Factor | Date Analyzed | Result | Result Notes |
|---|---|---|---|---|---|---|---|
| BXS-4 | K0502965-001 | 0.2 | 0.03 | 1 | 08/18/05 | 0.4 | |
| BXS-6 | K0502965-002 | 0.2 | 0.03 | 1 | 08/18/05 | 0.4 | |
| BXS-1 | K0502965-003 | 0.2 | 0.03 | 1 | 08/18/05 | 0.2 | |
| BXS-2 | K0502965-004 | 0.2 | 0.03 | 1 | 08/18/05 | 1.0 | |
| BXS-3 | K0502965-005 | 0.2 | 0.06 | 2 | 08/18/05 | 8.7 | |
| BXS-5 | K0502965-006 | 0.2 | 0.03 | 1 | 08/18/05 | 0.05 | J |
| Method Blank | K0502965-MB | 0.2 | 0.03 | 1 | 08/18/05 | ND | |

SM Standard Methods for the Examination of Water and Wastewater, 19th Ed., 1995.

# COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

**Client :** JH Baxter & Company
**Project Name :** Arlington Landfill Wells
**Project Number :** BXS-Wells-Landfill
**Sample Matrix :** WATER

**Service Request :** K0502965
**Date Collected :** 08/09,10/05
**Date Received :** 08/11/05

## Carbon, Total Organic

Analysis Method 415.1
Test Notes :

Units : mg/L (ppm)
Basis : NA

| Sample Name | Lab Code | MRL | MDL | Dilution Factor | Date Analyzed | Result | Result Notes |
|---|---|---|---|---|---|---|---|
| BXS-4 | K0502965-001 | 0.5 | 0.1 | 1 | 08/23/05 | 1.1 | |
| BXS-6 | K0502965-002 | 0.5 | 0.1 | 1 | 08/23/05 | 1.0 | |
| BXS-1 | K0502965-003 | 0.5 | 0.1 | 1 | 08/23/05 | 6.5 | |
| BXS-2 | K0502965-004 | 5.0 | 1.0 | 10 | 08/23/05 | 17.0 | |
| BXS-3 | K0502965-005 | 5.0 | 1.0 | 10 | 08/23/05 | 29.9 | |
| BXS-5 | K0502965-006 | 0.5 | 0.1 | 1 | 08/23/05 | 0.2 | J |
| Method Blank | K0502965-MB | 0.5 | 0.1 | 1 | 08/23/05 | ND | |

SM Standard Methods for the Examination of Water and Wastewater, 19th Ed., 1995.

# DISSOLVED METALS

## - Cover Page -
## INORGANIC ANALYSIS DATA PACKAGE

Client: JH Baxter & Company

Service Request: K0502965

Project No.: BXS-Wells-Landfill

Project Name: Arlington Landfill Wells

| Sample No. | Lab Sample ID. |
|---|---|
| BXS-4 | K0502965-001 DISS |
| BXS-4D | K0502965-001D DISS |
| BXS-4S | K0502965-001S DISS |
| BXS-6 | K0502965-002 DISS |
| BXS-1 | K0502965-003 DISS |
| BXS-2 | K0502965-004 DISS |
| BXS-3 | K0502965-005 DISS |
| BXS-5 | K0502965-006 DISS |
| Method Blank | K0502965-MB |

Were ICP interelement corrections applied? Yes/No YES

Were ICP background corrections applied? Yes/No YES

If yes-were raw data generated before application of background corrections? Yes/No NO

Comments:

Signature: [signature]

Date: 9/6/05

# DISSOLVED METALS
## -1-
## INORGANIC ANALYSIS DATA SHEET

Client: JH Baxter & Company
Project No.: BXS-Wells-Landfill
Project Name: Arlington Landfill Wells
Matrix: WATER

Service Request: K0502965
Date Collected: 08/09/05
Date Received: 08/11/05
Units: MG/L
Basis: NA

Sample Name: BXS-4
Lab Code: K0502965-001 DISS

| Analyte | Analysis Method | MRL | MDL | Dil. | Date Extracted | Date Analyzed | Result | C | Q |
|---|---|---|---|---|---|---|---|---|---|
| Arsenic | 7060A | 0.005 | 0.001 | 1 | 8/29/05 | 9/1/05 | 0.004 | B | |
| Barium | 6010B | 0.0050 | 0.0007 | 1 | 8/29/05 | 9/3/05 | 0.0280 | | |
| Cadmium | 6010B | 0.0050 | 0.0003 | 1 | 8/29/05 | 9/3/05 | 0.0008 | B | |
| Copper | 6010B | 0.010 | 0.008 | 1 | 8/29/05 | 9/3/05 | 0.008 | U | |
| Iron | 6010B | 0.020 | 0.004 | 1 | 8/29/05 | 9/3/05 | 0.041 | | |
| Manganese | 6010B | 0.0050 | 0.0002 | 1 | 8/29/05 | 9/3/05 | 0.1070 | | |
| Nickel | 6010B | 0.020 | 0.002 | 1 | 8/29/05 | 9/3/05 | 0.002 | U | |
| Zinc | 6010B | 0.010 | 0.002 | 1 | 8/29/05 | 9/3/05 | 0.002 | U | |

% Solids: 0.0

Comments:

# DISSOLVED METALS

-1-

## INORGANIC ANALYSIS DATA SHEET

Client: JH Baxter & Company
Project No.: BXS-Wells-Landfill
Project Name: Arlington Landfill Wells
Matrix: WATER

Service Request: K0502965
Date Collected: 08/09/05
Date Received: 08/11/05
Units: MG/L
Basis: NA

Sample Name: BXS-6

Lab Code: K0502965-002 DISS

| Analyte | Analysis Method | MRL | MDL | Dil. | Date Extracted | Date Analyzed | Result | C | Q |
|---|---|---|---|---|---|---|---|---|---|
| Arsenic | 7060A | 0.005 | 0.001 | 1 | 8/29/05 | 9/1/05 | 0.005 | B | |
| Barium | 6010B | 0.0050 | 0.0007 | 1 | 8/29/05 | 9/3/05 | 0.0284 | | |
| Cadmium | 6010B | 0.0050 | 0.0003 | 1 | 8/29/05 | 9/3/05 | 0.0003 | B | |
| Copper | 6010B | 0.010 | 0.008 | 1 | 8/29/05 | 9/3/05 | 0.008 | U | |
| Iron | 6010B | 0.020 | 0.004 | 1 | 8/29/05 | 9/3/05 | 0.040 | | |
| Manganese | 6010B | 0.0050 | 0.0002 | 1 | 8/29/05 | 9/3/05 | 0.1070 | | |
| Nickel | 6010B | 0.020 | 0.002 | 1 | 8/29/05 | 9/3/05 | 0.002 | U | |
| Zinc | 6010B | 0.010 | 0.002 | 1 | 8/29/05 | 9/3/05 | 0.002 | U | |

% Solids: 0.0

Comments:

# DISSOLVED METALS
## -1-
## INORGANIC ANALYSIS DATA SHEET

| | | | |
|---|---|---|---|
| Client: | JH Baxter & Company | Service Request: | K0502965 |
| Project No.: | BXS-Wells-Landfill | Date Collected: | 08/09/05 |
| Project Name: | Arlington Landfill Wells | Date Received: | 08/11/05 |
| Matrix: | WATER | Units: | MG/L |
| | | Basis: | NA |

Sample Name: BXS-1 Lab Code: K0502965-003 DISS

| Analyte | Analysis Method | MRL | MDL | Dil. | Date Extracted | Date Analyzed | Result | C | Q |
|---|---|---|---|---|---|---|---|---|---|
| Arsenic | 7060A | 0.005 | 0.001 | 1 | 8/29/05 | 9/1/05 | 0.001 | U | |
| Barium | 6010B | 0.0050 | 0.0007 | 1 | 8/29/05 | 9/3/05 | 0.0230 | | |
| Cadmium | 6010B | 0.0050 | 0.0003 | 1 | 8/29/05 | 9/3/05 | 0.0003 | U | |
| Copper | 6010B | 0.010 | 0.008 | 1 | 8/29/05 | 9/3/05 | 0.008 | U | |
| Iron | 6010B | 0.020 | 0.004 | 1 | 8/29/05 | 9/3/05 | 0.005 | B | |
| Manganese | 6010B | 0.0050 | 0.0002 | 1 | 8/29/05 | 9/3/05 | 0.1600 | | |
| Nickel | 6010B | 0.020 | 0.002 | 1 | 8/29/05 | 9/3/05 | 0.011 | B | |
| Zinc | 6010B | 0.010 | 0.002 | 1 | 8/29/05 | 9/3/05 | 0.005 | B | |

% Solids: 0.0

Comments:

# DISSOLVED METALS

-1-

## INORGANIC ANALYSIS DATA SHEET

Client: JH Baxter & Company
Project No.: BXS-Wells-Landfill
Project Name: Arlington Landfill Wells
Matrix: WATER

Service Request: K0502965
Date Collected: 08/10/05
Date Received: 08/11/05
Units: MG/L
Basis: NA

Sample Name: BXS-2
Lab Code: K0502965-004 DISS

| Analyte | Analysis Method | MRL | MDL | Dil. | Date Extracted | Date Analyzed | Result | C | Q |
|---|---|---|---|---|---|---|---|---|---|
| Arsenic | 7060A | 0.005 | 0.001 | 1 | 8/29/05 | 9/1/05 | 0.001 | U | |
| Barium | 6010B | 0.0050 | 0.0007 | 1 | 8/29/05 | 9/3/05 | 0.0419 | | |
| Cadmium | 6010B | 0.0050 | 0.0003 | 1 | 8/29/05 | 9/3/05 | 0.0003 | B | |
| Copper | 6010B | 0.010 | 0.008 | 1 | 8/29/05 | 9/3/05 | 0.008 | U | |
| Iron | 6010B | 0.020 | 0.004 | 1 | 8/29/05 | 9/3/05 | 0.732 | | |
| Manganese | 6010B | 0.0050 | 0.0002 | 1 | 8/29/05 | 9/3/05 | 1.3000 | | |
| Nickel | 6010B | 0.020 | 0.002 | 1 | 8/29/05 | 9/3/05 | 0.032 | | |
| Zinc | 6010B | 0.010 | 0.002 | 1 | 8/29/05 | 9/3/05 | 0.015 | | |

% Solids: 0.0

Comments:

# DISSOLVED METALS
## -1-
## INORGANIC ANALYSIS DATA SHEET

| | | | |
|---|---|---|---|
| Client: | JH Baxter & Company | Service Request: | K0502965 |
| Project No.: | BXS-Wells-Landfill | Date Collected: | 08/10/05 |
| Project Name: | Arlington Landfill Wells | Date Received: | 08/11/05 |
| Matrix: | WATER | Units: | MG/L |
| | | Basis: | NA |

Sample Name: BXS-3 Lab Code: K0502965-005 DISS

| Analyte | Analysis Method | MRL | MDL | Dil. | Date Extracted | Date Analyzed | Result | C | Q |
|---|---|---|---|---|---|---|---|---|---|
| Arsenic | 7060A | 0.005 | 0.001 | 1 | 8/29/05 | 9/1/05 | 0.009 | | |
| Barium | 6010B | 0.0050 | 0.0007 | 1 | 8/29/05 | 9/3/05 | 0.0944 | | |
| Cadmium | 6010B | 0.0050 | 0.0003 | 1 | 8/29/05 | 9/3/05 | 0.0014 | B | |
| Copper | 6010B | 0.010 | 0.008 | 1 | 8/29/05 | 9/3/05 | 0.008 | U | |
| Iron | 6010B | 0.020 | 0.004 | 1 | 8/29/05 | 9/3/05 | 18.3 | | |
| Manganese | 6010B | 0.0050 | 0.0002 | 1 | 8/29/05 | 9/3/05 | 14.1 | | |
| Nickel | 6010B | 0.020 | 0.002 | 1 | 8/29/05 | 9/3/05 | 0.025 | | |
| Zinc | 6010B | 0.010 | 0.002 | 1 | 8/29/05 | 9/3/05 | 0.005 | B | |

% Solids: 0.0

Comments:

# DISSOLVED METALS

-1-

## INORGANIC ANALYSIS DATA SHEET

| | | | |
|---|---|---|---|
| Client: | JH Baxter & Company | Service Request: | K0502965 |
| Project No.: | BXS-Wells-Landfill | Date Collected: | 08/10/05 |
| Project Name: | Arlington Landfill Wells | Date Received: | 08/11/05 |
| Matrix: | WATER | Units: | MG/L |
| | | Basis: | NA |

Sample Name: BXS-5 Lab Code: K0502965-006 DISS

| Analyte | Analysis Method | MRL | MDL | Dil. | Date Extracted | Date Analyzed | Result | C | Q |
|---|---|---|---|---|---|---|---|---|---|
| Arsenic | 7060A | 0.005 | 0.001 | 1 | 8/29/05 | 9/1/05 | 0.001 | U | |
| Barium | 6010B | 0.0050 | 0.0007 | 1 | 8/29/05 | 9/3/05 | 0.0007 | U | |
| Cadmium | 6010B | 0.0050 | 0.0003 | 1 | 8/29/05 | 9/3/05 | 0.0003 | U | |
| Copper | 6010B | 0.010 | 0.008 | 1 | 8/29/05 | 9/3/05 | 0.008 | U | |
| Iron | 6010B | 0.020 | 0.004 | 1 | 8/29/05 | 9/3/05 | 0.004 | U | |
| Manganese | 6010B | 0.0050 | 0.0002 | 1 | 8/29/05 | 9/3/05 | 0.0003 | B | |
| Nickel | 6010B | 0.020 | 0.002 | 1 | 8/29/05 | 9/3/05 | 0.002 | U | |
| Zinc | 6010B | 0.010 | 0.002 | 1 | 8/29/05 | 9/3/05 | 0.002 | U | |

% Solids: 0.0

Comments:

# DISSOLVED METALS
## -1-
## INORGANIC ANALYSIS DATA SHEET

Client: JH Baxter & Company
Project No.: BXS-Wells-Landfill
Project Name: Arlington Landfill Wells
Matrix: WATER

Service Request: K0502965
Date Collected:
Date Received:
Units: MG/L
Basis: NA

Sample Name: Method Blank
Lab Code: K0502965-MB

| Analyte | Analysis Method | MRL | MDL | Dil. | Date Extracted | Date Analyzed | Result | C | Q |
|---|---|---|---|---|---|---|---|---|---|
| Arsenic | 7060A | 0.005 | 0.001 | 1 | 8/29/05 | 9/1/05 | 0.001 | U | |
| Barium | 6010B | 0.0050 | 0.0007 | 1 | 8/29/05 | 9/3/05 | 0.0007 | U | |
| Cadmium | 6010B | 0.0050 | 0.0003 | 1 | 8/29/05 | 9/3/05 | 0.0003 | U | |
| Copper | 6010B | 0.010 | 0.008 | 1 | 8/29/05 | 9/3/05 | 0.008 | U | |
| Iron | 6010B | 0.020 | 0.004 | 1 | 8/29/05 | 9/3/05 | 0.004 | U | |
| Manganese | 6010B | 0.0050 | 0.0002 | 1 | 8/29/05 | 9/3/05 | 0.0002 | U | |
| Nickel | 6010B | 0.020 | 0.002 | 1 | 8/29/05 | 9/3/05 | 0.002 | U | |
| Zinc | 6010B | 0.010 | 0.002 | 1 | 8/29/05 | 9/3/05 | 0.002 | U | |

% Solids: 0.0

Comments:

1317 South 13th Avenue P.O. Box 479 Kelso, Washington 98626 (360) 577-7222 (360) 636-1068 fax

Columbia Analytical Services
An Employee - Owned Company

RECEIVED
1-3-06
KP

December 30, 2005 Service Request No: K0506270

Mary Larson
JH Baxter & Company
6520 188th Northeast
P.O. Box 305
Arlington, WA 98233

**RE: Arlington Landfill Wells**

Dear Mary:

Enclosed are the results of the sample(s) submitted to our laboratory on December 2, 2005. For your reference, these analyses have been assigned our service request number K0506270.

All analyses were performed according to our laboratory's quality assurance program. The test results meet requirements of the NELAC standards except as noted in the case narrative report. 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 items submitted to the laboratory for analysis and individual items (samples) analyzed, as listed in the report.

Please call if you have any questions. My extension is 3291.

Respectfully submitted,

**Columbia Analytical Services, Inc.**

for

Ed Wallace
Project Chemist

EW/jeb

# CHAIN OF CUSTODY

SR#: K0506270

Columbia Analytical Services INC.
An Employee - Owned Company

1317 South 13th Ave. • Kelso, WA 98626 • (360) 577-7222 • (800) 695-7222x07 • FAX (360) 636-1068

PAGE 1 OF 1 COC #

PROJECT NAME: TH Bastendorf Co
PROJECT NUMBER: Landfill Wells
PROJECT MANAGER: Mary Pearson
COMPANY/ADDRESS: 6520 188th St NE
PO Box 305
CITY/STATE/ZIP: Arlington WA 98223
E-MAIL ADDRESS:
PHONE #: 360 435-2446 FAX: 360 435-3035
SAMPLER'S SIGNATURE: Mary Pearson

| SAMPLE I.D. | DATE | TIME | LAB I.D. | MATRIX | NUMBER OF CONTAINERS | REMARKS |
|---|---|---|---|---|---|---|
| BXS-1 | 11-30-05 | 14:50 | | Water | 3 | |
| BXS-2 | 12-1-05 | 12:15 | | | 3 | |
| BXS-3 | 12-1-05 | 13:05 | | | 3 | |
| BXS-4 | 11-30-05 | 10:45 | | | 3 | |
| BXS-5 | 12-1-05 | 10:30 | | | 3 | |
| BXS-6 | 11-30-05 | 11:00 | | | 3 | |

Semivolatile Organics by GC/MS 625 ☐ 8270 ☐ 8270LL ☐
Volatile Organics 624 ☐ 8260 ☐
Hydrocarbons Gas ☐ 8021 ☐ BTEX ☐ Diesel ☐ (*see below) Oil ☐
☐ Fuel Fingerprint (FIQ) ☐ NW-HCID Screen
Oil & Grease/TPH 1664 HEM ☐ 1664 SGT ☐
PCB's Aroclors ☐ Congeners ☐
Pesticides/Herbicides 608 ☐ 8081A ☐ 8141A ☐ 8151A ☐
Chlorophenolics Tri ☐ Tetra ☐ - 8151M PCP ☐
PAHs 8310 ☐ SIM ☐
Metals (See list below) Total ☐ Dissolved ☐
Cyanide ☐
Hex-Chrom ☐
pH, Cond, (circle) $SO_4$, $PO_4$, $F$, $NO_3$, $NH_3$-N, COD, TSS, TDS, BOD
DOC (circle) Total-P, TKN, $NO_2$+$NO_3$
TOX 9020 ☐ AOX 1650 ☐ 506 ☐
Tannin/Lignin

**REPORT REQUIREMENTS**

X I. Routine Report: Method Blank, Surrogate, as required
___ II. Report Dup., MS, MSD as required
___ III. Data Validation Report (includes all raw data)
___ IV. CLP Deliverable Report
___ V. EDD

**INVOICE INFORMATION**

P.O. #
Bill To: TH Bastendorf Co
PO Box 10447
Eugene, OR 97440

**TURNAROUND REQUIREMENTS**

___ 24 hr. ___ 48 hr.
___ 5 Day
X Standard (10-15 working days)
___ Provide FAX Results

Requested Report Date

Circle which metals are to be analyzed:

Total Metals: Al As Sb Ba Be B Ca Cd Co Cr Cu Fe Pb Mg Mn Mo Ni K Ag Na Se Sr Tl Sn V Zn Hg

Dissolved Metals: Al (As) Sb (Ba) Be B Ca (Cd) Co Cr (Cu) (Fe) Pb Mg (Mn) Mo (Ni) K Ag Na Se Sr Tl Sn V (Zn) Hg

*INDICATE STATE HYDROCARBON PROCEDURE: AK CA WI NORTHWEST OTHER:_____ (CIRCLE ONE)

SPECIAL INSTRUCTIONS/COMMENTS:

| RELINQUISHED BY: | RECEIVED BY: | RELINQUISHED BY: | RECEIVED BY: |
|---|---|---|---|
| Signature: Mary Pearson | Signature: [illegible] | Signature | Signature |
| Date/Time: 12-1-05 16:00 | Date/Time: 12/2/05 1030 | Date/Time | Date/Time |
| Printed Name: Mary Pearson | Printed Name: [illegible] | Printed Name | Printed Name |
| Firm: TH Bastendorf | Firm: CAS | Firm | Firm |

## Acronyms

| | |
|---|---|
| ASTM | American Society for Testing and Materials |
| A2LA | American Association for Laboratory Accreditation |
| CARB | California Air Resources Board |
| CAS Number | Chemical Abstract Service registry Number |
| CFC | Chlorofluorocarbon |
| CFU | Colony-Forming Unit |
| DEC | Department of Environmental Conservation |
| DEQ | Department of Environmental Quality |
| DHS | Department of Health Services |
| DOE | Department of Ecology |
| DOH | Department of Health |
| EPA | U. S. Environmental Protection Agency |
| ELAP | Environmental Laboratory Accreditation Program |
| GC | Gas Chromatography |
| GC/MS | Gas Chromatography/Mass Spectrometry |
| LUFT | Leaking Underground Fuel Tank |
| M | Modified |
| MCL | Maximum Contaminant Level is the highest permissible concentration of a substance allowed in drinking water as established by the USEPA. |
| MDL | Method Detection Limit |
| MPN | Most Probable Number |
| MRL | Method Reporting Limit |
| NA | Not Applicable |
| NC | Not Calculated |
| NCASI | National Council of the Paper Industry for Air and Stream Improvement |
| ND | Not Detected |
| NIOSH | National Institute for Occupational Safety and Health |
| PQL | Practical Quantitation Limit |
| RCRA | Resource Conservation and Recovery Act |
| SIM | Selected Ion Monitoring |
| TPH | Total Petroleum Hydrocarbons |
| tr | Trace level is the concentration of an analyte that is less than the PQL but greater than or equal to the MDL. |

## Inorganic Data Qualifiers

| | |
|---|---|
| * | The result is an outlier. See case narrative. |
| # | The control limit criteria is not applicable. See case narrative. |
| B | The analyte was found in the associated method blank at a level that is significant relative to the sample result. |
| E | The result is an estimate amount because the value exceeded the instrument calibration range. |
| J | The result is an estimated concentration that is less than the MRL but greater than or equal to the MDL. |
| U | The compound was analyzed for, but was not detected ("Non-detect") at or above the MRL/MDL. |
| i | The MRL/MDL has been elevated due to a matrix interference. |
| X | See case narrative. |

## Metals Data Qualifiers

| | |
|---|---|
| # | The control limit criteria is not applicable. See case narrative. |
| B | The result is an estimated concentration that is less than the MRL but greater than or equal to the MDL. |
| E | The percent difference for the serial dilution was greater than 10%, indicating a possible matrix interference in the sample. |
| M | The duplicate injection precision was not met. |
| N | The Matrix Spike sample recovery is not within control limits. See case narrative. |
| S | The reported value was determined by the Method of Standard Additions (MSA). |
| U | The compound was analyzed for, but was not detected ("Non-detect") at or above the MRL/MDL. |
| W | The post-digestion spike for furnace AA analysis is out of control limits, while sample absorbance is less than 50% of spike absorbance. |
| i | The MRL/MDL has been elevated due to a matrix interference. |
| X | See case narrative. |
| * | The duplicate analysis not within control limits. See case narrative. |
| + | The correlation coefficient for the MSA is less than 0.995. |

## Organic Data Qualifiers

| | |
|---|---|
| * | The result is an outlier. See case narrative. |
| # | The control limit criteria is not applicable. See case narrative. |
| A | A tentatively identified compound, a suspected aldol-condensation product. |
| B | The analyte was found in the associated method blank at a level that is significant relative to the sample result. |
| C | The analyte was qualitatively confirmed using GC/MS techniques, pattern recognition, or by comparing to historical data. |
| D | The reported result is from a dilution. |
| E | The result is an estimate amount because the value exceeded the instrument calibration range. |
| J | The result is an estimated concentration that is less than the MRL but greater than or equal to the MDL. |
| N | The result is presumptive. The analyte was tentatively identified, but a confirmation analysis was not performed. |
| P | The GC or HPLC confirmation criteria was exceeded. The relative percent difference is greater than 40% between the two analytical results (25% for CLP Pesticides). |
| U | The compound was analyzed for, but was not detected ("Non-detect") at or above the MRL/MDL. |
| i | The MRL/MDL has been elevated due to a chromatographic interference. |
| X | See case narrative. |

## Additional Petroleum Hydrocarbon Specific Qualifiers

| | |
|---|---|
| F | The chromatographic fingerprint of the sample matches the elution pattern of the calibration standard. |
| L | The chromatographic fingerprint of the sample resembles a petroleum product, but the elution pattern indicates the presence of a greater amount of lighter molecular weight constituents than the calibration standard. |
| H | The chromatographic fingerprint of the sample resembles a petroleum product, but the elution pattern indicates the presence of a greater amount of heavier molecular weight constituents than the calibration standard. |
| O | The chromatographic fingerprint of the sample resembles an oil, but does not match the calibration standard. |
| Y | The chromatographic fingerprint of the sample resembles a petroleum product eluting in approximately the correct carbon range, but the elution pattern does not match the calibration standard. |
| Z | The chromatographic fingerprint does not resemble a petroleum product. |

COLUMBIA ANALYTICAL SERVICES, INC.

| | | | |
|---|---|---|---|
| **Client:** | JH Baxter & Company | **Service Request No.:** | K0506270 |
| **Project:** | Arlington Landfill Wells | **Date Received:** | 12/2/05 |
| **Sample Matrix:** | Water | | |

## CASE NARRATIVE

All analyses were performed consistent with the quality assurance program of Columbia Analytical Services, Inc. (CAS). This report contains analytical results for samples designated for Tier III validation deliverables including summary forms and all of the associated raw data for each of the analyses. When appropriate to the method, method blank results have been reported with each analytical test.

### Sample Receipt

Six water samples were received for analysis at Columbia Analytical Services on 12/2/05 in good condition and consistent with the accompanying chain of custody form. The samples were stored in a refrigerator at 4°C upon receipt at the laboratory.

### General Chemistry Parameters

**Nitrate + Nitrite as Nitrogen by EPA Method 353.2:**
The Relative Percent Difference (RPD) criterion for the replicate analysis of Nitrate+Nitrite as Nitrogen in sample BXS-1 is not applicable because the analyte concentration was not significantly greater than the Method Reporting Limit (MRL). Analytical values derived from measurements close to the detection limit are not subject to the same accuracy and precision criteria as results derived from measurements higher on the calibration range for the method.

**Chloride by EPA Method 300.0:**
The matrix spike recovery of Chloride for sample Batch QC was outside control criteria because of suspected matrix interference. A Matrix Spike Duplicate (MSD) was also analyzed, but produced similar results. The results of the original analysis are reported. No further corrective action was appropriate.

### Dissolved Metals

No anomalies associated with the analysis of this batch were observed.

**Approved by** _____ **Date** 12/30/05

**Columbia Analytical Services Inc.**
**Cooler Receipt and Preservation Form**

PC Ed

Project/Client BARTEL Service Request K05 6270

Cooler received on 12/2/05 and opened on 12/2/05 by JD

| | | | |
|---|---|---|---|
| 1. | Were custody seals on outside of coolers? GH | (Y) | N |
| | If yes, how many and where? 1F | | |
| 2. | Were custody seals intact? | (Y) | N |
| 3. | Were signature and date present on the custody seals? | (Y) | N |
| 4. | Is the shipper's airbill available and filed? If no, record airbill number: | Y | (N) |
| 5. | COC# | | |
| | **Temperature of cooler(s) upon receipt: (°C)** 3.1 | | |
| | **Temperature Blank: (°C)** 5.6 | | |
| | Were samples hand delivered on the same day as collection? | ~~Y~~ | ~~N~~ |
| 6. | Were custody papers properly filled out (ink, signed, etc.)? | (Y) | N |
| 7. | Type of packing material present ICE | | |
| 8. | **Did all bottles arrive in good condition (unbroken)?** | (Y) | N |
| 9. | Were all bottle labels complete (i.e analysis, preservation, etc.)? | (Y) | N |
| 10. | Did all bottle labels and tags agree with custody papers? | (Y) | N |
| 11. | **Were the correct types of bottles used for the tests indicated?** | (Y) | N |
| 12. | Were all of the preserved bottles received at the lab with the appropriate pH? | (Y) | N |
| 13. | Were VOA vials checked for absence of air bubbles, and if present, noted below? | ~~Y~~ | ~~N~~ |
| 14. | Were the 1631 Mercury bottles checked for absence of air bubbles, and if present, noted below? | ~~Y~~ | ~~N~~ |
| 15. | Did the bottles originate from CAS/K or a branch laboratory? | (Y) | N |
| 16. | **Are CWA Microbiology samples received with >1/2 the 24hr. hold time remaining from collection?** | ~~Y~~ | ~~N~~ |
| 17. | Was C12/Res negative? | Y | N |

Explain any discrepancies: _____

RESOLUTION: _____

Samples that required preservation or received out of temperature:

| Sample ID | Reagent | Volume | Lot Number | Bottle Type | Rec'd out of Temperature | Initials |
|---|---|---|---|---|---|---|
| | | | | | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |

Analytical Report

**Client :** JH Baxter & Company
**Project Name :** Arlington Landfill Wells
**Project Number :** NA
**Sample Matrix :** WATER

**Service Request :** K0506270
**Date Collected :** 11/30,12/01/05
**Date Received :** 12/02/05

Ammonia as Nitrogen

Analysis Method 350.1
Test Notes :

Units : mg/L (ppm)
Basis : NA

| Sample Name | Lab Code | MRL | MDL | Dilution Factor | Date Analyzed | Result | Result Notes |
|---|---|---|---|---|---|---|---|
| BXS-1 | K0506270-001 | 0.05 | 0.02 | 1 | 12/13/05 | ND | |
| BXS-2 | K0506270-002 | 0.05 | 0.02 | 1 | 12/13/05 | ND | |
| BXS-3 | K0506270-003 | 0.05 | 0.02 | 1 | 12/13/05 | 0.17 | |
| BXS-4 | K0506270-004 | 0.05 | 0.02 | 1 | 12/13/05 | 0.49 | |
| BXS-5 | K0506270-005 | 0.05 | 0.02 | 1 | 12/13/05 | ND | |
| BXS-6 | K0506270-006 | 0.05 | 0.02 | 1 | 12/13/05 | 0.48 | |
| Method Blank | K0506270-MB | 0.05 | 0.02 | 1 | 12/13/05 | ND | |

Report By: JWhite

Analytical Report

| | | | |
|---|---|---|---|
| **Client :** | JH Baxter & Company | **Service Request :** | K0506270 |
| **Project Name :** | Arlington Landfill Wells | **Date Collected :** | 11/30,12/01/05 |
| **Project Number :** | NA | **Date Received :** | 12/02/05 |
| **Sample Matrix :** | WATER | | |

pH

Analysis Method 150.1
Test Notes :

Units : pH UNITS
Basis : NA

| Sample Name | Lab Code | MRL | MDL | Dilution Factor | Date Analyzed | Result | Result Notes |
|---|---|---|---|---|---|---|---|
| BXS-1 | K0506270-001 | - | - | 1 | 12/02/05 | 6.33 | |
| BXS-2 | K0506270-002 | - | - | 1 | 12/02/05 | 6.63 | |
| BXS-3 | K0506270-003 | - | - | 1 | 12/02/05 | 6.73 | |
| BXS-4 | K0506270-004 | - | - | 1 | 12/02/05 | 8.00 | |
| BXS-5 | K0506270-005 | - | - | 1 | 12/02/05 | 5.78 | |
| BXS-6 | K0506270-006 | - | - | 1 | 12/02/05 | 7.91 | |

Report By: JWhite

# COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

**Client :** JH Baxter & Company
**Project Name :** Arlington Landfill Wells
**Project Number :** NA
**Sample Matrix :** WATER

**Service Request :** K0506270
**Date Collected :** 11/30,12/01/05
**Date Received :** 12/02/05

## Chemical Oxygen Demand

Analysis Method 410.2
Test Notes :

Units : mg/L (ppm)
Basis : NA

| Sample Name | Lab Code | MRL | MDL | Dilution Factor | Date Analyzed | Result | Result Notes |
|---|---|---|---|---|---|---|---|
| BXS-1 | K0506270-001 | 5 | 2 | 1 | 12/05/05 | 17 | |
| BXS-2 | K0506270-002 | 5 | 2 | 1 | 12/05/05 | 40 | |
| BXS-3 | K0506270-003 | 5 | 2 | 1 | 12/05/05 | 66 | |
| BXS-4 | K0506270-004 | 5 | 2 | 1 | 12/05/05 | ND | |
| BXS-5 | K0506270-005 | 5 | 2 | 1 | 12/05/05 | ND | |
| BXS-6 | K0506270-006 | 5 | 2 | 1 | 12/05/05 | 3 | J |
| Method Blank | K0506270-MB | 5 | 2 | 1 | 12/05/05 | ND | |

Report By: JWhite

Analytical Report

| | | | |
|---|---|---|---|
| **Client :** | JH Baxter & Company | **Service Request :** | K0506270 |
| **Project Name :** | Arlington Landfill Wells | **Date Collected :** | 11/30,12/01/05 |
| **Project Number :** | NA | **Date Received :** | 12/02/05 |
| **Sample Matrix :** | WATER | | |

Tannin and Lignin

Analysis Method SM 5550 B
Test Notes :

Units : mg/L (ppm)
Basis : NA

| Sample Name | Lab Code | MRL | MDL | Dilution Factor | Date Analyzed | Result | Result Notes |
|---|---|---|---|---|---|---|---|
| BXS-1 | K0506270-001 | 0.2 | 0.03 | 1 | 12/08/05 | 0.4 | |
| BXS-2 | K0506270-002 | 0.2 | 0.03 | 1 | 12/08/05 | 1.5 | |
| BXS-3 | K0506270-003 | 0.8 | 0.1 | 4 | 12/08/05 | 10.3 | |
| BXS-4 | K0506270-004 | 0.2 | 0.03 | 1 | 12/08/05 | 0.4 | |
| BXS-5 | K0506270-005 | 0.2 | 0.03 | 1 | 12/08/05 | 0.09 | J |
| BXS-6 | K0506270-006 | 0.2 | 0.03 | 1 | 12/08/05 | 0.4 | |
| Method Blank | K0506270-MB | 0.2 | 0.03 | 1 | 12/08/05 | 0.04 | J |

SM Standard Methods for the Examination of Water and Wastewater, 20th Ed., 1998.

Report By: JWhite

# COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

**Client :** JH Baxter & Company
**Project Name :** Arlington Landfill Wells
**Project Number :** NA
**Sample Matrix :** WATER

**Service Request :** K0506270
**Date Collected :** 11/30,12/01/05
**Date Received :** 12/02/05

Nitrate+Nitrite as Nitrogen

Analysis Method 353.2
Test Notes :

Units : mg/L (ppm)
Basis : NA

| Sample Name | Lab Code | MRL | MDL | Dilution Factor | Date Analyzed | Result | Result Notes |
|---|---|---|---|---|---|---|---|
| BXS-1 | K0506270-001 | 0.2 | 0.03 | 1 | 12/07/05 | 0.3 | |
| BXS-2 | K0506270-002 | 0.2 | 0.03 | 1 | 12/07/05 | 0.11 | J |
| BXS-3 | K0506270-003 | 0.2 | 0.03 | 1 | 12/07/05 | 0.08 | J |
| BXS-4 | K0506270-004 | 0.2 | 0.03 | 1 | 12/07/05 | 0.10 | J |
| BXS-5 | K0506270-005 | 0.2 | 0.03 | 1 | 12/07/05 | 0.10 | J |
| BXS-6 | K0506270-006 | 0.2 | 0.03 | 1 | 12/07/05 | 0.09 | J |
| Method Blank | K0506270-MB | 0.2 | 0.03 | 1 | 12/07/05 | 0.08 | J |

Report By: JWhite

Analytical Report

**Client :** JH Baxter & Company
**Project Name :** Arlington Landfill Wells
**Project Number :** NA
**Sample Matrix :** WATER

**Service Request :** K0506270
**Date Collected :** 11/30,12/01/05
**Date Received :** 12/02/05

## Carbon, Total Organic

Analysis Method 415.1
Test Notes :

Units : mg/L (ppm)
Basis : NA

| Sample Name | Lab Code | MRL | MDL | Dilution Factor | Date Analyzed | Result | Result Notes |
|---|---|---|---|---|---|---|---|
| BXS-1 | K0506270-001 | 0.5 | 0.1 | 1 | 12/08/05 | 6.0 | |
| BXS-2 | K0506270-002 | 0.5 | 0.1 | 1 | 12/08/05 | 14.5 | |
| BXS-3 | K0506270-003 | 0.5 | 0.1 | 1 | 12/08/05 | 25.2 | |
| BXS-4 | K0506270-004 | 0.5 | 0.1 | 1 | 12/08/05 | 1.1 | |
| BXS-5 | K0506270-005 | 0.5 | 0.1 | 1 | 12/08/05 | 0.1 | J |
| BXS-6 | K0506270-006 | 0.5 | 0.1 | 1 | 12/08/05 | 0.9 | |
| Method Blank | K0506270-MB | 0.5 | 0.1 | 1 | 12/08/05 | ND | |

Report By: JWhite

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

**Client :** JH Baxter & Company
**Project Name :** Arlington Landfill Wells
**Project Number :** NA
**Sample Matrix :** WATER

**Service Request :** K0506270
**Date Collected :** 11/30,12/01/05
**Date Received :** 12/02/05

Solids, Total Dissolved (TDS)

Analysis Method 160.1
Test Notes :

Units : mg/L (ppm)
Basis : NA

| Sample Name | Lab Code | MRL | MDL | Dilution Factor | Date Analyzed | Result | Result Notes |
|---|---|---|---|---|---|---|---|
| BXS-1 | K0506270-001 | 5 | 5 | 1 | 12/07/05 | 276 | |
| BXS-2 | K0506270-002 | 5 | 5 | 1 | 12/07/05 | 500 | |
| BXS-3 | K0506270-003 | 5 | 5 | 1 | 12/07/05 | 440 | |
| BXS-4 | K0506270-004 | 5 | 5 | 1 | 12/07/05 | 126 | |
| BXS-5 | K0506270-005 | 5 | 5 | 1 | 12/07/05 | ND | |
| BXS-6 | K0506270-006 | 5 | 5 | 1 | 12/07/05 | 127 | |
| Method Blank | K0506270-MB | 5 | 5 | 1 | 12/07/05 | ND | |

Report By: JWhite

Analytical Report

**Client :** JH Baxter & Company
**Project Name :** Arlington Landfill Wells
**Project Number :** NA
**Sample Matrix :** WATER

**Service Request :** K0506270
**Date Collected :** 11/30,12/01/05
**Date Received :** 12/02/05

## Conductivity

Analysis Method 120.1
Test Notes :

Units : uMhos/cm
Basis : NA

| Sample Name | Lab Code | MRL | MDL | Dilution Factor | Date Analyzed | Result | Result Notes |
|---|---|---|---|---|---|---|---|
| BXS-1 | K0506270-001 | 2 | 0.04 | 1 | 12/13/05 | 442 | |
| BXS-2 | K0506270-002 | 2 | 0.04 | 1 | 12/13/05 | 778 | |
| BXS-3 | K0506270-003 | 2 | 0.04 | 1 | 12/13/05 | 793 | |
| BXS-4 | K0506270-004 | 2 | 0.04 | 1 | 12/13/05 | 194 | |
| BXS-5 | K0506270-005 | 2 | 0.04 | 1 | 12/13/05 | 1.4 | J |
| BXS-6 | K0506270-006 | 2 | 0.04 | 1 | 12/13/05 | 194 | |
| Method Blank | K0506270-MB | 2 | 0.04 | 1 | 12/13/05 | 0.41 | J |

Report By: JWhite

# COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

**Client :** JH Baxter & Company
**Project Name :** Arlington Landfill Wells
**Project Number :** NA
**Sample Matrix :** WATER

**Service Request :** K0506270
**Date Collected :** 11/30,12/01/05
**Date Received :** 12/02/05

Chloride

Analysis Method : 300.0
Test Notes :

Units : mg/L (ppm)
Basis : NA

| Sample Name | Lab Code | MRL | MDL | Dilution Factor | Date Analyzed | Result | Result Notes |
|---|---|---|---|---|---|---|---|
| BXS-1 | K0506270-001 | 0.2 | 0.04 | 2 | 12/10/05 | 3.1 | |
| BXS-2 | K0506270-002 | 0.2 | 0.04 | 2 | 12/10/05 | 3.7 | |
| BXS-3 | K0506270-003 | 0.2 | 0.04 | 2 | 12/10/05 | 2.8 | |
| BXS-4 | K0506270-004 | 0.2 | 0.04 | 2 | 12/10/05 | 1.8 | |
| BXS-5 | K0506270-005 | 0.2 | 0.02 | 1 | 12/10/05 | 0.04 | J |
| BXS-6 | K0506270-006 | 0.2 | 0.04 | 2 | 12/10/05 | 1.9 | |
| Method Blank | K0506270-MB | 0.2 | 0.02 | 1 | 12/09/05 | ND | |
| Method Blank | K0506270-MB | 0.2 | 0.02 | 1 | 12/10/05 | 0.02 | J |

Analytical Report

| | | | |
|---|---|---|---|
| **Client :** | JH Baxter & Company | **Service Request :** | K0506270 |
| **Project Name :** | Arlington Landfill Wells | **Date Collected :** | 11/30,12/01/05 |
| **Project Number :** | NA | **Date Received :** | 12/02/05 |
| **Sample Matrix :** | WATER | | |

Sulfate

Analysis Method 300.0
Test Notes :

Units : mg/L (ppm)
Basis : NA

| Sample Name | Lab Code | MRL | MDL | Dilution Factor | Date Analyzed | Result | Result Notes |
|---|---|---|---|---|---|---|---|
| BXS-1 | K0506270-001 | 0.2 | 0.1 | 2 | 12/10/05 | 7.9 | |
| BXS-2 | K0506270-002 | 0.2 | 0.1 | 2 | 12/10/05 | 0.3 | |
| BXS-3 | K0506270-003 | 0.2 | 0.1 | 2 | 12/10/05 | ND | |
| BXS-4 | K0506270-004 | 0.2 | 0.1 | 2 | 12/10/05 | 1.6 | |
| BXS-5 | K0506270-005 | 0.2 | 0.06 | 1 | 12/10/05 | ND | |
| BXS-6 | K0506270-006 | 0.2 | 0.1 | 2 | 12/10/05 | 1.6 | |
| Method Blank | K0506270-MB | 0.2 | 0.06 | 1 | 12/10/05 | ND | |
| Method Blank | K0506270-MB | 0.2 | 0.06 | 1 | 12/09/05 | ND | |

Report By: JWhite

# DISSOLVED METALS

## - Cover Page -
## INORGANIC ANALYSIS DATA PACKAGE

Client: JH Baxter & Company

Service Request: K0506270

Project No.:

Project Name: Arlington Landfill Wells

| Sample No. | Lab Sample ID. |
|---|---|
| BXS-1 DISS | K0506270-001 DISS |
| BXS-1D DISS | K0506270-001D DISS |
| BXS-1S DISS | K0506270-001S DISS |
| BXS-2 DISS | K0506270-002 DISS |
| BXS-3 DISS | K0506270-003 DISS |
| BXS-4 DISS | K0506270-004 DISS |
| BXS-5 DISS | K0506270-005 DISS |
| BXS-6 DISS | K0506270-006 DISS |
| Method Blank | K0506270-MB |

Were ICP interelement corrections applied? Yes/No YES

Were ICP background corrections applied? Yes/No YES

If yes-were raw data generated before application of background corrections? Yes/No NO

Comments:

Signature: [signature]

Date: 12/29/05

# DISSOLVED METALS

-1-

## INORGANIC ANALYSIS DATA SHEET

Client: JH Baxter & Company
Project No.: NA
Project Name: Arlington Landfill Wells
Matrix: WATER

Service Request: K0506270
Date Collected: 11/30/05
Date Received: 12/02/05
Units: MG/L
Basis: NA

Sample Name: BXS-1 DISS

Lab Code: K0506270-001 DISS

| Analyte | Analysis Method | MRL | MDL | Dil. | Date Extracted | Date Analyzed | Result | C | Q |
|---|---|---|---|---|---|---|---|---|---|
| Arsenic | 7060A | 0.005 | 0.001 | 1 | 12/14/05 | 12/15/05 | 0.001 | U | |
| Barium | 6010B | 0.005 | 0.002 | 1 | 12/14/05 | 12/19/05 | 0.023 | | |
| Cadmium | 6010B | 0.005 | 0.003 | 1 | 12/14/05 | 12/19/05 | 0.003 | U | |
| Copper | 6010B | 0.010 | 0.005 | 1 | 12/14/05 | 12/19/05 | 0.005 | U | |
| Iron | 6010B | 0.020 | 0.003 | 1 | 12/14/05 | 12/19/05 | 0.003 | U | |
| Manganese | 6010B | 0.0050 | 0.0008 | 1 | 12/14/05 | 12/19/05 | 0.4290 | | |
| Nickel | 6010B | 0.02 | 0.02 | 1 | 12/14/05 | 12/19/05 | 0.02 | U | |
| Zinc | 6010B | 0.010 | 0.006 | 1 | 12/14/05 | 12/19/05 | 0.007 | B | |

% Solids: 0.0

Comments:

# DISSOLVED METALS

-1-

## INORGANIC ANALYSIS DATA SHEET

Client: JH Baxter & Company
Project No.: NA
Project Name: Arlington Landfill Wells
Matrix: WATER

Service Request: K0506270
Date Collected: 12/01/05
Date Received: 12/02/05
Units: MG/L
Basis: NA

Sample Name: BXS-2 DISS

Lab Code: K0506270-002 DISS

| Analyte | Analysis Method | MRL | MDL | Dil. | Date Extracted | Date Analyzed | Result | C | Q |
|---|---|---|---|---|---|---|---|---|---|
| Arsenic | 7060A | 0.005 | 0.001 | 1 | 12/14/05 | 12/15/05 | 0.002 | B | |
| Barium | 6010B | 0.005 | 0.002 | 1 | 12/14/05 | 12/19/05 | 0.044 | | |
| Cadmium | 6010B | 0.005 | 0.003 | 1 | 12/14/05 | 12/19/05 | 0.003 | U | |
| Copper | 6010B | 0.010 | 0.005 | 1 | 12/14/05 | 12/19/05 | 0.005 | U | |
| Iron | 6010B | 0.020 | 0.003 | 1 | 12/14/05 | 12/19/05 | 0.770 | | |
| Manganese | 6010B | 0.0050 | 0.0008 | 1 | 12/14/05 | 12/19/05 | 1.3000 | | |
| Nickel | 6010B | 0.02 | 0.02 | 1 | 12/14/05 | 12/19/05 | 0.03 | | |
| Zinc | 6010B | 0.010 | 0.006 | 1 | 12/14/05 | 12/19/05 | 0.051 | | |

% Solids: 0.0

Comments:

# DISSOLVED METALS

-1-

## INORGANIC ANALYSIS DATA SHEET

Client: JH Baxter & Company
Project No.: NA
Project Name: Arlington Landfill Wells
Matrix: WATER

Service Request: K0506270
Date Collected: 12/01/05
Date Received: 12/02/05
Units: MG/L
Basis: NA

Sample Name: BXS-3 DISS

Lab Code: K0506270-003 DISS

| Analyte | Analysis Method | MRL | MDL | Dil. | Date Extracted | Date Analyzed | Result | C | Q |
|---|---|---|---|---|---|---|---|---|---|
| Arsenic | 7060A | 0.005 | 0.001 | 1 | 12/14/05 | 12/15/05 | 0.007 | | |
| Barium | 6010B | 0.005 | 0.002 | 1 | 12/14/05 | 12/19/05 | 0.063 | | |
| Cadmium | 6010B | 0.005 | 0.003 | 1 | 12/14/05 | 12/19/05 | 0.003 | U | |
| Copper | 6010B | 0.010 | 0.005 | 1 | 12/14/05 | 12/19/05 | 0.005 | U | |
| Iron | 6010B | 0.200 | 0.030 | 10 | 12/14/05 | 12/19/05 | 4.330 | | |
| Manganese | 6010B | 0.0500 | 0.0080 | 10 | 12/14/05 | 12/19/05 | 17.2 | | |
| Nickel | 6010B | 0.02 | 0.02 | 1 | 12/14/05 | 12/19/05 | 0.02 | U | |
| Zinc | 6010B | 0.010 | 0.006 | 1 | 12/14/05 | 12/19/05 | 0.007 | B | |

% Solids: 0.0

Comments:

# DISSOLVED METALS
-1-
## INORGANIC ANALYSIS DATA SHEET

| | | | |
|---|---|---|---|
| Client: | JH Baxter & Company | Service Request: | K0506270 |
| Project No.: | NA | Date Collected: | 11/30/05 |
| Project Name: | Arlington Landfill Wells | Date Received: | 12/02/05 |
| Matrix: | WATER | Units: | MG/L |
| | | Basis: | NA |

Sample Name: BXS-4 DISS  Lab Code: K0506270-004 DISS

| Analyte | Analysis Method | MRL | MDL | Dil. | Date Extracted | Date Analyzed | Result | C | Q |
|---|---|---|---|---|---|---|---|---|---|
| Arsenic | 7060A | 0.005 | 0.001 | 1 | 12/14/05 | 12/15/05 | 0.006 | | |
| Barium | 6010B | 0.005 | 0.002 | 1 | 12/14/05 | 12/19/05 | 0.029 | | |
| Cadmium | 6010B | 0.005 | 0.003 | 1 | 12/14/05 | 12/19/05 | 0.003 | U | |
| Copper | 6010B | 0.010 | 0.005 | 1 | 12/14/05 | 12/19/05 | 0.005 | U | |
| Iron | 6010B | 0.020 | 0.003 | 1 | 12/14/05 | 12/19/05 | 0.042 | | |
| Manganese | 6010B | 0.0050 | 0.0008 | 1 | 12/14/05 | 12/19/05 | 0.1120 | | |
| Nickel | 6010B | 0.02 | 0.02 | 1 | 12/14/05 | 12/19/05 | 0.02 | U | |
| Zinc | 6010B | 0.010 | 0.006 | 1 | 12/14/05 | 12/19/05 | 0.006 | U | |

% Solids: 0.0

Comments:

# DISSOLVED METALS



## INORGANIC ANALYSIS DATA SHEET

| | | | |
|---|---|---|---|
| Client: | JH Baxter & Company | Service Request: | K0506270 |
| Project No.: | NA | Date Collected: | 12/01/05 |
| Project Name: | Arlington Landfill Wells | Date Received: | 12/02/05 |
| Matrix: | WATER | Units: | MG/L |
| | | Basis: | NA |

Sample Name: BXS-5 DISS  Lab Code: K0506270-005 DISS

| Analyte | Analysis Method | MRL | MDL | Dil. | Date Extracted | Date Analyzed | Result | C | Q |
|---|---|---|---|---|---|---|---|---|---|
| Arsenic | 7060A | 0.005 | 0.001 | 1 | 12/14/05 | 12/15/05 | 0.001 | U | |
| Barium | 6010B | 0.005 | 0.002 | 1 | 12/14/05 | 12/19/05 | 0.002 | U | |
| Cadmium | 6010B | 0.005 | 0.003 | 1 | 12/14/05 | 12/19/05 | 0.003 | U | |
| Copper | 6010B | 0.010 | 0.005 | 1 | 12/14/05 | 12/19/05 | 0.005 | U | |
| Iron | 6010B | 0.020 | 0.003 | 1 | 12/14/05 | 12/19/05 | 0.004 | B | |
| Manganese | 6010B | 0.0050 | 0.0008 | 1 | 12/14/05 | 12/19/05 | 0.0008 | U | |
| Nickel | 6010B | 0.02 | 0.02 | 1 | 12/14/05 | 12/19/05 | 0.02 | U | |
| Zinc | 6010B | 0.010 | 0.006 | 1 | 12/14/05 | 12/19/05 | 0.006 | U | |

% Solids: 0.0

Comments:

# DISSOLVED METALS
-1-
## INORGANIC ANALYSIS DATA SHEET

Client: JH Baxter & Company
Project No.: NA
Project Name: Arlington Landfill Wells
Matrix: WATER

Service Request: K0506270
Date Collected: 11/30/05
Date Received: 12/02/05
Units: MG/L
Basis: NA

Sample Name: BXS-6 DISS
Lab Code: K0506270-006 DISS

| Analyte | Analysis Method | MRL | MDL | Dil. | Date Extracted | Date Analyzed | Result | C | Q |
|---|---|---|---|---|---|---|---|---|---|
| Arsenic | 7060A | 0.005 | 0.001 | 1 | 12/14/05 | 12/15/05 | 0.001 | U | |
| Barium | 6010B | 0.005 | 0.002 | 1 | 12/14/05 | 12/19/05 | 0.002 | U | |
| Cadmium | 6010B | 0.005 | 0.003 | 1 | 12/14/05 | 12/19/05 | 0.003 | U | |
| Copper | 6010B | 0.010 | 0.005 | 1 | 12/14/05 | 12/19/05 | 0.005 | U | |
| Iron | 6010B | 0.020 | 0.003 | 1 | 12/14/05 | 12/19/05 | 0.003 | U | |
| Manganese | 6010B | 0.0050 | 0.0008 | 1 | 12/14/05 | 12/19/05 | 0.0008 | U | |
| Nickel | 6010B | 0.02 | 0.02 | 1 | 12/14/05 | 12/19/05 | 0.02 | U | |
| Zinc | 6010B | 0.010 | 0.006 | 1 | 12/14/05 | 12/19/05 | 0.006 | U | |

% Solids: 0.0

Comments:

# DISSOLVED METALS

-1-

## INORGANIC ANALYSIS DATA SHEET

Client: JH Baxter & Company
Project No.: NA
Project Name: Arlington Landfill Wells
Matrix: WATER

Service Request: K0506270
Date Collected:
Date Received:
Units: MG/L
Basis: NA

Sample Name: Method Blank
Lab Code: K0506270-MB

| Analyte | Analysis Method | MRL | MDL | Dil. | Date Extracted | Date Analyzed | Result | C | Q |
|---|---|---|---|---|---|---|---|---|---|
| Arsenic | 7060A | 0.005 | 0.001 | 1 | 12/14/05 | 12/15/05 | 0.001 | U | |
| Barium | 6010B | 0.005 | 0.002 | 1 | 12/14/05 | 12/19/05 | 0.002 | U | |
| Cadmium | 6010B | 0.005 | 0.003 | 1 | 12/14/05 | 12/19/05 | 0.003 | U | |
| Copper | 6010B | 0.010 | 0.005 | 1 | 12/14/05 | 12/19/05 | 0.005 | U | |
| Iron | 6010B | 0.020 | 0.003 | 1 | 12/14/05 | 12/19/05 | 0.003 | U | |
| Manganese | 6010B | 0.0050 | 0.0008 | 1 | 12/14/05 | 12/19/05 | 0.0008 | U | |
| Nickel | 6010B | 0.02 | 0.02 | 1 | 12/14/05 | 12/19/05 | 0.02 | U | |
| Zinc | 6010B | 0.010 | 0.006 | 1 | 12/14/05 | 12/19/05 | 0.006 | U | |

% Solids: 0.0

Comments:

# Appendix C

Statistical Analysis of
Groundwater Quality Results
(BXS-1 through BXS-4)

**Appendix C. Statistical Analysis of Groundwater Quality Results for Downgradient Well, South Landfill**

# Field pH

$$t_{stat} = (X_{bar} - m_o)/sqrt(s^1/n+s^2/n)$$

*Number of Samples* **n** 4

*Critical Statistic* $t_c$ **2.447**

**BXS-4**

*(Upgradient well)*

| | | | | | *Average Concentration* $m_o$ | $s^1$ |
|---|---|---|---|---|---|---|
| Apr-04 | 7.48 | | | | | |
| Jul-04 | 7.38 | | | | | |
| Oct-04 | 7.54 | | | | | |
| Jan-05 | 6.11 | 7.48 | 7.38 | 7.54 | 7.13 | 0.46 |
| Apr-05 | 7.5 | 7.38 | 7.54 | 6.11 | 7.13 | 0.47 |
| Aug-05 | 5.37 | 7.54 | 6.11 | 7.5 | 6.63 | 1.15 |
| Dec-05 | 8 | 6.11 | 7.5 | 5.37 | 6.75 | 1.48 |

**BXS-3**

*(Downgradient well)*

| | | | | | $X_{bar}$ | $s^2$ | s | $t_{stat}$ |
|---|---|---|---|---|---|---|---|---|
| Apr-04 | 6.11 | | | | | | | |
| Jul-04 | 6.02 | | | | | | | |
| Oct-04 | 6.16 | | | | | | | |
| Jan-05 | 5.03 | 6.11 | 6.02 | 6.16 | 5.83 | 0.29 | 0.54 | *-2.99* |
| Apr-05 | 6.3 | 6.02 | 6.16 | 5.03 | 5.88 | 0.33 | 0.58 | *-2.81* |
| Aug-05 | 5.84 | 6.16 | 5.03 | 6.3 | 5.83 | 0.32 | 0.57 | -1.80 |
| Dec-05 | 6.47 | 5.03 | 6.3 | 5.84 | 5.91 | 0.42 | 0.64 | -1.78 |

**BXS-2**

*(Downgradient well)*

| | | | | | $X_{bar}$ | $s^2$ | s | $t_{stat}$ |
|---|---|---|---|---|---|---|---|---|
| Apr-04 | 6.07 | | | | | | | |
| Jul-04 | 5.96 | | | | | | | |
| Oct-04 | 6.11 | | | | | | | |
| Jan-05 | 5.16 | 6.07 | 5.96 | 6.11 | 5.83 | 0.20 | 0.45 | *-3.19* |
| Apr-05 | 6.20 | 5.96 | 6.11 | 5.16 | 5.86 | 0.23 | 0.48 | *-3.07* |
| Aug-05 | 5.77 | 6.11 | 5.16 | 6.20 | 5.81 | 0.22 | 0.47 | -1.98 |
| Dec-05 | 6.36 | 5.16 | 6.20 | 5.77 | 5.87 | 0.29 | 0.54 | -2.01 |

**BXS-1**

*(Downgradient well)*

| | | | | | $X_{bar}$ | $s^2$ | s | $t_{stat}$ |
|---|---|---|---|---|---|---|---|---|
| Apr-04 | 5.84 | | | | | | | |
| Jul-04 | 5.92 | | | | | | | |
| Oct-04 | 6.01 | | | | | | | |
| Jan-05 | 5.51 | 5.84 | 5.92 | 6.01 | 5.82 | 0.05 | 0.22 | *-3.65* |
| Apr-05 | 6.1 | 5.92 | 6.01 | 5.51 | 5.89 | 0.07 | 0.26 | *-3.42* |
| Aug-05 | 5.87 | 5.92 | 5.51 | 6.1 | 5.85 | 0.06 | 0.25 | -2.15 |
| Dec-05 | 6.15 | 5.51 | 6.1 | 5.87 | 5.91 | 0.09 | 0.29 | -2.26 |

**Notes:**

$X_{bar}$ Average Concentration

$s^2$ Sample variance

s Sample Standard Deviation

$t_{stat}$ Student's T-Test Statistic

Item shown in **bold** or ***gray italics*** indicate a statistically valid detection (according to the student's T-Test statistic).

Items with no difference at all (zero difference) will indicate #DIV/0!

**Appendix C. Statistical Analysis of Groundwater Quality Results for Downgradient Well, South Landfill**

# Field Conductivity

$$t_{stat} = (X_{bar} - m_o)/sqrt(s^1/n+s^2/n)$$

*Number of Samples* **n** = 4

*Critical Statistic* $t_c$ = 2.447

**BXS-4**

*(Upgradient well)*

| | | | | | *Average Concentration* $m_o$ | $s^1$ |
|---|---|---|---|---|---|---|
| Apr-04 | 197 | | | | | |
| Jul-04 | 216 | | | | | |
| Oct-04 | 203 | | | | | |
| Jan-05 | 187 | 197 | 216 | 203 | 200.75 | 146.92 |
| Apr-05 | 194 | 216 | 203 | 187 | 200.00 | 156.67 |
| Aug-05 | 195 | 203 | 187 | 194 | 194.75 | 42.92 |
| Dec-05 | 194 | 187 | 194 | 195 | 192.50 | 13.67 |

---

**BXS-3**

*(Downgradient well)*

| | | | | | $X_{bar}$ | $s^2$ | s | $t_{stat}$ |
|---|---|---|---|---|---|---|---|---|
| Apr-04 | 836 | | | | | | | |
| Jul-04 | 926 | | | | | | | |
| Oct-04 | 949 | | | | | | | |
| Jan-05 | 571 | 836 | 926 | 949 | 821 | 30044 | 173 | **7.13** |
| Apr-05 | 785 | 926 | 949 | 571 | 808 | 30168 | 174 | **6.98** |
| Aug-05 | 788 | 949 | 571 | 785 | 773 | 24050 | 155 | **7.44** |
| Dec-05 | 854 | 571 | 785 | 788 | 750 | 15175 | 123 | **9.00** |

**BXS-2**

*(Downgradient well)*

| | | | | | $X_{bar}$ | $s^2$ | s | $t_{stat}$ |
|---|---|---|---|---|---|---|---|---|
| Apr-04 | 838 | | | | | | | |
| Jul-04 | 874 | | | | | | | |
| Oct-04 | 834 | | | | | | | |
| Jan-05 | 768 | 838 | 874 | 834 | 829 | 1950 | 44 | **27.42** |
| Apr-05 | 812 | 874 | 834 | 768 | 822 | 1955 | 44 | **27.14** |
| Aug-05 | 794 | 834 | 768 | 812 | 802 | 781 | 28 | **39.86** |
| Dec-05 | 778 | 768 | 812 | 794 | 788 | 371 | 19 | **52.35** |

**BXS-1**

*(Downgradient well)*

| | | | | | $X_{bar}$ | $s^2$ | s | $t_{stat}$ |
|---|---|---|---|---|---|---|---|---|
| Apr-04 | 339 | | | | | | | |
| Jul-04 | 417 | | | | | | | |
| Oct-04 | 478 | | | | | | | |
| Jan-05 | 328 | 339 | 417 | 478 | 391 | 4972 | 71 | **5.30** |
| Apr-05 | 380 | 417 | 478 | 328 | 401 | 3985 | 63 | **6.25** |
| Aug-05 | 426 | 478 | 328 | 380 | 403 | 4103 | 64 | **6.39** |
| Dec-05 | 439 | 328 | 380 | 426 | 393 | 2533 | 50 | **7.76** |

**Notes:**

$X_{bar}$ Average Concentration

$s^2$ Sample variance

s Sample Standard Deviation

$t_{stat}$ Student's T-Test Statistic

Item shown in **bold** or ***gray italics*** indicate a statistically valid detection (according to the student's T-Test statistic).

Items with no difference at all (zero difference) will indicate #DIV/0!

**Appendix C. Statistical Analysis of Groundwater Quality Results for Downgradient Well, South Landfill**

# Ammonia

$$t_{stat} = (X_{bar} - m_o)/sqrt(s^1/n+s^2/n)$$

*Number of Samples* **n** 4

*Critical Statistic* $t_c$ **2.447**

**BXS-4**

*(Upgradient well)*

| | | | | | *Average Concentration* $m_o$ | $s^1$ |
|---|---|---|---|---|---|---|
| Apr-04 | 0.55 | | | | | |
| Jul-04 | 0.5 | | | | | |
| Oct-04 | 0.53 | | | | | |
| Jan-05 | 0.52 | 0.55 | 0.5 | 0.53 | 0.53 | 0.00 |
| Apr-05 | 0.51 | 0.5 | 0.53 | 0.52 | 0.52 | 0.00 |
| Aug-05 | 0.5 | 0.53 | 0.52 | 0.51 | 0.52 | 0.00 |
| Nov-05 | 0.49 | 0.52 | 0.51 | 0.5 | 0.51 | 0.00 |

**BXS-3**

*(Downgradient well)*

| | | | | | $X_{bar}$ | $s^2$ | s | $t_{stat}$ |
|---|---|---|---|---|---|---|---|---|
| Apr-04 | 0.61 | | | | | | | |
| Jul-04 | 0.13 | | | | | | | |
| Oct-04 | 0.12 | | | | | | | |
| Jan-05 | 0.21 | 0.61 | 0.13 | 0.12 | 0.27 | 0.05 | 0.23 | -2.21 |
| Apr-05 | 0.58 | 0.13 | 0.12 | 0.21 | 0.26 | 0.05 | 0.22 | -2.34 |
| Aug-05 | 0.74 | 0.12 | 0.21 | 0.58 | 0.41 | 0.09 | 0.30 | -0.69 |
| Nov-05 | 0.17 | 0.21 | 0.58 | 0.74 | 0.43 | 0.08 | 0.28 | -0.57 |

**BXS-2**

*(Downgradient well)*

| | | | | | $X_{bar}$ | $s^2$ | s | $t_{stat}$ |
|---|---|---|---|---|---|---|---|---|
| Apr-04 | 0.05 | | | | | | | |
| Jul-04 | 0.06 | | | | | | | |
| Oct-04 | 0.025 | | | | | | | |
| Jan-05 | 0.025 | 0.05 | 0.06 | 0.025 | 0.04 | 0.00 | 0.02 | *-35.42* |
| Apr-05 | 0.025 | 0.06 | 0.025 | 0.025 | 0.03 | 0.00 | 0.02 | *-35.39* |
| Aug-05 | 0.03 | 0.025 | 0.025 | 0.025 | 0.03 | 0.00 | 0.00 | *-46.62* |
| Nov-05 | 0.025 | 0.025 | 0.025 | 0.03 | 0.03 | 0.00 | 0.00 | *-45.67* |

**BXS-1**

*(Downgradient well)*

| | | | | | $X_{bar}$ | $s^2$ | s | $t_{stat}$ |
|---|---|---|---|---|---|---|---|---|
| Apr-04 | 0.025 | | | | | | | |
| Jul-04 | 0.025 | | | | | | | |
| Oct-04 | 0.025 | | | | | | | |
| Jan-05 | 0.025 | 0.025 | 0.025 | 0.025 | 0.03 | 0.00 | 0.00 | *-48.04* |
| Apr-05 | 0.025 | 0.025 | 0.025 | 0.025 | 0.03 | 0.00 | 0.00 | *-47.08* |
| Aug-05 | 0.025 | 0.025 | 0.025 | 0.025 | 0.03 | 0.00 | 0.00 | *-47.08* |
| Nov-05 | 0.025 | 0.025 | 0.025 | 0.025 | 0.03 | 0.00 | 0.00 | *-46.12* |

**Notes:**

$X_{bar}$ Average Concentration

$s^2$ Sample variance

s Sample Standard Deviation

$t_{stat}$ Student's T-Test Statistic

Item shown in **bold** or *gray italics* indicate a statistically valid detection (according to the student's T-Test statistic).

Items with no difference at all (zero difference) will indicate #DIV/0!

**Appendix C. Statistical Analysis of Groundwater Quality Results for Downgradient Well, South Landfill**

# Chemical Oxygen Demand

$$t_{stat} = (X_{bar} - m_o)/sqrt(s^1/n+s^2/n)$$

*Number of Samples* **n** 4

*Critical Statistic* $t_c$ **2.447**

**BXS-4**

*(Upgradient well)*

| | | | | | *Average Concentration* $m_o$ | $s^1$ |
|---|---|---|---|---|---|---|
| Apr-04 | 2.5 | | | | | |
| Jul-04 | 2.5 | | | | | |
| Oct-04 | 4 | | | | | |
| Jan-05 | 24 | 2.5 | 2.5 | 4 | 8.25 | 110.75 |
| Apr-05 | 5 | 2.5 | 4 | 24 | 8.88 | 102.73 |
| Aug-05 | 2 | 4 | 24 | 5 | 8.75 | 104.92 |
| Nov-05 | 2.5 | 24 | 5 | 2 | 8.38 | 110.23 |

**BXS-3**

*(Downgradient well)*

| | | | | | $X_{bar}$ | $s^2$ | s | $t_{stat}$ |
|---|---|---|---|---|---|---|---|---|
| Apr-04 | 65 | | | | | | | |
| Jul-04 | 58 | | | | | | | |
| Oct-04 | 63 | | | | | | | |
| Jan-05 | 72 | 65 | 58 | 63 | 64.50 | 33.67 | 5.80 | **9.36** |
| Apr-05 | 69 | 58 | 63 | 72 | 65.50 | 39.00 | 6.24 | **9.25** |
| Aug-05 | 71 | 63 | 72 | 69 | 68.75 | 16.25 | 4.03 | **10.65** |
| Nov-05 | 66 | 72 | 69 | 71 | 69.50 | 7.00 | 2.65 | **11.27** |

**BXS-2**

*(Downgradient well)*

| | | | | | $X_{bar}$ | $s^2$ | s | $t_{stat}$ |
|---|---|---|---|---|---|---|---|---|
| Apr-04 | 37 | | | | | | | |
| Jul-04 | 37 | | | | | | | |
| Oct-04 | 43 | | | | | | | |
| Jan-05 | 52 | 37 | 37 | 43 | 42.25 | 50.25 | 7.09 | **5.36** |
| Apr-05 | 43 | 37 | 43 | 52 | 43.75 | 38.25 | 6.18 | **5.71** |
| Aug-05 | 36 | 43 | 52 | 43 | 43.50 | 43.00 | 6.56 | **5.61** |
| Nov-05 | 40 | 52 | 43 | 36 | 42.75 | 46.25 | 6.80 | **5.49** |

**BXS-1**

*(Downgradient well)*

| | | | | | $X_{bar}$ | $s^2$ | s | $t_{stat}$ |
|---|---|---|---|---|---|---|---|---|
| Apr-04 | 10 | | | | | | | |
| Jul-04 | 14 | | | | | | | |
| Oct-04 | 15 | | | | | | | |
| Jan-05 | 20 | 10 | 14 | 15 | 14.75 | 16.92 | 4.11 | 1.15 |
| Apr-05 | 14 | 14 | 15 | 20 | 15.75 | 8.25 | 2.87 | 1.26 |
| Aug-05 | 13 | 15 | 20 | 14 | 15.50 | 9.67 | 3.11 | 1.23 |
| Nov-05 | 17 | 20 | 14 | 13 | 16.00 | 10.00 | 3.16 | 1.39 |

**Notes:**

$X_{bar}$ Average Concentration

$s^2$ Sample variance

s Sample Standard Deviation

$t_{stat}$ Student's T-Test Statistic

Item shown in **bold** or ***gray italics*** indicate a statistically valid detection (according to the student's T-Test statistic).

Items with no difference at all (zero difference) will indicate #DIV/0!

**Appendix C. Statistical Analysis of Groundwater Quality Results for Downgradient Well, South Landfill**

# Chloride

$$t_{stat} = (X_{bar} - m_o)/sqrt(s^1/n+s^2/n)$$

*Number of Samples* **n** 4

*Critical Statistic* $t_c$ **2.447**

**BXS-4**

*(Upgradient well)*

| | | | | | *Average Concentration* $m_o$ | $s^1$ |
|---|---|---|---|---|---|---|
| Apr-04 | 1.8 | | | | | |
| Jul-04 | 1.9 | | | | | |
| Oct-04 | 1.6 | | | | | |
| Jan-05 | 1.7 | 1.8 | 1.9 | 1.6 | 1.75 | 0.02 |
| Apr-05 | 1.9 | 1.9 | 1.6 | 1.7 | 1.78 | 0.02 |
| Aug-05 | 1.7 | 1.6 | 1.7 | 1.9 | 1.73 | 0.02 |
| Nov-05 | 1.8 | 1.7 | 1.9 | 1.7 | 1.78 | 0.01 |

**BXS-3**

*(Downgradient well)*

| | | | | | $X_{bar}$ | $s^2$ | s | $t_{stat}$ |
|---|---|---|---|---|---|---|---|---|
| Apr-04 | 3.1 | | | | | | | |
| Jul-04 | 2.7 | | | | | | | |
| Oct-04 | 0.8 | | | | | | | |
| Jan-05 | 4.6 | 3.1 | 2.7 | 0.8 | 2.80 | 2.45 | 1.56 | 1.34 |
| Apr-05 | 3.8 | 2.7 | 0.8 | 4.6 | 2.98 | 2.71 | 1.65 | 1.45 |
| Aug-05 | 3.6 | 0.8 | 4.6 | 3.8 | 3.20 | 2.75 | 1.66 | 1.77 |
| Nov-05 | 2.8 | 4.6 | 3.8 | 3.6 | 3.70 | 0.55 | 0.74 | **5.13** |

**BXS-2**

*(Downgradient well)*

| | | | | | $X_{bar}$ | $s^2$ | s | $t_{stat}$ |
|---|---|---|---|---|---|---|---|---|
| Apr-04 | 4.6 | | | | | | | |
| Jul-04 | 4.8 | | | | | | | |
| Oct-04 | 3.3 | | | | | | | |
| Jan-05 | 5 | 4.6 | 4.8 | 3.3 | 4.43 | 0.59 | 0.77 | **6.87** |
| Apr-05 | 4.7 | 4.8 | 3.3 | 5 | 4.45 | 0.60 | 0.78 | **6.79** |
| Aug-05 | 4.2 | 3.3 | 5 | 4.7 | 4.30 | 0.55 | 0.74 | **6.82** |
| Nov-05 | 3.7 | 5 | 4.7 | 4.2 | 4.40 | 0.33 | 0.57 | **8.96** |

**BXS-1**

*(Downgradient well)*

| | | | | | $X_{bar}$ | $s^2$ | s | $t_{stat}$ |
|---|---|---|---|---|---|---|---|---|
| Apr-04 | 4.8 | | | | | | | |
| Jul-04 | 4.3 | | | | | | | |
| Oct-04 | 3 | | | | | | | |
| Jan-05 | 5 | 4.8 | 4.3 | 3 | 4.28 | 0.81 | 0.90 | **5.56** |
| Apr-05 | 4.6 | 4.3 | 3 | 5 | 4.23 | 0.75 | 0.87 | **5.60** |
| Aug-05 | 5.4 | 3 | 5 | 4.6 | 4.50 | 1.11 | 1.05 | **5.24** |
| Nov-05 | 3.1 | 5 | 4.6 | 5.4 | 4.53 | 1.01 | 1.00 | **5.43** |

**Notes:**

$X_{bar}$ Average Concentration

$s^2$ Sample variance

s Sample Standard Deviation

$t_{stat}$ Student's T-Test Statistic

Item shown in **bold** or *gray italics* indicate a statistically valid detection (according to the student's T-Test statistic).

Items with no difference at all (zero difference) will indicate #DIV/0!

**Appendix C. Statistical Analysis of Groundwater Quality Results for Downgradient Well; South Landfill**

## Nitrate + Nitrite as N

$$t_{stat} = (X_{bar} - m_o)/sqrt(s^1/n+s^2/n)$$

*Number of Samples* **n** 4

*Critical Statistic* $t_c$ **2.447**

**BXS-4**

*(Upgradient well)*

| | | | | | *Average Concentration* $m_o$ | $s^1$ |
|---|---|---|---|---|---|---|
| Apr-04 | 0.1 | | | | | |
| Jul-04 | 0.05 | | | | | |
| Oct-04 | 0.025 | | | | | |
| Jan-05 | 0.01 | 0.1 | 0.05 | 0.025 | 0.05 | 0.00 |
| Apr-05 | 0.1 | 0.05 | 0.025 | 0.01 | 0.05 | 0.00 |
| Aug-05 | 0.025 | 0.025 | 0.01 | 0.1 | 0.04 | 0.00 |
| Nov-05 | 0.1 | 0.01 | 0.1 | 0.025 | 0.06 | 0.00 |

**BXS-3**

*(Downgradient well)*

| | | | | | $X_{bar}$ | $s^2$ | s | $t_{stat}$ |
|---|---|---|---|---|---|---|---|---|
| Apr-04 | 0.1 | | | | | | | |
| Jul-04 | 0.1 | | | | | | | |
| Oct-04 | 0.01 | | | | | | | |
| Jan-05 | 0.03 | 0.1 | 0.1 | 0.01 | 0.06 | 0.00 | 0.05 | 0.45 |
| Apr-05 | 0.1 | 0.1 | 0.01 | 0.03 | 0.06 | 0.00 | 0.05 | 0.45 |
| Aug-05 | 0.02 | 0.01 | 0.03 | 0.1 | 0.04 | 0.00 | 0.04 | 0.00 |
| Nov-05 | 0.08 | 0.03 | 0.1 | 0.02 | 0.06 | 0.00 | 0.04 | -0.05 |

**BXS-2**

*(Downgradient well)*

| | | | | | $X_{bar}$ | $s^2$ | s | $t_{stat}$ |
|---|---|---|---|---|---|---|---|---|
| Apr-04 | 0.1 | | | | | | | |
| Jul-04 | 0.1 | | | | | | | |
| Oct-04 | 0.01 | | | | | | | |
| Jan-05 | 0.01 | 0.1 | 0.1 | 0.01 | 0.06 | 0.00 | 0.05 | 0.27 |
| Apr-05 | 0.1 | 0.1 | 0.01 | 0.01 | 0.06 | 0.00 | 0.05 | 0.27 |
| Aug-05 | 0.01 | 0.01 | 0.01 | 0.1 | 0.03 | 0.00 | 0.05 | -0.25 |
| Nov-05 | 0.11 | 0.01 | 0.1 | 0.01 | 0.06 | 0.00 | 0.06 | -0.04 |

**BXS-1**

*(Downgradient well)*

| | | | | | $X_{bar}$ | $s^2$ | s | $t_{stat}$ |
|---|---|---|---|---|---|---|---|---|
| Apr-04 | 1.4 | | | | | | | |
| Jul-04 | 0.6 | | | | | | | |
| Oct-04 | 0.3 | | | | | | | |
| Jan-05 | 0.75 | 1.4 | 0.6 | 0.3 | 0.76 | 0.22 | 0.46 | **3.07** |
| Apr-05 | 1 | 0.6 | 0.3 | 0.75 | 0.66 | 0.09 | 0.29 | **4.17** |
| Aug-05 | 0.95 | 0.3 | 0.75 | 1 | 0.75 | 0.10 | 0.32 | **4.42** |
| Nov-05 | 0.3 | 0.75 | 1 | 0.95 | 0.75 | 0.10 | 0.32 | **4.30** |

**Notes:**

$X_{bar}$ Average Concentration

$s^2$ Sample variance

s Sample Standard Deviation

$t_{stat}$ Student's T-Test Statistic

Item shown in **bold** or ***gray italics*** indicate a statistically valid detection (according to the student's T-Test statistic).

Items with no difference at all (zero difference) will indicate #DIV/0!

**Appendix C. Statistical Analysis of Groundwater Quality Results for Downgradient Well, South Landfill**

# Total Dissolved Solids

$$t_{stat} = (X_{bar} - m_o)/sqrt(s^1/n+s^2/n)$$

*Number of Samples* **n** = 4

*Critical Statistic* $t_c$ = 2.447

**BXS-4**

*(Upgradient well)*

| | | | | | *Average Concentration* $m_o$ | $s^1$ |
|---|---|---|---|---|---|---|
| Apr-04 | 126 | | | | | |
| Jul-04 | 128 | | | | | |
| Oct-04 | 129 | | | | | |
| Jan-05 | 151 | 126 | 128 | 129 | 133.50 | 137.67 |
| Apr-05 | 129 | 128 | 129 | 151 | 134.25 | 124.92 |
| Aug-05 | | 129 | 151 | 129 | 136.33 | 161.33 |
| Nov-05 | 126 | 151 | 129 | | 135.33 | 186.33 |

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**BXS-3**

*(Downgradient well)*

| | | | | | $X_{bar}$ | $s^2$ | s | $t_{stat}$ |
|---|---|---|---|---|---|---|---|---|
| Apr-04 | 512 | | | | | | | |
| Jul-04 | 528 | | | | | | | |
| Oct-04 | 528 | | | | | | | |
| Jan-05 | 440 | 512 | 528 | 528 | 502 | 1765 | 42 | **16.89** |
| Apr-05 | 468 | 528 | 528 | 440 | 491 | 1956 | 44 | **15.59** |
| Aug-05 | | 528 | 440 | 468 | 479 | 2021 | 45 | **14.74** |
| Nov-05 | 440 | 440 | 468 | | 449 | 261 | 16 | **31.44** |

**BXS-2**

*(Downgradient well)*

| | | | | | $X_{bar}$ | $s^2$ | s | $t_{stat}$ |
|---|---|---|---|---|---|---|---|---|
| Apr-04 | 492 | | | | | | | |
| Jul-04 | 396 | | | | | | | |
| Oct-04 | 440 | | | | | | | |
| Jan-05 | 564 | 492 | 396 | 440 | 473 | 5220 | 72 | **9.28** |
| Apr-05 | 484 | 396 | 440 | 564 | 471 | 5135 | 72 | **9.28** |
| Aug-05 | | 440 | 564 | 484 | 496 | 3952 | 63 | **11.25** |
| Nov-05 | 500 | 564 | 484 | | 516 | 1792 | 42 | **17.33** |

**BXS-1**

*(Downgradient well)*

| | | | | | $X_{bar}$ | $s^2$ | s | $t_{stat}$ |
|---|---|---|---|---|---|---|---|---|
| Apr-04 | 226 | | | | | | | |
| Jul-04 | 222 | | | | | | | |
| Oct-04 | 262 | | | | | | | |
| Jan-05 | 248 | 226 | 222 | 262 | 240 | 356 | 19 | **9.54** |
| Apr-05 | 242 | 222 | 262 | 248 | 244 | 276 | 17 | **10.75** |
| Aug-05 | | 262 | 248 | 242 | 251 | 105 | 10 | **14.67** |
| Nov-05 | 276 | 248 | 242 | | 255 | 329 | 18 | **11.11** |

**Notes:**

$X_{bar}$ Average Concentration
$s^2$ Sample variance
s Sample Standard Deviation
$t_{stat}$ Student's T-Test Statistic

Item shown in **bold** or ***gray italics*** indicate a statistically valid detection (according to the student's T-Test statistic).
Items with no difference at all (zero difference) will indicate #DIV/0!

**Appendix C. Statistical Analysis of Groundwater Quality Results for Downgradient Well, South Landfill**

# Sulfate

$$t_{stat} = (X_{bar} - m_o)/sqrt(s^1/n+s^2/n)$$

*Number of Samples* **n** 4

*Critical Statistic* $t_c$ 2.447

**BXS-4**

*(Upgradient well)*

| | | | | | Average Concentration | |
|---|---|---|---|---|---|---|
| | | | | | $m_o$ | $s^1$ |
| Apr-04 | 0.9 | | | | | |
| Jul-04 | 0.9 | | | | | |
| Oct-04 | 1.5 | | | | | |
| Jan-05 | 1 | 0.9 | 0.9 | 1.5 | 1.08 | 0.08 |
| Apr-05 | 1.8 | 0.9 | 1.5 | 1 | 1.30 | 0.18 |
| Aug-05 | 0.9 | 1.5 | 1 | 1.8 | 1.30 | 0.18 |
| Nov-05 | 1.6 | 1 | 1.8 | 0.9 | 1.33 | 0.20 |

**BXS-3**

*(Downgradient well)*

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | | | | | $X_{bar}$ | $s^2$ | s | $t_{stat}$ |
| Apr-04 | 0.1 | | | | | | | |
| Jul-04 | 0.1 | | | | | | | |
| Oct-04 | 0.1 | | | | | | | |
| Jan-05 | 0.1 | 0.1 | 0.1 | 0.1 | 0.10 | 0.00 | 0.00 | *-6.79* |
| Apr-05 | 0.1 | 0.1 | 0.1 | 0.1 | 0.10 | 0.00 | 0.00 | *-8.36* |
| Aug-05 | 0.1 | 0.1 | 0.1 | 0.1 | 0.10 | 0.00 | 0.00 | *-8.36* |
| Nov-05 | 0.1 | 0.1 | 0.1 | 0.1 | 0.10 | 0.00 | 0.00 | *-8.53* |

**BXS-2**

*(Downgradient well)*

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | | | | | $X_{bar}$ | $s^2$ | s | $t_{stat}$ |
| Apr-04 | 0.1 | | | | | | | |
| Jul-04 | 0.1 | | | | | | | |
| Oct-04 | 0.1 | | | | | | | |
| Jan-05 | 0.1 | 0.1 | 0.1 | 0.1 | 0.10 | 0.00 | 0.00 | *-6.79* |
| Apr-05 | 1.4 | 0.1 | 0.1 | 0.1 | 0.43 | 0.42 | 0.65 | *-2.46* |
| Aug-05 | 0.1 | 0.1 | 0.1 | 1.4 | 0.43 | 0.42 | 0.65 | *-2.46* |
| Nov-05 | 0.3 | 0.1 | 1.4 | 0.1 | 0.48 | 0.39 | 0.62 | *-2.48* |

**BXS-1**

*(Downgradient well)*

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | | | | | $X_{bar}$ | $s^2$ | s | $t_{stat}$ |
| Apr-04 | 10.5 | | | | | | | |
| Jul-04 | 7.7 | | | | | | | |
| Oct-04 | 6.9 | | | | | | | |
| Jan-05 | 12.6 | 10.5 | 7.7 | 6.9 | 9.43 | 6.86 | 2.62 | **6.34** |
| Apr-05 | 11.7 | 7.7 | 6.9 | 12.6 | 9.73 | 8.08 | 2.84 | **5.90** |
| Aug-05 | 8.3 | 6.9 | 12.6 | 11.7 | 9.88 | 7.36 | 2.71 | **6.29** |
| Nov-05 | 7.9 | 12.6 | 11.7 | 8.3 | 10.13 | 5.63 | 2.37 | **7.36** |

**Notes:**

$X_{bar}$ Average Concentration

$s^2$ Sample variance

s Sample Standard Deviation

$t_{stat}$ Student's T-Test Statistic

Item shown in **bold** or ***gray italics*** indicate a statistically valid detection (according to the student's T-Test statistic).

Items with no difference at all (zero difference) will indicate #DIV/0!

**Appendix C. Statistical Analysis of Groundwater Quality Results for Downgradient Well, South Landfill**

# Tannin and Lignin

$$t_{stat} = (X_{bar} - m_o)/sqrt(s^1/n+s^2/n)$$

*Number of Samples* **n** = 4

*Critical Statistic* $t_c$ = **2.447**

**BXS-4**

*(Upgradient well)*

| | | | | | *Average Concentration* $m_o$ | $s^1$ |
|---|---|---|---|---|---|---|
| Apr-04 | 0.5 | | | | | |
| Jul-04 | 0.5 | | | | | |
| Oct-04 | 0.5 | | | | | |
| Jan-05 | 0.3 | 0.5 | 0.5 | 0.5 | 0.45 | 0.01 |
| Apr-05 | 0.4 | 0.5 | 0.5 | 0.3 | 0.43 | 0.01 |
| Aug-05 | 0.4 | 0.5 | 0.3 | 0.4 | 0.40 | 0.01 |
| Nov-05 | 0.4 | 0.3 | 0.4 | 0.4 | 0.38 | 0.00 |

**BXS-3**

*(Downgradient well)*

| | | | | | $X_{bar}$ | $s^2$ | s | $t_{stat}$ |
|---|---|---|---|---|---|---|---|---|
| Apr-04 | 9.9 | | | | | | | |
| Jul-04 | 4.4 | | | | | | | |
| Oct-04 | 8.3 | | | | | | | |
| Jan-05 | 4.5 | 9.9 | 4.4 | 8.3 | 6.78 | 7.64 | 2.76 | **4.57** |
| Apr-05 | 8.9 | 4.4 | 8.3 | 4.5 | 6.53 | 5.80 | 2.41 | **5.06** |
| Aug-05 | 8.7 | 8.3 | 4.5 | 8.9 | 7.60 | 4.33 | 2.08 | **6.91** |
| Nov-05 | 10.3 | 4.5 | 8.9 | 8.7 | 8.10 | 6.27 | 2.50 | **6.17** |

**BXS-2**

*(Downgradient well)*

| | | | | | $X_{bar}$ | $s^2$ | s | $t_{stat}$ |
|---|---|---|---|---|---|---|---|---|
| Apr-04 | 1.8 | | | | | | | |
| Jul-04 | 0.1 | | | | | | | |
| Oct-04 | 1.6 | | | | | | | |
| Jan-05 | 1 | 1.8 | 0.1 | 1.6 | 1.13 | 0.58 | 0.76 | 1.75 |
| Apr-05 | 1.2 | 0.1 | 1.6 | 1 | 0.98 | 0.40 | 0.63 | 1.71 |
| Aug-05 | 1 | 1.6 | 1 | 1.2 | 1.20 | 0.08 | 0.28 | **5.33** |
| Nov-05 | 1.5 | 1 | 1.2 | 1 | 1.18 | 0.06 | 0.24 | **6.24** |

**BXS-1**

*(Downgradient well)*

| | | | | | $X_{bar}$ | $s^2$ | s | $t_{stat}$ |
|---|---|---|---|---|---|---|---|---|
| Apr-04 | 0.1 | | | | | | | |
| Jul-04 | 0.3 | | | | | | | |
| Oct-04 | 0.3 | | | | | | | |
| Jan-05 | 0.1 | 0.1 | 0.3 | 0.3 | 0.20 | 0.01 | 0.12 | *-3.27* |
| Apr-05 | 0.18 | 0.3 | 0.3 | 0.1 | 0.22 | 0.01 | 0.10 | *-2.93* |
| Aug-05 | 0.2 | 0.3 | 0.1 | 0.18 | 0.20 | 0.01 | 0.08 | *-3.17* |
| Nov-05 | 0.4 | 0.1 | 0.18 | 0.2 | 0.22 | 0.02 | 0.13 | -1.91 |

**Notes:**

$X_{bar}$ Average Concentration

$s^2$ Sample variance

s Sample Standard Deviation

$t_{stat}$ Student's T-Test Statistic

Item shown in **bold** or *gray italics* indicate a statistically valid detection (according to the student's T-Test statistic).

Items with no difference at all (zero difference) will indicate #DIV/0!

**Appendix C. Statistical Analysis of Groundwater Quality Results for Downgradient Well, South Landfill**

# Total Organic Carbon

$$t_{stat} = (X_{bar} - m_o)/sqrt(s^1/n+s^2/n)$$

*Number of Samples* **n** 4

*Critical Statistic* $t_c$ **2.447**

**BXS-4**

*(Upgradient well)*

| | | | | | *Average Concentration* | |
|---|---|---|---|---|---|---|
| | | | | | $m_o$ | $s^1$ |
| Apr-04 | 0.8 | | | | | |
| Jul-04 | 0.9 | | | | | |
| Oct-04 | 1 | | | | | |
| Jan-05 | 1 | 0.8 | 0.9 | 1 | 0.93 | 0.01 |
| Apr-05 | 1.2 | 0.9 | 1 | 1 | 1.03 | 0.02 |
| Aug-05 | 1.1 | 1 | 1 | 1.2 | 1.08 | 0.01 |
| Nov-05 | 1.1 | 1 | 1.2 | 1.1 | 1.10 | 0.01 |

**BXS-3**

*(Downgradient well)*

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | | | | | $X_{bar}$ | $s^2$ | s | $t_{stat}$ |
| Apr-04 | 24.8 | | | | | | | |
| Jul-04 | 23.6 | | | | | | | |
| Oct-04 | 24.4 | | | | | | | |
| Jan-05 | 18.6 | 24.8 | 23.6 | 24.4 | 22.85 | 8.28 | 2.88 | **15.23** |
| Apr-05 | 26.7 | 23.6 | 24.4 | 18.6 | 23.33 | 11.65 | 3.41 | **13.06** |
| Aug-05 | 29.9 | 24.4 | 18.6 | 26.7 | 24.90 | 22.73 | 4.77 | **9.99** |
| Nov-05 | 25.2 | 18.6 | 26.7 | 29.9 | 25.10 | 22.62 | 4.76 | **10.09** |

**BXS-2**

*(Downgradient well)*

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | | | | | $X_{bar}$ | $s^2$ | s | $t_{stat}$ |
| Apr-04 | 15 | | | | | | | |
| Jul-04 | 15 | | | | | | | |
| Oct-04 | 14.7 | | | | | | | |
| Jan-05 | | 15 | 15 | 14.7 | 14.90 | 0.03 | 0.17 | **141.23** |
| Apr-05 | 16 | 15 | 14.7 | | 15.23 | 0.46 | 0.68 | **41.34** |
| Aug-05 | 17 | 14.7 | | 16 | 15.90 | 1.33 | 1.15 | **25.62** |
| Nov-05 | 14.5 | | 16 | 17 | 15.83 | 1.58 | 1.26 | **23.35** |

**BXS-1**

*(Downgradient well)*

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | | | | | $X_{bar}$ | $s^2$ | s | $t_{stat}$ |
| Apr-04 | 4.6 | | | | | | | |
| Jul-04 | 6.1 | | | | | | | |
| Oct-04 | 5.8 | | | | | | | |
| Jan-05 | 4.1 | 4.6 | 6.1 | 5.8 | 5.15 | 0.91 | 0.95 | **8.81** |
| Apr-05 | 6 | 6.1 | 5.8 | 4.1 | 5.50 | 0.89 | 0.94 | **9.46** |
| Aug-05 | 6.5 | 5.8 | 4.1 | 6 | 5.60 | 1.09 | 1.04 | **8.65** |
| Nov-05 | 6 | 4.1 | 6 | 6.5 | 5.65 | 1.12 | 1.06 | **8.55** |

**Notes:**

$X_{bar}$ Average Concentration

$s^2$ Sample variance

s Sample Standard Deviation

$t_{stat}$ Student's T-Test Statistic

Item shown in **bold** or ***gray italics*** indicate a statistically valid detection (according to the student's T-Test statistic).

Items with no difference at all (zero difference) will indicate #DIV/0!

**Appendix C. Statistical Analysis of Groundwater Quality Results for Downgradient Well, South Landfill**

# Total Coliform

$$t_{stat} = (X_{bar} - m_o)/sqrt(s^1/n+s^2/n)$$

*Number of Samples* **n** 4

*Critical Statistic* $t_c$ **2.447**

**BXS-4**

*(Upgradient well)*

| | | | | | *Average Concentration* | |
|---|---|---|---|---|---|---|
| | | | | | $m_o$ | $s^1$ |
| Apr-04 | 1 | | | | | |
| Jul-04 | 23 | | | | | |
| Oct-04 | 1 | | | | | |
| Jan-05 | 1 | 1 | 23 | 1 | 6.50 | 121.00 |
| Apr-05 | 1 | 23 | 1 | 1 | 6.50 | 121.00 |
| Aug-05 | 1 | 1 | 1 | 1 | 1.00 | 0.00 |
| Nov-05 | 1 | 1 | 1 | 1 | 1.00 | 0.00 |

**BXS-3**

*(Downgradient well)*

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | | | | | $X_{bar}$ | $s^2$ | s | $t_{stat}$ |
| Apr-04 | 1 | | | | | | | |
| Jul-04 | 14 | | | | | | | |
| Oct-04 | 12 | | | | | | | |
| Jan-05 | 27 | 1 | 14 | 12 | 14 | 114 | 11 | 0.91 |
| Apr-05 | 1 | 14 | 12 | 27 | 14 | 114 | 11 | 0.91 |
| Aug-05 | 1 | 12 | 27 | 1 | 10 | 152 | 12 | 1.12 |
| Nov-05 | 170 | 27 | 1 | 1 | 50 | 6577 | 81 | 1.19 |

**BXS-2**

*(Downgradient well)*

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | | | | | $X_{bar}$ | $s^2$ | s | $t_{stat}$ |
| Apr-04 | 1 | | | | | | | |
| Jul-04 | 4 | | | | | | | |
| Oct-04 | 1 | | | | | | | |
| Jan-05 | 1 | 1 | 4 | 1 | 2 | 2 | 2 | -0.86 |
| Apr-05 | 220 | 4 | 1 | 1 | 57 | 11883 | 109 | 0.91 |
| Aug-05 | 1 | 1 | 1 | 220 | 56 | 11990 | 110 | 0.99 |
| Nov-05 | 17 | 1 | 220 | 1 | 60 | 11470 | 107 | 1.09 |

**BXS-1**

*(Downgradient well)*

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | | | | | $X_{bar}$ | $s^2$ | s | $t_{stat}$ |
| Apr-04 | 1 | | | | | | | |
| Jul-04 | 1 | | | | | | | |
| Oct-04 | 4 | | | | | | | |
| Jan-05 | 1 | 1 | 1 | 4 | 2 | 2 | 2 | -0.86 |
| Apr-05 | 1 | 1 | 4 | 1 | 2 | 2 | 2 | -0.86 |
| Aug-05 | 1 | 4 | 1 | 1 | 2 | 2 | 2 | 0.14 |
| Nov-05 | 1 | 1 | 1 | 1 | 1 | 0 | 0 | 0.00 |

**Notes:**

$X_{bar}$ Average Concentration

$s^2$ Sample variance

s Sample Standard Deviation

$t_{stat}$ Student's T-Test Statistic

Item shown in **bold** or *gray italics* indicate a statistically valid detection (according to the student's T-Test statistic).

Items with no difference at all (zero difference) will indicate #DIV/0!

**Appendix C. Statistical Analysis of Groundwater Quality Results for Downgradient Well, South Landfill**

# Arsenic

$$t_{stat} = (X_{bar} - m_o)/sqrt(s^1/n+s^2/n)$$

*Number of Samples* **n** **4**

*Critical Statistic* $t_c$ **2.447**

**BXS-4**

*(Upgradient well)*

| | | | | | *Average Concentration* | |
|---|---|---|---|---|---|---|
| | | | | | $m_o$ | $s^1$ |
| Apr-04 | 5.6 | | | | | |
| Jul-04 | 5 | | | | | |
| Oct-04 | 5.7 | | | | | |
| Jan-05 | 5 | 5.6 | 5 | 5.7 | 5.33 | 0.14 |
| Apr-05 | 5 | 5 | 5.7 | 5 | 5.18 | 0.12 |
| Aug-05 | 4 | 5.7 | 5 | 5 | 4.93 | 0.49 |
| Nov-05 | 6 | 5 | 5 | 4 | 5.00 | 0.67 |

**BXS-3**

*(Downgradient well)*

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | | | | | $X_{bar}$ | $s^2$ | s | $t_{stat}$ |
| Apr-04 | 8.5 | | | | | | | |
| Jul-04 | 3 | | | | | | | |
| Oct-04 | 4.4 | | | | | | | |
| Jan-05 | 2.8 | 8.5 | 3 | 4.4 | 4.68 | 7.01 | 2.65 | -0.49 |
| Apr-05 | 6 | 3 | 4.4 | 2.8 | 4.05 | 2.20 | 1.48 | -1.47 |
| Aug-05 | 9 | 4.4 | 2.8 | 6 | 5.55 | 7.00 | 2.65 | 0.47 |
| Nov-05 | 7 | 2.8 | 6 | 9 | 6.20 | 6.69 | 2.59 | 0.92 |

**BXS-2**

*(Downgradient well)*

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | | | | | $X_{bar}$ | $s^2$ | s | $t_{stat}$ |
| Apr-04 | 2.5 | | | | | | | |
| Jul-04 | 1 | | | | | | | |
| Oct-04 | 2.5 | | | | | | | |
| Jan-05 | 2.5 | 2.5 | 1 | 2.5 | 2.13 | 0.56 | 0.75 | *-7.62* |
| Apr-05 | 1 | 1 | 2.5 | 2.5 | 1.75 | 0.75 | 0.87 | *-7.25* |
| Aug-05 | 2.5 | 2.5 | 2.5 | 1 | 2.13 | 0.56 | 0.75 | *-6.67* |
| Nov-05 | 2 | 2.5 | 1 | 2.5 | 2.00 | 0.50 | 0.71 | *-7.49* |

**BXS-1**

*(Downgradient well)*

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | | | | | $X_{bar}$ | $s^2$ | s | $t_{stat}$ |
| Apr-04 | 2.5 | | | | | | | |
| Jul-04 | 2.5 | | | | | | | |
| Oct-04 | 2.5 | | | | | | | |
| Jan-05 | 2.5 | 2.5 | 2.5 | 2.5 | 2.50 | 0.00 | 0.00 | *-14.97* |
| Apr-05 | 2.5 | 2.5 | 2.5 | 2.5 | 2.50 | 0.00 | 0.00 | *-14.17* |
| Aug-05 | 2.5 | 2.5 | 2.5 | 2.5 | 2.50 | 0.00 | 0.00 | *-12.85* |
| Nov-05 | 2.5 | 2.5 | 2.5 | 2.5 | 2.50 | 0.00 | 0.00 | *-13.25* |

**Notes:**

$X_{bar}$ Average Concentration

$s^2$ Sample variance

s Sample Standard Deviation

$t_{stat}$ Student's T-Test Statistic

Item shown in **bold** or ***gray italics*** indicate a statistically valid detection (according to the student's T-Test statistic).

Items with no difference at all (zero difference) will indicate #DIV/0!

**Appendix C. Statistical Analysis of Groundwater Quality Results for Downgradient Well, South Landfill**

# Barium

$$t_{stat} = (X_{bar} - m_o)/sqrt(s^1/n+s^2/n)$$

*Number of Samples* n = 4

*Critical Statistic* $t_c$ = 2.447

**BXS-4**

*(Upgradient well)*

| | | | | | Average Concentration | |
|---|---|---|---|---|---|---|
| | | | | | $m_o$ | $s^1$ |
| Apr-04 | 29.3 | | | | | |
| Jul-04 | 31 | | | | | |
| Oct-04 | 29.4 | | | | | |
| Jan-05 | 30.2 | 29.3 | 31 | 29.4 | 29.98 | 0.63 |
| Apr-05 | 29 | 31 | 29.4 | 30.2 | 29.90 | 0.79 |
| Aug-05 | 28 | 29.4 | 30.2 | 29 | 29.15 | 0.84 |
| Nov-05 | 29 | 30.2 | 29 | 28 | 29.05 | 0.81 |

**BXS-3**

*(Downgradient well)*

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | | | | | $X_{bar}$ | $s^2$ | s | $t_{stat}$ |
| Apr-04 | 111 | | | | | | | |
| Jul-04 | 54 | | | | | | | |
| Oct-04 | 53.3 | | | | | | | |
| Jan-05 | 103 | 111 | 54 | 53.3 | 80.33 | 959.49 | 30.98 | **3.25** |
| Apr-05 | 91 | 54 | 53.3 | 103 | 75.33 | 650.49 | 25.50 | **3.56** |
| Aug-05 | 94.4 | 53.3 | 103 | 91 | 85.43 | 484.18 | 22.00 | **5.11** |
| Nov-05 | 63 | 103 | 91 | 94.4 | 87.85 | 299.96 | 17.32 | **6.78** |

**BXS-2**

*(Downgradient well)*

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | | | | | $X_{bar}$ | $s^2$ | s | $t_{stat}$ |
| Apr-04 | 48.8 | | | | | | | |
| Jul-04 | 55 | | | | | | | |
| Oct-04 | 43.3 | | | | | | | |
| Jan-05 | 47.2 | 48.8 | 55 | 43.3 | 48.58 | 23.68 | 4.87 | **7.54** |
| Apr-05 | 44 | 55 | 43.3 | 47.2 | 47.38 | 28.72 | 5.36 | **6.45** |
| Aug-05 | 41.9 | 43.3 | 47.2 | 44 | 44.10 | 5.03 | 2.24 | **12.57** |
| Nov-05 | 44 | 47.2 | 44 | 41.9 | 44.28 | 4.78 | 2.19 | **13.09** |

**BXS-1**

*(Downgradient well)*

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | | | | | $X_{bar}$ | $s^2$ | s | $t_{stat}$ |
| Apr-04 | 19.9 | | | | | | | |
| Jul-04 | 21 | | | | | | | |
| Oct-04 | 23.4 | | | | | | | |
| Jan-05 | 16 | 19.9 | 21 | 23.4 | 20.08 | 9.52 | 3.08 | *-6.22* |
| Apr-05 | 23 | 21 | 23.4 | 16 | 20.85 | 11.56 | 3.40 | *-5.19* |
| Aug-05 | 23 | 23.4 | 16 | 23 | 21.35 | 12.76 | 3.57 | *-4.26* |
| Nov-05 | 23 | 16 | 23 | 23 | 21.25 | 12.25 | 3.50 | *-4.35* |

**Notes:**

$X_{bar}$ Average Concentration

$s^2$ Sample variance

s Sample Standard Deviation

$t_{stat}$ Student's T-Test Statistic

Item shown in **bold** or ***gray italics*** indicate a statistically valid detection (according to the student's T-Test statistic).

Items with no difference at all (zero difference) will indicate #DIV/0!

**Appendix C. Statistical Analysis of Groundwater Quality Results for Downgradient Well, South Landfill**

# Copper

$$t_{stat} = (X_{bar} - m_o)/sqrt(s^1/n+s^2/n)$$

*Number of Samples* **n** **4**

*Critical Statistic* $t_c$ **2.447**

**BXS-4**

*(Upgradient well)*

| | | | | | *Average Concentration* $m_o$ | $s^1$ |
|---|---|---|---|---|---|---|
| Apr-04 | 5 | | | | | |
| Jul-04 | 5 | | | | | |
| Oct-04 | 5 | | | | | |
| Jan-05 | 5 | 5 | 5 | 5 | 5.00 | 0.00 |
| Apr-05 | 5 | 5 | 5 | 5 | 5.00 | 0.00 |
| Aug-05 | 5 | 5 | 5 | 5 | 5.00 | 0.00 |
| Nov-05 | 5 | 5 | 5 | 5 | 5.00 | 0.00 |

**BXS-3**

*(Downgradient well)*

| | | | | | $X_{bar}$ | $s^2$ | s | $t_{stat}$ |
|---|---|---|---|---|---|---|---|---|
| Apr-04 | 5 | | | | | | | |
| Jul-04 | 5 | | | | | | | |
| Oct-04 | 5 | | | | | | | |
| Jan-05 | 5 | 5 | 5 | 5 | 5.00 | 0.00 | 0.00 | #DIV/0! |
| Apr-05 | 5 | 5 | 5 | 5 | 5.00 | 0.00 | 0.00 | #DIV/0! |
| Aug-05 | 5 | 5 | 5 | 5 | 5.00 | 0.00 | 0.00 | #DIV/0! |
| Nov-05 | 5 | 5 | 5 | 5 | 5.00 | 0.00 | 0.00 | #DIV/0! |

**BXS-2**

*(Downgradient well)*

| | | | | | $X_{bar}$ | $s^2$ | s | $t_{stat}$ |
|---|---|---|---|---|---|---|---|---|
| Apr-04 | 5 | | | | | | | |
| Jul-04 | 5 | | | | | | | |
| Oct-04 | 5 | | | | | | | |
| Jan-05 | 5 | 5 | 5 | 5 | 5.00 | 0.00 | 0.00 | #DIV/0! |
| Apr-05 | 8 | 5 | 5 | 5 | 5.75 | 2.25 | 1.50 | 1.00 |
| Aug-05 | 5 | 5 | 5 | 8 | 5.75 | 2.25 | 1.50 | 1.00 |
| Nov-05 | 5 | 5 | 8 | 5 | 5.75 | 2.25 | 1.50 | 1.00 |

**BXS-1**

*(Downgradient well)*

| | | | | | $X_{bar}$ | $s^2$ | s | $t_{stat}$ |
|---|---|---|---|---|---|---|---|---|
| Apr-04 | 5 | | | | | | | |
| Jul-04 | 11 | | | | | | | |
| Oct-04 | 5 | | | | | | | |
| Jan-05 | 6.1 | 5 | 11 | 5 | 6.78 | 8.20 | 2.86 | 1.24 |
| Apr-05 | 9 | 11 | 5 | 6.1 | 7.78 | 7.47 | 2.73 | 2.03 |
| Aug-05 | 5 | 5 | 6.1 | 9 | 6.28 | 3.57 | 1.89 | 1.35 |
| Nov-05 | 5 | 6.1 | 9 | 5 | 6.28 | 3.57 | 1.89 | 1.35 |

**Notes:**

$X_{bar}$ Average Concentration

$s^2$ Sample variance

s Sample Standard Deviation

$t_{stat}$ Student's T-Test Statistic

Item shown in **bold** or ***gray italics*** indicate a statistically valid detection (according to the student's T-Test statistic).

Items with no difference at all (zero difference) will indicate #DIV/0!

**Appendix C. Statistical Analysis of Groundwater Quality Results for Downgradient Well, South Landfill**

## Cadmium

$$t_{stat} = (X_{bar} - m_o)/sqrt(s^1/n+s^2/n)$$

*Number of Samples* **n** 4

*Critical Statistic* $t_c$ **2.447**

**BXS-4**

*(Upgradient well)*

| | | | | | *Average Concentration* $m_o$ | $s^1$ |
|---|---|---|---|---|---|---|
| Apr-04 | 2.5 | | | | | |
| Jul-04 | 2.5 | | | | | |
| Oct-04 | 2.5 | | | | | |
| Jan-05 | 2.5 | 2.5 | 2.5 | 2.5 | 2.50 | 0.00 |
| Apr-05 | 2.5 | 2.5 | 2.5 | 2.5 | 2.50 | 0.00 |
| Aug-05 | 0.8 | 2.5 | 2.5 | 2.5 | 2.08 | 0.72 |
| Nov-05 | 2.5 | 2.5 | 2.5 | 0.8 | 2.08 | 0.72 |

**BXS-3**

*(Downgradient well)*

| | | | | | $X_{bar}$ | $s^2$ | s | $t_{stat}$ |
|---|---|---|---|---|---|---|---|---|
| Apr-04 | 2.5 | | | | | | | |
| Jul-04 | 6 | | | | | | | |
| Oct-04 | 2.5 | | | | | | | |
| Jan-05 | 2.5 | 2.5 | 6 | 2.5 | 3.38 | 3.06 | 1.75 | 1.00 |
| Apr-05 | 2.5 | 6 | 2.5 | 2.5 | 3.38 | 3.06 | 1.75 | 1.00 |
| Aug-05 | 1.4 | 2.5 | 2.5 | 2.5 | 2.23 | 0.30 | 0.55 | 0.55 |
| Nov-05 | 2.5 | 2.5 | 2.5 | 1.4 | 2.23 | 0.30 | 0.55 | 0.55 |

**BXS-2**

*(Downgradient well)*

| | | | | | $X_{bar}$ | $s^2$ | s | $t_{stat}$ |
|---|---|---|---|---|---|---|---|---|
| Apr-04 | 2.5 | | | | | | | |
| Jul-04 | 2.5 | | | | | | | |
| Oct-04 | 2.5 | | | | | | | |
| Jan-05 | 2.5 | 2.5 | 2.5 | 2.5 | 2.50 | 0.00 | 0.00 | #DIV/0! |
| Apr-05 | 2.5 | 2.5 | 2.5 | 2.5 | 2.50 | 0.00 | 0.00 | #DIV/0! |
| Aug-05 | 0.3 | 2.5 | 2.5 | 2.5 | 1.95 | 1.21 | 1.10 | -0.23 |
| Nov-05 | 2.5 | 2.5 | 2.5 | 0.3 | 1.95 | 1.21 | 1.10 | -0.23 |

**BXS-1**

*(Downgradient well)*

| | | | | | $X_{bar}$ | $s^2$ | s | $t_{stat}$ |
|---|---|---|---|---|---|---|---|---|
| Apr-04 | 2.5 | | | | | | | |
| Jul-04 | 2.5 | | | | | | | |
| Oct-04 | 2.5 | | | | | | | |
| Jan-05 | 2.5 | 2.5 | 2.5 | 2.5 | 2.50 | 0.00 | 0.00 | #DIV/0! |
| Apr-05 | 2.5 | 2.5 | 2.5 | 2.5 | 2.50 | 0.00 | 0.00 | #DIV/0! |
| Aug-05 | 2.5 | 2.5 | 2.5 | 2.5 | 2.50 | 0.00 | 0.00 | #DIV/0! |
| Nov-05 | 2.5 | 2.5 | 2.5 | 2.5 | 2.50 | 0.00 | 0.00 | #DIV/0! |

**Notes:**

$X_{bar}$ Average Concentration

$s^2$ Sample variance

s Sample Standard Deviation

$t_{stat}$ Student's T-Test Statistic

Item shown in **bold** or *gray italics* indicate a statistically valid detection (according to the student's T-Test statistic).

Items with no difference at all (zero difference) will indicate #DIV/0!

**Appendix C. Statistical Analysis of Groundwater Quality Results for Downgradient Well, South Landfill**

# Iron

$$t_{stat} = (X_{bar} - m_o)/sqrt(s^1/n+s^2/n)$$

*Number of Samples* **n** **4**

*Critical Statistic* $t_c$ **2.447**

**BXS-4**

*(Upgradient well)*

| | | | | | *Average Concentration* | |
|---|---|---|---|---|---|---|
| | | | | | $m_o$ | $s^1$ |
| Apr-04 | 42.4 | | | | | |
| Jul-04 | 60 | | | | | |
| Oct-04 | 40.3 | | | | | |
| Jan-05 | 41.6 | 42.4 | 60 | 40.3 | 46.08 | 86.93 |
| Apr-05 | 46 | 60 | 40.3 | 41.6 | 46.98 | 81.35 |
| Aug-05 | 41 | 40.3 | 41.6 | 46 | 42.23 | 6.62 |
| Nov-05 | 42 | 41.6 | 46 | 41 | 42.65 | 5.16 |

**BXS-3**

*(Downgradient well)*

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | | | | | $X_{bar}$ | $s^2$ | s | $t_{stat}$ |
| Apr-04 | 8890 | | | | | | | |
| Jul-04 | 4290 | | | | | | | |
| Oct-04 | 1710 | | | | | | | |
| Jan-05 | 6520 | 8890 | 4290 | 1710 | 5353 | 9424558 | 3069.94 | **3.46** |
| Apr-05 | 10900 | 4290 | 1710 | 6520 | 5855 | 15174833 | 3895.49 | **2.98** |
| Aug-05 | 18300 | 1710 | 6520 | 10900 | 9358 | 49627758 | 7044.70 | **2.64** |
| Nov-05 | 4330 | 6520 | 10900 | 18300 | 10013 | 37986225 | 6163.30 | **3.24** |

**BXS-2**

*(Downgradient well)*

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | | | | | $X_{bar}$ | $s^2$ | s | $t_{stat}$ |
| Apr-04 | 796 | | | | | | | |
| Jul-04 | 750 | | | | | | | |
| Oct-04 | 836 | | | | | | | |
| Jan-05 | 761 | 796 | 750 | 836 | 786 | 1507 | 38.82 | **37.06** |
| Apr-05 | 769 | 750 | 836 | 761 | 779 | 1505 | 38.79 | **36.70** |
| Aug-05 | 732 | 836 | 761 | 769 | 775 | 1934 | 43.97 | **32.58** |
| Nov-05 | 770 | 761 | 769 | 732 | 758 | 317 | 17.80 | **71.22** |

**BXS-1**

*(Downgradient well)*

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | | | | | $X_{bar}$ | $s^2$ | s | $t_{stat}$ |
| Apr-04 | 10 | | | | | | | |
| Jul-04 | 10 | | | | | | | |
| Oct-04 | 10 | | | | | | | |
| Jan-05 | 10 | 10 | 10 | 10 | 10 | 0 | 0.00 | *-7.74* |
| Apr-05 | 10 | 10 | 10 | 10 | 10 | 0 | 0.00 | *-7.93* |
| Aug-05 | 5 | 10 | 10 | 10 | 9 | 6 | 2.50 | *-6.94* |
| Nov-05 | 10 | 10 | 10 | 5 | 9 | 6 | 2.50 | *-7.02* |

**Notes:**

$X_{bar}$ Average Concentration

$s^2$ Sample variance

s Sample Standard Deviation

$t_{stat}$ Student's T-Test Statistic

Item shown in **bold** or ***gray italics*** indicate a statistically valid detection (according to the student's T-Test statistic).

Items with no difference at all (zero difference) will indicate #DIV/0!

**Appendix C. Statistical Analysis of Groundwater Quality Results for Downgradient Well, South Landfill**

# Manganese

$$t_{stat} = (X_{bar} - m_o)/sqrt(s^1/n+s^2/n)$$

*Number of Samples* **n** = 4

*Critical Statistic* $t_c$ = 2.447

**BXS-4**

*(Upgradient well)*

| | | | | | *Average Concentration* | |
|---|---|---|---|---|---|---|
| | | | | | $m_o$ | $s^1$ |
| Apr-04 | 110 | | | | | |
| Jul-04 | 189 | | | | | |
| Oct-04 | 110 | | | | | |
| Jan-05 | 110 | 110 | 189 | 110 | 129.75 | 1560.25 |
| Apr-05 | 120 | 189 | 110 | 110 | 132.25 | 1453.58 |
| Aug-05 | 107 | 110 | 110 | 120 | 111.75 | 32.25 |
| Nov-05 | 112 | 110 | 120 | 107 | 112.25 | 30.92 |

**BXS-3**

*(Downgradient well)*

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | | | | | $X_{bar}$ | $s^2$ | s | $t_{stat}$ |
| Apr-04 | 14900 | | | | | | | |
| Jul-04 | 18200 | | | | | | | |
| Oct-04 | 17700 | | | | | | | |
| Jan-05 | 8510 | 14900 | 18200 | 17700 | 14828 | 19847025 | 4455.00 | **6.60** |
| Apr-05 | 14200 | 18200 | 17700 | 8510 | 14653 | 19935692 | 4464.94 | **6.50** |
| Aug-05 | 14100 | 17700 | 8510 | 14200 | 13628 | 14441692 | 3800.22 | **7.11** |
| Nov-05 | 17200 | 8510 | 14200 | 14100 | 13503 | 13146692 | 3625.84 | **7.39** |

**BXS-2**

*(Downgradient well)*

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | | | | | $X_{bar}$ | $s^2$ | s | $t_{stat}$ |
| Apr-04 | 1420 | | | | | | | |
| Jul-04 | 1420 | | | | | | | |
| Oct-04 | 1430 | | | | | | | |
| Jan-05 | 1270 | 1420 | 1420 | 1430 | 1385 | 5900 | 76.81 | **29.07** |
| Apr-05 | 1350 | 1420 | 1430 | 1270 | 1368 | 5492 | 74.11 | **29.42** |
| Aug-05 | 1300 | 1430 | 1270 | 1350 | 1338 | 4892 | 69.94 | **30.52** |
| Nov-05 | 1300 | 1270 | 1350 | 1300 | 1305 | 1100 | 33.17 | **46.25** |

**BXS-1**

*(Downgradient well)*

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | | | | | $X_{bar}$ | $s^2$ | s | $t_{stat}$ |
| Apr-04 | 144 | | | | | | | |
| Jul-04 | 326 | | | | | | | |
| Oct-04 | 478 | | | | | | | |
| Jan-05 | 172 | 144 | 326 | 478 | 280 | 23827 | 154.36 | 1.89 |
| Apr-05 | 210 | 326 | 478 | 172 | 297 | 18932 | 137.59 | 2.29 |
| Aug-05 | 160 | 478 | 172 | 210 | 255 | 22556 | 150.19 | 1.84 |
| Nov-05 | 429 | 172 | 210 | 160 | 243 | 15872 | 125.98 | 1.98 |

**Notes:**

$X_{bar}$ Average Concentration

$s^2$ Sample variance

s Sample Standard Deviation

$t_{stat}$ Student's T-Test Statistic

Item shown in **bold** or ***gray italics*** indicate a statistically valid detection (according to the student's T-Test statistic).

Items with no difference at all (zero difference) will indicate #DIV/0!

**Appendix C. Statistical Analysis of Groundwater Quality Results for Downgradient Well, South Landfill**

# Nickel

$$t_{stat} = (X_{bar} - m_o)/sqrt(s^1/n+s^2/n)$$

*Number of Samples* **n** | **4**

*Critical Statistic* $t_c$ **2.447**

**BXS-4**

*(Upgradient well)*

| | | | | | *Average Concentration* | |
|---|---|---|---|---|---|---|
| | | | | | $m_o$ | $s^1$ |
| Apr-04 | 10 | | | | | |
| Jul-04 | 10 | | | | | |
| Oct-04 | 10 | | | | | |
| Jan-05 | 10 | 10 | 10 | 10 | 10.00 | 0.00 |
| Apr-05 | 10 | 10 | 10 | 10 | 10.00 | 0.00 |
| Aug-05 | 10 | 10 | 10 | 10 | 10.00 | 0.00 |
| Nov-05 | 10 | 10 | 10 | 10 | 10.00 | 0.00 |

**BXS-3**

*(Downgradient well)*

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | | | | | $X_{bar}$ | $s^2$ | s | $t_{stat}$ |
| Apr-04 | 30.8 | | | | | | | |
| Jul-04 | 10 | | | | | | | |
| Oct-04 | 29.5 | | | | | | | |
| Jan-05 | 98.9 | 30.8 | 10 | 29.5 | 42.30 | 1514.31 | 38.91 | 1.66 |
| Apr-05 | 40 | 10 | 29.5 | 98.9 | 44.60 | 1464.94 | 38.27 | 1.81 |
| Aug-05 | 25 | 29.5 | 98.9 | 40 | 48.35 | 1175.19 | 34.28 | 2.24 |
| Nov-05 | 10 | 98.9 | 40 | 25 | 43.48 | 1515.30 | 38.93 | 1.72 |

**BXS-2**

*(Downgradient well)*

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | | | | | $X_{bar}$ | $s^2$ | s | $t_{stat}$ |
| Apr-04 | 40.3 | | | | | | | |
| Jul-04 | 50 | | | | | | | |
| Oct-04 | 36.5 | | | | | | | |
| Jan-05 | 52.6 | 40.3 | 50 | 36.5 | 44.85 | 59.00 | 7.68 | **9.07** |
| Apr-05 | 30 | 50 | 36.5 | 52.6 | 42.28 | 116.77 | 10.81 | **5.97** |
| Aug-05 | 32 | 36.5 | 52.6 | 30 | 37.78 | 105.07 | 10.25 | **5.42** |
| Nov-05 | 30 | 52.6 | 30 | 32 | 36.15 | 121.16 | 11.01 | **4.75** |

**BXS-1**

*(Downgradient well)*

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | | | | | $X_{bar}$ | $s^2$ | s | $t_{stat}$ |
| Apr-04 | 10 | | | | | | | |
| Jul-04 | 20 | | | | | | | |
| Oct-04 | 18.8 | | | | | | | |
| Jan-05 | 10 | 10 | 20 | 18.8 | 14.70 | 29.69 | 5.45 | 1.73 |
| Apr-05 | 20 | 20 | 18.8 | 10 | 17.20 | 23.36 | 4.83 | **2.98** |
| Aug-05 | 11 | 18.8 | 10 | 20 | 14.95 | 26.81 | 5.18 | 1.91 |
| Nov-05 | 10 | 10 | 20 | 11 | 12.75 | 23.58 | 4.86 | 1.13 |

**Notes:**

$X_{bar}$ Average Concentration

$s^2$ Sample variance

s Sample Standard Deviation

$t_{stat}$ Student's T-Test Statistic

Item shown in **bold** or ***gray italics*** indicate a statistically valid detection (according to the student's T-Test statistic).

Items with no difference at all (zero difference) will indicate #DIV/0!

**Appendix C. Statistical Analysis of Groundwater Quality Results for Downgradient Well, South Landfill**

## Zinc

$$t_{stat} = (X_{bar} - m_o)/sqrt(s^1/n+s^2/n)$$

*Number of Samples* **n** 4

*Critical Statistic* $t_c$ **2.447**

**BXS-4**

*(Upgradient well)*

| | | | | | *Average Concentration* $m_o$ | $s^1$ |
|---|---|---|---|---|---|---|
| Apr-04 | 5 | | | | | |
| Jul-04 | 4 | | | | | |
| Oct-04 | 5 | | | | | |
| Jan-05 | 5 | 5 | 4 | 5 | 4.75 | 0.25 |
| Apr-05 | 5 | 4 | 5 | 5 | 4.75 | 0.25 |
| Aug-05 | 5 | 5 | 5 | 5 | 5.00 | 0.00 |
| Nov-05 | 5 | 5 | 5 | 5 | 5.00 | 0.00 |

**BXS-3**

*(Downgradient well)*

| | | | | | $X_{bar}$ | $s^2$ | s | $t_{stat}$ |
|---|---|---|---|---|---|---|---|---|
| Apr-04 | 5 | | | | | | | |
| Jul-04 | 21 | | | | | | | |
| Oct-04 | 8 | | | | | | | |
| Jan-05 | 11.2 | 5 | 21 | 8 | 11.30 | 48.23 | 6.94 | 1.88 |
| Apr-05 | 63 | 21 | 8 | 11.2 | 25.80 | 645.63 | 25.41 | 1.66 |
| Aug-05 | 5 | 8 | 11.2 | 63 | 21.80 | 760.83 | 27.58 | 1.22 |
| Nov-05 | 7 | 11.2 | 63 | 5 | 21.55 | 770.28 | 27.75 | 1.19 |

**BXS-2**

*(Downgradient well)*

| | | | | | $X_{bar}$ | $s^2$ | s | $t_{stat}$ |
|---|---|---|---|---|---|---|---|---|
| Apr-04 | 5 | | | | | | | |
| Jul-04 | 8 | | | | | | | |
| Oct-04 | 12.8 | | | | | | | |
| Jan-05 | 7.9 | 5 | 8 | 12.8 | 8.43 | 10.44 | 3.23 | 2.25 |
| Apr-05 | 10 | 8 | 12.8 | 7.9 | 9.68 | 5.28 | 2.30 | **4.19** |
| Aug-05 | 15 | 12.8 | 7.9 | 10 | 11.43 | 9.71 | 3.12 | **4.07** |
| Nov-05 | 51 | 7.9 | 10 | 15 | 20.98 | 409.54 | 20.24 | 1.58 |

**BXS-1**

*(Downgradient well)*

| | | | | | $X_{bar}$ | $s^2$ | s | $t_{stat}$ |
|---|---|---|---|---|---|---|---|---|
| Apr-04 | 33 | | | | | | | |
| Jul-04 | 24 | | | | | | | |
| Oct-04 | 9.9 | | | | | | | |
| Jan-05 | 15.1 | 33 | 24 | 9.9 | 20.50 | 103.34 | 10.17 | **3.09** |
| Apr-05 | 13 | 24 | 9.9 | 15.1 | 15.50 | 36.67 | 6.06 | **3.54** |
| Aug-05 | 5 | 9.9 | 15.1 | 13 | 10.75 | 19.26 | 4.39 | **2.60** |
| Nov-05 | 7 | 15.1 | 13 | 5 | 10.03 | 23.00 | 4.80 | 2.08 |

**Notes:**

$X_{bar}$ Average Concentration

$s^2$ Sample variance

s Sample Standard Deviation

$t_{stat}$ Student's T-Test Statistic

Item shown in **bold** or ***gray italics*** indicate a statistically valid detection (according to the student's T-Test statistic).

Items with no difference at all (zero difference) will indicate #DIV/0!