

July 16, 2009

Mrs. Martha Hynson, Chief
Landfill Operations
Maryland Department of the Environment
1800 Washington Boulevard
Baltimore, Maryland 21230

Dear Mrs. Hynson:

Please find enclosed the results of the latest water quality monitoring performed at the Gude Landfill for April 2009. The Montgomery County Department of Environmental Protection (DEP) has operated a groundwater and surface water monitoring program for the Gude Landfill since 1984. This report is based on the approved plan from MDHMH that has been our guidance for monitoring the Gude Landfill since 1984. As you may be aware, Montgomery County was recently requested by the Maryland Department of the Environment (MDE) to submit an updated Groundwater and Surface Water Monitoring Plan (G&SWM) to monitor the water quality contamination in and around the Gude Landfill in Montgomery County. Based on requirements and guidelines provided by MDE through a letter dated January 28, 2009, the County developed a G&SWM plan which was forwarded to MDE for approval on March 27, 2009. The submitted G&SWM plan was approved by MDE on May 11, 2009. Please note that future monitoring reports will be based on the approved G&SWM Plan.

The latest monitoring activities, which were conducted in April 2009 (prior to the approval of the new G&SWM plan for Gude Landfill), has been based on the 1984 monitoring program. In order to establish a benchmark for future reporting and provide background information, this “transitional report” has been prepared to report and evaluate groundwater and surface water data from 2001 to the present (Gude data in electronic format) with emphasis on the most recent monitoring results (April 2009).

The following provides a brief overview of the results obtained from the laboratory analyses for all the monitoring sites for this reporting period. Please refer to attached tables, diagrams, and enclosed CD for additional information.

VOLATILE ORGANIC COMPOUNDS:

The highlights of the results for this reporting period are listed below. Please refer to Table 1 of this report for all the VOC results.

- No VOCs were detected above recommended Maximum Contamination Level (MCL) in monitoring locations OB01, OB02, OB02A, OB04, OB04A, OB06, OB07, OB07A, OB10, OB-12, OB102, OB105, OB15, OB25, ST120, ST70, ST80, and ST15.
- A total of 29 VOCs exceeded the recommended MCL in monitoring locations OB03 (with 5 exceedances), OB03A (with 4 exceedances), OB08 (with 1 exceedance), OB08A (with 1 exceedance), OB11 (with 7 exceedances), OB11A (with 6 exceedances), OB12 (with 3 exceedances), OB15 (with 1 exceedance), and ST65 (with 1 exceedance).
- 45% of MCL exceedances were detected at observation well OB11/OB11A located on the south side (front side) of the landfill and 31% of MCL exceedances were detected at observation well OB03/OB03A located on the north side (back side) of the landfill.
- 1,2-Dichloropropane concentration exceeded the MCL of 5 ug/l for drinking water in Observation wells OB03, OB03A, OB11, and OB11A. Concentrations exceeding MCL for this compound ranged from 6.44 ug/l to 16.14 ug/l.
- Benzene concentration exceeded the MCL of 5 ug/L in OB03, OB011, and OB11A. Detected concentrations exceeding MCL ranged from 5.53 ug/l to 9.56 ug/l.
- cis-1,2-Dichloroethene concentration exceeded the MCL of 70 ug/l for drinking water in observation wells OB03, OB03A, OB11, and OB11A. Concentrations exceeding the MCL for this compound ranged from 137.52 ug/l to 190.55 ug/L
- Tetrachloroethene concentration exceeded the MCL of 5 ug/L for drinking water in observation wells OB11, OB11A, and OB12. Concentrations exceeding MCL for this compound ranged from 7.95 ug/L in OB12, 44.75 ug/L in OB 11A, and 67.92 ug/L in OB11.
- Trichloroethene concentration exceeded the MCL of 5 ug/L for drinking water in observation wells OB03, OB03A, OB11, OB11A and OB12 and stream location ST65. Concentrations exceeding the MCL for this compound ranged from 7.13 ug/L at ST65 to 130.79 ug/L at OB03.
- Vinyl Chloride concentration exceeded the MCL of 2 ug/L for drinking water in observation wells OB03, OB03A, OB08, OB08A, OB11, OB11A, OB12, and OB15 and at one surface water site (ST08). Concentrations exceeding the MCL for this compound ranged from 2.04 ug/L at ST08 to 28.49 ug/L at OB03.

ELEMENTS AND INDICATORS:

None of the metals analysis exceeded the recommended Maximum Contamination Levels (MCL) contained in National Primary Drinking Water Regulations in any of the monitoring sites.

Overall, data collected during this reporting period represent typical seasonal fluctuations in water quality with respect to monitored parameters for this landfill. Based on the latest monitoring and sample analysis obtained during this reporting period, there are no indications of any unexpected or unusual results that would require special attention and therefore no further actions are recommended. The County continues to closely monitor the presence of VOCs and other contaminants and will notify MDE prior to the next report in the event any detection is found to be significantly different from previous levels.

Please contact Nasser Kamazani at (240) 777-7717 with any questions about this report.

Sincerely,

David Lake, Manager
Water and Wastewater Policy Group

cc: Robert Hoyt, Director,
Department of Environmental Protection

Dan Locke, Chief
Division of Solid Waste Services,
Department of Environmental Protection

**WATER QUALITY
MONITORING REPORT**

for

Gude LANDFILL

Montgomery County, Maryland

July 2009

Report Period: April 2009

Prepared by Montgomery County Department of Environmental Protection

Prepared for Maryland Department of Environment, Solid Waste Program

July 16, 2009

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Appendix E Table of Groundwater Elevations and Groundwater Elevation Contour Map.

Introduction:

The Gude Landfill is located on the north side of Gude Drive near Southlawn Lane, northeast of the City of Rockville in Montgomery County. The site encompasses approximately 160 acres, of which approximately 100 acres have been used for the disposal of municipal waste and incinerator residues. It operated from the early 1960s until June 1, 1982. The Gude Landfill was constructed prior to the promulgation of regulations for landfill lining and leachate collection systems.

To monitor the quality of ground and surface water, the Montgomery County Department of Environmental Protection (DEP) collects samples at a total of 25 monitoring sites, which include 20 observation wells and 5 stream locations. Locations of these monitoring sites can be found on the attached aerial photo titled Groundwater and Surface Water Monitoring Locations in Appendix A. Sampling and analysis are conducted semi-annually and include laboratory analysis for Volatile Organic Compounds (VOCs), Heavy Metals, field parameters (temperature, pH, conductivity) and other water quality parameters and indicators.

This report is organized into four sections, which discuss the results and observations based on the landfill water quality monitoring program. The four sections include a discussion of:

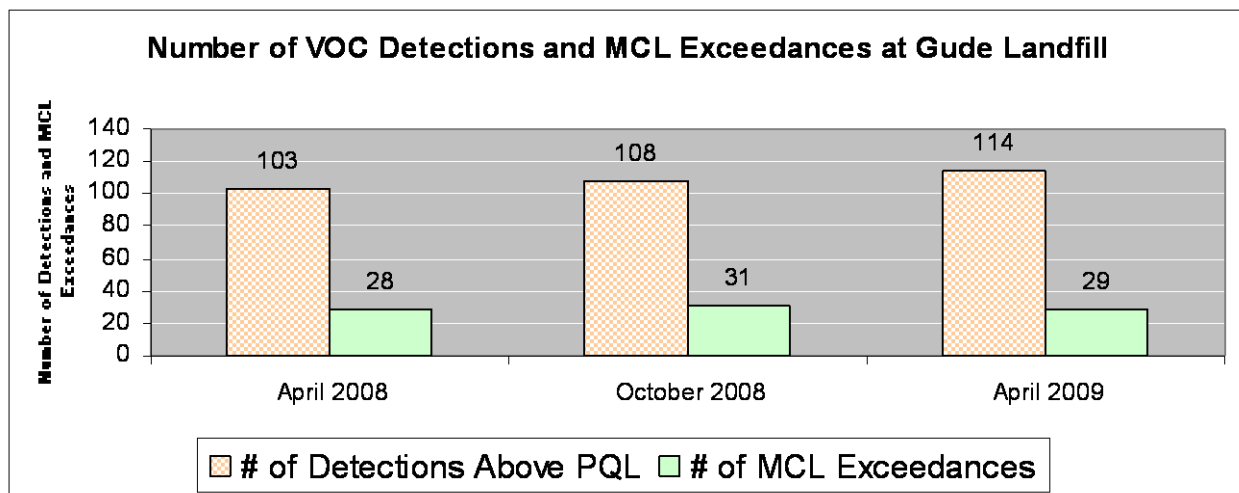
- VOC sampling results;
- Metals sampling results;
- Groundwater elevation and flow;
- Trends Analysis/Conclusions

The appendices provide data tables for reference, as well as aerial photos and maps.

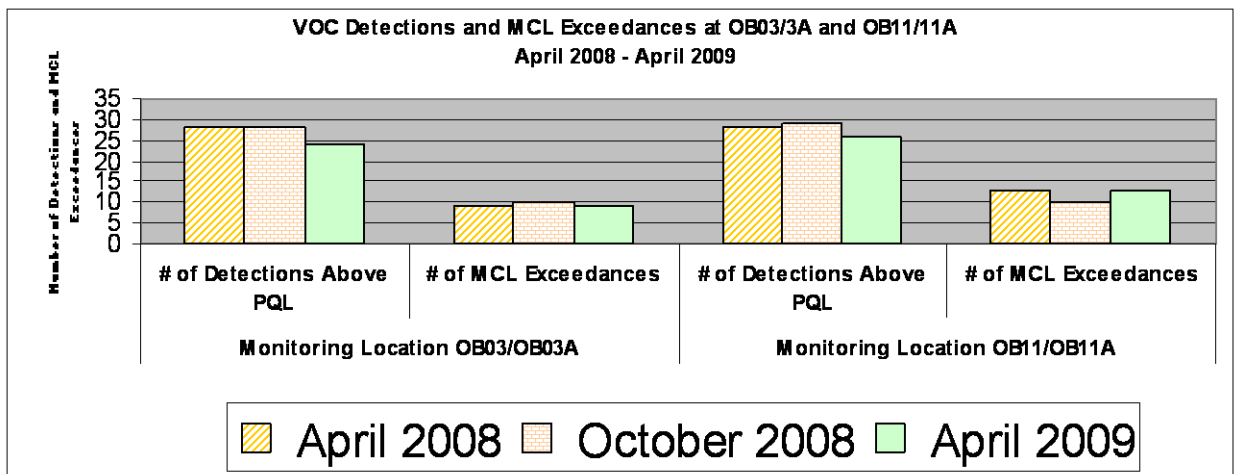
1. Volatile Organic Chemical Sampling Results:

The following is a summary of monitoring results obtained for this reporting period.

- The concentrations of VOCs in groundwater are similar to those that were recorded during the past monitoring activities.
- Results obtained for this reporting period are comparable with previously recorded observations in both number of detections and concentrations of contaminants for both PQL (practical quantitative limit) and MCL (maximum contaminate limit).



- For this monitoring period, no VOCs were detected above recommended Maximum Contamination Level (MCL) in monitoring locations OB01, OB02, OB02A, OB04, OB04A, OB06, OB07, OB07A, OB10, OB-12, OB102, OB105, OB15, OB25, ST120, ST70, ST80, and ST15.
- A total of 29 VOCs exceeded the recommended MCL in monitoring locations OB03 (with 5 exceedances), OB03A (with 4 exceedances), OB08 (with 1 exceedance), OB08A (with 1 exceedance), OB11 (with 7 exceedances), OB11A (with 6 exceedances), OB12 (with 3 exceedances), OB15 (with 1 exceedance), and ST65 (with 1 exceedance).
- 45% of MCL exceedances were detected at observation well OB11/OB11A located on the south side (front side) of the landfill and 31% of MCL exceedances were detected at observation well OB03/OB03A located on the north side (back side) of the landfill. High number of detections above the MCL for some of the VOCs at monitoring locations OB03/OB03A and OB11/OB11A is consistent with prior monitoring observations. (Adjacent observation wells are designated in the following format [OBxx/OBxxA] are adjacent wells with different depths and are constructed only a few feet apart.)



- 1,2-Dichloropropane concentration exceeded the MCL of 5 ug/l for drinking water in Observation wells OB03, OB03A, OB11, and OB11A. Concentrations exceeding the MCL for this compound ranged from 6.44 ug/l to 16.14 ug/l.
- Benzene concentration exceeded the MCL of 5 ug/L in OB03, OB011, and OB11A. Detected concentrations exceeding the MCL ranged from 5.53 ug/l to 9.56 ug/l.
- cis-1,2-Dichloroethene concentration exceeded the MCL of 70 ug/l for drinking water in observation wells OB03, OB03A, OB11, and OB11A. Concentrations exceeded MCL for this compound ranged from 137.52 ug/l to 190.55 ug/L
- Tetrachloroethene concentration exceeded the MCL of 5 ug/L for drinking water in observation wells OB11, OB11A, and OB12. Concentrations exceeding the MCL for this compound ranged from 7.95 ug/L in OB12, 44.75 ug/L in OB 11A, and 67.92 ug/L in OB11.
- Trichloroethene concentration exceeded the MCL of 5 ug/L for drinking water in observation wells OB03, OB03A, OB11, OB11A and OB12 and stream location ST65.

Concentrations exceeding the MCL for this compound ranged from 7.13 ug/L at ST65 to 130.79 ug/L at OB03.

- Vinyl Chloride concentration exceeded the MCL of 2 ug/L for drinking water in observation wells OB03, OB03A, OB08, OB08A, OB11, OB11A, OB12, and OB15. Concentrations exceeding the MCL for this compound ranged from 2.04 ug/L at ST08 to 28.49 ug/L at OB03.
- The presence of the above listed compounds, in terms of number and concentration, is similar and consistent with prior monitoring results. Results for all of the VOCs can be found in Table-1 and Table-2 in Appendix B of this report. Table-1 contains the results from the April 2009 sampling event. Table 2 shows the monitoring results for the past several years.

2. Inorganic and Metals Sampling Results:

None of the metals analysis exceeded the recommended Maximum Contamination Levels (MCL) contained in National Primary Drinking Water Regulations in any of the monitoring sites. Overall, the results indicate comparable concentrations for metals from the last reporting period. Laboratory results for these metals are included in Appendix D, Tables 3 and 4 of this report.

3. Physical Water Quality Measurements:

No physical water quality parameter measurements were conducted for this reporting period. Measurements on physical water quality will be included in this report according to the approved G&SWM for the next scheduled monitoring period.

4. Groundwater Elevations and Flow:

The April 2009 groundwater elevation measurements for all monitoring wells are included in Table 5 (data collected for first time). Analysis with respect to groundwater elevation changes and flow patterns will be included for the next monitoring cycle scheduled for the Fall 2009 (as required in the G&SWM Plan).

5. Conclusions/Trend Analysis:

A data review and analysis of the monitoring results for the past several years (2001 to present) indicates:

- I. There are indications of some (below toxic levels) groundwater and surface water contamination in the vicinity of Gude Landfill.
- II. Detected contaminants at Gude Landfill involve mainly chlorinated solvent degradation products including 1,1-Dichloroethane, 1,2-Dichloropropane, cis-1,2-Dichloroethene, Tetrachloroethene, Trichloroethene, Benzene, and Vinyl Chloride.
- III. Most of the contaminants (about 70%) are detected at observation wells OB11/OB11A located on the south side (front side) of the landfill and observation wells OB03/OB03A located on the north side (back side) of the landfill. (Observation wells OBxx/OBxxA are adjacent wells with different depths and are constructed within several feet apart.)

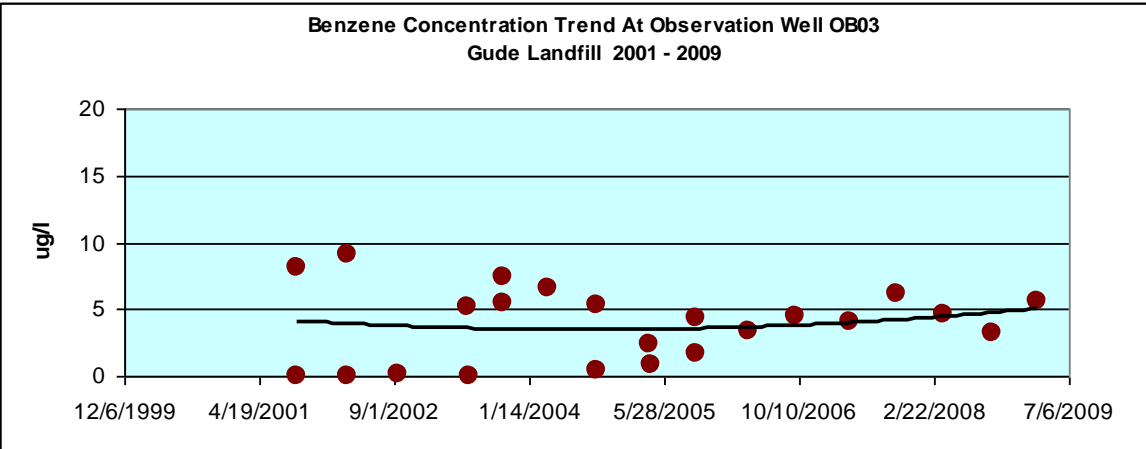
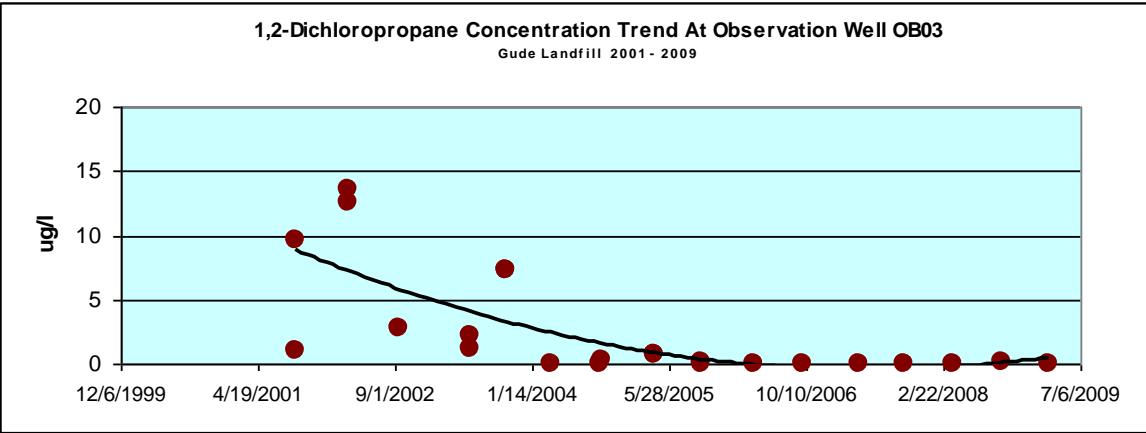
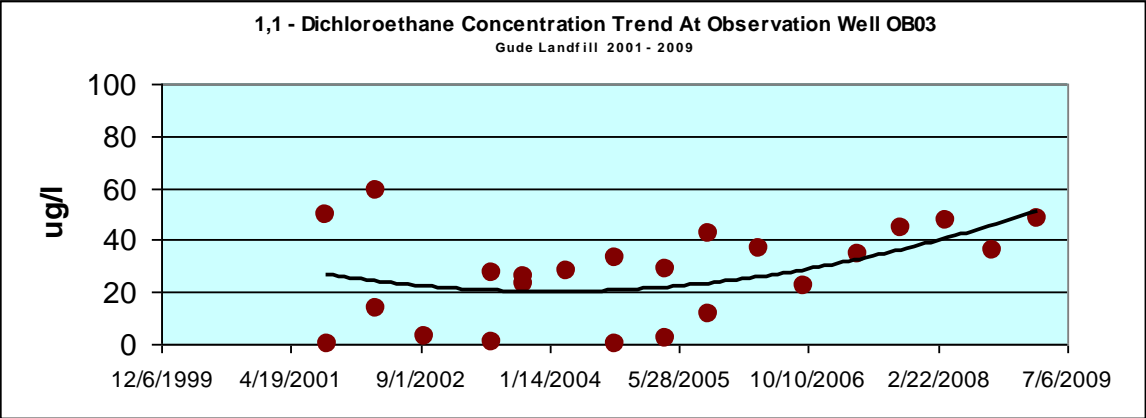
To provide an overall perspective on the quality of groundwater and surface water around the

Gude Landfill, a summary of statistical trend analyses and observations are provided below and are included in Appendix C of this report. Please refer to the attached tables and diagrams for additional information.

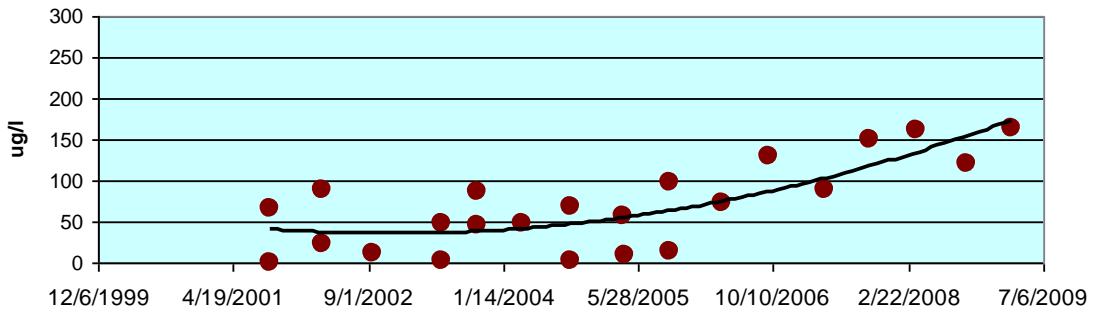
- Most of the detected groundwater contaminants at Gude Landfill are Volatile Organic Compounds (VOCs). These low levels of VOCs detected in groundwater are generally not transported to surface waters.
- The overall number of detections per year has remained relatively constant over the past 7-8 year time period. However, the number of detections exceeding established MCLs appears to be increasing slightly over the same period.
- While some detected VOC concentrations appear to be trending upwards, the concentration for other VOCs seem to be decreasing over the same period.
- Since April 2001, about 70 % of all detections exceeding MCL have occurred in observation wells OB03-OB03A and OB11-OB11A.

Volatile Organic Compounds

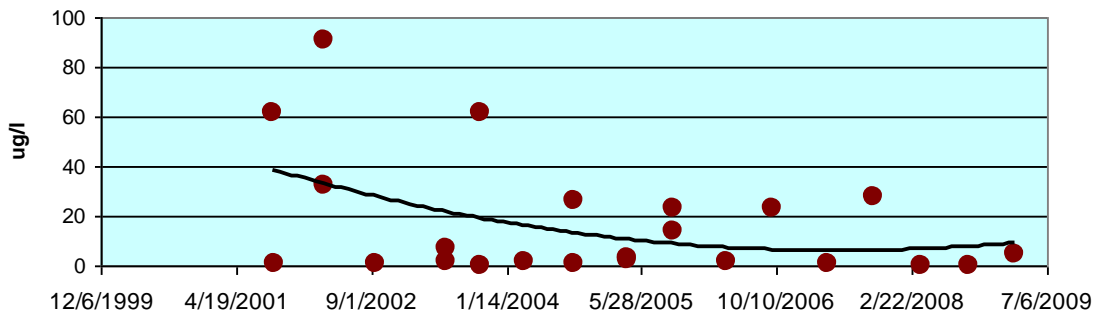
Trend Analysis



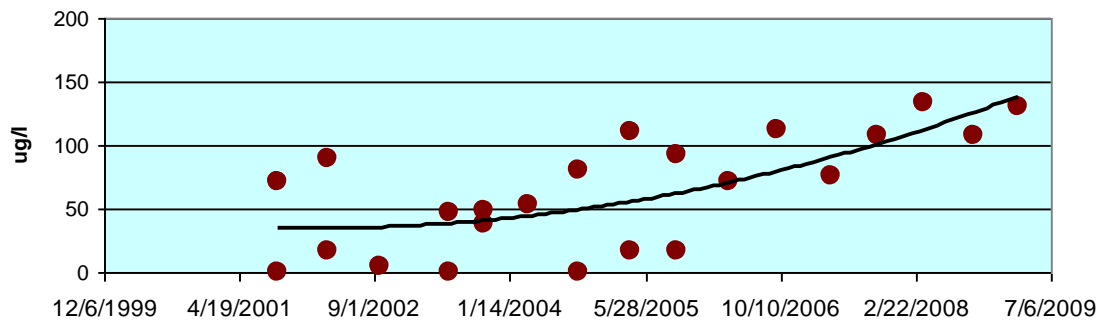
**cis-1,2-Dichloroethene Concentration Trend At Observation Well OB03
Gude Landfill 2001 - 2009**

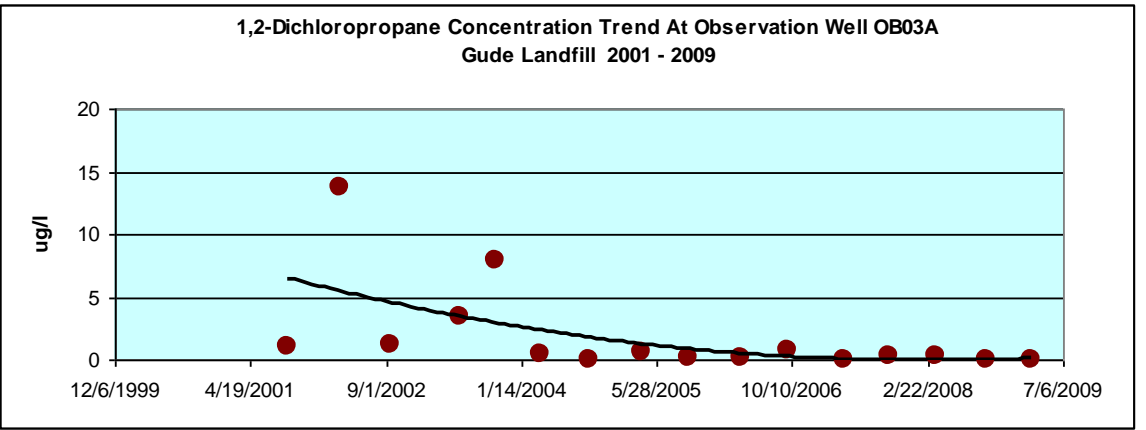
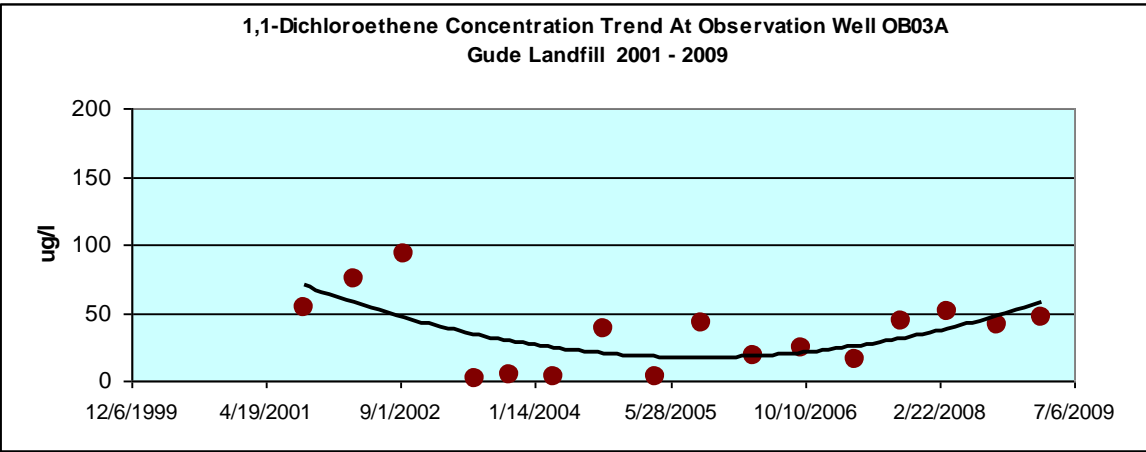
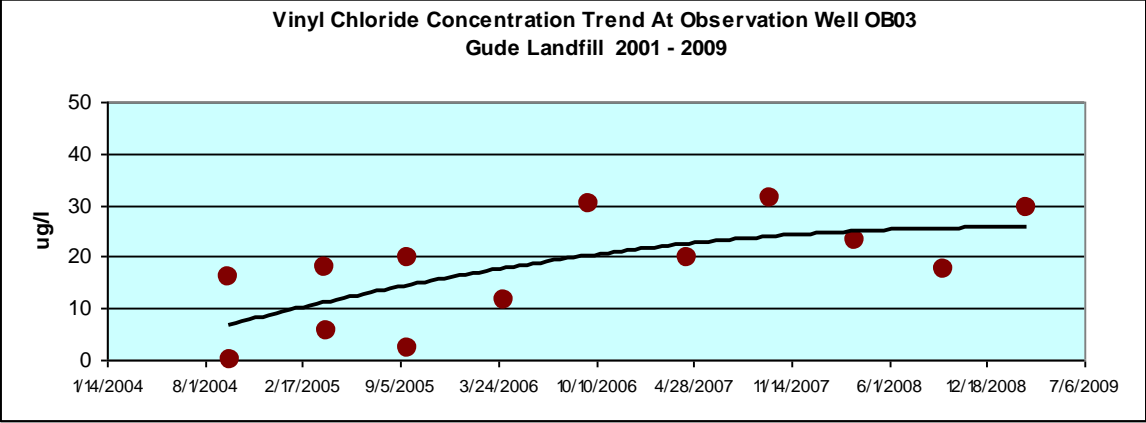


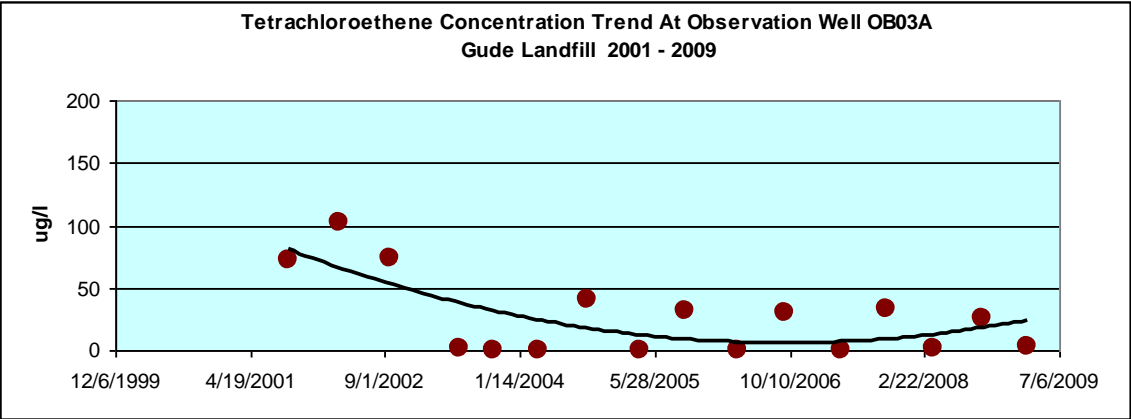
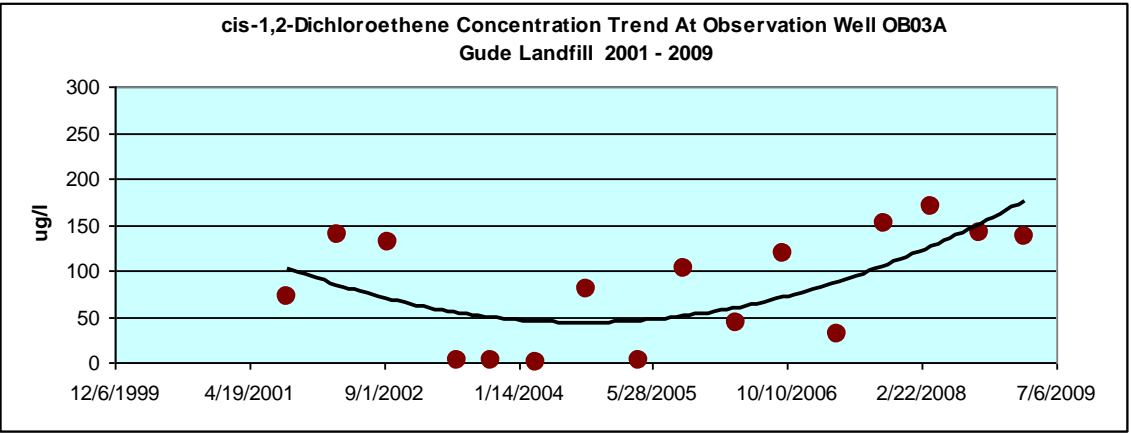
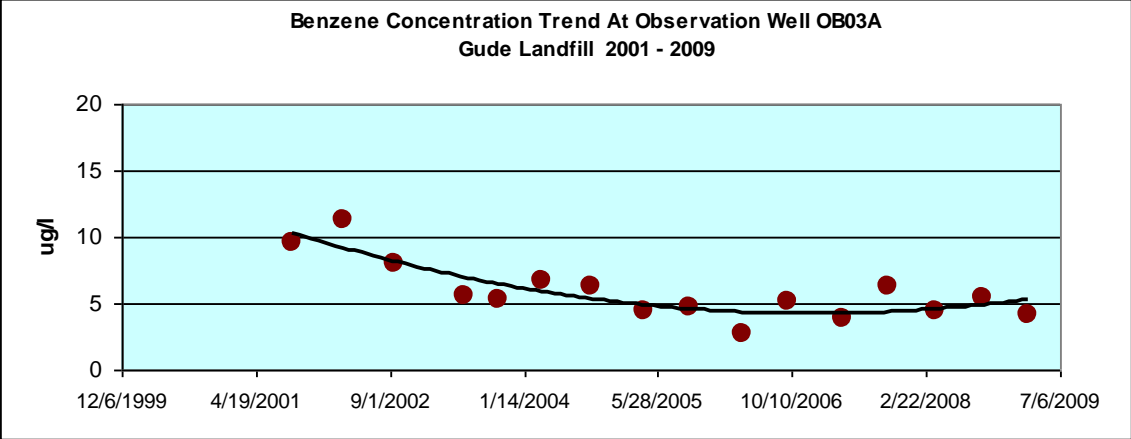
**Tetrachloroethene Concentration Trend At Observation Well OB03
Gude Landfill 2001 - 2009**

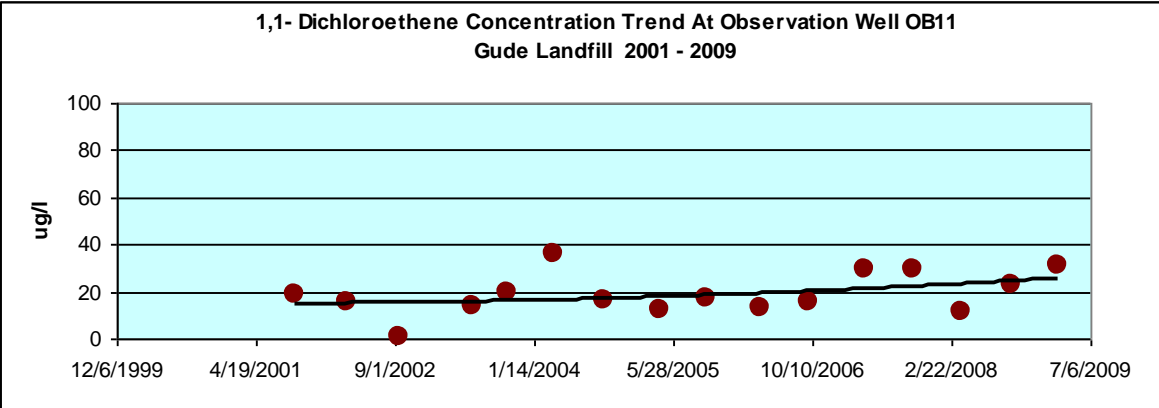
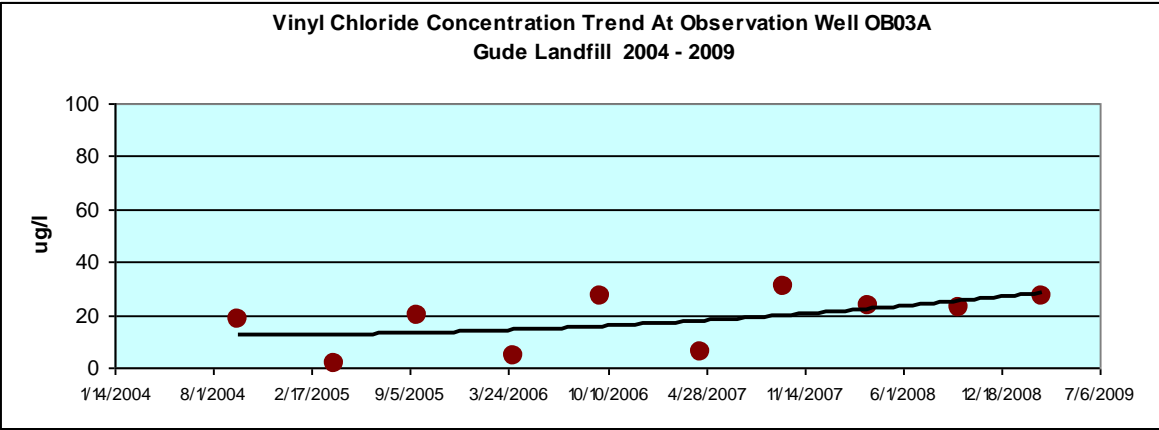
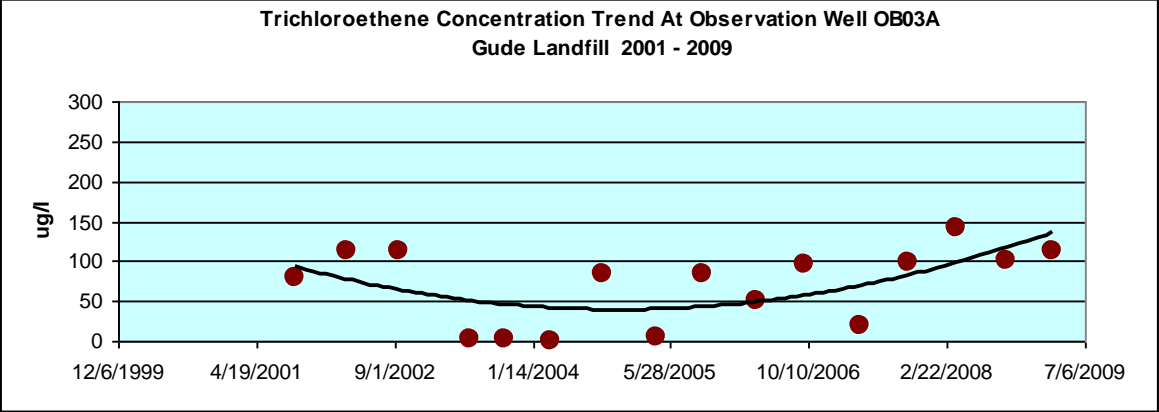


**Trichloroethene Concentration Trend At Observation Well OB03
Gude Landfill 2001 - 2009**

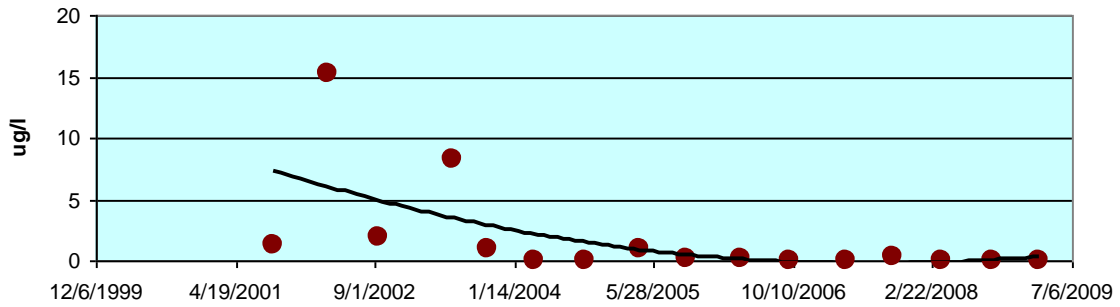




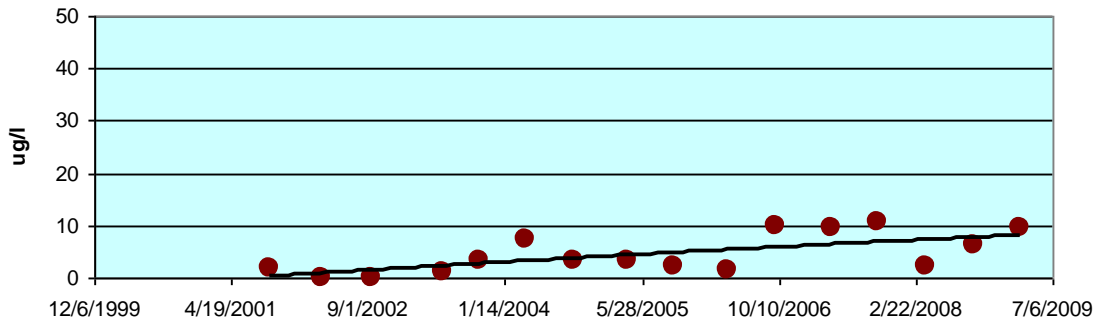




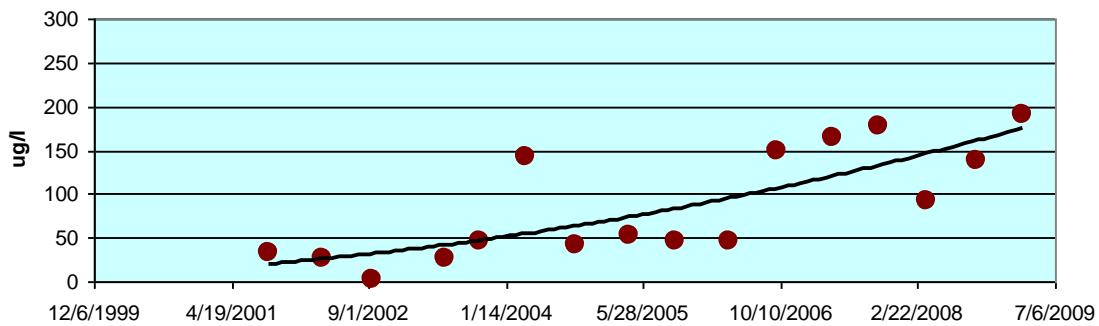
**1,2-Dichloroethene Concentration Trend At Observation Well OB11
Gude Landfill 2001 - 2009**

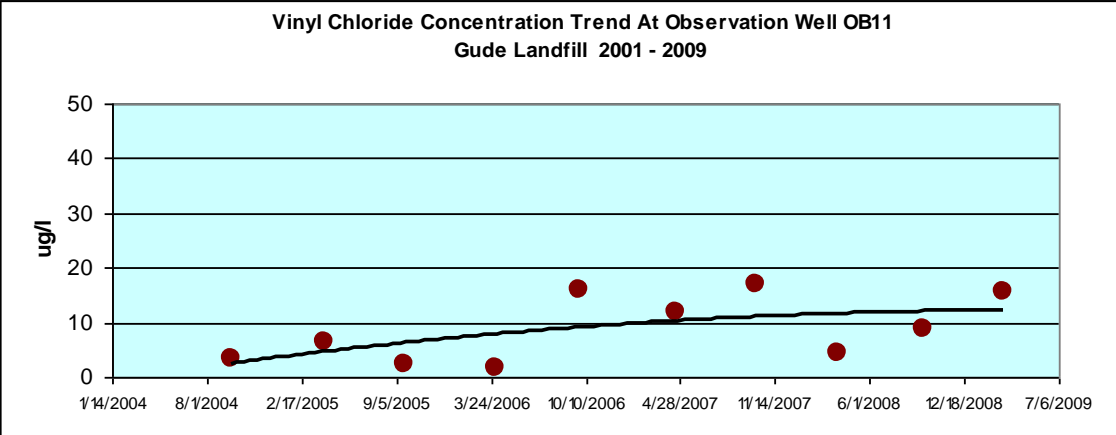
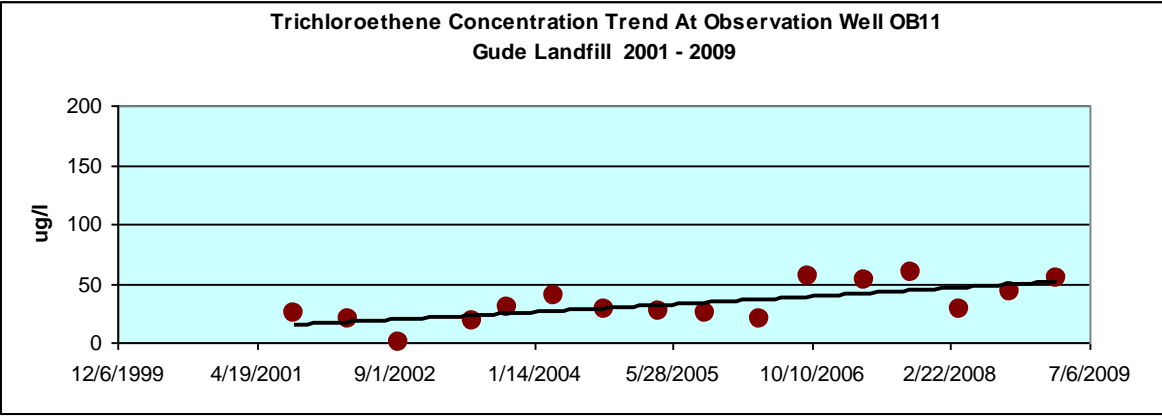
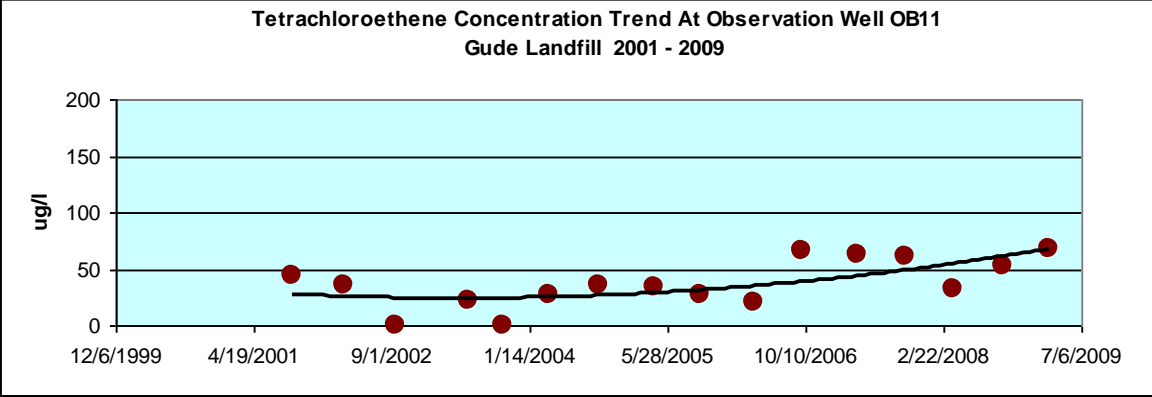


**Benzene Concentration Trend At Observation Well OB11
Gude Landfill 2001 - 2009**

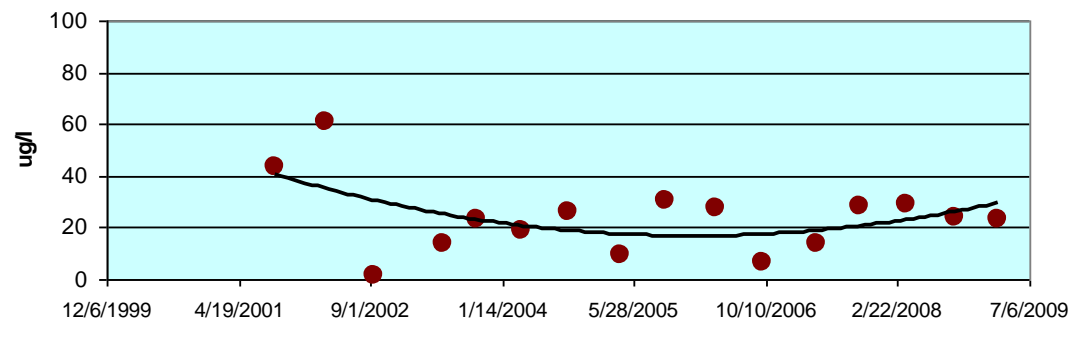


**cis-1,2-Dichloroethene Concentration Trend At Observation Well OB11
Gude Landfill 2001 - 2009**

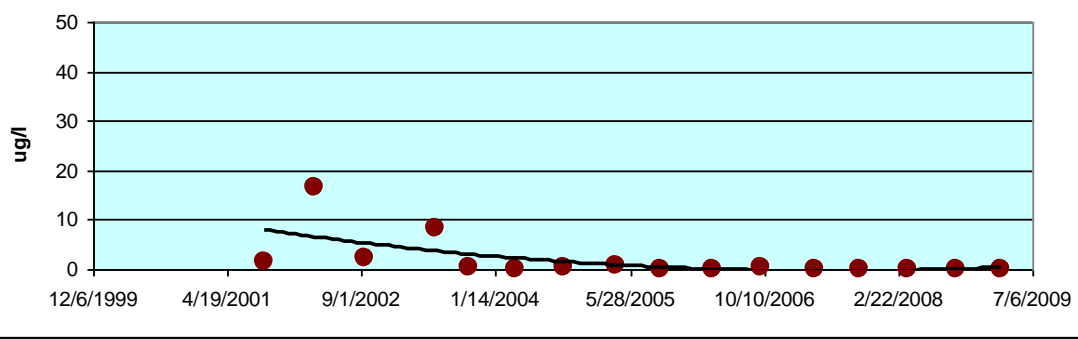




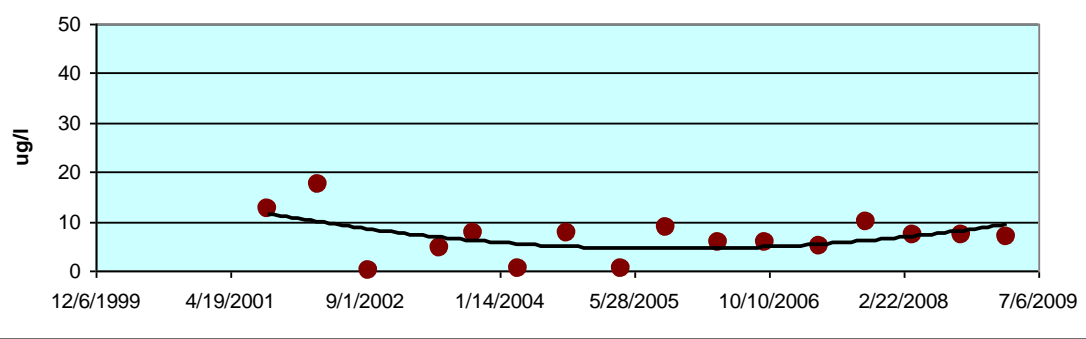
**1,2-Dichloroethane Concentration Trend At Observation Well OB11A
Gude Landfill 2001 - 2009**



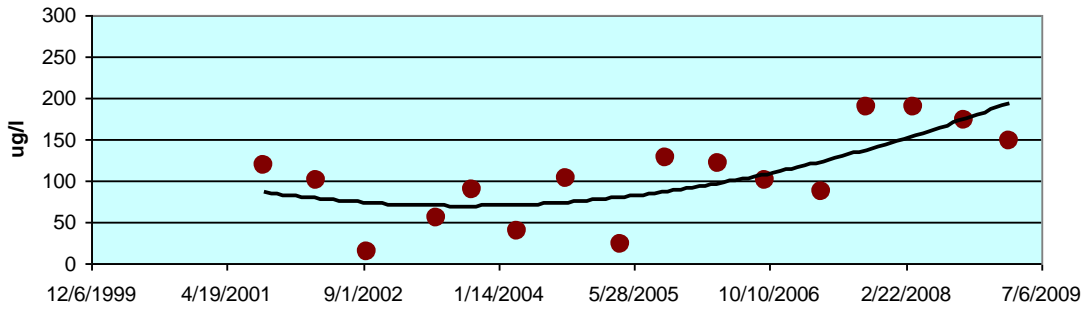
**1,2-Dichloropropane Concentration Trend At Observation Well OB11A
Gude Landfill 2001 - 2009**



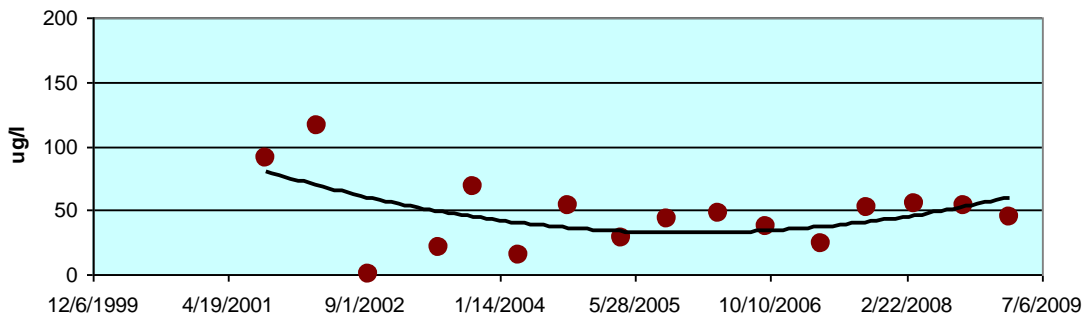
**Benzene Concentration Trend At Observation Well OB11A
Gude Landfill 2001 - 2009**



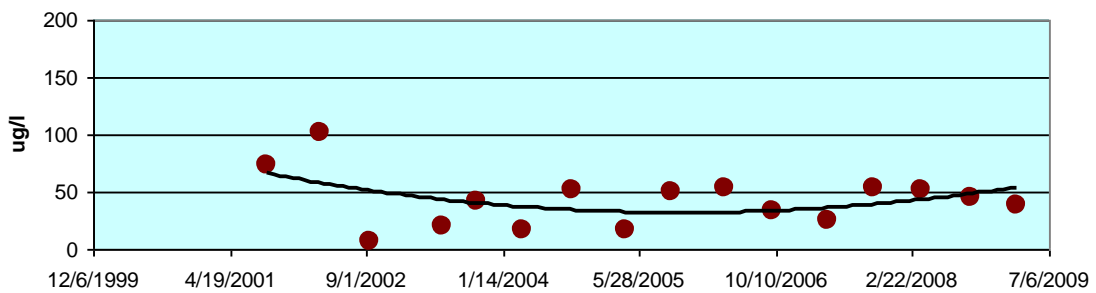
**cis-1,2-Dichloroethene Concentration Trend At Observation Well OB11A
Gude Landfill 2001 - 2009**

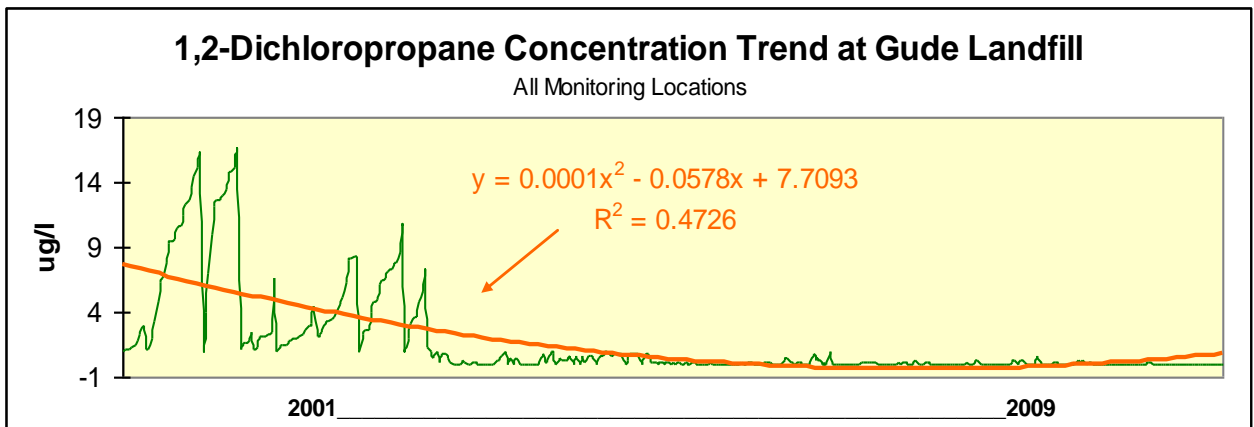
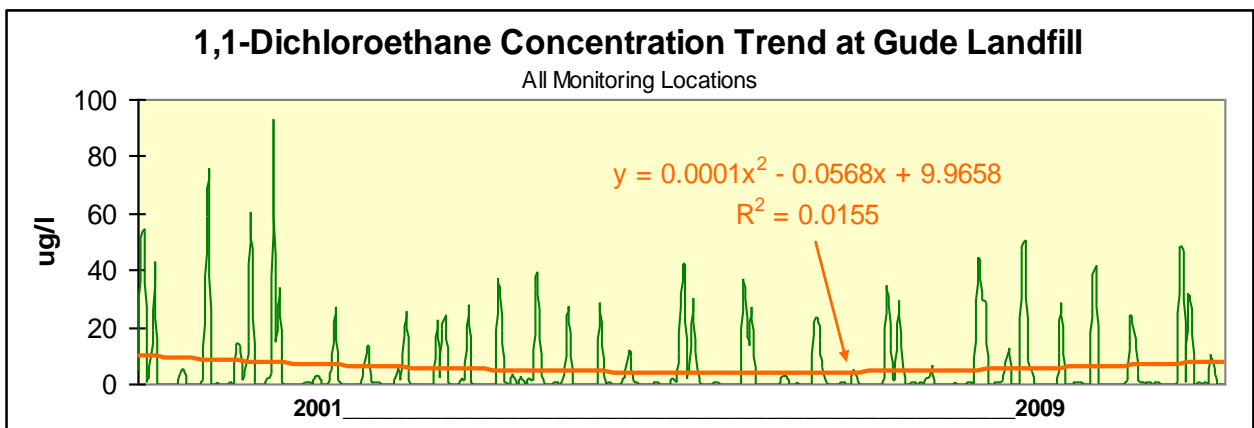
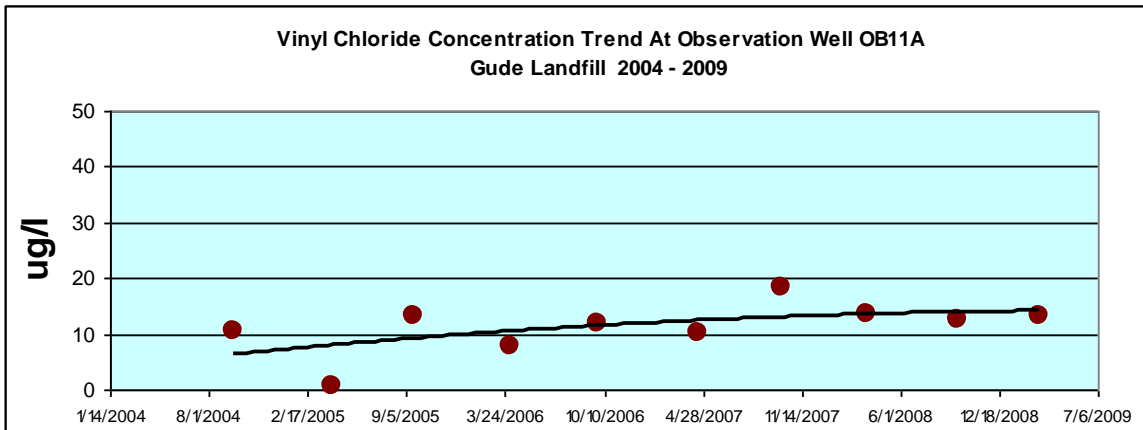


**Tetrachloroethene Concentration Trend At Observation Well OB11A
Gude Landfill 2001 - 2009**



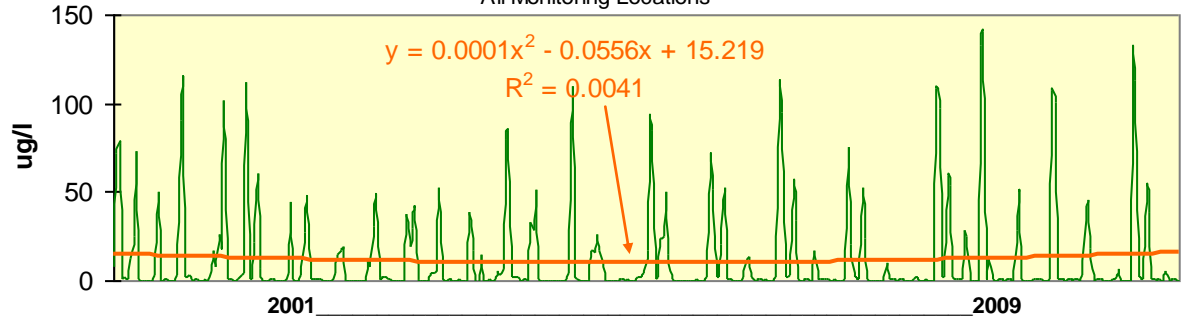
**Trichloroethene Concentration Trend At Observation Well OB11A
Gude Landfill 2001 - 2009**





Trichloroethene Concentration Trend at Gude Landfill

All Monitoring Locations



Vinyl Chloride Concentration Trend at Gude Landfill

All Monitoring Locations

