ARCADIS
Infrastructure, environment, buildings

Imagine the result

Ashland Inc.

Revised Draft RCRA Facility Investigation Report

Rensselaer, New York

March 2009

Table of Contents

1. Introduction **1**

1.1 General 1

1.2 Report Organization 2

2. Site Setting and History **3**

2.1 Site Location and Physical Setting 3

2.2 Site History 4

3. Geology **6**

3.1 Hydrogeology 6

3.1.1 Groundwater 6

3.1.2 Vertical Gradients 7

3.1.3 Hydraulic Conductivity 8

3.1.4 Surface Water 9

3.1.5 Groundwater – Surface Water Interaction 9

4. Constituents of Interest and Distribution **11**

4.1 Soil 11

4.2 Groundwater 12

4.3 Soil Vapor 13

5. Conclusion **14**

6. References **15**

Tables

Table 1 Summary of Historical Groundwater Elevation Data

Table 2 Well Construction Table

Table 3 Hydraulic Conductivity Values Calculated Using Slug Test Results

Table 4 VOC Analytical Data for Soil

Table 5 Post 2002 Draft RFI VOC Analytical Data in Groundwater

Table 6 Natural Attenuation Parameters

Table 7 VOC Analytical Data in Indoor Air and Soil Vapor

Figures

Figure 1 Site Plan

Figure 2 Cross Section Location Map

Figure 3 Cross Section A-A'

Figure 4 Cross Sections B-B' and C-C'

Figure 5 Groundwater Elevation Contours, November 17, 2008

Appendices

A Historical Documents

A-1 Draft RFI Report submitted in October 2002

A-2 Letter from USEPA to Ashland dated November 7, 2002

A-3 Groundwater Natural Attenuation Study

A-4 Human Health Risk Assessment

B Summary of Reports and Correspondence Starting with Submission of 2002 Draft RFI

C Photographs of Site Features Decommissioned During 2007/2008

D Boring Logs

E Summary of Historical VOC Data in Groundwater

1. Introduction

1.1 General

This *Revised Draft RCRA Facility Investigation Report* (Draft RFI Report) has been prepared on behalf of Ashland Inc. (Ashland) by ARCADIS U.S. Inc. (ARCADIS) for the Ashland Rensselaer site located at 130 South Street, Rensselaer, New York (site). This Draft RFI Report has been prepared in accordance with the Administrative Order on Consent (AOC), Docket No. II RCRA-92-3008(h)-0201, between Ashland and the United States Environmental Protection Agency (USEPA) Region 2. The purpose of this report is to summarize the results of environmental investigations completed at and near the site, to update the previous draft RFI submitted in 2006, and to address a few data gaps in the 2002 Draft RFI Report. The information presented in this current Draft RFI Report has been used in the development of the RCRA Corrective Measures Study (CMS) that has been prepared to select an appropriate remedial alternative for the site.

A previous Draft RFI Report was submitted to USEPA in October 2002. That report summarized all data collected at the site since the initial 1981 USEPA RCRA inspection. A copy of the October 2002 Draft RFI report is provided as Appendix A-1. In a November 7, 2002 letter to Ashland (provided in Appendix A-2), the USEPA provided comments and identified several data gaps to be addressed prior to completion of the RFI. These comments, as well as other pertinent correspondence are summarized in Appendix B. The data gaps were largely addressed in a subsequent resubmittal of the Draft RFI on December 19, 2002. In a January 15, 2003 letter, USEPA conditionally approved the Draft RFI Report, and requested that Ashland begin a CMS. The bulk of the information requested in USEPA's January 2003 conditional approval was provided in the First Quarter Progress Report submitted to USEPA on March 14, 2003, and committed to addressing outstanding groundwater issues in the CMS.

A CMS Work Plan was subsequently developed and, in accordance with that Work Plan, a Draft CMS was submitted to USEPA in November 2006. As part of, and in parallel with development of the CMS, USEPA had a number of comments regarding site conditions. These comments largely reflected the USEPA's questions regarding off-site groundwater quality and potential soil vapor conditions. To address these, a Groundwater Natural Attenuation Study was performed and reported in January 2004, and a Human Health Risk Assessment (HHRA) reported in September 2005 (both documents are provided in Appendix A-3 and A-4, respectively). The HHRA identified soil vapor as the most likely potential threat to human health and the environment. In

2007 and 2008, a series of soil vapor investigations were performed that are summarized in Appendix B of this report, and discussed in more detail in section 4.3.

In August 2007, a letter was submitted summarizing current site conditions and proposing a revision to the remedial approach that more effectively addressed site conditions. USEPA approved the proposed revised remedial approach in a letter dated September 27, 2007. The Revised Draft CMS was submitted in January 2008. This current Draft RFI provides a summary of the additional activities implemented at and near the site subsequent to the submission of the November 2006 Draft CMS and provides a summary of the findings of these investigations as well as an overall summary of the site environmental conditions. A Revised Draft CMS is also being submitted in coordination with this document to present a comprehensive remedy evaluation based on all available data.

1.2 Report Organization

The remainder of the report consists of six sections. Section 2 provides a summary of the site history and site conditions including location, physical setting and topography. Section 3 presents an updated discussion of the site geology and hydrogeology. Section 4 describes the constituents of interest (COI) and their distribution at and near the site in soil, groundwater, and soil vapor. Section 5 discusses potential receptors at and/or near the site, and Section 6 summarizes the RFI as a precursor to the CMS. References are provided in Section 7.

2. Site Setting and History

2.1 Site Location and Physical Setting

The Ashland site is located at 130 South Street in the City of Rensselaer, Rensselaer County, New York, north of the intersection of South Street with U.S. Routes 9 and 20 (Columbia Turnpike). The main portion of the site, located on the west side of South Street, has an areal extent of approximately 4.8 acres and is enclosed by a six-foot high chain-link fence (see Figure 1). The site has most recently been used by Ashland for a chemical distribution facility; however, these operations were discontinued in late 2001 and the site is now vacant. All related buildings and other structures have been removed from the site. A small parcel of land associated with the site and formerly used as a parking lot is located on the east side of South Street. A further discussion of site history and site use is provided below.

Land use in the areas surrounding the site is predominantly residential, commercial, and light industrial.

The main site area is bordered by CSX Transportation, Inc. (CSXT) property and rail lines to the west, undeveloped land to the north, South Street to the east, and Columbia Turnpike to the south. Commercial and light industrial properties are located west of the CSXT rail lines and residential properties are present along South Street east of the site.

The site is located on the edge of the Hudson River floodplain. The Hudson River is located approximately 1,650 feet northwest of the site. The northeast end of the site is located within the 100-year floodplain. A small unnamed creek enters the east central part of the site, crosses the site from east to northwest in a buried culvert then drains northward (still in the culvert) along the western side of the site and discharges into an open ditch at a headwall just inside the northern site boundary. Most surface water drains via overland flow to storm drains which discharge from the site into the creek. A small amount of surface water drains via overland flow to a drainage structure along the east side of the CSXT railroad tracks.

2.2 Site History

The site history, as presented in the 2006 Draft CMS Report, is summarized below.

From 1892 to approximately 1915, the southern portion of the site was occupied by the Fred Schwartz Slaughter House. Between 1909 and 1925, ownership of the site was transferred to Empire Size and Chemical Corporation (Empire). Empire utilized the southern portion of the site until approximately 1935. The exact nature of operations conducted by Empire is not known; however, a Sanborn Fire Insurance Map indicated that the area was used for the manufacture of “Rosin Size Paste”.

From approximately 1935 to 1944, Hercules Powder Company (Hercules) operated in the southern portion of the site. As a wholesale chemical distributor, Hercules transferred, drummed, and stored solvents in the southern portion of the site. A vehicle repair shed in the southern portion of the site was also used for product storage during the winter.

Ownership of the southern portion of the site was transferred from Hercules to Eastern Chemicals, Inc. (Eastern) in approximately 1944. Eastern retained the wholesale chemical distribution activities from Hercules and expanded the operations area. Interviews with long-term employees indicated that Eastern handled solvents and corrosives (similar to the former Ashland inventory) in bulk quantities. In addition, bulk linseed oil, turpentine, antifreeze, and sodium silicate was also transferred, drummed, and stored in the central portion of the site.

Ashland purchased the site in 1969 and continued chemical distribution operations. By 1975, several building additions were completed. In 1987, an aboveground solvent storage tank (AST) farm, which included a catastrophic release collection system, was relocated to the northern portion of the site. As part of the new AST farm construction, 6,000 cubic yards of soil were removed and subsequently placed and treated in an engineered secured stockpile located in the northern portion of the site. This work was conducted pursuant to a Consent Agreement/Consent Order issued by the USEPA in 1984 (Docket No. II RCRA-83-0253). In 1990, the acid tank farm neutralization unit was replaced and containment dikes were installed at truck transfer locations. Ashland discontinued operations at the site in December 2001. Subsequent to the shutdown, Ashland emptied and decontaminated the tanks and associated pipelines at the site.

From September 2003 to December 2006 the site was leased to a company for the storage and distribution of advertising inserts for newspapers. The lessee utilized the

warehouses, office buildings, and parking lot on the southern portion of the site. The central portion of the site was used for the lessee's truck parking/loading.

Since December 2006, the site has been unoccupied with the exception of occasional visits by personnel conducting maintenance and monitoring activities on the groundwater treatment system located in the northern portion of the site and routine building maintenance activities until 2008 when building demolition was complete.

In October 2007, Ashland implemented a limited decommissioning program at the former site. During this program, all above ground tanks, piping, and associated support structures were removed/recycled. Before and after photos are provided in Appendix C.

In November/December 2008 Ashland completed the site decommissioning activities through demolition of the one remaining building at the site. Post-removal photographs of this area are provided in Appendix C.

3. Geology

Based on the information provided in the 2006 Draft RFI and additional site-specific information collected since that time, the site is within the Great Valley physiographic province (NYSGS, 1990). The regional topography consists of gently to steeply sloping lowlands which are underlain by metamorphosed sandstone and shale. The site itself is underlain by Normanskill Shale. This unit is Ordovician in age and consists predominately of shale with minor sandstone and mudstone. Bedrock or drilling refusal was encountered in 19 borings across the site at depths of approximately 22 to 36 feet below ground surface (bgs). Boring logs are provided in Appendix D.

The overburden materials above the bedrock at the site are mapped on the 1986 New York State Geological Survey map (Fakundiny, 1986) as lacustrine silt and clay deposited in proglacial lakes, with variable thickness. Site-specific information from site borings was used to develop a series of cross sections for the site. Figure 2 is a cross section location map and Figures 3 and 4 provide three site cross sections. As shown on these sections, the unconsolidated material generally consists of approximately 3 to 6 feet of fill material (locally up to 10 feet in thickness) underlain by up to 20 or more feet of sand with variable amounts of silt, clay and fine gravel. This sandy material is locally interbedded with variable-sized materials, which in some areas is a sand and gravel in a till-like setting (e.g., see recovery well RW-7 on Cross Section A-A' on Figure 3), sand or silty sand (IW-B1 on the same section). The more conductive coarser-grained beds do not appear to be laterally continuous and therefore do not comprise a laterally continuous highly conductive water bearing unit. These deposits are underlain by bedrock or drilling refusal at up to 19 locations including MW-15 on Cross Section A-A' on Figure 3.

3.1 Hydrogeology

3.1.1 Groundwater

Based on current and historical groundwater investigation data, groundwater occurs at depths ranging between 3 and 9 feet bgs. Groundwater generally flows to the northwest with a horizontal hydraulic gradient of approximately 0.01 to 0.02. Prior to system shutdown July 2008, pumping from the groundwater treatment system sump in the center of the site provided localized drawdown and hydraulic control of affected groundwater in the central and northern portions of the site. Since the system was shut down in July 2008, the groundwater flow is no longer influenced by pumping at the site,

as illustrated by recent groundwater elevation contours provided on Figure 5. Groundwater elevation data are summarized in Table 1.

3.1.2 Vertical Gradients

Only one deeper/shallower monitoring well cluster is presently associated with the site. Monitoring well cluster MW-12S and MW-12D, located northwest of the Ashland Property, has been used to preliminarily assess the potential vertical gradients in the site area. A review of vertical gradients calculated based on head data from the last 10 years at the MW-12S/MW-12D cluster, as provided in the table below, reveals both upward and downward gradients over time, with an overall upward average vertical gradient.

Date	MW-12S Water Elevations	MW-12D Water Elevations	Vertical Gradient
11/15/1999	14.69	15.06	0.030
5/24/2000	15.91	16.54	0.051
11/29/2000	14.82	15.10	0.023
7/6/2001	16.64	15.87	-0.063
11/7/2001	13.91	14.56	0.053
5/21/2002	15.89	16.27	0.031
11/12/2002	14.97	15.24	0.022
4/21/2003	14.91	16.47	0.127
7/14/2003	15.20	15.64	0.036
10/28/2003	16.07	14.42	-0.134
4/6/2004	15.97	16.87	0.073
10/12/2004	15.42	15.44	0.002
4/13/2005	15.62	16.26	0.052
10/4/2005	12.74	14.16	0.115
5/2/2006	16.95	16.33	-0.050
10/3/2006	15.54	15.86	0.026
4/9/2007	15.91	16.82	0.074
9/11/2007	16.32	15.57	-0.061
4/9/2008	16.06	16.92	0.070
9/15/2008	15.33	15.90	0.046
Average:	**15.44**	**15.77**	**0.026**

Note:
Positive vertical gradients are interpreted to reflect upward groundwater movement.

3.1.3 Hydraulic Conductivity

Two pumping tests were performed by Environmental Strategies Corporation (ESC) in May 2001 and March 2002 to evaluate hydraulic containment of constituents in groundwater and evaluate aquifer properties (ESC, 2002; URS, 2002). The 2001 pumping test was performed in the southwest corner of the site on MW-19 and drawdown was measured in three nearby piezometers. The 2002 pumping test was conducted near the central area of the site on the Sump, and drawdown was monitored in nearby piezometers and monitoring wells between 40 and 260 feet from the Sump for 14 days. Aquifer transmissivity was estimated to be approximately 84.8 to 133.9 ft^2/day near the southwest corner and 293.6 ft^2/day at the central area of the site. Hydraulic conductivity was estimated to be between 2.9 and 13.1 ft/day in the southwest area and approximately 11.2 ft/day near the central area.

Rising head slug tests were performed by ARCADIS, from October 15 to October 19, 2007 using calibrated continuously recording data logger pressure transducers near the bottom of the monitoring well tested near the proposed area of remedial measures as proposed in the 2009 Revised Draft CMS. These data were used to calculate the hydraulic conductivity of the formation in the vicinity of the monitoring well intake interval.

The Bouwer-Rice (1976, 1989) solution was used to calculate hydraulic conductivity from the resulting water level/time data. AQTESOLV® for Windows® (Version 3.01-Professional), which employs the Bouwer-Rice methodology, was specifically used to analyze each set of test data.

Due to the heterogeneities of the uppermost saturated unit, the thickness of the highly conductive zone within the screened interval was used as the aquifer saturated thickness. The silty clay and clayey silt have a low vertical hydraulic conductivity value in the range 2.5E-4 to 3.9E-3 feet per day (ft/day), obtained from Shelby tube undisturbed samples using ASTM D 5084 (URS, 2004).

Well construction information is presented in Table 2. Calculated hydraulic conductivities are presented in Table 3. The slug testing indicates a hydraulic conductivity of between 2.5 and 4.8 ft/day for MW-19, PZ-1, PZ-2, and PZ-3. Hydraulic conductivity was approximately one order of magnitude lower for IW-A1 and MW-A1 (0.1 and 0.3 ft/day respectively).

The results of the slug tests compare favorably with the results of the pumping tests, but it is important to note that the resulting transmissivity from the slug tests primarily reflects the aquifer conditions near the tested wells (Bouwer and Rice, 1976). The large range of hydraulic conductivity values from the slug tests suggests highly heterogeneous conditions in the water-bearing unit. This is also reflected in the results of the pumping tests which indicated that the permeable unit at the site is laterally and vertically discontinuous and poorly connected (ESC, 2002).

3.1.4 Surface Water

Surface water bodies in and near the site are restricted to the unnamed tributary which crosses the site as discussed in Section 2.1. This tributary was routed in a buried culvert as part of remedial activities required in the 1984 Consent Agreement/Consent Order.

3.1.5 Groundwater – Surface Water Interaction

The influence of the culverted stream on the groundwater flow pattern was analyzed using invert elevations obtained during a site survey completed in October 2008 (see Figure 5) and surface and groundwater elevations from November 17, 2008. A summary of the surface water and groundwater elevations near/within the culvert are as follows:

Table of Surface Water and Groundwater Elevations from November 17, 2008:

Invert Location	Surface Water Elevations (feet amsl)	Groundwater Elevations** (feet amsl)
BM-2	22.6	24.5
BM-4	18.6	22.0
MH-1*	17.0	21.0
MH-2*	15.9	<18

Notes:
* = Water depth not determined, manhole invert elevation plus an estimated 0.5 feet of water at invert assumed for surface water elevation.
** = Groundwater elevation estimated from groundwater elevation contours on Figure 5.

Given that the culvert pipe invert elevations and surface water elevations are between approximately 2-feet and 3.5-feet below the adjacent groundwater elevations in the

central portion of the site (near BM-2, BM-4, and MH-1), the presence of the culvert appears to have very little to no influence on groundwater elevations in this area (see also Cross Section C-C' on Figure 4). Further to the north (more or less sidegradient), the surface water and groundwater elevations are closer together, and it is more difficult to ascertain whether the culvert has an influence on groundwater in this area. As discussed in Section 4.2, however, groundwater in the more northerly areas of the site do not contain constituents of interest (COIs), so even if groundwater was entering the culvert in this area, this groundwater discharge would not have an impact on the surface water quality (e.g., MW-3 and MW-10, both located very near the culvert, and have been nondetect for COIs since 2005).

4. Constituents of Interest and Distribution

4.1 Soil

A hydrogeologic investigation was performed in 1984 to determine the extent of the area affected by an underground storage tank that had left sheen on the tributary that passed through the site. In the same year, this tributary was isolated in a concrete culvert under the site as part of the remediation of onsite soils and groundwater. This investigation included completion of 10 soil borings in the vicinity of the former 2,000-gallon underground storage tank in the northern area of the site, and installation of monitoring wells within the borings. Oil and grease present in the soil and groundwater samples were attributed at the time to pre-Ashland activities. Volatile organic compounds (VOCs) were also detected in soil and groundwater onsite. Approximately 6,000 cubic yards of soil were excavated in 1987 and placed in an onsite engineered soil stockpile at the north end of the site for subsequent treatment by vacuum extraction and carbon adsorption on the vacuum effluent.

The northern stockpile vacuum extraction system operated intermittently from 1988 to 1994. The soils from the stockpile were sampled between 1985 and 1996 to determine the effectiveness of the stockpile treatment system and USEPA indicated no additional investigation/remediation was necessary in a meeting on August 6, 1998.

A new warehouse foundation was excavated in the southern area of the site in 1990 which uncovered soils with suspected VOC impacts. Soil vapor extraction was used in this area from 1992 to 1998 when it was determined by USEPA that the system was removing very little VOC mass and could be shutdown until groundwater in the area was delineated and remediated.

In preparation for the evaluation of remedial technologies associated with the Draft CMS in 2006, Ashland conducted a Groundwater Natural Attenuation Study reported in January 2004 (see Appendix A-3). As a key component of the study, soil sampling was conducted to evaluate fate and transport. The data was also intended to be used for a future risk assessment associated with the CMS. Shallow soil samples were obtained from the northern (three samples), central (three samples), and southern (five samples) and analyzed for both VOCs and physical parameters. The only exceedance of current NYSDEC Part 375 soil criteria for industrial areas was at SSB-13 (3-4') near MW-10, where toluene was detected at 4,600 mg/Kg and Xylene was detected at 2,300 mg/Kg.

The primary constituents found in soil were tetracholorethene (PCE), tricholorethene (TCE), 1,2-dichlorethene (1,2-DCE), vinyl chloride (VC), and benzene. Other detections found at the site included toluene, ethylbenzene, xylenes, acetone, 1,1,1-trichloroethane (1,1,1-TCA) 1,1-dichloroethane (1,1-DCA), and chlorobenzene. A summary of soil analytical results is presented in Table 4.

The Natural Attenuation Study concluded that the highest concentrations in soil were detected in the south and central area of the site. VOC concentrations in the northern area are generally orders of magnitude less than those in the south and central areas.

4.2 Groundwater

The COIs detected in groundwater at and near the site consist of the aromatic VOCs: benzene, toluene, ethylbenzene, and xylenes (BTEX), and the chlorinated VOCs (CVOCs): PCE, TCE, 1,2-DCE, 1,1-DCA, 1,1,1-TCA, and VC. A summary of VOC data since the 2002 Draft RFI was submitted is provided in Table 5. The highest concentrations of total VOCs have been detected in groundwater monitoring wells on site or just downgradient of the site in the southern (MW-19, PZ-1) to central (MW-1, MW-16 and MW-18) areas. A summary of historical VOC data in groundwater is provided in Appendix E.

The distribution of PCE and TCE relative to their degradation products (cis-1,2-DCE, 1,1-DCA, VC, ethane, and ethane) indicates that naturally occurring biological and chemical attenuation processes are degrading the CVOCs in groundwater beneath the site. Monitoring wells with the highest concentration of VOCs (MW-1 and MW-19) have exhibited a high proportion of PCE and TCE; however, they also have contained significant proportions of CVOC degradation compounds. Wells located hydraulically downgradient of the wells with higher VOC concentrations (e.g., IMP-3, IP-1, and MW-18), contain CVOCs that have a larger proportion of degradation compounds compared to their associated parent compounds. Ethene and ethane have also been observed in site groundwater (e.g., PZ-6, PZ-7, and MW-18), indicating that complete reductive dechlorination is occurring (Table 6).

The aromatic hydrocarbons toluene, ethylbenzene, and xylenes have not been detected in offsite monitoring wells. Benzene concentrations in samples collected from onsite monitoring wells were approximately one order of magnitude higher than the NYSDEC TOGS 1.1.1 Water Guidance Values of 1 ug/L (e.g., 34 ug/L at MW-15 and 18 ug/L at MW-19 in samples collected in September 2008). In downgradient, offsite monitoring wells, benzene has not been detected (e.g., MW-16) or has only been

detected at concentrations slightly above the NYSDEC criterion (e.g., 1.1 ug/L in MW-18 in April 2007) in the past two years. Based on these observations, it appears that BTEX compounds are being addressed by natural attenuation mechanisms or being consumed by indigenous bacteria to support the ongoing natural degradation of chlorinated compounds and that offsite migration of BTEX compounds is minimal.

4.3 Soil Vapor

The September 2005 Human Health Risk Assessment (see Appendix A-4) concluded that a potential exposure route for exposure to VOCs from the site would be through inhalation of indoor air for both onsite and offsite areas – the vapor intrusion pathway. The recent demolition of all the buildings on the property eliminates the potential for indoor air issues on the site itself.

Based on the potential for offsite indoor air issues, however, the Agency suggested in their comments on the 2006 Draft CMS that a soil vapor investigation be conducted west of the site in the former Volvo service garage and surrounding area hydraulically downgradient of the site, as well as along South Street at the eastern boundary of the site. These investigations were performed in April 2007. In two reports submitted on May 17, 2007 (Offsite Indoor Air Sampling Summary) and June 1, 2007 (Offsite Soil Vapor Sampling Summary), it was concluded that no impacts would be found further away and/or upgradient of the site. The Agency concurred with the recommendation that air sampling and subslab soil vapor sampling be performed at the former Volvo service center as proposed in the March 12, 2007 Supplemental RFI Work Plan in their review letter of March 22, 2007, but disagreed with the findings that no impacts would be found further away and/or upgradient of the site (i.e., on South Street), and required further investigation in two houses on the east side of South Street adjacent to the two locations (SV-1 and SV-2 on Figure 1) with detections of VOCs in soil vapor from the spring 2007 investigation.

In February 2008, the two houses on South Street were screened and sampled. A summary of soil vapor and indoor air data collected during this investigation is provided on Table 7. A report of results related to the indoor air sampling submitted to the Agencies on June 26, 2008, showed no site-related concentrations currently regulated by the New York State Department of Health (NYSDOH). The USEPA and NYSDOH (collectively, the 'Agencies') agreed with the conclusion that no further action was required related to indoor air on South Street in a letter dated August 14, 2008.

5. Conclusion

The main purpose of this revised Draft RFI Report was to update the initial 2006 Draft RFI Report and to address the few outstanding data needs as identified by the Agencies following submission of the 2006 Draft RFI. Based on the data presented in this report and the correspondence with the Agencies as documented in Appendix B, the remaining data needs have been addressed. Furthermore, the site and site area has been sufficiently characterized in terms of the site geology, hydrogeology, COI distribution in soil, groundwater, and soil vapor and the potential receptors and exposure pathways have been adequately addressed for the purpose of the CMS.

This Draft RFI Report will be submitted in parallel with the Revised Draft CMS for the site. Following public comment and response to the comments received from the public (assuming that the public comments received do not alter the remedial approach proposed in the CMS), these documents can be finalized and the Corrective Measures as recommended in the CMS can be implemented.

6. References

Bouwer, H. and R.C. Rice, 1976. A slug test method for determining hydraulic conductivity of unconfined aquifers with completely or partially penetrating wells, Water Resources Research, vol. 12, no. 3, pp. 423-428.

ESC, RCRA Facility Investigation Report, Ashland Distribution Company Facility, Rensselaer, New York, October 22, 2002.

Fakundiny, R. H. 1986. Trans-Adirondack Mountains Structural Discontinuities. In *Proceedings of the Sixth International Conference on Basement Tectonics*, edited by M. J., Jr. Aldrich, and A. W. Laughlin, pp. 64-75. International Basement Tectonics Association, Salt Lake City, Utah.

NYSGS (New York State Geological Survey), 1990, New York State Highway Map, Plate 2 Geologic Map and Cross Sections, Plate 3 Legend for Geologic Map, University of the State of New York, State Education Department, New York State Geological Survey, New York State Museum, Albany, New York.

URS Diamond, Third Quarter 2002 Progress Report, Ashland Inc., Rensselaer, New York, August 28, 2002.

URS Diamond, Human Health Risk Assessment, Former Ashland Distribution Facility, Rensselaer, NY, September, 2005.

Site correspondence is listed in Appendix B.

ARCADIS

TABLES

Table 1. Summary of Historical Groundwater Elevation Data, Revised Draft RFI, Ashland Inc., Rensselaer, New York

Well ID	Measuring Pt. Elevation (feet above msl)	Date	Depth to Water	Groundwater Elevation (feet above msl)
MW-1	28.98	11/15/1999	8.47	20.51
		5/24/2000	5.78	23.20
		11/29/2000	6.73	22.25
		7/6/2001	NM	NM
		11/7/2001	8.07	20.91
		5/21/2002	6.30	22.68
		11/12/2002	6.79	22.19
		4/21/2003	7.03	21.95
		7/14/2003	6.61	22.37
		10/28/2003	7.08	21.90
		4/6/2004	6.54	22.44
		10/12/2004	8.49	20.49
		4/13/2005	7.28	21.70
		10/4/2005	9.65	19.33
		5/2/2006	7.29	21.69
		10/3/2006	6.51	22.47
		4/9/2007	6.75	22.23
		9/11/2007	6.58	22.40
		4/9/2008	5.34	23.64
		9/15/2008	5.55	23.43
		11/17/2008	5.70	23.28
MW-3	24.27	11/15/1999	5.48	18.79
		5/24/2000	1.94	22.33
		11/29/2000	4.93	19.34
		7/6/2001	3.35	20.92
		11/7/2001	5.50	18.77
		5/21/2002	3.48	20.79
		11/12/2002	4.26	20.01
		4/21/2003	4.64	19.63
		7/14/2003	3.62	20.65
		10/28/2003	3.42	20.85
		4/6/2004	3.54	20.73
		10/12/2004	5.34	18.93
		4/13/2005	4.38	19.89
		10/5/2005	7.10	17.17
		5/2/2006	4.79	19.48
		10/3/2006	5.10	19.17
		4/9/2007	4.88	19.39
		9/11/2007	5.07	19.20
		4/9/2008	1.32	22.95
		9/15/2008	2.32	21.95
		11/17/2008	2.67	21.60
MW-4	25.95	11/15/1999	8.61	17.34
		5/24/2000	4.79	21.16
		11/29/2000	7.39	18.56
		7/6/2001	5.68	20.27
		11/7/2001	8.71	17.24
		5/21/2002	7.15	18.80
	25.95	11/12/2002	7.45	18.50
		4/21/2003	8.41	17.54
		7/14/2003	6.95	19.00

See Notes on Page 8.

Table 1. Summary of Historical Groundwater Elevation Data, Revised Draft RFI, Ashland Inc., Rensselaer, New York

Well ID	Measuring Pt. Elevation (feet above msl)	Date	Depth to Water	Groundwater Elevation (feet above msl)
MW-4 (cont.)	25.95	10/28/2003	7.55	18.40
		4/6/2004	7.06	18.89
		10/12/2004	8.55	17.40
		4/13/2005	7.51	18.44
		10/5/2005	10.86	15.09
		5/2/2006	6.90	19.05
		10/3/2006	5.84	20.11
		4/9/2007	7.30	18.65
		9/11/2007	6.61	19.34
		4/9/2008	5.58	20.37
		9/15/2008	6.37	19.58
		11/17/2008	5.90	20.05
MW-9	27.18	11/15/1999	7.98	19.20
		5/24/2000	4.34	22.84
		11/29/2000	6.81	20.37
		7/6/2001	5.59	21.59
		11/7/2001	7.99	19.19
		5/21/2002	7.93	19.25
		11/12/2002	7.88	19.30
		4/21/2003	8.29	18.89
		7/14/2003	8.04	19.14
		10/28/2003	9.28	17.90
		4/6/2004	6.18	21.00
		10/12/2004	8.78	18.40
		4/13/2005	7.75	19.43
		10/5/2005	10.55	16.63
		5/2/2006	7.04	20.14
		10/3/2006	7.63	19.55
		4/9/2007	6.39	20.79
		9/11/2007	6.76	20.42
		4/9/2008	4.18	23.00
		9/15/2008	5.68	21.50
		11/17/2008	5.56	21.62
MW-10	26.34	11/15/1999	6.58	18.97
		5/24/2000	3.49	22.06
		11/29/2000	5.86	19.69
		7/6/2001	4.73	20.82
		11/7/2001	6.78	18.77
		5/21/2002	4.45	21.10
		11/12/2002	5.34	20.21
		4/21/2003	5.34	20.21
		7/14/2003	5.68	19.87
		10/28/2003	3.80	21.75
		4/6/2004	4.61	20.94
		10/12/2004	6.61	18.94
	26.34	4/13/2005	5.63	19.92
		10/4/2005	8.34	17.21
		5/2/2006	5.63	19.92
		10/3/2006	4.44	21.11
		4/9/2007	4.84	20.71
		9/11/2007	6.76	18.79

See Notes on Page 8.

Table 1. Summary of Historical Groundwater Elevation Data, Revised Draft RFI, Ashland Inc., Rensselaer, New York

Well ID	Measuring Pt. Elevation (feet above msl)	Date	Depth to Water	Groundwater Elevation (feet above msl)
MW-10	26.34	4/9/2008	4.38	21.17
(cont.)		9/15/2008	4.61	21.73
		11/17/2008	5.36	20.98
MW-11	25.16	11/15/1999	7.21	17.95
		5/24/2000	5.61	19.55
		11/29/2000	6.46	18.70
		7/6/2001	5.88	19.28
		11/7/2001	8.62	16.54
		5/21/2002	5.60	19.56
		11/12/2002	6.38	18.78
		4/21/2003	6.29	19.09
		7/14/2003	5.83	19.55
		10/28/2003	6.98	18.40
		4/6/2004	5.62	19.76
		10/12/2004	7.54	17.84
		4/13/2005	5.97	19.41
		10/4/2005	9.66	15.72
		5/2/2006	6.02	19.36
		10/3/2006	5.58	19.80
		4/9/2007	5.64	19.74
		9/11/2007	5.33	19.83
		4/9/2008	5.69	19.47
		9/15/2008	5.61	19.55
		11/17/2008	6.15	19.01
MW-12S	23.12	11/15/1999	8.43	14.69
		5/24/2000	7.21	15.91
		11/29/2000	8.30	14.82
		7/6/2001	6.48	16.64
		11/7/2001	9.21	13.91
		5/21/2002	7.23	15.89
		11/12/2002	8.15	14.97
		4/21/2003	8.21	14.91
		7/14/2003	7.92	15.20
		10/28/2003	7.05	16.07
		4/6/2004	7.15	15.97
		10/12/2004	7.70	15.42
		4/13/2005	7.50	15.62
		10/4/2005	10.38	12.74
		5/2/2006	6.17	16.95
		10/3/2006	7.58	15.54
		4/9/2007	7.21	15.91
		9/11/2007	6.80	16.32
	23.12	4/9/2008	7.06	16.06
		9/15/2008	7.79	15.33
		11/17/2008	6.71	16.41
MW-12D	24.08	11/15/1999	9.02	15.06
		5/24/2000	7.54	16.54
		11/29/2000	8.98	15.10
		7/6/2001	8.21	15.87
		11/7/2001	9.52	14.56
		5/21/2002	7.81	16.27

See Notes on Page 8.

Table 1. Summary of Historical Groundwater Elevation Data, Revised Draft RFI, Ashland Inc., Rensselaer, New York

Well ID	Measuring Pt. Elevation (feet above msl)	Date	Depth to Water	Groundwater Elevation (feet above msl)
MW-12D (cont.)	24.08	11/12/2002	8.84	15.24
		4/21/2003	7.61	16.47
		7/14/2003	8.44	15.64
		10/28/2003	9.66	14.42
		4/6/2004	7.21	16.87
		10/12/2004	8.64	15.44
		4/13/2005	7.82	16.26
		10/4/2005	9.92	14.16
		5/2/2006	7.75	16.33
		10/3/2006	8.22	15.86
		4/9/2007	7.26	16.82
		9/11/2007	8.51	15.57
		4/9/2008	7.16	16.92
		9/15/2008	8.18	15.90
		11/17/2008	8.07	16.01
MW-13	36.86	11/15/1999	3.83	33.03
		5/24/2000	3.89	32.97
		11/29/2000	4.51	32.35
		7/6/2001	3.49	33.37
		11/7/2001	4.75	32.11
		5/21/2002	3.04	33.82
		11/12/2002	3.54	33.32
		4/21/2003	3.33	33.53
		7/14/2003	3.42	33.44
		10/28/2003	3.88	32.98
		4/6/2004	2.67	34.19
		10/12/2004	3.32	33.54
		4/13/2005	2.73	34.13
		10/4/2005	4.24	32.62
		5/2/2006	2.87	33.99
		10/3/2006	3.19	33.67
		4/9/2007	2.72	34.14
		9/11/2007	3.07	33.79
		4/9/2008	2.63	34.23
		9/15/2008	3.25	33.61
		11/17/2008	3.15	33.71
MW-14	33.85	11/15/1999	7.11	26.74
		5/24/2000	6.41	27.44
		11/29/2000	7.17	26.68
		7/6/2001	6.93	26.92
		11/7/2001	7.93	25.92
		5/21/2002	5.90	27.95
		11/12/2002	7.28	26.57
		4/21/2003	6.18	27.67
		7/14/2003	6.86	26.99
		10/28/2003	7.18	26.67
		4/6/2004	5.70	28.15
		10/12/2004	6.95	26.90
		4/13/2005	6.20	27.65
		10/4/2005	8.51	25.34
		5/2/2006	6.00	27.85

See Notes on Page 8.

Table 1. Summary of Historical Groundwater Elevation Data, Revised Draft RFI, Ashland Inc., Rensselaer, New York

Well ID	Measuring Pt. Elevation (feet above msl)	Date	Depth to Water	Groundwater Elevation (feet above msl)
MW-14	33.85	10/3/2006	6.04	27.81
(cont.)		4/9/2007	5.91	27.94
		9/11/2007	6.01	27.84
		4/9/2008	5.80	28.05
		9/15/2008	6.35	27.50
		11/17/2008	6.28	27.57
MW-15	25.19	11/15/1999	3.91	21.28
		5/24/2000	2.56	22.63
		11/29/2000	2.98	22.21
		7/6/2001	3.02	22.17
		11/7/2001	4.37	20.82
		5/21/2002	2.88	22.31
		11/12/2002	2.91	22.28
		4/21/2003	3.46	21.73
		7/14/2003	3.08	22.11
		10/28/2003	2.98	22.21
		4/6/2004	2.93	22.26
		10/12/2004	3.68	21.51
		4/13/2005	3.45	21.74
		8/11/2005	5.21	19.98
		10/6/2005	4.84	20.35
		5/2/2006	2.74	22.45
		10/3/2006	2.17	23.02
		4/9/2007	2.29	22.90
		9/11/2007	2.20	22.99
		4/9/2008	2.26	22.93
		9/15/2008	2.10	23.09
		11/17/2008	2.29	22.90
MW-16	25.41	7/6/2001	8.28	17.13
		11/7/2001	8.75	16.66
		5/21/2002	7.25	18.16
		11/12/2002	8.11	17.30
		4/21/2003	8.46	16.95
		7/14/2003	8.26	17.15
		10/28/2003	8.03	17.38
		4/6/2004	7.68	17.73
		10/12/2004	8.56	16.85
		4/13/2005	8.15	17.26
		8/11/2005	8.83	16.58
		10/6/2005	9.21	16.20
		5/2/2006	8.23	17.18
		10/3/2006	7.48	17.93
		4/9/2007	9.25	16.16
		9/11/2007	7.38	18.03
		4/9/2008	7.47	17.94
		9/15/2008	7.97	17.44
		11/17/2008	7.87	17.54
MW-17	21.78	7/6/2001	6.10	15.68
		11/7/2001	6.78	15.00
		5/21/2002	6.07	15.71
		11/12/2002	6.57	15.21

See Notes on Page 8.

Table 1. Summary of Historical Groundwater Elevation Data, Revised Draft RFI, Ashland Inc., Rensselaer, New York

Well ID	Measuring Pt. Elevation (feet above msl)	Date	Depth to Water	Groundwater Elevation (feet above msl)
MW-17	21.78	4/21/2003	6.31	15.47
(cont.)		7/14/2003	6.29	15.49
		10/28/2003	6.56	15.22
		4/6/2004	5.94	15.84
		10/12/2004	6.47	15.31
		4/13/2005	6.08	15.70
		10/4/2005	7.89	13.89
		5/2/2006	5.89	15.89
		10/3/2006	6.33	15.45
		4/9/2007	6.03	15.75
		9/11/2007	6.75	15.03
		4/9/2008	5.77	16.01
		9/15/2008	6.38	15.40
		11/17/2008	6.60	15.18
MW-18	23.98	7/6/2001	5.08	18.90
		11/7/2001	6.36	17.62
		5/21/2002	4.38	19.60
		11/12/2002	5.62	18.36
		4/21/2003	5.71	18.27
		7/14/2003	5.13	18.85
		10/28/2003	5.54	18.44
		4/6/2004	4.33	19.65
		10/12/2004	6.73	17.25
		4/13/2005	5.38	18.60
		10/5/2005	7.18	16.80
		5/2/2006	5.30	18.68
		10/3/2006	4.48	19.50
		4/9/2007	4.53	19.45
		9/11/2007	4.29	19.69
		4/9/2008	4.19	19.79
		9/15/2008	4.88	19.10
		11/17/2008	4.96	19.02
MW-19	25.51	7/6/2001	3.65	21.86
		11/7/2001	4.56	20.95
		5/21/2002	NM	NM
		11/12/2002	3.49	22.02
		4/21/2003	3.53	21.98
		7/14/2003	3.71	21.80
		10/28/2003	3.11	22.40
		4/6/2004	3.76	21.75
		10/12/2004	4.17	21.34
		4/13/2005	3.82	21.69
		8/11/2005	5.38	20.13
		10/4/2005	4.91	20.60
		5/2/2006	1.91	23.60
		10/3/2006	1.62	23.89
		4/9/2007	1.72	23.79
		9/11/2007	1.90	23.61
		4/9/2008	1.79	23.72
		9/15/2008	2.51	23.00
		11/17/2008	2.00	23.51

See Notes on Page 8.

Table 1. Summary of Historical Groundwater Elevation Data, Revised Draft RFI, Ashland Inc., Rensselaer, New York

Well ID	Measuring Pt. Elevation (feet above msl)	Date	Depth to Water	Groundwater Elevation (feet above msl)
SUMP	26.82	11/15/1999	9.34	17.48
		5/24/2000	1.44	25.38
		11/29/2000	3.08	23.74
		7/6/2001	3.80	23.02
		11/7/2001	6.48	20.34
		5/21/2002	NM	NM
		11/12/2002	9.33	17.49
		4/21/2003	NM	NM
		7/14/2003	17.24	9.58
		10/28/2003	18.60	8.22
		4/6/2004	9.29	17.53
		10/12/2004	18.80	8.02
		4/13/2005	18.75	8.07
		10/5/2005	14.00	12.82
		5/2/2006	18.74	8.08
		10/4/2006	18.62	8.20
		4/9/2007	18.71	8.11
		9/11/2007	8.80	18.02
		4/9/2008	3.01	23.81
		9/15/2008	4.10	22.72
		11/17/2008	4.51	22.31
MW-A1	28.34	4/9/2008	4.73	23.61
		9/15/2008	4.97	23.38
		11/17/2008	4.99	23.35
MW-B1	27.53	4/9/2008	5.18	22.35
		9/15/2008	5.14	22.41
		11/17/2008	5.48	22.05
MW-B2	27.40	4/9/2008	5.08	22.32
		11/17/2008	5.35	22.05
IMP-3	25.13	9/15/2008	8.39	16.74
		11/17/2008	8.08	17.05
PZ-1	26.10	9/11/2007	4.52	21.58
		4/9/2008	4.77	21.33
		9/15/2008	5.14	20.96
		11/17/2008	5.32	20.78
PZ-2	26.10	9/11/2007	NM	NM
		4/9/2008	4.60	21.50
		9/15/2008	4.88	21.22
		11/17/2008	4.92	21.18
PZ-3	28.33	9/11/2007	4.93	23.40
		4/9/2008	4.12	24.21
		9/15/2008	4.52	23.81
		11/17/2008	4.53	23.80
PZ-4	25.60	9/11/2007	NM	NM
		4/9/2008	NM	NM
		9/15/2008	2.65	22.95
		11/17/2008	2.67	22.93
PZ-5	25.86	9/11/2007	4.67	21.19
		4/9/2008	2.77	23.09
		9/15/2008	3.18	22.68
		11/17/2008	3.63	22.23

See Notes on Page 8.

Table 1. Summary of Historical Groundwater Elevation Data, Revised Draft RFI, Ashland Inc., Rensselaer, New York

Well ID	Measuring Pt. Elevation (feet above msl)	Date	Depth to Water	Groundwater Elevation (feet above msl)
PZ-6	25.52	9/11/2007	3.42	22.10
		4/9/2008	3.18	22.34
		9/15/2008	3.34	22.18
		11/17/2008	3.46	22.06
PZ-7	25.86	9/11/2007	2.59	23.27
		4/9/2008	2.94	22.92
		9/15/2008	2.69	23.17
		11/17/2008	2.90	22.96
BM-2	28.02*	11/17/2008	5.40	22.62
BM-4	26.59*	11/17/2008	7.95	18.64
MH-1	16.45**	11/17/2008	NM	NM
MH-2	15.40**	11/17/2008	NM	NM

Notes:

All elevations are referenced to feet above mean sea level (msl) (NGVD, 1929).

DTW = Depth to groundwater in feet below measuring point.

NM = Not measured.

Top of inner casing measuring point elevations have been updated with survey performed by Thew Associates in 2008.

* = Benchmark elevation above the culverted stream.

** = Invert elevation of bottom of culverted stream.

Table 2. Well Construction Table, Revised Draft RFI, Ashland Inc., Rensselaer, New York

Well ID	Log?	Date Installed	Method	Elevation (ground ft. amsl)	Elevation (TOC ft. amsl)	Total Depth of Boring (ft. bgs)	Total Installed Depth of Well (bgs)	Screen Interval (ft. bgs)	Screen Length	Screen Top Elevation (ft. amsl)	Screen Bottom Elevation (ft. amsl)	Material & Diameter/ Slot Size	Surface Completion	Drilling Contractor	Consultant	Comment
RW-1	X	10/12/93	HSA	NA	NA	26.5	26.5	6.5-26.5	15	NA	NA	PVC/4"/0.010	Flushmount	Empire Soil	TM Gates	Boring log ID was "CW" originally. Geology and well construction matches "RW" information provided on 2002 Draft RFI Cross Section C-C' on Figure 6. Therefore, ID was changed from "CW" to "RW" to be consistent with figures, tables, and text of the 2002 Draft RFI.
RW-2	X	10/12/93	HSA	NA	NA	29	29	9-29	20	NA	NA	PVC/4"/0.010	Flushmount	Empire Soil	TM Gates	Boring log IDs were "CW" originally. Geology and well construction matches "RW" information provided on 2002 Draft RFI Cross Section C-C' on Figure 6 for logs CW-1 and CW-7. Therefore, IDs for the remaining "CW" borings were changed to reflect the change from "CW" to "RW" to be consistent with figures, tables, and text of the 2002 Draft RFI.
RW-3	X	10/12/93	HSA	NA	NA	26	NA	6-26	20	NA	NA	PVC/4"/0.010	Flushmount	Empire Soil	TM Gates	Boring log IDs were "CW" originally. Geology and well construction matches "RW" information provided on 2002 Draft RFI Cross Section C-C' on Figure 6 for logs CW-1 and CW-7. Therefore, IDs for the remaining "CW" borings were changed to reflect the change from "CW" to "RW" to be consistent with figures, tables, and text of the 2002 Draft RFI.
RW-4	X	01/04/93	HSA	NA	NA	27	NA	2-27	25	NA	NA	PVC/4"/0.010	Flushmount	Empire Soil	TM Gates	Boring log IDs were "CW" originally. Geology and well construction matches "RW" information provided on 2002 Draft RFI Cross Section C-C' on Figure 6 for logs CW-1 and CW-7. Therefore, IDs for the remaining "CW" borings were changed to reflect the change from "CW" to "RW" to be consistent with figures, tables, and text of the 2002 Draft RFI.
RW-5	X	10/13/93	HSA	NA	NA	24	NA	9-24	15	NA	NA	PVC/4"/0.010	Flushmount	Empire Soil	TM Gates	Boring log IDs were "CW" originally. Geology and well construction matches "RW" information provided on 2002 Draft RFI Cross Section C-C' on Figure 6 for logs CW-1 and CW-7. Therefore, IDs for the remaining "CW" borings were changed to reflect the change from "CW" to "RW" to be consistent with figures, tables, and text of the 2002 Draft RFI.
RW-6	X	10/13/93	HSA	NA	NA	24.5	NA	9.5-24.5	15	NA	NA	PVC/4"/0.010	Flushmount	Empire Soil	TM Gates	Boring log IDs were "CW" originally. Geology and well construction matches "RW" information provided on 2002 Draft RFI Cross Section C-C' on Figure 6 for logs CW-1 and CW-7. Therefore, IDs for the remaining "CW" borings were changed to reflect the change from "CW" to "RW" to be consistent with figures, tables, and text of the 2002 Draft RFI.

See Notes on Page 3.

Table 2. Well Construction Table, Revised Draft RFI, Ashland Inc., Rensselaer, New York

Well ID	Log?	Date Installed	Method	Elevation (ground ft. amsl)	Elevation (TOC ft. amsl)	Total Depth of Boring (ft. bgs)	Total Installed Depth of Well (bgs)	Screen Interval (ft. bgs)	Screen Length	Screen Top Elevation (ft. amsl)	Screen Bottom Elevation (ft. amsl)	Material & Diameter/ Slot Size	Surface Completion	Drilling Contractor	Consultant	Comment
RW-7	X	10/14/93	HSA	NA	NA	28	NA	8-28	20	NA	NA	PVC/4"/0.010	Flushmount	Empire Soil	TM Gates	Boring log ID was "CW" originally. Geology and well construction matches "RW" information provided on 2002 Draft RFI Cross Section C-C' on Figure 6. Therefore, ID was changed from "CW" to "RW" to be consistent with figures, tables, and text of the 2002 Draft RFI.
GB-11	X	11/05/90	HSA	NA	NA	26	NA	NA	NA	NA	NA	PVC/4"/0.010	Flushmount	Empire Soil	TM Gates	NA
GB-5	X	11/01/90	HSA	NA	NA	21.5	21.5	NA	NA	NA	NA	PVC/4"/0.010	Flushmount	Empire Soil	TM Gates	NA
HP-1	X	04/09/07	Geoprobe	NA	NA	12	12	NA	NA	NA	NA	NA	NA	Zebra	URS	Temporary
HP-2	X	04/09/07	Geoprobe	NA	NA	7	7	NA	NA	NA	NA	NA	NA	Zebra	URS	Temporary
HP-3	X	04/09/07	Geoprobe	NA	NA	8	8	NA	NA	NA	NA	NA	NA	Zebra	URS	Temporary
IMP-1		02/20/06	HSA	22.8	25.13	16	16	6-16	10	16.8	6.8	PVC/2"/0.010	Stick-Up (2.33' ags)	Aztek	URS	NA
IMP-2		02/20/06	HSA	22.8	25.17	16	16	6-16	10	16.8	6.8	PVC/2"/0.010	Stick-Up (2.37' ags)	Aztek	URS	NA
IMP-3	X	02/20/06	HSA	23	25.13	16	16	6-16	10	17	7	PVC/2"/0.010	Stick-Up (2.13' ags)	Aztek	URS	NA
IW-A1	X	10/01/07	HSA	25.4	25.18	20	20	10-20	10	15.4	5.4	PVC/2"/0.010	Flushmount	Parrott-Wolff	ARCADIS	Active
IW-B1	X	10/02/07	HSA	25.2	25.03	20	20	10-20	10	15.2	5.2	PVC/2"/0.010	Flushmount	Parrott-Wolff	ARCADIS	Active
MW-1	X	11/14/84	HSA	26.3	28.98	12.5	12.5	2.5-12.5	10	23.8	13.8	SS/6"/0.010	Stick-Up (2.68' ags)	Empire Soil	TM Gates	Replaced
MW-2*	X	11/14/84	HAS	22.38	24.84	12.5	12.5	2.5-12.5	10	19.88	9.88	SS/6"/0.010	Stick-Up (2.46' ags)	Empire Soil	TM Gates	Abandoned
MW-3	X	10/12/1992	HSA	24.7	24.27	15	15	5-15	10	19.7	9.7	SS/2"/0.010	Flushmount	TM Gates	TM Gates	Active
MW-4	X	9/29/1988	HSA	24.7	25.95	14	14	3.3-14	10.7	21.4	10.7	SS/2"/0.010	Stick-Up (1.25' ags)	TM Gates	TM Gates	Active
MW-5*	X	11/15/84	HSA	19.02	NA	12.5	12.5	2.5-12.5	10	16.52	6.52	SS/6"/0.010	Stick-Up (2.92' ags)	Empire Soil	TM Gates	Replaced
MW-5D*	X	09/27/88	HSA	23.2	25.43	23.5	23.5	12.5-23.5	11	10.7	-0.3	SS/2"/0.010	Stick-Up (2.23' ags)	TM Gates	TM Gates	Abandoned
MW-5S*	X	09/27/88	HSA	23.3	25.51	14	14	3.3-14	10.7	20	9.3	SS/2"/0.010	Stick-Up (2.21' ags)	TM Gates	TM Gates	Active
MW-6A*	X	11/07/84	HSA	21.69	23.85	25	25	15-25	10	21.69	-3.31	SS/2"/0.010	Stick-Up (2.16' ags)	Empire Soil	TM Gates	Abandoned
MW-6B*	X	11/08/84	HSA	23.51	25.61	15	14.5	4.5-14.5	10	19.01	9.01	SS/2"/0.010	Stick-Up (2.1' ags)	TM Gates	TM Gates	Abandoned
MW-7*	X	11/14/84	HSA	22.83	25.7	12.5	12.5	2.5-12.5	10	20.33	10.33	SS/2"/0.010	Stick-Up (2.87' ags)	Empire Soil	TM Gates	Abandoned
MW-8*	X	11/07/84	HSA	NA	NA	15	NA	NA	NA	NA	NA	NA	NA	Empire Soil	TM Gates	No well installed
MW-9	X	11/08/84	HSA	26.4	27.18	15.5	15.5	5.5-15.5	10	20.9	10.9	SS/6"/0.010	Stick-Up (0.78' ags)	Empire Soil	TM Gates	Active
MW-10	X	09/24/86	NA	22.8	26.34	12.5	12.5	1.8-12.5	10.7	21	10.3	SS/2"/0.010	Stick-Up (3.54' ags)	Empire Soil	TM Gates	Active

See Notes on Page 3.

Table 2. Well Construction Table, Revised Draft RFI, Ashland Inc., Rensselaer, New York

Well ID	Log?	Date Installed	Method	Elevation (ground ft. amsl)	Elevation (TOC ft. amsl)	Total Depth of Boring (ft. bgs)	Total Installed Depth of Well (bgs)	Screen Interval (ft. bgs)	Screen Length	Screen Top Elevation (ft. amsl)	Screen Bottom Elevation (ft. amsl)	Material & Diameter/ Slot Size	Surface Completion	Drilling Contractor	Consultant	Comment
MW-11	X	09/24/86	HSA	22.5	25.16	13.5	13.5	1.8-12.5	10.7	20.7	10	SS/7"/0.010	Stick-Up (2.66' ags)	Empire Soil	TM Gates	Active
MW-12D	X	09/27/88	HSA	22.2	24.08	25.5	25.5	14.7-25.5	10.8	7.5	-3.3	SS/2"/0.010	Stick-Up (1.8' ags)	TM Gates	TM Gates	Active
MW-12S	X	09/27/88	HSA	23.12	23.12	14.1	14.1	3.4-14.1	10.7	19.72	9.02	SS/2"/0.010	Stick-Up (0.89' ags)	TM Gates	TM Gates	Active
MW-13	X	09/23/93	HSA	34.9	36.86	20.5	20.5	10.5-20.5	10	24.4	14.4	SS/2"/0.010	Stick-Up (2.13 ags)	Empire Soil	TM Gates	Active
MW-13D*	X	11/27/90	HSA	NA	NA	28	23.5	13.5-23.5	10	NA	NA	PVC/2"/0.010	Stick-Up	Empire Soil	TM Gates	Abandoned
MW-13S*	X	11/27/90	HSA	NA	NA	13	13	3-13	10	NA	NA	PVC/2"/0.010	Stick-Up	Empire Soil	TM Gates	Abandoned
MW-14	X	09/24/93	NA	32.1	33.85	15	15	5-15	10	27.1	17.1	PVC/2"/0.010	Flushmount	TM Gates	TM Gates	Active
MW-14S*	X	11/26/90	NA	NA	NA	14	13	10-13	3	NA	NA	PVC/2"/0.010	Unknown	Empire Soil	TM Gates	Abandoned
MW-14D*	X	11/27/90	NA	NA	NA	24	23.5	13.5-23.5	10	NA	NA	PVC/2"/0.010	Unknown	Empire Soil	TM Gates	Abandoned
MW-15	X	10/13/92	HSA	25.6	25.19	28	27.5	2.5-27.5	15	23.1	-1.9	PVC/2"/0.010	Flushmount	TM Gates	TM Gates	Active
MW-16	X	05/16/01	HSA	23.5	25.41	34	15	10-15	5	13.5	8.5	PVC/2"/0.010	Stick-Up (2.01' ags)	Parrott-Wolff	ESC	Active
MW-17	X	05/17/01	HSA	22.2	21.78	27.8	18	10-18	8	12.2	4.2	PVC/2"/0.010	Flushmount	Parrott-Wolff	ESC	Active
MW-18	X	05/16/01	HSA	22.4	23.98	27.7	16	7-16	9	15.4	6.4	PVC/2"/0.010	Stick-Up (1.67' ags)	Parrott-Wolff	ESC	Active
MW-19	X	05/14/01	HSA	25.6	25.51	18	17.5	3.5-17.5	14	22.1	8.1	PVC/4"/0.010	Flushmount	Parrott-Wolff	ESC	Active
MW-A1	X	10/02/07	HSA	25.8	28.34	20	20	10-20	10	15.8	5.8	PVC/2"/0.010	Stick-Up (3.0 ags)	Parrott-Wolff	ARCADIS	Active
MW-B1	X	10/03/07	HSA	25.1	27.53	20	20	10-20	10	15.1	5.1	PVC/2"/0.010	Stick-Up (3.0 ags)	Parrott-Wolff	ARCADIS	Active
MW-B2	X	10/03/07	HSA	25.2	27.4	20	20	10-20	10	15.2	5.2	PVC/2"/0.010	Stick-Up (3.0 ags)	Parrott-Wolff	ARCADIS	Active
IP-1	X	02/20/06	HSA	22.8	25.15	16	16	6-16	10	16.8	6.8	PVC/2"/0.010	Stick-Up (2.5 ags)	Aztek	URS	NA
PZ-1	X	5/15/2001	HSA	26.1	27.88	18	18	3.5-17.5	14	22.6	8.6	PVC/2"/0.010	Stick-Up (1.82' ags)	Parrott-Wolff	ESC	Active
PZ-2	X	5/15/2001	HSA	26.1	28.34	16	13.5	3.5-13.5	10	22.6	12.6	PVC/2"/0.010	Stick-Up (1.93' ags)	Parrott-Wolff	ESC	Active
PZ-3	X	5/15/2001	HSA	28.3	29.97	22	22	6.5-21.5	15	21.8	6.8	PVC/2"/0.010	Stick-Up (1.84' ags)	Parrott-Wolff	ESC	Active
PZ-4		NA	NA	25.6	25.2	NA	NA	NA	NA	NA	NA	NA	Flushmount	NA	NA	Active
PZ-5		NA	NA	25.9	25.52	NA	NA	NA	NA	NA	NA	NA	Flushmount	NA	NA	Active
PZ-6		NA	NA	25.5	25.22	NA	NA	NA	NA	NA	NA	NA	Flushmount	NA	NA	Active
PZ-7		NA	NA	25.2	24.9	NA	NA	NA	NA	NA	NA	NA	Flushmount	NA	NA	Active

Notes:

* = Well abandoned by URS/ESC. Elevation is from prior survey which was referenced to an onsite benchmark elevation.
X = Log available.
HSA = Hollow Stem Auger.
NA = Not Available/Applicable.
ags = above ground surface.
PVC = polyvinyl chloride
SS = stainless steel.

Table 3. Hydraulic Conductivity Values Calculated Using Slug Test Results, Revised Draft RFI, Ashland Inc., Rensselaer, New York

Well ID	Hydraulic Conductivity (ft/day)
wells near southwest area of site	
PZ-1	2.55
PZ-2	4.84
PZ-3	2.34
MW-19	2.52
IW-A1	0.12
MW-A1	0.31
wells near central area of site	
PZ-7	0.74
IW-B1	0.38
MW-B1	0.58
MW-B2	0.52

Table 4. VOC Analytical Data in Soil, Revised Draft RFI, Ashland Inc., Facility, Rensselaer, New York

Location ID:	NYSDEC	SSB-1	SSB-2	SSB-3	SSB-4	SSB-5	SSB-6	SSB-6	SSB-7
Sample Depth (Feet):	Restricted Use	0.5 - 2	0.5 - 1.5	0.5 - 2	0.5 - 1.5	0 - 1.5	1 - 2	2 - 3	0.5 - 1.5
Date Collected:	SCRs Industrial	11/17/03	11/17/03	11/17/03	11/17/03	11/17/03	11/14/03	11/14/03	11/18/03
Volatile Organics									
1,1,1-Trichloroethane	1,000	**0.0015**	0.0052 U	**0.086 U [0.0074]**	**0.013**	**0.026**	0.0079 U	**0.0073**	0.0046 U
1,1,2,2-Tetrachloroethane	- -	0.0025 U	0.013 U	0.10 U [0.011 U]	0.012 U	0.0023 U	0.0092 U	0.0022 U	0.011 U
1,1,2-Trichloroethane	- -	0.0022 U	0.012 U	0.11 U [0.010 U]	0.011 U	0.0020 U	0.0099 U	0.0019 U	0.010 U
1,1-Dichloroethane	480	0.0012 U	0.0064 U	**0.88 [0.0056 U]**	**0.22**	**0.0064**	0.010 U	0.0011 U	**0.0072**
1,1-Dichloroethene	1,000	0.0021 U	0.011 U	0.25 U [0.0096 U]	**0.040**	0.0019 U	0.022 U	0.0018 U	0.0096 U
1,2-Dichloroethane	60	0.0019 U	0.0096 U	0.10 U [0.0084 U]	0.0091 U	0.0017 U	0.0094 U	0.0016 U	0.0084 U
1,2-Dichloropropane	- -	0.0015 U	0.0077 U	0.089 U [0.0067 U]	0.0073 U	0.0014 U	0.0081 U	0.0013 U	0.0067 U
2-Butanone	1,000	0.0058 U	0.030 U	1.6 U [0.026 U]	0.029 U	0.0053 U	**0.28 B**	**0.039**	0.026 U
2-Hexanone	- -	0.0063 U	0.033 U	0.44 U [0.029 U]	0.031 U	0.0058 U	0.040 U	**0.076**	0.029 U
4-Methyl-2-pentanone	- -	0.0062 U	0.032 U	1.2 U [0.028 U]	**0.032**	0.0056 U	0.11 U	0.0054 U	0.028 U
Acetone	1,000	**0.021**	**0.14**	**1.0 U [0.057]**	**13 DB**	0.0090 U	**0.64**	**0.32**	**0.078**
Benzene	89	**0.0081**	**0.038**	**6.8 [0.68]**	**0.12**	**0.0077**	**0.046**	**0.034**	**0.023**
Bromodichloromethane	- -	0.0016 U	0.0083 U	0.079 U [0.0073 U]	0.0079 U	0.0015 U	0.0072 U	0.0014 U	0.0073 U
Bromoform	- -	0.0021 U	0.011 U	0.25 U [0.0096 U]	0.010 U	0.0019 U	0.022 U	0.0018 U	0.0096 U
Bromomethane	- -	0.0042 U	0.022 U	0.42 U [0.019 U]	0.021 U	0.0038 U	0.038 U	0.0037 U	0.019 U
Carbon Disulfide	- -	0.0025 U	0.013 U	**0.16 U [0.025]**	**0.021**	**0.0059**	**0.018**	**0.0022**	0.011 U
Carbon Tetrachloride	44	0.0012 U	0.0060 U	0.079 U [0.0053 U]	0.0057 U	**0.0042**	0.0072 U	0.0010 U	0.0053 U
Chlorobenzene	1,000	**0.0021**	0.0083 U	0.10 U [0.0073 U]	0.0079 U	0.0015 U	**0.018**	**0.0084**	0.0073 U
Chloroethane	- -	0.0021 U	0.011 U	0.25 U [0.0096 U]	0.010 U	0.0019 U	0.022 U	0.0018 U	0.0096 U
Chloroform	700	0.0015 U	0.0077 U	0.25 U [0.0067 U]	0.0073 U	**0.013**	0.022 U	0.0013 U	0.0067 U
Chloromethane	- -	0.0017 U	0.0090 U	0.34 U [0.0079 U]	0.0085 U	0.0016 U	0.031 U	0.0015 U	0.0079 U
cis-1,2-Dichloroethene	1,000	**0.0087**	**0.63**	**82 [12 D]**	**41 D**	**0.043**	**0.61**	**0.12**	**0.71**
cis-1,3-Dichloropropene	- -	0.0015 U	0.0077 U	0.089 U [0.0067 U]	0.0073 U	0.0014 U	0.0081 U	0.0013 U	0.0067 U
Dibromochloromethane	- -	0.0017 U	0.0090 U	0.25 U [0.0079 U]	0.0085 U	0.0016 U	0.022 U	0.0015 U	0.0079 U
Ethylbenzene	780	0.0012 U	0.0064 U	**0.086 U [0.019]**	**0.15**	**0.077**	**0.018**	**0.0031**	0.0056 U
Methylene Chloride	1,000	0.0030 U	0.015 U	0.25 U [0.013 U]	0.015 U	**0.0093**	**0.023 B**	0.0026 U	0.013 U
Styrene	- -	0.0014 U	0.0070 U	0.074 U [0.0062 U]	0.0067 U	**0.0017**	**0.0092**	**0.0024**	0.0062 U
Tetrachloroethene	300	**0.0050**	**0.074**	**0.28 [0.44]**	**0.0095**	**4.7 D**	**0.75**	**0.41 D**	**0.020**
Toluene	1,000	0.0022 U	0.012 U	**0.37 B [0.12]**	**0.29**	**0.0080**	**0.033**	**0.0055**	0.010 U
trans-1,2-Dichloroethene	1,000	0.0015 U	**0.023**	**0.65 [0.11]**	**0.88**	**0.0036**	**0.021**	**0.0023**	**0.024**
trans-1,3-Dichloropropene	- -	0.0020 U	0.010 U	0.064 U [0.0090 U]	0.0098 U	0.0018 U	0.0058 U	0.0017 U	0.0090 U
Trichloroethene	400	**0.0094**	**0.32**	**3.0 [6.1 D]**	**0.80**	**0.17**	**0.22**	**0.053**	**0.21**
Vinyl Chloride	27	**0.0018**	**0.11**	**1.4 [0.25]**	**1.5 D**	**0.0030**	**0.055**	**0.012**	**0.32**
Xylenes (total)	1,000	0.0037 U	0.019 U	**0.37 B [0.12]**	**0.51**	**0.094**	**0.23**	**0.036**	0.017 U
Total VOCs	- -	**0.058**	**1.3**	**96 [20]**	**59**	**5.2**	**3.0**	**1.1**	**1.4**

See Notes on Page 4.

Table 4. VOC Analytical Data in Soil, Revised Draft RFI, Ashland Inc., Facility, Rensselaer, New York

Location ID:	NYSDEC	SSB-7	SSB-8	SSB-8	SSB-9	SSB-9	SSB-10	SSB-10
Sample Depth (Feet):	Restricted Use	2 - 3.5	0.5 - 2	5 - 6.5	1 - 2	9.5 - 10.5	1 - 2	10.5 - 12
Date Collected:	SCRs Industrial	11/18/03	11/18/03	11/18/03	11/18/03	11/18/03	11/18/03	11/18/03
Volatile Organics								
1,1,1-Trichloroethane	1,000	0.0081 U	0.0043 U	**0.0032**	**0.00085**	**0.0010**	**0.0012**	0.00076 U [0.00089 U]
1,1,2,2-Tetrachloroethane	- -	0.0095 U	0.011 U	0.0023 U	0.0011 U	0.0018 U	0.0022 U	0.0019 U [0.0022 U]
1,1,2-Trichloroethane	- -	0.010 U	0.0096 U	0.0021 U	0.00097 U	0.0017 U	0.0020 U	0.0017 U [0.0020 U]
1,1-Dichloroethane	480	**0.10**	0.0053 U	**0.0023**	0.00054 U	0.00092 U	0.0011 U	0.00093 U [0.0011 U]
1,1-Dichloroethene	1,000	0.023 U	0.0090 U	0.0020 U	0.00091 U	0.0016 U	0.0019 U	0.0016 U [0.0019 U]
1,2-Dichloroethane	60	0.0098 U	0.0080 U	0.0018 U	0.00081 U	0.0014 U	0.0017 U	0.0014 U [0.0016 U]
1,2-Dichloropropane	- -	0.0084 U	0.0064 U	0.0014 U	0.00064 U	0.0011 U	0.0013 U	0.0011 U [0.0013 U]
2-Butanone	1,000	**0.23 B**	0.025 U	0.0055 U	**0.0027**	0.0043 U	0.0052 U	0.0044 U [0.0052 U]
2-Hexanone	- -	0.042 U	0.027 U	0.0060 U	0.0027 U	0.0047 U	0.0056 U	0.0048 U [0.0056 U]
4-Methyl-2-pentanone	- -	0.12 U	0.026 U	0.0058 U	0.0027 U	0.0046 U	0.0055 U	0.0047 U [0.0055 U]
Acetone	1,000	**0.48 B**	0.042 U	0.0094 U	0.0043 U	0.0074 U	0.0089 U	0.0075 U [0.0088 U]
Benzene	89	**0.026**	**0.029**	**0.0086**	**0.011**	**0.0071**	**0.011**	**0.0048 [0.0087]**
Bromodichloromethane	- -	0.0074 U	0.0069 U	0.0015 U	0.00070 U	0.0012 U	0.0014 U	0.0012 U [0.0014 U]
Bromoform	- -	0.023 U	0.0090 U	0.0020 U	0.00091 U	0.0016 U	0.0019 U	0.0016 U [0.0019 U]
Bromomethane	- -	0.040 U	0.018 U	0.0040 U	0.0018 U	0.0031 U	0.0038 U	0.0032 U [0.0037 U]
Carbon Disulfide	- -	0.015 U	0.011 U	0.0023 U	0.0011 U	0.0018 U	0.0022 U	0.0019 U [0.0022 U]
Carbon Tetrachloride	44	0.0074 U	0.0050 U	0.0011 U	0.00050 U	0.00087 U	0.0010 U	0.00088 U [0.0010 U]
Chlorobenzene	1,000	**0.011 B**	0.0069 U	**0.0016**	**0.0053**	0.0012 U	**0.0030**	**0.0012 U [0.0015]**
Chloroethane	- -	0.023 U	0.0090 U	0.0020 U	0.00091 U	0.0016 U	0.0019 U	0.0016 U [0.0019 U]
Chloroform	700	0.023 U	0.0064 U	0.0014 U	0.00064 U	0.0011 U	0.0013 U	0.0011 U [0.0013 U]
Chloromethane	- -	0.032 U	0.0074 U	0.0016 U	0.00075 U	0.0013 U	0.0016 U	0.0013 U [0.0015 U]
cis-1,2-Dichloroethene	1,000	**22 D**	**0.62**	**0.029**	**0.018**	**0.021**	**0.0074**	**0.030 [0.045]**
cis-1,3-Dichloropropene	- -	0.0084 U	0.0064 U	0.0014 U	0.00064 U	0.0011 U	0.0013 U	0.0011 U [0.0013 U]
Dibromochloromethane	- -	0.023 U	0.0074 U	0.0016 U	0.00075 U	0.0013 U	0.0016 U	0.0013 U [0.0015 U]
Ethylbenzene	780	0.0081 U	0.0053 U	0.0012 U	**0.00081**	0.00092 U	0.0011 U	0.00093 U [0.0011 U]
Methylene Chloride	1,000	0.023 U	0.013 U	0.0028 U	0.0013 U	0.0022 U	0.0027 U	0.0022 U [0.0026 U]
Styrene	- -	0.0070 U	0.0058 U	0.0013 U	**0.00067**	0.0010 U	0.0012 U	0.0010 U [0.0012 U]
Tetrachloroethene	300	**0.061**	**0.036**	0.0018 U	**0.011**	**0.0093**	**0.0075**	**0.0063 [0.0092]**
Toluene	1,000	**0.017 B**	**0.016**	0.0021 U	**0.0033**	**0.0058**	**0.0022**	0.0017 U [0.0020 U]
trans-1,2-Dichloroethene	1,000	**0.26**	**0.024**	0.0014 U	0.00064 U	0.0011 U	0.0013 U	0.0011 U [0.0013 U]
trans-1,3-Dichloropropene	- -	0.0060 U	0.0085 U	0.0019 U	0.00086 U	0.0015 U	0.0018 U	0.0015 U [0.0018 U]
Trichloroethene	400	**0.35**	**0.10**	**0.028**	**0.023**	**0.017**	**0.017**	**0.014 [0.024]**
Vinyl Chloride	27	**0.48**	**0.033**	**0.0027**	0.00075 U	0.0013 U	0.0016 U	0.0013 U [0.0015 U]
Xylenes (total)	1,000	0.023 U	**0.0052**	0.0035 U	**0.0024**	0.0028 U	0.0033 U	0.0028 U [0.0033 U]
Total VOCs	- -	**24**	**0.86**	**0.075**	**0.079**	**0.061**	**0.049**	**0.055 [0.088]**

See Notes on Page 4.

Table 4. VOC Analytical Data in Soil, Revised Draft RFI, Ashland Inc., Facility, Rensselaer, New York

Location ID:	NYSDEC	SSB-11	SSB-11	SSB-12	SSB-12	SSB-13	SSB-13
Sample Depth (Feet):	Restricted Use	1 - 2	7 - 8	1 - 2	5.5 - 6.5	1 - 2	3 - 4
Date Collected:	SCRs Industrial	11/19/03	11/19/03	11/18/03	11/18/03	11/19/03	11/19/03
Volatile Organics							
1,1,1-Trichloroethane	1,000	0.00087 U	0.00079 U	0.00084 U	0.00094 U	0.00095 U	49 U
1,1,2,2-Tetrachloroethane	- -	0.0022 U	0.0019 U	0.0021 U	0.0023 U	0.0023 U	58 U
1,1,2-Trichloroethane	- -	0.0019 U	0.0017 U	0.0019 U	0.0021 U	0.0021 U	62 U
1,1-Dichloroethane	480	0.0011 U	0.00097 U	0.0010 U	0.0012 U	**0.0016**	66 U
1,1-Dichloroethene	1,000	0.0018 U	0.0016 U	0.0018 U	0.0020 U	0.0020 U	140 U
1,2-Dichloroethane	60	0.0016 U	0.0014 U	0.0016 U	0.0017 U	0.0018 U	59 U
1,2-Dichloropropane	- -	0.0013 U	0.0012 U	0.0012 U	0.0014 U	0.0014 U	51 U
2-Butanone	1,000	0.0051 U	0.0046 U	0.0048 U	0.0054 U	0.0055 U	940 U
2-Hexanone	- -	0.0055 U	0.0049 U	0.0053 U	0.0059 U	0.0060 U	250 U
4-Methyl-2-pentanone	- -	0.0054 U	0.0048 U	0.0052 U	0.0058 U	0.0058 U	700 U
Acetone	1,000	0.0086 U	0.0078 U	0.0083 U	0.0092 U	**0.042**	580 U
Benzene	89	**0.0098**	0.0011 U	**0.0064**	**0.012**	**0.0088**	39 U
Bromodichloromethane	- -	0.0014 U	0.0013 U	0.0013 U	0.0015 U	0.0015 U	45 U
Bromoform	- -	0.0018 U	0.0016 U	0.0018 U	0.0020 U	0.0020 U	140 U
Bromomethane	- -	0.0037 U	0.0033 U	0.0035 U	0.0039 U	0.0040 U	240 U
Carbon Disulfide	- -	0.0022 U	0.0019 U	0.0021 U	0.0023 U	0.0023 U	92 U
Carbon Tetrachloride	44	0.0010 U	0.00091 U	0.00097 U	0.0011 U	0.0011 U	45 U
Chlorobenzene	1,000	**0.0092**	0.0013 U	**0.0016**	**0.0029**	**0.0045**	59 U
Chloroethane	- -	0.0018 U	0.0016 U	0.0018 U	0.0020 U	0.0020 U	140 U
Chloroform	700	0.0013 U	0.0012 U	0.0012 U	0.0014 U	0.0014 U	140 U
Chloromethane	- -	0.0015 U	0.0014 U	0.0014 U	0.0016 U	0.0016 U	200 U
cis-1,2-Dichloroethene	1,000	**0.0072**	**0.0021**	0.0011 U	**0.0077**	**0.012**	75 U
cis-1,3-Dichloropropene	- -	0.0013 U	0.0012 U	0.0012 U	0.0014 U	0.0014 U	51 U
Dibromochloromethane	- -	0.0015 U	0.0014 U	0.0014 U	0.0016 U	0.0016 U	140 U
Ethylbenzene	780	**0.0012**	0.00097 U	0.0010 U	0.0012 U	**0.0040**	**410**
Methylene Chloride	1,000	0.0026 U	0.0023 U	0.0025 U	0.0028 U	0.0028 U	140 U
Styrene	- -	0.0012 U	0.0011 U	0.0011 U	0.0013 U	0.0013 U	42 U
Tetrachloroethene	300	**0.011**	0.0014 U	**0.0029**	**0.0076**	**0.011**	80 U
Toluene	1,000	**0.0079**	0.0017 U	0.0019 U	0.0021 U	**0.030**	**4,600**
trans-1,2-Dichloroethene	1,000	0.0013 U	0.0012 U	0.0012 U	0.0014 U	0.0014 U	58 U
trans-1,3-Dichloropropene	- -	0.0017 U	0.0016 U	0.0016 U	0.0018 U	0.0019 U	37 U
Trichloroethene	400	**0.027**	**0.0064**	**0.0081**	**0.020**	**0.020**	140 U
Vinyl Chloride	27	0.0015 U	0.0014 U	0.0014 U	0.0016 U	0.0016 U	140 U
Xylenes (total)	1,000	**0.0033**	0.0029 U	0.0031 U	0.0035 U	**0.023**	**2,300**
Total VOCs	- -	**0.077**	**0.0085**	**0.019**	**0.050**	**0.16**	**7,300**

See Notes on Page 4.

Table 4. VOC Analytical Data in Soil, Revised Draft RFI, Ashland Inc., Facility, Rensselaer, New York

Notes:

Shaded results exceed criteria for groundwater.

Bolded results are detections.

Shaded values indicate the result exceeded the soil cleanup objectives as referenced in the NYSDEC Part 375-6.5 soil cleanup requirements (SCRs), dated December 14, 2006, for the protection of groundwater, human health, and ecology.

All results are in milligrams per Kilogram (mg/Kg), equivalent to parts per million (ppm).

NA = Not Analyzed.

Duplicate sample results are in brackets.

Lab Qualifiers	Definition
J	Indicates an estimated value.
DB	Compound quantitated using a secondary dilution. Analyte was also detected in the associated method blank.
U	The compound was analyzed for but not detected. The associated value is the compound quantitation limit.
D	Compound quantitated using a secondary dilution.

Table 5. Post-2002 Draft RFI VOC Analytical Data in Groundwater, Revised Draft RFI, Ashland Inc., Rensselaer, New York

Location ID: / Date Collected:	NYSDEC TOGS 1.1.1 Water Guidance Values	HP-1 04/09/07	HP-2 04/09/07	HP-3 04/09/07	IMP-1 02/28/06	IMP-1 05/03/06	IMP-1 10/05/06	IMP-2 02/28/06	IMP-2 05/03/06	IMP-2 10/05/06	IMP-3 02/28/06	IMP-3 05/03/06
Volatile Organics												
1,1,1-Trichloroethane	5	1.0 U	1.0 U	1.0 U	1.0 U	5.0 U	1.0 U	1.0 U	2.0 U	1.0 U	1.0 U	2.0 U
1,1,2,2-Tetrachloroethane	5	1.0 U	1.0 U	1.0 U	1.0 U	5.0 U	1.0 U	1.0 U	2.0 U	1.0 U	1.0 U	2.0 U
1,1,2-Trichloroethane	1	1.0 U	1.0 U	1.0 U	1.0 U	5.0 U	NA	1.0 U	2.0 U	NA	1.0 U	2.0 U
1,1-Dichloroethane	5	1.0 U	1.0 U	1.0 U	1.0 U	5.0 U	1.0 U	1.0 U	2.0 U	1.0 U	1.0 U	2.0 U
1,1-Dichloroethene	5	1.0 U	1.0 U	1.0 U	1.0 U	5.0 U	1.0 U	1.0 U	2.0 U	1.0 U	1.0 U	2.0 U
1,2-Dichloroethane	0.6	1.0 U	1.0 U	1.0 U	**110**	**100**	**76**	**82**	**51**	**49**	**45**	**60**
1,2-Dichloropropane	1	1.0 U	1.0 U	1.0 U	1.0 U	5.0 U	NA	1.0 U	2.0 U	NA	1.0 U	2.0 U
2-Butanone	- -	10 U	10 U	10 U	10 U	50 U*	10 U	10 U	20 U*	10 U	10 U	20 U*
2-Hexanone	50	10 U	10 U	10 U	10 U	50 U*	NA	10 U	20 U*	NA	10 U	20 U*
4-Methyl-2-pentanone	- -	10 U	10 U	10 U	10 U	50 U	10 U	10 U	20 U	10 U	10 U	20 U
Acetone	50	25 U	25 U	25 U	25 U	130 U	25 U	25 U	50 U	25 U	25 U	50 U
Benzene	1	1.0 U	1.0 U	1.0 U	1.0 U	5.0 U	1.0 U	1.0 U	2.0 U	1.0 U	1.0 U	2.0 U
Bromodichloromethane	50	1.0 U	1.0 U	1.0 U	1.0 U	5.0 U	NA	1.0 U	2.0 U	NA	1.0 U	2.0 U
Bromoform	50	1.0 U	1.0 U	1.0 U	1.0 U	5.0 U	NA	1.0 U	2.0 U	NA	1.0 U	2.0 U
Bromomethane	5	1.0 U	1.0 U	1.0 U	1.0 U	5.0 U	NA	1.0 U	2.0 U	NA	1.0 U	2.0 U
Carbon Disulfide	- -	2.0 U	2.0 U	2.0 U	2.0 U	10 U	NA	2.0 U	4.0 U	NA	2.0 U	4.0 U
Carbon Tetrachloride	5	1.0 U	1.0 U	1.0 U	1.0 U	5.0 U	1.0 U	1.0 U	2.0 U	1.0 U	1.0 U	2.0 U
Chlorobenzene	5	1.0 U	1.0 U	1.0 U	1.0 U	5.0 U	NA	1.0 U	2.0 U	NA	1.0 U	2.0 U
Chloroethane	5	1.0 U	1.0 U	1.0 U	1.0 U	5.0 U	1.0 U	1.0 U	2.0 U	1.0 U	1.0 U	2.0 U
Chloroform	7	1.0 U	1.0 U	1.0 U	1.0 U	5.0 U	NA	1.0 U	2.0 U	NA	1.0 U	2.0 U
Chloromethane	- -	1.0 U	1.0 U	1.0 U	1.0 U	5.0 U	NA	1.0 U	2.0 U	NA	1.0 U	2.0 U
cis-1,2-Dichloroethene	5	1.0 U	1.0 U	1.0 U	**330**	**570**	**680 D**	**330 D**	**520 D**	**700 D**	**190**	**390**
cis-1,3-Dichloropropene	0.4	1.0 U	1.0 U	1.0 U	1.0 U	5.0 U	NA	1.0 U	2.0 U	NA	1.0 U	2.0 U
Dibromochloromethane	50	1.0 U	1.0 U	1.0 U	1.0 U	5.0 U	NA	1.0 U	2.0 U	NA	1.0 U	2.0 U
Ethylbenzene	5	1.0 U	1.0 U	1.0 U	1.0 U	5.0 U	1.0 U	1.0 U	2.0 U	1.0 U	1.0 U	2.0 U
Methylene Chloride	5	5.0 U	5.0 U	5.0 U	5.0 U	25 U	5.0 U	5.0 U	10 U	5.0 U	5.0 U	10 U
Naphthalene	10	NA	NA	NA	NA	NA	1.0 U	NA	NA	1.0 U	NA	NA
Styrene	5	1.0 U	1.0 U	1.0 U	1.0 U	5.0 U	NA	1.0 U	2.0 U	NA	1.0 U	2.0 U
Tetrachloroethene	5	1.0 U	1.0 U	1.0 U	1.0 U	5.0 U	1.0 U	1.0 U	2.0 U	1.0 U	1.0 U	2.0 U
Toluene	5	1.0 U	1.0 U	**1.1**	1.0 U	5.0 U	1.0 U	1.0 U	2.0 U	1.0 U	**2.3**	2.0 U
trans-1,2-Dichloroethene	5	1.0 U	1.0 U	1.0 U	**4.5**	**10**	**6.7**	**5.6**	**11**	**9.7**	**3.1**	**8.1**
trans-1,3-Dichloropropene	0.4	1.0 U	1.0 U	1.0 U	1.0 U	5.0 U	NA	1.0 U	2.0 U	NA	1.0 U	2.0 U
Trichloroethene	5	1.0 U	1.0 U	1.0 U	1.0 U	5.0 U	1.0 U	1.0 U	2.0 U	1.0 U	1.0 U	2.0 U
Vinyl Chloride	2	1.0 U	1.0 U	1.0 U	**88**	**97**	**120**	**22**	**28**	**39**	**43**	**72**
Xylenes (total)	5	2.0 U	2.0 U	2.0 U	2.0 U	10 U	2.0 U*	2.0 U	4.0 U	2.0 U*	2.0 U	4.0 U
Total VOCs	- -	ND	ND	**1.1**	**530**	**780**	**880**	**440**	**610**	**800**	**280**	**530**

See Notes on Page 25.

Table 5. Post-2002 Draft RFI VOC Analytical Data in Groundwater, Revised Draft RFI, Ashland Inc., Rensselaer, New York

Location ID: / Date Collected:	NYSDEC TOGS 1.1.1 Water Guidance Values	IMP-3 10/05/06	IMP-3 04/10/08	IMP-3 09/16/08	IP-1 02/28/06	IP-1 05/03/06	IP-1 10/05/06	MW-1 11/13/02	MW-1 04/23/03	MW-1 07/16/03	MW-1 10/27/03	MW-1 04/05/04
Volatile Organics												
1,1,1-Trichloroethane	5	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	**130**	**52**	**66**	**110**	1.0 U
1,1,2,2-Tetrachloroethane	5	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	25 U	5.0 U	**19**	5.0 U	1.0 U
1,1,2-Trichloroethane	1	NA	1.0 U	1.0 U	1.0 U	1.0 U	NA	25 U	5.0 U	10 U	5.0 U	1.0 U
1,1-Dichloroethane	5	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	25 U	5.0 U	10 U	5.0 U	1.0 U
1,1-Dichloroethene	5	**5.5**	1.0 U	1.0 U	1.0 U	1.0 U	**1.1**	**66**	**15**	**48**	**34**	1.0 U
1,2-Dichloroethane	0.6	**15**	1.0 U	**5.6**	1.0 U	1.0 U	**1.2**	25 U	5.0 U	10 U	5.0 U	1.0 U
1,2-Dichloropropane	1	NA	1.0 U	1.0 U	1.0 U	1.0 U	NA	25 U	5.0 U	10 U	5.0 U	1.0 U
2-Butanone	- -	10 U	10 U	10 U	10 U	10 U*	10 U	250 U	50 U	100 U	50 U	10 U
2-Hexanone	50	NA	10 U	10 U	10 U	10 U*	NA	250 U	50 U	100 U	50 U	10 U
4-Methyl-2-pentanone	- -	10 U	10 U	10 U	10 U	10 U	10 U	250 U	50 U	100 U	50 U	10 U
Acetone	50	25 U	25 U	25 U	25 U	25 U	25 U	620 U	120 U	250 U	120 U	25 U
Benzene	1	1.0 U	1.0 U	1.0 U	**1.6**	1.0 U	1.0 U	25 U	5.0 U	10 U	5.0 U	1.0 U
Bromodichloromethane	50	NA	1.0 U	1.0 U	1.0 U	1.0 U	NA	25 U	5.0 U	10 U	5.0 U	1.0 U
Bromoform	50	NA	1.0 U	1.0 U	1.0 U	1.0 U	NA	25 U	5.0 U	**10**	5.0 U	1.0 U
Bromomethane	5	NA	1.0 UJ	1.0 U	1.0 U	1.0 U	NA	25 U	5.0 U	10 U	5.0 U	1.0 U
Carbon Disulfide	- -	NA	2.0 U	2.0 U	2.0 U	2.0 U	NA	25 U	5.0 U	10 U	5.0 U	1.0 U
Carbon Tetrachloride	5	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	25 U	5.0 U	10 U	**20**	1.0 U
Chlorobenzene	5	NA	1.0 U	1.0 U	1.0 U	1.0 U	NA	25 U	5.0 U	10 U	5.0 U	1.0 U
Chloroethane	5	1.0 U	1.0 U	1.0 UJ	1.0 U	1.0 U	1.0 U	25 U	5.0 U	10 U	5.0 U	1.0 U
Chloroform	7	NA	1.0 U	1.0 U	1.0 U	1.0 U	NA	25 U	5.0 U	10 U	5.0 U	**1.6**
Chloromethane	- -	NA	1.0 UJ	1.0 UJ	1.0 U	1.0 U	NA	25 U	5.0 U	10 U	5.0 U	1.0 U
cis-1,2-Dichloroethene	5	**400 D**	**30**	**73**	**230 D**	**170**	**560 D**	**1,200**	**700**	**1,100**	**1,600 D**	1.0 U
cis-1,3-Dichloropropene	0.4	NA	1.0 U	1.0 U	1.0 U	1.0 U	NA	25 U	5.0 U	10 U	5.0 U	1.0 U
Dibromochloromethane	50	NA	1.0 U	1.0 U	1.0 U	1.0 U	NA	25 U	5.0 U	10 U	5.0 U	1.0 U
Ethylbenzene	5	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	25 U	5.0 U	10 U	5.0 U	1.0 U
Methylene Chloride	5	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	120 U	25 U	50 U	25 U	5.0 U
Naphthalene	10	1.0 U	NA	NA	NA	NA	1.0 U	NA	NA	NA	NA	NA
Styrene	5	NA	1.0 U	1.0 U	1.0 U	1.0 U	NA	25 U	5.0 U	**23**	5.0 U	1.0 U
Tetrachloroethene	5	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	**250**	**100**	**130**	**260**	**6.6**
Toluene	5	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	25 U	5.0 U	10 U	5.0 U	1.0 U
trans-1,2-Dichloroethene	5	**4.2**	1.0 U	**1.1**	**5.1**	**3.5**	**12**	25 U	**28**	**13**	**87**	1.0 U
trans-1,3-Dichloropropene	0.4	NA	1.0 U	1.0 U	1.0 U	1.0 U	NA	25 U	5.0 U	10 U	5.0 U	1.0 U
Trichloroethene	5	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	**2,000**	**740**	**1,300**	**2,100 D**	**9.4**
Vinyl Chloride	2	**34**	1.0 U	**6.9**	**94**	**43**	**160**	25 U	5.0 U	**14**	5.0 U	1.0 U
Xylenes (total)	5	2.0 U*	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U*	50 U	10 U	20 U	10 U	2.0 U
Total VOCs	- -	**460**	**30**	**87 J**	**330**	**220**	**730**	**3,600**	**1,600**	**2,700**	**4,200**	**18**

See Notes on Page 25.

Table 5. Post-2002 Draft RFI VOC Analytical Data in Groundwater, Revised Draft RFI, Ashland Inc., Rensselaer, New York

Location ID: / Date Collected:	NYSDEC TOGS 1.1.1 Water Guidance Values	MW-1 04/06/04	MW-1 10/13/04	MW-1 04/14/05	MW-1 05/10/06	MW-1 10/05/06	MW-1 04/12/07	MW-1 09/14/07	MW-1 04/09/08	MW-1 09/15/08	MW-3 11/12/02
Volatile Organics											
1,1,1-Trichloroethane	5	25 U	**150**	**230**	**210**	**1.7**	**20**	**8.0**	4.0 U [4.0 U]	5.0 U	1.0 U
1,1,2,2-Tetrachloroethane	5	25 U	25 U	10 U	25 U	1.0 U	5.0 U	2.0 U	4.0 U [4.0 U]	5.0 U	1.0 U
1,1,2-Trichloroethane	1	25 U	25 U	10 U	25 U	NA	5.0 U	2.0 U	4.0 U [4.0 U]	5.0 U	1.0 U
1,1-Dichloroethane	5	25 U	25 U	**10**	25 U	1.0 U	5.0 U	**2.1**	4.0 U [4.0 U]	5.0 U	1.0 U
1,1-Dichloroethene	5	25 U	**64**	**160**	**170**	**2.1**	**43**	**7.6**	4.0 U [4.0 U]	5.0 U	1.0 U
1,2-Dichloroethane	0.6	25 U	25 U	10 U	25 U	1.0 U	5.0 U	2.0 U	4.0 U [4.0 U]	5.0 U	1.0 U
1,2-Dichloropropane	1	25 U	25 U	10 U	25 U	NA	5.0 U	2.0 U	4.0 U [4.0 U]	5.0 U	1.0 U
2-Butanone	- -	250 U	250 U	100 U	250 U	10 U	50 U	20 U	40 U [40 U]	50 U	10 U
2-Hexanone	50	250 U	250 U	100 U	250 U	NA	50 U	20 U	40 U [40 U]	50 U	10 U
4-Methyl-2-pentanone	- -	250 U	250 U	100 U	250 U	10 U	50 U	20 U	40 U [40 U]	50 U	10 U
Acetone	50	620 U	620 U	250 U	630 U	25 U	130 U	50 U	100 U [100 U]	120 U	25 U
Benzene	1	25 U	25 U	10 U	25 U	1.0 U	5.0 U	2.0 U	4.0 U [4.0 U]	5.0 U	1.0 U
Bromodichloromethane	50	25 U	25 U	10 U	25 U	NA	5.0 U	2.0 U	4.0 U [4.0 U]	5.0 U	1.0 U
Bromoform	50	25 U	25 U	10 U	25 U	NA	5.0 U	2.0 U	4.0 U [4.0 U]	5.0 U	1.0 U
Bromomethane	5	25 U	25 U	10 U	25 U	NA	5.0 U	2.0 UJ	4.0 UJ [4.0 U]	5.0 U	1.0 U
Carbon Disulfide	- -	25 U	25 U	10 U	50 U	NA	10 U	4.0 U	8.0 U [8.0 U]	10 UJ	1.0 U
Carbon Tetrachloride	5	25 U	25 U	10 U	25 U	1.0 U	5.0 U	2.0 U	4.0 U [4.0 U]	5.0 U	1.0 U
Chlorobenzene	5	25 U	25 U	10 U	25 U	NA	5.0 U	2.0 U	4.0 U [4.0 U]	5.0 U	1.0 U
Chloroethane	5	25 U	25 U	10 U	25 U	1.0 U	5.0 U	2.0 U	4.0 U [4.0 U]	5.0 UJ	1.0 U
Chloroform	7	25 U	25 U	10 U	25 U	NA	5.0 U	2.0 U	4.0 U [4.0 U]	5.0 U	1.0 U
Chloromethane	- -	25 U	25 U	10 U	25 U	NA	5.0 U	2.0 U	4.0 UJ [4.0 UJ]	5.0 U	1.0 U
cis-1,2-Dichloroethene	5	**480**	**1,200**	**5,400 D**	**4,700**	**91**	**1,400 D**	**420 D**	**150 [150]**	**340 J**	**3.1**
cis-1,3-Dichloropropene	0.4	25 U	25 U	10 U	25 U	NA	5.0 U	2.0 U	4.0 U [4.0 U]	5.0 U	1.0 U
Dibromochloromethane	50	25 U	25 U	10 U	25 U	NA	5.0 U	2.0 U	4.0 U [4.0 U]	5.0 U	1.0 U
Ethylbenzene	5	25 U	25 U	10 U	25 U	1.0 U	5.0 U	2.0 U	4.0 U [4.0 U]	5.0 U	1.0 U
Methylene Chloride	5	120 U	120 U	10 U	130 U	5.0 U	25 U	10 U	20 U [20 U]	25 U	5.0 U
Naphthalene	10	NA	NA	NA	NA	1.0 U	NA	NA	NA	NA	NA
Styrene	5	25 U	25 U	10 U	25 U	NA	5.0 U	2.0 U	4.0 U [4.0 U]	5.0 U	1.0 U
Tetrachloroethene	5	**32**	**260**	**650**	**470**	**5.9**	**48**	**42**	**10 [10]**	**23**	1.0 U
Toluene	5	25 U	25 U	10 U	25 U	1.0 U	5.0 U	2.0 U	4.0 U [4.0 U]	5.0 U	1.0 U
trans-1,2-Dichloroethene	5	25 U	25 U	**42**	**29**	1.0 U	5.0 U	2.0 U	4.0 U [4.0 U]	5.0 U	1.0 U
trans-1,3-Dichloropropene	0.4	25 U	25 U	10 U	25 U	NA	5.0 U	2.0 U	4.0 U [4.0 U]	5.0 U	1.0 U
Trichloroethene	5	**600**	**2,300**	**2,800 D**	**2,200**	**110**	**610**	**1,100 D**	**310 J [310]**	**750 J**	1.0 U
Vinyl Chloride	2	25 U	25 U	**69**	**59**	1.0 U	**6.3**	2.0 U	4.0 U [4.0 U]	5.0 U	**6.9**
Xylenes (total)	5	50 U	50 U	20 U	50 U	2.0 U	10 U	4.0 U	8.0 U [8.0 U]	10 U	2.0 U
Total VOCs	- -	**1,100**	**4,000**	**9,400**	**7,800**	**210**	**2,100**	**1,600**	**470 J [470]**	**1,100 J**	**10**

See Notes on Page 25.

Table 5. Post-2002 Draft RFI VOC Analytical Data in Groundwater, Revised Draft RFI, Ashland Inc., Rensselaer, New York

Location ID: / Date Collected:	NYSDEC TOGS 1.1.1 Water Guidance Values	MW-3 04/23/03	MW-3 07/15/03	MW-3 10/27/03	MW-3 04/05/04	MW-3 04/08/04	MW-3 10/13/04	MW-3 04/13/05	MW-3 05/09/06	MW-3 10/04/06	MW-3 04/11/07
Volatile Organics											
1,1,1-Trichloroethane	5	1.0 U [1.0 U]	1.0 U	1.0 U	**3.3**	1.0 U [1.0 U]	1.0 U	1.0 U [1.0 U]	1.0 U	1.0 U	1.0 U
1,1,2,2-Tetrachloroethane	5	1.0 U [1.0 U]	1.0 U	1.0 U	1.0 U	1.0 U [1.0 U]	1.0 U	1.0 U [1.0 U]	1.0 U	1.0 U	1.0 U
1,1,2-Trichloroethane	1	1.0 U [1.0 U]	1.0 U	1.0 U	1.0 U	1.0 U [1.0 U]	1.0 U	1.0 U [1.0 U]	1.0 U	NA	1.0 U
1,1-Dichloroethane	5	**3.2 [2.0]**	1.0 U	1.0 U	**1.7**	1.0 U [1.0 U]	1.0 U	1.0 U [1.0 U]	1.0 U	1.0 U	1.0 U
1,1-Dichloroethene	5	1.0 U [1.0 U]	1.0 U	1.0 U	1.0 U	1.0 U [1.0 U]	1.0 U	1.0 U [1.0 U]	1.0 U	1.0 U	1.0 U
1,2-Dichloroethane	0.6	1.0 U [1.0 U]	1.0 U	1.0 U	1.0 U	1.0 U [1.0 U]	1.0 U	1.0 U [1.0 U]	1.0 U	1.0 U	1.0 U
1,2-Dichloropropane	1	1.0 U [1.0 U]	1.0 U	1.0 U	1.0 U	1.0 U [1.0 U]	1.0 U	1.0 U [1.0 U]	1.0 U	NA	1.0 U
2-Butanone	- -	10 U [10 U]	10 U	10 U	10 U	10 U [10 U]	10 U	10 U [10 U]	10 U	10 U	10 U
2-Hexanone	50	10 U [10 U]	10 U	10 U	10 U	10 U [10 U]	10 U	10 U [10 U]	10 U	NA	10 U
4-Methyl-2-pentanone	- -	10 U [10 U]	10 U	10 U	10 U	10 U [10 U]	10 U	10 U [10 U]	10 U	10 U	10 U
Acetone	50	25 U [25 U]	25 U	25 U	25 U	25 U [25 U]	25 U	25 U [25 U]	25 U	25 U	25 U
Benzene	1	1.0 U [1.0 U]	1.0 U	1.0 U	1.0 U	**2.9 [1.0 U]**	1.0 U	1.0 U [1.0 U]	1.0 U	1.0 U	1.0 U
Bromodichloromethane	50	1.0 U [1.0 U]	1.0 U	1.0 U	1.0 U	1.0 U [1.0 U]	1.0 U	1.0 U [1.0 U]	1.0 U	NA	1.0 U
Bromoform	50	1.0 U [1.0 U]	1.0 U	1.0 U	1.0 U	1.0 U [1.0 U]	1.0 U	1.0 U [1.0 U]	1.0 U	NA	1.0 U
Bromomethane	5	1.0 U [1.0 U]	1.0 U	1.0 U	1.0 U	1.0 U [1.0 U]	1.0 U	1.0 U [1.0 U]	1.0 U	NA	1.0 U
Carbon Disulfide	- -	1.0 U [1.0 U]	1.0 U	1.0 U	1.0 U	1.0 U [1.0 U]	1.0 U	1.0 U [1.0 U]	2.0 U	NA	2.0 U
Carbon Tetrachloride	5	1.0 U [1.0 U]	1.0 U	1.0 U	1.0 U	1.0 U [1.0 U]	1.0 U	1.0 U [1.0 U]	1.0 U	1.0 U	1.0 U
Chlorobenzene	5	1.0 U [1.0 U]	1.0 U	1.0 U	1.0 U	1.0 U [1.0 U]	1.0 U	1.0 U [1.0 U]	1.0 U	NA	1.0 U
Chloroethane	5	1.0 U [1.0 U]	1.0 U	1.0 U	1.0 U	1.0 U [1.0 U]	1.0 U	1.0 U [1.0 U]	1.0 U	1.0 U	1.0 U
Chloroform	7	1.0 U [1.0 U]	1.0 U	1.0 U	1.0 U	1.0 U [1.0 U]	1.0 U	1.0 U [1.0 U]	1.0 U	NA	1.0 U
Chloromethane	- -	1.0 U [1.0 U]	1.0 U	1.0 U	1.0 U	1.0 U [1.0 U]	1.0 U	1.0 U [1.0 U]	1.0 U*	NA	1.0 U
cis-1,2-Dichloroethene	5	**1.6 [1.8]**	**2.4**	**1.1**	**16**	1.0 U [1.0 U]	1.0 U	1.0 U [1.0 U]	1.0 U	1.0 U	1.0 U
cis-1,3-Dichloropropene	0.4	1.0 U [1.0 U]	1.0 U	1.0 U	1.0 U	1.0 U [1.0 U]	1.0 U	1.0 U [1.0 U]	1.0 U	NA	1.0 U
Dibromochloromethane	50	1.0 U [1.0 U]	1.0 U	1.0 U	1.0 U	1.0 U [1.0 U]	1.0 U	1.0 U [1.0 U]	1.0 U	NA	1.0 U
Ethylbenzene	5	1.0 U [1.0 U]	1.0 U	1.0 U	1.0 U	**1.3 [1.0 U]**	1.0 U	1.0 U [1.0 U]	1.0 U	1.0 U	1.0 U
Methylene Chloride	5	5.0 U [5.0 U]	5.0 U	5.0 U	5.0 U	5.0 U [5.0 U]	5.0 U	1.0 U [1.0 U]	5.0 U	5.0 U	5.0 U
Naphthalene	10	NA	NA	NA	NA	NA	NA	NA	NA	1.0 U	NA
Styrene	5	1.0 U [1.0 U]	**2.1**	1.0 U	1.0 U	1.0 U [1.0 U]	1.0 U	1.0 U [1.0 U]	1.0 U	NA	1.0 U
Tetrachloroethene	5	1.0 U [1.0 U]	1.0 U	1.0 U	**100**	1.0 U [1.0 U]	1.0 U	1.0 U [1.0 U]	1.0 U	1.0 U	1.0 U
Toluene	5	1.0 U [1.0 U]	1.0 U	1.0 U	1.0 U	1.0 U [1.0 U]	1.0 U	1.0 U [1.0 U]	1.0 U	1.0 U	1.0 U
trans-1,2-Dichloroethene	5	1.0 U [1.0 U]	**1.3**	1.0 U	1.0 U	1.0 U [1.0 U]	1.0 U	1.0 U [1.0 U]	1.0 U	1.0 U	1.0 U
trans-1,3-Dichloropropene	0.4	1.0 U [1.0 U]	1.0 U	1.0 U	1.0 U	1.0 U [1.0 U]	1.0 U	1.0 U [1.0 U]	1.0 U	NA	1.0 U
Trichloroethene	5	1.0 U [1.0 U]	1.0 U	1.0 U	**85**	1.0 U [1.0 U]	1.0 U	1.0 U [1.0 U]	1.0 U	1.0 U	1.0 U
Vinyl Chloride	2	**2.2 [2.1]**	**2.9**	**1.8**	**2.4**	1.0 U [1.0 U]	**1.2**	1.0 U [1.0 U]	1.0 U*	1.0 U	1.0 U
Xylenes (total)	5	2.0 U [2.0 U]	2.0 U	2.0 U	2.0 U	**3.3 [2.0 U]**	2.0 U	2.0 U [2.0 U]	2.0 U	2.0 U	2.0 U
Total VOCs	- -	**7.0 [5.9]**	**8.7**	**2.9**	**210**	**7.5 [ND]**	**1.2**	ND [ND]	ND	ND	ND

See Notes on Page 25.

Table 5. Post-2002 Draft RFI VOC Analytical Data in Groundwater, Revised Draft RFI, Ashland Inc., Rensselaer, New York

Location ID: / Date Collected:	NYSDEC TOGS 1.1.1 Water Guidance Values	MW-3 09/13/07	MW-3 04/09/08	MW-3 09/15/08	MW-4 11/12/02	MW-4 04/23/03	MW-4 10/27/03	MW-4 04/05/04	MW-4 04/06/04	MW-4 10/13/04	MW-4 04/13/05
Volatile Organics											
1,1,1-Trichloroethane	5	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	**2.5**	1.0 U	1.0 U
1,1,2,2-Tetrachloroethane	5	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
1,1,2-Trichloroethane	1	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
1,1-Dichloroethane	5	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	**3.0**	1.0 U	1.0 U
1,1-Dichloroethene	5	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
1,2-Dichloroethane	0.6	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
1,2-Dichloropropane	1	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
2-Butanone	- -	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
2-Hexanone	50	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
4-Methyl-2-pentanone	- -	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Acetone	50	25 U	25 U	25 U	25 U	25 U	25 U	25 U	25 U	25 U	25 U
Benzene	1	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Bromodichloromethane	50	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Bromoform	50	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Bromomethane	5	1.0 UJ	1.0 UJ	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Carbon Disulfide	- -	2.0 U	2.0 U	2.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Carbon Tetrachloride	5	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Chlorobenzene	5	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Chloroethane	5	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Chloroform	7	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Chloromethane	- -	1.0 U	1.0 UJ	1.0 UJ	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
cis-1,2-Dichloroethene	5	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	**26**	1.0 U	1.0 U
cis-1,3-Dichloropropene	0.4	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Dibromochloromethane	50	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Ethylbenzene	5	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Methylene Chloride	5	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	1.0 U
Naphthalene	10	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Styrene	5	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Tetrachloroethene	5	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	**3.8**	1.0 U	1.0 U
Toluene	5	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
trans-1,2-Dichloroethene	5	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
trans-1,3-Dichloropropene	0.4	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Trichloroethene	5	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	**16**	1.0 U	1.0 U
Vinyl Chloride	2	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	**2.2**	1.0 U	1.0 U
Xylenes (total)	5	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U
Total VOCs	- -	ND	ND	NDJ	ND	ND	ND	ND	**54**	ND	ND

See Notes on Page 25.

Table 5. Post-2002 Draft RFI VOC Analytical Data in Groundwater, Revised Draft RFI, Ashland Inc., Rensselaer, New York

Location ID: / Date Collected:	NYSDEC TOGS 1.1.1 Water Guidance Values	MW-4 05/09/06	MW-4 10/04/06	MW-4 04/11/07	MW-4 09/14/07	MW-4 04/09/08	MW-4 09/15/08	MW-9 11/12/02	MW-9 04/23/03	MW-9 10/27/03	MW-9 04/06/04
Volatile Organics											
1,1,1-Trichloroethane	5	1.0 U [1.0 U]	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
1,1,2,2-Tetrachloroethane	5	1.0 U [1.0 U]	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
1,1,2-Trichloroethane	1	1.0 U [1.0 U]	NA	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
1,1-Dichloroethane	5	1.0 U [1.0 U]	**1.3**	1.0 U	**2.2**	1.0 U	1.0 U	**5.8**	**1.2**	**3.6**	1.0 U
1,1-Dichloroethene	5	1.0 U [1.0 U]	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
1,2-Dichloroethane	0.6	1.0 U [1.0 U]	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
1,2-Dichloropropane	1	1.0 U [1.0 U]	NA	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
2-Butanone	- -	10 U [10 U]	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
2-Hexanone	50	10 U [10 U]	NA	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
4-Methyl-2-pentanone	- -	10 U [10 U]	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Acetone	50	25 U [25 U]	25 U	25 U	25 U	25 U	25 U	25 U	25 U	25 U	25 U
Benzene	1	1.0 U [1.0 U]	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Bromodichloromethane	50	1.0 U [1.0 U]	NA	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Bromoform	50	1.0 U [1.0 U]	NA	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Bromomethane	5	1.0 U [1.0 U]	NA	1.0 U	1.0 UJ	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Carbon Disulfide	- -	2.0 U [2.0 U]	NA	2.0 U	**2.9**	2.0 U	2.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Carbon Tetrachloride	5	1.0 U [1.0 U]	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Chlorobenzene	5	1.0 U [1.0 U]	NA	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Chloroethane	5	1.0 U [1.0 U]	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Chloroform	7	1.0 U [1.0 U]	NA	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Chloromethane	- -	1.0 U* [1.0 U*]	NA	1.0 U	1.0 U	1.0 U	1.0 UJ	1.0 U	1.0 U	1.0 U	1.0 U
cis-1,2-Dichloroethene	5	1.0 U [1.0 U]	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	**1.4**	1.0 U	1.0 U	1.0 U
cis-1,3-Dichloropropene	0.4	1.0 U [1.0 U]	NA	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Dibromochloromethane	50	1.0 U [1.0 U]	NA	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Ethylbenzene	5	1.0 U [1.0 U]	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Methylene Chloride	5	5.0 U [5.0 U]	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U
Naphthalene	10	NA	1.0 U	NA	NA	NA	NA	NA	NA	NA	NA
Styrene	5	1.0 U [1.0 U]	NA	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Tetrachloroethene	5	1.0 U [1.0 U]	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Toluene	5	1.0 U [1.0 U]	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
trans-1,2-Dichloroethene	5	1.0 U [1.0 U]	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
trans-1,3-Dichloropropene	0.4	1.0 U [1.0 U]	NA	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Trichloroethene	5	1.0 U [1.0 U]	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Vinyl Chloride	2	1.0 U* [1.0 U*]	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Xylenes (total)	5	2.0 U [2.0 U]	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U
Total VOCs	- -	ND [ND]	**1.3**	ND	**5.1**	ND	NDJ	**7.2**	**1.2**	**3.6**	ND

See Notes on Page 25.

Table 5. Post-2002 Draft RFI VOC Analytical Data in Groundwater, Revised Draft RFI, Ashland Inc., Rensselaer, New York

Location ID:	NYSDEC TOGS 1.1.1 Water	MW-9	MW-9	MW-9	MW-9	MW-9	MW-9	MW-9	MW-9	MW-10	MW-10	MW-10
Date Collected:	Guidance Values	10/13/04	04/13/05	05/09/06	10/04/06	04/11/07	09/18/07	04/09/08	09/15/08	11/12/02	04/21/03	07/16/03
Volatile Organics												
1,1,1-Trichloroethane	5	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U [1.0 U]
1,1,2,2-Tetrachloroethane	5	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U [1.0 U]
1,1,2-Trichloroethane	1	1.0 U	1.0 U	1.0 U	NA	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U [1.0 U]
1,1-Dichloroethane	5	**2.2**	**1.5**	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U [1.0 U]
1,1-Dichloroethene	5	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U [1.0 U]
1,2-Dichloroethane	0.6	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U [1.0 U]
1,2-Dichloropropane	1	1.0 U	1.0 U	1.0 U	NA	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U [1.0 U]
2-Butanone	- -	10 U	10 U	10 U	10 U	10 U	10 UJ	10 U	10 U	10 U	10 U	10 U [10 U]
2-Hexanone	50	10 U	10 U	10 U	NA	10 U	10 U	10 U	10 U	10 U	10 U	10 U [10 U]
4-Methyl-2-pentanone	- -	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U [10 U]
Acetone	50	25 U	25 U	25 U	25 U	25 U	25 UJ	25 U	25 U	25 U	25 U	25 U [25 U]
Benzene	1	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U [1.0 U]
Bromodichloromethane	50	1.0 U	1.0 U	1.0 U	NA	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U [1.0 U]
Bromoform	50	1.0 U	1.0 U	1.0 U	NA	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U [1.0 U]
Bromomethane	5	1.0 U	1.0 U	1.0 U	NA	1.0 U	1.0 U	1.0 UJ	1.0 U	1.0 U	1.0 U	1.0 U [1.0 U]
Carbon Disulfide	- -	1.0 U	1.0 U	2.0 U	NA	2.0 U	2.0 U	2.0 U	2.0 U	1.0 U	1.0 U	1.0 U [1.0 U]
Carbon Tetrachloride	5	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U [1.0 U]
Chlorobenzene	5	1.0 U	1.0 U	1.0 U	NA	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U [1.0 U]
Chloroethane	5	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 UJ	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U [1.0 U]
Chloroform	7	1.0 U	1.0 U	1.0 U	NA	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U [1.0 U]
Chloromethane	- -	1.0 U	1.0 U	1.0 U*	NA	1.0 U	1.0 U	1.0 UJ	1.0 UJ	1.0 U	1.0 U	1.0 U [1.0 U]
cis-1,2-Dichloroethene	5	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U [1.0 U]
cis-1,3-Dichloropropene	0.4	1.0 U	1.0 U	1.0 U	NA	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U [1.0 U]
Dibromochloromethane	50	1.0 U	1.0 U	1.0 U	NA	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U [1.0 U]
Ethylbenzene	5	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U [1.0 U]
Methylene Chloride	5	5.0 U	1.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U [5.0 U]
Naphthalene	10	NA	NA	NA	1.0 U	NA	NA	NA	NA	NA	NA	NA
Styrene	5	1.0 U	1.0 U	1.0 U	NA	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	**3.0 [2.0]**
Tetrachloroethene	5	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U [1.0 U]
Toluene	5	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U [1.0 U]
trans-1,2-Dichloroethene	5	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U [1.0 U]
trans-1,3-Dichloropropene	0.4	1.0 U	1.0 U	1.0 U	NA	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U [1.0 U]
Trichloroethene	5	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U [1.0 U]
Vinyl Chloride	2	1.0 U	1.0 U	1.0 U*	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U [1.0 U]
Xylenes (total)	5	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U [2.0 U]
Total VOCs	- -	**2.2**	**1.5**	ND	ND	ND	ND	ND	NDJ	ND	ND	**3.0 [2.0]**

See Notes on Page 25.

Table 5. Post-2002 Draft RFI VOC Analytical Data in Groundwater, Revised Draft RFI, Ashland Inc., Rensselaer, New York

Location ID:	NYSDEC TOGS 1.1.1 Water	MW-10	MW-10	MW-10	MW-10	MW-10	MW-10	MW-10	MW-10	MW-10	MW-10	MW-11
Date Collected:	Guidance Values	10/27/03	04/06/04	10/13/04	04/13/05	05/09/06	10/04/06	04/11/07	09/12/07	04/10/08	09/16/08	11/12/02
Volatile Organics												
1,1,1-Trichloroethane	5	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U [1.0 U]	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
1,1,2,2-Tetrachloroethane	5	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U [1.0 U]	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
1,1,2-Trichloroethane	1	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	NA	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
1,1-Dichloroethane	5	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U [1.0 U]	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
1,1-Dichloroethene	5	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U [1.0 U]	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
1,2-Dichloroethane	0.6	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U [1.0 U]	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
1,2-Dichloropropane	1	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	NA	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
2-Butanone	- -	10 U	10 U	10 U	10 U	10 U	10 U [10 U]	10 U	10 U	10 U	10 U	10 U
2-Hexanone	50	10 U	10 U	10 U	10 U	10 U	NA	10 U	10 UJ	10 U	10 U	10 U
4-Methyl-2-pentanone	- -	10 U	10 U	10 U	10 U	10 U	10 U [10 U]	10 U	10 U	10 U	10 U	10 U
Acetone	50	25 U	25 U	25 U	25 U	25 U	25 U [25 U]	25 U	25 U	25 U	25 U	25 U
Benzene	1	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U [1.0 U]	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Bromodichloromethane	50	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	NA	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Bromoform	50	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	NA	1.0 U	1.0 UJ	1.0 U	1.0 U	1.0 U
Bromomethane	5	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	NA	1.0 U	1.0 U	1.0 UJ	1.0 U	1.0 U
Carbon Disulfide	- -	1.0 U	1.0 U	1.0 U	1.0 U	2.0 U	NA	2.0 U	2.0 U	2.0 U	2.0 U	1.0 U
Carbon Tetrachloride	5	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U [1.0 U]	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Chlorobenzene	5	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	NA	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Chloroethane	5	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U [1.0 U]	1.0 U	1.0 U	1.0 U	1.0 UJ	1.0 U
Chloroform	7	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	NA	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Chloromethane	- -	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U*	NA	1.0 U	1.0 UJ	1.0 UJ	1.0 UJ	1.0 U
cis-1,2-Dichloroethene	5	1.0 U	**7.4**	**1.5**	1.0 U	1.0 U	1.0 U [1.0 U]	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
cis-1,3-Dichloropropene	0.4	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	NA	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Dibromochloromethane	50	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	NA	1.0 U	1.0 UJ	1.0 U	1.0 U	1.0 U
Ethylbenzene	5	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U [1.0 U]	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Methylene Chloride	5	5.0 U	5.0 U	5.0 U	1.0 U	5.0 U	5.0 U [5.0 U]	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U
Naphthalene	10	NA	NA	NA	NA	NA	1.0 U [1.0 U]	NA	NA	NA	NA	NA
Styrene	5	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	NA	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Tetrachloroethene	5	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U [1.0 U]	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Toluene	5	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U [1.0 U]	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
trans-1,2-Dichloroethene	5	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U [1.0 U]	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
trans-1,3-Dichloropropene	0.4	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	NA	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Trichloroethene	5	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U [1.0 U]	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Vinyl Chloride	2	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U*	1.0 U [1.0 U]	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Xylenes (total)	5	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U [2.0 U]	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U
Total VOCs	- -	ND	**7.4**	**1.5**	ND	ND	ND [ND]	ND	ND	ND	NDJ	ND

See Notes on Page 25.

Table 5. Post-2002 Draft RFI VOC Analytical Data in Groundwater, Revised Draft RFI, Ashland Inc., Rensselaer, New York

Location ID:	NYSDEC TOGS 1.1.1 Water	MW-11	MW-11	MW-11	MW-11	MW-11	MW-11	MW-11	MW-11	MW-11	MW-11
Date Collected:	Guidance Values	04/21/03	10/28/03	04/09/04	10/13/04	04/14/05	05/08/06	10/04/06	04/11/07	09/24/07	04/10/08
Volatile Organics											
1,1,1-Trichloroethane	5	1.0 U	1.0 U [1.0 U]	1.0 U	1.0 U [1.0 U]	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
1,1,2,2-Tetrachloroethane	5	1.0 U	1.0 U [1.0 U]	1.0 U	1.0 U [1.0 U]	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
1,1,2-Trichloroethane	1	1.0 U	1.0 U [1.0 U]	1.0 U	1.0 U [1.0 U]	1.0 U	1.0 U	NA	1.0 U	1.0 U	1.0 U
1,1-Dichloroethane	5	1.0 U	1.0 U [1.0 U]	1.0 U	1.0 U [1.0 U]	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
1,1-Dichloroethene	5	1.0 U	1.0 U [1.0 U]	1.0 U	1.0 U [1.0 U]	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
1,2-Dichloroethane	0.6	1.0 U	1.0 U [1.0 U]	1.0 U	1.0 U [1.0 U]	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
1,2-Dichloropropane	1	1.0 U	1.0 U [1.0 U]	1.0 U	1.0 U [1.0 U]	1.0 U	1.0 U	NA	1.0 U	1.0 U	1.0 U
2-Butanone	- -	10 U	10 U [10 U]	10 U	10 U [10 U]	10 U	10 U	10 U	10 U	10 U	10 U
2-Hexanone	50	10 U	10 U [10 U]	10 U	10 U [10 U]	10 U	10 U	NA	10 U	10 U	10 U
4-Methyl-2-pentanone	- -	10 U	10 U [10 U]	10 U	10 U [10 U]	10 U	10 U	10 U	10 U	10 U	10 U
Acetone	50	25 U	25 U [25 U]	25 U	25 U [25 U]	25 U	25 U	25 U	25 U	25 U	25 U
Benzene	1	1.0 U	1.0 U [1.0 U]	1.0 U	1.0 U [1.0 U]	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Bromodichloromethane	50	1.0 U	1.0 U [1.0 U]	1.0 U	1.0 U [1.0 U]	1.0 U	1.0 U	NA	1.0 U	1.0 U	1.0 U
Bromoform	50	1.0 U	1.0 U [1.0 U]	1.0 U	1.0 U [1.0 U]	1.0 U	1.0 U	NA	1.0 U	1.0 U	1.0 U
Bromomethane	5	1.0 U	1.0 U [1.0 U]	1.0 U	1.0 U [1.0 U]	1.0 U	1.0 U	NA	1.0 U	1.0 UJ	1.0 UJ
Carbon Disulfide	- -	1.0 U	1.0 U [1.0 U]	1.0 U	1.0 U [1.0 U]	1.0 U	2.0 U	NA	2.0 U	2.0 U	2.0 U
Carbon Tetrachloride	5	1.0 U	1.0 U [1.0 U]	1.0 U	1.0 U [1.0 U]	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Chlorobenzene	5	1.0 U	1.0 U [1.0 U]	1.0 U	1.0 U [1.0 U]	1.0 U	1.0 U	NA	1.0 U	1.0 U	1.0 U
Chloroethane	5	1.0 U	1.0 U [1.0 U]	1.0 U	1.0 U [1.0 U]	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Chloroform	7	1.0 U	1.0 U [1.0 U]	1.0 U	1.0 U [1.0 U]	1.0 U	1.0 U	NA	1.0 U	1.0 U	1.0 U
Chloromethane	- -	1.0 U	1.0 U [1.0 U]	1.0 U	1.0 U [1.0 U]	1.0 U	1.0 U	NA	1.0 U	1.0 U	1.0 UJ
cis-1,2-Dichloroethene	5	1.0 U	1.0 U [1.0 U]	1.0 U	1.0 U [1.0 U]	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
cis-1,3-Dichloropropene	0.4	1.0 U	1.0 U [1.0 U]	1.0 U	1.0 U [1.0 U]	1.0 U	1.0 U	NA	1.0 U	1.0 U	1.0 U
Dibromochloromethane	50	1.0 U	1.0 U [1.0 U]	1.0 U	1.0 U [1.0 U]	1.0 U	1.0 U	NA	1.0 U	1.0 U	1.0 U
Ethylbenzene	5	1.0 U	1.0 U [1.0 U]	1.0 U	1.0 U [1.0 U]	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Methylene Chloride	5	5.0 U	5.0 U [5.0 U]	5.0 U	5.0 U [5.0 U]	1.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U
Naphthalene	10	NA	NA	NA	NA	NA	NA	1.0 U	NA	NA	NA
Styrene	5	1.0 U	1.0 U [1.0 U]	1.0 U	1.0 U [1.0 U]	1.0 U	1.0 U	NA	1.0 U	1.0 U	1.0 U
Tetrachloroethene	5	1.0 U	1.0 U [1.0 U]	1.0 U	1.0 U [1.0 U]	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Toluene	5	1.0 U	1.0 U [1.0 U]	1.0 U	1.0 U [1.0 U]	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
trans-1,2-Dichloroethene	5	1.0 U	1.0 U [1.0 U]	1.0 U	1.0 U [1.0 U]	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
trans-1,3-Dichloropropene	0.4	1.0 U	1.0 U [1.0 U]	1.0 U	1.0 U [1.0 U]	1.0 U	1.0 U	NA	1.0 U	1.0 U	1.0 U
Trichloroethene	5	1.0 U	1.0 U [1.0 U]	1.0 U	1.0 U [1.0 U]	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Vinyl Chloride	2	1.0 U	1.0 U [1.0 U]	1.0 U	1.0 U [1.0 U]	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Xylenes (total)	5	2.0 U	2.0 U [2.0 U]	2.0 U	2.0 U [2.0 U]	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U
Total VOCs	- -	ND	ND [ND]	ND	ND [ND]	ND	ND	ND	ND	ND	ND

See Notes on Page 25.

Table 5. Post-2002 Draft RFI VOC Analytical Data in Groundwater, Revised Draft RFI, Ashland Inc., Rensselaer, New York

Location ID: / Date Collected:	NYSDEC TOGS 1.1.1 Water Guidance Values	MW-11 09/16/08	MW-12D 11/12/02	MW-12D 04/21/03	MW-12D 10/28/03	MW-12D 04/08/04	MW-12D 10/13/04	MW-12D 04/14/05	MW-12D 05/08/06	MW-12D 10/03/06	MW-12D 04/10/07	MW-12D 09/21/07
Volatile Organics												
1,1,1-Trichloroethane	5	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
1,1,2,2-Tetrachloroethane	5	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
1,1,2-Trichloroethane	1	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	NA	1.0 U	1.0 U
1,1-Dichloroethane	5	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
1,1-Dichloroethene	5	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
1,2-Dichloroethane	0.6	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
1,2-Dichloropropane	1	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	NA	1.0 U	1.0 U
2-Butanone	- -	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
2-Hexanone	50	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	NA	10 U	10 U
4-Methyl-2-pentanone	- -	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Acetone	50	25 U	25 U	25 U	25 U	25 U	25 U	25 U	25 U	25 U	25 U	25 U
Benzene	1	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Bromodichloromethane	50	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	NA	1.0 U	1.0 U
Bromoform	50	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	NA	1.0 U	1.0 U
Bromomethane	5	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	NA	1.0 U	1.0 UJ
Carbon Disulfide	- -	2.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	2.0 U	NA	2.0 U	2.0 U
Carbon Tetrachloride	5	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Chlorobenzene	5	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	NA	1.0 U	1.0 U
Chloroethane	5	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 UJ
Chloroform	7	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	NA	1.0 U	1.0 U
Chloromethane	- -	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	NA	1.0 U	1.0 UJ
cis-1,2-Dichloroethene	5	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
cis-1,3-Dichloropropene	0.4	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	NA	1.0 U	1.0 U
Dibromochloromethane	50	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	NA	1.0 U	1.0 U
Ethylbenzene	5	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Methylene Chloride	5	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	1.0 U	5.0 U	5.0 U	5.0 U	5.0 U
Naphthalene	10	NA	NA	NA	NA	NA	NA	NA	NA	1.0 U	NA	NA
Styrene	5	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	NA	1.0 U	1.0 U
Tetrachloroethene	5	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Toluene	5	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
trans-1,2-Dichloroethene	5	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
trans-1,3-Dichloropropene	0.4	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	NA	1.0 U	1.0 U
Trichloroethene	5	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Vinyl Chloride	2	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Xylenes (total)	5	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U
Total VOCs	- -	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND

See Notes on Page 25.

Table 5. Post-2002 Draft RFI VOC Analytical Data in Groundwater, Revised Draft RFI, Ashland Inc., Rensselaer, New York

Location ID: / Date Collected:	NYSDEC TOGS 1.1.1 Water Guidance Values	MW-12D 04/10/08	MW-12D 09/16/08	MW-12S 11/12/02	MW-12S 04/21/03	MW-12S 10/28/03	MW-12S 04/09/04	MW-12S 10/13/04	MW-12S 04/14/05	MW-12S 05/08/06	MW-12S 10/04/06	MW-12S 04/10/07
Volatile Organics												
1,1,1-Trichloroethane	5	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
1,1,2,2-Tetrachloroethane	5	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
1,1,2-Trichloroethane	1	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	NA	1.0 U
1,1-Dichloroethane	5	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
1,1-Dichloroethene	5	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
1,2-Dichloroethane	0.6	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
1,2-Dichloropropane	1	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	NA	1.0 U
2-Butanone	- -	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
2-Hexanone	50	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	NA	10 U
4-Methyl-2-pentanone	- -	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Acetone	50	25 U	25 U	25 U	25 U	25 U	25 U	25 U	25 U	25 U	25 U	25 U
Benzene	1	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Bromodichloromethane	50	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	NA	1.0 U
Bromoform	50	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	NA	1.0 U
Bromomethane	5	1.0 UJ	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	NA	1.0 U
Carbon Disulfide	- -	2.0 U	2.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	2.0 U	NA	2.0 U
Carbon Tetrachloride	5	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Chlorobenzene	5	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	NA	1.0 U
Chloroethane	5	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Chloroform	7	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	NA	1.0 U
Chloromethane	- -	1.0 UJ	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	NA	1.0 U
cis-1,2-Dichloroethene	5	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
cis-1,3-Dichloropropene	0.4	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	NA	1.0 U
Dibromochloromethane	50	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	NA	1.0 U
Ethylbenzene	5	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Methylene Chloride	5	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	1.0 U	5.0 U	5.0 U	5.0 U
Naphthalene	10	NA	NA	NA	NA	NA	NA	NA	NA	NA	1.0 U	NA
Styrene	5	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	NA	1.0 U
Tetrachloroethene	5	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Toluene	5	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
trans-1,2-Dichloroethene	5	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
trans-1,3-Dichloropropene	0.4	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	NA	1.0 U
Trichloroethene	5	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Vinyl Chloride	2	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Xylenes (total)	5	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U
Total VOCs	- -	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND

See Notes on Page 25.

Table 5. Post-2002 Draft RFI VOC Analytical Data in Groundwater, Revised Draft RFI, Ashland Inc., Rensselaer, New York

Location ID:	NYSDEC TOGS 1.1.1 Water Guidance Values	MW-12S	MW-12S	MW-12S	MW-13	MW-13	MW-13	MW-13	MW-13	MW-13	MW-13	MW-13
Date Collected:		09/21/07	04/10/08	09/16/08	11/12/02	04/23/03	07/16/03	10/28/03	04/08/04	10/13/04	04/14/05	05/08/06
Volatile Organics												
1,1,1-Trichloroethane	5	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
1,1,2,2-Tetrachloroethane	5	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
1,1,2-Trichloroethane	1	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
1,1-Dichloroethane	5	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
1,1-Dichloroethene	5	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
1,2-Dichloroethane	0.6	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
1,2-Dichloropropane	1	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
2-Butanone	- -	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
2-Hexanone	50	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
4-Methyl-2-pentanone	- -	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Acetone	50	25 U	25 U	25 U	25 U	25 U	25 U	25 U	25 U	25 U	25 U	25 U
Benzene	1	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Bromodichloromethane	50	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Bromoform	50	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Bromomethane	5	1.0 UJ	1.0 UJ	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Carbon Disulfide	- -	2.0 U	2.0 U	2.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	2.0 U
Carbon Tetrachloride	5	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Chlorobenzene	5	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Chloroethane	5	1.0 UJ	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Chloroform	7	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Chloromethane	- -	1.0 UJ	1.0 UJ	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
cis-1,2-Dichloroethene	5	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
cis-1,3-Dichloropropene	0.4	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Dibromochloromethane	50	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Ethylbenzene	5	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Methylene Chloride	5	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	1.0 U	5.0 U
Naphthalene	10	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Styrene	5	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	**2.0**	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Tetrachloroethene	5	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Toluene	5	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
trans-1,2-Dichloroethene	5	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	**1.1**	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
trans-1,3-Dichloropropene	0.4	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Trichloroethene	5	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Vinyl Chloride	2	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Xylenes (total)	5	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U
Total VOCs	- -	ND	ND	ND	ND	ND	**3.1**	ND	ND	ND	ND	ND

See Notes on Page 25.

Table 5. Post-2002 Draft RFI VOC Analytical Data in Groundwater, Revised Draft RFI, Ashland Inc., Rensselaer, New York

Location ID:	NYSDEC TOGS 1.1.1 Water	MW-13	MW-13	MW-13	MW-13	MW-13	MW-14	MW-14	MW-14	MW-14	MW-14	MW-14
Date Collected:	Guidance Values	10/03/06	04/10/07	09/17/07	04/09/08	09/15/08	11/12/02	12/20/02	04/23/03	07/15/03	10/27/03	04/08/04
Volatile Organics												
1,1,1-Trichloroethane	5	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
1,1,2,2-Tetrachloroethane	5	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
1,1,2-Trichloroethane	1	NA	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
1,1-Dichloroethane	5	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
1,1-Dichloroethene	5	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
1,2-Dichloroethane	0.6	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
1,2-Dichloropropane	1	NA	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
2-Butanone	- -	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
2-Hexanone	50	NA	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
4-Methyl-2-pentanone	- -	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Acetone	50	25 U	25 U	25 U	25 U	25 U	25 U	25 U	25 U	25 U	25 U	25 U
Benzene	1	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	**1.1**
Bromodichloromethane	50	NA	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Bromoform	50	NA	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Bromomethane	5	NA	1.0 U	1.0 UJ	1.0 UJ	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Carbon Disulfide	- -	NA	2.0 U	2.0 U	2.0 U	2.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Carbon Tetrachloride	5	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Chlorobenzene	5	NA	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Chloroethane	5	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Chloroform	7	NA	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Chloromethane	- -	NA	1.0 U	1.0 U	1.0 UJ	1.0 UJ	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
cis-1,2-Dichloroethene	5	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
cis-1,3-Dichloropropene	0.4	NA	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Dibromochloromethane	50	NA	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Ethylbenzene	5	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Methylene Chloride	5	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U
Naphthalene	10	1.0 U	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Styrene	5	NA	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	**2.0**	1.0 U	1.0 U
Tetrachloroethene	5	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	**1.3**	1.0 U	1.0 U
Toluene	5	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
trans-1,2-Dichloroethene	5	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
trans-1,3-Dichloropropene	0.4	NA	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Trichloroethene	5	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Vinyl Chloride	2	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Xylenes (total)	5	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U
Total VOCs	- -	ND	ND	ND	ND	NDJ	ND	ND	ND	**3.3**	ND	**1.1**

See Notes on Page 25.

Table 5. Post-2002 Draft RFI VOC Analytical Data in Groundwater, Revised Draft RFI, Ashland Inc., Rensselaer, New York

Location ID:	NYSDEC TOGS 1.1.1 Water	MW-14	MW-14	MW-14	MW-14	MW-14	MW-14	MW-14	MW-14	MW-15	MW-15	MW-15
Date Collected:	Guidance Values	10/13/04	04/13/05	05/08/06	10/03/06	04/10/07	09/17/07	04/09/08	09/15/08	11/13/02	04/23/03	07/16/03
Volatile Organics												
1,1,1-Trichloroethane	5	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
1,1,2,2-Tetrachloroethane	5	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
1,1,2-Trichloroethane	1	1.0 U	1.0 U	1.0 U	NA	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
1,1-Dichloroethane	5	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	**2.0**	1.0 U	**3.0**
1,1-Dichloroethene	5	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
1,2-Dichloroethane	0.6	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
1,2-Dichloropropane	1	1.0 U	1.0 U	1.0 U	NA	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
2-Butanone	- -	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
2-Hexanone	50	10 U	10 U	10 U	NA	10 U	10 U	10 U	10 U	10 U	10 U	10 U
4-Methyl-2-pentanone	- -	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Acetone	50	25 U	25 U	25 U	25 U	25 U	25 U	25 U	25 U	25 U	25 U	25 U
Benzene	1	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	**9.1**	**6.6**	**12**
Bromodichloromethane	50	1.0 U	1.0 U	1.0 U	NA	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Bromoform	50	1.0 U	1.0 U	1.0 U	NA	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Bromomethane	5	1.0 U	1.0 U	1.0 U	NA	1.0 U	1.0 UJ	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Carbon Disulfide	- -	1.0 U	1.0 U	2.0 U	NA	2.0 U	2.0 U	2.0 U	2.0 U	1.0 U	1.0 U	1.0 U
Carbon Tetrachloride	5	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Chlorobenzene	5	1.0 U	1.0 U	1.0 U	NA	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Chloroethane	5	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Chloroform	7	1.0 U	1.0 U	1.0 U	NA	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	**2.1**
Chloromethane	- -	1.0 U	1.0 U	1.0 U	NA	1.0 U	1.0 U	1.0 U	1.0 UJ	1.0 U	1.0 U	1.0 U
cis-1,2-Dichloroethene	5	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	**1.1**	**34**	**35**	**59**
cis-1,3-Dichloropropene	0.4	1.0 U	1.0 U	1.0 U	NA	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Dibromochloromethane	50	1.0 U	1.0 U	1.0 U	NA	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Ethylbenzene	5	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Methylene Chloride	5	5.0 U	1.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U
Naphthalene	10	NA	NA	NA	1.0 U	NA	NA	NA	NA	NA	NA	NA
Styrene	5	1.0 U	1.0 U	1.0 U	NA	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	**2.2**
Tetrachloroethene	5	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	**24**	**12**	**43**
Toluene	5	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
trans-1,2-Dichloroethene	5	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	**1.5**
trans-1,3-Dichloropropene	0.4	1.0 U	1.0 U	1.0 U	NA	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Trichloroethene	5	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	**36**	**16**	**55**
Vinyl Chloride	2	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	**13**	**13**	**6.2**
Xylenes (total)	5	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U
Total VOCs	- -	ND	ND	ND	ND	ND	ND	ND	**1.1 J**	**120**	**83**	**180**

See Notes on Page 25.

Table 5. Post-2002 Draft RFI VOC Analytical Data in Groundwater, Revised Draft RFI, Ashland Inc., Rensselaer, New York

Location ID: / Date Collected:	NYSDEC TOGS 1.1.1 Water Guidance Values	MW-15 10/27/03	MW-15 04/08/04	MW-15 10/12/04	MW-15 04/13/05	MW-15 08/11/05	MW-15 05/09/06	MW-15 10/05/06	MW-15 04/12/07	MW-15 09/18/07	MW-15 04/09/08
Volatile Organics											
1,1,1-Trichloroethane	5	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U [1.0 U]	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
1,1,2,2-Tetrachloroethane	5	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U [1.0 U]	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
1,1,2-Trichloroethane	1	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U [1.0 U]	1.0 U	NA	1.0 U	1.0 U	1.0 U
1,1-Dichloroethane	5	**1.4**	**1.1**	**1.4**	1.0 U	**1.0 U [1.1]**	**1.5**	1.0 U	**1.0**	**2.3**	1.0 U
1,1-Dichloroethene	5	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U [1.0 U]	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
1,2-Dichloroethane	0.6	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U [1.0 U]	1.0 U	**1.5**	1.0 U	1.0 U	1.0 U
1,2-Dichloropropane	1	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U [1.0 U]	1.0 U	NA	1.0 U	1.0 U	1.0 U
2-Butanone	- -	10 U	10 U	10 U	10 U	10 U [10 U]	10 U	10 U	10 U	10 UJ	10 U
2-Hexanone	50	10 U	10 U	10 U	10 U	10 U [10 U]	10 U	NA	10 U	10 U	10 U
4-Methyl-2-pentanone	- -	10 U	10 U	10 U	10 U	10 U [10 U]	10 U	10 U	10 U	10 U	10 U
Acetone	50	25 U	25 U	25 U	25 U	25 U [25 U]	25 U	25 U	25 U	25 UJ	25 U
Benzene	1	**8.3**	**1.7**	**19**	**4.8**	**11 [12]**	**43**	**58**	**28**	**29**	**21**
Bromodichloromethane	50	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U* [1.0 U*]	1.0 U	NA	1.0 U	1.0 U	1.0 U
Bromoform	50	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U [1.0 U]	1.0 U	NA	1.0 U	1.0 U	1.0 U
Bromomethane	5	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U [1.0 U]	1.0 U	NA	1.0 U	1.0 U	1.0 U
Carbon Disulfide	- -	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U [1.0 U]	2.0 U	NA	2.0 U	2.0 U	2.0 U
Carbon Tetrachloride	5	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U [1.0 U]	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Chlorobenzene	5	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U [1.0 U]	1.0 U	NA	1.0 U	1.0 U	1.0 U
Chloroethane	5	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U [1.0 U]	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Chloroform	7	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U [1.0 U]	1.0 U	NA	1.0 U	1.0 U	1.0 U
Chloromethane	- -	1.0 U	1.0 U	1.0 U	1.0 U	**1.4 [1.5]**	1.0 U*	NA	1.0 U	1.0 U	1.0 U
cis-1,2-Dichloroethene	5	**16**	**28**	**46**	**23**	**2.2 [2.6]**	**3.7**	**12**	**1.5**	**13**	**2.7**
cis-1,3-Dichloropropene	0.4	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U [1.0 U]	1.0 U	NA	1.0 U	1.0 U	1.0 U
Dibromochloromethane	50	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U [1.0 U]	1.0 U	NA	1.0 U	1.0 U	1.0 U
Ethylbenzene	5	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U [1.0 U]	**4.4**	**2.4**	1.0 U	1.0 U	1.0 U
Methylene Chloride	5	5.0 U	5.0 U	5.0 U	1.0 U	5.0 U [5.0 U]	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U
Naphthalene	10	NA	NA	NA	NA	NA	NA	1.0 U	NA	NA	NA
Styrene	5	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U [1.0 U]	1.0 U	NA	1.0 U	1.0 U	1.0 U
Tetrachloroethene	5	**12**	**26**	**4.3**	**15**	1.0 U [1.0 U]	1.0 U	**1.1**	1.0 U	1.0 U	1.0 U
Toluene	5	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U [1.0 U]	**2.6**	1.0 U	1.0 U	1.0 U	1.0 U
trans-1,2-Dichloroethene	5	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U [1.0 U]	1.0 U	**1.3**	1.0 U	1.0 U	1.0 U
trans-1,3-Dichloropropene	0.4	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U [1.0 U]	1.0 U	NA	1.0 U	1.0 U	1.0 U
Trichloroethene	5	**13**	**41**	**9.2**	**18**	**1.6 [1.6]**	**2.9**	**1.6**	**2.9**	**6.5**	**1.6**
Vinyl Chloride	2	**5.2**	1.0 U	**47**	**12**	**5.4 [6.0]**	**2.9 ***	**12**	**2.0**	**12**	**3.4**
Xylenes (total)	5	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U [2.0 U]	**65**	**16**	2.0 U	2.0 U	2.0 U
Total VOCs	- -	**56**	**98**	**130**	**73**	**22 [25]**	**130**	**110**	**35**	**63**	**29**

See Notes on Page 25.

Table 5. Post-2002 Draft RFI VOC Analytical Data in Groundwater, Revised Draft RFI, Ashland Inc., Rensselaer, New York

Location ID: / Date Collected:	NYSDEC TOGS 1.1.1 Water Guidance Values	MW-15 09/16/08	MW-16 11/12/02	MW-16 12/20/02	MW-16 04/21/03	MW-16 07/15/03	MW-16 10/28/03	MW-16 04/09/04	MW-16 10/13/04	MW-16 04/14/05	MW-16 08/11/05	MW-16 05/09/06
Volatile Organics												
1,1,1-Trichloroethane	5	1.0 U	2.0 U	1.0 U	1.0 U	5.0 U	1.0 U	1.0 U	10 U	1.0 U	10 U	1.0 U
1,1,2,2-Tetrachloroethane	5	1.0 U	2.0 U	1.0 U	1.0 U	5.0 U	1.0 U	1.0 U	10 U	1.0 U	10 U	1.0 U
1,1,2-Trichloroethane	1	1.0 U	2.0 U	1.0 U	1.0 U	5.0 U	1.0 U	1.0 U	10 U	1.0 U	10 U	1.0 U
1,1-Dichloroethane	5	**2.1**	2.0 U	1.0 U	1.0 U	5.0 U	1.0 U	1.0 U	10 U	1.0 U	10 U	1.0 U
1,1-Dichloroethene	5	1.0 U	2.0 U	1.0 U	1.0 U	5.0 U	**1.1**	**1.3**	10 U	1.0 U	10 U	**1.4**
1,2-Dichloroethane	0.6	1.0 U	**4.5**	1.0 U	1.0 U	**6.1**	**2.1**	**3.4**	10 U	1.0 U	**13**	**2.4**
1,2-Dichloropropane	1	1.0 U	2.0 U	1.0 U	1.0 U	5.0 U	1.0 U	1.0 U	10 U	1.0 U	10 U	1.0 U
2-Butanone	- -	10 U	20 U	10 U	10 U	50 U	10 U	10 U	100 U	10 U	100 U	10 U
2-Hexanone	50	10 U	20 U	10 U	10 U	50 U	10 U	10 U	100 U	10 U	100 U	10 U
4-Methyl-2-pentanone	- -	10 U	20 U	10 U	10 U	50 U	10 U	10 U	100 U	10 U	100 U	10 U
Acetone	50	25 U	50 U	25 U	25 U	120 U	25 U	25 U	250 U	25 U	250 U	25 U
Benzene	1	**34**	2.0 U	1.0 U	1.0 U	5.0 U	1.0 U	1.0 U	10 U	1.0 U	10 U	1.0 U
Bromodichloromethane	50	1.0 U	2.0 U	1.0 U	1.0 U	5.0 U	1.0 U	1.0 U	10 U	1.0 U	10 U*	1.0 U
Bromoform	50	1.0 U	2.0 U	1.0 U	1.0 U	5.0 U	1.0 U	1.0 U	10 U	1.0 U	10 U	1.0 U
Bromomethane	5	1.0 U	2.0 U	1.0 U	1.0 U	5.0 U	1.0 U	1.0 U	10 U	1.0 U	10 U	1.0 U
Carbon Disulfide	- -	2.0 U	2.0 U	1.0 U	1.0 U	5.0 U	1.0 U	1.0 U	10 U	1.0 U	10 U	2.0 U
Carbon Tetrachloride	5	1.0 U	2.0 U	1.0 U	1.0 U	5.0 U	1.0 U	1.0 U	10 U	1.0 U	10 U	1.0 U
Chlorobenzene	5	1.0 U	2.0 U	1.0 U	1.0 U	5.0 U	1.0 U	1.0 U	10 U	1.0 U	10 U	1.0 U
Chloroethane	5	1.0 UJ	2.0 U	1.0 U	1.0 U	5.0 U	1.0 U	1.0 U	10 U	1.0 U	10 U	1.0 U
Chloroform	7	1.0 U	2.0 U	1.0 U	1.0 U	5.0 U	1.0 U	1.0 U	10 U	1.0 U	10 U	1.0 U
Chloromethane	- -	1.0 UJ	2.0 U	1.0 U	1.0 U	5.0 U	1.0 U	1.0 U	10 U	1.0 U	10 U	1.0 U*
cis-1,2-Dichloroethene	5	**4.6**	**200**	**150**	**50**	**450**	**210 D**	**220 D**	**340**	**120**	**840**	**180 D**
cis-1,3-Dichloropropene	0.4	1.0 U	2.0 U	1.0 U	1.0 U	5.0 U	1.0 U	1.0 U	10 U	1.0 U	10 U	1.0 U
Dibromochloromethane	50	1.0 U	2.0 U	1.0 U	1.0 U	5.0 U	1.0 U	1.0 U	10 U	1.0 U	10 U	1.0 U
Ethylbenzene	5	1.0 U	2.0 U	1.0 U	1.0 U	5.0 U	1.0 U	1.0 U	10 U	1.0 U	10 U	1.0 U
Methylene Chloride	5	5.0 U	10 U	5.0 U	5.0 U	25 U	5.0 U	5.0 U	50 U	1.0 U	50 U	5.0 U
Naphthalene	10	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Styrene	5	1.0 U	2.0 U	1.0 U	1.0 U	**10**	1.0 U	1.0 U	10 U	1.0 U	10 U	1.0 U
Tetrachloroethene	5	1.0 U	2.0 U	1.0 U	1.0 U	5.0 U	1.0 U	1.0 U	10 U	1.0 U	10 U	1.0 U
Toluene	5	1.0 U	2.0 U	1.0 U	1.0 U	5.0 U	1.0 U	1.0 U	10 U	1.0 U	10 U	1.0 U
trans-1,2-Dichloroethene	5	1.0 U	2.0 U	1.0 U	1.0 U	**9.1**	**1.0**	**4.4**	10 U	1.0 U	10 U	**3.8**
trans-1,3-Dichloropropene	0.4	1.0 U	2.0 U	1.0 U	1.0 U	5.0 U	1.0 U	1.0 U	10 U	1.0 U	10 U	1.0 U
Trichloroethene	5	1.0 U	**15**	**12**	**5.1**	**32**	**13**	**8.2**	**14**	**8.4**	**26**	**17**
Vinyl Chloride	2	**13**	**23**	**1.8**	1.0 U	**20**	**8.9**	**3.1**	**31**	1.0 U	**28**	**4.8 ***
Xylenes (total)	5	2.0 U	4.0 U	2.0 U	2.0 U	10 U	2.0 U	2.0 U	20 U	2.0 U	20 U	2.0 U
Total VOCs	- -	**54 J**	**240**	**160**	**55**	**530**	**240**	**240**	**390**	**130**	**910**	**210**

See Notes on Page 25.

Table 5. Post-2002 Draft RFI VOC Analytical Data in Groundwater, Revised Draft RFI, Ashland Inc., Rensselaer, New York

Location ID: / Date Collected:	NYSDEC TOGS 1.1.1 Water Guidance Values	MW-16 10/05/06	MW-16 04/12/07	MW-16 09/24/07	MW-16 04/10/08	MW-16 09/16/08	MW-17 11/12/02	MW-17 04/21/03	MW-17 07/15/03	MW-17 10/28/03	MW-17 04/06/04	MW-17 10/13/04
Volatile Organics												
1,1,1-Trichloroethane	5	1.0 U	2.0 U	5.0 U	1.0 U	5.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
1,1,2,2-Tetrachloroethane	5	1.0 U	2.0 U	5.0 UJ	1.0 U	5.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
1,1,2-Trichloroethane	1	NA	2.0 U	5.0 U	1.0 U	5.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
1,1-Dichloroethane	5	**1.1**	2.0 U	5.0 U	1.0 U	5.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
1,1-Dichloroethene	5	**4.5**	2.0 U	5.0 U	1.0 U	5.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
1,2-Dichloroethane	0.6	**7.5**	2.0 U	**6.0**	1.0 U	**6.8**	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
1,2-Dichloropropane	1	NA	2.0 U	5.0 U	1.0 U	5.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
2-Butanone	- -	10 U	20 U	50 U	10 U	50 U	10 U	10 U	10 U	10 U	10 U	10 U
2-Hexanone	50	NA	20 U	50 UJ	10 U	50 U	10 U	10 U	10 U	10 U	10 U	10 U
4-Methyl-2-pentanone	- -	10 U	20 U	50 U	10 U	50 U	10 U	10 U	10 U	10 U	10 U	10 U
Acetone	50	25 U	50 U	130 UJ	25 U	120 U	25 U	25 U	25 U	25 U	25 U	25 U
Benzene	1	1.0 U	2.0 U	5.0 U	1.0 U	5.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Bromodichloromethane	50	NA	2.0 U	5.0 U	1.0 U	5.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Bromoform	50	NA	2.0 U	5.0 U	1.0 U	5.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Bromomethane	5	NA	2.0 U	5.0 U	1.0 UJ	5.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Carbon Disulfide	- -	NA	4.0 U	10 U	2.0 U	10 UJ	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Carbon Tetrachloride	5	1.0 U	2.0 U	5.0 U	1.0 U	5.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Chlorobenzene	5	NA	2.0 U	5.0 U	1.0 U	5.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Chloroethane	5	1.0 U	2.0 U	5.0 U	1.0 U	5.0 UJ	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Chloroform	7	NA	2.0 U	5.0 U	1.0 U	5.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Chloromethane	- -	NA	2.0 U	5.0 U	1.0 UJ	5.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
cis-1,2-Dichloroethene	5	**600 D**	**300**	**410**	**150**	**490**	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
cis-1,3-Dichloropropene	0.4	NA	2.0 U	5.0 U	1.0 U	5.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Dibromochloromethane	50	NA	2.0 U	5.0 U	1.0 U	5.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Ethylbenzene	5	1.0 U	2.0 U	5.0 U	1.0 U	5.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Methylene Chloride	5	5.0 U	10 U	25 U	5.0 U	25 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U
Naphthalene	10	1.0 U	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Styrene	5	NA	2.0 U	5.0 U	1.0 U	5.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Tetrachloroethene	5	1.0 U	2.0 U	5.0 U	1.0 U	5.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Toluene	5	1.0 U	2.0 U	5.0 U	1.0 U	5.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
trans-1,2-Dichloroethene	5	**4.9**	**2.1**	**6.8**	**1.4**	5.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
trans-1,3-Dichloropropene	0.4	NA	2.0 U	5.0 U	1.0 U	5.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Trichloroethene	5	**33**	**21**	5.0 U	**15**	**42**	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Vinyl Chloride	2	**26**	**4.2**	**63**	1.0 U	5.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Xylenes (total)	5	2.0 U*	4.0 U	10 U	2.0 U	10 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U
Total VOCs	- -	**680**	**330**	**490**	**170**	**540 J**	ND	ND	ND	ND	ND	ND

See Notes on Page 25.

Table 5. Post-2002 Draft RFI VOC Analytical Data in Groundwater, Revised Draft RFI, Ashland Inc., Rensselaer, New York

Location ID:	NYSDEC TOGS 1.1.1 Water	MW-17	MW-17	MW-17	MW-17	MW-17	MW-17	MW-17	MW-17	MW-18	MW-18	MW-18
Date Collected:	Guidance Values	04/14/05	02/28/06	05/03/06	10/03/06	04/10/07	09/21/07	04/10/08	09/16/08	11/12/02	04/21/03	10/28/03
Volatile Organics												
1,1,1-Trichloroethane	5	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	10 U	10 U	10 U
1,1,2,2-Tetrachloroethane	5	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	10 U	10 U	10 U
1,1,2-Trichloroethane	1	1.0 U	1.0 U	1.0 U	NA	1.0 U	1.0 U	1.0 U	1.0 U	10 U	10 U	10 U
1,1-Dichloroethane	5	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	10 U	10 U	10 U
1,1-Dichloroethene	5	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	**13**	10 U	10 U
1,2-Dichloroethane	0.6	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	**55**	**41**	10 U
1,2-Dichloropropane	1	1.0 U	1.0 U	1.0 U	NA	1.0 U	1.0 U	1.0 U	1.0 U	10 U	10 U	10 U
2-Butanone	- -	10 U	10 U	10 U*	10 U	10 U	10 U	10 U	10 U	100 U	100 U	100 U
2-Hexanone	50	10 U	10 U	10 U*	NA	10 U	10 U	10 U	10 U	100 U	100 U	100 U
4-Methyl-2-pentanone	- -	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	100 U	100 U	100 U
Acetone	50	25 U	25 U	25 U	25 U	25 U	25 U	25 U	25 U	250 U	250 U	250 U
Benzene	1	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	10 U	10 U	10 U
Bromodichloromethane	50	1.0 U	1.0 U	1.0 U	NA	1.0 U	1.0 U	1.0 U	1.0 U	10 U	10 U	10 U
Bromoform	50	1.0 U	1.0 U	1.0 U	NA	1.0 U	1.0 U	1.0 U	1.0 U	10 U	10 U	10 U
Bromomethane	5	1.0 U	1.0 U	1.0 U	NA	1.0 U	1.0 UJ	1.0 UJ	1.0 U	10 U	10 U	10 U
Carbon Disulfide	- -	1.0 U	2.0 U	2.0 U	NA	2.0 U	2.0 U	2.0 U	2.0 U	10 U	10 U	10 U
Carbon Tetrachloride	5	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	10 U	10 U	10 U
Chlorobenzene	5	1.0 U	1.0 U	1.0 U	NA	1.0 U	1.0 U	1.0 U	1.0 U	**14**	10 U	10 U
Chloroethane	5	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 UJ	1.0 U	1.0 U	10 U	10 U	10 U
Chloroform	7	1.0 U	1.0 U	1.0 U	NA	1.0 U	1.0 U	1.0 U	1.0 U	10 U	10 U	10 U
Chloromethane	- -	1.0 U	1.0 U	1.0 U	NA	1.0 U	1.0 UJ	1.0 UJ	1.0 U	10 U	10 U	10 U
cis-1,2-Dichloroethene	5	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	**1,000**	**860**	**800**
cis-1,3-Dichloropropene	0.4	1.0 U	1.0 U	1.0 U	NA	1.0 U	1.0 U	1.0 U	1.0 U	10 U	10 U	10 U
Dibromochloromethane	50	1.0 U	1.0 U	1.0 U	NA	1.0 U	1.0 U	1.0 U	1.0 U	10 U	10 U	10 U
Ethylbenzene	5	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	**10**	10 U	10 U
Methylene Chloride	5	1.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	50 U	50 U	50 U
Naphthalene	10	NA	NA	NA	1.0 U	NA	NA	NA	NA	NA	NA	NA
Styrene	5	1.0 U	1.0 U	1.0 U	NA	1.0 U	1.0 U	1.0 U	1.0 U	**10**	10 U	10 U
Tetrachloroethene	5	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	**17**	10 U	10 U
Toluene	5	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	**12**	10 U	10 U
trans-1,2-Dichloroethene	5	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	**27**	10 U	**13**
trans-1,3-Dichloropropene	0.4	1.0 U	1.0 U	1.0 U	NA	1.0 U	1.0 U	1.0 U	1.0 U	10 U	10 U	10 U
Trichloroethene	5	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	**19**	10 U	10 U
Vinyl Chloride	2	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	**240**	**180**	**140**
Xylenes (total)	5	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	**23**	20 U	20 U
Total VOCs	- -	ND	ND	ND	ND	ND	ND	ND	ND	**1,400**	**1,100**	**950**

See Notes on Page 25.

Table 5. Post-2002 Draft RFI VOC Analytical Data in Groundwater, Revised Draft RFI, Ashland Inc., Rensselaer, New York

Location ID:	NYSDEC TOGS 1.1.1 Water	MW-18	MW-18	MW-18	MW-18	MW-18	MW-18	MW-18	MW-18	MW-18	MW-18
Date Collected:	Guidance Values	04/09/04	10/13/04	04/14/05	02/28/06	05/03/06	10/04/06	04/12/07	09/24/07	04/10/08	09/16/08
Volatile Organics											
1,1,1-Trichloroethane	5	10 U	10 U	10 U	1.0 U	2.0 U [2.0 U]	1.0 U	1.0 U	5.0 U	5.0 U	5.0 U
1,1,2,2-Tetrachloroethane	5	10 U	10 U	10 U	1.0 U	2.0 U [2.0 U]	1.0 U	1.0 U	5.0 U	5.0 U	5.0 U
1,1,2-Trichloroethane	1	10 U	10 U	10 U	1.0 U	2.0 U [2.0 U]	NA	1.0 U	5.0 U	5.0 U	5.0 U
1,1-Dichloroethane	5	10 U	10 U	10 U	1.0 U	2.0 U [2.0 U]	1.0 U	1.0 U	5.0 U	5.0 U	5.0 U
1,1-Dichloroethene	5	10 U	10 U	10 U	1.0 U	2.0 U [2.0 U]	**1.1**	1.0 U	5.0 U	5.0 U	5.0 U
1,2-Dichloroethane	0.6	**27**	**36**	**49**	**18**	**32 [33]**	**15**	**13**	5.0 U	5.0 U	5.0 U
1,2-Dichloropropane	1	10 U	10 U	10 U	1.0 U	2.0 U [2.0 U]	NA	1.0 U	5.0 U	5.0 U	5.0 U
2-Butanone	- -	100 U	100 U	100 U	10 U	20 U* [20 U*]	10 U	10 U	50 UJ	50 U	50 U
2-Hexanone	50	100 U	100 U	100 U	10 U	20 U* [20 U*]	NA	10 U	50 U	50 U	50 U
4-Methyl-2-pentanone	- -	100 U	100 U	100 U	10 U	20 U [20 U]	10 U	10 U	50 U	50 U	50 U
Acetone	50	250 U	250 U	250 U	25 U	50 U [50 U]	25 U	25 U	130 UJ	120 U	120 U
Benzene	1	10 U	10 U	10 U	**1.4**	2.0 U [2.0 U]	**1.3**	**1.1**	5.0 U	5.0 U	5.0 U
Bromodichloromethane	50	10 U	10 U	10 U	1.0 U	2.0 U [2.0 U]	NA	1.0 U	5.0 U	5.0 U	5.0 U
Bromoform	50	10 U	10 U	10 U	1.0 U	2.0 U [2.0 U]	NA	1.0 U	5.0 U	5.0 U	5.0 U
Bromomethane	5	10 U	10 U	10 U	1.0 U	2.0 U [2.0 U]	NA	1.0 U	5.0 UJ	5.0 UJ	5.0 U
Carbon Disulfide	- -	10 U	10 U	10 U	2.0 U	4.0 U [4.0 U]	NA	2.0 U	10 U	10 U	10 U
Carbon Tetrachloride	5	10 U	10 U	10 U	1.0 U	2.0 U [2.0 U]	1.0 U	1.0 U	5.0 U	5.0 U	5.0 U
Chlorobenzene	5	10 U	10 U	10 U	1.0 U	2.0 U [2.0 U]	NA	1.0 U	5.0 U	5.0 U	5.0 U
Chloroethane	5	10 U	10 U	10 U	1.0 U	2.0 U [2.0 U]	1.0 U	1.0 U	5.0 U	5.0 U	5.0 U
Chloroform	7	10 U	10 U	10 U	1.0 U	2.0 U [2.0 U]	NA	1.0 U	5.0 U	5.0 U	5.0 U
Chloromethane	- -	10 U	10 U	10 U	1.0 U	2.0 U [2.0 U]	NA	1.0 U	5.0 U	5.0 UJ	5.0 UJ
cis-1,2-Dichloroethene	5	**650**	**830**	**570**	**470 D**	**420 D [360]**	**740 D**	**460 D**	**460**	**420**	**380**
cis-1,3-Dichloropropene	0.4	10 U	10 U	10 U	1.0 U	2.0 U [2.0 U]	NA	1.0 U	5.0 U	5.0 U	5.0 U
Dibromochloromethane	50	10 U	10 U	10 U	1.0 U	2.0 U [2.0 U]	NA	1.0 U	5.0 U	5.0 U	5.0 U
Ethylbenzene	5	10 U	10 U	10 U	1.0 U	2.0 U [2.0 U]	1.0 U	1.0 U	5.0 U	5.0 U	5.0 U
Methylene Chloride	5	50 U	50 U	10 U	5.0 U	10 U [10 U]	5.0 U	5.0 U	25 U	25 U	25 U
Naphthalene	10	NA	NA	NA	NA	NA	1.0 U	NA	NA	NA	NA
Styrene	5	10 U	10 U	10 U	1.0 U	2.0 U [2.0 U]	NA	1.0 U	5.0 U	5.0 U	5.0 U
Tetrachloroethene	5	10 U	10 U	10 U	1.0 U	2.0 U [2.0 U]	1.0 U	1.0 U	5.0 U	5.0 U	5.0 U
Toluene	5	10 U	10 U	10 U	1.0 U	2.0 U [2.0 U]	1.0 U	1.0 U	5.0 U	5.0 U	5.0 U
trans-1,2-Dichloroethene	5	**31**	**15**	10 U	**12**	**7.9 [7.4]**	**12**	**8.6**	**7.5**	**8.3**	**6.7**
trans-1,3-Dichloropropene	0.4	10 U	10 U	10 U	1.0 U	2.0 U [2.0 U]	NA	1.0 U	5.0 U	5.0 U	5.0 U
Trichloroethene	5	10 U	10 U	10 U	1.0 U	2.0 U [2.0 U]	1.0 U	1.0 U	5.0 U	5.0 U	5.0 U
Vinyl Chloride	2	**130**	**230**	**100**	**100**	**45 [40]**	**110**	**110**	**76**	**56**	**59**
Xylenes (total)	5	20 U	20 U	20 U	2.0 U	4.0 U [4.0 U]	2.0 U	2.0 U	10 U	10 U	10 U
Total VOCs	- -	**840**	**1,100**	**720**	**600**	**500 [440]**	**880**	**590**	**540**	**480**	**450 J**

See Notes on Page 25.

Table 5. Post-2002 Draft RFI VOC Analytical Data in Groundwater, Revised Draft RFI, Ashland Inc., Rensselaer, New York

Location ID: / Date Collected:	NYSDEC TOGS 1.1.1 Water Guidance Values	MW-19 11/13/02	MW-19 04/21/03	MW-19 07/16/03	MW-19 10/27/03	MW-19 04/08/04	MW-19 10/12/04	MW-19 04/13/05	MW-19 08/11/05	MW-19 05/10/06	MW-19 10/05/06
Volatile Organics											
1,1,1-Trichloroethane	5	**29 [29]**	**33**	**16**	**16**	**58**	25 U	**34**	20 U	**57**	1.0 U
1,1,2,2-Tetrachloroethane	5	10 U [10 U]	10 U	10 U	10 U	1.0 U	25 U	20 U	20 U	1.0 U	1.0 U
1,1,2-Trichloroethane	1	10 U [10 U]	10 U	10 U	10 U	1.0 U	25 U	20 U	20 U	1.0 U	NA
1,1-Dichloroethane	5	**91 [95]**	**52**	**49**	**40**	**150**	**130**	**100**	**150**	**150**	**160**
1,1-Dichloroethene	5	10 U [10 U]	10 U	10 U	10 U	**6.4**	25 U	20 U	20 U	1.0 U	1.0 U
1,2-Dichloroethane	0.6	10 U [10 U]	10 U	10 U	10 U	1.0 U	25 U	20 U	20 U	1.0 U	1.0 U
1,2-Dichloropropane	1	10 U [10 U]	10 U	10 U	10 U	**1.4**	25 U	20 U	20 U	**1.2**	NA
2-Butanone	- -	100 U [100 U]	100 U	100 U	100 U	10 U	250 U	200 U	200 U	10 U	10 U
2-Hexanone	50	100 U [100 U]	100 U	100 U	100 U	10 U	250 U	200 U	200 U	10 U	NA
4-Methyl-2-pentanone	- -	100 U [100 U]	100 U	100 U	100 U	10 U	250 U	200 U	200 U	10 U	10 U
Acetone	50	250 U [250 U]	250 U	250 U	250 U	25 U	620 U	500 U	500 U	25 U	25 U
Benzene	1	**16 [15]**	10 U	**12**	10 U	**16**	25 U	20 U	20 U	**12**	**16**
Bromodichloromethane	50	10 U [10 U]	10 U	10 U	10 U	1.0 U	25 U	20 U	20 U*	1.0 U	NA
Bromoform	50	10 U [10 U]	10 U	10 U	10 U	1.0 U	25 U	20 U	20 U	1.0 U	NA
Bromomethane	5	10 U [10 U]	10 U	10 U	10 U	1.0 U	25 U	20 U	20 U	1.0 U	NA
Carbon Disulfide	- -	10 U [10 U]	10 U	10 U	10 U	1.0 U	25 U	20 U	20 U	2.0 U	NA
Carbon Tetrachloride	5	10 U [10 U]	10 U	10 U	10 U	1.0 U	25 U	20 U	20 U	1.0 U	1.0 U
Chlorobenzene	5	10 U [10 U]	10 U	10 U	10 U	**3.0**	25 U	20 U	20 U	**1.0**	NA
Chloroethane	5	10 U [10 U]	10 U	10 U	10 U	**49**	**28**	20 U	20 U	**110 D**	**490 D**
Chloroform	7	**23 [20]**	**90**	**20**	**100**	**1.9**	25 U	**31**	20 U	1.0 U	NA
Chloromethane	- -	10 U [10 U]	10 U	10 U	10 U	1.0 U	25 U	20 U	20 U	1.0 U	NA
cis-1,2-Dichloroethene	5	**1,200 [1,100]**	**1,100**	**740**	**1,600**	**2,200 D**	**1,600**	**1,200**	**1,600**	**4.9**	**3.5**
cis-1,3-Dichloropropene	0.4	10 U [10 U]	10 U	10 U	10 U	1.0 U	25 U	20 U	20 U	1.0 U	NA
Dibromochloromethane	50	10 U [10 U]	10 U	10 U	10 U	1.0 U	25 U	20 U	20 U	1.0 U	NA
Ethylbenzene	5	10 U [10 U]	10 U	10 U	10 U	**3.4**	25 U	20 U	20 U	**4.9**	**6.3**
Methylene Chloride	5	50 U [50 U]	50 U	50 U	50 U	5.0 U	120 U	20 U	100 U	5.0 U	5.0 U
Naphthalene	10	NA	NA	NA	NA	NA	NA	NA	NA	NA	1.0 U
Styrene	5	10 U [10 U]	10 U	**20**	10 U	1.0 U	25 U	20 U	20 U	1.0 U	NA
Tetrachloroethene	5	**41 [38]**	**150**	**21**	**200**	**5.6**	25 U	**82**	20 U	1.0 U	1.0 U
Toluene	5	10 U [10 U]	10 U	10 U	10 U	**8.9**	25 U	20 U	20 U	**7.7**	**9.9**
trans-1,2-Dichloroethene	5	**12 [10 U]**	**12**	**15**	10 U	**28**	25 U	20 U	**21**	**7.7**	**10**
trans-1,3-Dichloropropene	0.4	10 U [10 U]	10 U	10 U	10 U	1.0 U	25 U	20 U	20 U	1.0 U	NA
Trichloroethene	5	**170 [140]**	**520**	**96**	**340**	**17**	**62**	**260**	20 U	1.0 U	1.0 U
Vinyl Chloride	2	**860 [870]**	**320**	**270**	**230**	**2,100 D**	**2,100**	**1,100**	**1,700**	**3.8**	**8.6**
Xylenes (total)	5	20 U [20 U]	20 U	20 U	20 U	**9.0**	50 U	40 U	40 U	**11**	**15**
Total VOCs	- -	**2,400 [2,300]**	**2,300**	**1,300**	**2,500**	**4,700**	**3,900**	**2,800**	**3,500**	**370**	**720**

See Notes on Page 25.

Table 5. Post-2002 Draft RFI VOC Analytical Data in Groundwater, Revised Draft RFI, Ashland Inc., Rensselaer, New York

Location ID: / Date Collected:	NYSDEC TOGS 1.1.1 Water Guidance Values	MW-19 04/12/07	MW-19 09/18/07	MW-19 04/09/08	MW-19 09/15/08	MW-A1 04/09/08	MW-A1 09/15/08	MW-B1 04/09/08	MW-B1 09/15/08	PZ-1 08/11/05	PZ-1 05/10/06
Volatile Organics											
1,1,1-Trichloroethane	5	**1.3 [1.0 U]**	**1.3**	5.0 U	1.0 U	1.0 U	2.0 U	5.0 U	10 U [1.0 U]	20 U	10 U
1,1,2,2-Tetrachloroethane	5	1.0 U [1.0 U]	1.0 U	5.0 U	1.0 U	1.0 U	2.0 U	5.0 U	10 U [1.0 U]	20 U	10 U
1,1,2-Trichloroethane	1	1.0 U [1.0 U]	1.0 U	5.0 U	1.0 U	1.0 U	2.0 U	5.0 U	10 U [1.0 U]	20 U	10 U
1,1-Dichloroethane	5	**86 [1.3]**	**42**	**36**	**40**	**27**	**28**	5.0 U	10 UJ [1.0 U]	**110**	**28**
1,1-Dichloroethene	5	1.0 U [1.0 U]	1.0 U	**5.7**	1.0 U	1.0 U	2.0 U	5.0 U	**10 U [4.7 J]**	20 U	10 U
1,2-Dichloroethane	0.6	1.0 U [1.0 U]	1.0 U	5.0 U	1.0 U	1.0 U	2.0 U	**70**	**81 [76]**	20 U	10 U
1,2-Dichloropropane	1	1.0 U [1.0 U]	1.0 U	5.0 U	1.0 U	1.0 U	2.0 U	5.0 U	10 U [1.0 U]	20 U	10 U
2-Butanone	- -	10 U [10 U]	10 UJ	50 U	10 U	10 U	20 U	50 U	100 U [10 U]	200 U	100 U
2-Hexanone	50	10 U [10 U]	10 U	50 U	10 U	10 U	20 U	50 U	100 U [10 U]	200 U	100 U
4-Methyl-2-pentanone	- -	10 U [10 U]	10 U	50 U	10 U	10 U	20 U	50 U	100 U [10 U]	200 U	100 U
Acetone	50	25 U [25 U]	25 UJ	120 U	25 U	25 U	50 U	120 U	250 U [25 U]	500 U	250 U
Benzene	1	**13 [4.1]**	**17**	**13**	**18**	**9.2**	**8.9**	5.0 U	10 U [1.0 U]	20 U	10 U
Bromodichloromethane	50	1.0 U [1.0 U]	1.0 U	5.0 U	1.0 U	1.0 U	2.0 U	5.0 U	10 U [1.0 U]	20 U*	10 U
Bromoform	50	1.0 U [1.0 U]	1.0 U	5.0 U	1.0 U	1.0 U	2.0 U	5.0 U	10 U [1.0 U]	20 U	10 U
Bromomethane	5	1.0 U [1.0 U]	1.0 U	5.0 U	1.0 U	1.0 U	2.0 U	**26**	10 U [1.0 U]	20 U	10 U
Carbon Disulfide	- -	2.0 U [2.0 U]	2.0 U	10 U	2.0 UJ	2.0 U*	4.0 U	10 U	20 U [2.0 U]	20 U	20 U
Carbon Tetrachloride	5	1.0 U [1.0 U]	1.0 U	5.0 U	1.0 U	1.0 U	2.0 U	5.0 U	10 U [1.0 U]	20 U	10 U
Chlorobenzene	5	**1.2 [1.0 U]**	1.0 U	5.0 U	1.0 U	**1.8**	2.0 U	5.0 U	10 U [1.0 U]	20 U	10 U
Chloroethane	5	**280 D [1.0 U]**	**190 D**	5.0 U	**59 J**	**20**	**12 J**	5.0 U	10 U [1.0 U]	20 U	10 U
Chloroform	7	1.0 U [1.0 U]	1.0 U	**8.4**	**1.7**	1.0 U	2.0 U	5.0 U	10 U [1.0 U]	**90**	**39**
Chloromethane	- -	1.0 U [1.0 U]	1.0 U	5.0 U	1.0 U	1.0 U	2.0 UJ	5.0 U	10 U [1.0 U]	20 U	10 U
cis-1,2-Dichloroethene	5	**100 [1.2]**	**100**	**490**	**15**	**230 D**	**360**	**1,000 D**	**1,300 [1,300 D]**	**6,800 D**	**1,900**
cis-1,3-Dichloropropene	0.4	1.0 U [1.0 U]	1.0 U	5.0 U	1.0 U	1.0 U	2.0 U	5.0 U	10 U [1.0 U]	20 U	10 U
Dibromochloromethane	50	1.0 U [1.0 U]	1.0 U	5.0 U	1.0 U	1.0 U	2.0 U	5.0 U	10 U [1.0 U]	20 U	10 U
Ethylbenzene	5	**4.4 [1.0 U]**	**4.1**	5.0 U	1.0 U	1.0 U	2.0 U	5.0 U	10 U [1.0 U]	20 U	10 U
Methylene Chloride	5	5.0 U [5.0 U]	5.0 U	25 U	5.0 U	5.0 U	10 U	25 U	50 U [5.0 U]	100 U	50 U
Naphthalene	10	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Styrene	5	1.0 U [1.0 U]	1.0 U	5.0 U	1.0 U	1.0 U	2.0 U	5.0 U	10 U [1.0 U]	20 U	10 U
Tetrachloroethene	5	1.0 U [1.0 U]	1.0 U	**19**	1.0 U	**2.6**	2.0 U	5.0 U	10 U [1.0 U]	**180**	10 U
Toluene	5	**5.9 [2.8]**	**4.3**	**5.9**	**5.4**	1.0 U	2.0 U	5.0 U	10 U [1.0 U]	**50**	**32**
trans-1,2-Dichloroethene	5	**8.6 [1.0 U]**	**6.0**	5.0 U	**3.5**	**3.3**	**2.8**	**28**	**34 [34]**	**49**	**29**
trans-1,3-Dichloropropene	0.4	1.0 U [1.0 U]	1.0 U	5.0 U	1.0 U	1.0 U	2.0 U	5.0 U	10 U [1.0 U]	20 U	10 U
Trichloroethene	5	**1.1 [3.7]**	1.0 U	**70**	1.0 U	**5.0**	**4.0**	5.0 U	10 U [1.0 U]	**75**	10 U
Vinyl Chloride	2	**310 D [1.1]**	**310 D**	**230**	**30**	**240 D**	**360**	**310**	**270 [300 D]**	**3,200**	**790**
Xylenes (total)	5	**8.9 [2.0 U]**	**9.3**	10 U	**2.4**	2.0 U	4.0 U	10 U	20 U [2.0 U]	40 U	**22**
Total VOCs	- -	**820 [14]**	**680**	**880**	**180 J**	**540**	**780 J**	**1,400**	**1,700 J [1,500 J]**	**11,000**	**2,800**

See Notes on Page 25.

Table 5. Post-2002 Draft RFI VOC Analytical Data in Groundwater, Revised Draft RFI, Ashland Inc., Rensselaer, New York

Location ID: / Date Collected:	NYSDEC TOGS 1.1.1 Water Guidance Values	PZ-1 10/05/06	PZ-1 09/18/07	PZ-2 08/11/05	PZ-2 05/10/06	PZ-2 10/05/06	PZ-3 08/11/05	PZ-3 05/10/06	PZ-3 09/21/07	PZ-4 10/05/06	PZ-5 09/14/07	PZ-6 02/28/06
Volatile Organics												
1,1,1-Trichloroethane	5	**50**	50 U	1.0 U	1.0 U	1.0 U [1.0 U]	20 U	1.0 U	10 U	**8.1**	**17**	1.0 U
1,1,2,2-Tetrachloroethane	5	10 U	50 U	1.0 U	1.0 U	1.0 U [1.0 U]	20 U	1.0 U	10 U	1.0 U	1.0 U	1.0 U
1,1,2-Trichloroethane	1	NA	50 U	1.0 U	1.0 U	NA	20 U	1.0 U	10 U	NA	1.0 U	1.0 U
1,1-Dichloroethane	5	**260**	**120**	**17**	**14**	**1.4 [1.5]**	**27**	**35**	**33**	**18**	**160**	**5.7**
1,1-Dichloroethene	5	**26**	50 U	**1.2**	1.0 U	1.0 U [1.0 U]	20 U	1.0 U	10 U	1.0 U	**1.4**	**1.0**
1,2-Dichloroethane	0.6	10 U	50 U	**3.4**	**4.0**	**2.9 [2.7]**	20 U	1.0 U	10 U	**3.3**	1.0 U	1.0 U
1,2-Dichloropropane	1	NA	50 U	1.0 U	1.0 U	NA	20 U	1.0 U	10 U	NA	1.0 U	1.0 U
2-Butanone	- -	100 U	500 UJ	10 U	10 U	10 U [10 U]	200 U	10 U	100 U	10 U	10 U	10 U
2-Hexanone	50	NA	500 U	10 U	10 U	NA	200 U	10 U	100 U	NA	10 U	10 U
4-Methyl-2-pentanone	- -	100 U	500 U	10 U	10 U	10 U [10 U]	200 U	10 U	100 U	10 U	10 U	10 U
Acetone	50	250 U	1,300 UJ	25 U	25 U	25 U [25 U]	500 U	25 U	250 U	25 U	25 U	25 U
Benzene	1	**43**	50 U	**15**	**2.2**	**9.0 [7.9]**	20 U	**7.3**	10 U	**6.2**	**3.4**	1.0 U
Bromodichloromethane	50	NA	50 U	1.0 U*	1.0 U	NA	20 U*	1.0 U	10 U	NA	1.0 U	1.0 U
Bromoform	50	NA	50 U	1.0 U	1.0 U	NA	20 U	1.0 U	10 U	NA	1.0 U	1.0 U
Bromomethane	5	NA	50 U	1.0 U	1.0 U	NA	20 U	1.0 U	10 UJ	NA	1.0 UJ	1.0 U
Carbon Disulfide	- -	NA	100 U	1.0 U	2.0 U	NA	20 U	2.0 U	20 U	NA	2.0 U	2.0 U
Carbon Tetrachloride	5	10 U	50 U	1.0 U	1.0 U	1.0 U [1.0 U]	20 U	1.0 U	10 U	1.0 U	1.0 U	1.0 U
Chlorobenzene	5	NA	50 U	1.0 U	1.0 U	NA	20 U	**12**	**12**	NA	1.0 U	1.0 U
Chloroethane	5	10 U	50 U	**37**	**12**	**32 [39]**	**41**	**58**	**100 J**	1.0 U	**74**	1.0 U
Chloroform	7	NA	**76**	1.0 U	1.0 U	NA	20 U	1.0 U	10 U	NA	1.0 U	1.0 U
Chloromethane	- -	NA	50 U	1.0 U	1.0 U	NA	20 U	1.0 U	10 UJ	NA	1.0 U	1.0 U
cis-1,2-Dichloroethene	5	**23,000 D**	**5,900**	**150 D**	**3.3**	1.0 U [1.0 U]	**2,900**	**46**	**1,100**	1.0 U	**66**	**130**
cis-1,3-Dichloropropene	0.4	NA	50 U	1.0 U	1.0 U	NA	20 U	1.0 U	10 U	NA	1.0 U	1.0 U
Dibromochloromethane	50	NA	50 U	1.0 U	1.0 U	NA	20 U	1.0 U	10 U	NA	1.0 U	1.0 U
Ethylbenzene	5	**120**	**51**	1.0 U	**1.6**	**4.0 [3.9]**	20 U	1.0 U	10 U	1.0 U	1.0 U	1.0 U
Methylene Chloride	5	50 U	250 U	5.0 U	5.0 U	5.0 U [5.0 U]	100 U	5.0 U	50 U	5.0 U	5.0 U	5.0 U
Naphthalene	10	10 U	NA	NA	NA	1.0 U [1.0 U]	NA	NA	NA	1.0 U	NA	NA
Styrene	5	NA	50 U	1.0 U	1.0 U	NA	20 U	1.0 U	10 U	NA	1.0 U	1.0 U
Tetrachloroethene	5	**11**	50 U	**60**	1.0 U	1.0 U [1.0 U]	**340**	1.0 U	10 U	**2.5**	1.0 U	1.0 U
Toluene	5	**650**	**260**	**1.0**	**3.9**	**11 [12]**	20 U	**1.6**	10 U	1.0 U	1.0 U	1.0 U
trans-1,2-Dichloroethene	5	**210**	**84**	**2.7**	**6.8**	**1.7 [1.8]**	**27**	**10**	**12**	1.0 U	**1.4**	**1.1**
trans-1,3-Dichloropropene	0.4	NA	50 U	1.0 U	1.0 U	NA	20 U	1.0 U	10 U	NA	1.0 U	1.0 U
Trichloroethene	5	10 U	50 U	**20**	1.0 U	1.0 U [1.0 U]	**200**	1.0 U	10 U	**7.7**	**5.1**	**34**
Vinyl Chloride	2	**14,000 D**	**2,900**	**250 D**	**4.3**	1.0 U [1.0 U]	**1,500**	**79**	**570**	**62**	**7.1**	**54**
Xylenes (total)	5	**530 ***	**230**	**4.7**	**7.0**	**18 [17]**	40 U	2.0 U	20 U	2.0 U	2.0 U	2.0 U
Total VOCs	- -	**39,000**	**9,600**	**560**	**59**	**80 [86]**	**5,000**	**250**	**1,800 J**	**110**	**340**	**230**

See Notes on Page 25.

Table 5. Post-2002 Draft RFI VOC Analytical Data in Groundwater, Revised Draft RFI, Ashland Inc., Rensselaer, New York

Location ID: / Date Collected:	NYSDEC TOGS 1.1.1 Water Guidance Values	PZ-6 05/03/06	PZ-6 10/04/06	PZ-6 09/14/07	PZ-7 09/14/07	SUMP 11/13/02	SUMP 04/21/03	SUMP 07/15/03	SUMP 10/27/03	SUMP 04/06/04	SUMP 10/12/04	SUMP 04/13/05
Volatile Organics												
1,1,1-Trichloroethane	5	1.0 U	1.0 U	1.0 U	1.0 U	**5.7**	**2.7**	**12**	**9.6**	**2.2**	4.0 U	**4.5**
1,1,2,2-Tetrachloroethane	5	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	4.0 U	1.0 U
1,1,2-Trichloroethane	1	1.0 U	NA	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	4.0 U	1.0 U
1,1-Dichloroethane	5	**6.5**	**7.2**	**9.6**	1.0 U	**8.0**	**3.8**	**16**	**15**	**1.0**	4.0 U	**6.4**
1,1-Dichloroethene	5	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	4.0 U	1.0 U
1,2-Dichloroethane	0.6	1.0 U	1.0 U	1.0 U	1.0 U	**1.8**	**3.0**	**2.8**	**2.3**	1.0 U	4.0 U	**2.8**
1,2-Dichloropropane	1	1.0 U	NA	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	4.0 U	1.0 U
2-Butanone	- -	10 U*	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	40 U	10 U
2-Hexanone	50	10 U*	NA	10 U	10 U	10 U	10 U	10 U	10 U	10 U	40 U	10 U
4-Methyl-2-pentanone	- -	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	40 U	10 U
Acetone	50	25 U	25 U	25 U	25 U	25 U	25 U	25 U	25 U	25 U	100 U	25 U
Benzene	1	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	4.0 U	1.0 U
Bromodichloromethane	50	1.0 U	NA	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	4.0 U	1.0 U
Bromoform	50	1.0 U	NA	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	4.0 U	1.0 U
Bromomethane	5	1.0 U	NA	1.0 UJ	1.0 UJ	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	4.0 U	1.0 U
Carbon Disulfide	- -	2.0 U	NA	2.0 U	2.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	4.0 U	1.0 U
Carbon Tetrachloride	5	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	4.0 U	1.0 U
Chlorobenzene	5	1.0 U	NA	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	4.0 U	1.0 U
Chloroethane	5	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	**1.6**	1.0 U	**3.4**	1.0 U	4.0 U	1.0 U
Chloroform	7	1.0 U	NA	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	**1.8**	1.0 U	4.0 U	1.0 U
Chloromethane	- -	1.0 U	NA	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	4.0 U	1.0 U
cis-1,2-Dichloroethene	5	**100**	**110**	**130**	**22**	**30**	**72**	**160**	**210 D**	**25**	**100**	**200**
cis-1,3-Dichloropropene	0.4	1.0 U	NA	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	4.0 U	1.0 U
Dibromochloromethane	50	1.0 U	NA	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	4.0 U	1.0 U
Ethylbenzene	5	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	4.0 U	1.0 U
Methylene Chloride	5	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	20 U	1.0 U
Naphthalene	10	NA	1.0 U	NA	NA	NA	NA	NA	NA	NA	NA	NA
Styrene	5	1.0 U	NA	1.0 U	1.0 U	1.0 U	1.0 U	**2.2**	1.0 U	1.0 U	4.0 U	1.0 U
Tetrachloroethene	5	1.0 U	1.0 U	1.0 U	**4.5**	**1.5**	1.0 U	**3.4**	**3.7**	1.0 U	4.0 U	1.0 U
Toluene	5	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	4.0 U	1.0 U
trans-1,2-Dichloroethene	5	**1.4**	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	**4.0**	**1.0**	1.0 U	4.0 U	**1.2**
trans-1,3-Dichloropropene	0.4	1.0 U	NA	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	4.0 U	1.0 U
Trichloroethene	5	**7.2**	**8.0**	**8.4**	**3.8**	**6.1**	**1.7**	**10**	**12**	**1.6**	4.0 U	**3.5**
Vinyl Chloride	2	**20**	**26**	**30**	**10**	1.0 U	**2.7**	**2.5**	**3.4**	**1.2**	4.0 U	**1.0**
Xylenes (total)	5	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	8.0 U	2.0 U
Total VOCs	- -	**140**	**150**	**180**	**40**	**53**	**88**	**210**	**260**	**31**	**100**	**220**

See Notes on Page 25.

Table 5. Post-2002 Draft RFI VOC Analytical Data in Groundwater, Revised Draft RFI, Ashland Inc., Rensselaer, New York

Location ID: / Date Collected:	NYSDEC TOGS 1.1.1 Water Guidance Values	SUMP 05/09/06	SUMP 10/04/06	SUMP 04/11/07	SUMP 09/13/07	SUMP 04/10/08	SUMP 09/15/08
Volatile Organics							
1,1,1-Trichloroethane	5	**4.7**	1.0 U	**6.5**	**8.8 D [7.0]**	**4.2**	5.0 U
1,1,2,2-Tetrachloroethane	5	1.0 U	1.0 U	1.0 U	1.0 U [1.0 U]	1.0 U	5.0 U
1,1,2-Trichloroethane	1	1.0 U	NA	1.0 U	1.0 U [1.0 U]	1.0 U	5.0 U
1,1-Dichloroethane	5	**53**	**9.1**	**7.8**	**14 [14]**	**10**	**9.1**
1,1-Dichloroethene	5	1.0 U	1.0 U	**1.5**	1.0 U [1.0 U]	**1.1**	5.0 U
1,2-Dichloroethane	0.6	**3.9**	**1.3**	**1.2**	1.0 U [1.0 U]	1.0 U	5.0 U
1,2-Dichloropropane	1	1.0 U	NA	1.0 U	1.0 U [1.0 U]	1.0 U	5.0 U
2-Butanone	- -	10 U	10 U	10 U	10 U [10 U]	10 U	50 U
2-Hexanone	50	10 U	NA	10 U	10 U [10 U]	10 U	50 U
4-Methyl-2-pentanone	- -	10 U	10 U	10 U	10 U [10 U]	10 U	50 U
Acetone	50	25 U	25 U	25 U	25 U [25 U]	25 U	120 U
Benzene	1	1.0 U	1.0 U	1.0 U	1.0 U [1.0 U]	1.0 U	5.0 U
Bromodichloromethane	50	1.0 U	NA	1.0 U	1.0 U [1.0 U]	1.0 U	5.0 U
Bromoform	50	1.0 U	NA	1.0 U	1.0 U [1.0 U]	1.0 U	5.0 U
Bromomethane	5	1.0 U	NA	1.0 U	1.0 UJ [1.0 UJ]	1.0 UJ	5.0 U
Carbon Disulfide	- -	2.0 U	NA	2.0 U	2.0 U [2.0 U]	2.0 U	10 U
Carbon Tetrachloride	5	1.0 U	1.0 U	1.0 U	1.0 U [1.0 U]	1.0 U	5.0 U
Chlorobenzene	5	1.0 U	NA	1.0 U	1.0 U [1.0 U]	1.0 U	5.0 U
Chloroethane	5	1.0 U	1.0 U	1.0 U	1.0 U [1.0 U]	1.0 U	5.0 UJ
Chloroform	7	1.0 U	NA	1.0 U	1.0 U [1.0 U]	1.0 U	5.0 U
Chloromethane	- -	1.0 U*	NA	1.0 U	1.0 U [1.0 U]	1.0 UJ	5.0 UJ
cis-1,2-Dichloroethene	5	**180 D**	**170**	**170**	**320 D [300 D]**	**310 DJ**	**240**
cis-1,3-Dichloropropene	0.4	1.0 U	NA	1.0 U	1.0 U [1.0 U]	1.0 U	5.0 U
Dibromochloromethane	50	1.0 U	NA	1.0 U	1.0 U [1.0 U]	1.0 U	5.0 U
Ethylbenzene	5	1.0 U	1.0 U	1.0 U	1.0 U [1.0 U]	1.0 U	5.0 U
Methylene Chloride	5	5.0 U	5.0 U	5.0 U	5.0 U [5.0 U]	5.0 U	25 U
Naphthalene	10	NA	1.0 U	NA	NA	NA	NA
Styrene	5	1.0 U	NA	1.0 U	1.0 U [1.0 U]	1.0 U	5.0 U
Tetrachloroethene	5	**1.2**	**2.0**	1.0 U	**2.9 D [2.8 D]**	**2.0**	5.0 U
Toluene	5	1.0 U	1.0 U	1.0 U	1.0 U [1.0 U]	1.0 U	5.0 U
trans-1,2-Dichloroethene	5	**2.3**	**1.2**	1.0 U	**1.2 [1.1]**	**1.5**	5.0 U
trans-1,3-Dichloropropene	0.4	1.0 U	NA	1.0 U	1.0 U [1.0 U]	1.0 U	5.0 U
Trichloroethene	5	**4.0**	**8.6**	**3.5**	**13 D [9.4]**	**7.0**	5.0 U
Vinyl Chloride	2	**1.6 ***	**3.9**	**7.6**	**41 [38]**	**56**	**64**
Xylenes (total)	5	2.0 U	2.0 U	2.0 U	2.0 U [2.0 U]	2.0 U	10 U
Total VOCs	- -	**250**	**200**	**200**	**400 [370]**	**390 J**	**310 J**

See Notes on Page 25.

Table 5. Post-2002 Draft RFI VOC Analytical Data in Groundwater, Revised Draft RFI, Ashland Inc., Rensselaer, New York

Notes:
NYSDEC TOGS 1.1.1 Water Guidance Values = New York State Department of Environmental Conservation Technical and Operational Guidance Series (TOGS), June 1998, and its addenda (January 1999 Errata Sheet, April 2000 Addendum, and June 2004 Addendum).
Shaded cells denote results in exceedance of criteria.
Bold results denote detections.
All results are in micrograms per liter (ug/l), equivalent to parts per billion (ppb).
Duplicate sample results are in brackets.
NA = Not Analyzed.

Lab Qualifiers	Definition
D	Compound quantitated using a secondary dilution.
J	Indicates an estimated value.
U	The compound was analyzed for but not detected. The associated value is the compound quantitation limit.
UJ	The compound was analyzed for but not detected. The estimated associated value is the compound quantitation limit.

Table 6. Natural Attenuation Parameters, Revised Draft RFI, Ashland Inc., Facility, Rensselaer, New York

	On-Site Monitoring Wells								
Location ID:	**MW-15**	**MW-15**	**MW-15**	**MW-19**	**MW-19**	**MW-19**	**MW-19**	**PZ-1**	**PZ-1**
Date Collected:	**08/11/05**	**04/12/07**	**09/18/07**	**08/11/05**	**05/10/06**	**04/12/07**	**09/18/07**	**08/11/05**	**05/10/06**
Ethane	**31**	**38**	**60**	**290**	**270**	NA	**310**	**63**	**150**
Ethene	0.33 U	**0.67**	**1.9**	**640**	**950**	NA	**530**	**740**	**1,100**
Methane	**2,300**	**2,400**	**3,600**	**3,600**	**13,000**	NA	**24,000**	**740**	**4,300**
Total Organic Carbon	**6,000**	**2,800**	**2,800**	**6,900**	**69,000**	**1,500 [2,800]**	**11,000**	**7,200**	**130,000**

	On-Site Monitoring Wells							
Location ID:	**PZ-1**	**PZ-2**	**PZ-3**	**PZ-3**	**PZ-6**	**PZ-6**	**PZ-6**	**PZ-7**
Date Collected:	**09/18/07**	**08/11/05**	**08/11/05**	**09/21/07**	**02/28/06**	**05/03/06**	**09/14/07**	**09/14/07**
Ethane	**11**	**160**	**130**	**310**	**120**	**14**	**85**	**9.7**
Ethene	**430**	**460**	**340**	**390**	**5.7**	0.33 U	**2.4**	**1.0**
Methane	**1,800**	**1,600**	**1,700**	**19,000**	**1,100**	**1.5**	**1,200**	**280**
Total Organic Carbon	**270,000**	**6,800**	**5,100**	**8,800**	**4,600**	**4,100**	**8,200**	**5,200**

	Off-Site Monitoring Wells								
Location ID:	**IMP-3**	**IMP-3**	**IP-1**	**IP-1**	**MW-11**	**MW-16**	**MW-16**	**MW-16**	**MW-17**
Date Collected:	**02/28/06**	**05/03/06**	**02/28/06**	**05/03/06**	**04/11/07**	**08/11/05**	**04/12/07**	**09/24/07**	**02/28/06**
Ethane	**12**	**13**	**76**	**50**	0.35 U	**0.59**	**0.68**	**41**	0.35 U
Ethene	**2.5**	**2.7**	**33**	**16**	0.33 U	0.33 U	0.33 U	**4.4**	0.33 U
Methane	**250**	**100**	**4,400**	**1,900**	0.19 U	**0.52**	**6.9**	**900**	**6.5**
Total Organic Carbon	**2,300**	**1,000**	**3,100**	**3,100**	**1,700**	**1,700**	1,000 U	**2,100**	1,000 U

	Off-Site Monitoring Wells				
Location ID:	**MW-17**	**MW-18**	**MW-18**	**MW-18**	**MW-18**
Date Collected:	**04/10/07**	**02/28/06**	**05/03/06**	**04/12/07**	**09/24/07**
Ethane	0.35 U	**70**	**19**	**40**	**43**
Ethene	0.33 U	**8.6**	**3.4**	**3.5**	**5.1**
Methane	**15**	**1,500**	**450**	**580**	**1,100**
Total Organic Carbon	1,000 U	**1,800**	**2,000**	**11,000**	**2,000**

Notes:
Bold results denote detections.
All results are in micrograms per Liter (ug/L), equivalent to parts per billion (ppb).
Duplicate sample results are in brackets.

Lab Qualifiers	**Definition**
U	The compound was analyzed for but not detected. The associated value is the compound quantitation limit.

Table 7. VOC Analytical Data in Indoor Air and Soil Vapor, Revised Draft RFI, Ashland Inc., Facility, Rensselaer, New York

Location ID:	GAR-BG	GAR-IA-1	GAR-SS-1	GAR-SS-2	GAR-SS-3	RENS1-BA	RENS1-OA	RENS1-SS
Air Sample Location:	Volvo Garage	Volvo Garage	Volvo Garage	Volvo Garage	Volvo Garage	South Street Residence	South Street Residence	South Street Residence
Sample Type:	OA	IA	SS	SS	SS	IA	OA	SS
Date Collected:	04/08/07	04/08/07	04/08/07	04/08/07	04/08/07	03/28/08	03/28/08	03/28/08
Volatile Organics								
1,1,1-Trichloroethane	0.22 U	0.22 U [0.22 U]	**1.1**	**9.8**	**5.3**	0.22 U	0.22 U	2.2 U
1,1-Dichloroethane	0.16 U	0.16 U [0.16 U]	0.65 U	0.65 U	0.65 U	0.16 U	0.16 U	1.6 U
1,1-Dichloroethene	0.16 U	0.16 U [0.16 U]	0.63 U	0.63 U	0.63 U	0.16 U	0.16 U	1.6 U
1,2-Dichloroethane	0.32 U	0.32 U [0.32 U]	0.65 U	0.65 U	0.65 U	0.32 U	0.32 U	1.6 U
Benzene	**0.35**	**3.1 [3.5]**	**1.1**	**1.7**	**0.86**	**0.23**	**0.54**	**1.5**
cis-1,2-Dichloroethene	0.16 U	0.16 U [0.16 U]	0.63 U	0.63 U	0.63 U	0.16 U	0.16 U	1.6 U
Ethylbenzene	0.17 U	**2.2 [2.2]**	**2.9**	**4.3**	**11**	0.17 U	0.17 U	**5.6**
m&p-Xylene	NA	NA	NA	NA	NA	0.35 U	**0.42**	**21**
Methyl tert-butyl ether	NA	NA	NA	NA	NA	0.14 U	0.14 U	3.6 U
o-Xylene	NA	NA	NA	NA	NA	0.17 U	0.17 U	**9.6**
tert-Butyl Alcohol	NA	NA	NA	NA	NA	NA	NA	30 U
Tetrachloroethene	0.27 U	**0.95 [1.1]**	**2.5**	**4.1**	**2.1**	**1.1**	0.27 U	2.7 U
Toluene	**0.98**	**13 [14]**	**15**	**28**	**110**	0.15 U	**0.79**	**1,200 D**
trans-1,2-Dichloroethene	0.16 U	0.16 U [0.16 U]	0.63 U	**0.67**	0.63 U	0.16 U	0.16 U	1.6 U
Trichloroethene	0.21 U	**0.64 [0.81]**	0.86 U	0.86 U	0.86 U	0.21 U	0.21 U	2.1 U
Vinyl Chloride	0.20 U	0.20 U [0.20 U]	0.41 U	0.41 U	0.41 U	0.20 U	0.20 U	1.0 U
Xylenes (total)	**0.41**	**10 [10]**	**9.1**	**20**	**52**	0.17 U	**0.41**	**31**
Total VOCs	**1.7**	**30 [32]**	**32**	**69**	**180**	**1.3**	**1.7**	**1,200**

See Notes on Page 2.

Table 7. VOC Analytical Data in Indoor Air and Soil Vapor, Revised Draft RFI, Ashland Inc., Facility, Rensselaer, New York

Location ID:	RENS2-BA	RENS2-OA	RENS2-SS	SV-1-SG	SV-2-BG	SV-2-SG	SV-3-SG	SV-4-SG-1
Air Sample Location:	South Street Residence	South Street Residence	South Street Residence	South Street	South Street	South Street	South Street	South Street
Sample Type:	IA	OA	SS	SV	OA	SV	SV	SV
Date Collected:	03/14/08	03/14/08	03/14/08	04/11/07	04/11/07	04/11/07	04/11/07	04/11/07
Volatile Organics								
1,1,1-Trichloroethane	0.22 U [0.22 U]	0.22 U	1.1 UJ	**3.2**	1.1 U	**14**	**7.6**	**5.1**
1,1-Dichloroethane	0.16 U [0.16 U]	0.16 U	0.81 UJ	0.65 U	0.81 U	8.1 U	1.6 U	0.65 U
1,1-Dichloroethene	0.16 U [0.16 U]	0.16 U	0.79 UJ	0.63 U	0.79 U	7.9 U	1.6 U	0.63 U
1,2-Dichloroethane	0.32 U [0.32 U]	0.32 U	0.81 UJ	0.65 U	0.81 U	8.1 U	1.6 U	0.65 U
Benzene	**0.96 [0.89]**	**0.80**	**0.80 J**	**2.7**	0.64 U	6.4 U	**45**	**8.6**
cis-1,2-Dichloroethene	0.16 U [0.16 U]	0.16 U	0.79 UJ	0.63 U	0.79 U	7.9 U	1.6 U	0.63 U
Ethylbenzene	**0.36 [0.36]**	**0.56**	**9.1 J**	**1.5**	0.87 U	8.7 U	**31**	**7.4**
m&p-Xylene	**1.2 [1.3]**	**1.9**	**39 J**	NA	NA	NA	NA	NA
Methyl tert-butyl ether	0.14 U [0.14 U]	0.14 U	1.8 U	NA	NA	NA	NA	NA
o-Xylene	**0.48 [0.48]**	**0.74**	**12 J**	NA	NA	NA	NA	NA
tert-Butyl Alcohol	NA	NA	15 U	NA	NA	NA	NA	NA
Tetrachloroethene	**0.28 [0.27 U]**	0.27 U	1.4 UJ	**14**	1.4 U	14 U	**3.9**	**1.9**
Toluene	**2.3 [2.3]**	**3.2**	**26 J**	**6.4**	**2.3**	7.5 U	**180**	**38**
trans-1,2-Dichloroethene	0.16 U [0.16 U]	0.16 U	0.79 UJ	0.63 U	0.79 U	7.9 U	1.6 U	0.63 U
Trichloroethene	0.21 U [0.21 U]	0.21 U	1.1 UJ	**40**	1.1 U	**75**	2.1 U	**4.6**
Vinyl Chloride	0.20 U [0.20 U]	0.20 U	0.51 UJ	0.41 U	0.51 U	5.1 U	1.0 U	0.41 U
Xylenes (total)	**1.7 [1.7]**	**2.6**	**52 J**	**6.9**	0.87 U	8.7 U	**110**	**26**
Total VOCs	**5.6 [5.3]**	**7.2**	**88 J**	**75**	**2.3**	**89**	**380**	**92**

Notes:

Bold results denote detections.

Duplicate sample results are in brackets.

All results are provided in micrograms per meter cubed ($\mu g/m^3$).

IA = Indoor Air Sample.

OA = Outdoor Ambient Air Sample.

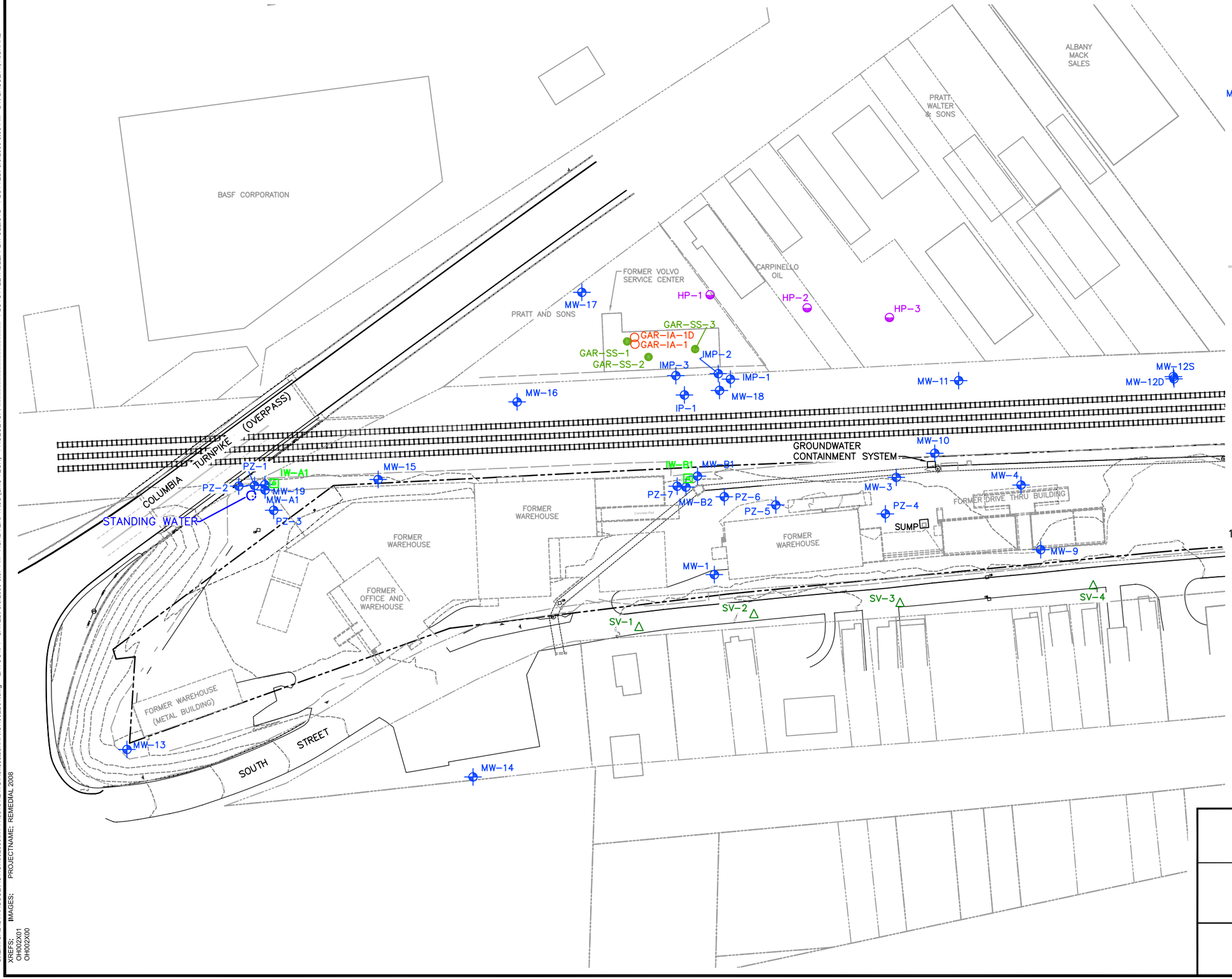
SS = Subslab Air Sample.

SV = Soil Vapor Sample (approximately 8 feet below ground surface).

Lab Qualifiers	Definition
D	Compound quantitated using a secondary dilution.
U	The compound was analyzed for but not detected. The associated value is the compound quantitation limit.
UJ	The compound was analyzed for but not detected. The associated estimated value is the compound quantitation limit.
J	Indicates an estimated value.

ARCADIS

FIGURES



LEGEND:

- MW-1/PZ-1/GP-18/IMP-1/IP-1 — PERMANENT GROUNDWATER SAMPLING LOCATION
- SUB-SLAB AIR SAMPLE LOCATION
- INDOOR AIR SAMPLE LOCATION
- HP-3 — TEMPORARY GROUNDWATER SAMPLING LOCATION
- SV-3 — SOIL VAPOR SAMPLE LOCATION
- IW-B1 — INJECTION WELL LOCATION
- SURFACE CONTOUR
- RAILROAD TRACK
- CULVERTED STREAM PIPE
- PROPERTY LINE
- FORMER BUILDINGS AND STRUCTURES

NOTE:

1. LOCATIONS AND TOPOGRAPHY EAST OF CSX RAILROAD PROPERTY AND WEST OF AND INCLUDING SOUTH STREET, SURVEYED BY THEW ASSOCIATES PE-LS, PLLC (OCTOBER 2008). REFERENCED HORIZONTALLY TO THE NORTH AMERICAN DATUM OF 1983 (NAD83) AND PROJECTED ON THE NEW YORK STATE PLANE COORDINATE SYSTEM (EAST ZONE). VERTICAL REFERENCE TO NGVD 1929. OTHER PROPERTY LINE MAP FEATURES SHOWN ARE FROM RENSSELAER COUNTY TAX MAPPING AND BUILDINGS SHOWN ARE FROM NEW YORK STATE CLEARING-HOUSE AERIAL PHOTOGRAPHY.

0 100' 200'

GRAPHIC SCALE

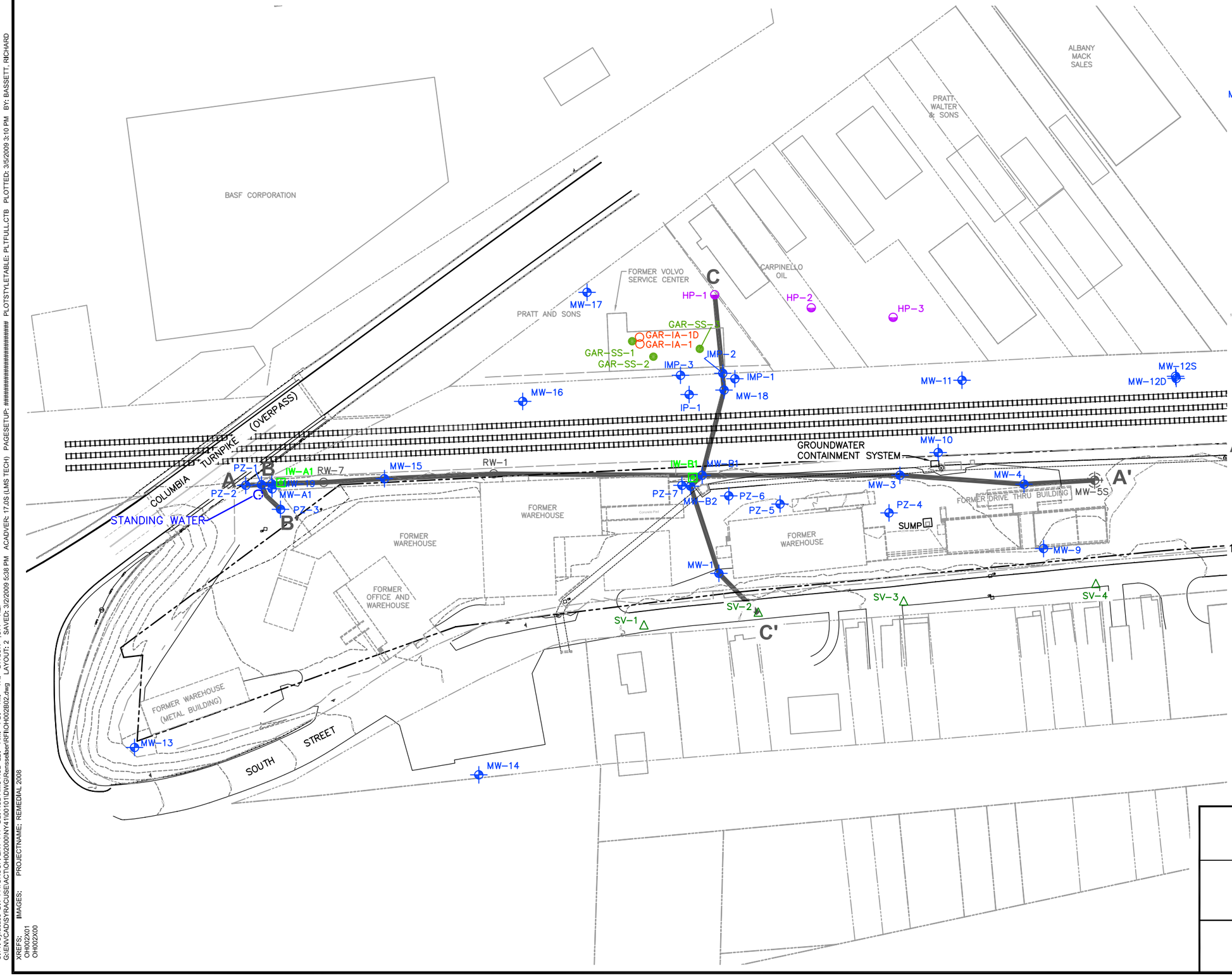
ASHLAND INC. FACILITY
RENSSELAER, NEW YORK
REVISED DRAFT RFI REPORT

SITE PLAN

ARCADIS

FIGURE
1

CITY: Syracuse DIV/GROUP: ENV-141 DB: RCB AMS RCB LD: AM: PD: TM: TR: LYRON="OFF="REF"
G:\ENV\CAD\SYRACUSE\ACT\OH002000\NY41\001011\DWG\Rensselaer\RFI\OH002B01.dwg LAYOUT: 1 SAVED: 3/5/2009 3:07 PM ACADVER: 17.0S (LMS TECH) PAGESETUP: ########## PLOTSTYLETABLE: PLTFULL.CTB PLOTTED: 3/5/2009 3:08 PM BY: BASSETT, RICHARD
XREFS: IMAGES: PROJECTNAME: REMEDIAL 2008
OH002X01
OH002X00



LEGEND:

- MW-1/PZ-1/GP-18/IMP-1/IP-1 — PERMANENT GROUNDWATER SAMPLING LOCATION
- SUB-SLAB AIR SAMPLE LOCATION
- INDOOR AIR SAMPLE LOCATION
- HP-3 — TEMPORARY GROUNDWATER SAMPLING LOCATION
- SV-3 — SOIL VAPOR SAMPLE LOCATION
- IW-B1 — INJECTION WELL LOCATION
- RW-7 — URS RECOVERY WELL LOCATION
- MW-5S — URS ABANDONED MONITORING WELL LOCATION
- SURFACE CONTOUR
- RAILROAD TRACK
- CULVERTED STREAM PIPE
- PROPERTY LINE
- FORMER BUILDINGS AND STRUCTURES
- A—A' LINE OF CROSS SECTION

NOTE:

1. LOCATIONS AND TOPOGRAPHY EAST OF CSX RAILROAD PROPERTY AND WEST OF AND INCLUDING SOUTH STREET, SURVEYED BY THEW ASSOCIATES PE-LS, PLLC (OCTOBER 2008). REFERENCED HORIZONTALLY TO THE NORTH AMERICAN DATUM OF 1983 (NAD83) AND PROJECTED ON THE NEW YORK STATE PLANE COORDINATE SYSTEM (EAST ZONE). VERTICAL REFERENCE TO NGVD 1929. OTHER PROPERTY LINE MAP FEATURES SHOWN ARE FROM RENSSELAER COUNTY TAX MAPPING AND BUILDINGS SHOWN ARE FROM NEW YORK STATE CLEARING-HOUSE AERIAL PHOTOGRAPHY.

0 100' 200'

GRAPHIC SCALE

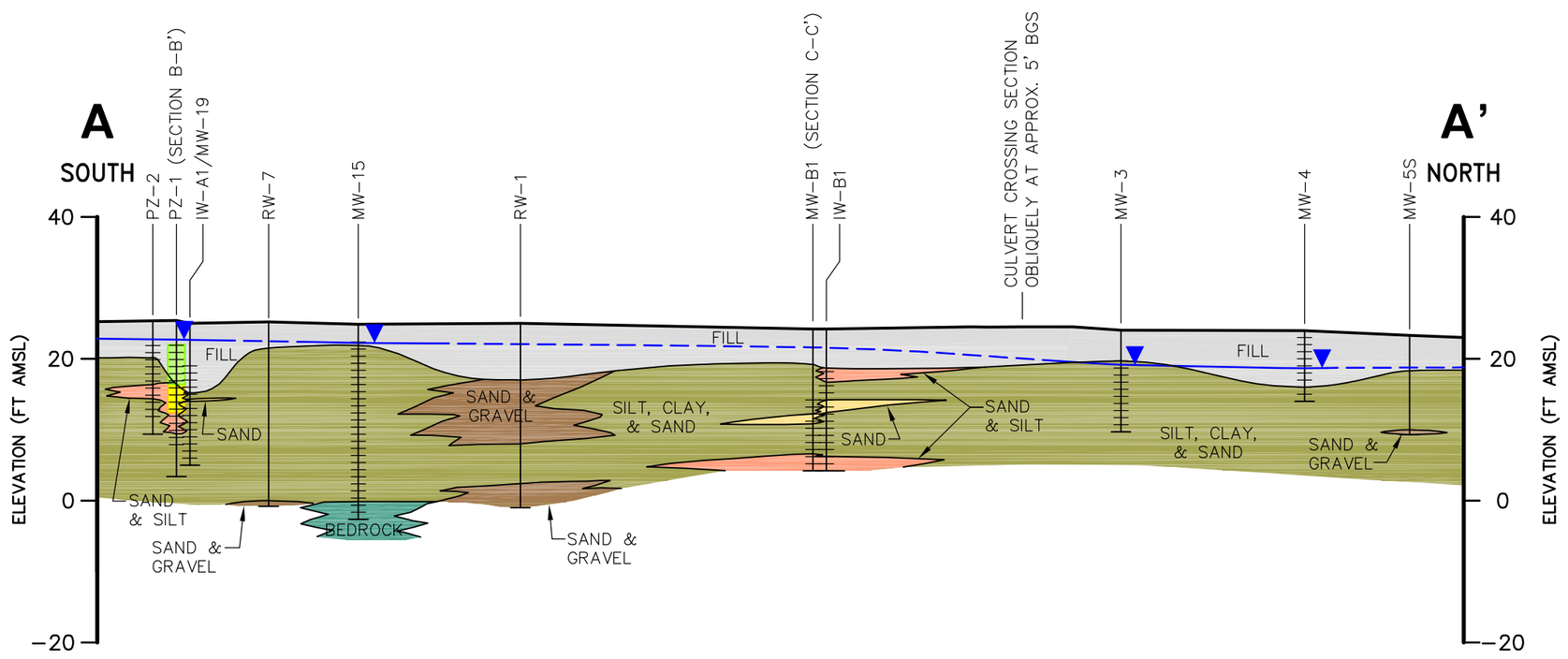
ASHLAND INC. FACILITY
RENSSELAER, NEW YORK
REVISED DRAFT RFI REPORT

CROSS SECTION LOCATION MAP

ARCADIS

FIGURE 2

CITY: Syracuse DIV: 141/GROUP: ENV-141 DB: RCB AMS RCB LD: AM: PD: TM: TR: LYRON="OFF="REF"
G:\ENV\CAD\SYRACUSE\ACT\OH002000\NY41001011\DWG\Rensselaer\RFI\OH002B02.dwg LAYOUT: 2 SAVED: 3/2/2009 5:38 PM ACADVER: 17.0S (LMS TECH) PAGESETUP: ######################## PLOTSTYLETABLE: PLTFULL.CTB PLOTTED: 3/5/2009 3:10 PM BY: BASSETT, RICHARD
XREFS: OH002X01 OH002X00 IMAGES: PROJECTNAME: REMEDIAL 2008



LEGEND:

- WELL OR BORING ID (MW-15)
- GROUND SURFACE
- GROUNDWATER (11/17/2008) DASHED WHERE INFERRED
- LITHOLOGIC CONTACT (DASHED WHERE INFERRED)
- SCREEN
- NAPL IN SOIL
- SHEEN
- BOTTOM OF BORING
- FILL
- SILT, CLAY, AND SAND
- SAND
- SAND AND SILT
- SAND AND GRAVEL
- BEDROCK

NOTES:

1. GROUND SURFACE ELEVATIONS ARE APPROXIMATE.
2. CONTACTS ARE APPROXIMATE AND INFERRED BETWEEN KNOWN DATA POINTS (MONITORING AND INJECTION WELLS).
3. MW-19 IS SHOWN IN CONJUNCTION WITH IW-A1. GEOLOGY IS INTERPRETED FROM IW-A1 BORING LOG.
4. NAPL IN SOIL OBSERVED DURING INSTALLATION OF BORING PZ-1 DESCRIBED AS "OILY SUBSTANCE" WITH ODOR AND SHEEN PRESENT. AN ACCUMULATION OF NAPL IN PZ-1 HAS NOT BEEN OBSERVED.

0 20' 40'
VERTICAL SCALE

0 100' 200'
HORIZONTAL SCALE

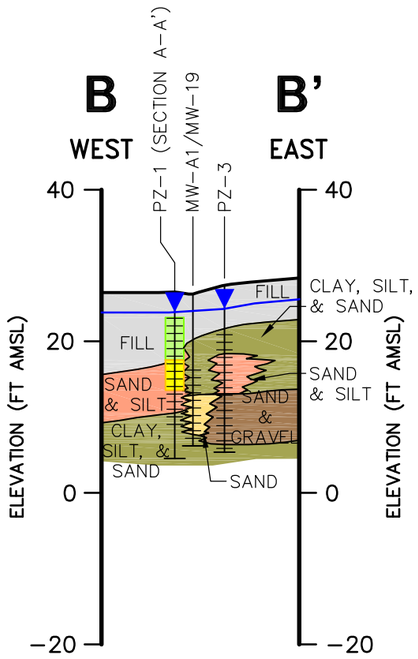
ASHLAND INC. FACILITY
RENSSELAER, NEW YORK
REVISED DRAFT RFI REPORT

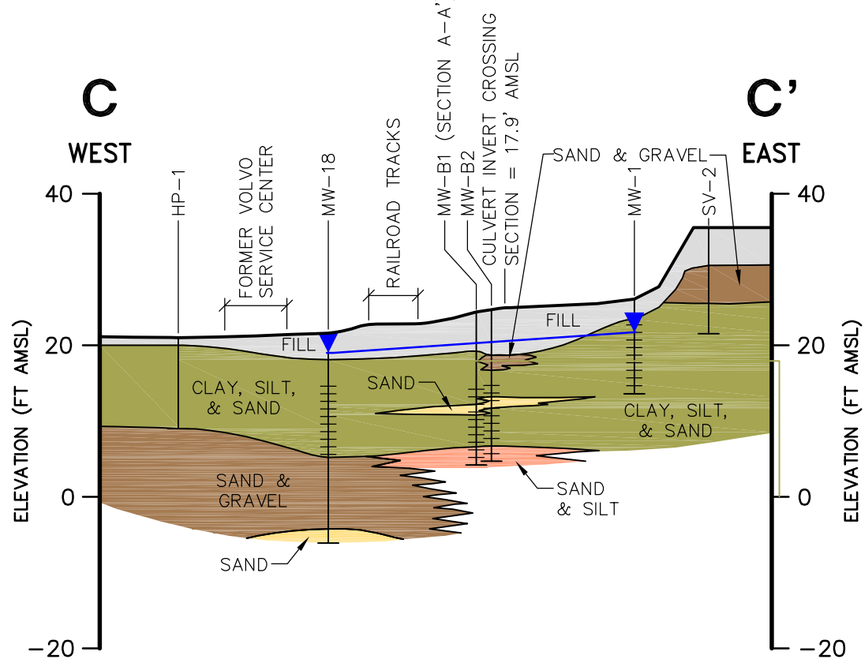
CROSS SECTION A-A'

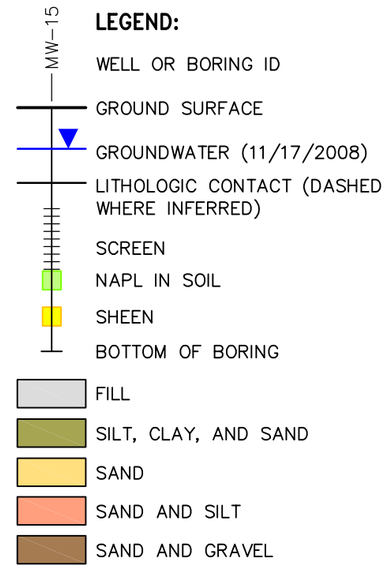
ARCADIS

FIGURE
3

CITY: SYR DIV 85/GROUP: ENV 141 DB:RCB LD: AM: PD: TM: TR: LYR:ON=*;OFF=*REF*
G:\ENVCAD\SYRACUSE\ACTIVE\H002000\NY41001\01DWG\Rensselaer\RFI\OH002V02.dwg LAYOUT: 3 SAVED: 2/27/2009 5:02 PM ACADVER: 17.0S (LMS TECH) PAGESETUP: ######################## PLOTSTYLETABLE: PLTFULL.CTB PLOTTED: 2/27/2009 5:08 PM BY: BASSETT, RICHARD
XREFS: IMAGES: PROJECTNAME: REMEDIAL 2008
OH002X00







NOTES:

1. GROUND SURFACE ELEVATIONS ARE APPROXIMATE.
2. CONTACTS ARE APPROXIMATE AND INFERRED BETWEEN KNOWN DATA POINTS (MONITORING AND INJECTION WELLS).
3. NAPL IN SOIL OBSERVED DURING INSTALLATION OF BORING PZ-1 DESCRIBED AS "OILY SUBSTANCE" WITH ODOR AND SHEEN PRESENT. AN ACCUMULATION OF NAPL IN PZ-1 HAS NOT BEEN OBSERVED.

VERTICAL EXAGGERATION = 5X

0 20' 40'

VERTICAL SCALE

0 100' 200'

HORIZONTAL SCALE

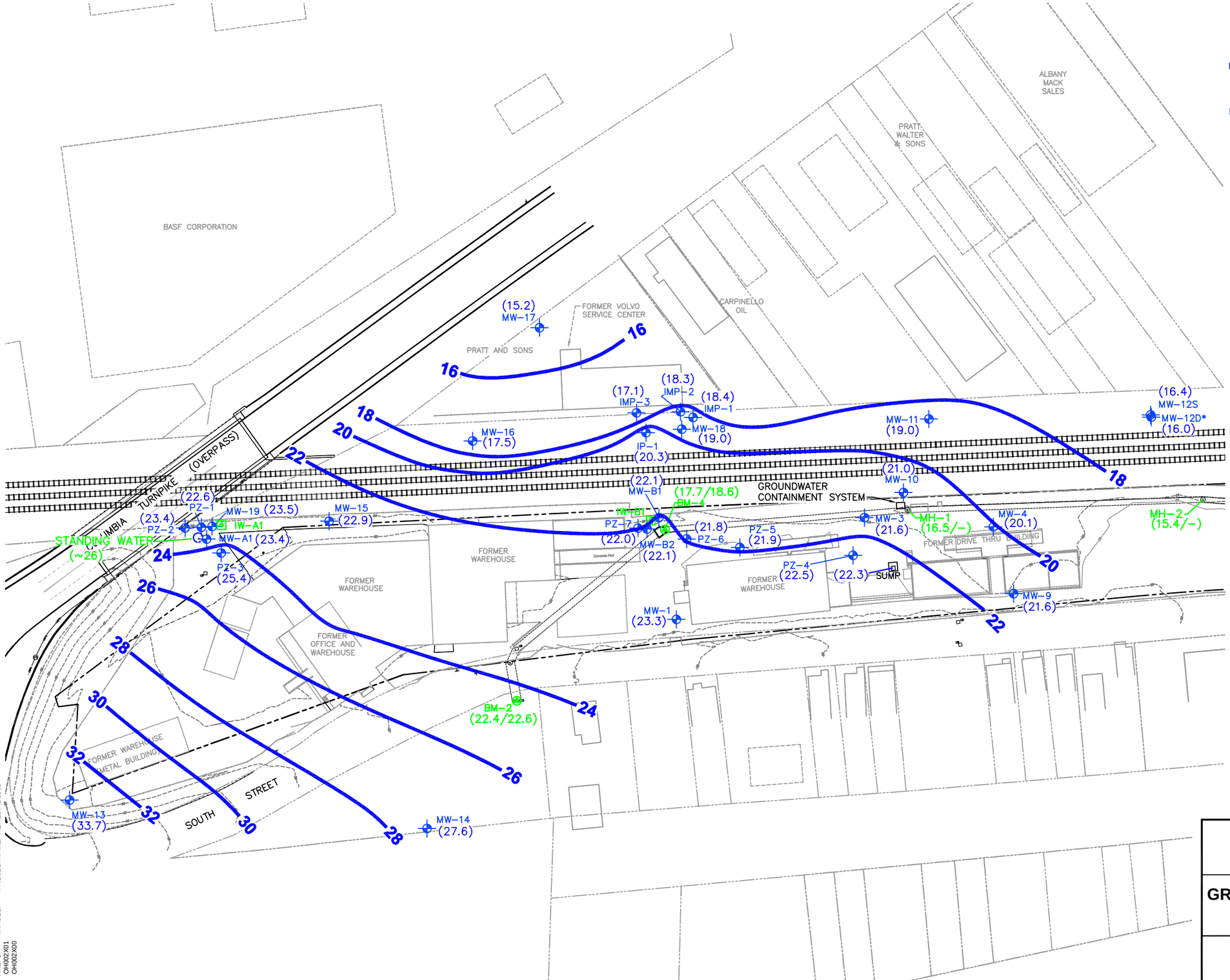
ASHLAND INC. FACILITY
RENSSELAER, NEW YORK
REVISED DRAFT RFI REPORT

CROSS SECTIONS B-B' AND C-C'

ARCADIS

FIGURE
4

CITY: Syracuse DIV: ENV-141 DB: HC AMS RCB LD: AM: PD: TM: TR: LYR:ON=*;OFF=*REF*
G:\ENVCAD\SYRACUSE\ACT\OH002000\NY41\00101\DWG\Rensselaer\RFI\OH002V01.dwg LAYOUT: 4 SAVED: 2/27/2009 5:03 PM ACADVER: 17.0S (LMS TECH) PAGESETUP: ---- PLOTSTYLETABLE: PLTFULL.CTB PLOTTED: 2/27/2009 5:05 PM BY: BASSETT, RICHARD
XREFS: IMAGES: PROJECTNAME: REMEDIAL 2008
OH002X00



LEGEND:

- MW-1/PZ-1/GP-18/IMP-1/IP-1 — PERMANENT GROUNDWATER SAMPLING LOCATION
- MW-12D* — GROUNDWATER SAMPLING LOCATION WHERE ELEVATION NOT USED IN CONTOURING
- IW-B1 — INJECTION WELL LOCATION
- (15.2) — GROUNDWATER ELEVATION COLLECTED ON 11/17/08 (FEET)
- 16 — GROUNDWATER ELEVATION CONTOUR LINE
- (17.7/18.6) — CULVERTED STREAM PIPE INVERT ELEVATION/ SURFACE WATER ELEVATION
- (15.4/–) — CULVERTED STREAM PIPE INVERT ELEVATION/ NO SURFACE WATER MEASUREMENT
- SURFACE CONTOUR
- RAILROAD TRACK
- CULVERTED STREAM PIPE
- PROPERTY LINE
- FORMER BUILDINGS AND STRUCTURES

NOTES:

1. INVERT ELEVATIONS FOR THE CULVERTED STREAM THAT RUNS EAST TO NORTHEAST ON THE SITE WERE SURVEYED BY THEW ASSOCIATES PE–LS, PLLC (OCTOBER 2008).
2. LOCATIONS AND TOPOGRAPHY EAST OF CSX RAILROAD PROPERTY AND WEST OF AND INCLUDING SOUTH STREET, SURVEYED BY THEW ASSOCIATES PE–LS, PLLC (OCTOBER 2008). REFERENCED HORIZONTALLY TO THE NORTH AMERICAN DATUM OF 1983 (NAD83) AND PROJECTED ON THE NEW YORK STATE PLANE COORDINATE SYSTEM (EAST ZONE). VERTICAL REFERENCE TO NGVD 1929. OTHER PROPERTY LINE MAP FEATURES SHOWN ARE FROM RENSSELAER COUNTY TAX MAPPING AND BUILDINGS SHOWN ARE FROM NEW YORK STATE CLEARING–HOUSE AERIAL PHOTOGRAPHY.
3. GROUNDWATER MEASUREMENTS COLLECTED ON NOVEMBER 17, 2008.

0 100' 200'
GRAPHIC SCALE

ASHLAND INC. FACILITY
RENSSELAER, NEW YORK
REVISED DRAFT RFI REPORT

GROUNDWATER ELEVATION CONTOURS NOVEMBER 17, 2008

ARCADIS

FIGURE 5

CITY: SYRACUSE, NY GROUP: ENVCAD DB: RCB, PGL, RCB PM: M. KITTINGER TM: K. POTTER TR: K. POTTER LYR:ON=*;OFF=REF; (FRZ)
G:\ENVCAD\SYRACUSE\ACTIVE\OH002000\NY410101\DWG\RensselaerRFI\OH002W01.dwg LAYOUT: 5 SAVED: 3/13/2009 2:21 PM ACADVER: 17.0S (LMS TECH) PAGESETUP: ---- PLOTSTYLETABLE: PLTFULL.CTB PLOTTED: 3/13/2009 2:22 PM BY: BASSETT, RICHARD
XREFS: IMAGES: PROJECTNAME: REMEDIAL 2008
OH002X01
OH002X00

APPENDICES

ARCADIS

Appendix A

Historical Documents

Appendix A-1 – Draft RFI Report Submitted in October 2002

ESC

ESC ENGINEERING OF NEW YORK, P.C.

9 Albany Street ▪ Cazenovia, NY 13035 ▪ Telephone (315) 655-3900 ▪ Facsimile (315) 655-3907

RESOURCE CONSERVATION AND RECOVERY ACT FACILITY INVESTIGATION REPORT

FOR THE

ASHLAND DISTRIBUTION COMPANY FACILITY
RENSSELAER, NEW YORK
EPA IDENTIFICATION NO. NYD046877775
AOC DOCKET NO. II RCRA-92-3008(h)-0201

PREPARED

BY

ESC ENGINEERING OF NEW YORK, P.C.

OCTOBER 22, 2002

Contents

Acronym List iii

1.0 Introduction 1
1.1 General 1
1.2 Report Organization 1

2.0 Site Description 2
2.1 Site Location and Description 2
2.2 Regional Topography and Geology 2
2.3 Previous Investigative and Remedial Activities 3

3.0 Scope of Work 6
3.1 General 6
3.2 *In-situ* Sampling Activities 6
3.3 DNAPL Investigation 8
3.4 Monitoring Well Installation and Sampling 9
3.5 Pumping Test 11

4.0 Investigation Results 13
4.1 Site Geology and Hydrogeology 13
4.1.1 Northern and Central Areas 13
4.1.2 Southern and Offsite Areas 13
4.2 *In-situ* Sampling Activities 16
4.2.1 Upper Shallow Groundwater Zone 16
4.2.2 Lower Shallow Groundwater Zone 17
4.3 DNAPL Investigation 17
4.4 Monitoring Well Sampling 18
4.5 Pumping Test 18

5.0 Conclusions and Recommendations 20

6.0 References 22

List of Figures:

Figure 1 – Site Location
Figure 2 – Site Layout
Figure 3 – Total VOC Concentrations in the Upper Shallow Groundwater Zone
Figure 4 – Total VOC Concentrations in the Lower Shallow Groundwater Zone
Figure 5 – Pumping Well and Piezometer Locations
Figure 6 – Cross-Section Location Plan
Figure 7 – Generalized Cross Sections A-A', B-B' and C-C'
Figure 8 – Groundwater Elevation Contour Map – June 4, 2001
Figure 9 – Groundwater Elevation Contour Map – July 6, 2001

Contents
(Continued)

List of Tables:

Table 1 – *In-situ* Groundwater Sampling Results – Upper Shallow Groundwater Zone
Table 2 – *In-situ* Groundwater Sampling Results – Lower Shallow Groundwater Zone
Table 3 – Semiannual Groundwater Sampling Results – June 2001
Table 4 – Groundwater Sampling Results – July 2001
Table 5 – Groundwater Measurements and Elevations – June 2001
Table 6 – Groundwater Measurements and Elevations – July 2001

List of Appendices:

Appendix A – Boring Logs and As-Built Diagrams
Appendix B – Summary of Pump Test Activities

Acronym List

AOC	area of concern
bgs	below ground surface
CA/CO	consent agreement/consent order
CSXT	CSX Transportation, Inc.
DCA	dichloroethane
DCE	dichloroethene
DNAPL	dense non-aqueous phase liquid
DOT	U.S. Department of Transportation
EPA	U.S. Environmental Protection Agency
gpm	gallon per minute
ID	inside-diameter
LSGZ	lower shallow groundwater zone
mg/kg	milligram per kilogram
PCE	tetrachloroethene
PVC	polyvinyl chloride
RCRA	Resource Conservation and Recovery Act
RFI	RCRA Facility Investigation
SPDES	State Pollutant Discharge Elimination System
SWMU	solid waste management unit
TCE	trichloroethene
µg/l	micrograms per liter
USGZ	upper shallow groundwater zone
VOCs	volatile organic compounds

1.0 Introduction

1.1 General

ESC Engineering of New York, P.C., was retained by Ashland Inc. (Ashland) to conduct a Resource Conservation and Recovery Act (RCRA) Facility Investigation (RFI) at the Ashland Distribution Company facility on South Street in Rensselaer, New York. In accordance with the *SWMU and AOC Assessment Investigative Report* prepared by T.M. Gates (1994a), the purpose of the RFI was to delineate the extent of affected groundwater in the southern and central portions of the site. No soil samples were collected for chemical analysis during the RFI.

The RFI was conducted in accordance with the requirements stipulated in Section VI(1) of the 1992 Administrative Order on Consent issued by the U.S. Environmental Protection Agency (EPA) Region 2. In addition, the work was conducted in accordance with ESC Engineering's *Revised Phase I RCRA Facility Investigation Workplan*, dated March 30, 1999, and *Pumping Test and Groundwater Modeling Work Plan*, dated November 3, 2000, and the recommendations for additional investigations outlined in Ashland's RFI summary letters to EPA Region 2 (ESC Engineering 1999a, 1999b, 1999c, 2000a, 2000b, 2000c, and 2001). This RFI report summarizes the information previously submitted to the EPA in the above referenced documents.

1.2 Report Organization

The remainder of the report consists of four sections. Section 2 provides a description of the site, including its location, regional geology and topography, and a summary of previous investigative and remedial activities. Sections 3 and 4 describe the scope and results of the RFI investigations. Section 5 presents the conclusions and recommendations.

2.0 Site Description

2.1 Site Location and Description

The Ashland facility is located on South Street in Rensselaer, New York (Figure 1). The approximately 4-acre site occupies a narrow strip of land in an industrial and residential area. The facility is bordered on the east by South Street, across which lies residences and an AMTRAK rail bed. The site is bordered to the south by Columbia Avenue, to the west by the CSX Transportation, Inc., (CSXT) right-of-way, and to the north by vacant land. An unnamed tributary of the Hudson River, which has been isolated in a concrete culvert, flows to the west through the middle of the site and then north along the western property line. (This tributary was incorrectly referenced in previous reports as "Mill Creek" or "tributary of Mill Creek.")

The main features of the site include warehouses, aboveground storage tanks, an office complex, parking areas, and a truck loading rack (Figure 2). Currently, the facility is inactive. The Ashland facility formerly received bulk shipments of industrial chemicals and solvents, and distributed them in smaller quantities to local industrial users. The use of the site for industrial and other activities began in 1892. In general, the operations of the previous site owners were restricted to the southern portion of the Ashland facility. Historical activities at the site have included a slaughter house, the manufacturing of rosin size paste, and the distribution of solvents, corrosives, sodium silicate, linseed oil, turpentine, and antifreeze (T.M. Gates 1993). Ashland purchased the site from Eastern Chemical in 1969 and continued the distribution of various chemicals, including solvents, acids, and caustics. Since 1969, Ashland made several modifications and improvements to the site, including the re-location of the solvent tank farm and installation of a catastrophic release collection system, replacement of the acid neutralization pit, and installation of dikes at truck transfer locations. A complete summary of the site history is presented in the *SWMU Assessment Report* for the site prepared by T.M. Gates (1993).

2.2 Regional Topography and Geology

The Ashland facility lies in the Hudson-Champlain section of the Ridge and Valley physiographic province. The regional topography consists of gently to steeply sloping lowlands, which are underlain by metamorphosed sandstone and shale. Underlying the unconsolidated materials at the site is the Normanskill Shale. This unit is Ordovician in age and consists

predominately of shale with minor sandstone and mudstone. Bedrock is present on the site at depths from approximately 20 feet to 33 feet below ground surface (bgs).

The topography of the site is relatively flat with a gentle slope toward the north-northwest. The north end of the Ashland facility is located within the 100-year floodplain of the Hudson River, which is approximately 1,650 feet northwest of the site. Further information regarding the regional topography and geology of Rensselaer County is provided in the *Phase I RCRA Facility Investigation Work Plan* prepared by T.M. Gates (1994b).

2.3 Previous Investigative and Remedial Activities

During a RCRA inspection in 1981, EPA inspectors reported observing a solvent sheen on the Hudson River tributary that was believed to be from a 2,000-gallon underground storage tank on the Ashland property. The tank was formerly used as an oil/water separator, which received storm water drainage from a tank farm and other portions of the Ashland property until 1978 when it was disconnected. The underground tank was removed without a closure plan in 1981, shortly after the EPA inspection. In June 1983, the EPA performed a second RCRA inspection of the facility. As a result of this inspection, the EPA issued an administrative complaint to Ashland alleging that the former underground tank was a regulated unit and should be classified as a Solid Waste Management Unit (SWMU).

On October 5, 1984, Ashland and the EPA Region 2 entered into a Consent Agreement and Consent Order ([CA/CO] Docket No. II RCRA-83-0253). The CA/CO required investigation and remediation of potentially hazardous constituents believed to have originated from the leaking underground tank. As required by the CA/CO, a hydrogeologic investigation was performed in 1984 on the central and northern portions of the site to determine the nature and extent of volatile organic compounds (VOCs), oil, and grease potentially associated with the former underground tank.

As part of the hydrogeologic investigation, 10 soil borings were installed and converted to groundwater monitoring wells in the vicinity of the former underground tank. Oil and grease were detected in soil and groundwater; however, the presence of oil and grease was believed to reflect the predevelopment condition of the site and, thus, was unrelated to facility operations (T.M. Gates 1985). VOCs were detected in soil and groundwater onsite. Based on the results of soil analyses, approximately 6,000 cubic yards of soil had been affected by VOCs and required remediation

(T.M. Gates 1988). The horizontal and vertical extent of affected soils was limited to onsite areas due to the relatively low permeability of the site soils.

In September 1987, soils containing greater than 1.0 milligram per kilogram (mg/kg) of VOCs were excavated and placed in an onsite engineered soil stockpile at the north end of the property for subsequent treatment by vacuum extraction and carbon adsorption. During the excavation activities, the excavation sidewalls were periodically tested to confirm that soils with VOC concentrations above the 1.0 mg/kg level had been removed. On completion of the excavation activities, the excavation was backfilled with crushed stone. A groundwater collection sump, which was initially installed to dewater the excavation, was left in-place to serve as a groundwater recovery well (T.M. Gates 1985).

The northern stockpile vacuum extraction system operated intermittently from 1988 to 1994. The soils from the stockpile were sampled in six phases (Phases I through VI) from 1985 to 1996 to determine the effectiveness of the soil stockpile treatment system. Based on the results of Phase VI sampling, which was conducted in May 1996, and the results of an additional sample collected in April 1998, the soil from the northern stockpile was determined to meet site-specific risk-based cleanup objectives. During an August 6, 1998, meeting, the EPA Region 2 indicated that no additional investigation or remediation of the stockpile was necessary. On January 6, 1999, the EPA Region 2 accepted a site restoration plan for the soil stockpile. In October and November 1999, the soil vapor extraction system was dismantled and the northern portion of the site was graded in accordance with the approved plan.

Additional remedial activities were conducted in the northern portion of the Rensselaer facility under the 1984 CA/CO. These activities included the installation of a groundwater recovery system to collect VOC-containing groundwater for treatment by air stripping with discharge of the treated groundwater to the Hudson River tributary and isolation of the Hudson River tributary in a concrete culvert. Discharges from the groundwater treatment system were allowed under a New York State Department of Environmental Conservation State Pollutant Discharge Elimination System (SPDES) permit. The groundwater treatment system operated intermittently until November 1999, when it was shutdown due to SPDES permit limit exceedances. The groundwater treatment system was restarted in March 2002.

In 1990, a warehouse in the southern portion of the facility was expanded as part of plans to modernize the Rensselaer facility. During excavation for the warehouse foundation, Ashland

encountered soils suspected of containing VOCs. Subsequent hydrogeologic investigations verified the presence VOCs in unsaturated and saturated soils beneath the proposed warehouse location. A soil vapor extraction system was installed in the summer of 1991 and the spring of 1992 to remediate the unsaturated soils. The soil vapor extraction system became operational in June 1992. ESC Engineering, on behalf of Ashland, performed a test of the southern soil vapor extraction system in April 1998 to evaluate the system's performance. Based on the results of the test, the system was determined to be removing only trace quantities of VOCs, thereby making further operation of the system unjustifiable. As discussed during an August 6, 1998, meeting with the EPA Region 2, the southern soil vapor extraction system will remain inactive until the nature and extent of VOCs in groundwater in the southern portion of the site are determined and a final remedy for the site is selected.

3.0 Scope of Work

3.1 General

From June 1999 through July 2001, Ashland performed the following RFI investigations at the Rensselaer facility:

- collected *in-situ* groundwater samples to determine the horizontal and vertical extent of VOCs in groundwater in the southern and central portions of the site.
- conducted an investigation to determine the potential presence of dense non-aqueous phase liquid (DNAPL) in the southwest corner of the property
- installed and sampled four groundwater monitoring wells
- installed three piezometers and conducted a groundwater pumping test in the southwest corner of the site

The investigations were conducted in accordance with ESC Engineering's *Revised Phase I RCRA Facility Investigation Work Plan* and *Pumping Test and Groundwater Modeling Work Plan*, and Ashland's Phase I RFI summary letters to the EPA Region 2 (ESC Engineering 1999a, 1999b, 1999c, 2000a, 2000b, 2000c, and 2001). A description of the RFI investigations is presented below.

3.2 *In-situ* Sampling Activities

Ashland collected *in-situ* groundwater samples at locations GP-1 through GP-6, and GP-8 through GP-33 to determine the horizontal and vertical extent of affected groundwater in the central and southern portions of the site (Figures 3 and 4). The *in-situ* groundwater samples were collected using either hydraulically-driven screen point sampling equipment or, in cases where the recharge rate was low, with a temporary one-inch inside-diameter (ID) polyvinyl chloride (PVC) casing. The temporary casings consisted of a 5-foot-long or 10-foot-long section of 0.01-inch machine-slotted screen attached to a sufficient length of PVC blank casing to reach the ground surface. The groundwater samples were retrieved from the screen points and temporary casings using dedicated polyethylene tubing equipped with a stainless steel check ball. All non-dedicated sampling equipment, including probe rods and screen points, were

decontaminated before each use in accordance with the procedures outlined in Table 1 of the *Revised Phase I RCRA Facility Investigation Workplan* (ESC Engineering 1999a).

At the conclusion of the sampling activities, each boring was abandoned. The borings sampled with temporary PVC casings were backfilled with bentonite chips and hydrated with potable water. Borings sampled with screen point sampling equipment were backfilled by injecting bentonite grout through the hollow probe rods as they were removed. The borings were capped with cold patch asphalt or soil to match the surrounding surface. Temporary PVC casings, polysheeting, tubing, and the decontamination rinsate were placed in U.S. Department of Transportation- (DOT)-authorized open-top 55-gallon steel drums. The drums were properly labeled and staged onsite for later disposal by Ashland in accordance with state and federal regulations.

The *in-situ* groundwater sampling activities were conducted in four separate field events from June 1999 through June 2001. A brief description of the scope and rationale for each sampling event is presented below:

June 1999: *In-situ* groundwater samples were collected at GP-1 through GP-6 and GP-8 through GP-12 to evaluate the horizontal extent of VOCs and methanol in the upper portion of the upper shallow groundwater zone (USGZ) in the vicinity of the former solvent transfer and drum storage area formerly south of the office building (i.e., area of concern [AOC] 1, Figure 3), the former drum storage area formerly south of the drum reconditioning building (i.e., SWMU 3, Figure 3), and along the western property line (ESC Engineering 1999b). The groundwater samples were submitted to STL Savannah Laboratories, Inc., in Savannah, Georgia, for analysis of VOCs and methanol by EPA Method 8260B. Because methanol was not detected in any of the groundwater samples, subsequent groundwater samples were analyzed only for VOCs.

March 2000: Based on the results of the June 1999 investigation, *in-situ* groundwater samples were collected at GP-13 through GP-18 and GP-22 through GP-25 to determine the southern, northern, and western extent of affected groundwater in the USGZ. *In-situ* samples GP-20 and GP-21 were collected directly above bedrock to evaluate the groundwater quality in the lower shallow groundwater zone (LSGZ) within AOC 1 and SWMU 3 (ESC Engineering 2000c). As discussed in the following section, an exploratory boring was drilled at GP-19 and three groundwater samples were collected to evaluate the potential presence of DNAPL in the vicinity of GP-4. Sample GP-4, which was collected in June 1999, contained 40,000 micrograms

per liter (µg/l) of tetrachloroethene (PCE). The groundwater samples were submitted to Adirondack Environmental Services, Inc., in Albany, New York, for analysis of VOCs by EPA Method 8260B.

August 2000: From August 16 through 18, 2001, Ashland collected *in-situ* groundwater samples GP-26A through GP-30A to evaluate the horizontal extent of VOCs previously detected from 11 to 15 feet bgs (i.e., the lower portion of the USGZ) at location GP-19. In addition, GP-26B through GP-28B, and GP-30B, were collected to evaluate the horizontal extent of VOCs detected in the LSGZ at location GP-19 (ESC Engineering 2000b). As discussed in Section 4.1 of this report, the LSGZ is not present at GP-29 and, thus no sample was collected. The groundwater samples were submitted to Adirondack for analysis of VOCs by EPA Method 8260B.

Ashland drilled exploratory borings to bedrock (i.e., refusal) at locations GP-27, GP-28, and GP-29 to characterize the geology and hydrogeology west of the CSXT property. The exploratory borings were advanced using a vehicle-mounted hydraulic probe. Continuous soil samples were collected from each boring from the ground surface to the refusal depth using a 2-foot-long split spoon sampler. Boring logs for GP-27, GP-28, and GP-29 are included in Appendix A.

May 2001: Ashland collected *in-situ* groundwater sample GP-33 at a depth of 13 to 17 feet bgs to investigate the groundwater quality in the lower portion of the USGZ south of GP-26, which contained 16,400 µg/l total VOCs. The groundwater sample was submitted to Adirondack for analysis of VOCs by EPA Method 8260B (ESC Engineering 2001).

3.3 DNAPL Investigation

In-situ groundwater sample GP-4, which was collected from the USGZ in June 1999, contained PCE at a concentration of 40,000 µg/l. According to the EPA's "Soil Screening Guidance: User's Guide," dated July 1996, the aqueous solubility limit of PCE is 200,000 µg/l. Therefore, the PCE concentration in GP-4 is 20 percent of its aqueous solubility. Based on this criterion, the potential existed for DNAPL to be present in the vicinity of GP-4.

In March 2000, Ashland advanced a boring to bedrock (i.e., refusal) at GP-19 to identify low permeability layers that could act as barriers to the downward migration of VOCs or potential DNAPL (ESC Engineering 2000c). Two low permeability zones were identified in the

exploratory boring: a relatively thin (approximately 2 feet thick) layer of dense silt and clay was observed between 5.5 feet and 7.5 feet bgs; and an approximately 2-foot-thick layer of dark grey, medium dense silt underlain by greenish-grey soft to medium stiff clay from 17 feet to 21.5 feet bgs. The coarser materials at this location varied from gravelly silt and sand to sand with gravel. A boring log for GP-19 is included in Appendix A.

Three *in-situ* groundwater samples were collected from GP-19 using hydraulically-driven screen point sampling equipment. Sample GP-19A and GP-19B were collected from 2 to 6 feet bgs and 11 to 15 feet bgs, respectively (i.e., above the identified low permeability layers). Sample GP-19C was collected directly above bedrock from 23 to 27 feet bgs. Each *in-situ* groundwater sample was collected from a separate hole advanced adjacent to the exploratory boring to limit the potential for cross contamination from overlying water-bearing zones. The groundwater samples were submitted to Adirondack for analysis of VOCs by EPA Method 8260B.

3.4 Monitoring Well Installation and Sampling

Based on the results of the *in-situ* groundwater investigations, Ashland installed groundwater monitoring wells MW-16 through MW-19 in the USGZ to supplement the existing well network (Figure 2). Before the wells were installed, Ashland installed exploratory borings down to bedrock (i.e., refusal) at MW-16 through MW-18 to identify the water-bearing zone(s) comprising the USGZ. The exploratory borings were advanced using a vehicle-mounted hydraulic probe and continuous soil samples were collected from ground surface to the refusal depth using a 2-foot-long split spoon sampler. The borings were backfilled with the soil cores, followed by bentonite chips hydrated with potable water. The borings were capped with cold patch asphalt or soil to match the surrounding surface. Because MW-19 was drilled approximately 2 feet south of exploratory boring GP-19 (drilled in August 2000), split-spoon soil samples were only collected down to groundwater. Boring logs for MW-16 through MW-19 are included in Appendix A.

Monitoring wells MW-16 through MW-18 were installed at depths ranging from 15 to 18 feet bgs and were screened to monitor the entire USGZ. A separate well boring was drilled adjacent to each exploratory boring using a truck-mounted drill rig equipped with 4.25-inch ID hollow stem augers. The wells were constructed using 2-inch ID, 0.010-inch machine-slotted

schedule 40 PVC screen and blank casing. A clean sand filter pack was placed from approximately 0.5 foot below the screen to approximately 1 foot above the screen. An approximately 2-foot-thick bentonite pellet seal was then placed on top of the sand pack and hydrated with potable water. Once the bentonite seal had completely hydrated, the remaining annular space was sealed with a cement/bentonite grout. MW-19 was installed to a depth of approximately 17.5 feet bgs using a truck-mounted drill rig equipped with 8.25-inch ID hollow stem augers. Because MW-19 was installed as a pumping well, it was constructed using 4-inch ID, 0.020-inch machine-slotted, schedule 40 PVC screen and blank casing. The wells were finished with either an aboveground or flush-mount protective steel cover set in a cement pad. All downhole drilling equipment was steam-cleaned over a temporary decontamination pad before beginning each boring. As-built construction diagrams for each well are included in Appendix A.

The newly installed wells were developed 24 hours or longer after the installation of the well seals using submersible pumps, suction-lift pumps, and dedicated bailers. Field measurements were obtained for temperature, pH, and conductivity before development began and after the removal of each well volume. Development continued until the water was relatively free of suspended sediment and two successive readings for each parameter varied by less than 10 percent. The location and elevation of the newly installed wells were surveyed by a New York-licensed land surveyor.

On June 5 through 7, 2001, Ashland purged and sampled MW-16 through MW-19 as part of the semiannual groundwater sampling event. The sampling activities were conducted in accordance with the quality assurance project plan prepared by T.M. Gates (1994b) and the samples were submitted to STL Savannah for analysis of VOCs by EPA Method 8260. As part of the sampling activities, water-level measurements were obtained from MW-16 through MW-19. To verify the water levels and VOC concentrations obtained from MW-16 through MW-19 during the June 2001 semiannual sampling event, Ashland resampled these wells on July 6, 2001, and obtained water-level measurements from the onsite and offsite monitoring wells and the onsite deep sump.

Soil cuttings, polysheeting, bailers, and tubing generated during the well installation, development, and sampling activities, were contained in DOT-authorized open-top 55-gallon steel drums. Development water, purge water, and decontamination rinsate were contained in

DOT-authorized closed-top 55-gallon steel drums. The drums were properly labeled and staged onsite for later disposal by Ashland in accordance with state and federal regulations.

3.5 Pumping Test

On May 14 through 16, 2001, Ashland installed three piezometers at locations PZ-1 through PZ-3 in preparation for the pumping test (Figure 5). The piezometer borings were advanced using a truck-mounted drilling rig equipped with 4.25-inch ID hollow-stem augers. Continuous soil samples were collected from ground surface to depths from 16 to 22 feet bgs using a 2-foot-long split spoon sampler. The borings were terminated on the layer of dense silt and clay that marks the bottom of the USGZ in the southwest corner of the site. Piezometers were constructed in each boring using 2-inch ID schedule 40 PVC casing with a sufficient length of 0.020-inch machine-slotted screen to monitor the entire USGZ. A clean sand filter pack was placed from approximately 0.5 foot below the screen to approximately 1 foot above the screen. An approximately 2-foot-thick bentonite pellet seal was then placed on top of the sand pack and hydrated with potable water. Once the bentonite seal had completely hydrated, the remaining annular space was sealed with a cement/bentonite grout. The piezometers were completed with aboveground protective steel covers set in cement pads. All downhole drilling equipment was steam cleaned over a temporary decontamination pad before beginning each boring. Boring logs and as-built diagrams for the piezometers are included in Appendix A.

The newly installed piezometers were developed 24 hours or longer after the installation of the well seals using submersible pumps, suction-lift pumps, and dedicated bailers. Field measurements were obtained for temperature, pH, and conductivity before development began and after the removal of each well volume. Development continued until the water was relatively free of suspended sediment and two successive readings for each parameter varied by less than 10 percent. The location and elevation of the newly installed piezometers were surveyed by a New York-licensed land surveyor.

Soil cuttings, polysheeting, bailers, and tubing generated during the piezometer installation and development activities, were contained in DOT-authorized open-top 55-gallon steel drums. Development water and decontamination rinsate were contained in DOT-authorized closed-top 55-gallon steel drums. The drums were properly labeled and staged onsite for later disposal by Ashland in accordance with state and federal regulations.

From June 4 through 8, 2001, Ashland conducted a pumping test on MW-19 in accordance with the EPA-approved pump test work plan, dated November 3, 2000. The pumping test included collecting background water-level measurements from the pumping well and piezometers for 24 hours and performing three step drawdown tests (1.0 gallon per minute [gpm], 1.7 gpm, and 1.3 gpm), three constant-rate drawdown tests (1.2 gpm, 0.8 gpm, and 0.4 gpm), and a recovery test. All purge water generated from the pump test was contained onsite in a 7,500-gallon tank wagon. On completion of the pump test activities, the tank wagon was transported by Ashland Environmental Services to the E.I. Dupont de Nemours and Company facility in Deepwater, New Jersey, for disposal. Approximately 2,353 gallons of purge water were disposed of at the facility. A detailed description of the pump test scope of work is presented in Appendix B.

4.0 Investigation Results

4.1 Site Geology and Hydrogeology

4.1.1 Northern and Central Areas

According to T.M. Gates (1989), the unconsolidated sediments in the central and northern portions of the site consist of approximately 10 to 20 feet of alluvium overlying approximately 5 to 10 feet of lacustrine silt. The alluvial deposits consist primarily of clay and have been locally disturbed by previous excavation, construction, and grading activities. In these areas, the alluvial deposits contain construction debris, including brick, concrete, wood, glass bottles, and steel beams. In the northern and central portions of the site, there are reportedly two hydraulically isolated water-bearing zones (T.M. Gates 1991). These zones include a 1- to 2-foot-thick sand lens within the alluvial deposits (i.e., USGZ) and the saturated materials at the sediment/bedrock interface (i.e., LSGZ). The USGZ is unconfined in nature, whereas the LSGZ is under confined conditions. The hydraulic isolation of these groundwater zones is supported by historical groundwater elevation data from existing and former monitoring well pairs MW-5A/MW-5B, MW-6A/MW-6B, and MW-12A/MW-12B. For each well pair, the "A" wells were screened across the water table and the "B" wells were screened on top of bedrock. The difference in groundwater elevations between the shallow and deep wells within the well pairs was on the order of 0.5 foot to 2 feet.

During the RFI, ESC Engineering installed soil-boring GP-21 down to bedrock in the vicinity of MW-1. The unconsolidated sediments encountered at GP-21 consist of silt and clay to 16.5 feet bgs, followed by silty sand, sand, and sand with gravel to a depth of 33 feet bgs. The sediments encountered at GP-21 are consistent with those previously reported for MW-1 (T.M. Gates 1994b).

4.1.2 Southern and Offsite Areas

The unconsolidated sediments in the southern portion of the site are heterogeneous and relatively coarse grained as compared to the central and northern portions of the site. In general, the sediments consist of approximately 3 to 6 feet of fill material underlain by 5 to 13 feet of sand and gravelly-sand. The sand and gravelly-sand unit thickens toward the northwest (Figures 6 and 7; section B-B^{1}). The sand and gravelly-sand unit is underlain by silt and clay, which is in turn underlain by approximately 4 to 8 feet of sand and gravel with varying amounts of silt and clay.

Due to the shallow depth of monitoring well MW-13, it is unclear whether the silt unit is underlain by sand and gravel in the southernmost portion of the site. Along the western property line, the coarser-grained deposits abruptly change to low permeability silts and clays north of RW-7 and south of MW-19 (Figures 6 and 7; Sections A-A^{1} and C-C^{1}). Bedrock is present in the southern portion of the site at depths from approximately 20 to 28 feet bgs (Figure 7).

The subsurface geology west of the Ashland facility is variable. South of the Volvo Service Center building, the geology consists of approximately 3 to 7 feet of silt, sand, and gravel fill, which is underlain by approximately 14 to 16 feet of silt, silty clay, and clay with thin layers of silt with gravel. The unconsolidated deposits below a depth of approximately 20 feet consist primarily of medium dense to dense sand, sandy silt, and silt with gravel. At GP-27, an approximately 8-foot-deep void was encountered below the asphalt surface, which may represent a basement from one of the former buildings that occupied the parcel. The sediments become gradually coarser-grained toward the north. The sediments at MW-18 consist of approximately 3.5 feet of sand and gravel fill underlain by approximately 16 feet of silt and silt with gravel, which contains several thin (less than 1-foot-thick) layers of silty clay or sand. This sequence is underlain by approximately 7 feet of sand and sand with gravel. Boring GP-29, which is located north of MW-18, is characterized by sand and sand with gravel from 8 feet to 24.5 feet bgs. Bedrock was encountered in the offsite borings at depths from 24.5 to 34 feet bgs.

T.M. Gates (1994b) subdivided the groundwater system in the southern portion of the Rensselaer facility into a shallow groundwater zone, which included groundwater under unconfined conditions from ground surface to the top of the Normanskill Shale, and a deep groundwater zone, which included groundwater below the top of the Normanskill Shale. The shallow groundwater zone was further subdivided into an USGZ and a LSGZ. The USGZ was defined as groundwater within about 8 feet of the water table, whereas the LSGZ included groundwater within 5 feet of the sediment bedrock interface.

From August 2000 to May 2001, Ashland advanced exploratory borings down to bedrock at locations GP-27, GP-28, GP-29, and MW-16 through MW-18 to evaluate the offsite hydrogeology. The results of the exploratory borings indicated that there are several discrete water-bearing zones within the unconsolidated deposits. The water-bearing zones are typically less than one foot thick and vary considerably in depth over short horizontal distances. For example, at GP-27, GP-28, MW-16, and MW-17, the entire USGZ is represented by an

approximately 1-foot-thick interval that varies in depth from 4 to 16 feet bgs. The USGZ at GP-27 and GP-28 is at the base of the fill material above a low permeability layer and, thus, may represent the local infiltration of precipitation and may not be hydraulically connected to the USGZ in the southern portion of the Ashland site. The USGZ in MW-18 consists of two water-bearing zones from approximately 8 to 9 feet bgs and 15 to 16 feet bgs. In contrast, the USGZ at GP-29 is represented by saturated deposits from approximately 8 to 18 feet bgs; however, no water-bearing zones were encountered in the unconsolidated deposits below 18 feet bgs. Therefore, the LSGZ does not appear to be present at GP-29. The LSGZ at GP-27 and GP-28 consists of two isolated water-bearing zones that are each approximately 0.5 foot thick.

Static water-level measurements recorded from MW-16 through MW-18 during the June and July 2001 sampling events were approximately 5 to 9 feet above the observed depth to groundwater during installation of the exploratory borings. Therefore, the USGZ may be under confined conditions west of the CSXT railroad tracks. In addition, the background water-level monitoring conducted during the pump test in the southwest corner of the property indicate that the USGZ may be locally confined by a shallow clay layer.

Due to the variation in depth and thickness of the USGZ, and the fact that the USGZ is apparently confined in some areas, Ashland redefined the USGZ and LSGZ based on depth. Ashland used the stratigraphy observed in exploratory boring EB-19 (drilled near location GP-19) as the basis for the revised definitions. In March 2000, ESC Engineering drilled exploratory boring EB-19 in the southwest corner of the site to investigate the potential presence of DNAPL downgradient from GP-4 (Figure 3). Based on the exploratory boring, water-bearing zones were identified at 3.5 to 5.5 feet bgs, 7.5 to 17 feet bgs, 21.2 to 21.4 feet bgs, and 24 to 25 feet bgs (ESC Engineering 2000c). Each of the water-bearing zones was underlain by a low permeability layer consisting of medium dense to dense silt and clay. A review of geologic logs from borings in the area indicated that the uppermost silt and clay layer is thin or absent. However, the low permeability layer encountered from 17.5 to 21 feet bgs appears to be continuous across the southern portion of the site (Figures 6 and 7; Section A-A[1]). Therefore, the USGZ was considered to include water-bearing zones from approximately 3 feet bgs to approximately 17 feet bgs (ESC Engineering 2000a). The LSGZ includes water-bearing zones within the unconsolidated sediments at depths greater than approximately 17 feet bgs.

Water-level measurements and groundwater elevations for the June and July 2001 sampling events are summarized in Tables 5 and 6 and groundwater elevation contour maps of the site are presented in Figures 8 and 9. The groundwater contour maps indicate that the general flow direction is northwest toward the Hudson River. However, the flow direction in the central portion of the site is west. Thus, MW-17 is hydraulically downgradient from MW-18.

In June 2001, ESC Engineering performed a pumping test on MW-19 to determine the hydraulic characteristics of the USGZ in the southwest corner of the property. The results of the pumping test indicated an estimated transmissivity of 84.81 to 133.92 square feet per day and an estimated hydraulic conductivity of 2.86 to 13.10 feet per day. The results of the pumping test also indicated that the USGZ in the southwest corner of the property is limited in extent and bounded by low permeability hydraulic barriers (ESC Engineering 2001). The pump test results are described in greater detail in Appendix B.

4.2 *In-situ* Sampling Activities

The *in-situ* groundwater sample results are summarized in Tables 1 and 2. Copies of the analytical results were previously submitted to the EPA Region 2 (ESC Engineering 1999b, 2000a, 2000c, and 2001).

4.2.1 Upper Shallow Groundwater Zone

Groundwater samples were collected from the USGZ at locations GP-1 through GP-6, GP-8 through GP-18, GP-19A, GP-19B, GP-22 through GP-25, GP-26A, GP-27A, GP-28A, GP-29, GP-30A, and GP-33 (Figure 3). Sample GP-10, which was at the top of a steep incline, was collected at a depth of 20 to 24 feet bgs. Due to the drop in elevation west of GP-10, this interval corresponds to the USGZ sampled at the remaining onsite and offsite locations.

The total VOC concentrations in the southern portion of the site ranged from 21 µg/l at GP-17 to 71,090 µg/l at GP-4 (Figure 3). The following VOCs were detected in groundwater in the southern portion of the site: vinyl chloride (430 and 520 µg/l); 1,1-dichloroethane ([1,1-DCA] 21 to 1,600 µg/l); 1,2-dichloroethene ([1,2-DCE] 750 to 19,000 µg/l); chloroform (11 µg/l); 1,1,1-trichloroethane (550 to 1,700 µg/l); trichloroethene ([TCE] 12 to 5,400 µg/l); PCE (87 to 40,000 µg/l); toluene (730 µg/l); ethylbenzene (560 µg/l); and total xylenes (2,100 µg/l). Methanol was not detected in groundwater samples from the southern portion of the Ashland facility.

Groundwater samples GP-9 through GP-12, GP-18, and GP-30A were collected in the central portion of the site the vicinity of SWMU 3. The total VOC concentrations ranged from non-detectable levels at GP-10 and GP-12 to 2,774 µg/l at GP-9. The VOCs detected in the central portion of the site were vinyl chloride (42 to 490 µg/l), 1,2-DCE (35 to 3,300 µg/l), 1,2-DCA (7.1 µg/l), TCE (800 to 1,200 µg/l), and PCE (4,700 µg/l). Groundwater samples GP-9 through GP-12 were also analyzed for methanol. No methanol was detected in the groundwater samples.

In-situ groundwater samples were collected downgradient of the Ashland facility at GP-5, GP-6, GP-8, GP-13 through GP-16, and GP-22 through GP-29. No VOCs were detected in samples GP-5, GP-14, GP-15, GP-23 through GP-25, and GP-29. The VOCs detected in the remaining samples were vinyl chloride (480 µg/l), 1,2-DCE (18 to 3,300 µg/l), 1,2-DCA (1,700 µg/l), carbon tetrachloride (51 µg/l), TCE (170 to 410 µg/l), and toluene (10 to 20 µg/l). Offsite groundwater samples GP-5, GP-6, and GP-8 were analyzed for methanol. Methanol was not detected in any of the groundwater samples.

4.2.2 Lower Shallow Groundwater Zone

In-situ groundwater samples were collected from the LSGZ at locations GP-19, GP-20, GP-21, GP-26, GP-27, GP-28, and GP-30 (Table 2). No VOCs were detected in offsite samples GP-27B, GP-28B, and GP-30B. The highest total VOC concentration was detected in sample GP-19C (486 µg/l) in the southwest corner of the site. The VOCs detected in the remaining samples are 1,2-DCE (8 to 11 µg/l) and vinyl chloride (33 µg/l).

4.3 DNAPL Investigation

Three *in-situ* groundwater samples were collected from GP-19 to evaluate the potential presence of DNAPL downgradient on GP-4. Samples GP-19A and GP-19B were collected directly above low-permeability layers, and GP-19C was collected directly above bedrock. Four VOCs, vinyl chloride (1,800 µg/l), 1,1-DCA (550 µg/l), 1,2-DCE (750 µg/l), and 1,1,1-trichloroethane (550 µg/l) were detected in sample GP-19A (Table 1). Two of the four VOCs, vinyl chloride (7,000 µg/l) and 1,2-DCE (9,800 µg/l), were also detected above the second low permeability layer in sample GP-19B. Relatively lower concentrations of vinyl chloride (300 µg/l), 1,1-DCA (12 µg/l), and 1,2-DCE (130 µg/l) were detected in GP-19C. An

additional VOC, PCE (44 µg/l), was detected only in GP-19C. Based on the groundwater results from GP-19, no DNAPL is present at the intervals sampled.

4.4 Monitoring Well Sampling

A summary of the analytes detected in onsite and offsite wells during the June and July 2001 sampling events is provided in Tables 3 and 4. Copies of the laboratory reports were previously submitted to the EPA Region 2.

No VOCs were detected in MW-17 and only one VOC, cis-1,2-DCE (22 µg/l), was detected in MW-16. MW-18 contained vinyl chloride (210 µg/l), cis-1,2-DCE (390 µg/l), trans-1,2-DCE (23 µg/l), and 1,2-DCA (180 µg/l). MW-19, which is located in the southwest corner of the Ashland facility, contained vinyl chloride (520 µg/l), 1,1-DCA (100 µg/l), cis-1,2-DCE (870 µg/l), TCE (360 µg/l), and PCE (82 µg/l).

The July sampling results for these wells are similar to the June results. No VOCs were detected in MW-16 and only one VOC, 1,2-DCE (8 µg/l), was detected in MW-17. MW-18 contained vinyl chloride (150 µg/l), cis-1,2-DCE (370 µg/l), trans-1,2-DCE (5.1µg/l), and 1,2-DCA (130 µg/l). MW-19 contained vinyl chloride (490 µg/l), chloroethane (16 µg/l), 1,1-dichloroethane (100 µg/l), cis-1,2-DCE (820 µg/l), trans-1,2-DCE (7.3 µg/l), chloroform (16-µg/l), 1,1,1-trichloroethene (34 µg/l), TCE (330 µg/l), benzene (15 µg/l), and PCE (57 µg/l).

4.5 Pumping Test

The results of the pumping test indicate that the hydrogeology in the southwest corner of the site is complex with significant heterogeneity over short distances. Based on background water-level monitoring, some areas of the USGZ appear to be confined by a shallow clay layer encountered between approximately 5 and 7 feet bgs (i.e., PZ-2 and PZ-3), while in other areas the clay layer is not present (i.e., PZ-1), or does not act as a confining layer (i.e., MW-19). The geological complexity was also apparent during the pumping phases of the test. The drawdown data indicate that the USGZ in the southwest corner of the site is bounded by vertical hydraulic barriers. This boundary condition resulted in a continual drawdown in the area, even under very low pumping rates, and the inability to achieve a steady-state pumping condition in the well. The 0.8-gpm test drawdown curves indicate that the boundary condition started to significantly

influence flow and the water levels in the pumping well after only 250 minutes, which translates to a removal of only 200 gallons of groundwater from the system.

These results suggest that the USGZ in the southwest corner is limited in extent and sustained pumping rates are not possible. A more detailed discussion of the pump test results is presented in Appendix B.

5.0 Conclusions and Recommendations

The results of the RFI groundwater investigations indicate that the extent of affected groundwater in the southern and central portions of the site has been defined and it is restricted to the Ashland and adjacent CSXT properties. The existing monitoring well network is sufficient for long-term monitoring. Therefore, no further groundwater investigation is warranted at the site.

The *in-situ* groundwater samples collected from the USGZ in the southern portion of the site indicate that shallow groundwater has been affected by historic site operations in the vicinity of AOC 1. However, the highest VOC concentrations were detected in sample GP-4, which is sidegradient of AOC 1. Thus, the VOCs detected in the southwest corner of the site may represent a localized area of affected groundwater rather than the migration of VOCs from AOC 1 (Figure 3). The extent of affected groundwater in the vicinity of GP-4 is limited, as evidenced by the non-detectable concentrations of VOCs in samples GP-33 and GP-5, and the trace levels of VOCs in GP-17 (21 µg/l) and MW-15 (which contained 231 µg/l in June 2001). The limited extent of affected groundwater in this area is consistent with the pump test results, which indicates that the USGZ in the southwest corner of the site has a limited horizontal extent and is bounded by vertical hydraulic barriers (see Appendix B). Furthermore, information on the subsurface geology in the southwest corner of the site indicates that the coarse-grained deposits in the vicinity of GP-19 abruptly transition to fine-grained silts and clays. Therefore, no further investigation of the USGZ is warranted in the southern portion of the site.

Groundwater samples GP-9 through GP-12, and GP-30A, were collected from the USGZ in the central portion of the site the vicinity of SWMU 3. No VOCs were detected in sample GP-10, which indicates that VOCs have not migrated offsite east of the Ashland facility. The non-detectable levels of VOCs in sample GP-12, which is hydraulically upgradient of MW-1 and SWMU 3, confirm that affected groundwater in the vicinity of SWMU 3 is unrelated to the VOCs detected in the southern portion of the site. The analytical results from GP-9, GP-18, MW-15, MW-16, and GP-5, and the recent groundwater elevation contour maps of the site, suggest that the VOCs detected on the CSXT property (i.e., GP-6, GP-8, and MW-18) are not related to the southwest corner of the property. Instead, the VOCs detected in MW-18 appear to have originated in the central portion of the site near *in-situ* samples GP-9 and GP-18, which

were collected along the western property line (Figures 2 and 3). Furthermore, the results from GP-11, GP-16, GP-29, GP-30A, and MW-10 (no detectable VOCs in June 2001), indicates that affected groundwater from SWMU 3 is limited in extent and only trace levels of VOCs are present northwest of the site. Therefore, no further investigation of the USGZ is warranted in the central portion of the site.

In-situ groundwater samples were collected from the LSGZ in the central and southern portions of the site and west of the CSXT railroad tracks. The analytical results from samples collected in AOC 1 and SWMU 3 indicated the presence of only trace levels of VOCs above bedrock. Low levels of VOCs were detected above bedrock at GP-19 (486 µg/l); however, *in-situ* samples collected from the LSGZ west of the site contained no detectable VOCs. Therefore, no further investigation of the LSGZ is warranted.

Groundwater samples were collected from three depth intervals at GP-19 to evaluate the potential presence of DNAPL downgradient from GP-4. The analytical results indicate that no DNAPL is present at the intervals sampled.

Given that VOCs in the USGZ are restricted to a limited area near the southwest corner of the property, Ashland does not believe that a groundwater treatment system is warranted in the southern portion of the site. Therefore, the groundwater modeling activities described in the November 3, 2000, work plan will not be performed. Instead, Ashland intends to address affected groundwater in the central portion of the site (i.e., GP-9 area) by operating the existing deep sump.

6.0 References

Environmental Strategies Corporation. 2001. Summary of Additional Phase I RCRA Facility Investigation Activities and Pump Test Results. August 27.

Environmental Strategies Corporation. 2000a. Summary of Additional Phase I RCRA Facility Investigation Activities. October 13.

Environmental Strategies Corporation. 2000b. Pumping Test and Groundwater Modeling Work Plan. November 3.

Environmental Strategies Corporation. 2000c. Summary of Additional Phase I RCRA Facility Investigation Activities. May 12.

Environmental Strategies Corporation. 1999a. Revised Phase I RCRA Facility Investigation Workplan. March 30.

Environmental Strategies Corporation. 1999b. Summary of Phase I RCRA Facility Investigation Activities. August 25.

Environmental Strategies Corporation. 1999c. Addendum to Summary of Phase I RCRA Facility Investigation Activities. November 9.

T.M. Gates. 1994a. SWMU and AOC Assessment Investigative Report. April 18.

T.M. Gates. 1994b. Phase I RCRA Facility Investigation Workplan. April 18.

T.M. Gates. 1993. SWMU Assessment Report. March 22.

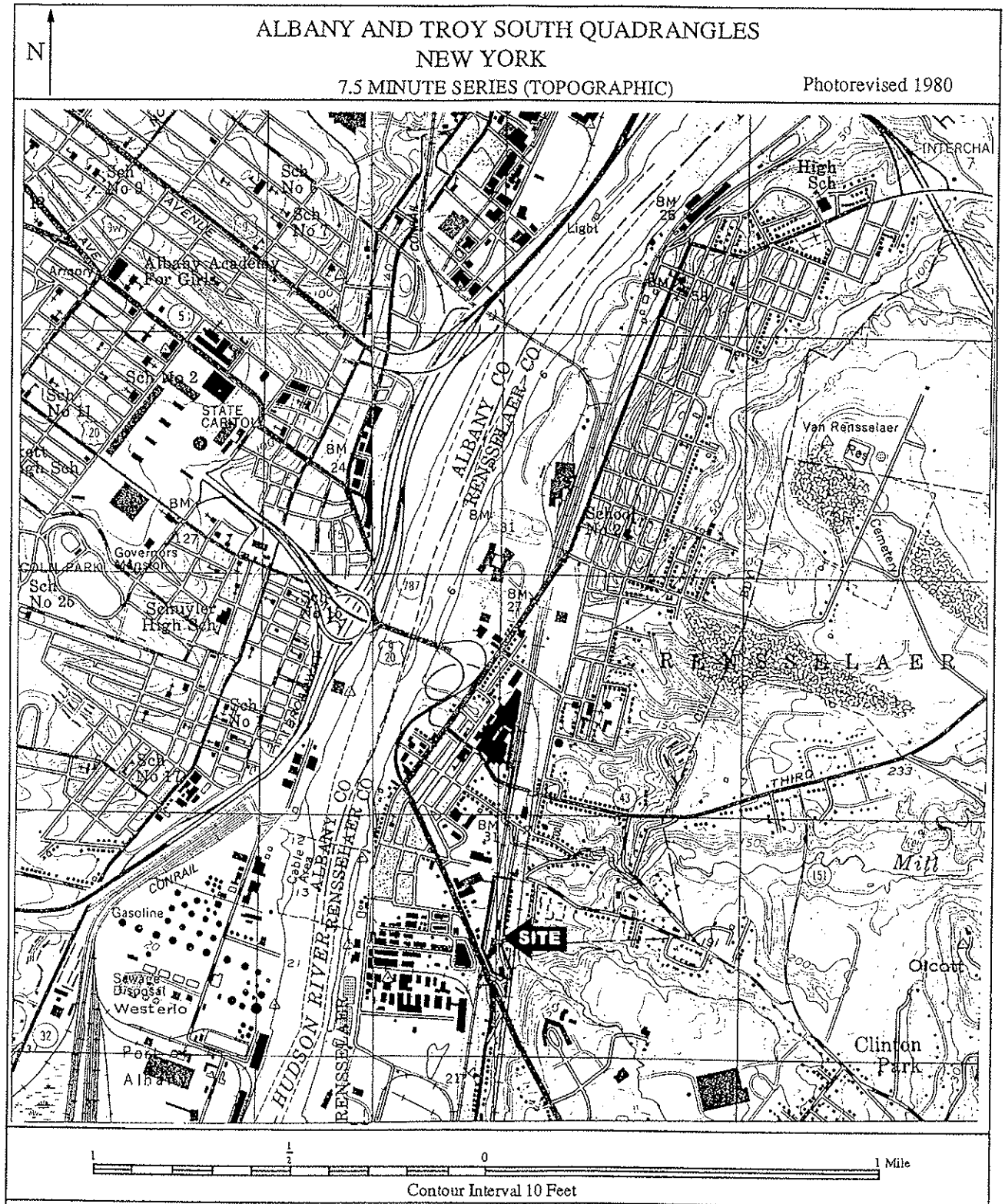
T.M. Gates. 1991. Supplemental Site Assessment and Phase II Remedial/Corrective Measures Plan. February 22.

T.M. Gates. 1989. Supplemental Hydrogeologic Assessment. March 8.

T.M. Gates. 1988. Chronology of Remedial Activities. September 20.

T.M. Gates. 1985. Summary of Remedial Investigation and Proposed Remedial Plan. May 21.

Figures



ENVIRONMENTAL STRATEGIES CORPORATION
Four Penn Center West • Suite 315
Pittsburgh, Pennsylvania 15276
(412) 787-5100

Figure 1
Site Location
Ashland Chemical Company
Rensselaer, New York

BASF CORPORATION

ALBANY MACK SALES

PRATT WALTER & SONS

CARPINELLO OIL

GB ENTERPRISES, LLC

VOLVO SERVICE CENTER

COLUMBIA TURNPIKE (OVERPASS)

CSX TRANSPORTATION, INC., PROPERTY

RAILROAD TRACKS

WAREHOUSE

WAREHOUSE

OFFICE AND WAREHOUSE

CONC PAD

ASPHALT

WAREHOUSE (METAL BUILDING)

GRAVEL

ASPHALT PARKING AREA

CONC RETAINING WALL

SHED

DRIVE THRU BUILDING

SUMP

FORMER SOIL STOCKPILE AREA

STREAM

SOUTH STREET

AIKEN AVE

AMTRACK PROPERTY

MW-10 MW-16 MW-17 MW-18 MW-11 MW-12A MW-12B MW-15 MW-19 MW-13 MW-14 MW-3 MW-4 MW-6S (ABANDONED) MW-9 MW-1

RW-7 RW-6 RW-5 RW-4 RW-3 RW-2 RW-1

PZ-2 PZ-1 PZ-3

LEGEND

MW-10 MONITORING WELL

⑧ STORAGE TANKS

RW-1 RECOVERY WELL

SCALE, FEET

0 100 200

NOTES:

1. Base mapping prepared by ABD Engineers & Surveyors from a July 1996 field survey.
2. Survey shown is subject to any subsurface easements, restrictions or conditions that exist, if any.
3. Underground utilities are shown from field location if possible. Others are shown from record data. Their exact location may be different from that as shown and others may exist.
4. This survey has been prepared in accordance with the code of practice for land surveys adopted by the New York State Association of Professional Land Surveyors as last revised January, 1993
5. Elevations based on USGS datum.
6. This survey was prepared without the benefit of an up to date abstract of title or title report and is subject to any statement of fact that such abstract of title or title report may reveal.

Drawn By: RZ — 061002
Checked:
Approved:
DWG Number: 462690-B50

ASHLAND INC. FACILITY
RENSSELAER, NEW YORK
PREPARED FOR
ASHLAND INC.
DUBLIN, OHIO

Figure 2

SITE LAYOUT

ESC ENGINEERING of NEW YORK, P.C.
9 Albany Street
Cazenovia, New York 13035
315-655-3900

D:\DWG\400\462690 Renss\462690B50.dwg, 06/10/2002 03:23:27 PM, raz

BASF CORPORATION

COLUMBIA TURNPIKE (OVERPASS)

GB ENTERPRISES, LLC

CARPINELLO OIL

PRATT WALTER & SONS

ALBANY MACK SALES

VOLVO SERVICE CENTER

GP-22 [20] (12-16)
GP-25 [ND] (2-6)
GP-23 [ND] (12-16)
GP-24 [ND] (2-6)
GP-14 [ND] (6-16)
GP-28A [19] (4-8)
GP-16 [ND] (2-6)
GP-13 [24] (9-14)
GP-27A [180] (6-16)
GP-16 [18] (4-8)
GP-29 [ND] (14-18)
GP-5 [ND] (4-14)
GP-6 [3,710] (4-14)
GP-8 [3,111] (4-14)
MW-11
MW-12A
MW-12B
MW-10
GP-33 [19,400] (13-17)
GP-26A
GP-17 [21] (4-8)
GP-4 [71,090] (4-8)
GP-19A and B [3,650] (2-6) [16,800] (11-15)
GP-18 [3,630] (2-6)
RW-7
RW-6
RW-5
RW-4
RW-3
RW-2
RW-1
MW-15
GP-11 [84] (8-12)
GP-30A [210] (13-17)
MW-3
MW-4
MW-6S (ABANDONED)
GP-9 [2,774] (8-12)
SHED
DRIVE THRU BUILDING
SUMP
FORMER SOIL STOCKPILE AREA
STREAM
WAREHOUSE
WAREHOUSE
WAREHOUSE
MW-9
MW-1
GP-12 [ND] (4-8)
GP-10 [ND] (20-24)
SWMU 3
SOUTH STREET
MIKEN AVE
[3,780] (4-8)
GP-3
GP-31 [7,000] (7-17)
CONC PAD
OFFICE AND WAREHOUSE
ASPHALT
ADC 1
[3,530] (4-7)
GP-1
GP-2 [110] (4-7)
WAREHOUSE (METAL BUILDING)
GRAVEL
MW-13
ASPHALT PARKING AREA
MW-14
CONC RETAINING WALL
AMTRACK PROPERTY
CSX TRANSPORTATION, INC., PROPERTY
RAILROAD TRACKS

LEGEND

MW-10	MONITORING WELL
GP-10	*IN-SITU* GROUNDWATER SAMPLE LOCATION (JUNE 1999)
GP-13	*IN-SITU* GROUNDWATER SAMPLE LOCATION (MARCH 2000)
GP-26	*IN-SITU* GROUNDWATER SAMPLE LOCATION (AUGUST 2000)
GP-33	*IN-SITU* GROUNDWATER SAMPLE LOCATION (MAY 2001)
⑧	STORAGE TANKS
RW-1	RECOVERY WELL
[110]	TOTAL VOCs IN GROUNDWATER IN µg/l
(4-7)	SAMPLE DEPTH IN FEET BGS
[ND]	VOCs NOT DETECTED IN GROUNDWATER

LEGEND

AOC 1	FORMER SOLVENT TRANSFER AND DRUM STORAGE AREA
SWMU 3	FORMER DRUM STORAGE AREA

SCALE, FEET
0 100 200

NOTES:

1. Base mapping prepared by ABD Engineers & Surveyors from a July 1996 field survey.
2. Survey shown is subject to any subsurface easements, restrictions or conditions that exist, if any.
3. Underground utilities are shown from field location if possible. Others are shown from record data. Their exact location may be different from that as shown and others may exist.
4. This survey has been prepared in accordance with the code of practice for land surveys adopted by the New York State Association of Professional Land Surveyors as last revised January, 1993
5. Elevations based on USGS datum.
6. This survey was prepared without the benefit of an up to date abstract of title or title report and is subject to any statement of fact that such abstract of title or title report may reveal.

Drawn By: RAZ — 061002
Checked:
Approved:
DWG Number: 462690-B51

ASHLAND INC. FACILITY
RENSSELAER, NEW YORK
PREPARED FOR
ASHLAND INC.
DUBLIN, OHIO

Figure 3

TOTAL VOC CONCENTRATIONS IN UPPER SHALLOW GROUNDWATER ZONE

ESC ENGINEERING of NEW YORK, P.C.
9 Albany Street
Cazenovia, New York 13035
315-655-3900

D:\DWG\400\462690 Rensl\462690B51.dwg, 06/26/2002 01:32:51 PM, raz

BASF CORPORATION

ALBANY MACK SALES

PRATT WALTER & SONS

CARPINELLO OIL

GB ENTERPRISES, LLC

VOLVO SERVICE CENTER

COLUMBIA TURNPIKE (OVERPASS)

CSX TRANSPORTATION, INC., PROPERTY

RAILROAD TRACKS

STREAM

SHED

DRIVE THRU BUILDING

SUMP

FORMER SOIL STOCKPILE AREA

WAREHOUSE

WAREHOUSE

WAREHOUSE

OFFICE AND WAREHOUSE

WAREHOUSE (METAL BUILDING)

ASPHALT

GRAVEL

ASPHALT PARKING AREA

CONC RETAINING WALL

AMTRACK PROPERTY

SOUTH STREET

AIKEN AVE.

AOC 1

SWMU 3

MW-1 MW-4 MW-5S (ABANDONED) MW-9 MW-10 MW-11 MW-12A MW-12B MW-13 MW-14 MW-15 MW-16 MW-17 MW-18 MW-19

GP-19C [486] GP-20 [41] GP-21 [9] GP-26B [11] GP-27B [ND] GP-28B [ND] GP-30B [ND]

PZ-1 PZ-2 PZ-3

RW-1 RW-2 RW-3 RW-4 RW-5 RW-6 RW-7

LEGEND

MW-10	MONITORING WELL
GP-13	*IN-SITU* GROUNDWATER SAMPLE LOCATION (MARCH 2000)
GP-26	*IN-SITU* GROUNDWATER SAMPLE LOCATION (AUGUST 2000)
PZ-2	PIEZOMETER LOCATION
(8)	STORAGE TANKS
RW-1	RECOVERY WELL
[11]	TOTAL VOCs IN GROUNDWATER IN µg/l
[ND]	VOCs NOT DETECTED IN GROUNDWATER

LEGEND

AOC 1	FORMER SOLVENT TRANSFER AND DRUM STORAGE AREA
SWMU 3	FORMER DRUM STORAGE AREA

SCALE, FEET

0 100 200

NOTES:

1. Base mapping prepared by ABD Engineers & Surveyors from a July 1996 field survey.
2. Survey shown is subject to any subsurface easements, restrictions or conditions that exist, if any.
3. Underground utilities are shown from field location if possible. Others are shown from record data. Their exact location may be different from that as shown and others may exist.
4. This survey has been prepared in accordance with the code of practice for land surveys adopted by the New York State Association of Professional Land Surveyors as last revised January, 1993
5. Elevations based on USGS datum.
6. This survey was prepared without the benefit of an up to date abstract of title or title report and is subject to any statement of fact that such abstract of title or title report may reveal.

Drawn By: raz — 061002
Checked:
Approved:
DWG Number: 462690-B52

ASHLAND INC. FACILITY
RENSSELAER, NEW YORK
PREPARED FOR
ASHLAND INC.
DUBLIN, OHIO

Figure 4

TOTAL VOC CONCENTRATIONS IN
LOWER SHALLOW GROUNDWATER ZONE

ESC ENGINEERING of NEW YORK, P.C.
9 Albany Street
Cazenovia, New York 13035
315-655-3900

D:\DWG\400\462690 Rensslt462690B52.dwg, 06/26/2002 01:31:59 PM, raz

COLUMBIA TURNPIKE (OVERPASS)

MW-16

N

CHAIN-LINK FENCE

PZ-2 PZ-1 MW-19 RW-7 RW-6 RW-5 MW-15 RW-4 RW-3 RW-2 RW-1

12"CMP

CONCRETE SWALE

REMAINS CONC RAILROAD SIDING

CONC REWALL

REMAINS CONC RAILROAD SIDING

STONE

PZ-3

12"PVC

CB

35 32

34 33

LEGEND

MW-15 MONITORING WELL

RW-7 RECOVERY WELL

PZ-1 PIEZOMETER

WAREHOUSE

WAREHOUSE

40

41

CONC PAD

OFFICE AND WAREHOUSE

LOADING DOCK

CONC PAD

GATE POST

GATE POST

ASPHALT

HEADWALL

HYDRANT

CULVERT

MH

ASPHALT

CONC RAMP

ENTRANCE

GATE POST

BOLLARD

BOLLARD

HEADWALL

RR SPIKE FOUND

IRF

WV

GRAVEL DRIVE

GATE

SCALE, FEET

0 15 30 60

D:\DWG\00\462690 Renss\462690B53.dwg, 06/10/2002 04:03:19 PM, raz

Drawn By: RAZ — 061002

Checked:

Approved:

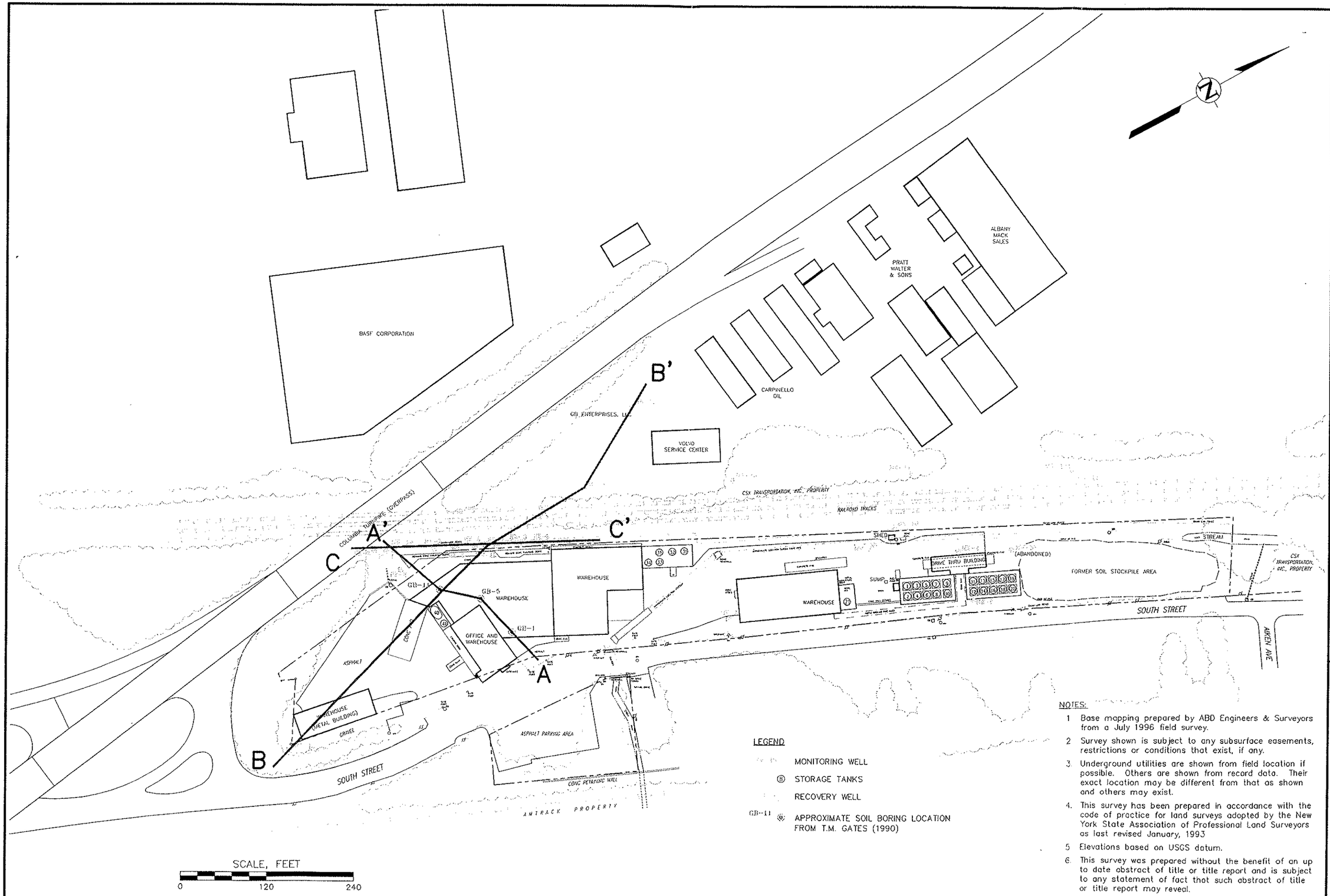
DWG Number: 462690-B53

ASHLAND INC. FACILITY
RENSSELAER, NEW YORK
PREPARED FOR
ASHLAND INC.
DUBLIN, OHIO

Figure 5

PUMPING WELL AND PIEZOMETER LOCATIONS

ESC ENGINEERING of NEW YORK, P.C.
9 Albany Street
Cazenovia, New York 13035
315-655-3900



LEGEND

- MONITORING WELL
- (B) STORAGE TANKS
- RECOVERY WELL
- GB-11 APPROXIMATE SOIL BORING LOCATION FROM T.M. GATES (1990)

NOTES:

1. Base mapping prepared by ABD Engineers & Surveyors from a July 1996 field survey.
2. Survey shown is subject to any subsurface easements, restrictions or conditions that exist, if any.
3. Underground utilities are shown from field location if possible. Others are shown from record data. Their exact location may be different from that as shown and others may exist.
4. This survey has been prepared in accordance with the code of practice for land surveys adopted by the New York State Association of Professional Land Surveyors as last revised January, 1993
5. Elevations based on USGS datum.
6. This survey was prepared without the benefit of an up to date abstract of title or title report and is subject to any statement of fact that such abstract of title or title report may reveal.

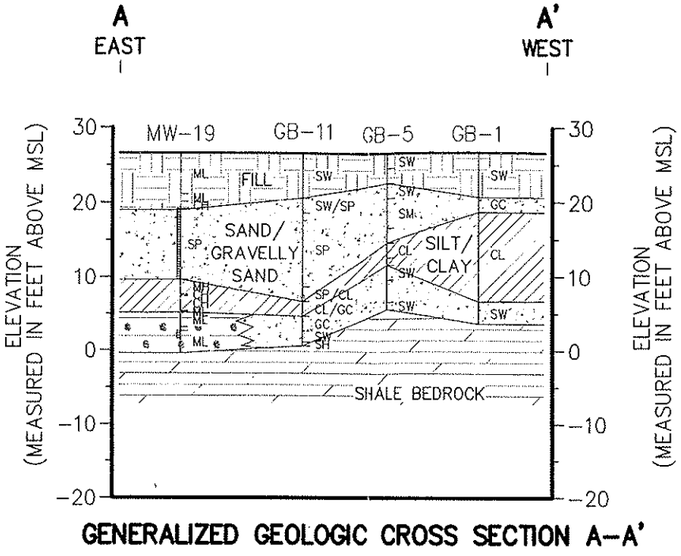
ASHLAND INC. FACILITY
RENSSELAER, NEW YORK
PREPARED FOR
ASHLAND INC.
DUBLIN, OHIO

Drawn By:	EGC
Checked:	
Approved:	
DWG Number:	46269005

Figure 6

CROSS SECTION LOCATION PLAN

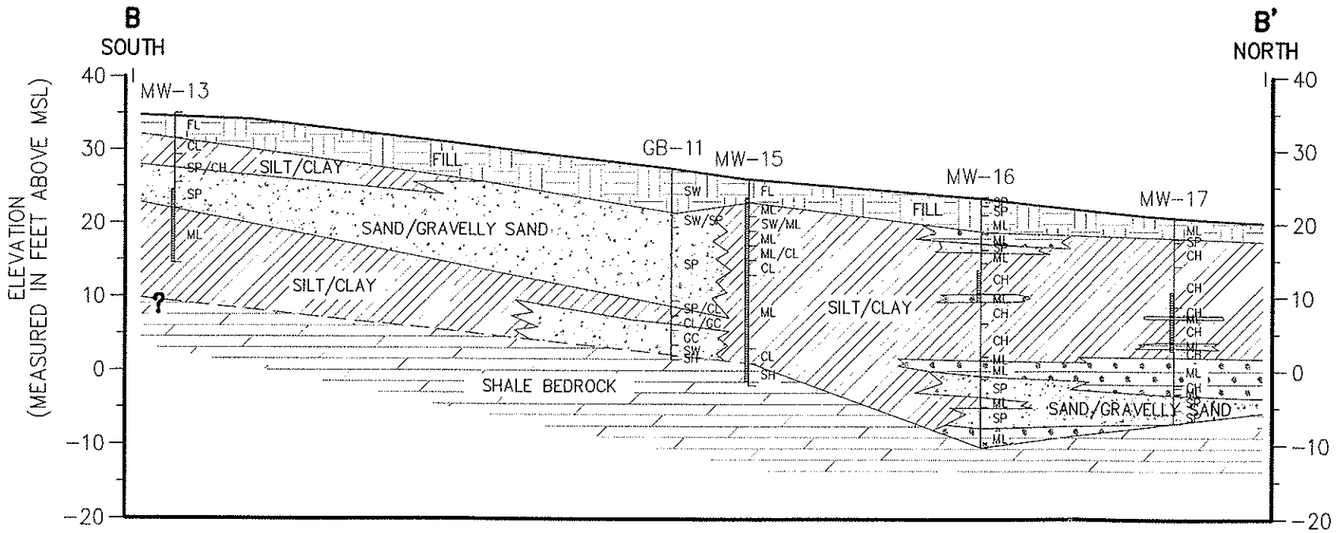
ENVIRONMENTAL STRATEGIES CORPORATION
Four Penn Center West, Suite 315
Pittsburgh, Pennsylvania 15276
(412) 787-5100
ESC



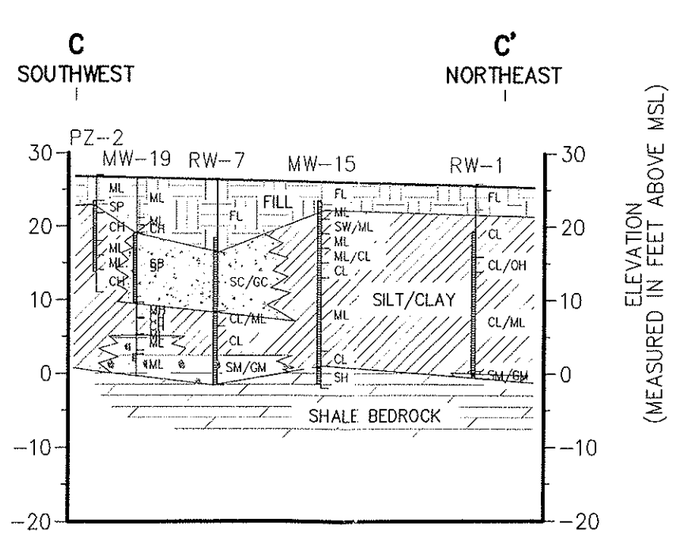
GENERALIZED GEOLOGIC CROSS SECTION A–A'

LEGEND

- FILL
- SILT/CLAY
- SAND/GRAVELLY SAND
- SILTY SAND/SILTY GRAVEL
- SHALE BEDROCK



GENERALIZED GEOLOGIC CROSS SECTION B–B'



GENERALIZED GEOLOGIC CROSS SECTION C–C'

5:1 VERTICAL EXAGGERATION

VERTICAL SCALE (FEET)

20 0 20

HORIZONTAL SCALE (FEET)

100 0 100

Drawn By: EGC 3/13/02
Checked:
Approved:
DWG Name: 46269001

ASHLAND INC. FACILITY
RENSSELEAR, NEW YORK
PREPARED FOR
ASHLAND INC.
DUBLIN, OHIO

Figure 7

GENERALIZED CROSS SECTION
A–A', B–B', AND C–C'

ESC ENGINEERING OF NEW YORK, P.C.

ESC

BASF CORPORATION

PRATT WALTER & SONS

ALBANY MACK SALES

GB ENTERPRISES, LLC

CARPINELLO OIL

VOLVO SERVICE CENTER

COLUMBIA TURNPIKE (OVERPASS)

CSX TRANSPORTATION, INC., PROPERTY

WAREHOUSE

OFFICE AND WAREHOUSE

WAREHOUSE (METAL BUILDING)

CONC PAD

ASPHALT

ASPHALT PARKING AREA

GRAVEL

DRIVE THRU BUILDING

SHED

SUMP

STREAM

FORMER SOIL STOCKPILE AREA

SOUTH STREET

AIKEN AVE

CONC RETAINING WALL

AMTRACK PROPERTY

MW-10 [22.46]
MW-17 [15.95]
MW-16 [19.77]
MW-18 [21.11]
MW-11 [19.95]
MW-12A [16.69]
MW-12B [17.13]
MW-19 [24.46]
MW-15 [23.47]
MW-3 [22.91]
MW-4 [21.86]
MW-2 (ABANDONED)
MW-1 [24.18]
MW-9 [22.85]
MW-13 [34.07]
MW-14 [28.08]
PZ-2
PZ-1
PZ-3
RW-8
RW-7
RW-6
RW-5
RW-4
RW-3
RW-2
[23.96]

18 20 22 24 26 28 30 32

SCALE, FEET
0 100 200

LEGEND

MW-10 MONITORING WELL
(B) STORAGE TANKS
RW-1 RECOVERY WELL
[28.08] GROUNDWATER ELEVATION
24 GROUNDWATER CONTOUR (DASHED WHERE INFERRED)

NOTES:

1. Base mapping prepared by ABD Engineers & Surveyors from a July 1996 field survey.
2. Survey shown is subject to any subsurface easements, restrictions or conditions that exist, if any.
3. Underground utilities are shown from field location if possible. Others are shown from record data. Their exact location may be different from that as shown and others may exist.
4. This survey has been prepared in accordance with the code of practice for land surveys adopted by the New York State Association of Professional Land Surveyors as last revised January, 1993
5. Elevations based on USGS datum.
6. This survey was prepared without the benefit of an up to date abstract of title or title report and is subject to any statement of fact that such abstract of title or title report may reveal.

Drawn By: RTZ — 061002
Checked:
Approved:
DWG Number: 462690-B55

ASHLAND INC. FACILITY
RENSSELAER, NEW YORK
PREPARED FOR
ASHLAND INC.
DUBLIN, OHIO

Figure 8
GROUNDWATER ELEVATION
CONTOUR MAP – JUNE 4, 2001

ESC ENGINEERING of NEW YORK, P.C.
9 Albany Street
Cazenovia, New York 13035
315-655-3900

D:\DWG\400\462690 Rens\462690B55.dwg, 06/10/2002 04:17:57 PM, rtz

BASF CORPORATION

PRATT WALTER & SONS

ALBANY MACK SALES

CB ENTERPRISES, LLC

MW-17 [16.11]

CARPINELLO OIL

VOLVO SERVICE CENTER

MW-16 [17.53]

MW-18 [19.29]

MW-11 [19.50]

MW-12A [17.77]

MW-12B [16.30]

CSX TRANSPORTATION, INC. PROPERTY

RAILROAD TRACKS

COLUMBIA TURNPIKE (OVERPASS)

MW-19 [24.17]

PZ-1

PZ-2

PZ-3

RW-8

RW-7

RW-6

RW-5

RW-4

RW-3

RW-2

RW-1

MW-15 [23.09]

WAREHOUSE

WAREHOUSE

OFFICE AND WAREHOUSE

CONC PAD

ASPHALT

WAREHOUSE (METAL BUILDING)

GRAVEL

MW-13 [33.97]

SOUTH STREET

ASPHALT PARKING AREA

MW-14 [27.27]

CONC RETAINING WALL

AMTRACK PROPERTY

MW-10 [21.20]

SHED

MW-3 [21.71]

MW-4 [21.18]

MW-5S (ABANDONED)

DRIVE THRU BUILDING

[23.15] SUMP

MW-1

MW-9 [22.06]

FORMER SOIL STOCKPILE AREA

STREAM

CSX TRANSPORTATION, INC., PROPERTY

SOUTH STREET

AIKEN AVE

17 19 21 23 25 27 29 31 33

SCALE, FEET

0 100 200

LEGEND

MW-10 MONITORING WELL

(8) STORAGE TANKS

RW-1 RECOVERY WELL

[24.17] GROUNDWATER ELEVATION

23 GROUNDWATER CONTOUR (DASHED WHERE INFERRED)

NOTES:

1. Base mapping prepared by ABD Engineers & Surveyors from a July 1996 field survey.
2. Survey shown is subject to any subsurface easements, restrictions or conditions that exist, if any.
3. Underground utilities are shown from field location if possible. Others are shown from record data. Their exact location may be different from that as shown and others may exist.
4. This survey has been prepared in accordance with the code of practice for land surveys adopted by the New York State Association of Professional Land Surveyors as last revised January, 1993
5. Elevations based on USGS datum.
6. This survey was prepared without the benefit of an up to date abstract of title or title report and is subject to any statement of fact that such abstract of title or title report may reveal.

Drawn By: RTZ — 061002
Checked:
Approved:
DWG Number: 462690-B56

ASHLAND INC. FACILITY
RENSSELAER, NEW YORK
PREPARED FOR
ASHLAND INC.
DUBLIN, OHIO

Figure 9
GROUNDWATER ELEVATION
CONTOUR MAP – JULY 6, 2001

ESC ENGINEERING of NEW YORK, P.C.
9 Albany Street
Cazenovia, New York 13035
315-655-3900

D:\DWG\400\462690 Renss\462690B56.dwg, 06/10/2002 04:20:04 PM, raz

Tables

Table 1

In-Situ Groundwater Sampling Results
Upper Shallow Groundwater Zone
Ashland Distribution Company
Rensselaer, New York
June 1999 through August 2000 (a) (b)

Sample Location	GP-1	GP-2	GP-3	GP-4	GP-5	GP-6	GP-8	GP-9	GP-90(c)	GP-10	GP-11	GP-12
Sample Depth (ft)	4-7	4-7	4-8	4-8	4-14	4-14	4-14	4-7	4-7	20-24	4-8	4-8
VOCs (µg/l)												
Vinyl Chloride	430	ND	520	ND	ND	ND	480	490	440	ND	42	ND
1,1-Dichloroethane	ND	ND	ND	1,600	ND	ND	ND	ND	ND	ND	ND	ND
1,2-Dichloroethene (total)	3,100	ND	1,500	19,000	ND	3,300	880	1,084	1,090	ND	35	ND
Chloroform	ND	11	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,2-Dichloroethane	ND	ND	ND	ND	ND	ND	1,700	ND	ND	ND	7.1	ND
1,1,1-Trichloroethane	ND	ND	ND	1,700	ND	ND	ND	ND	ND	ND	ND	ND
Carbon Tetrachloride	ND	ND	ND	ND	ND	ND	51	ND	ND	ND	ND	ND
Trichloroethene	ND	12	560	5,400	ND	410	ND	1,200	980	ND	ND	ND
Tetrachloroethene	ND	87	1,200	40,000	ND	ND	ND	ND	ND	ND	ND	ND
Toluene	ND	ND	ND	730	ND	ND	ND	ND	ND	ND	ND	ND
Ethylbenzene	ND	ND	ND	560	ND	ND	ND	ND	ND	ND	ND	ND
Xylenes (total)	ND	ND	ND	2,100	ND	ND	ND	ND	ND	ND	ND	ND

Sample Location	GP-13	GP-14	GP-15	GP-16	GP-17	GP-18	GP-19A	GP-190A(d)	GP-19B	GP-22	GP-23	GP-24
Sample Depth (ft)	9-14	6-16	2-6	4-8	4-8	2-6	2-6	2-6	11-15	12-16	12-16	2-6
VOCs (µg/l)												
Vinyl Chloride	ND	ND	ND	ND	ND	380	1,800	2,100	7,000	ND	ND	ND
1,1-Dichloroethane	ND	ND	ND	ND	21	ND	550	560	ND	ND	ND	ND
1,2-Dichloroethene (total)	24	ND	ND	18	ND	3,300	750	770	9,800	ND	ND	ND
Chloroform	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,2-Dichloroethane	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,1,1-Trichloroethane	ND	ND	ND	ND	ND	ND	550	590	ND	ND	ND	ND
Carbon Tetrachloride	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Trichloroethene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Tetrachloroethene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Toluene	ND	ND	ND	ND	ND	ND	ND	ND	ND	20	ND	ND
Ethylbenzene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Xylenes (total)	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND

Table 1 (cont.)
In-Situ Groundwater Sampling Results
Upper Shallow Groundwater Zone
Ashland Distribution Company
Rensselaer, New York
June 1999 through August 2000 (a) (b)

Sample Location	GP-25	GP-26A	GP-27A	GP-28A	GP-29	GP-30A	GP-31	GP-32(e)	GP-33
Sample Depth (ft)	2-6	13-17	6-16	4-8	14-18	13-17	7-17	7-17	13-17
VOCs (µg/l)									
Vinyl Chloride	ND	1,900	ND	ND	ND	210	ND	ND	ND
1,1-Dichloroethane	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,2-Dichloroethene (total)	ND	13,000	170	ND	ND	ND	1,500	1,400	ND
Chloroform	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,2-Dichloroethane	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,1,1-Trichloroethane	ND	ND	ND	ND	ND	ND	ND	ND	ND
Carbon Tetrachloride	ND	ND	ND	ND	ND	ND	ND	ND	ND
Trichloroethene	ND	4,500	ND	ND	ND	ND	800	760	ND
Tetrachloroethene	ND	ND	ND	ND	ND	ND	4,700	9,600	ND
Toluene	ND	ND	10	19	ND	ND	ND	ND	ND
Ethylbenzene	ND	ND	ND	ND	ND	ND	ND	ND	ND
Xylenes (total)	ND	ND	ND	ND	ND	ND	ND	ND	ND

a/ June 16-18, 1999 (GP-1 through GP-12, GP-90); March 13-16, 2000 (GP-13 through GP-25, GP-190A); August 16-18, 2000 (GP-26A through GP-33) May 14-18, 2001 (GP-33).
b/ µg/l = micrograms per liter; ND = compound not detected above laboratory reporting limit.
c/ Sample GP-90 is a duplicate of sample GP-9
d/ Sample GP-190A is a duplicate of sample GP-19A
e/ Sample GP-32 is a duplicate of sample GP-31

Table 2
***In-Situ* Groundwater Sampling Results**
Lower Shallow Groundwater Zone
Ashland Distribution Company
Rensselaer, New York
March 2000 and August 2000 (a) (b)

Sample Location	GP-19C	GP-20	GP-21	GP-26B	GP-27B	GP-28B	GP-30B
Sample Depth (ft)	23-27	21-25	24-28	24.5-28.5	28.5-32.5	25.5-29.5	24.5-28.5
VOCs (µg/l)							
Vinyl Chloride	300	33	ND	ND	ND	ND	ND
1,1-Dichloroethane	12	ND	ND	ND	ND	ND	ND
1,2-Dichloroethene (total)	130	8	9	11	ND	ND	ND
Tetrachloroethene	44	ND	ND	ND	ND	ND	ND

a/ March 13-16, 2000 (GP-19C, GP-20, GP-21); August 16-18, 2000 (GP-26B through GP-30B)
b/ µg/l = micrograms per liter; ND = compound not detected above laboratory reporting limit.

Table 3

Semiannual Groundwater Sampling Results
Ashland Distribution Company
Rensselaer, New York
June 5 through 7, 2001 (a)

Compound (µg/l)	MW-1	MW-20 (b)	MW-3	MW-4	MW-9	MW-10
Vinyl chloride	ND	ND	ND	ND	ND	ND
1,1-Dichlorethene	130	130	ND	ND	ND	ND
1,1-Dichlorethane	ND	ND	24	ND	ND	ND
cis-1,2-Dichloroethene	2,200	2,100	28	ND	ND	ND
trans-1,2-Dichloroethene	ND	ND	ND	ND	ND	ND
1,2-Dichloroethane	ND	ND	ND	ND	ND	ND
1,1,1-Trichloroethane	72	58	ND	ND	ND	ND
Trichloroethene	3,800	3,600	ND	ND	ND	ND
Tetrachloroethene	470	400	ND	ND	ND	ND

Compound (µg/l)	MW-11	MW-12A	MW-12B	MW-13	MW-14	MW-15
Vinyl chloride	ND	ND	ND	ND	ND	ND
1,1-Dichlorethene	ND	ND	ND	ND	ND	ND
1,1-Dichlorethane	ND	ND	ND	ND	ND	ND
cis-1,2-Dichloroethene	ND	ND	ND	ND	ND	88
trans-1,2-Dichloroethene	ND	ND	ND	ND	ND	ND
1,2-Dichloroethane	ND	ND	ND	ND	ND	ND
1,1,1-Trichloroethane	ND	ND	ND	ND	ND	ND
Trichloroethene	ND	ND	ND	ND	ND	80
Tetrachloroethene	ND	ND	ND	ND	ND	63

Compound (µg/l)	MW-16	MW-17	MW-18	MW-19
Vinyl chloride	ND	ND	210	520
1,1-Dichlorethene	ND	ND	ND	ND
1,1-Dichlorethane	ND	ND	ND	100
cis-1,2-Dichloroethene	22	ND	390	870
trans-1,2-Dichloroethene	ND	ND	23	ND
1,2-Dichloroethane	ND	ND	180	ND
1,1,1-Trichloroethane	ND	ND	ND	ND
Trichloroethene	ND	ND	ND	360
Tetrachloroethene	ND	ND	ND	82

a/ µg/l = micrograms per liter; ND = compound was analyzed for but not detected.
b/ MW-20 is a duplicate sample of MW-1.

Table 4

Groundwater Sampling Results
Ashland Distribution Company
Rensselaer, New York
July 6, 2001 (a)

Compound (µg/l)	MW-16	MW-17	MW-18	MW-19
Vinyl chloride	ND	ND	150	490
Chloroethane	ND	ND	ND	16
1,1-Dichlorethane	ND	ND	ND	100
cis-1,2-Dichloroethene	ND	8	370	820
trans-1,2-Dichloroethene	ND	ND	5.1	7.3
Chloroform	ND	ND	ND	16
1,2-Dichloroethane	ND	ND	130	ND
1,1,1-Trichloroethane	ND	ND	ND	34
Trichloroethene	ND	ND	ND	330
Benzene	ND	ND	ND	15
Tetrachloroethene	ND	ND	ND	57

a/ µg/l = micrograms per liter; ND = compound was analyzed for but not detected.

Table 5

Groundwater Measurements and Elevations
Ashland Distribution Company
Rensselaer, New York
June 4, 2001 (a)

Well Identification	Elevation at Reference Mark (feet above MSL)	Depth to Groundwater (feet)	Groundwater Elevation (feet above MSL)
MW-1	29.30	5.12	24.18
MW-3	25.06	2.15	22.91
MW-4	26.86	5.00	21.86
MW-9	27.67	4.82	22.85
MW-10	25.93	3.47	22.46
MW-11	25.38	5.43	19.95
MW-12A	24.25	7.56	16.69
MW-12B	24.51	7.38	17.13
MW-13	37.46	3.39	34.07
MW-14	34.20	6.12	28.08
MW-15	26.11	2.70	23.41
MW-16	25.81	6.04	19.77
MW-17	22.21	6.26	15.95
MW-18	24.37	3.26	21.11
MW-19	27.82	3.36	24.46
Deep Sump	26.95	2.99	23.96

a/ MSL = mean sea level.

Table 6

Groundwater Measurements and Elevations
Ashland Distribution Company
Rensselaer, New York
July 6, 2001 (a)

Well Identification	Elevation at Reference Mark (feet above MSL)	Depth to Groundwater (feet)	Groundwater Elevation (feet above MSL)
MW-3	25.06	3.35	21.71
MW-4	26.86	5.68	21.18
MW-9	27.67	5.59	22.08
MW-10	25.93	4.73	21.20
MW-11	25.38	5.88	19.50
MW-12A	24.25	6.48	17.77
MW-12B	24.51	8.21	16.30
MW-13	37.46	3.49	33.97
MW-14	34.20	6.93	27.27
MW-15	26.11	3.02	23.09
MW-16	25.81	8.28	17.53
MW-17	22.21	6.10	16.11
MW-18	24.37	5.08	19.29
MW-19	27.82	3.65	24.17
Deep Sump	26.95	3.80	23.15

a/ MSL = mean sea level.

Appendix A – Boring Logs and As-Built Diagrams

Boring Log: GP-19

Project: Ashland Chemical Co.

Project No.: 462690

Location: Rensselaer, NY

Geologist: David P. Bouchard

Completion Date: March 14, 2000

Surface Elevation (ft. MSL): Not determined

Total Depth (ft. bgs): 27

TOC Elevation (ft. MSL):

Borehole Diameter (in.) 2

ESC

Sample Data				SUBSURFACE PROFILE		
Depth	Sample Interval	% Recovery	PID (ppm)	Symbol	Description	Well Construction
0					Ground Surface	
1	1	25	10.2			
2						
3	2	12	35.0		*Gravelly silt (ML)* Dark grey to black silt and gravel, little fine-grained sand, little wood debris; loose; moist becoming wet at 3.5 feet; slight solvent-type odor.	
4						
5	3	75	20.3			
6					*Silt (ML)* Greenish-grey silt, little clay; very dense; dry; no odor.	
7	4	75	18.2		*Clay (CH)* Greenish-grey silt and clay, trace to little brick fragments, concrete; very stiff; medium plasticity; dry.	
8						
9	5	25	19.0			
10						
11	6	75	36			
12					*Sand with Gravel (SP)* Dark grey to black-stained fine to medium-grained sand and gravel, some thin (less than 1 inch) medium dense, fine-grained sand and silt layers between 12.0 to 14.0 feet; loose; wet.	
13	7	75	-			
14						
15	8	12	42			
16						
17	9	75	54			
18					*Silt (MH)* Dark grey silt, some clay; trace fine sand, trace woody debris; medium dense; low to medium plasticity; moist.	
19	10	50	50			
20					*Clay (CH)* Greenish-grey clay, some silt; medium stiff; medium to high plasticity; moist.	
21	11	50	9.2		*Clay (CH)* Grey clay, little to some silt; soft becoming medium stiff at 21.0 feet, sticky; moist.	
22					*Gravelly Silt (ML)* Dark grey silt and gravel, trace fine sand; loose; wet.	
23	12	25	8.2		*Gravelly Silt (ML)* Dark grey silt and gravel, little fine sand; medium dense; moist.	
24					*Poorly Graded Sand (SP)* Dark grey fine-grained sand, little to no gravel; medium dense; moist.	
25						

Subcontractor: Parrat Wolff, Inc.

Method: Direct Push

Driller/Operator: Doug Richmond/Dennis Fallon

Boring Log: GP-19

Project: Ashland Chemical Co.

Project No.: 462690

Location: Rensselaer, NY

Geologist: David P. Bouchard

Completion Date: March 14, 2000

Surface Elevation (ft. MSL): Not determined

Total Depth (ft. bgs): 27

TOC Elevation (ft. MSL):

Borehole Diameter (in.) 2

ESC

Sample Data				SUBSURFACE PROFILE		
Depth	Sample Interval	% Recovery	PID (ppm)	Symbol	Description	Well Construction
26	13	100	3.3		*Gravelly Silt with Sand (ML)* Dark grey silt and gravel, some fine-grained sand; loose becoming dense to very dense at 25 feet; wet becoming dry at 25 feet and moist at 26 feet.	
27	14	100	0		Refusal on Bedrock at 27 feet.	
28					Boring Terminated	
29						
30						
31						
32						
33						
34						
35						
36						
37						
38						
39						
40						
41						
42						
43						
44						
45						
46						
47						
48						
49						
50						

Subcontractor: Parrat Wolff, Inc.

Method: Direct Push

Driller/Operator: Doug Richmond/Dennis Fallon

Boring Log: GP-21

Project: Ashland Chemical Co.

Project No.: 462690

Location: Rensselaer, NY

Geologist: David P. Bouchard

Completion Date: March 15, 2000

Surface Elevation (ft. MSL): Not determined

Total Depth (ft. bgs): 33

Borehole Diameter (in.) 2

Depth	Sample Interval	% Recovery	PID (ppm)	Symbol	Description
0					Ground Surface
					Asphalt
1	1	25	10.2		*Gravelly Silt with Sand (ML)* Greyish-brown silt and coarse gravel, little fine to medium-grained sand; little brick, glass, asphalt; loose; moist.
2					
3	2	12	35.0		*Silt (MH)* Brown silt, some clay, medium dense to dense; low to medium plasticity; dry.
4					
5	3	75	20.3		*Clay (CH)* Brown silt and clay, stiff to very stiff; medium to high plasticity; moist.
6					
7	4	75	18.2		*Clay (CH)* Brown to greyish-brown clay, little silt; very stiff to hard; medium to high plasticity; moist.
8					
9	5	25	19.0		
10					*Clay (CH)* Brown silt and clay, stiff to very stiff; medium to high plasticity; moist.
11	6	75	36		*Clay (CH)* Brown to greyish-brown clay, little silt; very stiff to hard; medium to high plasticity; moist.
12					*Clay (CH)* Brown silt and clay, stiff to very stiff; medium to high plasticity; moist becoming wet between 10.7-10.9.
13	7	75	-		*Clay (CL)* Dark grey clay, trace silt; soft; high plasticity, sticky; moist to wet.
14					*Clay (CL)* Greyish-brown clay, very soft; high plasticity, sticky; wet.
15	8	12	42		*Silt (MH)* Dark grey silt, some clay; medium stiff; medium plasticity; moist.
16					
17	9	75	54		*Clay (CH)* Dark grey silt, some clay, trace gravel; soft; medium plasticity, sticky; wet.
18					
19	10	50	50		
20					
21	11	50	9.2		*Silty Sand (SM)* Dark grey fine-grained sand, little to some silt; loose to medium dense; wet.
22					
23	12	25	8.2		
24					
25					

Subcontractor: Parrat Wolff, Inc.

Method: Direct Push

Driller/Operator: Doug Richmond/Dennis Fallon

Boring Log: GP-21

Project: Ashland Chemical Co.

Project No.: 462690

Location: Rensselaer, NY

Geologist: David P. Bouchard

Completion Date: March 15, 2000

Surface Elevation (ft. MSL): Not determined

Total Depth (ft. bgs): 33

Borehole Diameter (in.) 2

Depth	Sample Interval	% Recovery	PID (ppm)	Symbol	Description
26	13	100	3.3		
	14	100	0		
27					*Sand (SP)* Dark grey medium to fine-grained sand, trace to little gravel; loose to medium dense; moist becoming wet at 27.2 feet.
28					*Sand with Gravel (SP)* Dark grey medium to coarse-grained sand, little gravel; medium dense to very dense; moist.
31					Refusal on Bedrock at 33 feet.
33					Boring Terminated

Subcontractor: Parrat Wolff, Inc.

Method: Direct Push

Driller/Operator: Doug Richmond/Dennis Fallon

Boring Log: GP-27

Project: Ashland Chemical Co.

Project No.: 462690

Location: Rensselaer, NY

Geologist: David P. Bouchard

Completion Date: 17 Aug 00

Surface Elevation (ft. MSL): Not determined

Total Depth (ft. bgs): 32.5

Borehole Diameter (in.) 2

Depth	Sample Interval	% Recovery	PID (ppm)	Symbol	Description
0					Ground Surface
1	1	0	-		
2					
3	2	0	-		
4					*No recovery*
5	3	0	-		
6					
7	4	12	0		
8					*Sand with Gravel (SP)*
9	5	50	2.8		Brown medium-grained sand and gravel; loose; dry.
10					*Silt with Gravel (ML)*
11	6	25	0		Brown silt, little to some gravel; medium dense; moist; some gray mottling between 9.5 and 10.0 feet.
12					
13	7	25	0		*Sand with Gravel (SP)*
14					Grayish-brown medium-grained sand and gravel, trace brick, wood; loose; dry.
15	8	100	0		*Sand with Gravel (SP)*
16					Brown medium to coarse-grained sand and gravel; loose; wet.
17	9	75	0		*Clay (CL)*
18					Grayish-brown clay, some silt; moist; very stiff.
19	10	100	0		*Silt (ML)*
20					Grayish-brown silt, some clay; medium dense to dense; moist becoming dry at 16.5 feet.
21	11	75	0		
22					
23	12	50	0		
24					
25					*Silt with gravel (ML)*
					Dark gray to black silt, little to some gravel; medium dense; dry.

Subcontractor: Parratt Wolff

Method: Direct Push

Driller/Operator: Rod Trask

Boring Log: GP-27

Project: Ashland Chemical Co.

Project No.: 462690

Location: Rensselaer, NY

Geologist: David P. Bouchard

Completion Date: 17 Aug 00

Surface Elevation (ft. MSL): Not determined

Total Depth (ft. bgs): 32.5

Borehole Diameter (in.) 2

Depth	Sample Interval	% Recovery	PID (ppm)	Symbol	Description
26	13	75	0		
27	14	75	0		*Silt with gravel (ML)* Dark gray to black silt, little to some gravel; medium dense; dry.
28					Wet between 24.5 and 25.0 feet.
29	15	75	0		
30					
31	16	75	0		*Silt (ML)* Dark gray silt; loose to medium dense; moist.
32					Wet between 31.0 and 31.6 feet.
	17	100	0		*Silt (ML)* Dark gray silt, little to some gravel (shale fragments); very dense; dry.
33					Boring Terminated
34					
35					
36					
37					
38					
39					
40					
41					
42					
43					
44					
45					
46					
47					
48					
49					
50					

Subcontractor: Parratt Wolff

Driller/Operator: Rod Trask

Method: Direct Push

Boring Log: GP-28

Project: Ashland Chemical Co.

Project No.: 462690

Location: Rensselaer, NY

Geologist: David P. Bouchard

Completion Date: 17 Aug 00

Surface Elevation (ft. MSL): Not determined

Total Depth (ft. bgs): 29

Borehole Diameter (in.) 2

ESC

Depth	Sample Interval	% Recovery	PID (ppm)	Symbol	Description
0					Ground Surface
					Asphalt
1	1	0	-		*Sand with Gravel (SP)*
					Greyish-brown medium-grained sand and gravel; loose; dry.
2					*Sand with Gravel (SP)*
3	2	75	-		Brown fine-grained sand, some gravel, trace brick, concrete, wood; medium dense; dry.
4					*Sand (SP)*
					Dark grey to black fine-grained sand, some cinders; loose; dry.
5	3	50	-		*Silt (ML)*
					Dark brown silt, some woody debris, medium dense; dry.
6					*Silty Sand with Gravel (SM)*
					Grayish-brown fine-grained sand, some silt, little gravel, trace brick, glass; medium dense; dry.
7	4	75	-		Water in spoon.
8					*Silt (ML)*
					Brownish-grey to reddish-brown silt, some clay; dense; dry.
9	5	75	-		
10					
11	6	75	-		
12					
13	7	75	-		*Clay (CL)*
14					Greyish-brown clay, trace gravel (shale fragments); stiff; dry.
15	8	75	-		Very stiff from 12 to 14 feet.
16					
17	9	0	-		
18					
19	10	25	-		*Silt (ML)*
20					Dark grey silt, some clay, trace rock fragments; dense; moist.
21	11	75	-		
22					
23	12	0	-		*Silt with Gravel (ML)*
24					Dark grey silt and gravel; very dense; dry.
25					

Subcontractor: Parratt Wolff

Method: Direct Push

Driller/Operator: Rod Trask

Boring Log: GP-28

Project: Ashland Chemical Co.

Project No.: 462690

Location: Rensselaer, NY

Geologist: David P. Bouchard

Completion Date: 17 Aug 00

Surface Elevation (ft. MSL): Not determined

Total Depth (ft. bgs): 29

Borehole Diameter (in.) 2

Depth	Sample Interval	% Recovery	PID (ppm)	Symbol	Description
26	13	75	-		*Silt (ML)* Dark gray silt, trace to no gravel; dense to very dense; dry.
27	14	75	-		Loose; moist to wet between 26.5 and 27.2 feet.
28	15	100	-		Loose; wet between 28.0 and 28.5 feet.
29					Boring Terminated
30					
31					
32					
33					
34					
35					
36					
37					
38					
39					
40					
41					
42					
43					
44					
45					
46					
47					
48					
49					
50					

Subcontractor: Parratt Wolff

Driller/Operator: Rod Trask

Method: Direct Push

Boring Log: GP-29

Project: Ashland Chemical Co.

Project No.: 462690

Location: Rensselaer, NY

Geologist: David P. Bouchard

Completion Date: 18 Aug 00

Surface Elevation (ft. MSL): Not determined

Total Depth (ft. bgs): 24.5

Borehole Diameter (in.) 2

ESC

Depth	Sample Interval	% Recovery	PID (ppm)	Symbol	Description
0					Ground Surface
1	1	0	-		*No Recovery*
2					
3	2	75	-		*Sand with Gravel (SP)* Brown to grayish-brown medium to fine-grained sand and gravel; loose; moist.
4					
5	3	75	-		*Silt (ML)* Grayish-brown silt, little to some gravel, trace fine-grained sand; medium dense to dense; dry.
6					Wet between 4.5 and 4.8 feet.
7	4	75	-		Moist between 4.8 and 8.0 feet; some greenish-gray mottling.
8					
9	5	50	-		*Sand (SP)* Dark gray medium to fine-grained sand; loose; moist to wet.
10					
11	6	75	-		
12					
13	7	100	-		*Sand with Gravel (SP)* Dark gray fine-grained sand and gravel, some silt, trace medium to coarse sand; loose to medium dense; wet.
14					
15	8	75	-		Medium dense; moist between 15.0 and 18.25.
16					
17	9	75	-		
18					
19	10	75	-		*Silt with Gravel (ML)* Dark gray silt and gravel; dense to very dense; dry.
20					
21	11	75	-		*Sand with Gravel (SP)* Dark gray fine to medium-grained sand and gravel, little silt; very dense; moist.
22					
23	12	100	-		
24	13	100	-		*Sand (SP)* Dark gray fine-grained sand; dense; moist.
25					

Subcontractor: Parratt Wolff

Driller/Operator: Rod Trask

Method: Direct Push

Boring Log: GP-29

Project: Ashland Chemical Co.

Project No.: 462690

Location: Rensselaer, NY

Geologist: David P. Bouchard

Completion Date: 18 Aug 00

Surface Elevation (ft. MSL): Not determined

Total Depth (ft. bgs): 24.5

Borehole Diameter (in.) 2

Depth	Sample Interval	% Recovery	PID (ppm)	Symbol	Description
					Boring Terminated
26					
27					
28					
29					
30					
31					
32					
33					
34					
35					
36					
37					
38					
39					
40					
41					
42					
43					
44					
45					
46					
47					
48					
49					
50					

Subcontractor: Parratt Wolff

Driller/Operator: Rod Trask

Method: Direct Push

Boring Log: MW-16

Project: Ashland Distribution Co.

Project No.: 462690

Location: Rensselaer, NY

Geologist: David P. Bouchard

Completion Date: May 16, 2001

Surface Elevation (ft. MSL): Not determined

Total Depth (ft. bgs): 34

TOC Elevation (ft. MSL): Not determined

Borehole Diameter (in.) 2.0 Probe/8.25 HSA

ESC

Sample Data				SUBSURFACE PROFILE		
Depth	Sample Interval	% Recovery	PID (ppm)	Symbol	Description	Well Construction
0					Ground Surface	
1	1	75	40.2		*Sand with Gravel (SP)* Brown fine-grained sand, some gravel, little silt; loose; dry.	
2					*Sand (SP)* Dark brown to black fine-grained sand, little gravel, little silt, trace brick, glass; loose; dry.	
3	2	50	29.6		*Silt (ML)* Brown to dark brown silt, little fine to medium-grained sand, little gravel, trace brick, wood; loose to medium dense; dry.	
4						
5	3	0	NA			
6					*Silt with Gravel (ML)* Dark grey to black silt and gravel, little clay; loose; moist; oily appearance.	
7	4	100	120.2		*Sand with Gravel (SP)* Brown fine-grained sand, some gravel, little wood debris; loose; dry.	
8					*Silt (ML)* Reddish-brown silt, little to some gravel, little to some clay; medium dense to dense; dry.	
9	5	0	NA			
10						
11	6	75	67.4		*Silty Clay (CH)* Greyish-brown silty clay, trace gravel between 12.0 and 13.2 feet; soft, plastic; moist.	
12						
13	7	100	60.4			
14					*Silt with Gravel (ML)* Brown silt and gravel, little clay; loose to medium dense; wet becoming moist between 13.8 and 14.25 feet.	
15	8	75	64.2			
16					*Silty Clay (CH)* Grey silty clay; soft, plastic, sticky; moist.	
17	9	75	60.4			
18						
19	10	50	47.9		*Clay (CH)* Grey clay; medium stiff, sticky; moist.	
20						
21	11	50	65.9			
22					*Silt (ML)* Grey silt, little clay; medium dense; wet (slow dilatancy).	
23	12	75	56.4		*Silt with Gravel (ML)* Grey silt and gravel, little to some clay; loose (soft, sticky) becoming medium dense between 23.6 and 24.0; moist to wet.	
24						
25						

Subcontractor: Parratt Wolff, Inc.

Method: 2-inch Probe/4.25-inch HSA

Driller/Operator: Ian Grassy

Boring Log: MW-16

Project: Ashland Distribution Co.

Project No.: 462690

Location: Rensselaer, NY

Geologist: David P. Bouchard

Completion Date: May 16, 2001

Surface Elevation (ft. MSL): Not determined

Total Depth (ft. bgs): 34

TOC Elevation (ft. MSL): Not determined

Borehole Diameter (in.) 2.0 Probe/8.25 HSA

ESC

Sample Data				SUBSURFACE PROFILE		
Depth	Sample Interval	% Recovery	PID (ppm)	Symbol	Description	Well Construction
26	13	75	28.2		*Sand (SP)* Grey fine-grained sand; dense to very dense; moist to wet (slow dilatancy).	
27	14	75	54.6			
28					*Sandy Silt (ML)* Grey fine-grained sandy silt; medium dense; moist to wet (slow dilatancy).	
29	15	50	64.4		*Sand (SP)* Grey fine-grained sand interbedded with thin (less than 1-inch-thick) bands of grey fine-grained sandy silt and grey medium-grained sand; medium dense to dense; moist.	
30						
31	16	50	0.0			
32					*Silt with Gravel (ML)* Grey silt and gravel, little fine to medium-grained sand; medium dense to dense becoming very dense between 32.5 and 34 feet; moist to wet (slow dilatancy).	
33	17	75	69.6			
34					Boring Terminated	
35						
36						
37						
38						
39						
40						
41						
42						
43						
44						
45						
46						
47						
48						
49						
50						

Subcontractor: Parratt Wolff, Inc.

Method: 2-inch Probe/4.25-inch HSA

Driller/Operator: Ian Grassy

Boring Log: MW-17

Project: Ashland Distribution Co.

Project No.: 462690

Location: Rensselaer, NY

Geologist: David P. Bouchard

Completion Date: May 17, 2001

Surface Elevation (ft. MSL): Not determined

Total Depth (ft. bgs): 27.8

TOC Elevation (ft. MSL): Not determined

Borehole Diameter (in.) 2.0 Probe/8.25 HSA

ESC

Sample Data				SUBSURFACE PROFILE		
Depth	Sample Interval	% Recovery	PID (ppm)	Symbol	Description	Well Construction
0					Ground Surface	
1	1	50	3.8		*Silt with Gravel (ML)* Dark brown to black silt, trace to some gravel, trace brick, wood, glass; medium dense to dense; dry.	
3	2	100	3.6		*Silty Sand (SP)* Greenish-grey fine-grained sand and silt; medium dense; dry.	
5	3	25	0.0		*Silty Clay (CH)* Greyish-brown silty clay, trace gravel; very stiff to hard; dry.	
7	4	50	0.0			
9	5	75	0.0		*Silty Clay (CH)* Reddish-brown silty clay trace to little fine to medium-grained sand, trace to little gravel; stiff to hard, non-plastic becoming plastic between 9.8 and 12.0 feet; dry.	
11	6	25	0.0			
13	7	100	81.6		*Silty Clay (CH)* Greyish-brown silty clay; stiff, dry.	
14					*Silt with Gravel (ML)* Greyish-brown silt and gravel, little clay; medium dense; dry.	
15	8	0	NA		*Clay (CH)* Greyish-brown clay, little silt; soft; moist.	
17	9	100	86.7		*Silt with Gravel (ML)* Brown silt and gravel, little clay; loose; wet.	
18					*Clay (CH)* Grey clay; soft, sticky; moist becoming wet between 18.5 and 18.9 feet.	
19	10	75	0.0			
21	11	50	65.9		*Silt with Gravel (ML)* Grey silt and gravel, little clay; dense to very dense; moist.	
23	12	100	0.2		*Silty Clay (CH)* Grey silty clay; soft, sticky; wet.	
24					*Silt with Gravel (ML)* Grey silt and gravel, little clay; loose; wet.	
25					*Sand (SP)* Grey fine-grained sand, little silt; very dense; wet (slow dilatancy)	

Subcontractor: Parratt Wolff, Inc.

Method: 2-inch Probe/4.25-inch HSA

Driller/Operator: Ian Grassy

Boring Log: MW-17

Project: Ashland Distribution Co.

Project No.: 462690

Location: Rensselaer, NY

Geologist: David P. Bouchard

Completion Date: May 17, 2001

Surface Elevation (ft. MSL): Not determined

Total Depth (ft. bgs): 27.8

TOC Elevation (ft. MSL): Not determined

Borehole Diameter (in.) 2.0 Probe/8.25 HSA

ESC

Sample Data				SUBSURFACE PROFILE		
Depth	Sample Interval	% Recovery	PID (ppm)	Symbol	Description	Well Construction
26	13	75	0.0			
27	14	100	0.0		*Sand with Gravel (SP)* Dark grey fine-grained sand and gravel, some silt; very dense; dry.	
28					Boring Terminated	
29						
30						
31						
32						
33						
34						
35						
36						
37						
38						
39						
40						
41						
42						
43						
44						
45						
46						
47						
48						
49						
50						

Subcontractor: Parratt Wolff, Inc.

Driller/Operator: Ian Grassy

Method: 2-inch Probe/4.25-inch HSA

Boring Log: MW-18

Project: Ashland Distribution Co.

Project No.: 462690

Location: Rensselaer, NY

Geologist: David P. Bouchard

Completion Date: May 16, 2001

Surface Elevation (ft. MSL): Not determined

Total Depth (ft. bgs): 27.7

TOC Elevation (ft. MSL): Not determined

Borehole Diameter (in.) 2.0 Probe/8.25 HSA

ESC

Sample Data				SUBSURFACE PROFILE		
Depth	Sample Interval	% Recovery	PID (ppm)	Symbol	Description	Well Construction
0					Ground Surface	
1	1	75	0.6		*Sand with Gravel (SP)* Dark brown to black medium-grained sand and gravel, little silt, trace brick, glass, cinders; medium dense to dense; dry.	
2						
3	2	75	0.2			
4					*Gravel (GP)* Coarse gravel (ballast); loose; dry.	
5	3	25	0.4		*Silt with Gravel (ML)* Greenish-grey to brown silt, some gravel; medium dense; dry.	
6						
7	4	50	0.4			
8					*Silty Clay (CH)* Greyish-brown silty clay, stiff to very stiff; dry.	
9	5	100	0.0		*Silt with Gravel (ML)* Greyish-black silt, some gravel, little medium-grained sand, little clay; loose; wet.	
10					*Silty Clay (CH)* Reddish-brown to grey silty clay: very stiff, plastic; dry.	
11	6	100	0.0			
12					*Silt (ML)* Greyish-brown silt, little clay, trace gravel; medium dense; dry becoming wet between 13.5 and 14.8 feet.	
13	7	25	0.1			
14						
15	8	100	0.0		*Silty Clay (CH)* Grey silty clay; soft, sticky; moist to wet.	
16					*Silt (ML)* Grey silt, little clay; dense; moist.	
17	9	75	0.0		*Silt with Gravel (ML)* Dark grey silt and gravel, trace coarse-grained sand; medium dense; moist.	
18					*Sand (SP)* Grey fine-grained sand; dense; moist.	
19	10	100	0.0		*Silt with Gravel (ML)* Grey silt and gravel, little clay; loose; wet.	
20					*Sand (SP)* Grey fine-grained sand; dense; wet (slow dilatancy).	
21	11	50	0.0			
22						
23	12	0	NA		*Sand with Gravel (SP)* Grey medium-grained sand and gravel, little silt; loose; wet.	
24						
25						

Subcontractor: Parratt Wolff, Inc.

Method: 2-inch Probe/4.25-inch HSA

Driller/Operator: Ian Grassy

Boring Log: MW-18

Project: Ashland Distribution Co.

Project No.: 462690

Location: Rensselaer, NY

Geologist: David P. Bouchard

Completion Date: May 16, 2001

Surface Elevation (ft. MSL): Not determined

Total Depth (ft. bgs): 27.7

TOC Elevation (ft. MSL): Not determined

Borehole Diameter (in.) 2.0 Probe/8.25 HSA

ESC

Sample Data				SUBSURFACE PROFILE		
Depth	Sample Interval	% Recovery	PID (ppm)	Symbol	Description	Well Construction
26	13	75	0.0			
27	14	100	0.0		*Sand (SP)* Dark grey fine-grained sand; dense; moist.	
28					*Sand (SP)* Grey medium-grained sand, trace gravel; dense to very dense; moist: faint odor.	
29					Boring Terminated	
30						
31						
32						
33						
34						
35						
36						
37						
38						
39						
40						
41						
42						
43						
44						
45						
46						
47						
48						
49						
50						

Subcontractor: Parratt Wolff, Inc.

Driller/Operator: Ian Grassy

Method: 2-inch Probe/4.25-inch HSA

Boring Log: MW-19

Project: Ashland Distribution Co.

Project No.: 462690

Location: Rensselaer, NY

Geologist: David P. Bouchard

Completion Date: May 14, 2001

Surface Elevation (ft. MSL): Not determined

Total Depth (ft. bgs): 18

TOC Elevation (ft. MSL): Not determined

Borehole Diameter (in.) 2.0 Probe/12.25 HSA

ESC

Sample Data				SUBSURFACE PROFILE		
Depth	Sample Interval	% Recovery	PID (ppm)	Symbol	Description	Well Construction
0					Ground Surface	
1	1	25	0.0		*Gravel (GP)* Coarse gravel; loose; dry.	
2						
3	2	75	66.2		*Sand with Gravel (SP)* Dark grey to black coarse-grained sand and gravel; loose; wet; strong odor.	
4					*Silty Clay (CH)* Grey to greyish-black silty clay; stiff to very stiff; moist; moderate odor.	
5	3	25	35.6		*Sand (SP)* Dark grey to black fine to medium-grained sand, trace silt; moist to wet; moderate odor.	
6					*Silty Clay (CH)* Grey to greyish-black silty clay; stiff to very stiff; moist; moderate odor.	
7					*Sand with Gravel (SP)* Dark grey to black coarse-grained sand and gravel, little silty clay (in discrete clumps); loose; wet; moderate to strong odor.	
8						
9						
10						
11						
12					*Not Logged* See EB-19.	
13						
14						
15						
16						
17						
18					Boring Terminated	
19						
20						
21						
22						
23						
24						
25						

Subcontractor: Parratt Wolff, Inc.

Driller/Operator: Ian Grassy

Method: 2-inch Probe/8.25-inch HSA

Boring Log: PZ-1

Project: Ashland Distribution Co.

Project No.: 462690

Location: Rensselaer, NY

Geologist: David P. Bouchard

Completion Date: May 15, 2001

Surface Elevation (ft. MSL): Not determined

Total Depth (ft. bgs): 18

TOC Elevation (ft. MSL): Not determined

Borehole Diameter (in.) 2.0 Probe/8.25 HSA

ESC

Sample Data				SUBSURFACE PROFILE		
Depth	Sample Interval	% Recovery	PID (ppm)	Symbol	Description	Well Construction
0					Ground Surface	
1	1	25	2.4		*Silt with Gravel (ML)* Greyish-brown silt, some gravel, trace to little fine to medium-grained sand; medium dense; dry.	
2						
3	2	25	97.4			
4						
5	3	25	44.5		*Sand with Gravel (SP)* Greyish-black medium to coarse-grained sand and gravel, trace to little silt; loose; wet; strong odor, sheen visible, brown oily substance coating some grains.	
6						
7	4	0	NA			
8						
9	5	50	40.5			
10					*Silt with Gravel (ML)* Greyish-black silt, little medium-grained sand, some coarse gravel; loose; wet; strong odor, sheen visible.	
11	6	50	47.0			
12					*Silt with Gravel (ML)* Greyish-brown silt, little medium-grained sand, some coarse gravel, trace fine to coarse-grained sand, trace to little clay nodules; medium dense; wet; moderate odor, sheen visible.	
13	7	100	18.6			
14					*Silt with Gravel (ML)* Reddish-brown silt, some gravel, little clay; dense to very dense; dry.	
15	8	100	30.4			
16						
17	9	100	40.6		*Silty Clay (CH)* Greyish-black silty clay, trace gravel; stiff, plastic; moist.	
18					*Clay (CH)* Greyish-black clay, little silt; very stiff, plastic; moist.	
19					Boring Terminated	
20						
21						
22						
23						
24						
25						

Subcontractor: Parratt Wolff, Inc.

Driller/Operator: Ian Grassy

Method: 2-inch Probe/4.25-inch HSA

Boring Log: PZ-2

Project: Ashland Distribution Co.

Project No.: 462690

Location: Rensselaer, NY

Geologist: David P. Bouchard

Completion Date: May 15, 2001

Surface Elevation (ft. MSL): Not determined

Total Depth (ft. bgs): 16

TOC Elevation (ft. MSL): Not determined

Borehole Diameter (in.) 2.0 Probe/8.25 HSA

ESC

Sample Data				SUBSURFACE PROFILE		
Depth	Sample Interval	% Recovery	PID (ppm)	Symbol	Description	Well Construction
0					Ground Surface	
1	1	25	0.9		*Silt with Sand (ML)* Dark brown silt, little fine to medium-grained sand, trace gravel, trace wood, brick; medium dense; dry.	
2						
3	2	25	3.5			
4					*Sand with Gravel (SP)* Dark grey to black coarse-grained sand and gravel, little silt; loose; wet; faint odor.	
5	3	50	0.4			
6					*Silty Clay (CH)* Greyish-brown to black silty clay; medium stiff, plastic, sticky; moist.	
7	4	0	NA			
8						
9	5	50	1.8		*Silt with Sand (ML)* Greyish-black silt, little fine to medium-grained sand, little gravel; medium dense; moist to wet.	
10						
11	6	50	5.3			
12					*Silt (ML)* Reddish-brown silt, little to some clay, trace fine-grained sand, trace gravel; medium dense to dense; moist.	
13	7	50	3.4			
14					*Silty Clay (CH)* Reddish-brown to greyish-brown silty clay; medium stiff to stiff becoming very stiff at 15.8 feet, plastic; moist.	
15	8	75	2.8			
16					Boring Terminated	
17						
18						
19						
20						
21						
22						
23						
24						
25						

Subcontractor: Parratt Wolff, Inc.

Driller/Operator: Ian Grassy

Method: 2-inch Probe/4.25-inch HSA

Boring Log: PZ-3

Project: Ashland Distribution Co.

Project No.: 462690

Location: Rensselaer, NY

Geologist: David P. Bouchard

Completion Date: May 15, 2001

Surface Elevation (ft. MSL): Not determined

Total Depth (ft. bgs): 22

TOC Elevation (ft. MSL): Not determined

Borehole Diameter (in.) 2.0 Probe/8.25 HSA

ESC

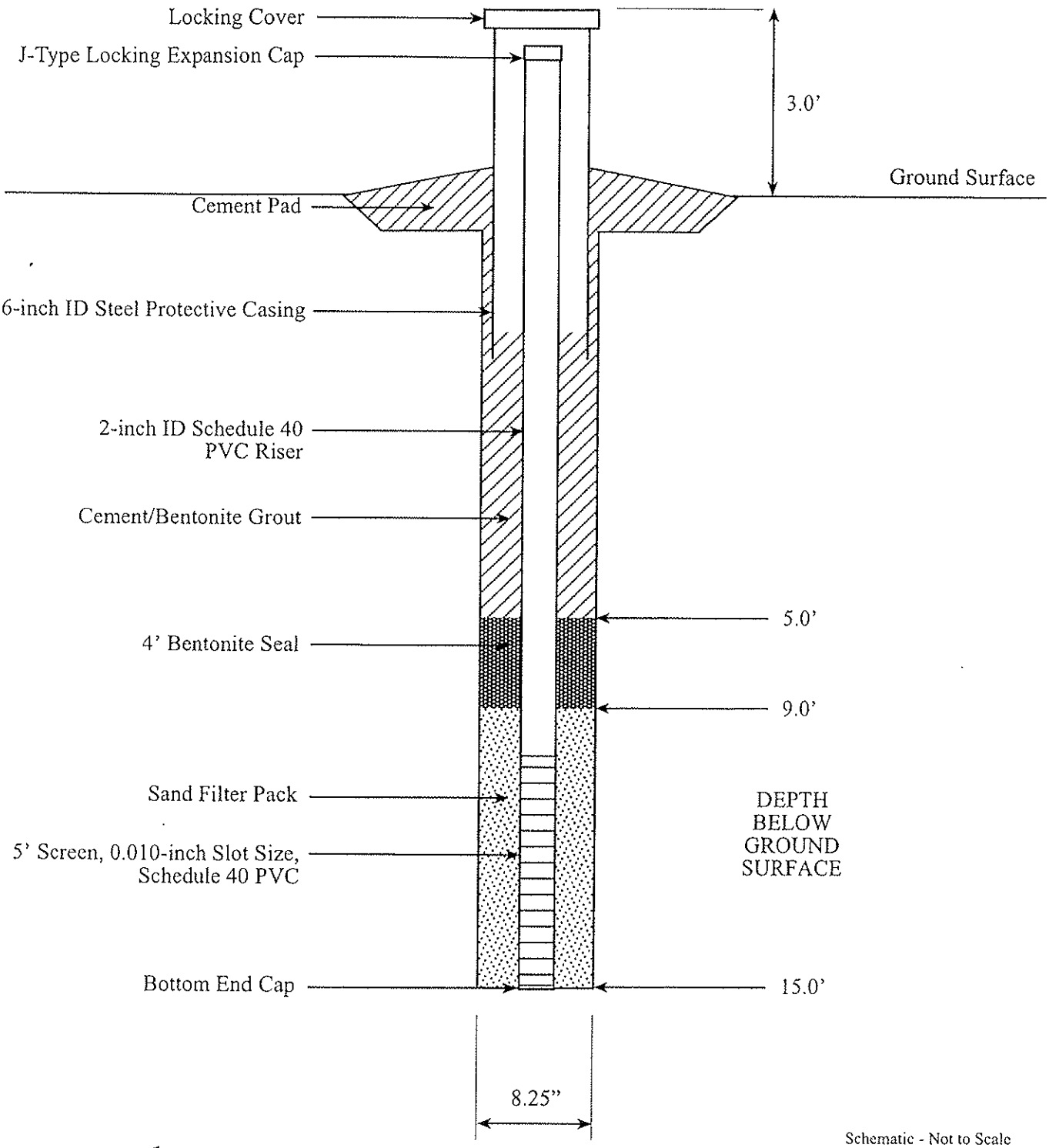
Sample Data				SUBSURFACE PROFILE		
Depth	Sample Interval	% Recovery	PID (ppm)	Symbol	Description	Well Construction
0					Ground Surface	
1	1	25	0.2		*Silt with Gravel (ML)* Brown to greyish-brown silt, some coarse gravel; dense; dry.	
2						
3	2	75	0.1			
4					*Sand with Gravel (SP)* Black fine to medium-grained sand and gravel, trace brick, glass, wood; medium dense to very dense; moist.	
5	3	0	NA			
6						
7	4	50	0.0		*Clay (CH)* Greenish-grey clay, trace to little silt; stiff, plastic; dry.	
8						
9	5	50	2.4		*Silt with gravel (ML)* Greenish-grey silt and coarse gravel, trace medium to coarse-grained sand; loose; wet.	
10					*Silt (ML)* Greenish-grey silt, trace gravel; medium dense; moist.	
11	6	100	5.8		*Sand with Gravel (SP)* Brown fine to medium-grained sand, some gravel; loose; wet.	
12						
13	7	0	NA		*Sand (SP)* Brown to reddish-brown fine-grained sand, little silt, trace coarse gravel; very dense; moist.	
14						
15	8	50	0.0			
16						
17	9	50	0.2		*Sand with Gravel (SP)* Brown fine to medium-grained sand and gravel; loose; wet.	
18						
19	10	0	NA			
20						
21	11	100	7.2			
22					*Silty Clay (CH)* Greyish-brown silty clay; stiff to very stiff, plastic; moist.	
					Boring Terminated	
23						
24						
25						

Subcontractor: Parratt Wolff, Inc.

Driller/Operator: Ian Grassy

Method: 2-inch Probe/4.25-inch HSA

Site Name: Ashland Distribution Co.
Location: Rensselaer, New York
Date: May 16, 2001

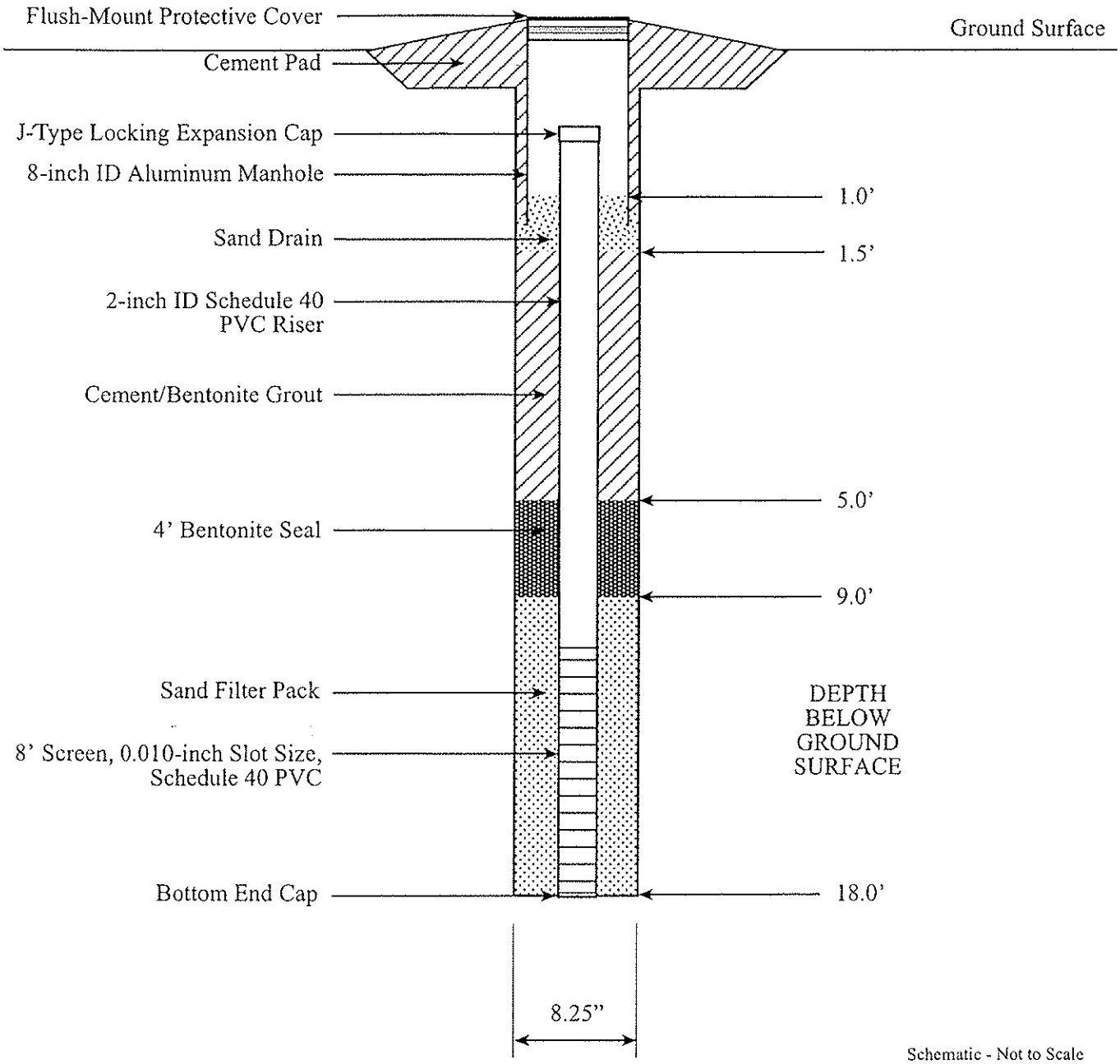


Schematic - Not to Scale

ESC
ENVIRONMENTAL STRATEGIES CORPORATION
11911 Freedom Drive Suite 900
Reston, Virginia 22090
703-709-6500

As-Built Diagram for Monitoring Well MW-16
Ashland Distribution Company.
Rensselaer, New York

Site Name: Ashland Distribution Co.
Location: Rensselaer, New York
Date: May 17, 2001

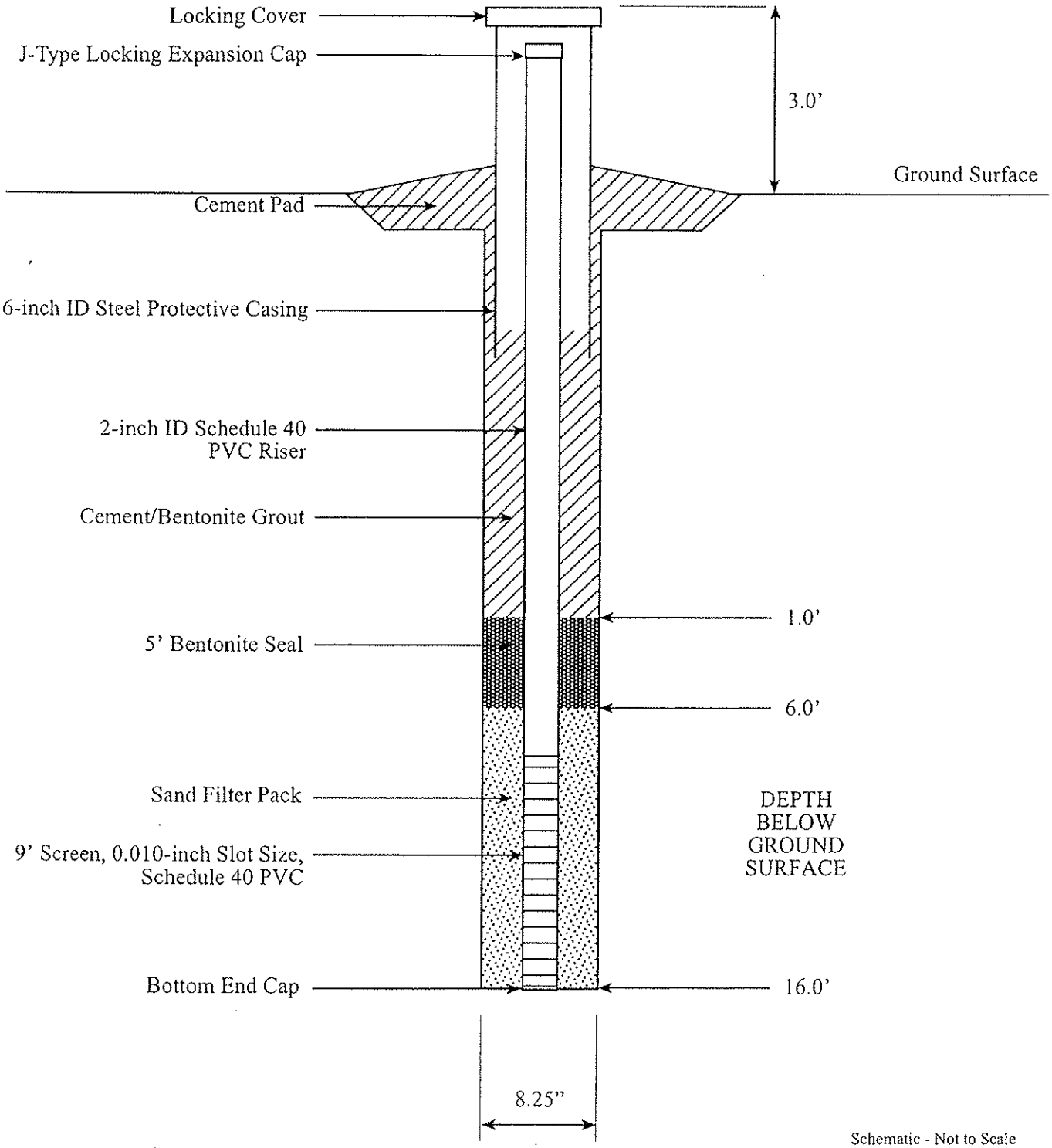


Schematic - Not to Scale

ESC
ENVIRONMENTAL STRATEGIES CORPORATION
11911 Freedom Drive Suite 900
Reston, Virginia 22090
703-709-6500

As-Built Diagram for Monitoring Well MW-17
Ashland Distribution Company.
Rensselaer, New York

Site Name: Ashland Distribution Co.
Location: Rensselaer, New York
Date: May 16, 2001

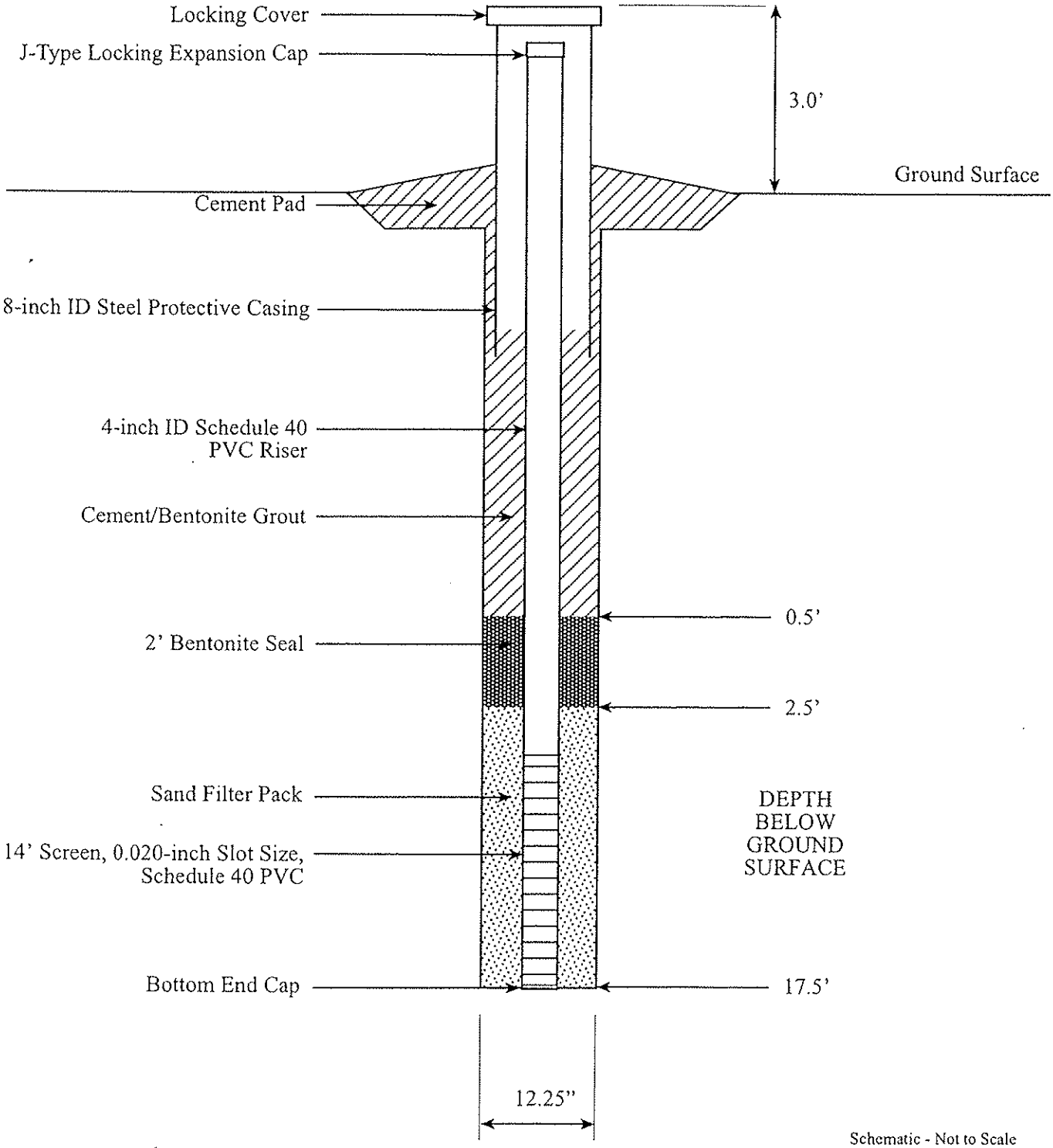


Schematic - Not to Scale

ESC
ENVIRONMENTAL STRATEGIES CORPORATION
11911 Freedom Drive Suite 900
Reston, Virginia 22090
703-709-6500

As-Built Diagram for Monitoring Well MW-18
Ashland Distribution Company.
Rensselaer, New York

Site Name: Ashland Distribution Co.
Location: Rensselaer, New York
Date: May 15, 2001

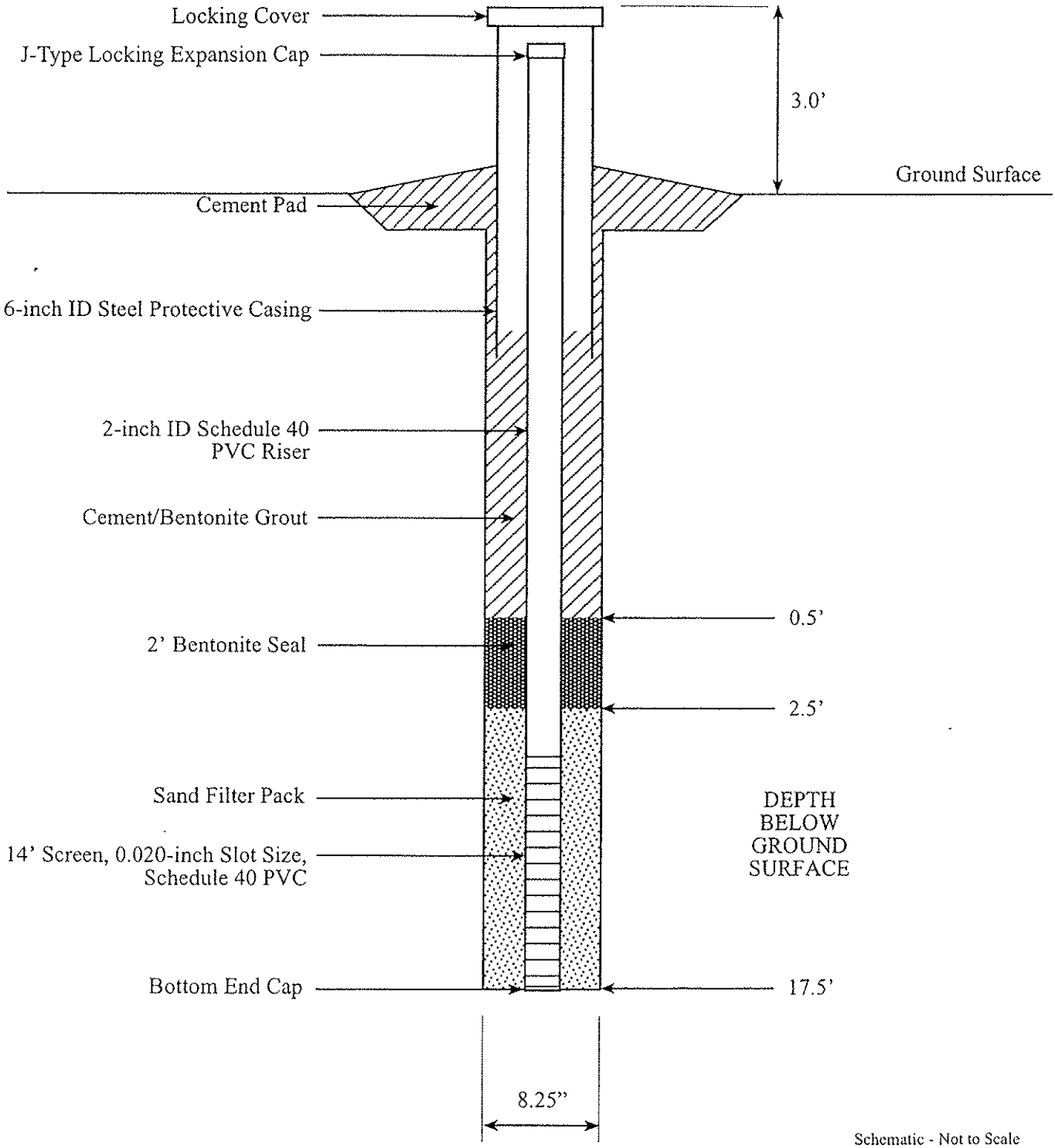


Schematic - Not to Scale

ESC
ENVIRONMENTAL STRATEGIES CORPORATION
11911 Freedom Drive Suite 900
Reston, Virginia 22090
703-709-6500

As-Built Diagram for Monitoring Well MW-19
Ashland Distribution Company.
Rensselaer, New York

Site Name: Ashland Distribution Co.
Location: Rensselaer, New York
Date: May 15, 2001

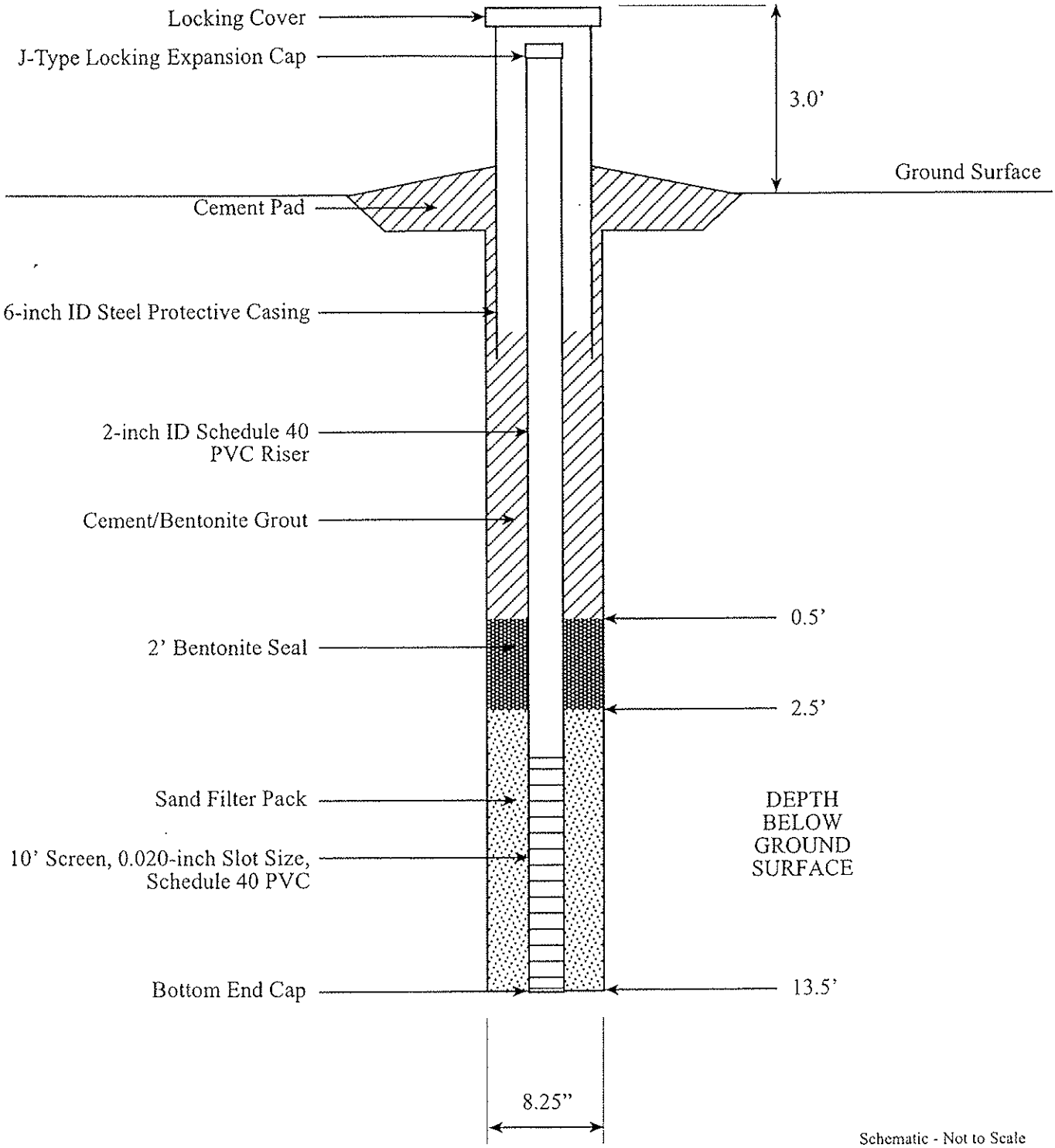


Schematic - Not to Scale

ESC
ENVIRONMENTAL STRATEGIES CORPORATION
11911 Freedom Drive Suite 900
Reston, Virginia 22090
703-709-6500

As-Built Diagram for Monitoring Well PZ-1
Ashland Distribution Company.
Rensselaer, New York

Site Name: Ashland Distribution Co.
Location: Rensselaer, New York
Date: May 15, 2001

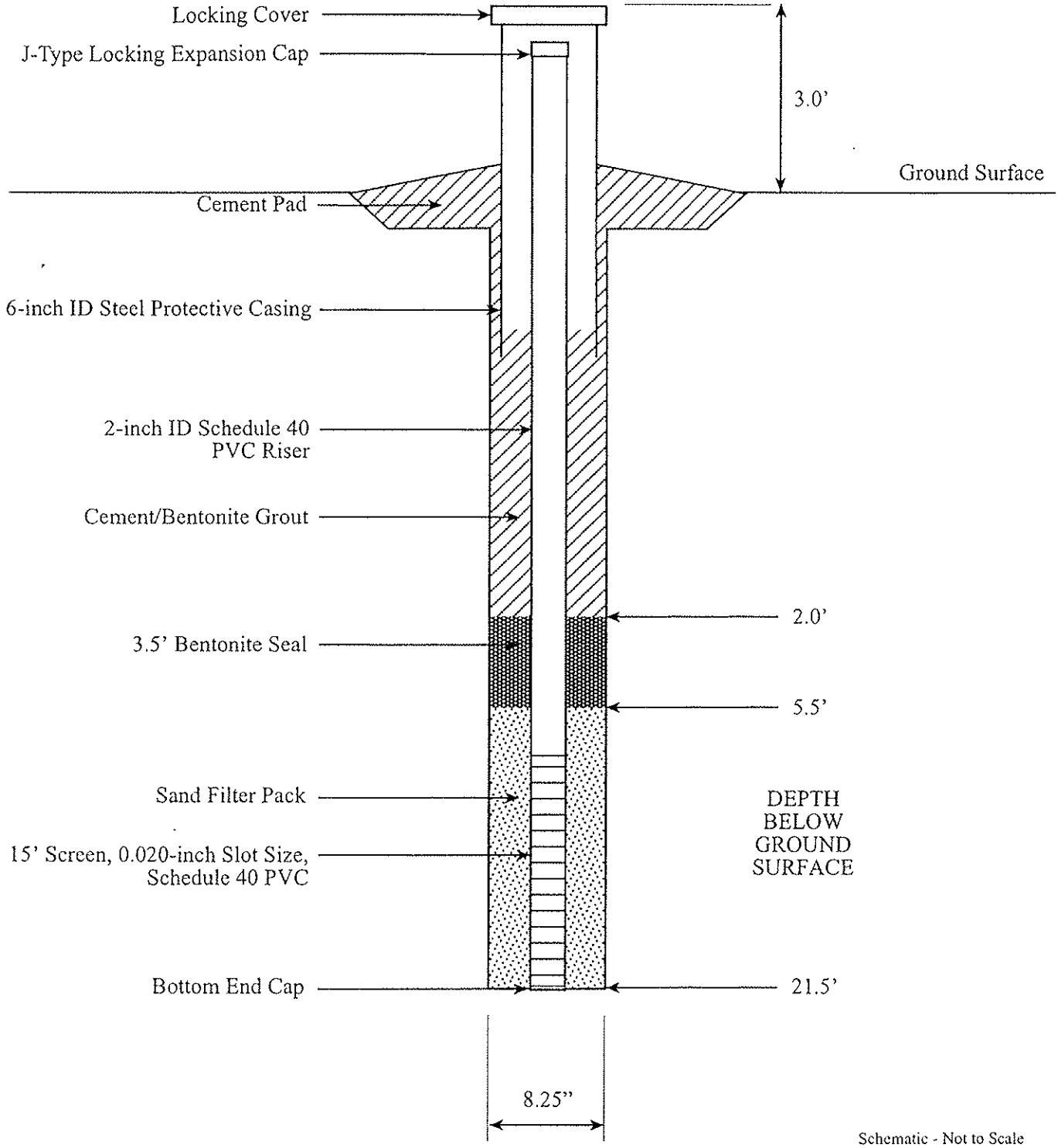


Schematic - Not to Scale

ENVIRONMENTAL STRATEGIES CORPORATION
11911 Freedom Drive Suite 900
Reston, Virginia 22090
703-709-6500

As-Built Diagram for Monitoring Well PZ-2
Ashland Distribution Company.
Rensselaer, New York

Site Name: Ashland Distribution Co.
Location: Rensselaer, New York
Date: May 15, 2001



Schematic - Not to Scale

ESC
ENVIRONMENTAL STRATEGIES CORPORATION
11911 Freedom Drive Suite 900
Reston, Virginia 22090
703-709-6500

As-Built Diagram for Monitoring Well PZ-3
Ashland Distribution Company.
Rensselaer, New York

Appendix B – Summary of Pump Test Activities

Summary of Pump Test Activities
Ashland Distribution Company Facility, Rensselaer, New York

This enclosure summarizes the pumping test activities that were performed at the Ashland Distribution Company (Ashland) facility in Rensselaer, New York, on May 14 through 18, 2001, and June 4 through June 8, 2001. The activities, which included the installation and development of the pumping and observation wells and the implementation of the pump test, were performed in accordance with the Pumping Test and Groundwater Modeling Work Plan, dated November 3, 2000. Background information, a summary of the work completed, and the results are presented below.

Background

Ashland is currently performing a Resource Conservation and Recovery Act (RCRA) facility investigation (RFI) at its Rensselaer facility in accordance with a 1992 Administrative Order on Consent issued by the U.S. Environmental Protection Agency (EPA) Region 2. On September 21, 2000, Ashland submitted a letter to the EPA outlining a proposed approach for evaluating potential groundwater interim measures (IMs) to address volatile organic compounds (VOCs) in the southern portion of the Rensselaer facility. A final IM was not selected for the site due to the identification of several data gaps, including estimates of aquifer parameters (e.g., hydraulic conductivity, transmissivity, etc.) of the upper shallow groundwater zone (USGZ) in the potential treatment area.

On November 3, 2000, ESC submitted a Pumping Test and Groundwater Modeling Work Plan to the EPA outlining a proposed pumping test to be conducted in the southwest corner of the facility. The pumping test was designed to provide information regarding the aquifer characteristics that could be used to aid in the selection of an appropriate IM.

Scope of Work

General

In May 2001, ESC installed three piezometers and one dual purpose monitoring and pumping well (MW-19; see RFI report) in the southwest corner of the Ashland facility. The wells were developed after installation and surveyed the following week by a licensed New York surveyor. In early June 2001, ESC performed a pump test using the newly installed piezometers and well. The pumping test consisted of four phases: background water level monitoring, a variable rate (step) drawdown test, a constant rate drawdown test, and a recovery test. A detailed description of the work conducted is provided below.

Well and Piezometer Installation

On May 14 through 16, 2001, ESC installed three piezometers at locations PZ-1 through PZ-3 (Figure 2). The piezometer borings were advanced using a truck-mounted drill rig equipped with 4.25-inch inside-diameter (ID) hollow-stem augers. Continuous soil samples were collected from ground surface to a depth of 16 to 22 feet bgs using a 2-foot-long split spoon sampler. The borings were terminated at the layer of dense silt and clay, which represents the base of the USGZ. Piezometers were constructed in each boring using 2-inch ID schedule 40 polyvinyl chloride casing with 0.020-inch machine-slotted screen. The piezometers were completed with an aboveground protective steel cover set in a cement pad. Boring logs and as-built construction diagrams for each piezometer are included in Attachment A.

The newly installed piezometers were developed 24 hours or later after the installation of the well seals using submersible pumps, suction-lift pumps, and dedicated bailers. Field measurements were obtained for temperature, pH, and conductivity before development began and after the removal of each well volume. Development continued until the water was relatively free of suspended sediment and two successive readings for each parameter varied by less than 10 percent.

Soil cuttings generated during the drilling activities and other disposable equipment were contained in Department of Transportation (DOT)-approved open-top 55-gallon steel drums. Development water, purge water, and decontamination rinsate were contained in DOT-approved closed-top 55-gallon steel drums. The drums were properly labeled and staged onsite for later disposal in accordance with state and federal regulations.

The newly installed wells and piezometers were surveyed by Richard Rybinski, a New York State-licensed land surveyor.

Pre-test Activities

On June 4, 2001, background water level measurements were collected from the three piezometers and the pumping well (MW-19) for a period of 24 hours. Water levels were measured at 15-minute intervals using transducers placed in each well, and the measurements were recorded using a Hermit 3000 data logger. The barometric pressure was also measured during the background monitoring period using the data logger's internal barometer. Data collected during the background water level monitoring are included in Attachment B.

A step drawdown test was performed on June 5, 2001, using pump rates of 1.0 gallon per minute (gpm), and 1.7 gpm. The test was conducted without allowing the well to recharge between changes in the pumping rates, each pumping step was scheduled to run for approximately 90 minutes. The 1.0 gpm pumping step was completed; however, the 1.7-gpm pumping step was stopped after approximately 45 minutes to prevent exposure of the pump due to excessive drawdown in the pumping well. The pumping rate was

reduced to 1.3 gpm and the well was pumped at this rate for the remainder of the test. Data from the step drawdown test are included in Attachment B.

Constant Discharge Test

On June 6, 2001, a constant discharge test was performed at the estimated maximum rate of 1.2 gpm determined during the step drawdown test. However, the test was halted after approximately 7.5 hours of pumping because the water level in the pumping well continued to decline and threatened to expose the pump. The well was allowed to recharge overnight and a second constant discharge test was initiated at a pumping rate of 0.8 gpm. The test was stopped after approximately 13.75 hours of pumping due to the continued drawdown in well MW-19. A third constant discharge pump test was conducted after allowing the well to recharge. For this test, the well was pumped at a very low rate (0.4 gpm) to determine if the well could sustain any measurable yield. After approximately six hours the pump was shut down because the water level in the well did not stabilize. Data collected during the constant discharge pumping tests are included in Attachment B.

Discharge from the step and constant discharge pumping tests was contained in a 7,500-gallon tank wagon staged near the test area. Approximately 2,353 gallons of was generated during the tests. On completion of the pump test activities, the tank wagon was transported by Ashland Environmental Services to the E.I. Dupont de Nemours and Company facility in Deepwater, New Jersey, for disposal as hazardous waste.

Recovery Test

A recovery test was performed immediately after the completion of the 0.8 gpm constant discharge test. Water level data was collected as soon as the pump was turned off and continued until the water levels had recovered to approximately pre-pumping levels. Data collected during the recovery test are included in Attachment B.

Pumping Test Results

General

All pump test analyses were performed using AquiferTest, a software package developed by Thomas Rochrich and Waterloo Hydrogeologic, Inc. The computer-generated outputs of these analyses are presented in Attachment C.

Background Water Level Monitoring

The background monitoring phase of the pumping test was performed to provide information on water level changes under natural (i.e., non-pumping) conditions and to evaluate the effect of barometric pressure on water levels in the wells. Any recognizable trends or fluctuations noted during the background monitoring could be used to adjust the

water level data collected during the pumping phases of the test.

The results indicate a wide degree of variation between the wells. The water level fluctuations in PZ-2 and PZ-3 matched the changes in barometric pressure during the monitoring period indicating that the USGZ in the vicinity of these piezometers was behaving as a confined water-bearing unit rather than an unconfined unit (Attachment C).

In contrast, the water level in PZ-1 rose slightly (approximately 0.21 feet maximum) over the 24-hour period. The water level in MW-19 showed a general decline (approximately 0.58 feet) over the course of the monitoring, with a period of relatively stable water levels recorded overnight. The water level fluctuations in PZ-1 and MW-19 do not appear to correspond with changes in the barometric pressure.

Based on an evaluation of the data, the exact cause(s) for these water level changes in MW-19 and PZ-1 could not be discerned. Since no consistent trend was noted and the observed fluctuation was small compared to the changes in the water level during the subsequent tests, no corrections were made to the MW-19 or PZ-1 test data. Although the barometric pressure affected PZ-2 and PZ-3, the changes were not significant compared to the water level changes during the relatively short duration of the pumping phases of the test. Barometric pressure affects are typically reflected in longer duration tests after the drawdown has stabilized and small fluctuations in water levels become more significant. Consequently, no barometric correction was applied to PZ-2 and PZ-3 for the pumping phases of the test.

Step Drawdown Test

A step drawdown test was conducted immediately following the completion of the background water level monitoring phase of the test to determine the optimal pump rate for the constant discharge test. The data collected were also analyzed to provide additional estimates of the hydraulic conductivity and transmissivity for the USGZ. Well MW-19 was pumped at a rate of 1.0 gpm for approximately 90 minutes and at 1.7-gpm for approximately 45 minutes. The pumping rate was then reduced to 1.3 gpm to prevent exposure of the pump due to drawdown in the pumping well.

The step drawdown data was analyzed using the Theis solution with the Jacob correction for unconfined aquifers (Attachment C). Since the Theis step test method assumes that each step represents an increase the pump rate, data collected during the 1.3-gpm step was not included in the analysis. Only data from PZ-1 was analyzed due to the short duration of the step test and the limited drawdown the piezometers PZ-2 and PZ-3.

The estimated transmissivity (T) based on the 1.0 and 1.7 gpm tests was 151.59 square-feet per day (ft^2/day; Table 1). The hydraulic conductivity (K) was estimated at 9.3 feet per day (ft/day). These values are in reasonable agreement with the values obtained during the constant discharge portion of the pump test (see below).

Constant Discharge Pumping Test

The constant discharge pumping test was initiated after the completion of the step drawdown test and after the water levels in the well and piezometers recovered to their approximate pre-pumping levels. The constant discharge pump test was conducted to collect data from nearby observation wells, which would be used to determine the hydraulic characteristics of the USGZ.

As indicated in the previous section, constant discharge tests were conducted at pumping rates of 1.2 gpm, 0.8 gpm, and 0.4 gpm. The test duration were less than the planned 48-hour period due to the inability to sustain the pumping rate in MW-19. The 0.8 gpm test data was selected for analysis because of the test duration (13.75 hours) and because it was free of random fluctuations in the data caused by changes in the pumping rate.

The drawdown data was analyzed using the Neuman Method and the Cooper and Jacob time-drawdown Method. The Neuman analysis was used in analyzing the data from the piezometers, including PZ-2 and PZ-3. Although typically used for the analysis of an unconfined aquifer, the Neuman Method Type A curves are similar to type curves for confined methods and, thus, are suitable for analysis of short duration tests on confined systems such as those observed at PZ-2 and PZ-3.

The Cooper and Jacob time-drawdown analysis was used to evaluate data during later periods of the test (i.e., greater than 250 minutes) when the data showed an unexpected and marked deviation from the Neuman type curves. The deviation was not restricted to PZ-2 and PZ-3 and was not the result of artesian conditions at those two wells. Rather, the deviation indicated that a low permeability vertical hydraulic barrier, or boundary condition, had been encountered. The Cooper and Jacob Method was used to provide an estimate of the T and K of the hydraulic barrier. The method was also used to provide a second estimate of the early-time T and K values.

The T and K values based on the early-time data using both methods are in reasonable agreement and are in accord with published values for the geological materials (i.e., silty sand) observed at the site. Initial transmissivity estimates for the USGZ ranged from 84.81 to 133.92 ft^2/day and hydraulic conductivity values ranged from 2.86 to 13.10 ft/day (Table 1; Attachment C). Later-time estimates of the barrier T and K based on the Cooper and Jacob Method were approximately one order of magnitude less than the early-time estimates and range from 14.23 to 31.24 ft^2/day and 0.87 to 1.92 ft/day for T and K, respectively.

Recovery Test

A recovery test was conducted after the completion of the 0.8 gpm constant discharge test. The data was analyzed using the Theis recovery solution (with Jacob correction for unconfined aquifers). The purpose of the recovery test was to observe water level

responses after cessation of pumping and provide additional estimates of T and K from the USGZ. Only data from PZ-1, which offered the greatest drawdown of the three piezometers, was analyzed. Transmissivity and hydraulic conductivity were estimated at 151.56 ft^2/day and 4.02 ft/day, respectively (Table 1; Attachment C). Both the T and K values are in reasonable agreement with the estimates determined from the early-time constant discharge pumping test.

Discussion

The results of the pump test indicate that the hydrogeology in the southwest corner is complex with significant heterogeneity over short distances. Based on background water level monitoring, some areas of the USGZ appear to be confined by a shallow clay layer encountered between approximately 5 and 7 feet bgs (i.e., PZ-2 and PZ-3), while in other areas the clay layer is not present (i.e., PZ-1), or does not act as a confining layer (i.e., MW-19).

The geological complexity was also apparent during the pumping phases of the test. The drawdown data indicate that the USGZ in the southwest corner of the site is bounded by vertical hydraulic barriers. The boundaries, which have an estimated hydraulic conductivity of at least one order of magnitude lower than the estimates for the USGZ, resulted in a continual drawdown in the pumping area, even under very low pumping rates, and the inability to achieve a steady state pumping condition in the well. The 0.8-gpm test drawdown curves indicate that the boundary condition started to significantly influence flow and the water levels in the pumping well after only 250 minutes, which translates to a removal of only 200 gallons of groundwater from the system.

Conclusions

Early-time data collected during the constant discharge pumping phase of the test indicates that the USGZ has an estimated transmissivity of 84.81 to 133.92 ft^2/day and an estimated hydraulic conductivity of 2.86 to 13.10 ft/day. These values are in reasonable agreement with the T and K estimates from the step drawdown and recovery test analyses. Analysis of the later-time data from the constant discharge pumping test indicates that the USGZ is bounded by low permeability hydraulic barriers with an estimated T of 14.23 to 31.24 ft^2/day and a K of 0.87 to 1.92 ft/day. The inability to achieve a steady state pumping condition and the limited amount of time that elapsed before the boundary was encountered suggests that the USGZ is limited in extent. Sustained pumping rates from the USGZ are probably not possible.

Table 1

Hydraulic Conductivity and Transmissivity Estimates
Ashland Distribution Company
Rensselaer, New York
June 4 through 8, 2001 (a)

Well ID	Step Drawdown Test		Constant Discharge Test - Neuman Method (b)		Constant Discharge Test - Cooper and Jacob Method (b)		Recovery Test	
	K (ft/day)	T (ft^2/day)	K (ft/day)	T (ft^2/day)	K (ft/day)	T (ft^2/day)	K (ft/day)	T (ft^2/day)
PZ-1	9.3	151.59	2.86	46.86	2.58	42.02	4.02	151.56
PZ-2	NA	NA	4.51	73.54	8.56	139.45	NA	NA
PZ-3	NA	NA	5.21	84.81	13.10	213.82	NA	NA

a/ ft/day = feet per day; ft^2/day = square feet per day; K = hydraulic conductivity; T = Transmissivity; NA = not analyzed.
b/ Early-time data only (less than approximately 250 minutes). See text for explanation.

Boring Log: PZ-1

Project: Ashland Distribution Co.

Project No.: 462690

Location: Rensselaer, NY

Geologist: David P. Bouchard

Completion Date: May 15, 2001

Surface Elevation (ft. MSL): Not determined

Total Depth (ft. bgs): 18

TOC Elevation (ft. MSL): Not determined

Borehole Diameter (in.) 2.0 Probe/8.25 HSA

ESC

Sample Data				SUBSURFACE PROFILE		
Depth	Sample Interval	% Recovery	PID (ppm)	Symbol	Description	Well Construction
0					Ground Surface	
1	1	25	2.4		*Silt with Gravel (ML)* Greyish-brown silt, some gravel, trace to little fine to medium-grained sand; medium dense; dry.	
2						
3	2	25	97.4			
4						
5	3	25	44.5		*Sand with Gravel (SP)* Greyish-black medium to coarse-grained sand and gravel, trace to little silt; loose; wet; strong odor, sheen visible, brown oily substance coating some grains.	
6						
7	4	0	NA			
8						
9	5	50	40.5			
10					*Silt with Gravel (ML)* Greyish-black silt, little medium-grained sand, some coarse gravel; loose; wet; strong odor, sheen visible.	
11	6	50	47.0			
12					*Silt with Gravel (ML)* Greyish-brown silt, little medium-grained sand, some coarse gravel, trace fine to coarse-grained sand, trace to little clay nodules; medium dense; wet; moderate odor, sheen visible.	
13	7	100	18.6			
14						
15	8	100	30.4		*Silt with Gravel (ML)* Reddish-brown silt, some gravel, little clay; dense to very dense; dry.	
16						
17	9	100	40.6		*Silty Clay (CH)* Greyish-black silty clay, trace gravel; stiff, plastic; moist.	
18					*Clay (CH)* Greyish-black clay, little silt; very stiff, plastic; moist.	
19					Boring Terminated	
20						
21						
22						
23						
24						
25						

Subcontractor: Parratt Wolff, Inc.

Driller/Operator: Ian Grassy

Method: 2-inch Probe/4.25-inch HSA

Boring Log: PZ-2

Project: Ashland Distribution Co.

Project No.: 462690

Location: Rensselaer, NY

Geologist: David P. Bouchard

Completion Date: May 15, 2001

Surface Elevation (ft. MSL): Not determined

Total Depth (ft. bgs): 16

TOC Elevation (ft. MSL): Not determined

Borehole Diameter (in.) 2.0 Probe/8.25 HSA

ESC

Sample Data				SUBSURFACE PROFILE		
Depth	Sample Interval	% Recovery	PID (ppm)	Symbol	Description	Well Construction
0					Ground Surface	
1–3	1	25	0.9		*Silt with Sand (ML)* Dark brown silt, little fine to medium-grained sand, trace gravel, trace wood, brick; medium dense; dry.	
3–5	2	25	3.5			
4–5	3	50	0.4		*Sand with Gravel (SP)* Dark grey to black coarse-grained sand and gravel, little silt; loose; wet; faint odor.	
6–8	4	0	NA		*Silty Clay (CH)* Greyish-brown to black silty clay; medium stiff, plastic, sticky; moist.	
9–10	5	50	1.8			
10–11	6	50	5.3		*Silt with Sand (ML)* Greyish-black silt, little fine to medium-grained sand, little gravel; medium dense; moist to wet.	
12–13	7	50	3.4		*Silt (ML)* Reddish-brown silt, little to some clay, trace fine-grained sand, trace gravel; medium dense to dense; moist.	
14–15	8	75	2.8		*Silty Clay (CH)* Reddish-brown to greyish-brown silty clay; medium stiff to stiff becoming very stiff at 15.8 feet, plastic; moist.	
16					Boring Terminated	
17–25						

Subcontractor: Parratt Wolff, Inc.

Driller/Operator: Ian Grassy

Method: 2-inch Probe/4.25-inch HSA

Boring Log: PZ-3

Project: Ashland Distribution Co.

Project No.: 462690

Location: Rensselaer, NY

Geologist: David P. Bouchard

Completion Date: May 15, 2001

Surface Elevation (ft. MSL): Not determined

Total Depth (ft. bgs): 22

TOC Elevation (ft. MSL): Not determined

Borehole Diameter (in.) 2.0 Probe/8.25 HSA

ESC

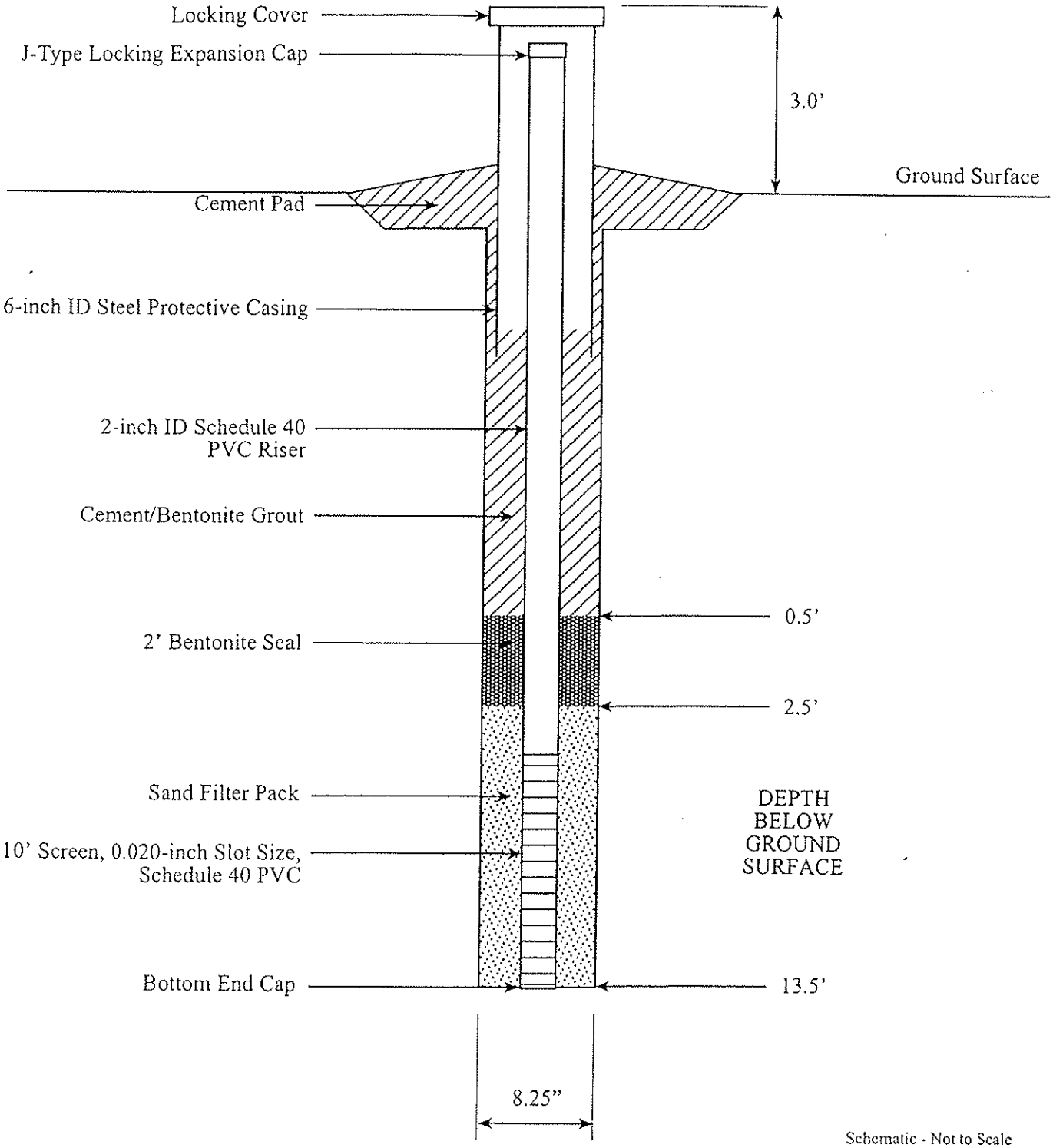
Sample Data				SUBSURFACE PROFILE		
Depth	Sample Interval	% Recovery	PID (ppm)	Symbol	Description	Well Construction
0					Ground Surface	
1	1	25	0.2		*Silt with Gravel (ML)* Brown to greyish-brown silt, some coarse gravel; dense; dry.	
2						
3	2	75	0.1			
4					*Sand with Gravel (SP)* Black fine to medium-grained sand and gravel, trace brick, glass, wood; medium dense to very dense; moist.	
5	3	0	NA			
6						
7	4	50	0.0		*Clay (CH)* Greenish-grey clay, trace to little silt; stiff, plastic; dry.	
8						
9	5	50	2.4		*Silt with gravel (ML)* Greenish-grey silt and coarse gravel, trace medium to coarse-grained sand; loose; wet.	
10						
11	6	100	5.8		*Silt (ML)* Greenish-grey silt, trace gravel; medium dense; moist.	
12					*Sand with Gravel (SP)* Brown fine to medium-grained sand, some gravel; loose; wet.	
13	7	0	NA		*Sand (SP)* Brown to reddish-brown fine-grained sand, little silt, trace coarse gravel; very dense; moist.	
14						
15	8	50	0.0			
16						
17	9	50	0.2		*Sand with Gravel (SP)* Brown fine to medium-grained sand and gravel; loose; wet.	
18						
19	10	0	NA			
20						
21	11	100	7.2			
22					*Silty Clay (CH)* Greyish-brown silty clay; stiff to very stiff, plastic; moist.	
23					Boring Terminated	
24						
25						

Subcontractor: Parratt Wolff, Inc.

Driller/Operator: Ian Grassy

Method: 2-inch Probe/4.25-inch HSA

Site Name: Ashland Distribution Co.
Location: Rensselaer, New York
Date: May 15, 2001

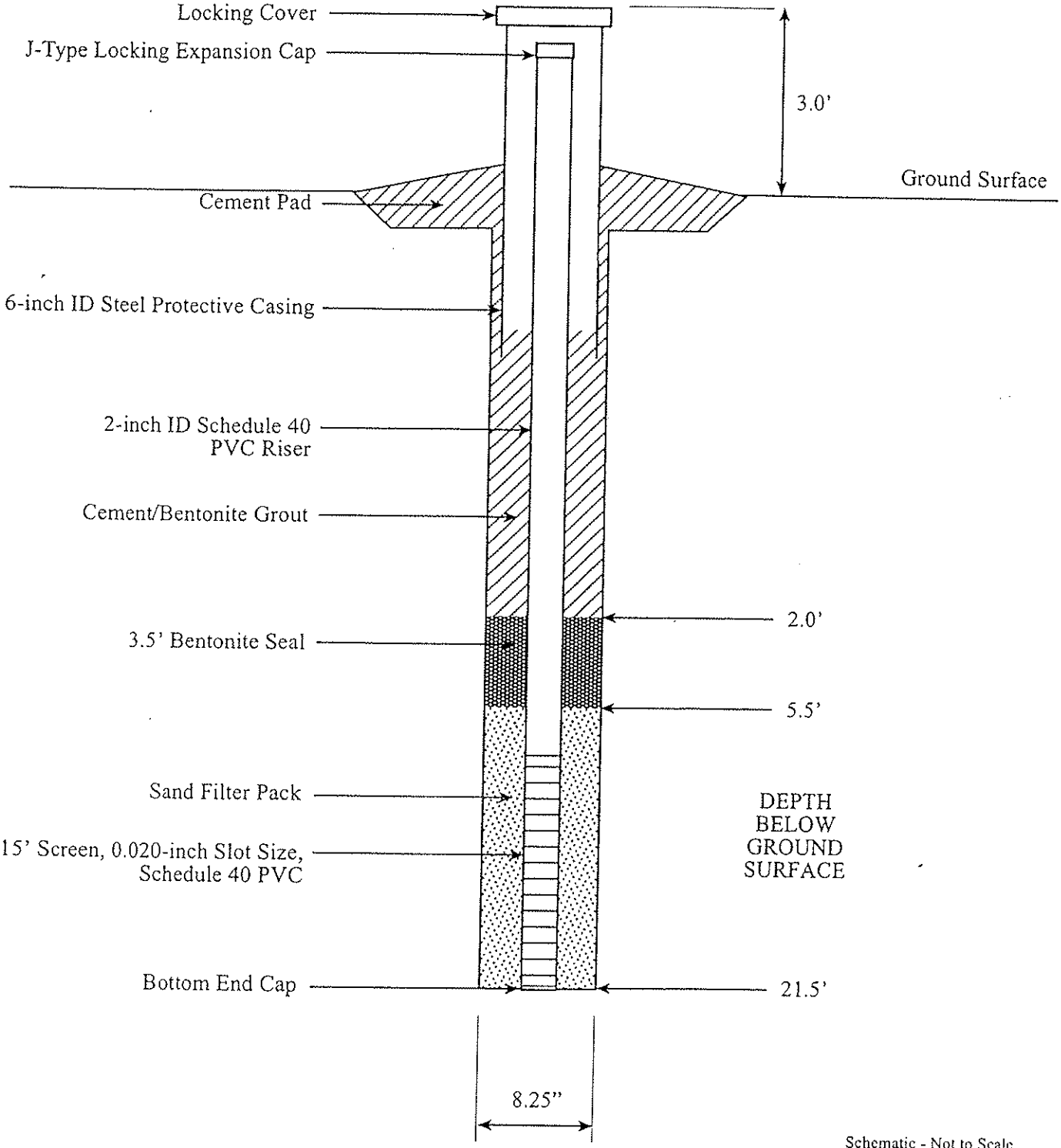


Schematic - Not to Scale

ESC
ENVIRONMENTAL STRATEGIES CORPORATION
11911 Freedom Drive Suite 900
Reston, Virginia 22090
703-709-6500

As-Built Diagram for Monitoring Well PZ-2
Ashland Distribution Company.
Rensselaer, New York

Site Name: Ashland Distribution Co.
Location: Rensselaer, New York
Date: May 15, 2001



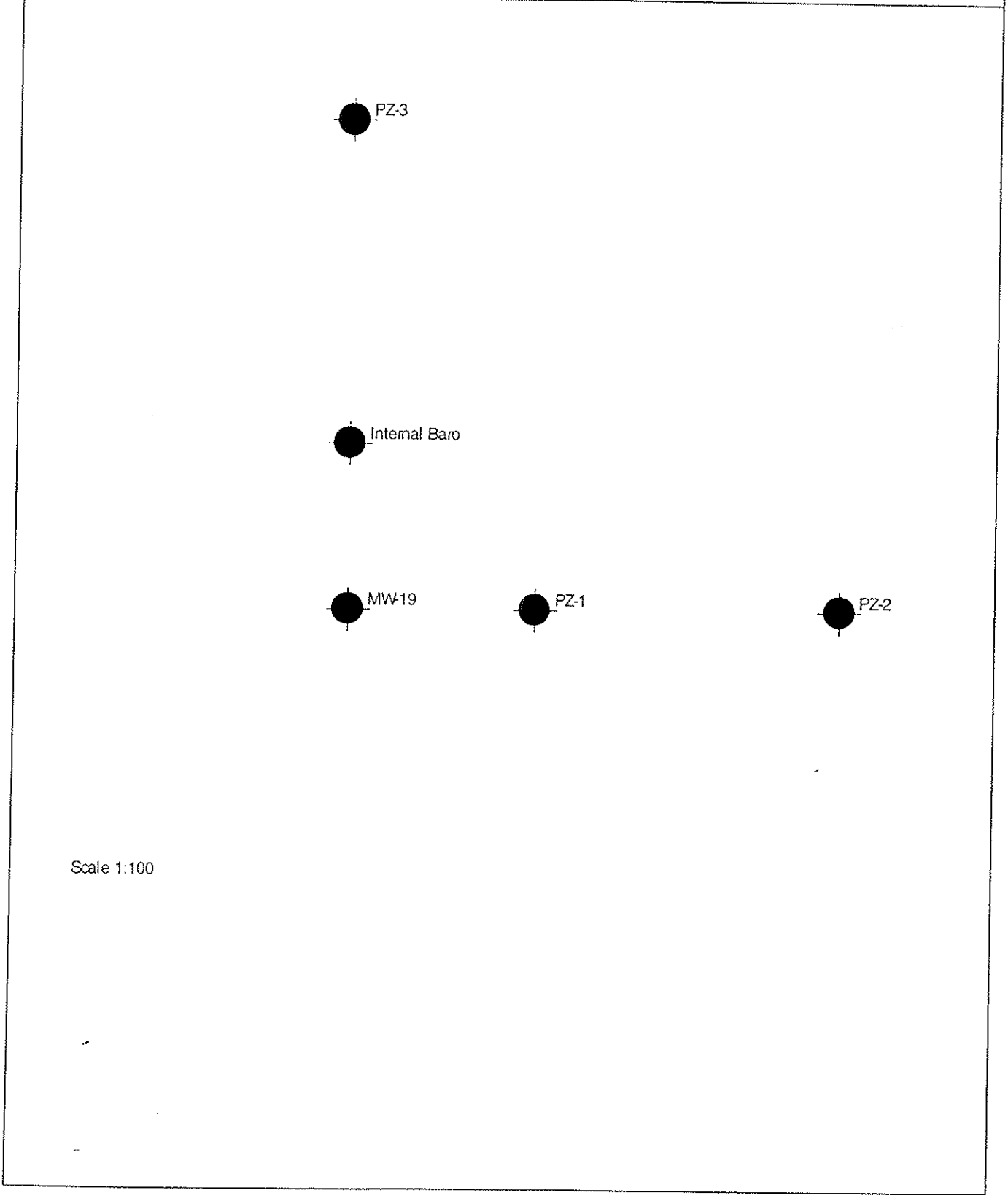
Schematic - Not to Scale

ESC
ENVIRONMENTAL STRATEGIES CORPORATION
11911 Freedom Drive Suite 900
Reston, Virginia 22090
703-709-6500

As-Built Diagram for Monitoring Well PZ-3
Ashland Distribution Company.
Rensselaer, New York

Pump Test Site Plan and Well Summary Report
Ashland Distribution Company
Rensselaer, NY
June 2001

Environmental Strategies Corp. Cazenovia, New York 13035 9 Albany Street 315-655-3900	Site plan No: 462690.04 Project: Rensselaer 2 Client: Ashland Distribution Co.
Location: Rensselaer, New York	Scale 1:100 Lower left corner [m] X: -5 Y: -5 Upper right corner [m] X: 10 Y: 10



Environmental Strategies Corp.
9 Albany Street
Cazenovia, New York 13035
315-655-3900

Well Summary Report

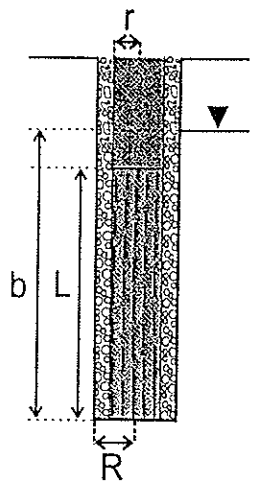
Project: Rensselaer 2

No: 462690.04

Client: Ashland Distribution Co.

Location: Rensselaer, New York

Legend



r - Effective well radius

R - Gravel pack radius

L - Screen length

	Well name	Position [m]		Elevatio		Well Installation [m]		
		X	Y	amsl	Benchmark	r	R	L
1	Internal Baro	0	3					
2	MW-19	0	0			0.10	0.30	4.97
3	PZ-1	3	0			0.05	0.20	4.97
4	PZ-2	8	0			0.05	0.20	4.97
5	PZ-3	0	8			0.05	0.20	4.97

Background Water Level Monitoring Data
Ashland Distribution Company
Rensselaer, NY
June 2001

Environmental Strategies Corp.
9 Albany Street
Cazenovia, New York
315-655-3900

Data

Project: Rensselaer 2

No: 462690.04 | Page 1

Client: Ashland Distribution Co.

Location: Rensselaer, New York | Pumping test: Background Test | Pumping well: MW-19

Test performed DPB

at 06/15/2001

Data observed at: Internal Barometer Depth to static WL: 0 [m]

Distance from pumping well: 3 [m]

	Time [min]	Depth to WL [m]	Drawdown [m]	
1	0	29.88	29.88	
2	15	29.87	29.87	
3	30	29.87	29.87	
4	45	29.88	29.88	
5	60	29.88	29.88	
6	75	29.88	29.88	
7	90	29.88	29.88	
8	105	29.89	29.89	
9	120	29.89	29.89	
10	135	29.89	29.89	
11	150	29.89	29.89	
12	165	29.90	29.90	
13	180	29.90	29.90	
14	195	29.89	29.89	
15	210	29.90	29.90	
16	225	29.90	29.90	
17	240	29.90	29.90	
18	255	29.90	29.90	
19	270	29.91	29.91	
20	285	29.91	29.91	
21	300	29.91	29.91	
22	315	29.91	29.91	
23	330	29.92	29.92	
24	345	29.92	29.92	
25	360	29.93	29.93	
26	375	29.93	29.93	
27	390	29.93	29.93	
28	405	29.93	29.93	
29	420	29.93	29.93	
30	435	29.93	29.93	
31	450	29.93	29.93	
32	465	29.93	29.93	
33	480	29.94	29.94	
34	495	29.94	29.94	
35	510	29.95	29.95	

Environmental Strategies Corp.
9 Albany Street
Cazenovia, New York
315-655-3900

Data

Project: Rensselaer 2

No: 462690.04 | Page 2

Client: Ashland Distribution Co.

Location: Rensselaer, New York | Pumping test: Background Test | Pumping well: MW-19

Test performed DPB

at 06/15/2001

Data observed at: Internal Barometer | Depth to static WL: 0 [m]

Distance from pumping well: 3 [m]

	Time [min]	Depth to WL [m]	Drawdown [m]	
36	525	29.95	29.95	
37	540	29.95	29.95	
38	555	29.95	29.95	
39	570	29.96	29.96	
40	585	29.96	29.96	
41	600	29.96	29.96	
42	615	29.97	29.97	
43	630	29.97	29.97	
44	645	29.97	29.97	
45	660	29.97	29.97	
46	675	29.97	29.97	
47	690	29.97	29.97	
48	705	29.96	29.96	
49	720	29.96	29.96	
50	735	29.97	29.97	
51	750	29.97	29.97	
52	765	29.97	29.97	
53	780	29.97	29.97	
54	795	29.98	29.98	
55	810	29.99	29.99	
56	825	29.99	29.99	
57	840	30.00	30.00	
58	855	30.00	30.00	
59	870	30.00	30.00	
60	885	30.00	30.00	
61	900	30.00	30.00	
62	915	30.00	30.00	
63	930	30.00	30.00	
64	945	30.00	30.00	
65	960	30.00	30.00	
66	975	30.00	30.00	
67	990	30.00	30.00	
68	1005	29.99	29.99	
69	1020	29.99	29.99	
70	1035	30.00	30.00	

Environmental Strategies Corp.
9 Albany Street
Cazenovia, New York
315-655-3900

Data

Project: Rensselaer 2

No: 462690.04 | Page 3

Client: Ashland Distribution Co.

Location: Rensselaer, New York | Pumping test: Background Test | Pumping well: MW-19

Test performed DPB

at 06/15/2001

Data observed at: Internal Barometer | Depth to static WL: 0 [m]

Distance from pumping well: 3 [m]

	Time [min]	Depth to WL [m]	Drawdown [m]	
71	1050	29.99	29.99	
72	1065	30.00	30.00	
73	1080	30.00	30.00	
74	1095	30.01	30.01	
75	1110	30.01	30.01	
76	1125	30.01	30.01	
77	1140	30.02	30.02	
78	1155	30.01	30.01	
79	1170	30.01	30.01	
80	1185	30.01	30.01	
81	1200	30.01	30.01	
82	1215	30.04	30.04	
83	1230	30.00	30.00	
84	1245	30.00	30.00	
85	1260	30.00	30.00	
86	1275	30.00	30.00	
87	1290	30.00	30.00	
88	1305	30.00	30.00	
89	1320	30.00	30.00	
90	1335	30.01	30.01	
91	1350	30.01	30.01	
92	1365	30.01	30.01	
93	1380	30.00	30.00	
94	1395	30.00	30.00	
95	1410	30.00	30.00	
96	1425	30.00	30.00	
97	1440	29.99	29.99	

Environmental Strategies Corp.
9 Albany Street
Cazenovia, New York
315-655-3900

Data

Project: Rensselaer 2

No: 462690.04 | Page 1

Client: Ashland Distribution Co.

Location: Rensselaer, New York | Pumping test: Background Test | Pumping well: MW-19

Test performed DPB

at 06/15/2001

Data observed at: MW-19 Depth to static WL: 0 [m]

Distance from pumping well: 0 [m]

	Time [min]	Depth to WL [m]	Drawdown [m]	
1	0	0.00	0.00	
2	15	0.01	0.01	
3	30	0.01	0.01	
4	45	0.01	0.01	
5	60	0.00	0.00	
6	75	0.00	0.00	
7	90	0.00	0.00	
8	105	0.05	0.05	
9	120	0.05	0.05	
10	135	0.05	0.05	
11	150	0.05	0.05	
12	165	0.05	0.05	
13	180	0.05	0.05	
14	195	0.05	0.05	
15	210	0.10	0.10	
16	225	0.11	0.11	
17	240	0.11	0.11	
18	255	0.11	0.11	
19	270	0.11	0.11	
20	285	0.11	0.11	
21	300	0.11	0.11	
22	315	0.11	0.11	
23	330	0.11	0.11	
24	345	0.11	0.11	
25	360	0.10	0.10	
26	375	0.10	0.10	
27	390	0.10	0.10	
28	405	0.10	0.10	
29	420	0.10	0.10	
30	435	0.10	0.10	
31	450	0.10	0.10	
32	465	0.10	0.10	
33	480	0.10	0.10	
34	495	0.10	0.10	
35	510	0.09	0.09	

Environmental Strategies Corp.
9 Albany Street
Cazenovia, New York
315-655-3900

Data

Project: Rensselaer 2

No: 462690.04 | Page 2

Client: Ashland Distribution Co.

Location: Rensselaer, New York | Pumping test: Background Test | Pumping well: MW-19

Test performed DPB

at 06/15/2001

Data observed at: MW-19 Depth to static WL: 0 [m]

Distance from pumping well: 0 [m]

	Time [min]	Depth to WL [m]	Drawdown [m]	
36	525	0.09	0.09	
37	540	0.09	0.09	
38	555	0.09	0.09	
39	570	0.09	0.09	
40	585	0.09	0.09	
41	600	0.09	0.09	
42	615	0.09	0.09	
43	630	0.09	0.09	
44	645	0.09	0.09	
45	660	0.08	0.08	
46	675	0.08	0.08	
47	690	0.08	0.08	
48	705	0.09	0.09	
49	720	0.09	0.09	
50	735	0.09	0.09	
51	750	0.09	0.09	
52	765	0.09	0.09	
53	780	0.09	0.09	
54	795	0.08	0.08	
55	810	0.08	0.08	
56	825	0.08	0.08	
57	840	0.08	0.08	
58	855	0.08	0.08	
59	870	0.08	0.08	
60	885	0.08	0.08	
61	900	0.08	0.08	
62	915	0.08	0.08	
63	930	0.08	0.08	
64	945	0.08	0.08	
65	960	0.08	0.08	
66	975	0.08	0.08	
67	990	0.08	0.08	
68	1005	0.09	0.09	
69	1020	0.09	0.09	
70	1035	0.08	0.08	

Environmental Strategies Corp.
9 Albany Street
Cazenovia, New York
315-655-3900

Data

Project: Rensselaer 2

No: 462690.04 |

Client: Ashland Distribution Co.

Location: Rensselaer, New York | Pumping test: Background Test | Pumping well: MW-19

Test performed DPB

at 06/15/2001

Data observed at: MW-19 Depth to static WL: 0 [m]

Distance from pumping well: 0 [m]

	Time [min]	Depth to WL [m]	Drawdown [m]	
71	1050	0.09	0.09	
72	1065	0.09	0.09	
73	1080	0.08	0.08	
74	1095	0.08	0.08	
75	1110	0.08	0.08	
76	1125	0.08	0.08	
77	1140	0.08	0.08	
78	1155	0.08	0.08	
79	1170	0.09	0.09	
80	1185	0.09	0.09	
81	1200	0.08	0.08	
82	1215	0.09	0.09	
83	1230	0.09	0.09	
84	1245	0.08	0.08	
85	1260	0.08	0.08	
86	1275	0.09	0.09	
87	1290	0.09	0.09	
88	1305	0.08	0.08	
89	1320	0.09	0.09	
90	1335	0.15	0.15	
91	1350	0.15	0.15	
92	1365	0.15	0.15	
93	1380	0.16	0.16	
94	1395	0.16	0.16	
95	1410	0.18	0.18	
96	1425	0.18	0.18	
97	1440	0.18	0.18	

Environmental Strategies Corp.
9 Albany Street
Cazenovia, New York
315-655-3900

Data

Project: Rensselaer 2

No: 462690.04 | Page 1

Client: Ashland Distribution Co.

Location: Rensselaer, New York | Pumping test: Background Test | Pumping well: MW-19

Test performed DPB

at 06/15/2001

Data observed at: PZ-1 Depth to static WL: 0 [m]

Distance from pumping well: 3.35 [m]

	Time [min]	Depth to WL [m]	Drawdown [m]	
1	0	0.00	0.00	
2	15	-0.01	-0.01	
3	30	-0.01	-0.01	
4	45	-0.02	-0.02	
5	60	-0.02	-0.02	
6	75	-0.03	-0.03	
7	90	-0.03	-0.03	
8	105	-0.03	-0.03	
9	120	-0.04	-0.04	
10	135	-0.04	-0.04	
11	150	-0.04	-0.04	
12	165	-0.04	-0.04	
13	180	-0.04	-0.04	
14	195	-0.04	-0.04	
15	210	-0.05	-0.05	
16	225	-0.05	-0.05	
17	240	-0.05	-0.05	
18	255	-0.05	-0.05	
19	270	-0.05	-0.05	
20	285	-0.06	-0.06	
21	300	-0.06	-0.06	
22	315	-0.06	-0.06	
23	330	-0.06	-0.06	
24	345	-0.06	-0.06	
25	360	-0.06	-0.06	
26	375	-0.06	-0.06	
27	390	-0.06	-0.06	
28	405	-0.06	-0.06	
29	420	-0.06	-0.06	
30	435	-0.06	-0.06	
31	450	-0.06	-0.06	
32	465	-0.06	-0.06	
33	480	-0.06	-0.06	
34	495	-0.06	-0.06	
35	510	-0.06	-0.06	

Environmental Strategies Corp.
9 Albany Street
Cazenovia, New York
315-655-3900

Data

Project: Rensselaer 2

No: 462690.04 |

Client: Ashland Distribution Co.

Location: Rensselaer, New York | Pumping test: Background Test | Pumping well: MW-19

Test performed DPB

at 06/15/2001

Data observed at: PZ-1 Depth to static WL: 0 [m]

Distance from pumping well: 3.35 [m]

	Time [min]	Depth to WL [m]	Drawdown [m]	
36	525	-0.06	-0.06	
37	540	-0.06	-0.06	
38	555	-0.06	-0.06	
39	570	-0.06	-0.06	
40	585	-0.06	-0.06	
41	600	-0.06	-0.06	
42	615	-0.06	-0.06	
43	630	-0.06	-0.06	
44	645	-0.06	-0.06	
45	660	-0.06	-0.06	
46	675	-0.06	-0.06	
47	690	-0.06	-0.06	
48	705	-0.06	-0.06	
49	720	-0.06	-0.06	
50	735	-0.06	-0.06	
51	750	-0.06	-0.06	
52	765	-0.06	-0.06	
53	780	-0.06	-0.06	
54	795	-0.06	-0.06	
55	810	-0.06	-0.06	
56	825	-0.06	-0.06	
57	840	-0.06	-0.06	
58	855	-0.06	-0.06	
59	870	-0.06	-0.06	
60	885	-0.06	-0.06	
61	900	-0.06	-0.06	
62	915	-0.06	-0.06	
63	930	-0.05	-0.05	
64	945	-0.05	-0.05	
65	960	-0.05	-0.05	
66	975	-0.06	-0.06	
67	990	-0.06	-0.06	
68	1005	-0.06	-0.06	
69	1020	-0.06	-0.06	
70	1035	-0.05	-0.05	

Environmental Strategies Corp.
9 Albany Street
Cazenovia, New York
315-655-3900

Data		
Project:	Rensselaer 2	
No:	462690.04	Page 3
Client:	Ashland Distribution Co.	

Location: Rensselaer, New York | Pumping test: Background Test | Pumping well: MW-19

Test performed DPB

at 06/15/2001

Data observed at: PZ-1 Depth to static WL: 0 [m]

Distance from pumping well: 3.35 [m]

	Time [min]	Depth to WL [m]	Drawdown [m]	
71	1050	-0.05	-0.05	
72	1065	-0.05	-0.05	
73	1080	-0.05	-0.05	
74	1095	-0.05	-0.05	
75	1110	-0.05	-0.05	
76	1125	-0.05	-0.05	
77	1140	-0.05	-0.05	
78	1155	-0.05	-0.05	
79	1170	-0.05	-0.05	
80	1185	-0.05	-0.05	
81	1200	-0.05	-0.05	
82	1215	-0.04	-0.04	
83	1230	-0.05	-0.05	
84	1245	-0.05	-0.05	
85	1260	-0.05	-0.05	
86	1275	-0.05	-0.05	
87	1290	-0.05	-0.05	
88	1305	-0.05	-0.05	
89	1320	-0.05	-0.05	
90	1335	-0.05	-0.05	
91	1350	-0.05	-0.05	
92	1365	-0.05	-0.05	
93	1380	-0.05	-0.05	
94	1395	-0.05	-0.05	
95	1410	-0.05	-0.05	
96	1425	-0.05	-0.05	
97	1440	-0.05	-0.05	

Environmental Strategies Corp.
9 Albany Street
Cazenovia, New York
315-655-3900

Data

Project: Rensselaer 2

No: 462690.04 | Page 1

Client: Ashland Distribution Co.

Location: Rensselaer, New York | Pumping test: Background Test | Pumping well: MW-19

Test performed DPB

at 06/15/2001

Data observed at: PZ-2 Depth to static WL: 0 [m]

Distance from pumping well: 8.84 [m]

	Time [min]	Depth to WL [m]	Drawdown [m]	
1	0	0.00	0.00	
2	15	0.00	0.00	
3	30	0.00	0.00	
4	45	0.00	0.00	
5	60	0.00	0.00	
6	75	0.00	0.00	
7	90	0.00	0.00	
8	105	0.00	0.00	
9	120	-0.01	-0.01	
10	135	0.00	0.00	
11	150	0.00	0.00	
12	165	0.00	0.00	
13	180	0.00	0.00	
14	195	0.00	0.00	
15	210	0.00	0.00	
16	225	0.00	0.00	
17	240	0.00	0.00	
18	255	0.00	0.00	
19	270	0.00	0.00	
20	285	0.00	0.00	
21	300	0.00	0.00	
22	315	0.00	0.00	
23	330	0.00	0.00	
24	345	0.00	0.00	
25	360	0.00	0.00	
26	375	0.00	0.00	
27	390	0.00	0.00	
28	405	0.00	0.00	
29	420	0.01	0.01	
30	435	0.00	0.00	
31	450	0.01	0.01	
32	465	0.01	0.01	
33	480	0.01	0.01	
34	495	0.01	0.01	
35	510	0.01	0.01	

Environmental Strategies Corp.
9 Albany Street
Cazenovia, New York
315-655-3900

Data

Project: Rensselaer 2

No: 462690.04 | Page 2

Client: Ashland Distribution Co.

Location: Rensselaer, New York | Pumping test: Background Test | Pumping well: MW-19

Test performed DPB

at 06/15/2001

Data observed at: PZ-2 Depth to static WL: 0 [m]

Distance from pumping well: 8.84 [m]

	Time [min]	Depth to WL [m]	Drawdown [m]	
36	525	0.01	0.01	
37	540	0.01	0.01	
38	555	0.01	0.01	
39	570	0.01	0.01	
40	585	0.01	0.01	
41	600	0.01	0.01	
42	615	0.01	0.01	
43	630	0.01	0.01	
44	645	0.01	0.01	
45	660	0.01	0.01	
46	675	0.01	0.01	
47	690	0.01	0.01	
48	705	0.01	0.01	
49	720	0.01	0.01	
50	735	0.01	0.01	
51	750	0.01	0.01	
52	765	0.01	0.01	
53	780	0.01	0.01	
54	795	0.01	0.01	
55	810	0.01	0.01	
56	825	0.01	0.01	
57	840	0.01	0.01	
58	855	0.01	0.01	
59	870	0.01	0.01	
60	885	0.01	0.01	
61	900	0.01	0.01	
62	915	0.01	0.01	
63	930	0.01	0.01	
64	945	0.02	0.02	
65	960	0.02	0.02	
66	975	0.02	0.02	
67	990	0.02	0.02	
68	1005	0.02	0.02	
69	1020	0.02	0.02	
70	1035	0.02	0.02	

Environmental Strategies Corp.
9 Albany Street
Cazenovia, New York
315-655-3900

Data

Project: Rensselaer 2

No: 462690.04 |

Client: Ashland Distribution Co.

Location: Rensselaer, New York | Pumping test: Background Test | Pumping well: MW-19

Test performed DPB

at 06/15/2001

Data observed at: PZ-2 Depth to static WL: 0 [m]

Distance from pumping well: 8.84 [m]

	Time [min]	Depth to WL [m]	Drawdown [m]	
71	1050	0.02	0.02	
72	1065	0.02	0.02	
73	1080	0.02	0.02	
74	1095	0.02	0.02	
75	1110	0.02	0.02	
76	1125	0.02	0.02	
77	1140	0.02	0.02	
78	1155	0.02	0.02	
79	1170	0.02	0.02	
80	1185	0.02	0.02	
81	1200	0.02	0.02	
82	1215	0.03	0.03	
83	1230	0.03	0.03	
84	1245	0.02	0.02	
85	1260	0.03	0.03	
86	1275	0.02	0.02	
87	1290	0.02	0.02	
88	1305	0.02	0.02	
89	1320	0.03	0.03	
90	1335	0.02	0.02	
91	1350	0.02	0.02	
92	1365	0.02	0.02	
93	1380	0.02	0.02	
94	1395	0.02	0.02	
95	1410	0.02	0.02	
96	1425	0.02	0.02	
97	1440	0.02	0.02	

Environmental Strategies Corp.
9 Albany Street
Cazenovia, New York
315-655-3900

Data

Project: Rensselaer 2

No: 462690.04 | Page 1

Client: Ashland Distribution Co.

Location: Rensselaer, New York | Pumping test: Background Test | Pumping well: MW-19

Test performed DPB

at 06/15/2001

Data observed at: PZ-3 Depth to static WL: 0 [m]

Distance from pumping well: 8.84 [m]

	Time [min]	Depth to WL [m]	Drawdown [m]	
1	0	0.00	0.00	
2	15	0.00	0.00	
3	30	0.00	0.00	
4	45	0.00	0.00	
5	60	0.00	0.00	
6	75	0.00	0.00	
7	90	0.00	0.00	
8	105	0.00	0.00	
9	120	0.00	0.00	
10	135	0.00	0.00	
11	150	0.00	0.00	
12	165	-0.01	-0.01	
13	180	0.00	0.00	
14	195	0.00	0.00	
15	210	0.00	0.00	
16	225	0.00	0.00	
17	240	0.00	0.00	
18	255	0.00	0.00	
19	270	0.00	0.00	
20	285	0.00	0.00	
21	300	0.00	0.00	
22	315	0.00	0.00	
23	330	0.00	0.00	
24	345	0.01	0.01	
25	360	0.01	0.01	
26	375	0.01	0.01	
27	390	0.00	0.00	
28	405	0.01	0.01	
29	420	0.01	0.01	
30	435	0.01	0.01	
31	450	0.01	0.01	
32	465	0.01	0.01	
33	480	0.01	0.01	
34	495	0.01	0.01	
35	510	0.01	0.01	

Environmental Strategies Corp.
9 Albany Street
Cazenovia, New York
315-655-3900

Data

Project: Rensselaer 2

No: 462690.04 | Page 2

Client: Ashland Distribution Co.

Location: Rensselaer, New York | Pumping test: Background Test | Pumping well: MW-19

Test performed DPB

at 06/15/2001

Data observed at: PZ-3 Depth to static WL: 0 [m]

Distance from pumping well: 8.84 [m]

	Time [min]	Depth to WL [m]	Drawdown [m]	
36	525	0.01	0.01	
37	540	0.01	0.01	
38	555	0.01	0.01	
39	570	0.01	0.01	
40	585	0.01	0.01	
41	600	0.01	0.01	
42	615	0.01	0.01	
43	630	0.01	0.01	
44	645	0.01	0.01	
45	660	0.01	0.01	
46	675	0.01	0.01	
47	690	0.01	0.01	
48	705	0.01	0.01	
49	720	0.01	0.01	
50	735	0.01	0.01	
51	750	0.01	0.01	
52	765	0.01	0.01	
53	780	0.01	0.01	
54	795	0.01	0.01	
55	810	0.02	0.02	
56	825	0.02	0.02	
57	840	0.02	0.02	
58	855	0.02	0.02	
59	870	0.02	0.02	
60	885	0.02	0.02	
61	900	0.02	0.02	
62	915	0.02	0.02	
63	930	0.02	0.02	
64	945	0.02	0.02	
65	960	0.02	0.02	
66	975	0.02	0.02	
67	990	0.02	0.02	
68	1005	0.02	0.02	
69	1020	0.02	0.02	
70	1035	0.02	0.02	

Environmental Strategies Corp.
9 Albany Street
Cazenovia, New York
315-655-3900

Data

Project: Rensselaer 2

No: 462690.04 | Page 3

Client: Ashland Distribution Co.

Location: Rensselaer, New York | Pumping test: Background Test | Pumping well: MW-19

Test performed DPB

at 06/15/2001

Data observed at: PZ-3 Depth to static WL: 0 [m]

Distance from pumping well: 8.84 [m]

	Time [min]	Depth to WL [m]	Drawdown [m]	
71	1050	0.02	0.02	
72	1065	0.02	0.02	
73	1080	0.02	0.02	
74	1095	0.02	0.02	
75	1110	0.02	0.02	
76	1125	0.02	0.02	
77	1140	0.03	0.03	
78	1155	0.03	0.03	
79	1170	0.03	0.03	
80	1185	0.03	0.03	
81	1200	0.03	0.03	
82	1215	0.03	0.03	
83	1230	0.03	0.03	
84	1245	0.03	0.03	
85	1260	0.03	0.03	
86	1275	0.03	0.03	
87	1290	0.03	0.03	
88	1305	0.03	0.03	
89	1320	0.03	0.03	
90	1335	0.03	0.03	
91	1350	0.03	0.03	
92	1365	0.03	0.03	
93	1380	0.03	0.03	
94	1395	0.03	0.03	
95	1410	0.02	0.02	
96	1425	0.02	0.02	
97	1440	0.03	0.03	

Variable Rate (Step) Pump Test Data
Ashland Distribution Company
Rensselaer, NY
June 2001

Environmental Strategies Corp.
9 Albany Street
Cazenovia, New York
315-655-3900

Data

Project: Rensselaer 2

No: 462690.04 | Page 1

Client: Ashland Distribution Co.

Location: Rensselaer, New York | Pumping test: Step Test | Pumping well: MW-19

Test performed DPB

at 08/22/2001

Data observed at: PZ-1 Depth to static WL: 0 [m]

Distance from pumping well: 3.35 [m]

	Time [min]	Depth to WL [m]	Drawdown [m]	
1	0	0.00	0.00	
2	0.02	0.00	0.00	
3	0.03	0.00	0.00	
4	0.05	0.00	0.00	
5	0.07	0.00	0.00	
6	0.08	0.00	0.00	
7	0.1	0.00	0.00	
8	0.11	0.00	0.00	
9	0.13	0.00	0.00	
10	0.15	0.00	0.00	
11	0.16	0.00	0.00	
12	0.18	0.00	0.00	
13	0.2	0.00	0.00	
14	0.21	0.00	0.00	
15	0.23	0.00	0.00	
16	0.24	0.00	0.00	
17	0.26	0.00	0.00	
18	0.28	0.00	0.00	
19	0.29	0.00	0.00	
20	0.31	0.00	0.00	
21	0.33	0.00	0.00	
22	0.34	0.00	0.00	
23	0.36	0.00	0.00	
24	0.38	0.00	0.00	
25	0.4	0.00	0.00	
26	0.42	0.00	0.00	
27	0.44	0.00	0.00	
28	0.47	0.00	0.00	
29	0.49	0.00	0.00	
30	0.52	0.00	0.00	
31	0.55	0.00	0.00	
32	0.57	0.00	0.00	
33	0.61	0.00	0.00	
34	0.64	0.01	0.01	
35	0.67	0.01	0.01	

Environmental Strategies Corp.
9 Albany Street
Cazenovia, New York
315-655-3900

Data

Project: Rensselaer 2

No: 462690.04 | Page 2

Client: Ashland Distribution Co.

Location: Rensselaer, New York | Pumping test: Step Test | Pumping well: MW-19

Test performed DPB

at 08/22/2001

Data observed at: PZ-1 Depth to static WL: 0 [m]

Distance from pumping well: 3.35 [m]

	Time [min]	Depth to WL [m]	Drawdown [m]	
36	0.71	0.01	0.01	
37	0.75	0.01	0.01	
38	0.79	0.01	0.01	
39	0.84	0.01	0.01	
40	0.88	0.01	0.01	
41	0.93	0.01	0.01	
42	0.99	0.01	0.01	
43	1.04	0.01	0.01	
44	1.1	0.01	0.01	
45	1.16	0.01	0.01	
46	1.23	0.01	0.01	
47	1.3	0.01	0.01	
48	1.38	0.01	0.01	
49	1.46	0.01	0.01	
50	1.54	0.01	0.01	
51	1.63	0.01	0.01	
52	1.72	0.02	0.02	
53	1.82	0.02	0.02	
54	1.93	0.02	0.02	
55	2.04	0.02	0.02	
56	2.16	0.02	0.02	
57	2.28	0.02	0.02	
58	2.41	0.03	0.03	
59	2.55	0.03	0.03	
60	2.7	0.03	0.03	
61	2.86	0.03	0.03	
62	3.03	0.03	0.03	
63	3.19	0.03	0.03	
64	3.36	0.04	0.04	
65	3.53	0.04	0.04	
66	3.69	0.04	0.04	
67	3.86	0.04	0.04	
68	4.03	0.04	0.04	
69	4.19	0.04	0.04	
70	4.36	0.04	0.04	

Environmental Strategies Corp.
9 Albany Street
Cazenovia, New York
315-655-3900

Data

Project: Rensselaer 2

No: 462690.04 | Page 3

Client: Ashland Distribution Co.

Location: Rensselaer, New York | Pumping test: Step Test | Pumping well: MW-19

Test performed DPB

at 08/22/2001

Data observed at: PZ-1 Depth to static WL: 0 [m]

Distance from pumping well: 3.35 [m]

	Time [min]	Depth to WL [m]	Drawdown [m]	
71	4.53	0.04	0.04	
72	4.69	0.05	0.05	
73	4.86	0.05	0.05	
74	5.03	0.05	0.05	
75	5.19	0.05	0.05	
76	5.36	0.05	0.05	
77	5.53	0.05	0.05	
78	5.69	0.05	0.05	
79	5.86	0.05	0.05	
80	6.03	0.05	0.05	
81	6.19	0.05	0.05	
82	6.36	0.05	0.05	
83	6.53	0.05	0.05	
84	6.69	0.05	0.05	
85	6.86	0.06	0.06	
86	7.03	0.06	0.06	
87	7.19	0.06	0.06	
88	7.36	0.06	0.06	
89	7.53	0.06	0.06	
90	7.69	0.06	0.06	
91	7.86	0.06	0.06	
92	8.03	0.06	0.06	
93	8.19	0.06	0.06	
94	8.36	0.06	0.06	
95	8.53	0.06	0.06	
96	8.69	0.06	0.06	
97	8.86	0.06	0.06	
98	9.03	0.06	0.06	
99	9.19	0.06	0.06	
100	9.36	0.06	0.06	
101	9.53	0.06	0.06	
102	9.69	0.06	0.06	
103	9.86	0.06	0.06	
104	10.03	0.06	0.06	
105	10.19	0.07	0.07	

Environmental Strategies Corp.
9 Albany Street
Cazenovia, New York
315-655-3900

Data
Project: Rensselaer 2
No: 462690.04 | Page 4
Client: Ashland Distribution Co.

Location: Rensselaer, New York | Pumping test: Step Test | Pumping well: MW-19

Test performed DPB
at 08/22/2001

Data observed at: PZ-1 Depth to static WL: 0 [m]
Distance from pumping well: 3.35 [m]

	Time [min]	Depth to WL [m]	Drawdown [m]	
106	10.36	0.07	0.07	
107	10.53	0.07	0.07	
108	10.69	0.07	0.07	
109	10.86	0.07	0.07	
110	11.03	0.07	0.07	
111	11.19	0.07	0.07	
112	11.36	0.07	0.07	
113	11.53	0.07	0.07	
114	11.69	0.07	0.07	
115	11.86	0.07	0.07	
116	12.03	0.07	0.07	
117	12.19	0.07	0.07	
118	12.36	0.07	0.07	
119	12.53	0.07	0.07	
120	12.69	0.07	0.07	
121	12.86	0.07	0.07	
122	13.03	0.07	0.07	
123	13.19	0.07	0.07	
124	13.36	0.07	0.07	
125	13.53	0.07	0.07	
126	13.69	0.07	0.07	
127	13.86	0.07	0.07	
128	14.03	0.07	0.07	
129	14.19	0.07	0.07	
130	14.36	0.07	0.07	
131	14.53	0.07	0.07	
132	14.69	0.07	0.07	
133	14.86	0.07	0.07	
134	15.03	0.08	0.08	
135	15.19	0.07	0.07	
136	15.36	0.08	0.08	
137	15.53	0.08	0.08	
138	15.69	0.08	0.08	
139	15.86	0.08	0.08	
140	16.03	0.08	0.08	

Environmental Strategies Corp.
9 Albany Street
Cazenovia, New York
315-655-3900

Data

Project: Rensselaer 2

No: 462690.04 | Page 5

Client: Ashland Distribution Co.

Location: Rensselaer, New York | Pumping test: Step Test | Pumping well: MW-19

Test performed DPB

at 08/22/2001

Data observed at: PZ-1 Depth to static WL: 0 [m]

Distance from pumping well: 3.35 [m]

	Time [min]	Depth to WL [m]	Drawdown [m]	
141	16.19	0.08	0.08	
142	16.36	0.08	0.08	
143	16.53	0.08	0.08	
144	16.69	0.08	0.08	
145	16.86	0.08	0.08	
146	17.03	0.08	0.08	
147	17.19	0.08	0.08	
148	17.36	0.08	0.08	
149	17.53	0.08	0.08	
150	17.69	0.08	0.08	
151	17.86	0.08	0.08	
152	18.03	0.08	0.08	
153	18.19	0.08	0.08	
154	18.36	0.08	0.08	
155	18.53	0.08	0.08	
156	18.69	0.08	0.08	
157	18.86	0.08	0.08	
158	19.03	0.08	0.08	
159	19.19	0.08	0.08	
160	19.36	0.08	0.08	
161	19.53	0.08	0.08	
162	19.69	0.08	0.08	
163	19.86	0.08	0.08	
164	20.03	0.08	0.08	
165	20.19	0.08	0.08	
166	20.36	0.08	0.08	
167	20.53	0.08	0.08	
168	20.69	0.08	0.08	
169	20.86	0.08	0.08	
170	21.03	0.08	0.08	
171	21.19	0.08	0.08	
172	21.36	0.08	0.08	
173	21.53	0.08	0.08	
174	21.69	0.08	0.08	
175	21.86	0.08	0.08	

Environmental Strategies Corp.
9 Albany Street
Cazenovia, New York
315-655-3900

Data

Project: Rensselaer 2

No: 462690.04 | Page 6

Client: Ashland Distribution Co.

Location: Rensselaer, New York | Pumping test: Step Test | Pumping well: MW-19

Test performed DPB

at 08/22/2001

Data observed at: PZ-1 Depth to static WL: 0 [m]

Distance from pumping well: 3.35 [m]

	Time [min]	Depth to WL [m]	Drawdown [m]	
176	22.03	0.08	0.08	
177	22.19	0.08	0.08	
178	22.36	0.08	0.08	
179	22.53	0.09	0.09	
180	22.69	0.09	0.09	
181	22.86	0.09	0.09	
182	23.03	0.09	0.09	
183	23.19	0.09	0.09	
184	23.36	0.09	0.09	
185	23.53	0.08	0.08	
186	23.69	0.08	0.08	
187	23.86	0.09	0.09	
188	24.03	0.09	0.09	
189	24.19	0.09	0.09	
190	24.36	0.09	0.09	
191	24.53	0.09	0.09	
192	24.69	0.09	0.09	
193	24.86	0.09	0.09	
194	25.03	0.09	0.09	
195	25.19	0.09	0.09	
196	25.36	0.09	0.09	
197	25.53	0.09	0.09	
198	25.69	0.09	0.09	
199	25.86	0.09	0.09	
200	26.03	0.09	0.09	
201	26.19	0.09	0.09	
202	26.36	0.09	0.09	
203	26.53	0.09	0.09	
204	26.69	0.09	0.09	
205	26.86	0.09	0.09	
206	27.03	0.09	0.09	
207	27.19	0.09	0.09	
208	27.36	0.09	0.09	
209	27.53	0.09	0.09	
210	27.69	0.09	0.09	

Environmental Strategies Corp.
9 Albany Street
Cazenovia, New York
315-655-3900

Data

Project: Rensselaer 2

No: 462690.04 | Page 7

Client: Ashland Distribution Co.

Location: Rensselaer, New York | Pumping test: Step Test | Pumping well: MW-19

Test performed DPB

at 08/22/2001

Data observed at: PZ-1 Depth to static WL: 0 [m]

Distance from pumping well: 3.35 [m]

	Time [min]	Depth to WL [m]	Drawdown [m]	
211	27.86	0.09	0.09	
212	28.03	0.09	0.09	
213	28.19	0.09	0.09	
214	28.36	0.09	0.09	
215	28.53	0.09	0.09	
216	28.69	0.09	0.09	
217	28.86	0.09	0.09	
218	29.03	0.09	0.09	
219	29.19	0.09	0.09	
220	29.36	0.09	0.09	
221	29.53	0.09	0.09	
222	29.69	0.09	0.09	
223	29.86	0.09	0.09	
224	30.03	0.09	0.09	
225	30.19	0.09	0.09	
226	30.36	0.09	0.09	
227	30.53	0.09	0.09	
228	30.69	0.09	0.09	
229	30.86	0.09	0.09	
230	31.03	0.09	0.09	
231	31.19	0.09	0.09	
232	31.36	0.09	0.09	
233	31.53	0.09	0.09	
234	31.69	0.09	0.09	
235	31.86	0.09	0.09	
236	32.03	0.09	0.09	
237	32.19	0.09	0.09	
238	32.36	0.09	0.09	
239	32.53	0.09	0.09	
240	32.69	0.09	0.09	
241	32.86	0.09	0.09	
242	33.03	0.09	0.09	
243	33.19	0.09	0.09	
244	33.36	0.09	0.09	
245	33.53	0.09	0.09	

Environmental Strategies Corp.
9 Albany Street
Cazenovia, New York
315-655-3900

Data

Project: Rensselaer 2

No: 462690.04 | Page 8

Client: Ashland Distribution Co.

Location: Rensselaer, New York | Pumping test: Step Test | Pumping well: MW-19

Test performed DPB

at 08/22/2001

Data observed at: PZ-1 Depth to static WL: 0 [m]

Distance from pumping well: 3.35 [m]

	Time [min]	Depth to WL [m]	Drawdown [m]	
246	33.69	0.09	0.09	
247	33.86	0.09	0.09	
248	34.03	0.09	0.09	
249	34.19	0.09	0.09	
250	34.36	0.09	0.09	
251	34.53	0.09	0.09	
252	34.69	0.09	0.09	
253	34.86	0.09	0.09	
254	35.03	0.09	0.09	
255	35.19	0.09	0.09	
256	35.36	0.09	0.09	
257	35.53	0.09	0.09	
258	35.69	0.09	0.09	
259	35.86	0.09	0.09	
260	36.03	0.09	0.09	
261	36.19	0.09	0.09	
262	36.36	0.09	0.09	
263	36.53	0.09	0.09	
264	36.69	0.09	0.09	
265	36.86	0.09	0.09	
266	37.03	0.09	0.09	
267	37.19	0.09	0.09	
268	37.36	0.09	0.09	
269	37.53	0.09	0.09	
270	37.69	0.09	0.09	
271	37.86	0.09	0.09	
272	38.03	0.09	0.09	
273	38.19	0.09	0.09	
274	38.36	0.09	0.09	
275	38.53	0.10	0.10	
276	38.69	0.10	0.10	
277	38.86	0.09	0.09	
278	39.03	0.09	0.09	
279	39.19	0.09	0.09	
280	39.36	0.10	0.10	

Environmental Strategies Corp.
9 Albany Street
Cazenovia, New York
315-655-3900

Data

Project: Rensselaer 2

No: 462690.04 | Page 9

Client: Ashland Distribution Co.

Location: Rensselaer, New York | Pumping test: Step Test | Pumping well: MW-19

Test performed DPB

at 08/22/2001

Data observed at: PZ-1 Depth to static WL: 0 [m]

Distance from pumping well: 3.35 [m]

	Time [min]	Depth to WL [m]	Drawdown [m]	
281	39.53	0.09	0.09	
282	39.69	0.09	0.09	
283	39.86	0.09	0.09	
284	40.03	0.10	0.10	
285	40.19	0.09	0.09	
286	40.36	0.09	0.09	
287	40.53	0.09	0.09	
288	40.69	0.09	0.09	
289	40.86	0.10	0.10	
290	41.03	0.10	0.10	
291	41.19	0.10	0.10	
292	41.36	0.10	0.10	
293	41.53	0.10	0.10	
294	41.69	0.10	0.10	
295	41.86	0.10	0.10	
296	42.03	0.10	0.10	
297	42.19	0.10	0.10	
298	42.36	0.10	0.10	
299	42.53	0.10	0.10	
300	42.69	0.10	0.10	
301	42.86	0.10	0.10	
302	43.03	0.10	0.10	
303	43.19	0.10	0.10	
304	43.36	0.10	0.10	
305	43.53	0.10	0.10	
306	43.69	0.10	0.10	
307	43.86	0.10	0.10	
308	44.03	0.10	0.10	
309	44.19	0.10	0.10	
310	44.36	0.10	0.10	
311	44.53	0.10	0.10	
312	44.69	0.10	0.10	
313	44.86	0.10	0.10	
314	45.03	0.10	0.10	
315	45.19	0.10	0.10	

Environmental Strategies Corp.
9 Albany Street
Cazenovia, New York
315-655-3900

Data

Project: Rensselaer 2

No: 462690.04 | Page

Client: Ashland Distribution Co.

Location: Rensselaer, New York | Pumping test: Step Test | Pumping well: MW-19

Test performed DPB

at 08/22/2001

Data observed at: PZ-1 Depth to static WL: 0 [m]

Distance from pumping well: 3.35 [m]

	Time [min]	Depth to WL [m]	Drawdown [m]	
316	45.36	0.10	0.10	
317	45.53	0.10	0.10	
318	45.69	0.10	0.10	
319	45.86	0.10	0.10	
320	46.03	0.10	0.10	
321	46.19	0.10	0.10	
322	46.36	0.10	0.10	
323	46.53	0.10	0.10	
324	46.69	0.10	0.10	
325	46.86	0.10	0.10	
326	47.03	0.10	0.10	
327	47.19	0.10	0.10	
328	47.36	0.10	0.10	
329	47.53	0.10	0.10	
330	47.69	0.10	0.10	
331	47.86	0.10	0.10	
332	48.03	0.10	0.10	
333	48.19	0.10	0.10	
334	48.36	0.10	0.10	
335	48.53	0.10	0.10	
336	48.69	0.10	0.10	
337	48.86	0.10	0.10	
338	49.03	0.10	0.10	
339	49.19	0.10	0.10	
340	49.36	0.10	0.10	
341	49.53	0.10	0.10	
342	49.69	0.10	0.10	
343	49.86	0.10	0.10	
344	50.03	0.10	0.10	
345	50.19	0.10	0.10	
346	50.36	0.10	0.10	
347	50.53	0.10	0.10	
348	50.69	0.10	0.10	
349	50.86	0.10	0.10	
350	51.03	0.10	0.10	

Environmental Strategies Corp.
9 Albany Street
Cazenovia, New York
315-655-3900

Data

Project: Rensselaer 2

No: 462690.04 | Page

Client: Ashland Distribution Co.

Location: Rensselaer, New York | Pumping test: Step Test | Pumping well: MW-19

Test performed DPB

at 08/22/2001

Data observed at: PZ-1 Depth to static WL: 0 [m]

Distance from pumping well: 3.35 [m]

	Time [min]	Depth to WL [m]	Drawdown [m]	
351	51.19	0.10	0.10	
352	51.36	0.10	0.10	
353	51.53	0.10	0.10	
354	51.69	0.10	0.10	
355	51.86	0.10	0.10	
356	52.03	0.10	0.10	
357	52.19	0.10	0.10	
358	52.36	0.10	0.10	
359	52.53	0.10	0.10	
360	52.69	0.10	0.10	
361	52.86	0.10	0.10	
362	53.03	0.10	0.10	
363	53.19	0.10	0.10	
364	53.36	0.10	0.10	
365	53.53	0.10	0.10	
366	53.69	0.10	0.10	
367	53.86	0.10	0.10	
368	54.03	0.10	0.10	
369	54.19	0.10	0.10	
370	54.36	0.10	0.10	
371	54.53	0.10	0.10	
372	54.69	0.10	0.10	
373	54.86	0.10	0.10	
374	55.03	0.10	0.10	
375	55.19	0.10	0.10	
376	55.36	0.10	0.10	
377	55.53	0.10	0.10	
378	55.69	0.10	0.10	
379	55.86	0.10	0.10	
380	56.03	0.10	0.10	
381	56.19	0.10	0.10	
382	56.36	0.10	0.10	
383	56.53	0.10	0.10	
384	56.69	0.10	0.10	
385	56.86	0.10	0.10	

Environmental Strategies Corp.
9 Albany Street
Cazenovia, New York
315-655-3900

Data

Project: Rensselaer 2

No: 462690.04 | Page

Client: Ashland Distribution Co.

Location: Rensselaer, New York | Pumping test: Step Test | Pumping well: MW-19

Test performed DPB

at 08/22/2001

Data observed at: PZ-1 | Depth to static WL: 0 [m]

Distance from pumping well: 3.35 [m]

	Time [min]	Depth to WL [m]	Drawdown [m]	
386	57.03	0.10	0.10	
387	57.19	0.10	0.10	
388	57.36	0.10	0.10	
389	57.53	0.10	0.10	
390	57.69	0.10	0.10	
391	57.86	0.10	0.10	
392	58.03	0.10	0.10	
393	58.19	0.10	0.10	
394	58.36	0.10	0.10	
395	58.53	0.10	0.10	
396	58.69	0.10	0.10	
397	58.86	0.10	0.10	
398	59.03	0.10	0.10	
399	59.19	0.10	0.10	
400	59.36	0.10	0.10	
401	59.53	0.10	0.10	
402	59.69	0.10	0.10	
403	59.86	0.10	0.10	
404	60.03	0.10	0.10	
405	60.19	0.10	0.10	
406	60.36	0.10	0.10	
407	60.53	0.10	0.10	
408	60.69	0.10	0.10	
409	60.86	0.10	0.10	
410	61.03	0.10	0.10	
411	61.19	0.10	0.10	
412	61.36	0.10	0.10	
413	61.53	0.10	0.10	
414	61.69	0.10	0.10	
415	61.86	0.10	0.10	
416	62.03	0.10	0.10	
417	62.19	0.10	0.10	
418	62.36	0.10	0.10	
419	62.53	0.10	0.10	
420	62.69	0.10	0.10	

Environmental Strategies Corp.
9 Albany Street
Cazenovia, New York
315-655-3900

Data

Project: Rensselaer 2

No: 462690.04 | Page

Client: Ashland Distribution Co.

Location: Rensselaer, New York | Pumping test: Step Test | Pumping well: MW-19

Test performed DPB

at 08/22/2001

Data observed at: PZ-1 | Depth to static WL: 0 [m]

Distance from pumping well: 3.35 [m]

	Time [min]	Depth to WL [m]	Drawdown [m]	
456	68.69	0.10	0.10	
457	68.86	0.10	0.10	
458	69.03	0.10	0.10	
459	69.19	0.10	0.10	
460	69.36	0.10	0.10	
461	69.53	0.10	0.10	
462	69.69	0.10	0.10	
463	69.86	0.10	0.10	
464	70.03	0.10	0.10	
465	70.19	0.10	0.10	
466	70.36	0.10	0.10	
467	70.53	0.10	0.10	
468	70.69	0.10	0.10	
469	70.86	0.10	0.10	
470	71.03	0.10	0.10	
471	71.19	0.10	0.10	
472	71.36	0.10	0.10	
473	71.53	0.10	0.10	
474	71.69	0.10	0.10	
475	71.86	0.10	0.10	
476	72.03	0.10	0.10	
477	72.19	0.10	0.10	
478	72.36	0.10	0.10	
479	72.53	0.10	0.10	
480	72.69	0.10	0.10	
481	72.86	0.10	0.10	
482	73.03	0.10	0.10	
483	73.19	0.10	0.10	
484	73.36	0.10	0.10	
485	73.53	0.10	0.10	
486	73.69	0.10	0.10	
487	73.86	0.11	0.11	
488	74.03	0.11	0.11	
489	74.19	0.11	0.11	
490	74.36	0.11	0.11	

Environmental Strategies Corp.
9 Albany Street
Cazenovia, New York
315-655-3900

Data

Project: Rensselaer 2

No: 462690.04 | Page

Client: Ashland Distribution Co.

Location: Rensselaer, New York | Pumping test: Step Test | Pumping well: MW-19

Test performed DPB

at 08/22/2001

Data observed at: PZ-1 Depth to static WL: 0 [m]

Distance from pumping well: 3.35 [m]

	Time [min]	Depth to WL [m]	Drawdown [m]	
421	62.86	0.10	0.10	
422	63.03	0.10	0.10	
423	63.19	0.10	0.10	
424	63.36	0.10	0.10	
425	63.53	0.10	0.10	
426	63.69	0.10	0.10	
427	63.86	0.10	0.10	
428	64.03	0.10	0.10	
429	64.19	0.10	0.10	
430	64.36	0.10	0.10	
431	64.53	0.10	0.10	
432	64.69	0.10	0.10	
433	64.86	0.10	0.10	
434	65.03	0.10	0.10	
435	65.19	0.10	0.10	
436	65.36	0.10	0.10	
437	65.53	0.10	0.10	
438	65.69	0.10	0.10	
439	65.86	0.10	0.10	
440	66.03	0.10	0.10	
441	66.19	0.10	0.10	
442	66.36	0.10	0.10	
443	66.53	0.10	0.10	
444	66.69	0.10	0.10	
445	66.86	0.10	0.10	
446	67.03	0.10	0.10	
447	67.19	0.10	0.10	
448	67.36	0.10	0.10	
449	67.53	0.10	0.10	
450	67.69	0.10	0.10	
451	67.86	0.10	0.10	
452	68.03	0.10	0.10	
453	68.19	0.10	0.10	
454	68.36	0.10	0.10	
455	68.53	0.10	0.10	

Environmental Strategies Corp.
9 Albany Street
Cazenovia, New York
315-655-3900

Data

Project: Rensselaer 2

No: 462690.04 | Page

Client: Ashland Distribution Co.

Location: Rensselaer, New York | Pumping test: Step Test | Pumping well: MW-19

Test performed DPB

at 08/22/2001

Data observed at: PZ-1 Depth to static WL: 0 [m]

Distance from pumping well: 3.35 [m]

	Time [min]	Depth to WL [m]	Drawdown [m]	
491	74.53	0.11	0.11	
492	74.69	0.11	0.11	
493	74.86	0.11	0.11	
494	75.03	0.11	0.11	
495	75.19	0.11	0.11	
496	75.36	0.11	0.11	
497	75.53	0.11	0.11	
498	75.69	0.11	0.11	
499	75.86	0.11	0.11	
500	76.03	0.11	0.11	
501	76.19	0.11	0.11	
502	76.36	0.11	0.11	
503	76.53	0.11	0.11	
504	76.69	0.10	0.10	
505	76.86	0.11	0.11	
506	77.03	0.11	0.11	
507	77.19	0.11	0.11	
508	77.36	0.11	0.11	
509	77.53	0.11	0.11	
510	77.69	0.11	0.11	
511	77.86	0.11	0.11	
512	78.03	0.11	0.11	
513	78.19	0.11	0.11	
514	78.36	0.11	0.11	
515	78.53	0.11	0.11	
516	78.69	0.11	0.11	
517	78.86	0.11	0.11	
518	79.03	0.11	0.11	
519	79.19	0.11	0.11	
520	79.36	0.11	0.11	
521	79.53	0.11	0.11	
522	79.69	0.11	0.11	
523	79.86	0.11	0.11	
524	80.03	0.11	0.11	
525	80.19	0.11	0.11	

Environmental Strategies Corp.
9 Albany Street
Cazenovia, New York
315-655-3900

Data

Project: Rensselaer 2

No: 462690.04 | Page

Client: Ashland Distribution Co.

Location: Rensselaer, New York | Pumping test: Step Test | Pumping well: MW-19

Test performed DPB

at 08/22/2001

Data observed at: PZ-1 | Depth to static WL: 0 [m]

Distance from pumping well: 3.35 [m]

	Time [min]	Depth to WL [m]	Drawdown [m]	
526	80.36	0.11	0.11	
527	80.53	0.11	0.11	
528	80.69	0.11	0.11	
529	80.86	0.11	0.11	
530	81.03	0.11	0.11	
531	81.19	0.11	0.11	
532	81.36	0.11	0.11	
533	81.53	0.11	0.11	
534	81.69	0.11	0.11	
535	81.86	0.11	0.11	
536	82.03	0.11	0.11	
537	82.19	0.11	0.11	
538	82.36	0.11	0.11	
539	82.53	0.11	0.11	
540	82.69	0.11	0.11	
541	82.86	0.11	0.11	
542	83.03	0.11	0.11	
543	83.19	0.12	0.12	
544	83.36	0.11	0.11	
545	83.53	0.11	0.11	
546	83.69	0.11	0.11	
547	83.86	0.11	0.11	
548	84.03	0.12	0.12	
549	84.19	0.12	0.12	
550	84.36	0.12	0.12	
551	84.53	0.12	0.12	
552	84.69	0.12	0.12	
553	84.86	0.12	0.12	
554	85.03	0.12	0.12	
555	85.19	0.12	0.12	
556	85.36	0.12	0.12	
557	85.53	0.12	0.12	
558	85.69	0.12	0.12	
559	85.86	0.12	0.12	
560	86.03	0.12	0.12	

Environmental Strategies Corp.
9 Albany Street
Cazenovia, New York
315-655-3900

Data

Project: Rensselaer 2

No: 462690.04 | Page

Client: Ashland Distribution Co.

Location: Rensselaer, New York | Pumping test: Step Test | Pumping well: MW-19

Test performed DPB

at 08/22/2001

Data observed at: PZ-1 | Depth to static WL: 0 [m]

Distance from pumping well: 3.35 [m]

	Time [min]	Depth to WL [m]	Drawdown [m]	
561	86.19	0.12	0.12	
562	86.36	0.12	0.12	
563	86.53	0.12	0.12	
564	86.69	0.12	0.12	
565	86.86	0.12	0.12	
566	87.03	0.12	0.12	
567	87.19	0.12	0.12	
568	87.36	0.12	0.12	
569	87.53	0.12	0.12	
570	87.69	0.12	0.12	
571	87.86	0.12	0.12	
572	88.03	0.12	0.12	
573	88.19	0.12	0.12	
574	88.36	0.12	0.12	
575	88.53	0.12	0.12	
576	88.69	0.12	0.12	
577	88.86	0.12	0.12	
578	89.03	0.12	0.12	
579	89.19	0.12	0.12	
580	89.36	0.12	0.12	
581	89.53	0.12	0.12	
582	89.69	0.12	0.12	
583	89.86	0.12	0.12	
584	90.03	0.12	0.12	
585	90.19	0.12	0.12	
586	90.36	0.12	0.12	
587	90.53	0.12	0.12	
588	90.69	0.12	0.12	
589	90.86	0.12	0.12	
590	91.03	0.12	0.12	
591	91.19	0.12	0.12	
592	91.35	0.12	0.12	
593	91.52	0.12	0.12	
594	91.7	0.12	0.12	
595	91.86	0.12	0.12	

Environmental Strategies Corp.
9 Albany Street
Cazenovia, New York
315-655-3900

Data

Project: Rensselaer 2

No: 462690.04 | Page

Client: Ashland Distribution Co.

Location: Rensselaer, New York | Pumping test: Step Test | Pumping well: MW-19

Test performed DPB

at 08/22/2001

Data observed at: PZ-1 | Depth to static WL: 0 [m]

Distance from pumping well: 3.35 [m]

	Time [min]	Depth to WL [m]	Drawdown [m]	
596	92.01	0.12	0.12	
597	92.19	0.12	0.12	
598	92.4	0.12	0.12	
599	92.57	0.12	0.12	
600	92.75	0.12	0.12	
601	92.95	0.12	0.12	
602	93.18	0.12	0.12	
603	93.31	0.12	0.12	
604	93.44	0.12	0.12	
605	93.58	0.12	0.12	
606	93.73	0.12	0.12	
607	93.89	0.12	0.12	
608	94.05	0.12	0.12	
609	94.22	0.12	0.12	
610	94.39	0.12	0.12	
611	94.55	0.12	0.12	
612	94.72	0.12	0.12	
613	94.89	0.12	0.12	
614	95.05	0.12	0.12	
615	95.22	0.12	0.12	
616	95.39	0.12	0.12	
617	95.55	0.12	0.12	
618	95.72	0.12	0.12	
619	95.89	0.12	0.12	
620	96.05	0.12	0.12	
621	96.22	0.12	0.12	
622	96.39	0.12	0.12	
623	96.55	0.12	0.12	
624	96.72	0.12	0.12	
625	96.89	0.12	0.12	
626	97.05	0.12	0.12	
627	97.22	0.12	0.12	
628	97.39	0.12	0.12	
629	97.55	0.12	0.12	
630	97.72	0.12	0.12	

Environmental Strategies Corp.
9 Albany Street
Cazenovia, New York
315-655-3900

Data

Project: Rensselaer 2

No: 462690.04 | Page

Client: Ashland Distribution Co.

Location: Rensselaer, New York | Pumping test: Step Test | Pumping well: MW-19

Test performed DPB

at 08/22/2001

Data observed at: PZ-1 Depth to static WL: 0 [m]

Distance from pumping well: 3.35 [m]

	Time [min]	Depth to WL [m]	Drawdown [m]	
631	97.89	0.12	0.12	
632	98.05	0.12	0.12	
633	98.22	0.12	0.12	
634	98.39	0.12	0.12	
635	98.55	0.12	0.12	
636	98.72	0.12	0.12	
637	98.89	0.12	0.12	
638	99.05	0.12	0.12	
639	99.22	0.12	0.12	
640	99.39	0.12	0.12	
641	99.55	0.12	0.12	
642	99.72	0.12	0.12	
643	99.89	0.12	0.12	
644	100.05	0.12	0.12	
645	100.22	0.12	0.12	
646	100.39	0.13	0.13	
647	100.55	0.13	0.13	
648	100.72	0.13	0.13	
649	100.89	0.13	0.13	
650	101.05	0.13	0.13	
651	101.22	0.13	0.13	
652	101.39	0.13	0.13	
653	101.55	0.13	0.13	
654	101.72	0.13	0.13	
655	101.89	0.13	0.13	
656	102.05	0.13	0.13	
657	102.22	0.14	0.14	
658	102.39	0.14	0.14	
659	102.55	0.14	0.14	
660	102.72	0.14	0.14	
661	102.89	0.14	0.14	
662	103.05	0.14	0.14	
663	103.22	0.14	0.14	
664	103.39	0.14	0.14	
665	103.55	0.14	0.14	

Environmental Strategies Corp.
9 Albany Street
Cazenovia, New York
315-655-3900

Data

Project: Rensselaer 2

No: 462690.04 | Page

Client: Ashland Distribution Co.

Location: Rensselaer, New York | Pumping test: Step Test | Pumping well: MW-19

Test performed DPB

at 08/22/2001

Data observed at: PZ-1 Depth to static WL: 0 [m]

Distance from pumping well: 3.35 [m]

	Time [min]	Depth to WL [m]	Drawdown [m]	
666	103.72	0.15	0.15	
667	103.89	0.15	0.15	
668	104.05	0.15	0.15	
669	104.22	0.15	0.15	
670	104.39	0.15	0.15	
671	104.55	0.15	0.15	
672	104.72	0.15	0.15	
673	104.89	0.15	0.15	
674	105.05	0.16	0.16	
675	105.22	0.16	0.16	
676	105.39	0.16	0.16	
677	105.55	0.16	0.16	
678	105.72	0.16	0.16	
679	105.89	0.16	0.16	
680	106.05	0.16	0.16	
681	106.22	0.16	0.16	
682	106.39	0.17	0.17	
683	106.55	0.17	0.17	
684	106.72	0.17	0.17	
685	106.89	0.17	0.17	
686	107.05	0.17	0.17	
687	107.22	0.17	0.17	
688	107.39	0.17	0.17	
689	107.55	0.17	0.17	
690	107.72	0.17	0.17	
691	107.89	0.18	0.18	
692	108.05	0.18	0.18	
693	108.22	0.18	0.18	
694	108.39	0.18	0.18	
695	108.55	0.18	0.18	
696	108.72	0.18	0.18	
697	108.89	0.18	0.18	
698	109.05	0.18	0.18	
699	109.22	0.18	0.18	
700	109.39	0.18	0.18	

Environmental Strategies Corp.
9 Albany Street
Cazenovia, New York
315-655-3900

Data

Project: Rensselaer 2

No: 462690.04 | Page

Client: Ashland Distribution Co.

Location: Rensselaer, New York | Pumping test: Step Test | Pumping well: MW-19

Test performed DPB

at 08/22/2001

Data observed at: PZ-1 Depth to static WL: 0 [m]

Distance from pumping well: 3.35 [m]

	Time [min]	Depth to WL [m]	Drawdown [m]	
701	109.55	0.18	0.18	
702	109.72	0.19	0.19	
703	109.89	0.19	0.19	
704	110.05	0.19	0.19	
705	110.22	0.19	0.19	
706	110.39	0.19	0.19	
707	110.55	0.19	0.19	
708	110.72	0.19	0.19	
709	110.89	0.19	0.19	
710	111.05	0.19	0.19	
711	111.22	0.19	0.19	
712	111.39	0.20	0.20	
713	111.55	0.19	0.19	
714	111.72	0.20	0.20	
715	111.89	0.20	0.20	
716	112.05	0.20	0.20	
717	112.22	0.20	0.20	
718	112.39	0.20	0.20	
719	112.55	0.20	0.20	
720	112.72	0.20	0.20	
721	112.89	0.20	0.20	
722	113.05	0.20	0.20	
723	113.22	0.20	0.20	
724	113.39	0.20	0.20	
725	113.55	0.20	0.20	
726	113.72	0.20	0.20	
727	113.89	0.20	0.20	
728	114.05	0.20	0.20	
729	114.22	0.21	0.21	
730	114.39	0.21	0.21	
731	114.55	0.21	0.21	
732	114.72	0.21	0.21	
733	114.89	0.21	0.21	
734	115.05	0.21	0.21	
735	115.22	0.21	0.21	

ESC
Environmental Strategies Corp.
9 Albany Street
Cazenovia, New York
315-655-3900

Data

Project: Rensselaer 2

No: 462690.04 | Page

Client: Ashland Distribution Co.

Location: Rensselaer, New York | Pumping test: Step Test | Pumping well: MW-19

Test performed DPB

at 08/22/2001

Data observed at: PZ-1 Depth to static WL: 0 [m]

Distance from pumping well: 3.35 [m]

	Time [min]	Depth to WL [m]	Drawdown [m]	
736	115.39	0.21	0.21	
737	115.55	0.21	0.21	
738	115.72	0.21	0.21	
739	115.89	0.21	0.21	
740	116.05	0.21	0.21	
741	116.22	0.22	0.22	
742	116.39	0.22	0.22	
743	116.55	0.22	0.22	
744	116.72	0.22	0.22	
745	116.89	0.22	0.22	
746	117.05	0.22	0.22	
747	117.22	0.22	0.22	
748	117.39	0.22	0.22	
749	117.55	0.22	0.22	
750	117.72	0.22	0.22	
751	117.89	0.22	0.22	
752	118.05	0.22	0.22	
753	118.22	0.22	0.22	
754	118.39	0.22	0.22	
755	118.55	0.22	0.22	
756	118.72	0.23	0.23	
757	118.89	0.23	0.23	
758	119.05	0.23	0.23	
759	119.22	0.23	0.23	
760	119.39	0.23	0.23	
761	119.55	0.23	0.23	
762	119.72	0.23	0.23	
763	119.89	0.23	0.23	
764	120.05	0.23	0.23	
765	120.22	0.23	0.23	
766	120.39	0.23	0.23	
767	120.55	0.23	0.23	
768	120.72	0.23	0.23	
769	120.89	0.23	0.23	
770	121.05	0.23	0.23	

Environmental Strategies Corp.
9 Albany Street
Cazenovia, New York
315-655-3900

Data

Project: Rensselaer 2

No: 462690.04 | Page

Client: Ashland Distribution Co.

Location: Rensselaer, New York | Pumping test: Step Test | Pumping well: MW-19

Test performed DPB

at 08/22/2001

Data observed at: PZ-1 Depth to static WL: 0 [m]

Distance from pumping well: 3.35 [m]

	Time [min]	Depth to WL [m]	Drawdown [m]	
771	121.22	0.23	0.23	
772	121.39	0.23	0.23	
773	121.55	0.23	0.23	
774	121.72	0.23	0.23	
775	121.89	0.23	0.23	
776	122.05	0.23	0.23	
777	122.22	0.23	0.23	
778	122.39	0.24	0.24	
779	122.55	0.24	0.24	
780	122.72	0.24	0.24	
781	122.89	0.24	0.24	
782	123.05	0.24	0.24	
783	123.22	0.24	0.24	
784	123.39	0.24	0.24	
785	123.55	0.24	0.24	
786	123.72	0.24	0.24	
787	123.89	0.24	0.24	
788	124.05	0.24	0.24	
789	124.22	0.24	0.24	
790	124.39	0.24	0.24	
791	124.55	0.24	0.24	
792	124.72	0.24	0.24	
793	124.89	0.24	0.24	
794	125.05	0.24	0.24	
795	125.22	0.24	0.24	
796	125.39	0.24	0.24	
797	125.55	0.24	0.24	
798	125.72	0.25	0.25	
799	125.89	0.25	0.25	
800	126.05	0.25	0.25	
801	126.22	0.25	0.25	
802	126.39	0.25	0.25	
803	126.55	0.25	0.25	
804	126.72	0.25	0.25	
805	126.89	0.25	0.25	

Environmental Strategies Corp.
9 Albany Street
Cazenovia, New York
315-655-3900

Data

Project: Rensselaer 2

No: 462690.04 | Page

Client: Ashland Distribution Co.

Location: Rensselaer, New York | Pumping test: Step Test | Pumping well: MW-19

Test performed DPB

at 08/22/2001

Data observed at: PZ-1 Depth to static WL: 0 [m]

Distance from pumping well: 3.35 [m]

	Time [min]	Depth to WL [m]	Drawdown [m]	
806	127.05	0.25	0.25	
807	127.22	0.25	0.25	
808	127.39	0.25	0.25	
809	127.55	0.25	0.25	
810	127.72	0.25	0.25	
811	127.89	0.25	0.25	
812	128.05	0.25	0.25	
813	128.22	0.25	0.25	
814	128.39	0.25	0.25	
815	128.55	0.25	0.25	
816	128.72	0.25	0.25	
817	128.89	0.25	0.25	
818	129.05	0.25	0.25	
819	129.22	0.25	0.25	
820	129.39	0.25	0.25	
821	129.55	0.25	0.25	
822	129.72	0.25	0.25	
823	129.89	0.25	0.25	
824	130.05	0.25	0.25	
825	130.22	0.25	0.25	
826	130.39	0.25	0.25	
827	130.55	0.25	0.25	
828	130.72	0.25	0.25	
829	130.89	0.25	0.25	
830	131.05	0.25	0.25	
831	131.22	0.26	0.26	
832	131.39	0.26	0.26	
833	131.55	0.26	0.26	
834	131.72	0.26	0.26	
835	131.89	0.26	0.26	
836	132.05	0.26	0.26	
837	132.22	0.26	0.26	
838	132.39	0.26	0.26	
839	132.55	0.26	0.26	
840	132.72	0.26	0.26	

Environmental Strategies Corp.
9 Albany Street
Cazenovia, New York
315-655-3900

Data

Project: Rensselaer 2

No: 462690.04 | Page

Client: Ashland Distribution Co.

Location: Rensselaer, New York | Pumping test: Step Test | Pumping well: MW-19

Test performed DPB

at 08/22/2001

Data observed at: PZ-1 Depth to static WL: 0 [m]

Distance from pumping well: 3.35 [m]

	Time [min]	Depth to WL [m]	Drawdown [m]	
841	132.89	0.26	0.26	
842	133.05	0.26	0.26	
843	133.22	0.26	0.26	
844	133.39	0.26	0.26	
845	133.55	0.26	0.26	
846	133.72	0.26	0.26	
847	133.89	0.26	0.26	
848	134.05	0.26	0.26	
849	134.22	0.26	0.26	
850	134.39	0.26	0.26	
851	134.55	0.26	0.26	
852	134.72	0.26	0.26	
853	134.89	0.26	0.26	
854	135.05	0.26	0.26	
855	135.22	0.26	0.26	
856	135.39	0.26	0.26	
857	135.55	0.26	0.26	
858	135.72	0.26	0.26	
859	135.89	0.26	0.26	
860	136.05	0.26	0.26	
861	136.22	0.26	0.26	
862	136.39	0.26	0.26	
863	136.55	0.26	0.26	
864	136.72	0.26	0.26	

Constant Discharge Pump Test Data – 0.8 GPM
Ashland Distribution Company
Rensselaer, NY
June 2001

Environmental Strategies Corp.
9 Albany Street
Cazenovia, New York
315-655-3900

Data

Project: Rensselaer 2

No: 462690.04 | Page 1

Client: Ashland Distribution Co.

Location: Rensselaer, New York | Pumping test: 0.8 gpm drawdown | Pumping well: MW-19

Test performed DPB

at 06/13/2001

Data observed at: MW-19 Depth to static WL: 0 [m]

Distance from pumping well: 0 [m]

	Time [min]	Depth to WL [m]	Drawdown [m]	
1	0	0.00	0.00	
2	0.03	0.02	0.02	
3	0.06	0.03	0.03	
4	0.1	0.04	0.04	
5	0.13	0.05	0.05	
6	0.16	0.06	0.06	
7	0.19	0.07	0.07	
8	0.23	0.08	0.08	
9	0.26	0.08	0.08	
10	0.29	0.09	0.09	
11	0.32	0.10	0.10	
12	0.36	0.11	0.11	
13	0.39	0.11	0.11	
14	0.42	0.12	0.12	
15	0.45	0.13	0.13	
16	0.48	0.13	0.13	
17	0.52	0.14	0.14	
18	0.55	0.15	0.15	
19	0.58	0.15	0.15	
20	0.61	0.15	0.15	
21	0.65	0.16	0.16	
22	0.68	0.17	0.17	
23	0.71	0.17	0.17	
24	0.75	0.18	0.18	
25	0.79	0.18	0.18	
26	0.83	0.18	0.18	
27	0.88	0.19	0.19	
28	0.93	0.19	0.19	
29	0.97	0.20	0.20	
30	1.03	0.20	0.20	
31	1.08	0.21	0.21	
32	1.14	0.21	0.21	
33	1.21	0.22	0.22	
34	1.27	0.23	0.23	
35	1.34	0.23	0.23	

Environmental Strategies Corp.
9 Albany Street
Cazenovia, New York
315-655-3900

Data

Project: Rensselaer 2

No: 462690.04 | Page 2

Client: Ashland Distribution Co.

Location: Rensselaer, New York | Pumping test: 0.8 gpm drawdown | Pumping well: MW-19

Test performed DPB

at 06/13/2001

Data observed at: MW-19 Depth to static WL: 0 [m]

Distance from pumping well: 0 [m]

	Time [min]	Depth to WL [m]	Drawdown [m]	
36	1.42	0.24	0.24	
37	1.5	0.24	0.24	
38	1.58	0.25	0.25	
39	1.67	0.26	0.26	
40	1.76	0.26	0.26	
41	1.86	0.27	0.27	
42	1.97	0.27	0.27	
43	2.08	0.28	0.28	
44	2.2	0.29	0.29	
45	2.32	0.29	0.29	
46	2.45	0.29	0.29	
47	2.59	0.30	0.30	
48	2.74	0.30	0.30	
49	2.9	0.31	0.31	
50	3.07	0.31	0.31	
51	3.23	0.32	0.32	
52	3.4	0.32	0.32	
53	3.57	0.33	0.33	
54	3.73	0.34	0.34	
55	3.9	0.36	0.36	
56	4.07	0.36	0.36	
57	4.23	0.37	0.37	
58	4.4	0.37	0.37	
59	4.57	0.38	0.38	
60	4.73	0.38	0.38	
61	4.9	0.39	0.39	
62	5.07	0.39	0.39	
63	5.23	0.39	0.39	
64	5.4	0.40	0.40	
65	5.57	0.40	0.40	
66	5.73	0.41	0.41	
67	5.9	0.41	0.41	
68	6.07	0.41	0.41	
69	6.23	0.41	0.41	
70	6.4	0.42	0.42	

Environmental Strategies Corp.
9 Albany Street
Cazenovia, New York
315-655-3900

Data

Project: Rensselaer 2

No: 462690.04 | Page 3

Client: Ashland Distribution Co.

Location: Rensselaer, New York | Pumping test: 0.8 gpm drawdown | Pumping well: MW-19

Test performed DPB

at 06/13/2001

Data observed at: MW-19 Depth to static WL: 0 [m]

Distance from pumping well: 0 [m]

	Time [min]	Depth to WL [m]	Drawdown [m]	
71	6.57	0.42	0.42	
72	6.73	0.42	0.42	
73	6.9	0.42	0.42	
74	7.07	0.43	0.43	
75	7.23	0.43	0.43	
76	7.4	0.43	0.43	
77	7.57	0.44	0.44	
78	7.73	0.44	0.44	
79	7.9	0.44	0.44	
80	8.07	0.44	0.44	
81	8.23	0.44	0.44	
82	8.4	0.44	0.44	
83	8.57	0.44	0.44	
84	8.73	0.45	0.45	
85	8.9	0.45	0.45	
86	9.07	0.45	0.45	
87	9.23	0.45	0.45	
88	9.4	0.45	0.45	
89	9.57	0.45	0.45	
90	9.73	0.46	0.46	
91	9.9	0.46	0.46	
92	10.07	0.46	0.46	
93	10.23	0.46	0.46	
94	10.4	0.46	0.46	
95	10.57	0.46	0.46	
96	10.73	0.46	0.46	
97	10.9	0.47	0.47	
98	11.07	0.47	0.47	
99	11.23	0.47	0.47	
100	11.4	0.47	0.47	
101	11.57	0.47	0.47	
102	11.73	0.47	0.47	
103	11.9	0.47	0.47	
104	12.07	0.47	0.47	
105	12.23	0.47	0.47	

Environmental Strategies Corp.
9 Albany Street
Cazenovia, New York
315-655-3900

Data

Project: Rensselaer 2

No: 462690.04 | Page 4

Client: Ashland Distribution Co.

Location: Rensselaer, New York | Pumping test: 0.8 gpm drawdown | Pumping well: MW-19

Test performed DPB

at 06/13/2001

Data observed at: MW-19 Depth to static WL: 0 [m]

Distance from pumping well: 0 [m]

	Time [min]	Depth to WL [m]	Drawdown [m]	
106	12.4	0.47	0.47	
107	12.57	0.48	0.48	
108	12.73	0.47	0.47	
109	12.9	0.48	0.48	
110	13.07	0.48	0.48	
111	13.23	0.48	0.48	
112	13.4	0.48	0.48	
113	13.57	0.48	0.48	
114	13.73	0.48	0.48	
115	13.9	0.48	0.48	
116	14.07	0.48	0.48	
117	14.23	0.48	0.48	
118	14.4	0.48	0.48	
119	14.57	0.48	0.48	
120	14.73	0.48	0.48	
121	14.9	0.48	0.48	
122	15.07	0.48	0.48	
123	16.07	0.49	0.49	
124	17.07	0.49	0.49	
125	18.07	0.49	0.49	
126	19.07	0.49	0.49	
127	20.07	0.49	0.49	
128	21.07	0.52	0.52	
129	22.07	0.52	0.52	
130	23.07	0.52	0.52	
131	24.07	0.52	0.52	
132	25.07	0.52	0.52	
133	26.07	0.52	0.52	
134	27.07	0.52	0.52	
135	28.07	0.52	0.52	
136	29.07	0.53	0.53	
137	31.07	0.53	0.53	
138	33.07	0.54	0.54	
139	35.07	0.55	0.55	
140	37.07	0.56	0.56	

Environmental Strategies Corp.
9 Albany Street
Cazenovia, New York
315-655-3900

Data

Project: Rensselaer 2

No: 462690.04 | Page 5

Client: Ashland Distribution Co.

Location: Rensselaer, New York | Pumping test: 0.8 gpm drawdown | Pumping well: MW-19

Test performed DPB

at 06/13/2001

Data observed at: MW-19 Depth to static WL: 0 [m]

Distance from pumping well: 0 [m]

	Time [min]	Depth to WL [m]	Drawdown [m]	
141	39.07	0.58	0.58	
142	41.07	0.58	0.58	
143	43.07	0.59	0.59	
144	45.07	0.60	0.60	
145	47.07	0.62	0.62	
146	49.07	0.62	0.62	
147	51.07	0.63	0.63	
148	53.07	0.63	0.63	
149	55.07	0.63	0.63	
150	57.07	0.64	0.64	
151	59.07	0.64	0.64	
152	64.07	0.65	0.65	
153	69.07	0.66	0.66	
154	74.07	0.67	0.67	
155	79.07	0.67	0.67	
156	84.07	0.68	0.68	
157	89.07	0.69	0.69	
158	94.07	0.69	0.69	
159	99.07	0.70	0.70	
160	104.07	0.71	0.71	
161	109.07	0.71	0.71	
162	114.07	0.72	0.72	
163	119.07	0.73	0.73	
164	126.07	0.73	0.73	
165	133.07	0.75	0.75	
166	140.07	0.75	0.75	
167	147.07	0.75	0.75	
168	154.07	0.75	0.75	
169	161.07	0.75	0.75	
170	168.07	0.75	0.75	
171	175.07	0.77	0.77	
172	185.07	0.80	0.80	
173	195.07	0.82	0.82	
174	205.07	0.97	0.97	
175	215.07	1.00	1.00	

Environmental Strategies Corp.
9 Albany Street
Cazenovia, New York
315-655-3900

Data

Project: Rensselaer 2

No: 462690.04 | Page 6

Client: Ashland Distribution Co.

Location: Rensselaer, New York | Pumping test: 0.8 gpm drawdown | Pumping well: MW-19

Test performed DPB

at 06/13/2001

Data observed at: MW-19 Depth to static WL: 0 [m]

Distance from pumping well: 0 [m]

	Time [min]	Depth to WL [m]	Drawdown [m]	
176	225.07	1.03	1.03	
177	235.07	1.05	1.05	
178	245.07	1.09	1.09	
179	255.07	1.11	1.11	
180	265.07	1.14	1.14	
181	275.07	1.17	1.17	
182	285.07	1.19	1.19	
183	295.07	1.22	1.22	
184	305.07	1.26	1.26	
185	315.07	1.31	1.31	
186	325.07	1.36	1.36	
187	335.07	1.41	1.41	
188	345.07	1.46	1.46	
189	355.07	1.49	1.49	
190	365.07	1.53	1.53	
191	375.07	1.56	1.56	
192	385.07	1.59	1.59	
193	395.07	1.62	1.62	
194	405.07	1.65	1.65	
195	415.07	1.68	1.68	
196	425.07	1.70	1.70	
197	435.07	1.80	1.80	
198	445.07	1.88	1.88	
199	455.07	1.96	1.96	
200	465.07	2.02	2.02	
201	475.07	2.07	2.07	
202	485.07	2.11	2.11	
203	495.07	2.16	2.16	
204	505.07	2.21	2.21	
205	515.07	2.27	2.27	
206	525.07	2.31	2.31	
207	535.07	2.35	2.35	
208	545.07	2.38	2.38	
209	555.07	2.41	2.41	
210	565.07	2.44	2.44	

Environmental Strategies Corp.
9 Albany Street
Cazenovia, New York
315-655-3900

Data

Project: Rensselaer 2

No: 462690.04 | Page 7

Client: Ashland Distribution Co.

Location: Rensselaer, New York | Pumping test: 0.8 gpm drawdown | Pumping well: MW-19

Test performed DPB

at 06/13/2001

Data observed at: MW-19 Depth to static WL: 0 [m]

Distance from pumping well: 0 [m]

	Time [min]	Depth to WL [m]	Drawdown [m]	
211	575.07	2.47	2.47	
212	585.07	2.50	2.50	
213	595.07	2.53	2.53	
214	605.07	2.56	2.56	
215	615.07	2.58	2.58	
216	625.07	2.61	2.61	
217	635.07	2.63	2.63	
218	645.07	2.66	2.66	
219	655.07	2.67	2.67	
220	665.07	2.69	2.69	
221	675.07	2.70	2.70	
222	685.07	2.75	2.75	
223	695.07	2.84	2.84	
224	705.07	2.92	2.92	
225	715.07	2.99	2.99	
226	725.07	3.05	3.05	
227	735.07	3.11	3.11	
228	745.07	3.17	3.17	
229	755.07	3.22	3.22	
230	765.07	3.29	3.29	
231	775.07	3.34	3.34	
232	785.07	3.39	3.39	
233	795.07	3.45	3.45	
234	805.07	3.50	3.50	
235	815.07	3.54	3.54	
236	825.07	3.60	3.60	

Environmental Strategies Corp.
9 Albany Street
Cazenovia, New York
315-655-3900

Data

Project: Rensselaer 2

No: 462690.04 | Page 1

Client: Ashland Distribution Co.

Location: Rensselaer, New York | Pumping test: 0.8 gpm drawdown | Pumping well: MW-19

Test performed DPB

at 06/13/2001

Data observed at: PZ-1 Depth to static WL: 0 [m]

Distance from pumping well: 3.35 [m]

	Time [min]	Depth to WL [m]	Drawdown [m]	
1	0	0.00	0.00	
2	0.03	0.00	0.00	
3	0.06	0.00	0.00	
4	0.1	0.00	0.00	
5	0.13	0.00	0.00	
6	0.16	0.00	0.00	
7	0.19	0.00	0.00	
8	0.23	0.00	0.00	
9	0.26	0.00	0.00	
10	0.29	0.00	0.00	
11	0.32	0.00	0.00	
12	0.36	0.00	0.00	
13	0.39	0.00	0.00	
14	0.42	0.00	0.00	
15	0.45	0.00	0.00	
16	0.48	0.00	0.00	
17	0.52	0.00	0.00	
18	0.55	0.00	0.00	
19	0.58	0.00	0.00	
20	0.61	0.00	0.00	
21	0.65	0.00	0.00	
22	0.68	0.00	0.00	
23	0.71	0.01	0.01	
24	0.75	0.01	0.01	
25	0.79	0.01	0.01	
26	0.83	0.01	0.01	
27	0.88	0.01	0.01	
28	0.93	0.01	0.01	
29	0.97	0.01	0.01	
30	1.03	0.01	0.01	
31	1.08	0.01	0.01	
32	1.14	0.01	0.01	
33	1.21	0.01	0.01	
34	1.27	0.01	0.01	
35	1.34	0.01	0.01	

Environmental Strategies Corp.
9 Albany Street
Cazenovia, New York
315-655-3900

Data

Project: Rensselaer 2

No: 462690.04 | Page 2

Client: Ashland Distribution Co.

Location: Rensselaer, New York | Pumping test: 0.8 gpm drawdown | Pumping well: MW-19

Test performed DPB

at 06/13/2001

Data observed at: PZ-1 Depth to static WL: 0 [m]

Distance from pumping well: 3.35 [m]

	Time [min]	Depth to WL [m]	Drawdown [m]	
36	1.42	0.01	0.01	
37	1.5	0.01	0.01	
38	1.58	0.01	0.01	
39	1.67	0.01	0.01	
40	1.76	0.02	0.02	
41	1.86	0.02	0.02	
42	1.97	0.02	0.02	
43	2.08	0.02	0.02	
44	2.2	0.02	0.02	
45	2.32	0.02	0.02	
46	2.45	0.02	0.02	
47	2.59	0.03	0.03	
48	2.74	0.03	0.03	
49	2.9	0.03	0.03	
50	3.07	0.03	0.03	
51	3.23	0.03	0.03	
52	3.4	0.03	0.03	
53	3.57	0.03	0.03	
54	3.73	0.04	0.04	
55	3.9	0.04	0.04	
56	4.07	0.04	0.04	
57	4.23	0.04	0.04	
58	4.4	0.04	0.04	
59	4.57	0.04	0.04	
60	4.73	0.04	0.04	
61	4.9	0.04	0.04	
62	5.07	0.04	0.04	
63	5.23	0.05	0.05	
64	5.4	0.05	0.05	
65	5.57	0.05	0.05	
66	5.73	0.05	0.05	
67	5.9	0.05	0.05	
68	6.07	0.05	0.05	
69	6.23	0.05	0.05	
70	6.4	0.05	0.05	

Environmental Strategies Corp.
9 Albany Street
Cazenovia, New York
315-655-3900

Data

Project: Rensselaer 2

No: 462690.04 | Page 3

Client: Ashland Distribution Co.

Location: Rensselaer, New York | Pumping test: 0.8 gpm drawdown | Pumping well: MW-19

Test performed DPB

at 06/13/2001

Data observed at: PZ-1 Depth to static WL: 0 [m]

Distance from pumping well: 3.35 [m]

	Time [min]	Depth to WL [m]	Drawdown [m]	
71	6.57	0.05	0.05	
72	6.73	0.05	0.05	
73	6.9	0.05	0.05	
74	7.07	0.05	0.05	
75	7.23	0.06	0.06	
76	7.4	0.06	0.06	
77	7.57	0.06	0.06	
78	7.73	0.06	0.06	
79	7.9	0.06	0.06	
80	8.07	0.06	0.06	
81	8.23	0.06	0.06	
82	8.4	0.06	0.06	
83	8.57	0.06	0.06	
84	8.73	0.06	0.06	
85	8.9	0.06	0.06	
86	9.07	0.06	0.06	
87	9.23	0.06	0.06	
88	9.4	0.06	0.06	
89	9.57	0.06	0.06	
90	9.73	0.06	0.06	
91	9.9	0.06	0.06	
92	10.07	0.06	0.06	
93	10.23	0.06	0.06	
94	10.4	0.06	0.06	
95	10.57	0.06	0.06	
96	10.73	0.07	0.07	
97	10.9	0.07	0.07	
98	11.07	0.07	0.07	
99	11.23	0.07	0.07	
100	11.4	0.07	0.07	
101	11.57	0.07	0.07	
102	11.73	0.07	0.07	
103	11.9	0.07	0.07	
104	12.07	0.07	0.07	
105	12.23	0.07	0.07	

Environmental Strategies Corp.
9 Albany Street
Cazenovia, New York
315-655-3900

Data

Project: Rensselaer 2

No: 462690.04 | Page 4

Client: Ashland Distribution Co.

Location: Rensselaer, New York | Pumping test: 0.8 gpm drawdown | Pumping well: MW-19

Test performed DPB

at 06/13/2001

Data observed at: PZ-1 Depth to static WL: 0 [m]

Distance from pumping well: 3.35 [m]

	Time [min]	Depth to WL [m]	Drawdown [m]	
106	12.4	0.07	0.07	
107	12.57	0.07	0.07	
108	12.73	0.07	0.07	
109	12.9	0.07	0.07	
110	13.07	0.07	0.07	
111	13.23	0.07	0.07	
112	13.4	0.07	0.07	
113	13.57	0.07	0.07	
114	13.73	0.07	0.07	
115	13.9	0.07	0.07	
116	14.07	0.07	0.07	
117	14.23	0.07	0.07	
118	14.4	0.07	0.07	
119	14.57	0.07	0.07	
120	14.73	0.07	0.07	
121	14.9	0.07	0.07	
122	15.07	0.07	0.07	
123	16.07	0.07	0.07	
124	17.07	0.08	0.08	
125	18.07	0.08	0.08	
126	19.07	0.08	0.08	
127	20.07	0.08	0.08	
128	21.07	0.08	0.08	
129	22.07	0.08	0.08	
130	23.07	0.08	0.08	
131	24.07	0.08	0.08	
132	25.07	0.09	0.09	
133	26.07	0.09	0.09	
134	27.07	0.09	0.09	
135	28.07	0.09	0.09	
136	29.07	0.09	0.09	
137	31.07	0.09	0.09	
138	33.07	0.09	0.09	
139	35.07	0.09	0.09	
140	37.07	0.10	0.10	

Environmental Strategies Corp.
9 Albany Street
Cazenovia, New York
315-655-3900

Data

Project: Rensselaer 2

No: 462690.04 | Page 5

Client: Ashland Distribution Co.

Location: Rensselaer, New York | Pumping test: 0.8 gpm drawdown | Pumping well: MW-19

Test performed DPB

at 06/13/2001

Data observed at: PZ-1 Depth to static WL: 0 [m]

Distance from pumping well: 3.35 [m]

	Time [min]	Depth to WL [m]	Drawdown [m]	
141	39.07	0.10	0.10	
142	41.07	0.10	0.10	
143	43.07	0.10	0.10	
144	45.07	0.10	0.10	
145	47.07	0.10	0.10	
146	49.07	0.10	0.10	
147	51.07	0.11	0.11	
148	53.07	0.11	0.11	
149	55.07	0.11	0.11	
150	57.07	0.11	0.11	
151	59.07	0.11	0.11	
152	64.07	0.12	0.12	
153	69.07	0.12	0.12	
154	74.07	0.12	0.12	
155	79.07	0.12	0.12	
156	84.07	0.13	0.13	
157	89.07	0.13	0.13	
158	94.07	0.13	0.13	
159	99.07	0.13	0.13	
160	104.07	0.13	0.13	
161	109.07	0.14	0.14	
162	114.07	0.14	0.14	
163	119.07	0.14	0.14	
164	126.07	0.14	0.14	
165	133.07	0.14	0.14	
166	140.07	0.14	0.14	
167	147.07	0.15	0.15	
168	154.07	0.15	0.15	
169	161.07	0.15	0.15	
170	168.07	0.15	0.15	
171	175.07	0.15	0.15	
172	185.07	0.16	0.16	
173	195.07	0.16	0.16	
174	205.07	0.16	0.16	
175	215.07	0.17	0.17	

Environmental Strategies Corp.
9 Albany Street
Cazenovia, New York
315-655-3900

Data

Project: Rensselaer 2

No: 462690.04 | Page 6

Client: Ashland Distribution Co.

Location: Rensselaer, New York | Pumping test: 0.8 gpm drawdown | Pumping well: MW-19

Test performed. DPB

at 06/13/2001

Data observed at: PZ-1 Depth to static WL: 0 [m]

Distance from pumping well: 3.35 [m]

	Time [min]	Depth to WL [m]	Drawdown [m]	
176	225.07	0.17	0.17	
177	235.07	0.17	0.17	
178	245.07	0.18	0.18	
179	255.07	0.18	0.18	
180	265.07	0.18	0.18	
181	275.07	0.18	0.18	
182	285.07	0.19	0.19	
183	295.07	0.19	0.19	
184	305.07	0.20	0.20	
185	315.07	0.20	0.20	
186	325.07	0.20	0.20	
187	335.07	0.22	0.22	
188	345.07	0.22	0.22	
189	355.07	0.23	0.23	
190	365.07	0.23	0.23	
191	375.07	0.23	0.23	
192	385.07	0.23	0.23	
193	395.07	0.24	0.24	
194	405.07	0.24	0.24	
195	415.07	0.24	0.24	
196	425.07	0.25	0.25	
197	435.07	0.25	0.25	
198	445.07	0.26	0.26	
199	455.07	0.27	0.27	
200	465.07	0.28	0.28	
201	475.07	0.29	0.29	
202	485.07	0.29	0.29	
203	495.07	0.30	0.30	
204	505.07	0.30	0.30	
205	515.07	0.31	0.31	
206	525.07	0.32	0.32	
207	535.07	0.32	0.32	
208	545.07	0.32	0.32	
209	555.07	0.33	0.33	
210	565.07	0.33	0.33	

Environmental Strategies Corp.
9 Albany Street
Cazenovia, New York
315-655-3900

Data

Project: Rensselaer 2

No: 462690.04 | Page 7

Client: Ashland Distribution Co.

Location: Rensselaer, New York | Pumping test: 0.8 gpm drawdown | Pumping well: MW-19

Test performed DPB

at 06/13/2001

Data observed at: PZ-1 Depth to static WL: 0 [m]

Distance from pumping well: 3.35 [m]

	Time [min]	Depth to WL [m]	Drawdown [m]	
211	575.07	0.33	0.33	
212	585.07	0.34	0.34	
213	595.07	0.34	0.34	
214	605.07	0.34	0.34	
215	615.07	0.34	0.34	
216	625.07	0.35	0.35	
217	635.07	0.35	0.35	
218	645.07	0.35	0.35	
219	655.07	0.35	0.35	
220	665.07	0.35	0.35	
221	675.07	0.35	0.35	
222	685.07	0.35	0.35	
223	695.07	0.36	0.36	
224	705.07	0.36	0.36	
225	715.07	0.36	0.36	
226	725.07	0.37	0.37	
227	735.07	0.37	0.37	
228	745.07	0.37	0.37	
229	755.07	0.38	0.38	
230	765.07	0.38	0.38	
231	775.07	0.38	0.38	
232	785.07	0.38	0.38	
233	795.07	0.38	0.38	
234	805.07	0.38	0.38	
235	815.07	0.38	0.38	
236	825.07	0.38	0.38	

Environmental Strategies Corp.
9 Albany Street
Cazenovia, New York
315-655-3900

Data

Project: Rensselaer 2

No: 462690.04 | Page 1

Client: Ashland Distribution Co.

Location: Rensselaer, New York | Pumping test: 0.8 gpm drawdown | Pumping well: MW-19

Test performed DPB

at 06/13/2001

Data observed at: PZ-2 Depth to static WL: 0 [m]

Distance from pumping well: 8.84 [m]

	Time [min]	Depth to WL [m]	Drawdown [m]	
1	0	0.00	0.00	
2	0.03	0.00	0.00	
3	0.06	0.00	0.00	
4	0.1	0.00	0.00	
5	0.13	0.00	0.00	
6	0.16	0.00	0.00	
7	0.19	0.00	0.00	
8	0.23	0.00	0.00	
9	0.26	0.00	0.00	
10	0.29	0.00	0.00	
11	0.32	0.00	0.00	
12	0.36	0.00	0.00	
13	0.39	0.00	0.00	
14	0.42	0.00	0.00	
15	0.45	0.00	0.00	
16	0.48	0.00	0.00	
17	0.52	0.00	0.00	
18	0.55	0.00	0.00	
19	0.58	0.00	0.00	
20	0.61	0.00	0.00	
21	0.65	0.00	0.00	
22	0.68	0.00	0.00	
23	0.71	0.00	0.00	
24	0.75	0.00	0.00	
25	0.79	0.00	0.00	
26	0.83	0.00	0.00	
27	0.88	0.00	0.00	
28	0.93	0.00	0.00	
29	0.97	0.00	0.00	
30	1.03	0.00	0.00	
31	1.08	0.00	0.00	
32	1.14	0.00	0.00	
33	1.21	0.00	0.00	
34	1.27	0.00	0.00	
35	1.34	0.00	0.00	

Environmental Strategies Corp.
9 Albany Street
Cazenovia, New York
315-655-3900

Data

Project: Rensselaer 2

No: 462690.04 | Page 2

Client: Ashland Distribution Co.

Location: Rensselaer, New York | Pumping test: 0.8 gpm drawdown | Pumping well: MW-19

Test performed DPB

at 06/13/2001

Data observed at: PZ-2 Depth to static WL: 0 [m]

Distance from pumping well: 8.84 [m]

	Time [min]	Depth to WL [m]	Drawdown [m]	
36	1.42	0.00	0.00	
37	1.5	0.00	0.00	
38	1.58	0.00	0.00	
39	1.67	0.00	0.00	
40	1.76	0.00	0.00	
41	1.86	0.00	0.00	
42	1.97	0.00	0.00	
43	2.08	0.00	0.00	
44	2.2	0.00	0.00	
45	2.32	0.00	0.00	
46	2.45	0.00	0.00	
47	2.59	0.00	0.00	
48	2.74	0.00	0.00	
49	2.9	0.00	0.00	
50	3.07	0.00	0.00	
51	3.23	0.00	0.00	
52	3.4	0.00	0.00	
53	3.57	0.00	0.00	
54	3.73	0.00	0.00	
55	3.9	0.00	0.00	
56	4.07	0.00	0.00	
57	4.23	0.00	0.00	
58	4.4	0.00	0.00	
59	4.57	0.00	0.00	
60	4.73	0.00	0.00	
61	4.9	0.00	0.00	
62	5.07	0.00	0.00	
63	5.23	0.00	0.00	
64	5.4	0.00	0.00	
65	5.57	0.00	0.00	
66	5.73	0.00	0.00	
67	5.9	0.00	0.00	
68	6.07	0.00	0.00	
69	6.23	0.00	0.00	
70	6.4	0.00	0.00	

Environmental Strategies Corp.
9 Albany Street
Cazenovia, New York
315-655-3900

Data

Project: Rensselaer 2

No: 462690.04 | Page 3

Client: Ashland Distribution Co.

Location: Rensselaer, New York | Pumping test: 0.8 gpm drawdown | Pumping well: MW-19

Test performed DPB

at 06/13/2001

Data observed at: PZ-2 Depth to static WL: 0 [m]

Distance from pumping well: 8.84 [m]

	Time [min]	Depth to WL [m]	Drawdown [m]	
71	6.57	0.00	0.00	
72	6.73	0.00	0.00	
73	6.9	0.00	0.00	
74	7.07	0.00	0.00	
75	7.23	0.00	0.00	
76	7.4	0.00	0.00	
77	7.57	0.00	0.00	
78	7.73	0.00	0.00	
79	7.9	0.00	0.00	
80	8.07	0.00	0.00	
81	8.23	0.00	0.00	
82	8.4	0.00	0.00	
83	8.57	0.00	0.00	
84	8.73	0.00	0.00	
85	8.9	0.00	0.00	
86	9.07	0.00	0.00	
87	9.23	0.00	0.00	
88	9.4	0.00	0.00	
89	9.57	0.00	0.00	
90	9.73	0.00	0.00	
91	9.9	0.00	0.00	
92	10.07	0.00	0.00	
93	10.23	0.00	0.00	
94	10.4	0.00	0.00	
95	10.57	0.00	0.00	
96	10.73	0.00	0.00	
97	10.9	0.00	0.00	
98	11.07	0.00	0.00	
99	11.23	0.00	0.00	
100	11.4	0.00	0.00	
101	11.57	0.00	0.00	
102	11.73	0.00	0.00	
103	11.9	0.00	0.00	
104	12.07	0.01	0.01	
105	12.23	0.01	0.01	

Environmental Strategies Corp.
9 Albany Street
Cazenovia, New York
315-655-3900

Data

Project: Rensselaer 2

No: 462690.04 | Page 4

Client: Ashland Distribution Co.

Location: Rensselaer, New York | Pumping test: 0.8 gpm drawdown | Pumping well: MW-19

Test performed DPB

at 06/13/2001

Data observed at: PZ-2 Depth to static WL: 0 [m]

Distance from pumping well: 8.84 [m]

	Time [min]	Depth to WL [m]	Drawdown [m]	
106	12.4	0.00	0.00	
107	12.57	0.00	0.00	
108	12.73	0.01	0.01	
109	12.9	0.00	0.00	
110	13.07	0.01	0.01	
111	13.23	0.01	0.01	
112	13.4	0.01	0.01	
113	13.57	0.01	0.01	
114	13.73	0.01	0.01	
115	13.9	0.01	0.01	
116	14.07	0.00	0.00	
117	14.23	0.00	0.00	
118	14.4	0.00	0.00	
119	14.57	0.00	0.00	
120	14.73	0.00	0.00	
121	14.9	0.00	0.00	
122	15.07	0.00	0.00	
123	16.07	0.01	0.01	
124	17.07	0.01	0.01	
125	18.07	0.00	0.00	
126	19.07	0.00	0.00	
127	20.07	0.01	0.01	
128	21.07	0.00	0.00	
129	22.07	0.00	0.00	
130	23.07	0.01	0.01	
131	24.07	0.01	0.01	
132	25.07	0.01	0.01	
133	26.07	0.01	0.01	
134	27.07	0.01	0.01	
135	28.07	0.01	0.01	
136	29.07	0.01	0.01	
137	31.07	0.01	0.01	
138	33.07	0.01	0.01	
139	35.07	0.01	0.01	
140	37.07	0.01	0.01	

Environmental Strategies Corp.
9 Albany Street
Cazenovia, New York
315-655-3900

Data

Project: Rensselaer 2

No: 462690.04 | Page 5

Client: Ashland Distribution Co.

Location: Rensselaer, New York | Pumping test: 0.8 gpm drawdown | Pumping well: MW-19

Test performed DPB

at 06/13/2001

Data observed at: PZ-2 Depth to static WL: 0 [m]

Distance from pumping well: 8.84 [m]

	Time [min]	Depth to WL [m]	Drawdown [m]	
141	39.07	0.01	0.01	
142	41.07	0.01	0.01	
143	43.07	0.01	0.01	
144	45.07	0.01	0.01	
145	47.07	0.01	0.01	
146	49.07	0.01	0.01	
147	51.07	0.01	0.01	
148	53.07	0.02	0.02	
149	55.07	0.02	0.02	
150	57.07	0.01	0.01	
151	59.07	0.02	0.02	
152	64.07	0.02	0.02	
153	69.07	0.02	0.02	
154	74.07	0.02	0.02	
155	79.07	0.02	0.02	
156	84.07	0.02	0.02	
157	89.07	0.02	0.02	
158	94.07	0.03	0.03	
159	99.07	0.03	0.03	
160	104.07	0.03	0.03	
161	109.07	0.03	0.03	
162	114.07	0.03	0.03	
163	119.07	0.03	0.03	
164	126.07	0.03	0.03	
165	133.07	0.03	0.03	
166	140.07	0.04	0.04	
167	147.07	0.04	0.04	
168	154.07	0.04	0.04	
169	161.07	0.04	0.04	
170	168.07	0.04	0.04	
171	175.07	0.04	0.04	
172	185.07	0.04	0.04	
173	195.07	0.04	0.04	
174	205.07	0.04	0.04	
175	215.07	0.05	0.05	

Environmental Strategies Corp.
9 Albany Street
Cazenovia, New York
315-655-3900

Data

Project: Rensselaer 2

No: 462690.04 | Page 6

Client: Ashland Distribution Co.

Location: Rensselaer, New York | Pumping test: 0.8 gpm drawdown | Pumping well: MW-19

Test performed . DPB

at 06/13/2001

Data observed at: PZ-2 Depth to static WL: 0 [m]

Distance from pumping well: 8.84 [m]

	Time [min]	Depth to WL [m]	Drawdown [m]	
176	225.07	0.05	0.05	
177	235.07	0.05	0.05	
178	245.07	0.05	0.05	
179	255.07	0.06	0.06	
180	265.07	0.05	0.05	
181	275.07	0.05	0.05	
182	285.07	0.06	0.06	
183	295.07	0.06	0.06	
184	305.07	0.06	0.06	
185	315.07	0.06	0.06	
186	325.07	0.06	0.06	
187	335.07	0.07	0.07	
188	345.07	0.06	0.06	
189	355.07	0.07	0.07	
190	365.07	0.07	0.07	
191	375.07	0.07	0.07	
192	385.07	0.07	0.07	
193	395.07	0.07	0.07	
194	405.07	0.08	0.08	
195	415.07	0.07	0.07	
196	425.07	0.08	0.08	
197	435.07	0.08	0.08	
198	445.07	0.08	0.08	
199	455.07	0.09	0.09	
200	465.07	0.08	0.08	
201	475.07	0.09	0.09	
202	485.07	0.09	0.09	
203	495.07	0.08	0.08	
204	505.07	0.09	0.09	
205	515.07	0.09	0.09	
206	525.07	0.09	0.09	
207	535.07	0.09	0.09	
208	545.07	0.09	0.09	
209	555.07	0.10	0.10	
210	565.07	0.10	0.10	

Environmental Strategies Corp.
9 Albany Street
Cazenovia, New York
315-655-3900

Data

Project: Rensselaer 2

No: 462690.04 | Page 7

Client: Ashland Distribution Co.

Location: Rensselaer, New York | Pumping test: 0.8 gpm drawdown | Pumping well: MW-19

Test performed DPB

at 06/13/2001

Data observed at: PZ-2 Depth to static WL: 0 [m]

Distance from pumping well: 8.84 [m]

	Time [min]	Depth to WL [m]	Drawdown [m]	
211	575.07	0.10	0.10	
212	585.07	0.10	0.10	
213	595.07	0.10	0.10	
214	605.07	0.10	0.10	
215	615.07	0.10	0.10	
216	625.07	0.10	0.10	
217	635.07	0.10	0.10	
218	645.07	0.10	0.10	
219	655.07	0.10	0.10	
220	665.07	0.10	0.10	
221	675.07	0.11	0.11	
222	685.07	0.11	0.11	
223	695.07	0.11	0.11	
224	705.07	0.11	0.11	
225	715.07	0.11	0.11	
226	725.07	0.11	0.11	
227	735.07	0.11	0.11	
228	745.07	0.12	0.12	
229	755.07	0.12	0.12	
230	765.07	0.12	0.12	
231	775.07	0.12	0.12	
232	785.07	0.12	0.12	
233	795.07	0.12	0.12	
234	805.07	0.12	0.12	
235	815.07	0.12	0.12	
236	825.07	0.12	0.12	

Recovery Test Data – 0.8 GPM
Ashland Distribution Company
Rensselaer, NY
June 2001

ESC
Environmental Strategies Corp.
9 Albany Street
Cazenovia, New York
315-655-3900

Data

Project: Rensselaer 2

No: 462690.04 | Page 1

Client: Ashland Distribution Co.

Location: Rensselaer, New York | Pumping test: 0.8 gpm drawdown | Pumping well: MW-19

Test performed DPB

at 06/13/2001

Data observed at: PZ-3 Depth to static WL: 0 [m]

Distance from pumping well: 8.84 [m]

	Time [min]	Depth to WL [m]	Drawdown [m]	
1	0	0.00	0.00	
2	0.03	0.00	0.00	
3	0.06	0.00	0.00	
4	0.1	0.00	0.00	
5	0.13	0.00	0.00	
6	0.16	0.00	0.00	
7	0.19	0.00	0.00	
8	0.23	0.00	0.00	
9	0.26	0.00	0.00	
10	0.29	0.00	0.00	
11	0.32	0.00	0.00	
12	0.36	0.00	0.00	
13	0.39	0.00	0.00	
14	0.42	0.00	0.00	
15	0.45	0.00	0.00	
16	0.48	0.00	0.00	
17	0.52	0.00	0.00	
18	0.55	0.00	0.00	
19	0.58	0.00	0.00	
20	0.61	0.00	0.00	
21	0.65	0.00	0.00	
22	0.68	0.00	0.00	
23	0.71	0.00	0.00	
24	0.75	0.00	0.00	
25	0.79	0.00	0.00	
26	0.83	0.00	0.00	
27	0.88	0.00	0.00	
28	0.93	0.00	0.00	
29	0.97	0.00	0.00	
30	1.03	0.00	0.00	
31	1.08	0.00	0.00	
32	1.14	0.00	0.00	
33	1.21	0.00	0.00	
34	1.27	0.00	0.00	
35	1.34	0.00	0.00	

Environmental Strategies Corp.
9 Albany Street
Cazenovia, New York
315-655-3900

Data

Project: Rensselaer 2

No: 462690.04 | Page 2

Client: Ashland Distribution Co.

Location: Rensselaer, New York | Pumping test: 0.8 gpm drawdown | Pumping well: MW-19

Test performed DPB

at 06/13/2001

Data observed at: PZ-3 Depth to static WL: 0 [m]

Distance from pumping well: 8.84 [m]

	Time [min]	Depth to WL [m]	Drawdown [m]	
36	1.42	0.00	0.00	
37	1.5	0.00	0.00	
38	1.58	0.00	0.00	
39	1.67	0.00	0.00	
40	1.76	0.00	0.00	
41	1.86	0.00	0.00	
42	1.97	0.00	0.00	
43	2.08	0.00	0.00	
44	2.2	0.00	0.00	
45	2.32	0.00	0.00	
46	2.45	0.00	0.00	
47	2.59	0.00	0.00	
48	2.74	0.00	0.00	
49	2.9	0.00	0.00	
50	3.07	0.00	0.00	
51	3.23	0.00	0.00	
52	3.4	0.00	0.00	
53	3.57	0.00	0.00	
54	3.73	0.00	0.00	
55	3.9	0.00	0.00	
56	4.07	0.00	0.00	
57	4.23	0.00	0.00	
58	4.4	0.00	0.00	
59	4.57	0.00	0.00	
60	4.73	0.00	0.00	
61	4.9	0.00	0.00	
62	5.07	0.00	0.00	
63	5.23	0.00	0.00	
64	5.4	0.00	0.00	
65	5.57	0.01	0.01	
66	5.73	0.01	0.01	
67	5.9	0.01	0.01	
68	6.07	0.01	0.01	
69	6.23	0.01	0.01	
70	6.4	0.01	0.01	

Environmental Strategies Corp.
9 Albany Street
Cazenovia, New York
315-655-3900

Data

Project: Rensselaer 2

No: 462690.04 | Page 3

Client: Ashland Distribution Co.

Location: Rensselaer, New York | Pumping test: 0.8 gpm drawdown | Pumping well: MW-19

Test performed DPB

at 06/13/2001

Data observed at: PZ-3 Depth to static WL: 0 [m]

Distance from pumping well: 8.84 [m]

	Time [min]	Depth to WL [m]	Drawdown [m]	
71	6.57	0.01	0.01	
72	6.73	0.01	0.01	
73	6.9	0.01	0.01	
74	7.07	0.01	0.01	
75	7.23	0.01	0.01	
76	7.4	0.01	0.01	
77	7.57	0.01	0.01	
78	7.73	0.01	0.01	
79	7.9	0.01	0.01	
80	8.07	0.01	0.01	
81	8.23	0.01	0.01	
82	8.4	0.01	0.01	
83	8.57	0.01	0.01	
84	8.73	0.01	0.01	
85	8.9	0.01	0.01	
86	9.07	0.01	0.01	
87	9.23	0.01	0.01	
88	9.4	0.01	0.01	
89	9.57	0.01	0.01	
90	9.73	0.01	0.01	
91	9.9	0.01	0.01	
92	10.07	0.01	0.01	
93	10.23	0.01	0.01	
94	10.4	0.01	0.01	
95	10.57	0.01	0.01	
96	10.73	0.01	0.01	
97	10.9	0.02	0.02	
98	11.07	0.01	0.01	
99	11.23	0.02	0.02	
100	11.4	0.02	0.02	
101	11.57	0.02	0.02	
102	11.73	0.02	0.02	
103	11.9	0.02	0.02	
104	12.07	0.02	0.02	
105	12.23	0.02	0.02	

Environmental Strategies Corp.
9 Albany Street
Cazenovia, New York
315-655-3900

Data

Project: Rensselaer 2

No: 462690.04 | Page 4

Client: Ashland Distribution Co.

Location: Rensselaer, New York | Pumping test: 0.8 gpm drawdown | Pumping well: MW-19

Test performed DPB

at 06/13/2001

Data observed at: PZ-3 Depth to static WL: 0 [m]

Distance from pumping well: 8.84 [m]

	Time [min]	Depth to WL [m]	Drawdown [m]	
106	12.4	0.02	0.02	
107	12.57	0.02	0.02	
108	12.73	0.02	0.02	
109	12.9	0.02	0.02	
110	13.07	0.02	0.02	
111	13.23	0.02	0.02	
112	13.4	0.02	0.02	
113	13.57	0.02	0.02	
114	13.73	0.02	0.02	
115	13.9	0.02	0.02	
116	14.07	0.02	0.02	
117	14.23	0.02	0.02	
118	14.4	0.02	0.02	
119	14.57	0.02	0.02	
120	14.73	0.02	0.02	
121	14.9	0.02	0.02	
122	15.07	0.02	0.02	
123	16.07	0.02	0.02	
124	17.07	0.02	0.02	
125	18.07	0.02	0.02	
126	19.07	0.02	0.02	
127	20.07	0.03	0.03	
128	21.07	0.03	0.03	
129	22.07	0.03	0.03	
130	23.07	0.03	0.03	
131	24.07	0.03	0.03	
132	25.07	0.03	0.03	
133	26.07	0.03	0.03	
134	27.07	0.03	0.03	
135	28.07	0.03	0.03	
136	29.07	0.03	0.03	
137	31.07	0.03	0.03	
138	33.07	0.03	0.03	
139	35.07	0.04	0.04	
140	37.07	0.04	0.04	

Environmental Strategies Corp.
9 Albany Street
Cazenovia, New York
315-655-3900

Data

Project: Rensselaer 2

No: 462690.04 | Page 5

Client: Ashland Distribution Co.

Location: Rensselaer, New York | Pumping test: 0.8 gpm drawdown | Pumping well: MW-19

Test performed DPB

at 06/13/2001

Data observed at: PZ-3 Depth to static WL: 0 [m]

Distance from pumping well: 8.84 [m]

	Time [min]	Depth to WL [m]	Drawdown [m]	
141	39.07	0.04	0.04	
142	41.07	0.04	0.04	
143	43.07	0.04	0.04	
144	45.07	0.04	0.04	
145	47.07	0.04	0.04	
146	49.07	0.04	0.04	
147	51.07	0.04	0.04	
148	53.07	0.04	0.04	
149	55.07	0.04	0.04	
150	57.07	0.04	0.04	
151	59.07	0.04	0.04	
152	64.07	0.05	0.05	
153	69.07	0.05	0.05	
154	74.07	0.05	0.05	
155	79.07	0.05	0.05	
156	84.07	0.05	0.05	
157	89.07	0.05	0.05	
158	94.07	0.05	0.05	
159	99.07	0.05	0.05	
160	104.07	0.06	0.06	
161	109.07	0.06	0.06	
162	114.07	0.06	0.06	
163	119.07	0.06	0.06	
164	126.07	0.06	0.06	
165	133.07	0.06	0.06	
166	140.07	0.06	0.06	
167	147.07	0.06	0.06	
168	154.07	0.06	0.06	
169	161.07	0.06	0.06	
170	168.07	0.06	0.06	
171	175.07	0.06	0.06	
172	185.07	0.06	0.06	
173	195.07	0.07	0.07	
174	205.07	0.07	0.07	
175	215.07	0.07	0.07	

Environmental Strategies Corp.
9 Albany Street
Cazenovia, New York
315-655-3900

Data

Project: Rensselaer 2

No: 462690.04 | Page 6

Client: Ashland Distribution Co.

Location: Rensselaer, New York | Pumping test: 0.8 gpm drawdown | Pumping well: MW-19

Test performed DPB

at 06/13/2001

Data observed at: PZ-3 Depth to static WL: 0 [m]

Distance from pumping well: 8.84 [m]

	Time [min]	Depth to WL [m]	Drawdown [m]	
176	225.07	0.07	0.07	
177	235.07	0.07	0.07	
178	245.07	0.07	0.07	
179	255.07	0.07	0.07	
180	265.07	0.08	0.08	
181	275.07	0.08	0.08	
182	285.07	0.08	0.08	
183	295.07	0.08	0.08	
184	305.07	0.09	0.09	
185	315.07	0.09	0.09	
186	325.07	0.09	0.09	
187	335.07	0.09	0.09	
188	345.07	0.10	0.10	
189	355.07	0.11	0.11	
190	365.07	0.11	0.11	
191	375.07	0.11	0.11	
192	385.07	0.11	0.11	
193	395.07	0.12	0.12	
194	405.07	0.12	0.12	
195	415.07	0.12	0.12	
196	425.07	0.12	0.12	
197	435.07	0.13	0.13	
198	445.07	0.14	0.14	
199	455.07	0.14	0.14	
200	465.07	0.15	0.15	
201	475.07	0.15	0.15	
202	485.07	0.16	0.16	
203	495.07	0.16	0.16	
204	505.07	0.17	0.17	
205	515.07	0.17	0.17	
206	525.07	0.18	0.18	
207	535.07	0.18	0.18	
208	545.07	0.19	0.19	
209	555.07	0.19	0.19	
210	565.07	0.20	0.20	

Environmental Strategies Corp.
9 Albany Street
Cazenovia, New York
315-655-3900

Data

Project: Rensselaer 2

No: 462690.04 | Page 7

Client: Ashland Distribution Co.

Location: Rensselaer, New York | Pumping test: 0.8 gpm drawdown | Pumping well: MW-19

Test performed DPB

at 06/13/2001

Data observed at: PZ-3 Depth to static WL: 0 [m]

Distance from pumping well: 8.84 [m]

	Time [min]	Depth to WL [m]	Drawdown [m]	
211	575.07	0.20	0.20	
212	585.07	0.20	0.20	
213	595.07	0.21	0.21	
214	605.07	0.21	0.21	
215	615.07	0.21	0.21	
216	625.07	0.21	0.21	
217	635.07	0.22	0.22	
218	645.07	0.22	0.22	
219	655.07	0.22	0.22	
220	665.07	0.23	0.23	
221	675.07	0.23	0.23	
222	685.07	0.23	0.23	
223	695.07	0.23	0.23	
224	705.07	0.23	0.23	
225	715.07	0.24	0.24	
226	725.07	0.24	0.24	
227	735.07	0.24	0.24	
228	745.07	0.25	0.25	
229	755.07	0.25	0.25	
230	765.07	0.26	0.26	
231	775.07	0.26	0.26	
232	785.07	0.26	0.26	
233	795.07	0.26	0.26	
234	805.07	0.26	0.26	
235	815.07	0.27	0.27	
236	825.07	0.27	0.27	

Environmental Strategies Corp.
9 Albany Street
Cazenovia, New York
315-655-3900

Data

Project: Rensselaer 2

No: 462690.04 | Page 1

Client: Ashland Distribution Co.

Location: Rensselaer, New York | Pumping test: 0.8 gpm Recovery Test | Pumping well: MW-19

Test performed DPB

at 06/13/2001

Data observed at: PZ-1 Depth to static WL: 0 [m]

Distance from pumping well: 3.35 [m]

	Time [min]	Depth to WL [m]	Drawdown [m]	
1	0	0.00	0.00	
2	0.03	0.00	0.00	
3	0.06	0.00	0.00	
4	0.1	0.00	0.00	
5	0.13	0.00	0.00	
6	0.16	0.00	0.00	
7	0.19	0.00	0.00	
8	0.23	0.00	0.00	
9	0.26	0.00	0.00	
10	0.29	0.00	0.00	
11	0.32	0.00	0.00	
12	0.36	0.00	0.00	
13	0.39	0.00	0.00	
14	0.42	0.00	0.00	
15	0.45	0.00	0.00	
16	0.48	0.00	0.00	
17	0.52	0.00	0.00	
18	0.55	0.00	0.00	
19	0.58	0.00	0.00	
20	0.61	0.00	0.00	
21	0.65	0.00	0.00	
22	0.68	0.00	0.00	
23	0.71	0.01	0.01	
24	0.75	0.01	0.01	
25	0.79	0.01	0.01	
26	0.83	0.01	0.01	
27	0.88	0.01	0.01	
28	0.93	0.01	0.01	
29	0.97	0.01	0.01	
30	1.03	0.01	0.01	
31	1.08	0.01	0.01	
32	1.14	0.01	0.01	
33	1.21	0.01	0.01	
34	1.27	0.01	0.01	
35	1.34	0.01	0.01	

Environmental Strategies Corp.
9 Albany Street
Cazenovia, New York
315-655-3900

Data

Project: Rensselaer 2

No: 462690.04 | Page 2

Client: Ashland Distribution Co.

Location: Rensselaer, New York | Pumping test: 0.8 gpm Recovery Test | Pumping well: MW-19

Test performed DPB

at 06/13/2001

Data observed at: PZ-1 Depth to static WL: 0 [m]

Distance from pumping well: 3.35 [m]

	Time [min]	Depth to WL [m]	Drawdown [m]	
36	1.42	0.01	0.01	
37	1.5	0.01	0.01	
38	1.58	0.01	0.01	
39	1.67	0.01	0.01	
40	1.76	0.02	0.02	
41	1.86	0.02	0.02	
42	1.97	0.02	0.02	
43	2.08	0.02	0.02	
44	2.2	0.02	0.02	
45	2.32	0.02	0.02	
46	2.45	0.02	0.02	
47	2.59	0.03	0.03	
48	2.74	0.03	0.03	
49	2.9	0.03	0.03	
50	3.07	0.03	0.03	
51	3.23	0.03	0.03	
52	3.4	0.03	0.03	
53	3.57	0.03	0.03	
54	3.73	0.04	0.04	
55	3.9	0.04	0.04	
56	4.07	0.04	0.04	
57	4.23	0.04	0.04	
58	4.4	0.04	0.04	
59	4.57	0.04	0.04	
60	4.73	0.04	0.04	
61	4.9	0.04	0.04	
62	5.07	0.04	0.04	
63	5.23	0.05	0.05	
64	5.4	0.05	0.05	
65	5.57	0.05	0.05	
66	5.73	0.05	0.05	
67	5.9	0.05	0.05	
68	6.07	0.05	0.05	
69	6.23	0.05	0.05	
70	6.4	0.05	0.05	

Environmental Strategies Corp.
9 Albany Street
Cazenovia, New York
315-655-3900

Data

Project: Rensselaer 2

No: 462690.04 | Page 3

Client: Ashland Distribution Co.

Location: Rensselaer, New York | Pumping test: 0.8 gpm Recovery Test | Pumping well: MW-19

Test performed DPB

at 06/13/2001

Data observed at: PZ-1 Depth to static WL: 0 [m]

Distance from pumping well: 3.35 [m]

	Time [min]	Depth to WL [m]	Drawdown [m]	
71	6.57	0.05	0.05	
72	6.73	0.05	0.05	
73	6.9	0.05	0.05	
74	7.07	0.05	0.05	
75	7.23	0.06	0.06	
76	7.4	0.06	0.06	
77	7.57	0.06	0.06	
78	7.73	0.06	0.06	
79	7.9	0.06	0.06	
80	8.07	0.06	0.06	
81	8.23	0.06	0.06	
82	8.4	0.06	0.06	
83	8.57	0.06	0.06	
84	8.73	0.06	0.06	
85	8.9	0.06	0.06	
86	9.07	0.06	0.06	
87	9.23	0.06	0.06	
88	9.4	0.06	0.06	
89	9.57	0.06	0.06	
90	9.73	0.06	0.06	
91	9.9	0.06	0.06	
92	10.07	0.06	0.06	
93	10.23	0.06	0.06	
94	10.4	0.06	0.06	
95	10.57	0.06	0.06	
96	10.73	0.07	0.07	
97	10.9	0.07	0.07	
98	11.07	0.07	0.07	
99	11.23	0.07	0.07	
100	11.4	0.07	0.07	
101	11.57	0.07	0.07	
102	11.73	0.07	0.07	
103	11.9	0.07	0.07	
104	12.07	0.07	0.07	
105	12.23	0.07	0.07	

Environmental Strategies Corp.
9 Albany Street
Cazenovia, New York
315-655-3900

Data

Project: Rensselaer 2

No: 462690.04 | Page 4

Client: Ashland Distribution Co.

Location: Rensselaer, New York | Pumping test: 0.8 gpm Recovery Test | Pumping well: MW-19

Test performed DPB

at 06/13/2001

Data observed at: PZ-1 Depth to static WL: 0 [m]

Distance from pumping well: 3.35 [m]

	Time [min]	Depth to WL [m]	Drawdown [m]	
106	12.4	0.07	0.07	
107	12.57	0.07	0.07	
108	12.73	0.07	0.07	
109	12.9	0.07	0.07	
110	13.07	0.07	0.07	
111	13.23	0.07	0.07	
112	13.4	0.07	0.07	
113	13.57	0.07	0.07	
114	13.73	0.07	0.07	
115	13.9	0.07	0.07	
116	14.07	0.07	0.07	
117	14.23	0.07	0.07	
118	14.4	0.07	0.07	
119	14.57	0.07	0.07	
120	14.73	0.07	0.07	
121	14.9	0.07	0.07	
122	15.07	0.07	0.07	
123	16.07	0.07	0.07	
124	17.07	0.08	0.08	
125	18.07	0.08	0.08	
126	19.07	0.08	0.08	
127	20.07	0.08	0.08	
128	21.07	0.08	0.08	
129	22.07	0.08	0.08	
130	23.07	0.08	0.08	
131	24.07	0.08	0.08	
132	25.07	0.09	0.09	
133	26.07	0.09	0.09	
134	27.07	0.09	0.09	
135	28.07	0.09	0.09	
136	29.07	0.09	0.09	
137	31.07	0.09	0.09	
138	33.07	0.09	0.09	
139	35.07	0.09	0.09	
140	37.07	0.10	0.10	

Environmental Strategies Corp.
9 Albany Street
Cazenovia, New York
315-655-3900

Data

Project: Rensselaer 2

No: 462690.04 | Page 5

Client: Ashland Distribution Co.

Location: Rensselaer, New York | Pumping test: 0.8 gpm Recovery Test | Pumping well: MW-19

Test performed DPB

at 06/13/2001

Data observed at: PZ-1 Depth to static WL: 0 [m]

Distance from pumping well: 3.35 [m]

	Time [min]	Depth to WL [m]	Drawdown [m]	
141	39.07	0.10	0.10	
142	41.07	0.10	0.10	
143	43.07	0.10	0.10	
144	45.07	0.10	0.10	
145	47.07	0.10	0.10	
146	49.07	0.10	0.10	
147	51.07	0.11	0.11	
148	53.07	0.11	0.11	
149	55.07	0.11	0.11	
150	57.07	0.11	0.11	
151	59.07	0.11	0.11	
152	64.07	0.12	0.12	
153	69.07	0.12	0.12	
154	74.07	0.12	0.12	
155	79.07	0.12	0.12	
156	84.07	0.13	0.13	
157	89.07	0.13	0.13	
158	94.07	0.13	0.13	
159	99.07	0.13	0.13	
160	104.07	0.13	0.13	
161	109.07	0.14	0.14	
162	114.07	0.14	0.14	
163	119.07	0.14	0.14	
164	126.07	0.14	0.14	
165	133.07	0.14	0.14	
166	140.07	0.14	0.14	
167	147.07	0.15	0.15	
168	154.07	0.15	0.15	
169	161.07	0.15	0.15	
170	168.07	0.15	0.15	
171	175.07	0.15	0.15	
172	185.07	0.16	0.16	
173	195.07	0.16	0.16	
174	205.07	0.16	0.16	
175	215.07	0.17	0.17	

Environmental Strategies Corp.
9 Albany Street
Cazenovia, New York
315-655-3900

Data

Project: Rensselaer 2

No: 462690.04 | Page 6

Client: Ashland Distribution Co.

Location: Rensselaer, New York | Pumping test: 0.8 gpm Recovery Test | Pumping well: MW-19

Test performed DPB

at 06/13/2001

Data observed at: PZ-1 Depth to static WL: 0 [m]

Distance from pumping well: 3.35 [m]

	Time [min]	Depth to WL [m]	Drawdown [m]	
176	225.07	0.17	0.17	
177	235.07	0.17	0.17	
178	245.07	0.18	0.18	
179	255.07	0.18	0.18	
180	265.07	0.18	0.18	
181	275.07	0.18	0.18	
182	285.07	0.19	0.19	
183	295.07	0.19	0.19	
184	305.07	0.20	0.20	
185	315.07	0.20	0.20	
186	325.07	0.20	0.20	
187	335.07	0.22	0.22	
188	345.07	0.22	0.22	
189	355.07	0.23	0.23	
190	365.07	0.23	0.23	
191	375.07	0.23	0.23	
192	385.07	0.23	0.23	
193	395.07	0.24	0.24	
194	405.07	0.24	0.24	
195	415.07	0.24	0.24	
196	425.07	0.25	0.25	
197	435.07	0.25	0.25	
198	445.07	0.26	0.26	
199	455.07	0.27	0.27	
200	465.07	0.28	0.28	
201	475.07	0.29	0.29	
202	485.07	0.29	0.29	
203	495.07	0.30	0.30	
204	505.07	0.30	0.30	
205	515.07	0.31	0.31	
206	525.07	0.32	0.32	
207	535.07	0.32	0.32	
208	545.07	0.32	0.32	
209	555.07	0.33	0.33	
210	565.07	0.33	0.33	

Environmental Strategies Corp.
9 Albany Street
Cazenovia, New York
315-655-3900

Data

Project: Rensselaer 2

No: 462690.04 | Page 7

Client: Ashland Distribution Co.

Location: Rensselaer, New York | Pumping test: 0.8 gpm Recovery Test | Pumping well: MW-19

Test performed DPB

at 06/13/2001

Data observed at: PZ-1 Depth to static WL: 0 [m]

Distance from pumping well: 3.35 [m]

	Time [min]	Depth to WL [m]	Drawdown [m]	
211	575.07	0.33	0.33	
212	585.07	0.34	0.34	
213	595.07	0.34	0.34	
214	605.07	0.34	0.34	
215	615.07	0.34	0.34	
216	625.07	0.35	0.35	
217	635.07	0.35	0.35	
218	645.07	0.35	0.35	
219	655.07	0.35	0.35	
220	665.07	0.35	0.35	
221	675.07	0.35	0.35	
222	685.07	0.35	0.35	
223	695.07	0.36	0.36	
224	705.07	0.36	0.36	
225	715.07	0.36	0.36	
226	725.07	0.37	0.37	
227	735.07	0.37	0.37	
228	745.07	0.37	0.37	
229	755.07	0.38	0.38	
230	765.07	0.38	0.38	
231	775.07	0.38	0.38	
232	785.07	0.38	0.38	
233	795.07	0.38	0.38	
234	805.07	0.38	0.38	
235	815.07	0.38	0.38	
236	825.07	0.38	0.38	
237	825.07	0.38	0.38	
238	825.1	0.38	0.38	
239	825.13	0.38	0.38	
240	825.16	0.38	0.38	
241	825.2	0.38	0.38	
242	825.23	0.38	0.38	
243	825.26	0.38	0.38	
244	825.3	0.38	0.38	
245	825.33	0.38	0.38	

Environmental Strategies Corp.
9 Albany Street
Cazenovia, New York
315-655-3900

Data

Project: Rensselaer 2

No: 462690.04 | Page 8

Client: Ashland Distribution Co.

Location: Rensselaer, New York | Pumping test: 0.8 gpm Recovery Test | Pumping well: MW-19

Test performed DPB

at 06/13/2001

Data observed at: PZ-1 Depth to static WL: 0 [m]

Distance from pumping well: 3.35 [m]

	Time [min]	Depth to WL [m]	Drawdown [m]	
246	825.36	0.38	0.38	
247	825.39	0.38	0.38	
248	825.43	0.39	0.39	
249	825.46	0.38	0.38	
250	825.49	0.38	0.38	
251	825.52	0.38	0.38	
252	825.56	0.39	0.39	
253	825.59	0.38	0.38	
254	825.62	0.38	0.38	
255	825.65	0.38	0.38	
256	825.69	0.39	0.39	
257	825.72	0.39	0.39	
258	825.75	0.39	0.39	
259	825.79	0.38	0.38	
260	825.83	0.38	0.38	
261	825.87	0.38	0.38	
262	825.91	0.38	0.38	
263	825.95	0.38	0.38	
264	826	0.38	0.38	
265	826.05	0.39	0.39	
266	826.1	0.38	0.38	
267	826.16	0.38	0.38	
268	826.22	0.38	0.38	
269	826.28	0.38	0.38	
270	826.35	0.38	0.38	
271	826.42	0.38	0.38	
272	826.49	0.38	0.38	
273	826.57	0.38	0.38	
274	826.65	0.38	0.38	
275	826.74	0.38	0.38	
276	826.83	0.38	0.38	
277	826.93	0.38	0.38	
278	827.04	0.38	0.38	
279	827.15	0.38	0.38	
280	827.27	0.38	0.38	

Environmental Strategies Corp.
9 Albany Street
Cazenovia, New York
315-655-3900

Data

Project: Rensselaer 2

No: 462690.04 | Page 9

Client: Ashland Distribution Co.

Location: Rensselaer, New York | Pumping test: 0.8 gpm Recovery Test | Pumping well: MW-19

Test performed DPB

at 06/13/2001

Data observed at: PZ-1 Depth to static WL: 0 [m]

Distance from pumping well: 3.35 [m]

	Time [min]	Depth to WL [m]	Drawdown [m]	
281	827.39	0.38	0.38	
282	827.53	0.38	0.38	
283	827.67	0.38	0.38	
284	827.82	0.38	0.38	
285	827.97	0.38	0.38	
286	828.14	0.38	0.38	
287	828.32	0.38	0.38	
288	828.5	0.38	0.38	
289	828.7	0.38	0.38	
290	828.91	0.38	0.38	
291	829.14	0.38	0.38	
292	829.37	0.38	0.38	
293	829.62	0.38	0.38	
294	829.89	0.38	0.38	
295	830.17	0.37	0.37	
296	830.46	0.37	0.37	
297	830.78	0.37	0.37	
298	831.11	0.37	0.37	
299	831.46	0.37	0.37	
300	831.84	0.37	0.37	
301	832.23	0.36	0.36	
302	832.65	0.36	0.36	
303	833.1	0.36	0.36	
304	833.57	0.35	0.35	
305	834.07	0.35	0.35	
306	834.59	0.35	0.35	
307	835.15	0.34	0.34	
308	835.75	0.34	0.34	
309	836.37	0.33	0.33	
310	837.04	0.33	0.33	
311	837.74	0.32	0.32	
312	838.49	0.31	0.31	
313	839.28	0.30	0.30	
314	840.12	0.30	0.30	
315	841	0.29	0.29	

Environmental Strategies Corp.
9 Albany Street
Cazenovia, New York
315-655-3900

Data

Project: Rensselaer 2

No: 462690.04 | Page

Client: Ashland Distribution Co.

Location: Rensselaer, New York | Pumping test: 0.8 gpm Recovery Test | Pumping well: MW-19

Test performed DPB

at 06/13/2001

Data observed at: PZ-1 Depth to static WL: 0 [m]

Distance from pumping well: 3.35 [m]

	Time [min]	Depth to WL [m]	Drawdown [m]	
316	841.94	0.28	0.28	
317	842.94	0.27	0.27	
318	843.99	0.26	0.26	
319	845.11	0.25	0.25	
320	846.29	0.24	0.24	
321	847.54	0.23	0.23	
322	848.87	0.22	0.22	
323	850.27	0.21	0.21	
324	851.76	0.19	0.19	
325	853.34	0.18	0.18	
326	855.01	0.18	0.18	
327	856.77	0.17	0.17	
328	858.65	0.17	0.17	
329	860.63	0.16	0.16	
330	862.74	0.15	0.15	
331	864.96	0.15	0.15	
332	867.32	0.14	0.14	
333	869.82	0.14	0.14	
334	872.47	0.13	0.13	
335	875.27	0.13	0.13	
336	878.24	0.12	0.12	
337	881.39	0.11	0.11	
338	884.72	0.11	0.11	
339	888.25	0.10	0.10	
340	891.99	0.10	0.10	
341	895.95	0.10	0.10	
342	900.14	0.09	0.09	
343	904.58	0.09	0.09	
344	909.29	0.09	0.09	
345	914.28	0.08	0.08	
346	919.56	0.08	0.08	
347	925.15	0.08	0.08	
348	931.08	0.08	0.08	
349	937.35	0.07	0.07	
350	944	0.07	0.07	

Environmental Strategies Corp.
9 Albany Street
Cazenovia, New York
315-655-3900

Data

Project: Rensselaer 2

No: 462690.04 | Page

Client: Ashland Distribution Co.

Location: Rensselaer, New York | Pumping test: 0.8 gpm Recovery Test | Pumping well: MW-19

Test performed DPB

at 06/13/2001

Data observed at: PZ-1 Depth to static WL: 0 [m]

Distance from pumping well: 3.35 [m]

	Time [min]	Depth to WL [m]	Drawdown [m]	
351	951.04	0.07	0.07	
352	958.5	0.07	0.07	
353	966.4	0.06	0.06	
354	974.77	0.06	0.06	
355	983.64	0.06	0.06	
356	993.03	0.06	0.06	
357	1002.98	0.06	0.06	
358	1013.51	0.05	0.05	
359	1024.68	0.05	0.05	
360	1036.5	0.05	0.05	
361	1049.02	0.05	0.05	
362	1062.29	0.04	0.04	
363	1076.34	0.04	0.04	
364	1091.22	0.04	0.04	
365	1106.99	0.04	0.04	
366	1123.69	0.04	0.04	
367	1141.38	0.04	0.04	
368	1160.11	0.03	0.03	
369	1179.96	0.03	0.03	
370	1200.99	0.03	0.03	
371	1223.26	0.03	0.03	
372	1246.84	0.03	0.03	
373	1271.83	0.03	0.03	
374	1298.3	0.02	0.02	
375	1326.34	0.02	0.02	
376	1356.03	0.02	0.02	
377	1386.03	0.02	0.02	

Attachment C – Pump Test Analysis

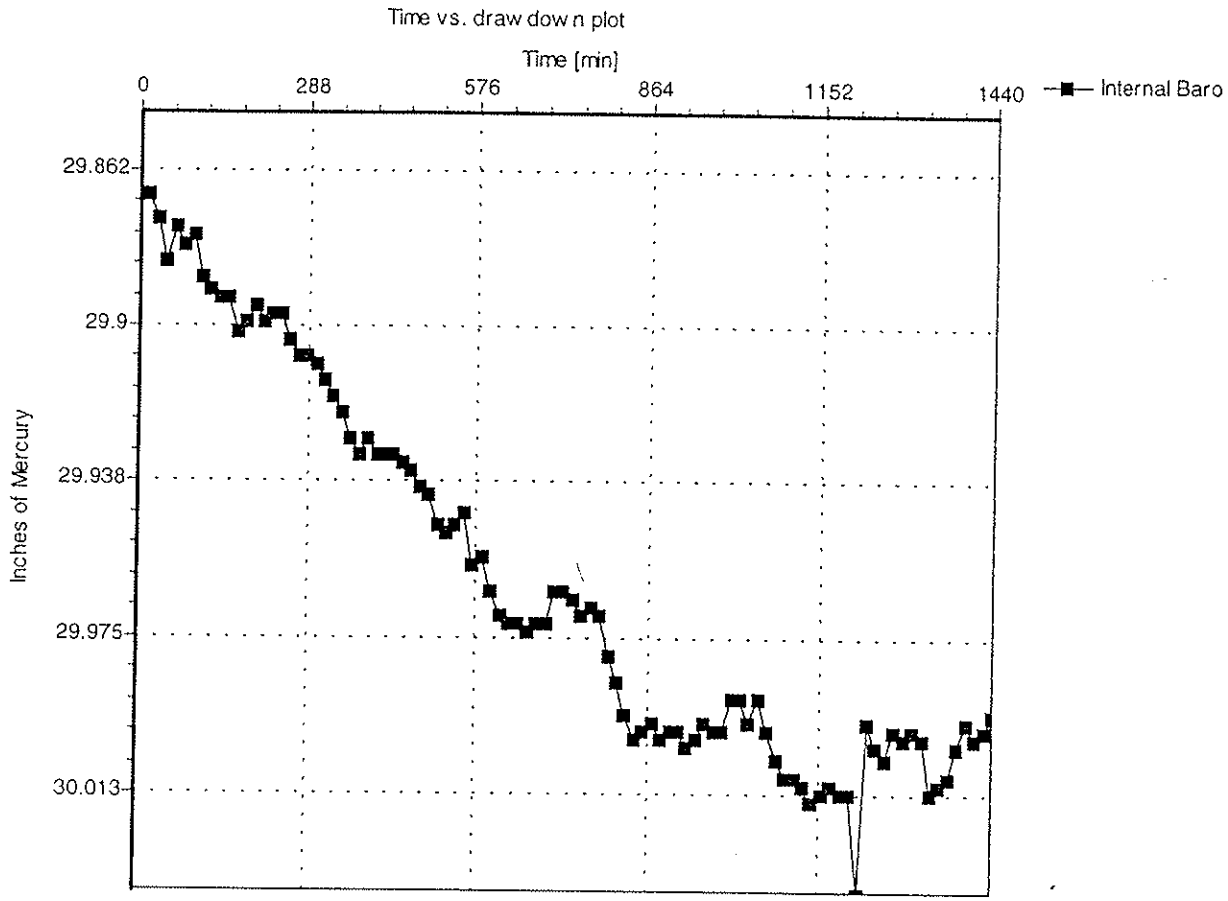
Background Water Level Monitoring
Ashland Distribution Company
Rensselaer, NY
June 2001

Environmental Strategies Corp.
9 Albany Street
Cazenovia, New York 13035
315-655-3900

Pumping test analysis	
No:	462690.04
Project:	Rensselaer 2
Client:	Ashland Distribution Co.

Location: Rensselaer, New York	Pumping test: Background Test	Pumping well: MW-19

Test performed by: DPB	Evaluated by: DPB
Test date: 06/15/2001	Evaluation date: 06/15/2001
Analysis method: Time vs. drawdown plot	Aquifer thickness: 4.97
	Discharge rate:



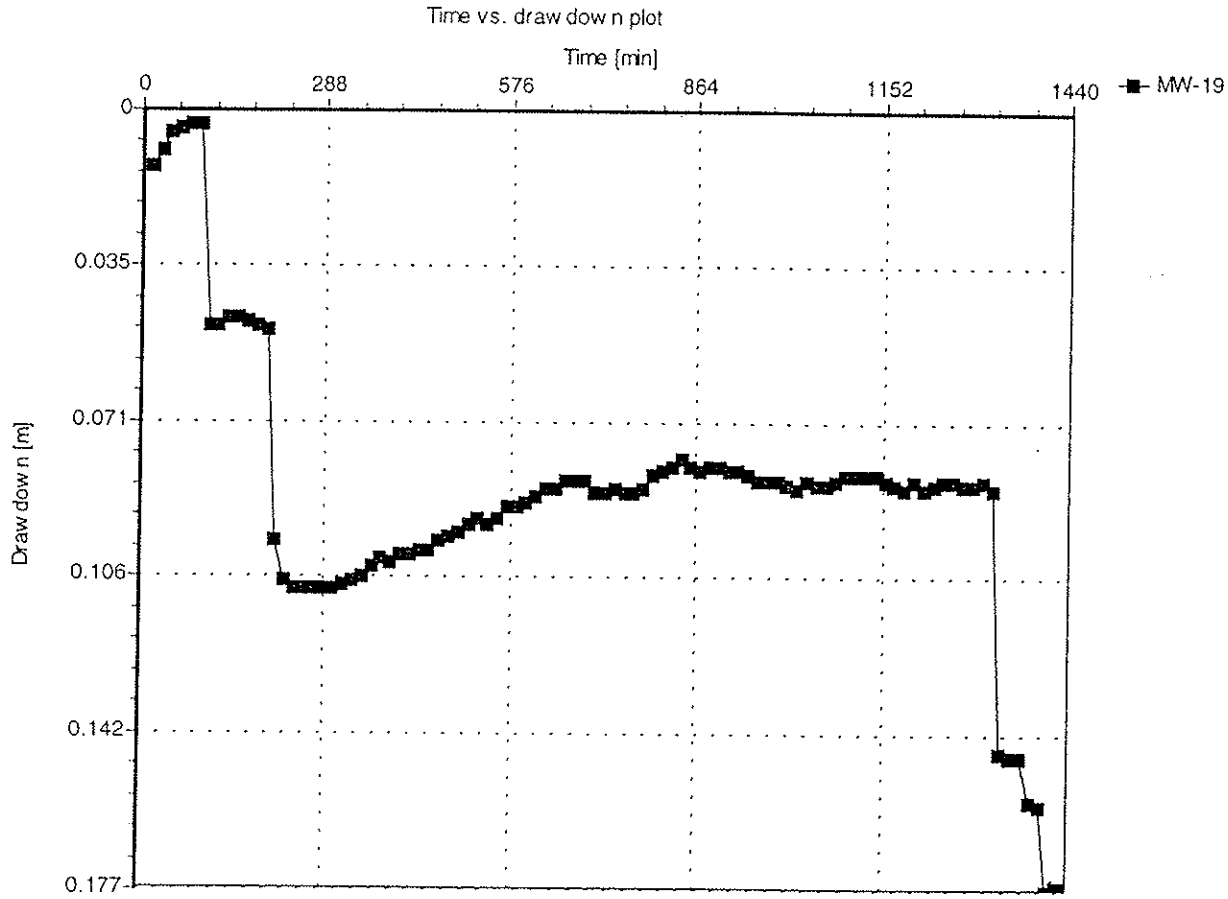
Environmental Strategies Corp.
9 Albany Street
Cazenovia, New York 13035
315-655-3900

Pumping test analysis

No:	462690.04
Project:	Rensselaer 2
Client:	Ashland Distribution Co.

Location: Rensselaer, New York	Pumping test: Background Test	Pumping well: MW-19

Test performed by: DPB	Evaluated by: DPB
Test date: 06/15/2001	Evaluation date: 06/15/2001
Analysis method: Time vs. drawdown plot	Aquifer thickness: 4.97
	Discharge rate:

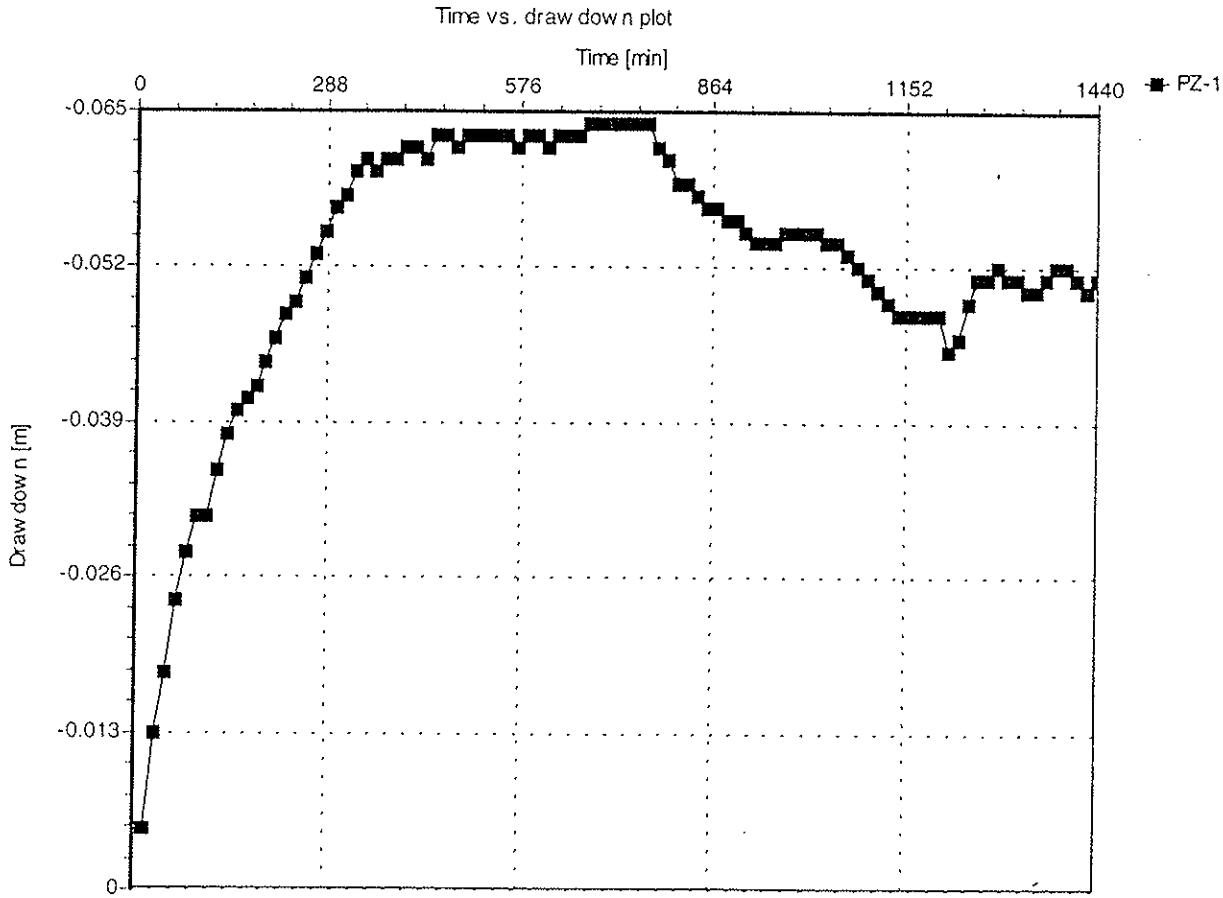


Environmental Strategies Corp.
9 Albany Street
Cazenovia, New York 13035
315-655-3900

Pumping test analysis	
No:	462690.04
Project:	Rensselaer 2
Client:	Ashland Distribution Co.

Location: Rensselaer, New York	Pumping test: Background Test	Pumping well: MW-19

Test performed by: DPB	Evaluated by: DPB
Test date: 06/15/2001	Evaluation date: 06/15/2001
Analysis method: Time vs. drawdown plot	Aquifer thickness: 4.97
	Discharge rate:



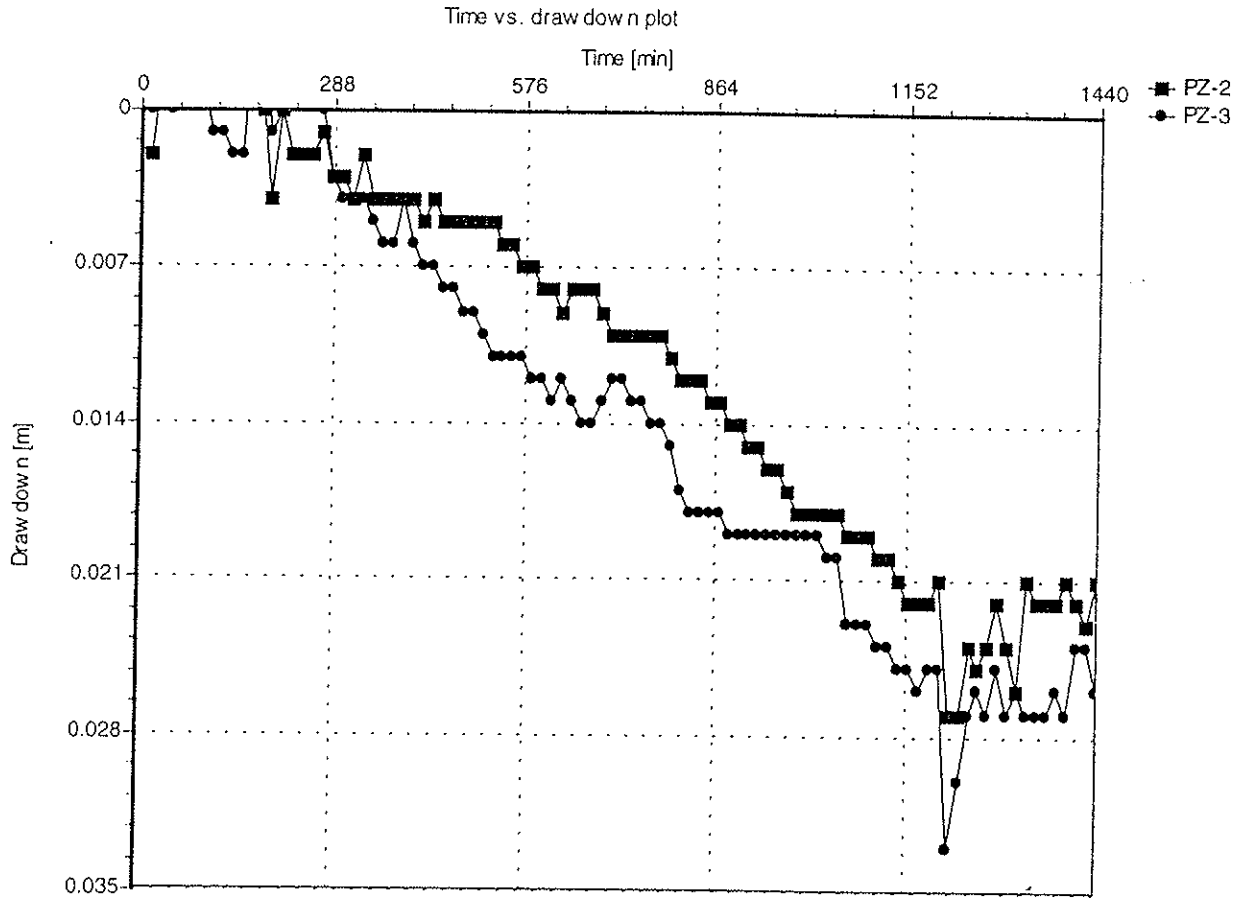
Environmental Strategies Corp.
9 Albany Street
Cazenovia, New York 13035
315-655-3900

Pumping test analysis

No:	462690.04
Project:	Rensselaer 2
Client:	Ashland Distribution Co.

Location: Rensselaer, New York	Pumping test: Background Test	Pumping well: MW-19

Test performed by: DPB	Evaluated by: DPB
Test date: 06/15/2001	Evaluation date: 06/15/2001
Analysis method: Time vs. drawdown plot	Aquifer thickness: 4.97
	Discharge rate:



Variable Rate (Step) Pump Test
Theis Step Analysis
Ashland Distribution Company
Rensselaer, NY
June 2001

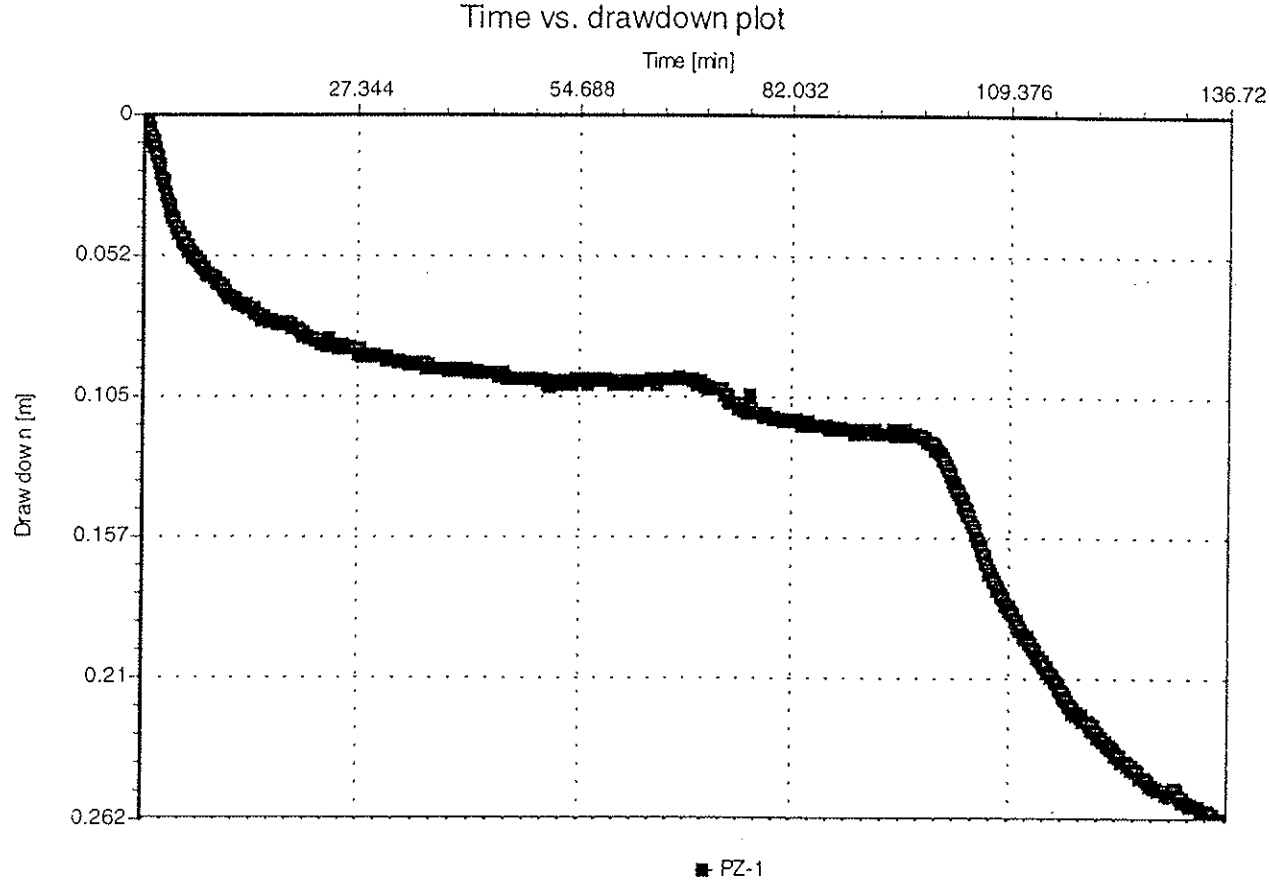
Environmental Strategies Corp.
9 Albany Street
Cazenovia, New York 13035
315-655-3900

Pumping test analysis

No:	462690.04
Project:	Rensselaer 2
Client:	Ashland Distribution Co.

Location: Rensselaer, New York	Pumping test: Step Test	Pumping well: MW-19

Test performed by: DPB	Evaluated by: DPB
Test date: 08/22/2001	Evaluation date: 08/22/2001
Analysis method: Time vs. drawdown plot	Aquifer thickness: 4.97
	Discharge rate: 1.2339476 [U.S. gal/min]



1.0 and 1.7 gpm tests

Environmental Strategies Corp.
9 Albany Street
Cazenovia, New York 13035
315-655-3900

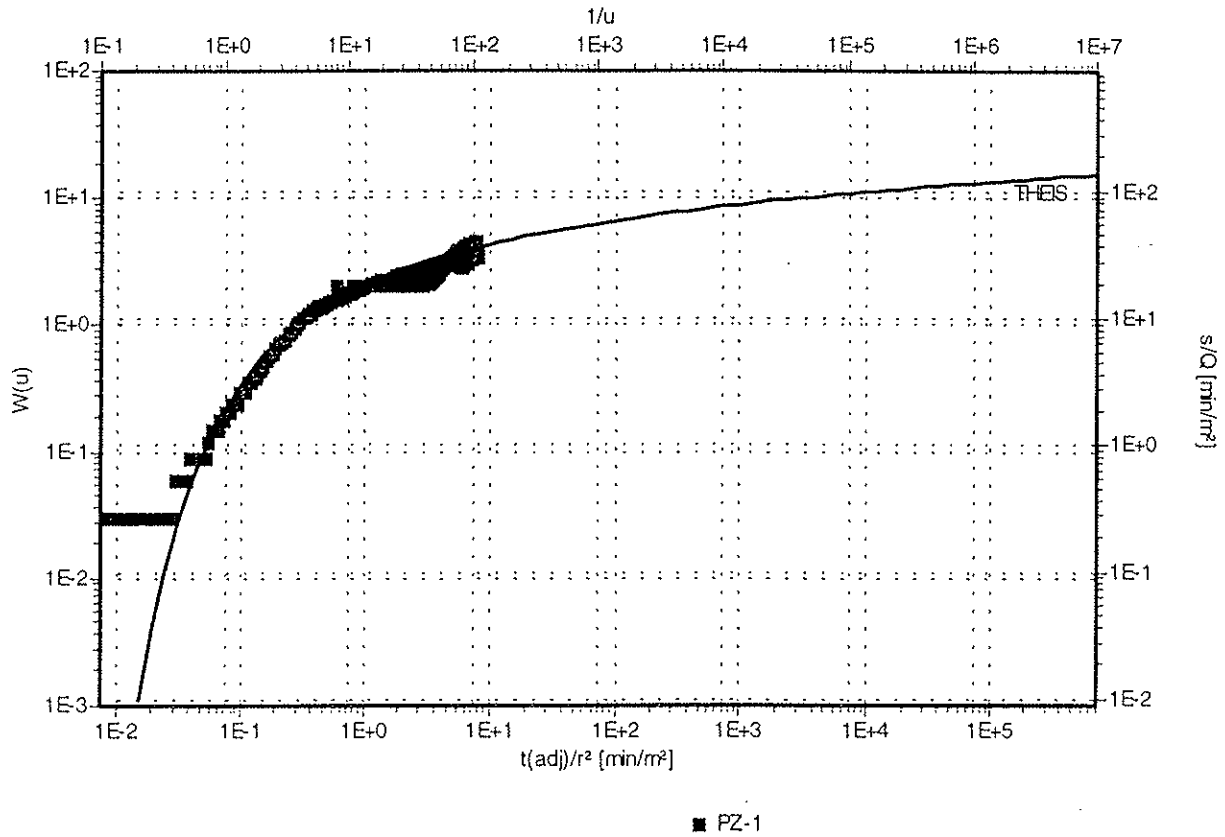
Pumping test analysis

No:	462690.04
Project:	Rensselaer 2
Client:	Ashland Distribution Co.

Location: Rensselaer, New York	Pumping test: Step Test	Pumping well: MW-19

Test performed by:	DPB	Evaluated by:	DPB
Test date:	08/22/2001	Evaluation date:	08/22/2001
Analysis method:	Steptest THEIS	Aquifer thickness:	4.97
		Discharge rate:	1.2339476 [U.S. gal/min]

Steptest THEIS



Transmissivity: 1.49×10^-4 [m²/s]

Conductivity: 2.99×10^-5 [m/s]

1.0 and 1.7 GPM tests (All data)

Constant Discharge Pump Test – 0.8 GPM
Neuman Analysis
Ashland Distribution Company
Rensselaer, NY
June 2001

Environmental Strategies Corp.
9 Albany Street
Cazenovia, New York 13035
315-655-3900

Pumping test analysis

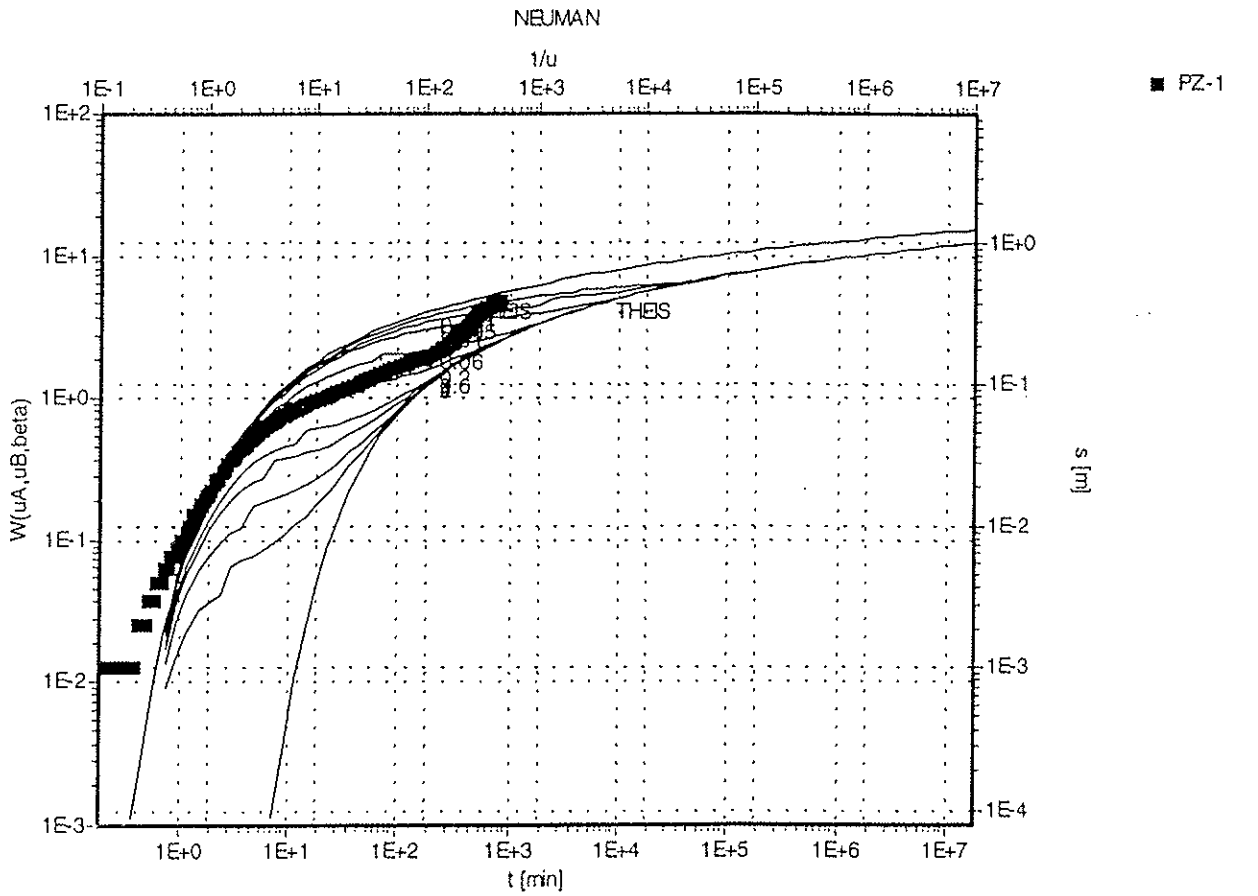
No: 462690.04

Project: Rensselaer 2

Client: Ashland Distribution Co.

Location: Rensselaer, New York	Pumping test: 0.8 gpm	Pumping well: MW-19

Test performed by: DPB	Evaluated by: DPB
Test date: 06/13/2001	Evaluation date: 06/13/2001
Analysis method: NEUMAN	Aquifer thickness: 4.97
	Discharge rate: 0.8 [U.S. gal/min]



Transmissivity: 5.04×10^-5 [m²/s]

Conductivity: 1.01×10^-5 [m/s]

Manual fit, beta=1.3

Environmental Strategies Corp.
9 Albany Street
Cazenovia, New York 13035
315-655-3900

Pumping test analysis

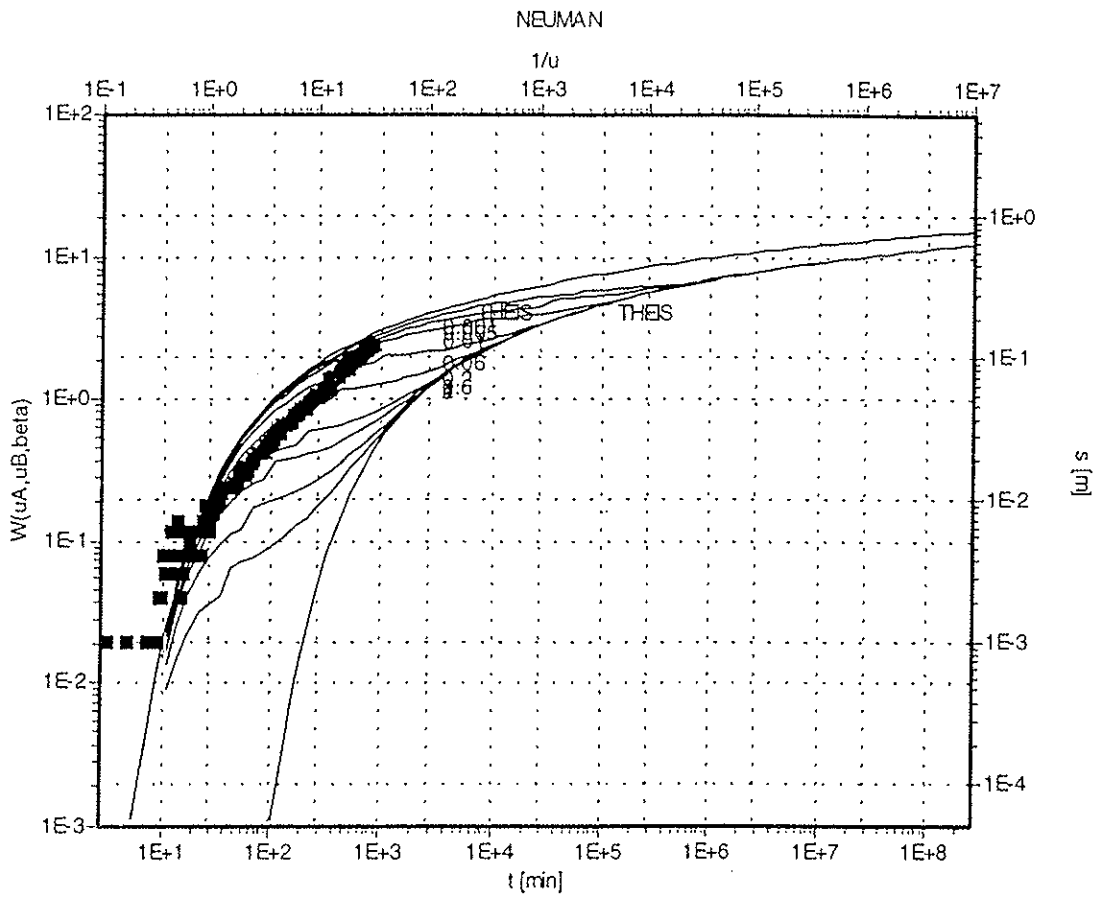
No: 462690.04

Project: Rensselaer 2

Client: Ashland Distribution Co.

Location: Rensselaer, New York	Pumping test: 0.8 gpm	Pumping well: MW-19

Test performed by: DPB	Evaluated by: DPB
Test date: 06/13/2001	Evaluation date: 06/13/2001
Analysis method: NEUMAN	Aquifer thickness: 4.97
	Discharge rate: 0.8 [U.S. gal/min]



Transmissivity: 7.91×10^-5 [m²/s]

Conductivity: 1.59×10^-5 [m/s]

Manual fit, Beta=1.3

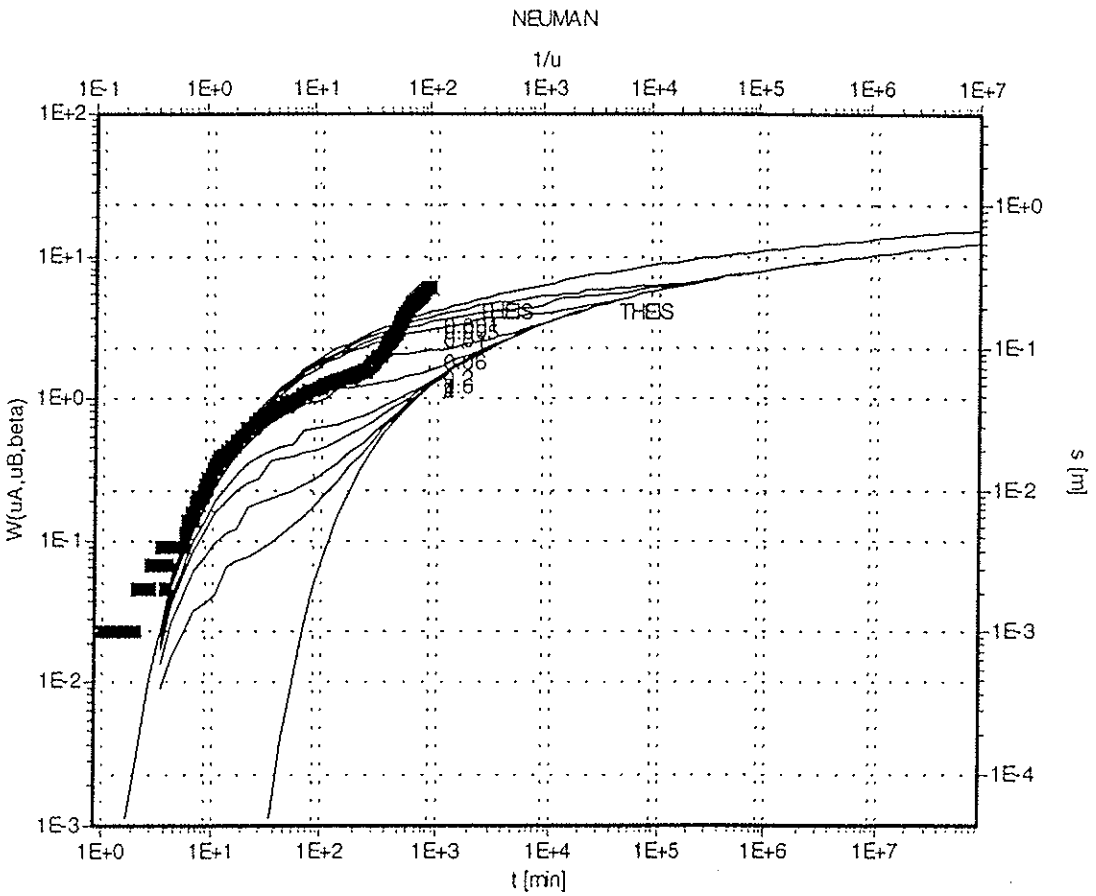
Environmental Strategies Corp.
9 Albany Street
Cazenovia, New York 13035
315-655-3900

Pumping test analysis

No:	462690.04
Project:	Rensselaer 2
Client:	Ashland Distribution Co.

Location: Rensselaer, New York	Pumping test: 0.8 gpm	Pumping well: MW-19

Test performed by:	DPB	Evaluated by:	DPB
Test date:	06/13/2001	Evaluation date:	06/13/2001
Analysis method:	NEUMAN	Aquifer thickness:	4.97
		Discharge rate:	0.8 [U.S. gal/min]



Transmissivity: 9.12×10^-5 [m²/s]

Conductivity: 1.84×10^-5 [m/s]

Manual fit, Beta=1.3

Constant Discharge Pump Test – 0.8 GPM
Cooper and Jacob Time vs. Drawdown Analysis (Early)
Ashland Distribution Company
Rensselaer, NY
June 2001

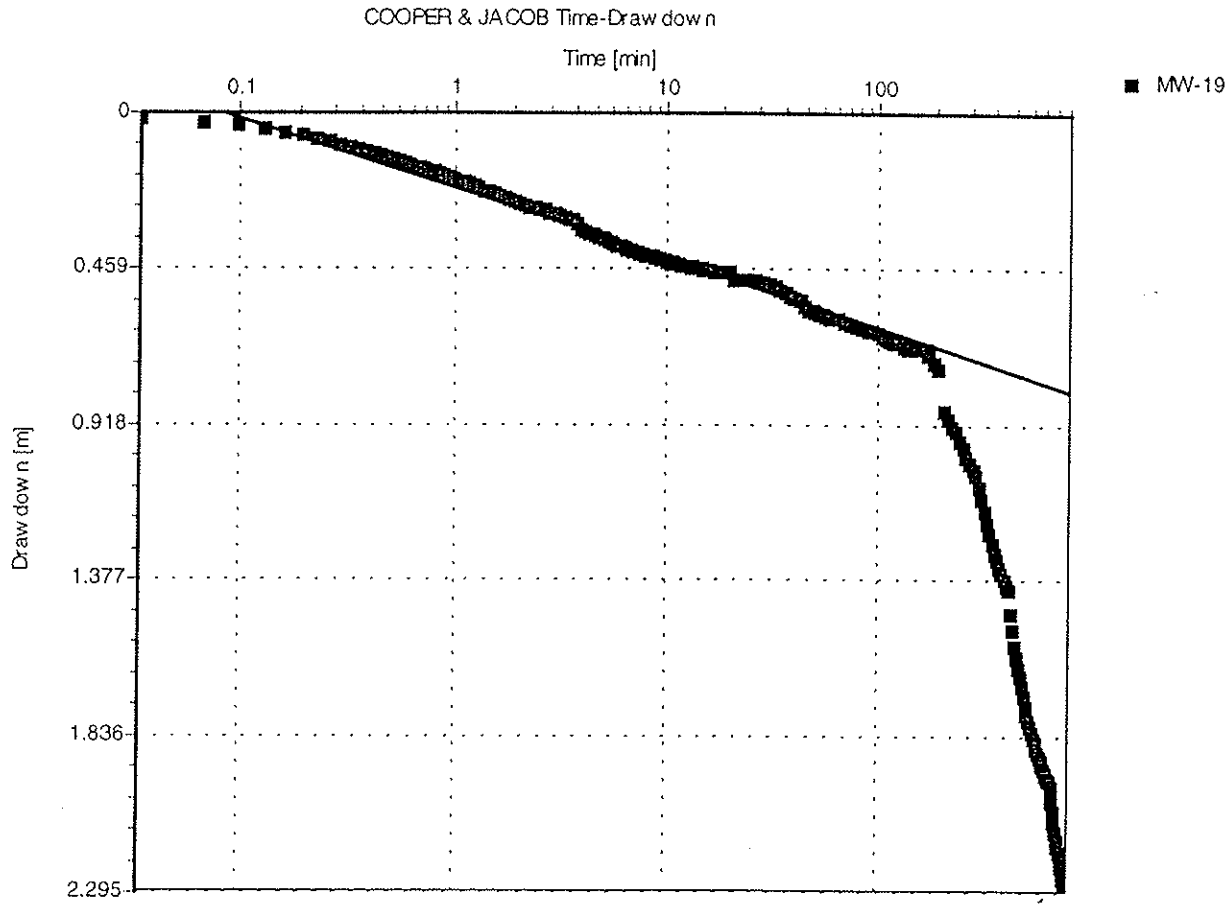
Environmental Strategies Corp.
9 Albany Street
Cazenovia, New York 13035
315-655-3900

Pumping test analysis

No:	462690.04
Project:	Rensselaer 2
Client:	Ashland Distribution Co.

Location: Rensselaer, New York	Pumping test: 0.8 gpm	Pumping well: MW-19

Test performed by:	DPB	Evaluated by:	DPB
Test date:	06/13/2001	Evaluation date:	06/18/2001
Analysis method:	COOPER & JACOB Time-Drawdown	Aquifer thickness:	4.97
		Discharge rate:	0.8 [U.S. gal/min]



Transmissivity: 4.52×10^-5 [m²/s]

Conductivity: 9.09×10^-6 [m/s]

manual fit, unconfined

Environmental Strategies Corp.
9 Albany Street
Cazenovia, New York 13035
315-655-3900

Pumping test analysis

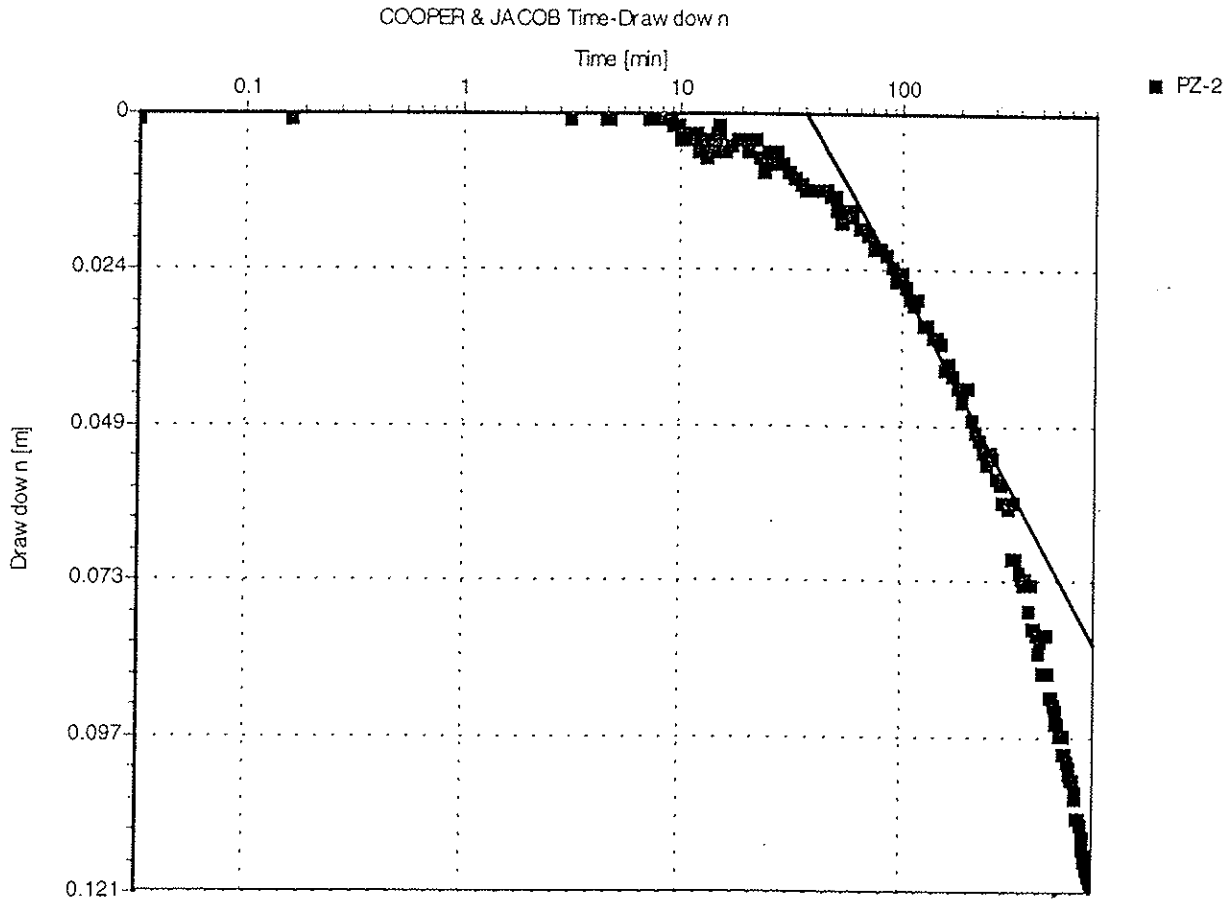
No: 462690.04

Project: Rensselaer 2

Client: Ashland Distribution Co.

Location: Rensselaer, New York	Pumping test: 0.8 gpm	Pumping well: MW-19

Test performed by:	DPB	Evaluated by:	DPB
Test date:	06/13/2001	Evaluation date:	06/18/2001
Analysis method:	COOPER & JACOB Time-Drawdown	Aquifer thickness:	4.97
		Discharge rate:	0.8 [U.S. gal/min]



Transmissivity: 1.50×10^-4 [m²/s]

Conductivity: 3.02×10^-5 [m/s]

Manual fit, unconfined

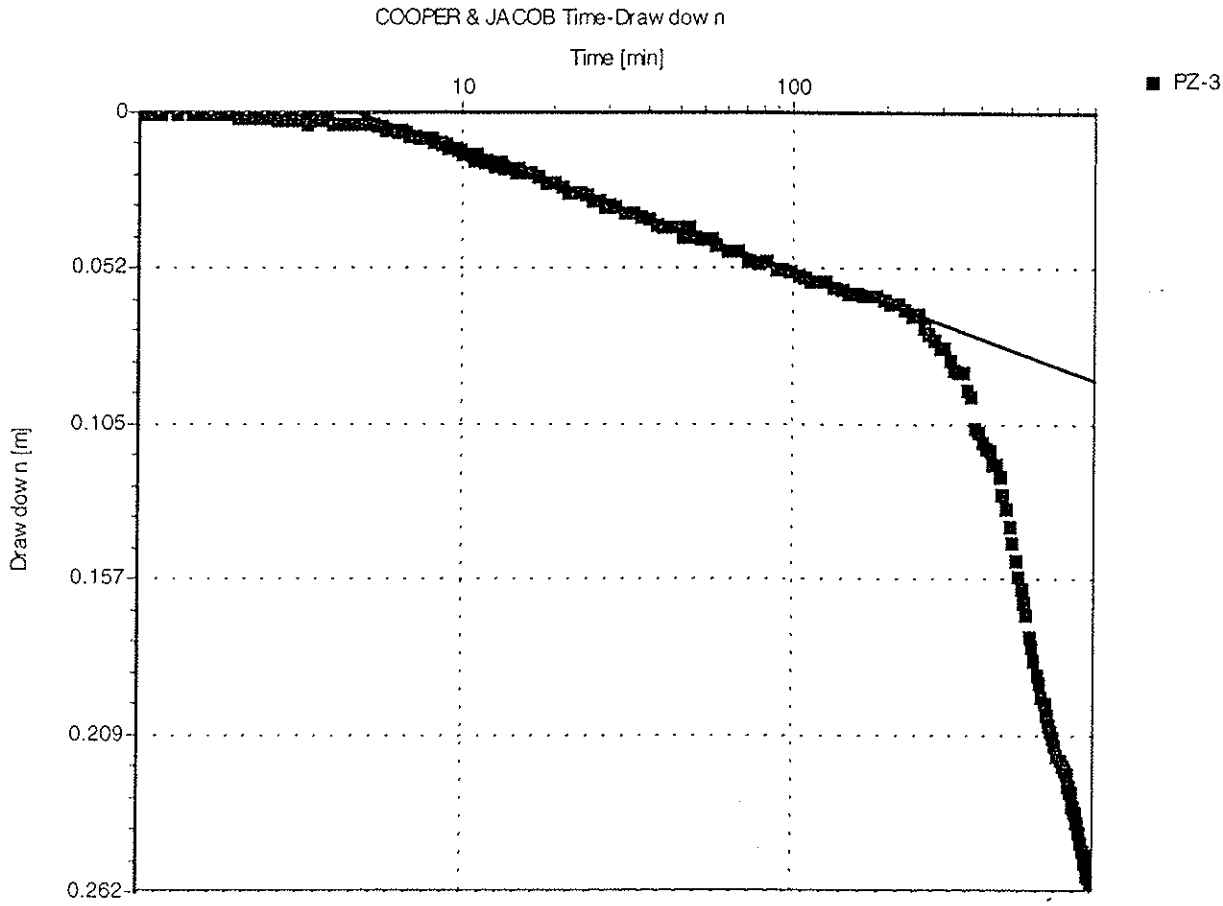
Environmental Strategies Corp.
9 Albany Street
Cazenovia, New York 13035
315-655-3900

Pumping test analysis

No:	462690.04
Project:	Rensselaer 2
Client:	Ashland Distribution Co.

Location: Rensselaer, New York	Pumping test: 0.8 gpm	Pumping well: MW-19

Test performed by:	DPB	Evaluated by:	DPB
Test date:	06/13/2001	Evaluation date:	06/18/2001
Analysis method:	COOPER & JACOB Time-Drawdown	Aquifer thickness:	4.97
		Discharge rate:	0.8 [U.S. gal/min]



Transmissivity: 2.30×10^-4 [m²/s]

Conductivity: 4.62×10^-5 [m/s]

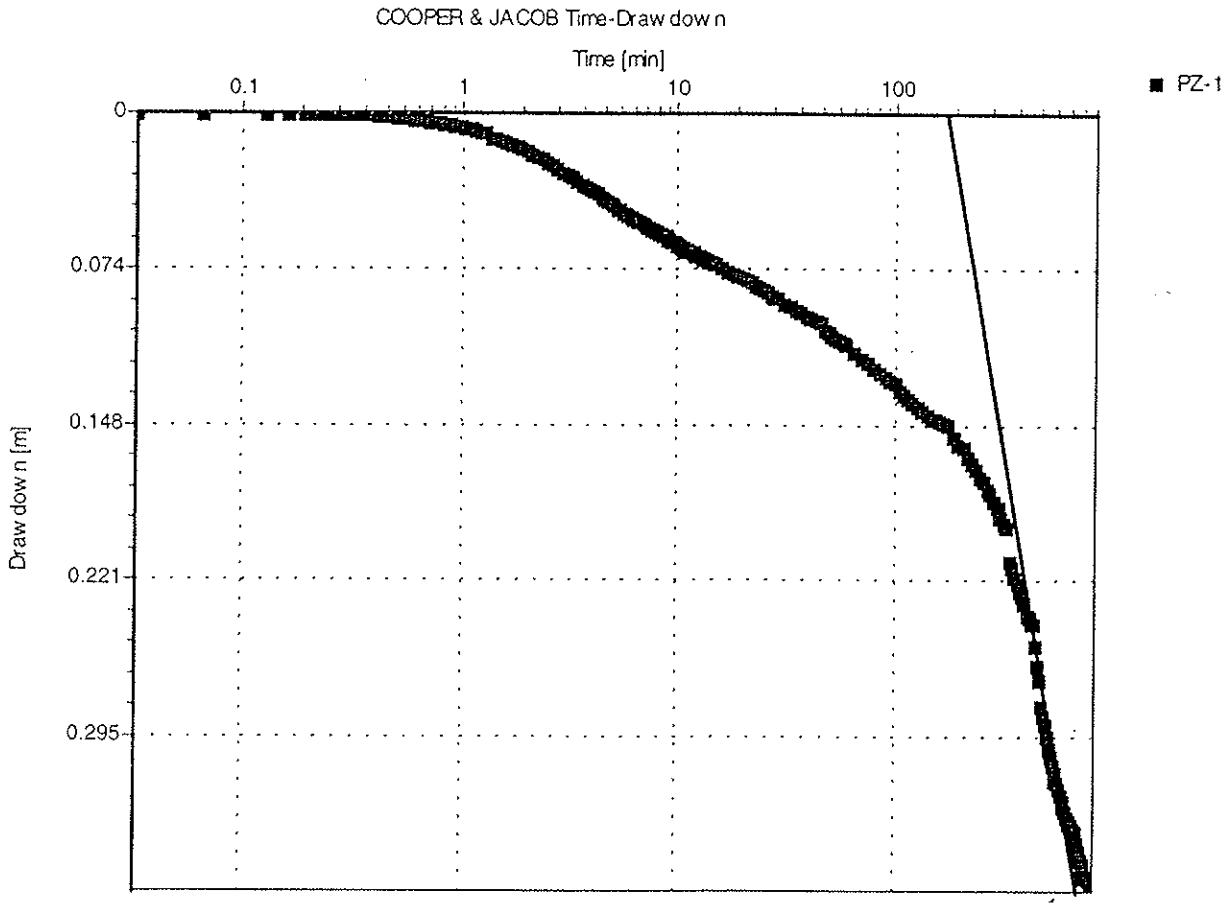
Manual fit, unconfined

Constant Discharge Pump Test – 0.8 GPM
Cooper and Jacob Time vs. Drawdown Analysis (Late)
Ashland Distribution Company
Rensselaer, NY
June 2001

Environmental Strategies Corp. 9 Albany Street Cazenovia, New York 13035 315-655-3900	**Pumping test analysis** No: 462690.04 Project: Rensselaer 2 Client: Ashland Distribution Co.

Location: Rensselaer, New York	Pumping test: 0.8 gpm	Pumping well: MW-19

Test performed by:	DPB	Evaluated by:	DPB
Test date:	06/13/2001	Evaluation date:	06/19/2001
Analysis method:	COOPER & JACOB Time-Drawdown	Aquifer thickness:	4.97
		Discharge rate:	0.8 [U.S. gal/min]



Transmissivity: 1.53×10^-5 [m²/s]

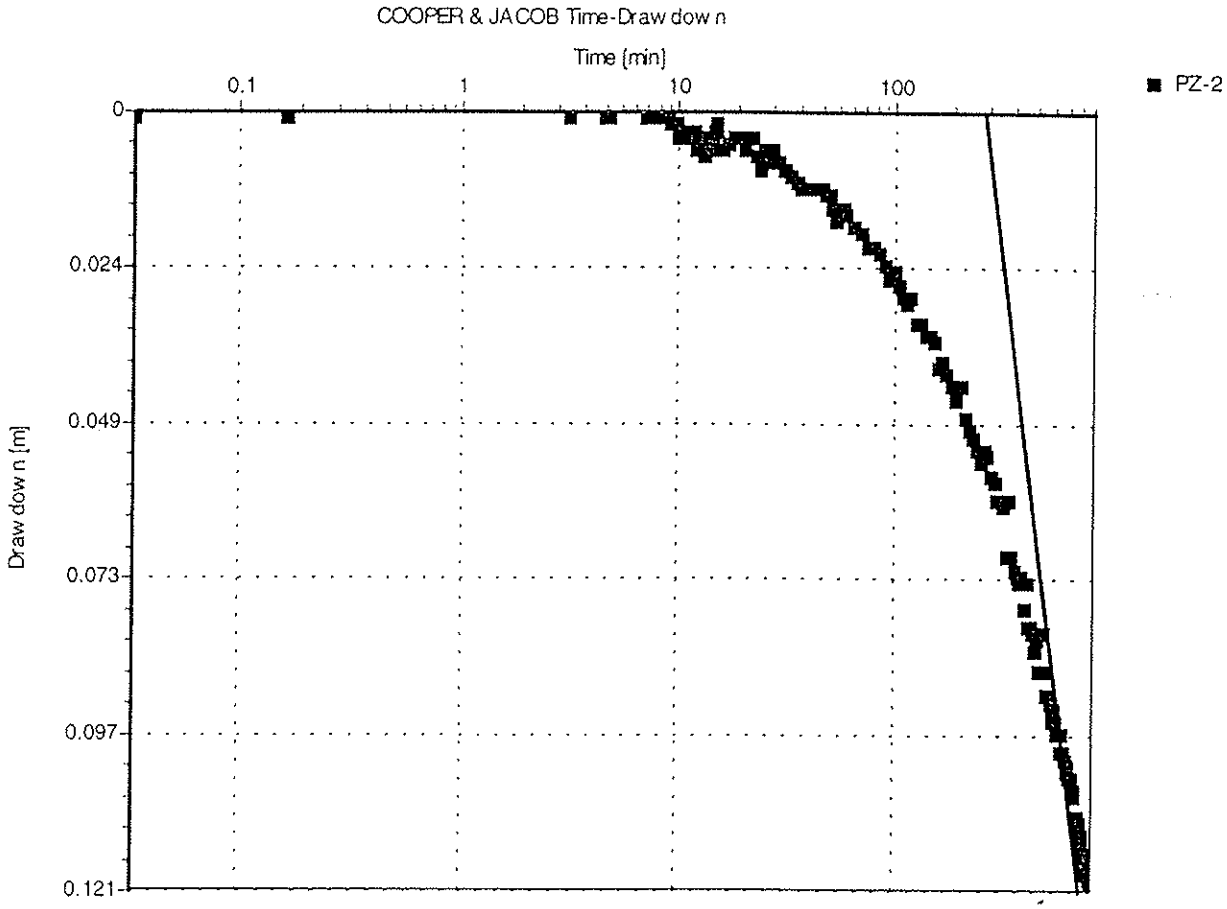
Conductivity: 3.08×10^-6 [m/s]

Manual fit, unconfined

Environmental Strategies Corp. 9 Albany Street Cazenovia, New York 13035 315-655-3900	Pumping test analysis	
	No: 462690.04	
	Project: Rensselaer 2	
	Client: Ashland Distribution Co.	

Location: Rensselaer, New York	Pumping test: 0.8 gpm	Pumping well: MW-19

Test performed by:	DPB	Evaluated by:	DPB
Test date:	06/13/2001	Evaluation date:	06/19/2001
Analysis method:	COOPER & JACOB Time-Drawdown	Aquifer thickness:	4.97
		Discharge rate:	0.8 [U.S. gal/min]



Transmissivity: 3.36×10^-5 [m²/s]

Conductivity: 6.76×10^-6 [m/s]

Manual fit, unconfined

Environmental Strategies Corp.
9 Albany Street
Cazenovia, New York 13035
315-655-3900

Pumping test analysis

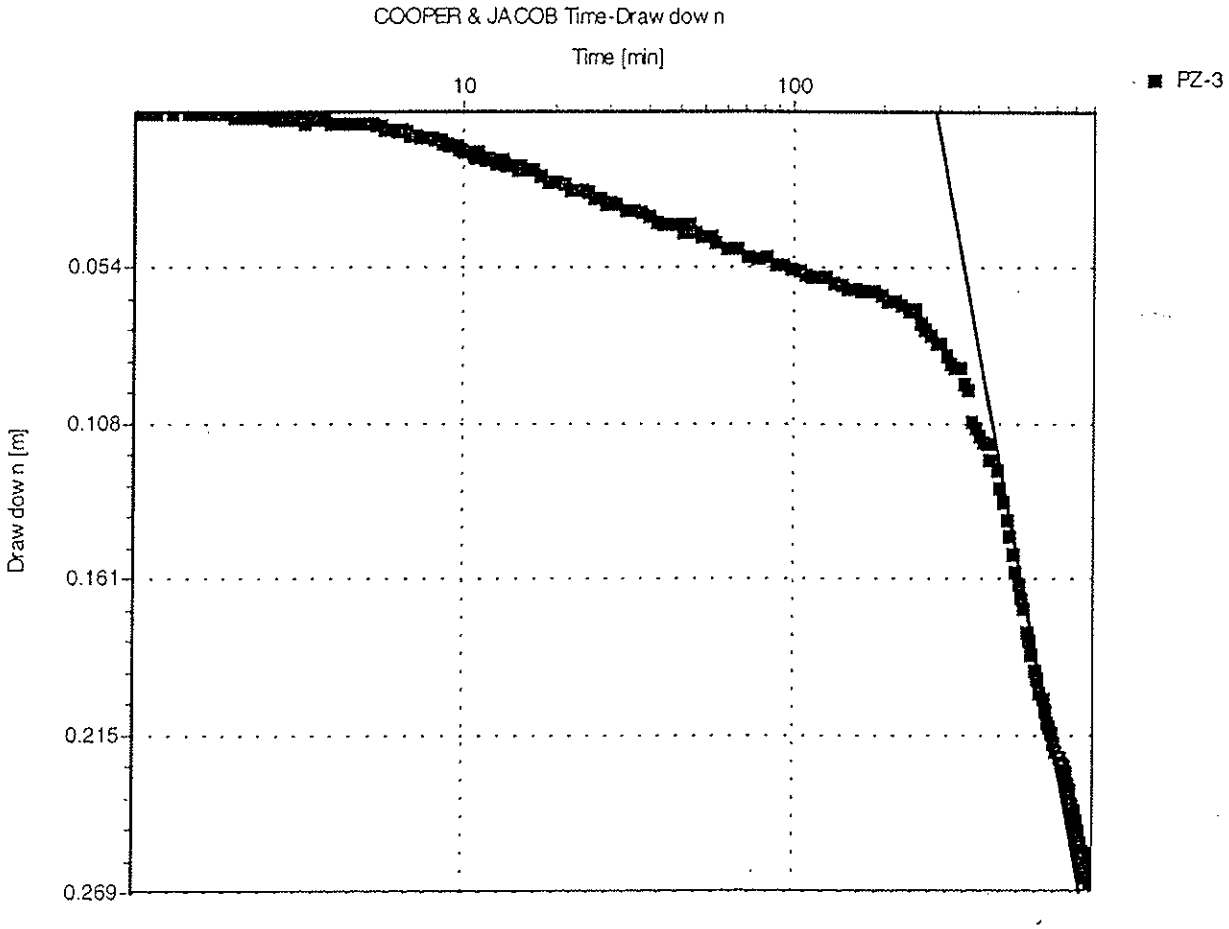
No: 462690.04

Project: Rensselaer 2

Client: Ashland Distribution Co.

Location: Rensselaer, New York	Pumping test: 0.8 gpm	Pumping well: MW-19

Test performed by:	DPB	Evaluated by:	DPB
Test date:	06/13/2001	Evaluation date:	06/18/1997
Analysis method:	COOPER & JACOB Time-Drawdown	Aquifer thickness:	4.97
		Discharge rate:	0.8 [U.S. gal/min]



Transmissivity: 1.53×10^-5 [m²/s]

Conductivity: 3.08×10^-6 [m/s]

Manual fit, unconfined

Recovery Test – 0.8 GPM
Theis Recovery Analysis
Ashland Distribution Company
Rensselaer, NY
June 2001

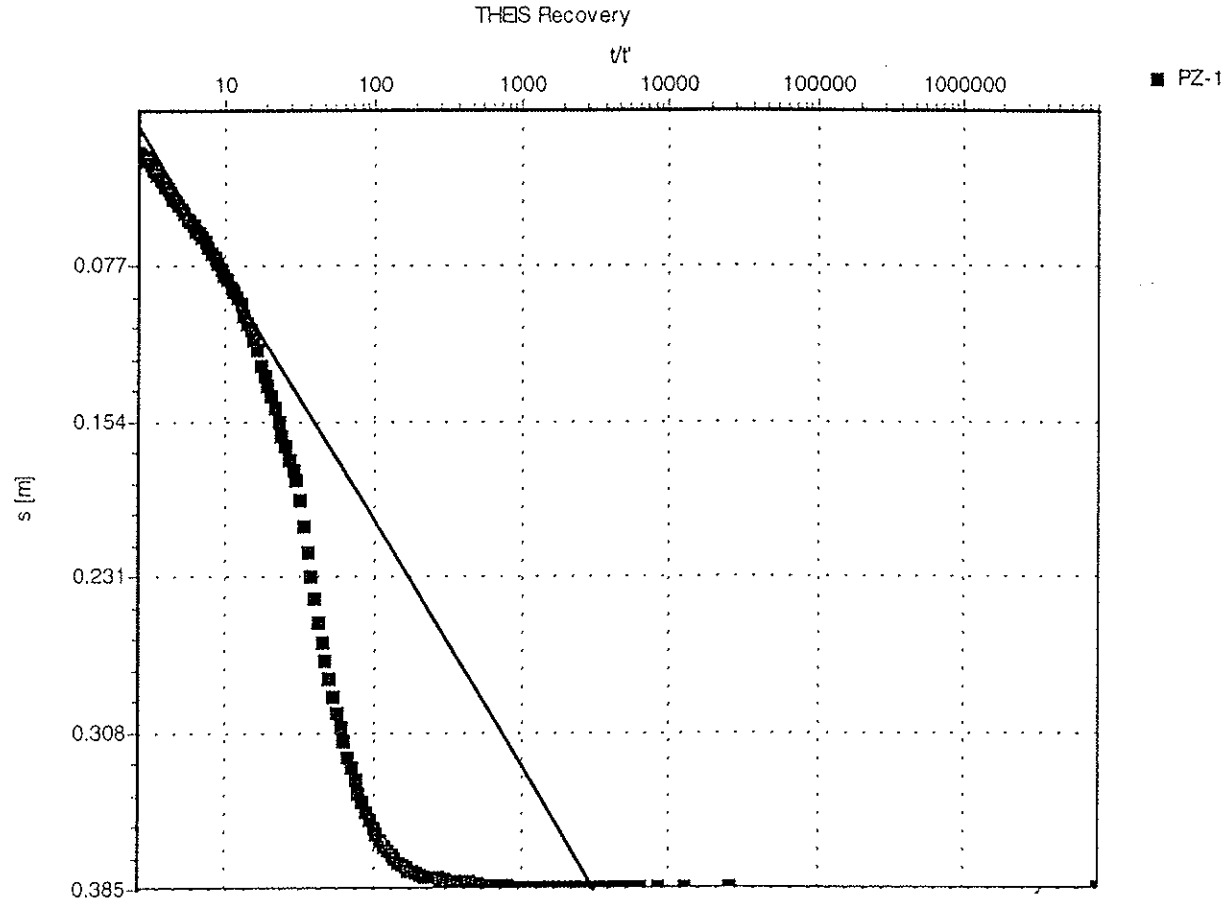
Environmental Strategies Corp.
9 Albany Street
Cazenovia, New York 13035
315-655-3900

Pumping test analysis

No:	462690.04
Project:	Rensselaer 2
Client:	Ashland Distribution Co.

Location: Rensselaer, New York	Pumping test: 0.8 gpm Recovery	Pumping well: MW-19

Test performed by:	DPB	Evaluated by:	DPB
Test date:	06/13/2001	Evaluation date:	06/13/2001
Analysis method:	THEIS Recovery	Aquifer thickness:	4.97
		Discharge rate:	0.8 [U.S. gal/min]



Transmissivity: 7.61×10^-5 [m²/s]

Conductivity: 1.53×10^-5 [m/s]

Manual fit, unconfined

Appendix A-2 – Letter from USEPA to Ashland dated November 7, 2002

Rensselaer, NY
Correspondence

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 2
290 BROADWAY
NEW YORK, NY 10007-1866

NOV 12

NOV - 7 2002

Mr. Rick Gentry
Environmental Engineer
Ashland Chemical Corporation
P.O. Box 2219
Columbus, Ohio 43216

Re: RCRA Facility Investigation (RFI) Report
Administrative Order on Consent - Ashland Chemicals
Docket No. II RCRA-92-3008(h)-0201
EPA ID #: NYD046877775

Dear Mr. Gentry:

The U.S. Environmental Protection Agency (EPA) has reviewed your submittal dated October 22, 2002, in which you presented the results of the RFI groundwater investigations conducted at the Ashland Rensselaer facility. Your submittal also provides conclusions and recommendations in which Ashland believes that VOC contamination in the groundwater at the facility is adequately defined, the RFI is complete and that Ashland intends to address affected groundwater in the central portion of the site (i.e. GP-9 area) by operating the existing deep sump.

Based upon our review of this document and the Conclusions and Recommendations made by Ashland in Section 5.0 of this report, we consider the RFI Report to be incomplete and request that the attached comments are addressed before a Corrective Measures Study is submitted. Please address these comments within thirty (30) days of this letter.

If you have any questions, you may contact me at (212) 637-4177.

Sincerely,

Michael Infurna
Geologist
New York Section

Enclosure

cc: Amy Romano, Environmental Strategies Corp. w/encl.

Enclosure

1. In accordance with the aforementioned Administrative Order on Consent (Attachment I - Scope of Work for an RFI), this report should include the following topics:

- ❑ A discussion on the nature and extent of contamination (specifically, all possible source areas responsible for contamination in the MW-1 area, which shows an increasing trend of groundwater concentrations over the past four semi-annual sampling events). It is not clear from the report if there is a continuing source of contamination and exactly where this increased contamination is suspected of originating from;

- ❑ A figure which identifies the location of all monitoring wells at the Ashland facility with the concentrations of Total VOCs found at each well for the past three (3) semi-annual groundwater sampling events. Those with trends of increasing concentrations should be bold-faced.

2. Under the "Conclusions and Recommendations" section of the report, it is stated that "no further groundwater investigation is warranted at the site". While this statement is presently true, EPA reserves the right under the Administrative Order to request additional work (i.e wells/groundwater sampling)in the future which may be necessary to protect human health and/or the environment. Please revise this language.

3. In Ashland's November 3, 2000 document entitled "Pumping Test and Groundwater Modeling Work Plan," you list several interim measures to address VOCs identified in the groundwater in the southern portion of the facility. This document also states that groundwater modeling will be performed to assist in evaluating the effectiveness of potential interim measures. However, under the "Conclusions and Recommendations" section of the RFI Report, Ashland does not believe that a groundwater treatment system is warranted in the southern portion of the site and that Ashland intends to address affected groundwater in the central portion of the site by operating the deep sump. This statement is contradictory, erroneous, and should be revised.

4. VOCs in the southwest corner (GP-1) and southern portion of the facility (GP-4, GP-26A) need to be addressed and remediated. Based on the results of the pumping test and the conclusions drawn by Ashland in the Third Quarter progress report dated September 12, 2002, operation of the deep sump will have no effect on the VOC contamination in the southwest corner of the property, as well as off-site groundwater contamination documented by in-situ groundwater samples GP-6 and GP-8. Besides containing the contaminated groundwater on-site, Ashland must also treat contaminated groundwater on and off-site. Remediation of this contaminated groundwater must be addressed in the CMS.

Appendix A-3 – Groundwater Natural Attenuation Study

GROUNDWATER NATURAL ATTENUATION STUDY FORMER ASHLAND DISTRIBUTION FACILITY RENSSELAER, NEW YORK

NYD 046877775

Date: January 30, 2004

Project No.: 37679253.04340

URS Diamond
EH&S, DS-4
5200 Blazer Parkway
Dublin, OH 43017

J. Gregory Gilbertsen
Project Manager

Nigel Goulding
Sr. Project Manager

TABLE OF CONTENTS

1.0 Introduction 1

2.0 Background 3
- 2.1 Location and Description 3
- 2.2 Hydrogeology 3
  - 2.2.1 Southern and Offsite Areas 4
  - 2.2.2 Northern and Central Areas 4
- 2.3 Site Conditions 5

3.0 Methods 6
- 3.1 Groundwater Natural Attenuation and VOC Sampling 6
  - 3.1.1 Measuring Water Levels 6
  - 3.1.2 Groundwater Sample Collection and Handling 6
  - 3.1.3 Decontamination Procedures 6
  - 3.1.4 Quality Assurance / Quality Control Procedures 7
- 3.2 Soil Sampling 7
  - 3.2.1 Soil Sample Collection and Handling 7
  - 3.2.2 Decontamination Procedures 8
  - 3.2.3 Quality Assurance / Quality Control Procedures 8
  - 3.2.4 Collection of Soil Samples for Physical Analyses 8

4.0 Results and Discussion 10
- 4.1 Groundwater Elevation and Flow Direction 10
- 4.2 Groundwater Natural Attenuation Parameter Results 10
  - 4.2.1 Southern Area 10
  - 4.2.2 Northern and Central Areas 11
- 4.3 Groundwater VOC Analytical Results 12
- 4.4 Supplemental Soil Sampling Results 12
  - 4.4.1 VOC Analytical Results 13
  - 4.4.2 Physical Parameter Results 14

5.0 Constituent Fate and Transport Modeling 15
- 5.1 Modeling Assumptions 15
- 5.2 Groundwater VOC Inputs 16
  - 5.2.1 Ethene Contamination 16
  - 5.2.2 Ethane Contamination 17
- 5.3 Modeling Analysis 17
  - 5.3.1 Model Description 17
  - 5.3.2 Model Input Parameters 18
  - 5.3.3 Input Parameter Selection 19
- 5.4 BIOCHLOR Model Results 20
- 5.5 BIOCHLOR Model Conclusions 22

6.0 Summary of Natural Attenuation Relative to the Site 24

TABLES

1. Groundwater Monitoring Well Network for Natural Attenuation Study, Ashland Inc., Rensselaer, New York.
2. Site Specific Conditions and Geochemical Parameters for Technical Evaluation of Natural Attenuation, Ashland Inc., Rensselaer, New York.
3. Summary of Historical Groundwater Elevation Data, Ashland Inc., Rensselaer, New York.
4. Summary of Groundwater Natural Attenuation Parameter Analyses, July 2003, Ashland Inc., Rensselaer, New York.
5. Summary of Historical Groundwater Analytical Results, Ashland Inc., Rensselaer, New York.
6. Summary of Physical Parameter Soil Data, November 2003, Ashland Inc., Rensselaer, New York.
7. Summary of Supplemental Soil Sample Analytical Results, November 2003, Ashland Inc., Rensselaer, New York.
8. Mean Concentrations and Confidence Intervals on the Mean, Ashland Inc., Rensselaer, New York.
9. Western Property Boundary Long-Term COC Concentrations in Groundwater, Ashland Inc., Rensselaer, New York.

FIGURES

1. Site Location, Ashland Inc., Rensselaer, New York.
2. Site Layout, Ashland Inc., Rensselaer, New York.
3. Key to Geologic Cross-Sections, Ashland Inc., Rensselaer, New York.
4. Geologic Cross-Sections A-A', B-B', and C-C', Ashland Inc., Rensselaer, New York.
5. Geologic Cross-Sections D-D', E-E', and F-F', Ashland Inc., Rensselaer, New York.
6. Historical Sampling Locations, Ashland Inc., Rensselaer, New York.
7. Potentiometric Surface, July 14, 2003, Ashland Inc., Rensselaer, New York.

APPENDICES

A. Groundwater Sampling Logs
B. Soil Boring Logs
C. STL Groundwater Sample Analytical Report

D. STL Supplemental Soil Sample Analytical Report

E. Atlantic Laboratory Physical Parameter Analytical Report

F. Spatial Distribution of Constituents in the Central and Southern Plumes

G. Plots of Spatial Distribution of Constituents in the Central and Southern Plumes

1.0 INTRODUCTION

This document presents the results of the groundwater natural attenuation (NA) study conducted at the Ashland Distribution Company (Ashland) facility in Rensselaer, New York (Figure 1). The natural attenuation study was conducted to provide data to assist in the evaluation of remedial technologies as part of the Corrective Measures Study (CMS) required by Ashland in accordance with the Administrative Order on Consent docket number II RCRA-92-3008(h)-0201. The CMS Workplan (URS, 2003) and a letter responding to United States Environmental Protection Agency (U.S. EPA) Region 2 comments, dated June 27, 2003, were approved by the U.S. EPA Region 2 in a letter dated July 24, 2003. This followed the U.S. EPA's approval of the RCRA Facility Investigation (RFI) report per it's letter to Ashland dated January 15, 2003. Specifically, the CMS will evaluate potential remedial measures needed to address contaminated groundwater in the Southern and Central portions of the site and other offsite areas adjacent to the Ashland facility.

The groundwater natural attenuation sampling program was implemented at the site during July 14 through 16, 2003 in accordance with guidance provided in EPA/600/R-98/128, " Technical Protocol for Evaluating Natural Attenuation of Chlorinated Solvents in Groundwater," September 1998 and EPA OSWER Policy Directive 9200.4-17P, "Use of Monitored Natural Attenuation at Superfund, RCRA Corrective Action, and Underground Storage Sites," April 1999.

Integral to the NA study was a program of supplemental soil sampling and fate and transport modeling. The supplemental soil sample results provided key input data for the contaminant fate and transport model and also will provide data for a risk assessment to be conducted as part of the CMS at a later date. The results of contaminant fate and transport modeling were utilized to evaluate field evidence, plume stability, and the viability of MNA as a partial option for management of either the onsite and/or offsite portions of the groundwater plume. Further the fate and transport modeling was utilized to determine the maximum extent of the plumes to support the proposed risk assessment activities.

The purpose of this NA study was to:

- Demonstrate that natural attenuation processes are occurring according to expectations;
- Verify that the plumes are not expanding (either downgradient, laterally or vertically);
- Provide key input parameters for the contaminant fate and transport modeling;
- Detect environmental conditions (geochemical, biological, etc.) that may reduce the efficacy of any of the natural attenuation processes.

This report presents an assessment of the potential for monitored natural attenuation (MNA) to facilitate achievement of the remedial goals at the facility and assesses the potential for attenuation of the chemical constituents of concern (COCs) detected in the

uppermost saturated groundwater zone (USGZ) at the site and adjacent downgradient properties through biological mechanisms (i.e., bioattenuation).

The following data were evaluated while assessing bioattenuation of chlorinated solvents:

- Historical data demonstrating a trend at appropriate locations of decreasing contaminant mass and/or concentration over time where the loss of mass must exceed losses attributable to transport processes alone; and
- Hydrogeologic and geochemical data which indirectly demonstrate the type(s) and rate of attenuation processes active at the site, including rates of biological degradation.

2.0 BACKGROUND

2.1 Location and Description

The Ashland facility is located on South Street in Rensselaer, New York (Figure 1). The approximately 4-acre site occupies a narrow strip of land in an industrial and residential area. The facility is bordered on the east by South Street, across which lies residences and an AMTRAK rail bed. The site is bordered to the south by Columbia Avenue, to the west by the CSX Transportation, Inc. (CSXT) right-of-way, and to the north by vacant land (Figure 2). An unnamed tributary of the Hudson River flows westward through the middle of the site and then north along the western property boundary. This tributary has been isolated in a concrete culvert where it passes through the site. (This tributary was incorrectly referenced in previous reports as "Mill Creek" or "tributary of Mill Creek".)

The main features of the site include warehouses, aboveground storage tanks, an office complex, parking areas, and a truck loading rack (Figure 2). The Ashland facility formerly received bulk shipments of industrial chemicals and solvents, and distributed them in smaller quantities to local industrial users. In general, the operations of the previous site owners were restricted to the southern portion of the Ashland facility. Historical activities at the site have included a slaughter house, the manufacturing of resin size paste, and the distribution of solvents, corrosives, sodium silicate, linseed oil, turpentine, and antifreeze (T.M. Gates 1993). Ashland purchased the site from Eastern Chemical in 1969 and continued the distribution of various chemicals, including solvents, acids, and caustics. Since 1969, Ashland made several modifications and improvements to the site, including the re-location of the solvent tank farm and installation of a catastrophic release collection system, replacement of the acid neutralization pit, and installation of dikes at truck transfer locations. Ashland ceased operation at the site in December 2000. Currently, the facility is leased by a company for the storage and distribution of advertising inserts for newspapers.

2.2 Hydrogeology

The geology of the Rensselaer Facility generally consists of fill materials mixed with or overlying alluvial (river) sediments, which overlie glacial-lacustrine (lake) silt deposits. All of these unconsolidated materials overlie shale bedrock. Borings drilled at the site show that the different unconsolidated materials are heterogeneous, with no consistent units identified site-wide. Significant heterogeneity in the types of unconsolidated materials is consistent with these two different depositional environments.

Water bearing zones have been identified within both types of unconsolidated deposits. Some of these zones have been found to occur over significant areas of the site, while others are restricted by the heterogeneity of the unconsolidated materials, which create vertical barriers within the water bearing zones. These barriers tend to prevent or hinder the mixing and the offsite migration of groundwater. Based on the groundwater elevations, groundwater flow in both water bearing zones is towards the north at a gradient of approximately 0.01.

The following sections present descriptions of the lithology encountered at the site based on historical assessment work. A key to cross-sections referenced in these descriptions is presented on Figure 3.

2.2.1 Southern and Offsite Areas

According to ESC (2002), the unconsolidated sediments in the southern portion of the site are heterogeneous and relatively coarse-grained as compared to unconsolidated soils on the northern portions of the site. In general, the sediments consist of approximately 3 to 6 feet of fill material underlain by 5 to 13 feet of sand and gravelly-sand. The sand and gravelly-sand unit is underlain by silt and clay, which in turn is underlain by approximately 4 to 8 feet of sand and gravel with varying amounts of silt and clay. Sections A-A' and B-B' display this sequence. Along the western property line, the coarse-grained deposits abruptly change to low permeability silts and clays (Figure 4, Sections B-B' and C-C'). Bedrock is present in the southern portion of the site at depths from about 20 to 28 feet below the ground surface.

The subsurface geology west of the Ashland facility is variable. The geology consists of approximately 3 to 7 feet of silt, sand, and gravel fill, underlain by 14 to 16 feet of silt, silty clay and clay with thin layers of silt and gravel, which in turn is underlain by sand, sandy silt, and silt with gravel. Bedrock was encountered in this area between 24 and 34 feet below the ground surface.

The ESC RFI investigation showed that there are several discrete water bearing zones within the unconsolidated sediments located in the southern site area and offsite areas. The water bearing zones are typically less than one foot thick and vary considerably in depth over short horizontal distances. Water levels collected from wells screened in these zones were typically 5 to 9 feet above the depth to groundwater observed during installation, indicating confined conditions.

In June 2001, ESC performed a pumping test on MW-19 to determine the hydraulic characteristics of the USGZ in the southwest corner of the property. The results of the test indicated a hydraulic conductivity within this heterogeneous unit of 2.86 to 13.10 feet per day. The results of the pumping test also indicated that the USGZ in the southwest corner of the property is limited in extent and bounded by low permeability hydraulic barriers (ESC, 2001).

2.2.2 Northern and Central Areas

T.M. Gates (1989) reported that unconsolidated sediments on the northern and central portions of the site consist of approximately 10 to 20 feet of alluvium overlying approximately 5 to 10 feet of lacustrine silt. Alluvium deposits primarily consist of clay, with minor sand and gravel. In some areas, alluvium deposits have been mixed with or replaced by fill materials as shown on Figure 5 (sections D-D' and E-E', MW-4). Bedrock was encountered in two borings around 24 feet below the ground surface.

T.M. Gates (1991) identified two hydraulically isolated water bearing units. The upper zone (USGZ) is a 1- to 2-foot thick sand lens within the alluvial deposits. The lower zone (LSGZ) occurs in the saturated materials at the sediment/bedrock interface. The USGZ is

unconfined in nature, whereas the LSGZ is under confined conditions. Cross sections D-D', E-E' and F-F' (Figure 5) display the location of both these zones.

2.3 Site Conditions

The results of investigations conducted at the site indicate that the extent of affected groundwater has been defined and is restricted to the Ashland and adjacent CSXT properties. Chemicals detected in groundwater at the site include predominantly, xylene, toluene, ethylbenzene, tetrachloroethene (PCE), trichloroethene (TCE), 1,2,-dichloroethene, 1,1-dichloroethane, 1,1,1–trichloroethane and vinyl chloride.

The highest concentrations of total VOCs have been detected in groundwater monitoring wells screened in the USGZ in the southwestern and central areas of the site. Based on the results of the most recent groundwater sampling event, the highest VOC concentrations were detected in groundwater from wells MW-19 (2,442 micrograms per liter [ug/L]) near the southwestern portion of the site, and MW-1 (3,636 ug/L) near the central portion of the site.

Groundwater impacts appear confined to the immediate vicinity of the site by the presence of low permeability soils down gradient of the site (on the CSXT property) and the organic carbon content of these soils. Impacts in the southwest corner of the site are contained by natural vertical hydraulic barriers, where coarse grained sand units transition into fine grained silts and clays on the down gradient property.

The presence of these low permeability units between the USGZ and the LSGZ appear to have also limited the vertical migration of these chemicals. All groundwater samples collected from the LSGZ yielded trace to non detectable concentrations of VOCs.

The distribution of chlorinated VOCs, such as PCE and TCE, relative to their degradation products (cis-1,2-dichloroethene, 1,1-dichloroethane, vinyl chloride, etc.) indicates that natural attenuation processes are degrading the chlorinated VOCs in groundwater beneath the site. The potential source-area wells (MW-1 and MW-19) contain large percentages of PCE and TCE and significant proportions of mid-range degradation compounds. Wells located hydraulically downgradient of the potential source areas, that contain VOCs, have large proportions of degradation compounds and small components, if any, of the source compounds (e.g. PCE, TCE).

Soil impacts at the site are generally limited with the highest concentrations generally detected within the saturated zone and only trace concentrations detected in shallow unsaturated soils. The highest concentrations of VOCs were historically detected in the area of the former Warehouse and above ground storage tank (AST) (see Figure 2). However, a soil removal action was conducted in the former AST farm and only limited areas of impacted soils remain on site. Remaining areas of the site are generally unimpacted.

Chemicals historically detected in soils at the site include methylene chloride, acetone, methyl ethyl ketone, methyl isobutyl ketone, 1,2-dichloroethene, 1,1-dichloroethane, TCE, PCE, toluene and xylene.

3.0 METHODS

3.1 Groundwater Natural Attenuation and VOC Sampling

The natural attenuation sampling program, implemented July 14, 2003, was conducted primarily in wells screened in the USGZ and, in accordance with the EPA monitored natural attenuation (MNA) guidance (EPA 1998), a combination of source, down gradient and cross gradient wells were sampled. This included twelve of the sixteen site monitoring wells (wells MW-4, MW-9, MW-10, and MW-12B were not included in the sampling event). In addition to natural attenuation parameters, groundwater samples collected from the wells were analyzed for volatile organic compounds (VOCs) by U.S. EPA Method 8260. The natural attenuation program sampling wells are provided in Table 1 and are shown on Figure 6. A summary of the analytical testing parameters is provided in Table 2.

3.1.1 Measuring Water Levels

Prior to purging and sampling groundwater, each well was opened and allowed to equilibrate. Water levels were gauged using an electric water level meter with precision of 0.01 foot. Depths to water were recorded and subtracted from known total depths of each well to determine heights of water columns. Depths to water were also subtracted from known top-of-casing elevations to calculate water level elevations which were used to evaluate groundwater flow direction.

3.1.2 Groundwater Sample Collection and Handling

The wells were purged and sampled via low flow sampling techniques using a peristaltic pump and YSI flow-through cell equipped with probes to measure field parameters. Field parameters measured included dissolved oxygen (DO), oxidation reduction potential (ORP), pH, specific conductivity, and temperature.

Water in the wells was purged via low flow methods until parameters stabilized. Upon stabilization, sample containers were filled and the samples were placed into an iced cooler for shipment to Severn Trent Laboratories (STL), of Savannah, Georgia, via overnight courier. Properly completed chain-of-custody forms accompanied the sample shipment to the laboratory. Sampling logs prepared during the sampling event are provided in Appendix A.

3.1.3 Decontamination Procedures

To prevent the possibility of cross contamination, new polyethlene tubing was used to purge and sample each well. Groundwater samples were collected in laboratory-prepared sample containers provided by STL. The water level meter was decontaminated between wells in a solution of laboratory grade soap and distilled water followed by multiple rinsings with distilled water.

3.1.4 Quality Assurance / Quality Control Procedures

To evaluate quality assurance and quality control (QA/QC) duplicate samples and blanks were collected and analyzed. Duplicate groundwater samples were collected at a ratio of 1 per 20 (1:20) samples collected and analyzed for VOCs vias U.S. EPA Method 8260.

In addition, trip blanks, obtained from the laboratory, accompanied all shipments of sample containers from the laboratory to the field and back to the laboratory with the samples. Trip blanks were also analyzed for VOCs via U.S. EPA Method 8260.

3.2 Soil Sampling

In accordance with the U.S. EPA-approved Soil Sampling Workplan (URS, 2003c), soil samples were collected in multiple areas of the site to gather supplemental soil data and address data gaps identified in an evaluation of risk assessment data sufficiency. The soil samples were collected during November 13 through 17, 2003. Data collected include both chemical and physical soil parameters. Sampling areas, testing, and analytical parameters are described below. Boring logs prepared in the field are provided in Appendix B. The supplemental soil sampling locations are depicted on Figure 6.

- **Northern portion of the site.** Three borings were advanced within the boundaries of the former tank farm excavation area (Figure 6). Samples were collected from soil or fill material in the 1- to 2-foot interval, and from soil beneath the excavation fill material, if unsaturated, or front fill material just above the water table. Additionally, two borings were advanced outside of the former tank farm excavation boundaries and soil samples collected from the 1- to 2-foot interval and from just above the water table. These samples were analyzed for volatile organic compounds (VOCs) by U.S. EPA Method 8260. Additionally, one soil sample was collected from a subsurface unit for physical parameter analyses (see Section 3.2.4 Collection of Soil Samples for Physical Analyses).
- **Central portion of the site.** Three borings were advanced in this area and soil samples collected from the 1- to 2-foot interval and from just above the water table. These samples were also analyzed for VOCs. Additionally, one soil sample was collected from a subsurface unit for physical parameter analyses.
- **Southern portion of the site.** Five borings were advanced in this area and soil samples collected from the 1- to 2-foot interval. This interval was just above the water table. These samples were also analyzed for VOCs. Additionally, one soil sample was collected from a subsurface unit for physical parameter analyses.

3.2.1 Soil Sample Collection and Handling

In accordance with the investigative techniques utilized in the RCRA Facility Investigation and American Society for Testing and Materials (ASTM) Standard D 1586,

soil borings were advanced via hollow-stem auger drilling and soil samples were collected using stainless steel split-spoons. Soil samples were collected continuously beginning at 1-foot below grade by advancing augers to the desired depth and driving a split-spoon sampler across the targeted 2-foot interval. Soil samples for chemical analyses were not collected below the groundwater table. The samples were retrieved from the split-spoons and divided into two portions. One portion was placed into laboratory-prepared sample containers and archived for laboratory analyses. The other portion was placed into resealable plastic bags for headspace screening in the field. All samples were described by a URS field scientist to provide a lithologic description of the subsurface material encountered above the water table.

The archived soil samples were immediately placed into an iced cooler to prevent volatilization of VOCs. Samples selected for laboratory analyses were shipped via overnight courier to Severn Trent Laboratories (STL) in Savannah, Georgia. Properly completed chain-of-custody forms accompanied all samples submitted for laboratory analyses.

Soil samples in the plastic bags were allowed to equilibrate under ambient conditions for a minimum of 10 minutes. Screening of VOCs in the headspace of the bag was conducted using a photoionizing detector (PID) calibrated against isobutylene gas. The probe of the instrument was inserted into the bag's headspace and the reading on the instrument's meter recorded in the field notes.

3.2.2 Decontamination Procedures

All downhole equipment was decontaminated prior to use. Decontamination of augers and rods was done via steam cleaning using a high-pressure wash system. Split-spoons were also steam cleaned initially. Between uses, split-spoons were washed with a solution of distilled water and laboratory grade soap followed by multiple rinses with distilled water. Decontaminated equipment was allowed to air dry.

3.2.3 Quality Assurance / Quality Control Procedures

To evaluate quality assurance and quality control (QA/QC) duplicate samples and blanks were collected and analyzed. Duplicate soil samples were collected at a ratio of 1 per 20 soil samples collected (1:20) and analyzed for VOCs via U.S. EPA Method 8260.

Equipment blanks were also collected at a 1:20 ratio. Equipment blanks were collected by opening a new container of distilled water and pouring it over a decontaminated split-spoon, and collecting the runoff directly into laboratory prepared sample containers. Equipment blanks were also analyzed for VOCs via U.S. EPA Method 8260.

Trip blanks, obtained from the laboratory, accompanied all shipments of sample containers from the laboratory to the field and back to the laboratory with the samples. Trip blanks were also analyzed for VOCs via U.S. EPA Method 8260.

3.2.4 Collection of Soil Samples for Physical Analyses

Soil samples for physical parameter analyses were collected via Shelby tube in accordance with ASTM standard D 1587. Again, augers were advanced to the desired

depth. The Shelby tube was then be pushed across the sampling interval by the drill rig. The Shelby tube was retrieved from the borehole and the two ends sealed in wax to prevent loss of moisture and sample material. The preserved Shelby tubes were delivered to Atlantic Testing Laboratories in Clifton Park, New York for analysis. Physical analyses performed include dry bulk density, moisture content, grain size distribution via hydrometer and sieve methods as applicable, fraction of organic carbon, pH, and water/air permeability. The physical analyses were performed using applicable ASTM standards.

4.0 RESULTS AND DISCUSSION

4.1 Groundwater Elevation and Flow Direction

Results of groundwater elevation data collected as part of the July 2003 sampling event are consistent with historical groundwater elevation data. Generally, groundwater flow at the site is northerly. Pumping from the sump provides localized drawdown and hydraulic control of impacted groundwater in the Central and Northern Portions of the site. Recent and historical groundwater elevation data is provided in Table 3. Figure 7 depicts the potentiometric surface based on the July 14, 2003 groundwater elevation data.

4.2 Groundwater Natural Attenuation Parameter Results

Natural attenuation (NA) parameter analytical results of groundwater samples collected from site monitoring wells indicate that groundwater conditions differ between the Northern and Southern portions of the site. Under non-impacted conditions, groundwater in the Northern portion of the site exhibits dissolved oxygen (DO) concentrations greater than 0.5 milligram/liter (mg/L), the threshold boundary between aerobic and anaerobic conditions. DO concentrations in the Northern portion of the site decrease as groundwater migrates into impacted areas. Non-impacted groundwater in the Southern portion of the site exhibits DO concentrations less than 0.5 mg/L. Subsequent anaerobic biodegradation processes such as denitrification and iron reduction are not readily apparent in either portion of the site. Consequently, high sulfate concentrations (> 20 mg/L) in both Northern and Southern portions may be causing competitive exclusion of dechlorination. Methanogensis, an indicator of the most strongly reducing conditions, is evident locally in impacted wells in both portions of the site. A summary of the groundwater natural attenuation parameter analytical results is presented in Table 4. The STL groundwater analytical report and a summary of the data quality review are provided in Appendix C.

4.2.1 Southern Area

Review of the groundwater analytical results revealed the following with regard to NA indicators in the Southern Portion of the site:

- Concentrations of chloride are inconclusive with respect to indicating whether reductive dechlorination is occurring in impacted groundwater.
- Total organic carbon (TOC) concentrations are higher in most on-site wells than in off-site wells.
- The process of denitrification (reduction of nitrate to nitrite) is not apparent in wells in the Southern area. This may be due to a lack of available nitrogen sources.

- The process of iron reduction is apparent in impacted-zone well MW-19. Iron reduction is an indicator of strongly reducing conditions, typical of conditions where chlorinated VOCs are being bioattenuated.
- Sulfate reduction is not apparent because no sulfides were detected. High sulfate concentrations (27 to 870 mg/L) may be causing competitive exclusion of dechlorination in the Southern area.
- A significant increase in the concentration of methane in MW-19 (1.2 mg/L versus 0.003 to 0.12 mg/L in other wells) infers methanogenesis may be occurring in this well. Methanogenesis is an indicator of very strongly reducing conditions.
- Dissolved oxygen (DO) concentrations are near or below 0.5 milligram per liter (mg/L) in all but one (MW-15) of the Southern area wells. Anaerobic bacteria typically do not function at DO concentrations greater than 0.5 mg/L. This may indicate that reductive dechlorination is occurring in groundwater in this area.
- Values for oxidation/reduction potential (ORP) are high in background well MW-13, drop off in impacted-zone wells MW-19 and MW-15, then rebound in clean, downgradient well MW-16.
- MW-17 exhibits significantly higher concentrations of total iron, sulfate, alkalinity, and specific conductivity reading than other wells at the site, which may be indicative of a change in lithology and minerology.

4.2.2 Northern and Central Areas

Review of the groundwater natural attenuation analytical results revealed the following with regard to groundwater NA indicators in the Northern Portion of the site:

- There were significant increases in chloride in groundwater in impacted zone wells MW-18S and MW-1 (79 to 130 ppm) versus non-impacted wells (2.9 to 39 ppm), which is an indication that reductive dechlorination is occurring.
- TOC concentrations are higher in most on-site wells versus off-site wells.
- The process of denitrification is not apparent in wells in the Central and Northern areas.
- Iron reduction is not apparent, low concentrations of total iron are present but ferrous iron was not detected.
- Sulfate reduction is not apparent because sulfides were not detected. High sulfate concentrations (23 to 240 mg/L in site wells) may be causing competitive exclusion of dechlorination.
- Significant increases in methane concentrations in MW-1, MW-18S and MW-3 (0.05 to 1.2 ppm) versus non-impacted wells (<0.004 ppm) indicates methanogenesis is occurring (strongly reducing conditions) in these three wells.
- DO concentrations are high (>1.2 ppm) in non-impacted groundwater wells, but concentrations are much lower in wells MW-18S and MW-3 (~0.4 ppm). This indicates that anaerobic conditions are being produced in impacted groundwater

as a result of biodegradation processes in an otherwise aerobic water bearing zone.

- ORP levels are high (236 to 379 mV) in non-impacted groundwater wells, but levels drop off in impacted wells MW-1, MW-18, and MW-3 (-127 to 92 mV). As with DO concentrations, this is indicative of biodegradation processes affecting conditions in impacted groundwater.
- Groundwater in the Sump is likely aerated as a result of the pumping, hence, biological degradation of chlorinated compounds is inhibited in the immediate vicinity of the Sump. Field parameters were not measured in groundwater from the Sump.

4.3 Groundwater VOC Analytical Results

In general, the July 2003 groundwater sampling results are consistent with historical groundwater sampling results, as summarized in Section 2.3 *Site Conditions*. VOCs were not detected in groundwater samples collected from wells MW11, MW-12S and MW-17, located off-site and on the downgradient sitde of the CSXT right-of-way.

In addition, VOCs were detected for the first time in background wells MW-13 and MW-14 for. Trans-1,2-dichloroethene was detected in MW-13 at 1.1 micrograms per liter (ug/L) and tetrachloroethene was detected in MW-14 at 1.3 ug/L.

The highest concentrations of total VOCs were detected in samples from wells MW-1, MW-18, and MW-19. The majority of constituents detected in MW-1 were PCE and TCE with some mid-process degradation constituents (1,1,1-TCA, cis-1,2-DCE, and 1,1-DCE). The majority of constituents detected in wells MW-18 and MW-19 were mid- to late-process degradation products of PCE and TCE, indicating that these two wells are located hydraulically downgradient of source areas.

A summary of historical groundwater analytical results is provided in Table 5. The STL laboratory analytical report and a summary of the data quality are provided in Appendix C.

4.4 Supplemental Soil Sampling Results

A review of historical environmental documents for the site revealed data gaps with respect to the quality of unsaturated soil at the site. Supplemental soil samples were collected at the site in November 2003 to evaluate shallow soil conditions and provide data with which to conduct constituent fate and transport modeling (see Section 5.3 *BIOCHLOR Model Results*). Additionally, these soil data will be used at a later date to conduct a risk assessment as part of the CMS. Because these soil data will be used and evaluated in specific applications, the analytical results are presented here with little discussion or evaluation.

Twenty-one samples were collected of unsaturated soil from thirteen locations at the site and analyzed for VOCs by U.S. EPA Method 8260. Because of the very shallow nature of groundwater (less than two feet below land surface [ft bls]) in the Southern Portion of

the site, only one sample was collected from each of five soil borings (SSB-1 through SSB-5) in this area. Two samples were collected from each of three soil borings located in the Central Portion (SSB-6 through SSB-8) and from each of five soil borings (SSB- 9 through SSB-13) located in the Northern Portion of the site.

In addition, one soil sample was collected via Shelby tube from each of the three portions of the site and analyzed for physical parameters including moisture content, bulk density, pH, fragment of organic content (foc), hydraulic conductivity (K), and particle size analysis. These samples (SSB-3, SSB-6, and SSB-13) were collected from fine grained soil units underlying the surficial sand and gravel unit at the site. All three of these soil samples were collected from beneath the water table. These boring locations are depicted on Figure 6.

4.4.1 VOC Analytical Results

All of the supplemental soil samples collected from borings in the Southern Portion of the site (SSB-1 through SSB-5) contained the following constituents within the listed concentration ranges (micrograms per kilogram [ug/kg]):

- tetrachloroethene (PCE), 5 – 4,700
- trichloroethene (TCE), 9.4 – 3,000
- cis-1,2-dichloroethene (cis-1,2-DCE), 8.7 – 82,000
- vinyl chloride, 1.8 – 1,500
- benzene, 7.7 – 6,800

Toluene, xylenes, acetone, 1,1-dichloroethane (1,1-DCA), and trans-1,2-dichloroethene (trans-1,2-DCE), were also detected in three or four of the five soil samples collected from the Southern Portion of the site.

In the Central Portion of the site, two soil samples were collected from each of three borings (SSB-6 through SSB-8). The following constituents were detected within the listed concentration ranges in all six of the supplemental soil samples collected from this portion of the site:

- TCE, 28 - 350
- cis-1,2-DCE, 29 – 22,000
- vinyl chloride, 2.7 - 480
- benzene, 8.6 – 46

Toluene, xylenes, 2-butanone (MEK), acetone, PCE, 1,1-DCA, trans-1,2-DCE, and chlorobenzene were also detected in three or four of the five soil samples collected from the Central Portion of the site.

In the Northern Portion of the site, two soil samples were also collected from each of five borings (SSB-9 through SSB-13). In sample SSB-13 (3 –4 ft bls), toluene was detected at a concentration of 4,600,000 ug/kg, ethylbenzene at 410,000 ug/kg, and xylenes at 2,300,000 ug/kg. These high concentrations resulted in elevated detection limits for the other constituents, therefore it is unknown whether other constituents were present in this

sample. TCE was detected in all samples collected from the Northern Portion except SSB-13 (3 – 4 ft bls) at concentrations ranging from 6.4 to 6,400 ug/kg. Benzene and PCE were detected in all Northern Portion soil samples except MW-13 (3 –4 ft bls) and SSB-11 (7 – 8 ft bls) at concentrations ranging from 4.8 to 680 ug/kg, and 2.9 – 440 ug/kg, resepctively. Cis-1,2-DCE was detected in all Northern Portion soil samples except MW-13 (3 –4 ft bls) and SSB-12 (1 - 2 ft bls) at concentrations ranging from 2.1 to 12,000 ug/kg. The supplemental soil sample analytical results are summarized in Table 6. The STL soil sample analytical report is provided in Appendix D.

4.4.2 Physical Parameter Results

Shelby tube sample SSB-3 was collected from 10 to 12 ft bls in the Southern Portion of the site. Groundwater was encountered at 2 ft bls at this location. Moisture content was 22.1%, bulk density was 105.6 pounds per cubic foot (pcf), pH was 8.1 standard units (s.u.), and foc was 0.7%. This sample consisted of 72% fine-grained particles (21% clay and 51% silt), 15% sand, and 13% gravel with an average value of K of 3E-07 centimeters per second (cm/sec).

Shelby tube sample SSB-6 was collected from 6 to 8 ft bls in the Central Portion of the site. Groundwater was encountered at 4 ft bls at this location. Moisture content was 34.6%, bulk density was 90.3 pcf, pH was 8.1 s.u., and foc was 3.1%. This sample consisted of 98% fine-grained particles (67% clay and 31% silt), 1% medium sand, and 1% fine gravel and exhibited a K value of 6.8E-07 cm/sec.

Shelby tube sample SSB-13 was collected from 4.5 to 6.5 ft bls in the Northern Portion of the site. Groundwater was encountered at 4.3 ft bls. Moisture content was 38.1%, bulk density was 81 pcf, pH was 7.1 s.u., and foc was 7.5%. This sample consisted of 61% fine-grained particles (32% clay and 29% silt), 30% sand, and 9% gravel and exhibited an average K value of 1.4E-07 cm/sec.

The results of these three soil samples reveals that the fine-grained soil underlying the sand and gravel unit are sufficiently impermeable to restrict the downward movement of groundwater through them. The physical parameter analytical results are summarized in Table 7. The laboratory analytical report from Atlantic Testing Laboratories is provided in Appendix E.

5.0 CONSTITUENT FATE AND TRANSPORT MODELING

The BIOCHLOR® model was used to assess the degree to which natural attenuation via dispersion and/or degradation is controlling the fate and transport of the COCs. The modeling also allows the extrapolation of groundwater conditions over time on private property down-gradient of the Ashland site. This section provides the results of the BIOCHLOR® modeling conducted for the Ashland facility.

5.1 Modeling Assumptions

Based on the site investigation data collected during the RFI (refer Section 2.3) and the supplementyal investigation data collected above the following conditions and assumptions were utilized in the modeling:

- The earliest contamination at the site may have occurred approximately 50 years ago.
- Chemicals detected in groundwater at the site include predominantly, xylene, toluene, ethylbenzene, tetrachloroethene (PCE), trichloroethene (TCE), 1,2,-dichloroethene, 1,1-dichloroethane, 1,1,1–trichloroethane and vinyl chloride
- The highest concentrations of total VOCs are detected in groundwater monitoring wells screened in the USGZ in the southwestern and central areas of the site, with all groundwater samples collected from the LSGZ yielding trace to non-detectable concentrations of VOCs. The presence of these low permeability units between the USGZ and the LSGZ appear to have limited the vertical migration of these chemicals
- Two distinct plumes are noted on the site, the south plume and central plume.
- The south plume generally exists on a line extending northwest through wells MW-19, MW-15, and MW-16 toward MW-17. Monitoring well MW-13 serves as an upgradient monitoring point for the south plume.
- The central plume generally exists on a line extending west through wells MW-1 and MW-18. Monitoring well MW-14 serves as an upgradient monitoring point for the central plume.
- Groundwater impacts appear confined to the immediate vicinity of the site by the presence of low permeability soils down gradient of the site (on the CSXT property) and the organic carbon content of the soil. Impacts in the southwest corner of the site are contained by natural vertical hydraulic barriers, where coarse grained sand units transition into fine grained silts and clays on the down gradient property.
- The distribution of chlorinated VOCs, such as PCE and TCE, relative to their degradation products (cis-1,2-dichloroethene, 1,1-dichloroethane, vinyl chloride,

etc.) indicates that natural attenuation processes are degrading the chlorinated VOCs in groundwater beneath the site.

- Potential source-area wells (MW-1 and MW-19) contain large percentages of PCE and TCE and significant proportions of mid-range degradation compounds. Wells located hydraulically downgradient of the potential source areas that contain VOCs, have large proportions of degradation compounds and small components, if any, of the source compounds (e.g. PCE, TCE).
- Pump tests, performed at the site in May and June of 2001, indicated groundwater velocity ranging from about 300 to 700 feet per year, but these results were reported to be unreliable. The hetrogeneous soil conditions are likely to affect the groundwater velocity. Based on site conditions a groundwater velocity of 15.7 feet per year is recommended for the site.
- Results of the November 2003 supplemental soil sampling indicate localized impacts in unsaturated soil in the Southern Portion of the site. The results for SSB-3 through SSB-5 may represent a secondary VOC source area in the vicinity of MW-19.
- Supplemental soil sampling results indicate that following the soil removal action in the area of the former warehouse and above ground storage tank (AST) farm only limited areas of impacted soil remain in this area of the site

5.2 Groundwater VOC Inputs

Ethene and ethane exhibit different physical properties and have different degradation pathways. As a consequence, the Biochlor model provides independent inputs and outputs for specific chemicals within ethane and ethene groups. A discussion of ethene and ethane distribution and assumptions utilized in the model for these groups of chemicals is provided below:

5.2.1 Ethene Contamination

Ethene contamination at the site is apparently from both PCE and TCE sources. These compounds along with cis-1,2-DCE and vinyl chloride were the four compounds evaluated.

The source for the south plume appears to be the area in the vicinity of historical soil borings SB-12, SB-11, SB-10, and SB-7. All of these soil borings display relatively high ethene compound concentrations in unsaturated soil samples in comparison to surrounding soil boring results. Ethene contamination in the central plume appears to be from the area around monitoring well MW-1. Soil borings SB-4 and SB-5, near MW-1, have relatively high ethene compound concentrations in unsaturated soil samples.

Since the monitoring period only covers a relatively short time of about 3 years, the groundwater monitoring results were considered to be steady-state. The historic data were used to develop means and 95% confidence intervals about the means for each COC. Using the COC means, spatial trends along the plume centerlines were established for

each of the plumes: along the sequence of wells MW-19, MW-15, MW-16, and MW-17 for the south plume and along MW-1 and MW-18 for the central plume. The spatial distributions are shown in Appendix F. The mean values and confidence intervals are shown in Table 7. The general trends revealed in the ethene data analysis are consistent with natural attenuation by both dispersion and degradation. BIOCHLOR modeling was conducted to quantify the role of dispersion and degradation as well as estimate COC concentrations down-gradient from the measurement area. For this purpose the 95% confidence intervals on the COC means were used to guide the model calibration.

5.2.2 Ethane Contamination

The source of ethane compound contamination at the site could not be defined from the soil borings results. The ethane compounds evaluated in this analysis included trichloroethane (TCA) and dichloroethane (DCA). In almost all soil analyses, the concentration of ethane compounds was below the detection limit. However, these limits were high because, in most cases, high ethene compound concentrations interfered with the analysis of the ethane compounds.

Ethane compound concentrations in groundwater were analyzed in the same manner as described above for ethenes. The means on 95% confidence intervals were calculated for each of the ethane compounds and shown spatially. Plots of the spatial distributions are shown in Appendix G and the calculated means and confidence intervals are shown in Table 7.

5.3 Modeling Analysis

5.3.1 Model Description

The BIOCHLOR model was developed for the U.S. Air Force and is promulgated for general use by the U.S. EPA. The following model description is excerpted from the BIOCHLOR manual.

BIOCHLOR is a screening model that simulates Remediation by Natural Attenuation (RNA) of dissolved solvents at chlorinated solvent release sites. The software is based on the Domenico analytical solute transport model. The model has the ability to simulate 1-D advection, 3-D dispersion, linear adsorption, and biotransformation via reductive dechlorination (the dominant biotransformation process at most chlorinated solvent sites). Reductive dechlorination is assumed to occur under anaerobic conditions and dissolved solvent degradation is assumed to follow a sequential first-order decay process.

BIOCHLOR can be used in two ways:

- As a screening-level model to determine if RNA is feasible at a chlorinated solvent site. BIOCHLOR can be used as a screening-level model to determine if natural attenuation is occurring at sufficient rates at a site to warrant a full natural attenuation study.

- As an RNA ground-water model to address selected chlorinated solvent problems. BIOCHLOR is an appropriate model at sites where simplifying assumptions (e.g., uniform ground-water flow, a vertical plane source, first-order decay) can be made so that the resulting simulations provide useful information for the problem being addressed.

BIOCHLOR has the following limitations:

- As an analytical model, BIOCHLOR assumes simple ground-water flow conditions. The model should not be applied where pumping systems create a complicated flow field. In addition, the model should not be applied where vertical flow gradients affect COC transport. (Note that a vertical distribution of chlorinated solvents throughout the saturated zone does not preclude the use of BIOCHLOR, as this phenomenon is related to the initial vertical migration of dense non-aqueous phase liquids in source areas.)
- As a screening tool, BIOCHLOR assumes uniform hydrogeologic and environmental conditions over the entire model area. Being an analytical model, BIOCHLOR assumes constant source, hydrogeological, and biological property values for the entire model area and, therefore, simplifies actual site conditions.
- BIOCHLOR is primarily designed for simulating the sequential reductive dechlorination of chlorinated ethanes and ethenes.

The model also includes a natural attenuation screening tool that evaluates in-situ conditions to estimate the likelihood of anaerobic degradation at the site.

5.3.2 Model Input Parameters

The application of the BIOCHLOR model requires the specification of a number of physical and chemical parameters to characterize the site and the COC behavior. The parameters are organized into groups representing physical processes, source conditions and specification of the time and spatial domain of interest. The physical processes included are advection, dispersion, adsorption and biotransformations. Advection can be specified as a seepage velocity or calculated by the model from specification of the hydraulic conductivity, hydraulic gradient and effective porosity. The dispersion can be represented by a longitudinal dispersion coefficient and the ratios of lateral to longitudinal and vertical to longitudinal dispersivities. Adsorption can be characterized directly by specifying a retardation coefficient or calculated by the model from specification of the soil bulk density, fraction of organic carbon and partitioning coefficients for each COC. The input parameters required for representing biotransformation processes are the half-lives for each COC. These parameters are generally the primary calibration coefficients in the modeling analysis.

The COC source parameters include the width and depth of the contamination zone and source concentrations for each of the COCs. It is also necessary to specify the duration

for which the source has existed and the down-gradient length over which model simulations should be reported and displayed.

5.3.3 Input Parameter Selection

The strategy for selecting model parameters and calibrating the model to the measured field data was to divide the parameters into three categories: (1) Fixed parameters, (2) secondary calibration parameters and (3) primary calibration parameters. Fixed parameters were those in which sufficient measured data was available to bound the selected values within a narrow range. Secondary calibration parameters were those in which less information was available for guiding the selection, but the model was either not very sensitive to variations in the parameter values or the allowable range of parameter values was sufficient to reduce model sensitivity. Finally, the primary calibration parameters were those for which the model showed a high degree of sensitivity to parameter variations or little information was available to guide the selection of parameter values.

The primary calibration parameters were the biodegradation rates and the width of the source area. Secondary calibration parameters include the dispersion, the seepage velocity and the duration. The selection of all other parameters were based on measured data and experience and were fixed throughout the analysis, except for some occasional minor adjustments. Initial parameters values used in the analysis are discussed below.

The seepage velocity of 15 ft/yr was used as a starting value, although the pump test indicated much higher seepage velocity may occur. This value was recommended because the flow rate is likely limited by fine silt and clay deposits in the aquifer. The higher rate indicated by the pump test is influenced by sand lenses within the aquifer and not representative of the average down-gradient flow rate.

The bulk density and organic carbon content of the aquifer material was selected from the geotechnical tests. The bulk density used in the modeling was 105 lbs/cf (1.7 kg/L). Although the selected bulk density is the highest of the geotechnical testing results, it should be more representative of the coarser grained aquifer material that should be the preferred flow pathway.

The range of organic carbon content was from 0.7 to 7.5 percent. The lowest carbon content was selected since that is more characteristic of the coarser grained aquifer material that should be the preferred flow pathway. The BIOCHLOR manual recommends that soil samples for organic be taken from outside the plume limits. Since the 0.7 percent organic carbon result came from soil boring SSB-3 located within the source area, the organic carbon content input into the model was reduced to 0.3 percent.

The organic carbon partition coefficients and retardation factor used in the model were calculated in the model using the bulk density and organic carbon content data input. These parameters were held constant throughout the calibration. The effective porosity of the aquifer material was estimated as 0.3. Soil porosity generally falls in a narrow range and this parameter was held constant.

In all cases, the COC source was assumed to be a continuous, single, planar type. The width of the contamination source has a profound effect on the spatial COC distribution. Since the width of the source was not known, this parameter was used as a primary calibration parameter and adjusted within a reasonable range to achieve an effective fit with the observed COC results. The depth of the source was assumed to be the full saturated depth of the aquifer unit (22 ft). The initial COC concentrations used in the models were the mean concentrations observed at MW-19 and MW-1 for the south and central plumes, respectively.

An initial value for the horizontal dispersivity of the plume was assumed to be one-tenth the plume length as recommended in the BIOCHLOR manual. The vertical dispersivity was set to zero since the limited depth of the aquifer unit and expected full penetration of the COC source are indications that vertical dispersivity will not effect the fate and transport.

Initial values for the first order decay coefficients for the various COCs were estimated from the documented in the BIOCHLOR manual. These parameters were considered primary calibration parameters and adjusted to make the model output fit the observed COC results.

The width and length of the plume models were set at 200 and 1000 feet, respectively, for both the central and south plumes. The model width is sufficient to accommodate the horizontal dispersion. The model length is sufficient to show the predicted limits of the COC plumes.

The COCs are assumed to have been in the aquifer system no longer than about 50 years. Thus the initial model duration for comparison to measured data (i.e. calibration) was 50 years. The actual length of the model's simulation time was set at 100 years to allow for predicting future plume concentrations and down-gradient extent.

5.4 BIOCHLOR Model Results

The first step in the analysis was to apply the natural attenuation screening to assess the likelihood of anaerobic biodegradation at the site. Using the field and laboratory data collected from monitoring wells at the site, the screening tool was used to quantify the likelihood of anaerobic biodegradation. The screening tool reported a score of about 23. A score of 20 or more indicates strong evidence for anaerobic biodegradation of chlorinated organics. The site is apparently suitable for modeling using the BIOCHLOR model.

The BIOCHLOR model allows the chronological stepping of the output through the selected simulation time. For this site, a simulation time of about 30 to 50 years would correspond to the observed COC results. Therefore, the model was calibrated by comparing the output results after 30 to 50 years to the observed COC concentrations. The model results after 100 years were considered to be steady-state results that should indicate the limits of plume growth.

The upper and lower 95% confidence intervals for the mean COC concentrations were input into the model to guide the model calibration. A successful calibration was

assumed when all of the predicted concentrations fell within the confidence intervals. Four models were developed: southern ethene plume, southern ethane plume, central ethene plume and central ethane plume.

The modeling assumed that the hydrogeologic conditions and biotransformation processes would be the same for both the south and central plumes. To provide a methodical process, the southern ethene plume model was calibrated for hydrogeologic and biotransformation parameters first. Only the first order decay coefficients were adjusted. The hydrogeologic parameters were then transferred to the southern ethane plume model and new biotransformation parameters were developed via calibration to the ethane data. Inherent in this approach is the assumption is that the degradation rates for ethenes and ethanes need not be identical.

After these models provided reasonable agreement with the observed data, all the input parameters were transferred to the central plume models. Only the width of the COC source was adjusted to improve agreement of the model output to the observed COC results. When this proved insufficient, the input parameters used in both the south and central models were adjusted in an iterative process to provide good agreement for all four plume models.

The seepage velocity was the first parameter evaluated. The recommended velocity of 15 ft/yr did not provide sufficient downgradient movement of either the degraded or undegraded plumes. BIOCHLOR calculates the undegraded output assuming that all COC movement and reduction is by dispersion without any biotransformation. Increasing the seepage velocity to 30 ft/yr moved the plume downgradient sufficiently to produce similar COC concentrations.

The COC concentrations show a large initial reduction when moving downgradient from the source area. The width of the source is a significant factor in duplicating the degree of reduction. Initial modeling trials used relatively large assumed source widths of 50- and 25-feet for the south and central models, respectively. To produce the similar degree of initial COC reduction as the observed results, the source widths were reduced to 25- and 10-feet for the south and central models, respectively. This result is consistent with the perception that the source area consists of numerous small source areas, each with a plume that merges with other plumes further down-gradient.

The horizontal dispersion was assumed to be 10 percent of the plume length, but its effect on the spatial distribution was evaluated. Increasing or decreasing the dispersion by a factor of 2 only provided minor alteration of the results. Because the 10 percent horizontal dispersion is apparently a fairly common value, we did not investigate this parameter any further

The first order decay coefficients were then adjusted for each constituent starting with the higher weight compounds (i.e., PCE and TCA) and then proceeding sequentially through the daughter products until each COC's spatial distribution was within the confidence interval observed at each monitoring well

The same first order decay coefficients were used for both the south and central plume models and the final calibrated decay coefficients were within the recommended ranges documented in the BIOCHLOR manual. The model calibration results for the south

plume are shown in Appendices C and D. The model calibration results for the central plume are shown in Appendices E and F. The model was successfully calibrated for three of the four plumes. However, the measured data for DCE and VC concentrations for the central plume observed in MW-18 do not show trends similar to those in the other plumes and a successful calibration could not be obtained using the calibration strategy described above. It is possible that the MW-1 and MW-18 are not well aligned with the actual groundwater plume, or that there is another ethene source area closer to MW-18. Samples of soil boring just upstream of MW-18 indicate that there are elevated concentrations of ethene compounds. The measured concentrations at MW-18 may be influenced by this source, and not reflective of sources comprising the assumed ethene plume source area (i.e. the area around MW-1).

The 100-year simulation time was used to estimate the long-term limits of plume movement. The model parameters obtained in the final model calibration were used for the long-term results. The results from the 100 year model simulations indicate that the chlorinated solvent concentrations of up to 1 ug/L could extend up to 600 feet downgradient from MW-19 and up to 700 feet downgradient from MW-1. The horizontal dispersion suggests that the chlorinated solvent concentrations could extend to the west side of Columbia Turnpike. The long-term COC modeling results for the south and central plumes are shown in Appendices G and H, respectively.

5.5 BIOCHLOR Model Conclusions

A spatial analysis of the mean groundwater concentrations indicates that the COC levels are substantially decreasing in the down-gradient direction. The natural attenuation screening tool available as part of the BIOCHLOR modeling toolkit indicates that anaerobic biodegradation is likely occurring onsite. The BIOCHLOR model was applied to quantify rates of dispersion and sequential degradation that are occurring on the site and to provide future estimates of COC concentrations on site and down-gradient. The model was successfully calibrated to simulate a majority of the COC concentrations and spatial trends reflected in the measured data. The calibration was accomplished using similar values for each calibration scenario using parameters that fell within the ranges recommended by the BIOCHLOR manual. The successful calibrations and selected parameter values indicate that the modeling analysis provides reliable and robust results.

During the calibration process, the estimation and selection of parameter values was conducted to favor conservative estimates of COC levels in the modeling analysis. For instance, final calibrated values for the seepage velocity of 30 feet per year and organic carbon content of 0.3 percent both increase the COC transport rate compared to the rate that would be obtained using the initially selected values of 15.7 feet per year and 0.7 percent.

The modeling confirms that biodegradation and dispersion are providing natural attenuation for the COC plumes. The difference between the 30 year and 100 year simulations show relatively minor differences at the down-gradient locations, which indicates that conditions on the site are approximately steady-state. The long-term modeling of the plumes indicate that the plumes under current conditions will not extend

more than 700 feet from the apparent source areas. This is the extent to which COC concentrations exceed 1 ug/L.

Given the rapid attenuation of dissolved phase concentrations down gradient of the site, high concentrations will continue to be confined to the immediate vicinity of the site. Due to this, groundwater conditions on and off-site are distinctly different and the risk assessment component of the CMS will have to assess separately the potential risks associated with on-site and off-site groundwater.

Long-term estimated COC concentrations at the western property boundary with CSX vary with location. The concentrations at the south end of the site are likely to be significantly higher than at the central portion of the site. Table 9 provides a summary of expected long-term COC concentrations at the property boundary in the south and central plumes.

6.0 SUMMARY OF NATURAL ATTENUATION RELATIVE TO THE SITE

NA parameter analytical results of groundwater samples collected from site monitoring wells indicate that anaerobic biodegradation processes are occurring to various degrees in groundwater beneath the site. Results of groundwater samples collected in the Northern Portion of the site are more definitive of the NA trends than results of samples collected in the Southern Portion.

Groundwater conditions differ between the Northern and Southern portions of the site. Under non-impacted conditions, groundwater in the Northern portion of the site exhibits DO concentrations greater than 0.5 mg/L. DO concentrations in the Northern portion of the site decrease as groundwater migrates into impacted areas. Non-impacted groundwater in the Southern portion of the site exhibits DO concentrations less than 0.5 mg/L. Subsequent anaerobic biodegradation processes such as denitrification and iron reduction are not readily apparent. On the other hand, high sulfate concentrations (> 20 mg/L) in both Northern and Southern portions may be causing competitive exclusion of dechlorination. Methanogensis, an indicator of the most strongly reducing conditions, is evident locally in impacted wells in both portions of the site.

Results of supplemental soil samples collected from within the Southern Portion indicate potential secondary sources of VOCs exist in the vicinity of borings SSB-3, SSB-4, and SSB-5. The presence of mid- and late-process chlorinated VOC degradation products in groundwater, along with localized NA indicators and the BIOCHLOR results demonstrates that NA processes are actively degrading VOCs in this area.

Results of supplemental soil samples collected from within the Central Portion of the site did not reveal potential secondary sources of VOCs.

Results of supplemental soil samples collected from within the Northern Portion also indicate a potential secondary source of VOCs exist in the vicinity of boring SSB-13. The most recent groundwater analytical results for monitoring well MW-3 show only 6.6 ug/L of total VOCs in groundwater; however, the NA results (high methane concentration, low DO concentration, and negative ORP) indicate biodegradation processes are active in groundwater in this vicinity. This well is located near the downgradient edge of the former excavation area and near where supplemental soil sample SSB-13 (3-4 ft) was collected. This soil sample contained the highest concentrations of toluene (4,600 parts per million [ppm]), ethylbenzene (410 ppm), and xylenes (2,300 ppm) detected at the site (concentrations of other constituents are unknown because of elevated detection limits due to sample dilution). The presence of high concentrations of VOCs in soil just above the water table, which was encountered at 4.3 ft bls in boring SSB-13, makes it likely that these constituents are leaching into groundwater and stimulating biodegradation processes. The VOCs are being degraded over a short distance as evidenced by the analytical results of groundwater samples collected from nearby wells MW-3 and MW-10. VOCs detected in groundwater from MW-3 were mid to late degradation process products of chlorinated VOCs including vinyl chloride at 2.9 ug/L, which is above the MCL of 2.0 ug/L. Cis- and trans-1,2-DCE

made up the remaining 4.7 ug/L of VOCs in this groundwater sample. No VOCs were detected in groundwater from well MW-10.

The BIOCHLOR fate and transport modeling support the findings of the NA evaluation and indicate that the NA processes are actively degrading VOCs in groundwater at the Rensselaer site. Although it is apparent that some VOCs remain in soil and may act as secondary sources in localized areas of the Southern and Northern Portions of the site, natural attenuation processes are degrading them as they leach to groundwater. This is supported by the NA parameter results and the fate and transport modeling. Based on the results of the BIOCLHOR modeling, it is estimated that the groundwater plumes in the Southern and Northern Portions of the site should not extend more than 700 feet from their apparent source areas under current site conditions.

Given the effectiveness of these attenuation mechanisms, the BIOCHLOR model indicates that high concentrations of VOCs in groundwater (under non-pumping conditions) will remain effectively confined to the site. As a consequence, the potential risks posed by on-site and off-site groundwater should be evaluated separately. Further, based on these site conditions it appears that any remedial activities focused on the source areas will result in rapid reductions in off-site groundwater concentration and potential extent of impacts.

TABLES

Table 1
Groundwater Monitoring Well Network for Natural Attenuation Study
Ashland Inc.
Rensselaer, New York

Upgradient	Source	Downgradient
MW13 MW14	MW1 Sump MW15 MW19	MW3 MW10 MW11 MW12A MW16 MW17 MW18

Table 2
Site-Specific Conditions and Geochemical Parameters for Technical Evaluation of Natural Attenuation (a) Ashland Inc., Rensselaer, New York

Analyte/Data Type	Included in Rensselaer NA Sampling?
Parameters listed in Table IV of Rule 62-777 F.A.C. (b)	
Microbial Communities Present	Not Recommended (c)
Permeability	Data has been collected
Physical Properties of the Contaminants	Data has been collected
Porosity	Data has been collected
Precipitation	Local NOAA meteorologic data
Soil Organic Carbon	Data has been collected
Soil Structure and Texture	Data has been collected
Aeration	Not applicable
Bulk Density	Data has been collected
Chemical Properties of the Contaminants	Data has been collected
Contaminant Degradation Products	Data has been collected
Groundwater Flow Rate	Data has been collected
Ammonia (as Nitrogen)	Data has been collected
BOD	Data has been collected
Carbon Dioxide	Data has been collected
Carbon Monoxide	Data has been collected
Chloride	Data has been collected
COD	Not Recommended
Conductivity	Data has been collected
Dissolved Ferrous Iron	Data has been collected
Ferric Iron	Data has been collected
Dissolved Hydrogen	Recommended
Dissolved Methane	Data has been collected
Dissolved Oxygen	Data has been collected
Hydrogen Sulfide	Not Recommended
Iron (total and dissolved)	Data has been collected
Manganese (total and dissolved)	Data has been collected
Nitrate	Data has been collected
Nitrite	Data has been collected
Nitrogen	Data has been collected
Sulfide	Data has been collected
Temperature	Data has been collected
Parameters not included in Table IV of Rule 62-777 F.A.C., but included in NA study:	
pH	Data has been collected
Oxidation Reduction Potential	Data has been collected
Alkalinity	Data has been collected
Major anions and cations (d)	Data has been collected
VOC concentrations	Data has been collected
Total organic carbon	Data has been collected
Ethene and ethane	Data has been collected

a\ Table adapted from Table IV of Rule 62-777 F.A.C.

b\ All of the listed site-specifid conditions or geochemical parameters may not be applicable to every site for testing. Some parameters may apply only to the unsaturated soil.

c\ Data that is not recommended is data not required to meet the goals of the investigation.

d\ Includes sodium, calcium, potassium, magnesium, chloride, sulfate. Carbonate and bicarbonate will be calculated from the pH and carbon dioxide data.

Table 3. Summary of Historical Groundwater Elevation Data, Ashland Inc., Rensselaer, New York.

Well ID	Measuring Pt. Elevation	Date	DTW	Groundwater Elevation
MW-1	29.3	11/15/1999	8.47	20.83
		5/24/2000	5.78	23.52
		11/29/2000	6.73	22.57
		7/6/2001	NM	NM
		11/7/2001	8.07	21.23
		5/21/2002	6.3	23.00
		11/12/2002	6.79	22.51
		4/21/2003	7.03	22.27
		7/14/2003	6.61	22.69
MW-3	25.06	11/15/1999	5.48	19.58
		5/24/2000	1.94	23.12
		11/29/2000	4.93	20.13
		7/6/2001	3.35	21.71
		11/7/2001	5.5	19.56
		5/21/2002	3.48	21.58
		11/12/2002	4.26	20.80
		4/21/2003	4.64	20.42
		7/14/2003	3.62	21.44
MW-4	26.86	11/15/1999	8.61	18.25
		5/24/2000	4.79	22.07
		11/29/2000	7.39	19.47
		7/6/2001	5.68	21.18
		11/7/2001	8.71	18.15
		5/21/2002	7.15	19.71
		11/12/2002	7.45	19.41
		4/21/2003	8.41	18.45
		7/14/2003	6.95	19.91
MW-9	27.67	11/15/1999	7.98	19.69
		5/24/2000	4.34	23.33
		11/29/2000	6.81	20.86
		7/6/2001	5.59	22.08
		11/7/2001	7.99	19.68
		5/21/2002	7.93	19.74
		11/12/2002	7.88	19.79
		4/21/2003	8.29	19.38
		7/14/2003	8.04	19.63
MW-10	25.93	11/15/1999	6.58	19.35
		5/24/2000	3.49	22.44
		11/29/2000	5.86	20.07
		7/6/2001	4.73	21.20
		11/7/2001	6.78	19.15
		5/21/2002	4.45	21.48
		11/12/2002	5.34	20.59
		4/21/2003	5.34	20.59
		7/14/2003	5.68	20.25

Table 3. Summary of Historical Groundwater Elevation Data, Ashland Inc., Rensselaer, New York.

Well ID	Measuring Pt. Elevation	Date	DTW	Groundwater Elevation
MW-11	25.38	11/15/1999	7.21	18.17
		5/24/2000	5.61	19.77
		11/29/2000	6.46	18.92
		7/6/2001	5.88	19.50
		11/7/2001	8.62	16.76
		5/21/2002	5.6	19.78
		11/12/2002	6.38	19.00
		4/21/2003	6.29	19.09
		7/14/2003	5.83	19.55
MW-12A	24.25	11/15/1999	8.43	15.82
		5/24/2000	7.21	17.04
		11/29/2000	8.3	15.95
		7/6/2001	6.48	17.77
		11/7/2001	9.21	15.04
		5/21/2002	7.23	17.02
		11/12/2002	8.15	16.10
		4/21/2003	8.21	16.04
		7/14/2003	7.92	16.33
MW-12B	24.51	11/15/1999	9.02	15.49
		5/24/2000	7.54	16.97
		11/29/2000	8.98	15.53
		7/6/2001	8.21	16.30
		11/7/2001	9.52	14.99
		5/21/2002	7.81	16.70
		11/12/2002	8.84	15.67
		4/21/2003	7.61	16.90
		7/14/2003	8.44	16.07
MW-13	37.46	11/15/1999	3.83	33.63
		5/24/2000	3.89	33.57
		11/29/2000	4.51	32.95
		7/6/2001	3.49	33.97
		11/7/2001	4.75	32.71
		5/21/2002	3.04	34.42
		11/12/2002	3.54	33.92
		4/21/2003	3.33	34.13
		7/14/2003	3.42	34.04
MW-14	34.2	11/15/1999	7.11	27.09
		5/24/2000	6.41	27.79
		11/29/2000	7.17	27.03
		7/6/2001	6.93	27.27
		11/7/2001	7.93	26.27
		5/21/2002	5.9	28.30
		11/12/2002	7.28	26.92
		4/21/2003	6.18	28.02
		7/14/2003	6.86	27.34

Table 3. Summary of Historical Groundwater Elevation Data, Ashland Inc., Rensselaer, New York.

Well ID	Measuring Pt. Elevation	Date	DTW	Groundwater Elevation
MW-15	26.11	11/15/1999	3.91	22.20
		5/24/2000	2.56	23.55
		11/29/2000	2.98	23.13
		7/6/2001	3.02	23.09
		11/7/2001	4.37	21.74
		5/21/2002	2.88	23.23
		11/12/2002	2.91	23.20
		4/21/2003	3.46	22.65
		7/14/2003	3.08	23.03
MW-16	25.81	7/6/2001	8.28	17.53
		11/7/2001	8.75	17.06
		5/21/2002	7.25	18.56
		11/12/2002	8.11	17.70
		4/21/2003	8.46	17.35
		7/14/2003	8.26	17.55
MW-17	22.21	7/6/2001	6.1	16.11
		11/7/2001	6.78	15.43
		5/21/2002	6.07	16.14
		11/12/2002	6.57	15.64
		4/21/2003	6.31	15.90
		7/14/2003	6.29	15.92
MW-18	24.37	7/6/2001	5.08	19.29
		11/7/2001	6.36	18.01
		5/21/2002	4.38	19.99
		11/12/2002	5.62	18.75
		4/21/2003	5.71	18.60
		7/14/2003	5.13	19.24
MW-19	27.82	7/6/2001	3.65	24.17
		11/7/2001	4.56	23.26
		5/21/2002	NM	NM
		11/12/2002	3.49	24.33
		4/21/2003	3.53	24.29
		7/14/2003	3.71	24.11
SUMP	26.95	11/15/1999	9.34	17.61
		5/24/2000	1.44	25.51
		11/29/2000	3.08	23.87
		7/6/2001	3.8	23.15
		11/7/2001	6.48	20.47
		5/21/2002	NM	NM
		11/12/2002	9.33	17.62
		4/21/2003	NM	NM
		7/14/2003	17.24	9.71

All elevations in feet above Mean Sea Level.
DTW - Depth to water in feet below measuring point.
NM - Not measured
Wells MW-16, MW-17, MW-18, and MW-19 were not installed until 2001.

Table 4. Summary of Groundwater Natural Attenuation Parameter Analyses, July 2003, Ashland Inc., Rensselaer, New York.

		Southern Area					Northern Area							
		UG	IZ	IZ	DG	DG	UG	IZ	IZ	IZ	DG	DG	DG	DG
Parameter	Units	MW-13	MW-19	MW-15	MW-16	MW-17	MW-14	MW-1	MW-18S	SUMP	MW-3	MW-10	MW-11	MW-12S
Ammonia	mg/L	0.12	6.0	0.36	0.1	0.41	0.086	0.094	0.47	0.21	0.6	0.1	0.095	0.098
Nitrate	mg/L	< 0.05	< 0.05	1.6	< 0.05	< 0.05	0.55	2.4	< 0.05	0.05	< 0.05	3.8	< 0.05	0.31
Nitrite	mg/L	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Iron, total	mg/L	0.22	2.2	3	0.35	13	0.23	0.34	0.78	15	4.4	0.069	0.85	0.079
Iron, ferrous	mg/L	< 0.1	0.24	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Iron, dissoved	mg/L	< 0.05	< 0.05	< 0.05	< 0.05	0.07	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Sulfate	mg/L	61	< 5	27	220	870	90	28	190	240	23	26	110	26
Sulfide	mg/L	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1
Manganese, total	mg/L	0.59	2.3	0.19	0.54	1.1	0.027	0.011	2.9	1.4	0.95	< 0.01	1.1	0.14
Manganese, dis.	mg/L	0.35	2.2	0.18	0.4	1.2	< 0.01	0.011	2.8	0.66	0.96	< 0.01	1	0.12
Chloride	mg/L	19	63	13	92	24	39	130	79	46	14	3.3	17	2.9
Alkalinity, pH 4.5	mg/L	330	330	260	58	520	310	260	70	440	390	260	310	320
Sodium	mg/L	23	110	19	78	130	17	150	84	63	26	13	7.9	5.4
Calcium	mg/L	90	100	84	190	230	150	100	210	160	87	97	150	100
Potassium	mg/L	1.5	11	307	2.1	3	2.8	2.2	2.9	3.6	3.7	3.4	1.6	3.3
Magnesium	mg/L	41	18	8.6	52	220	39	71	50	100	11	11	17	18
BOD	mg/L	6.2	< 2	< 2	< 2	< 2	4.7	< 2	< 2	47	< 2	< 2	< 2	< 2
TOC	mg/L	3.6	6.3	1.9	< 0.1	< 0.1	2.4	< 1	1.8	1.1	1.9	< 1	1.2	< 1
Permanent Gasses														
Total Nitrogen	mg/L	4.0	4.7	4.8	< 2.0	< 2.0	2.1	2.3	< 2.0	2.8	2.2	5.0	< 2.0	< 2.0
Carbon monoxide	mg/L	< 0.08	< 0.08	< 0.08	< 0.08	< 0.08	< 0.08	< 0.08	< 0.08	< 0.08	< 0.08	< 0.08	< 0.08	< 0.08
Carbon dioxide	mg/L	41	44	69	50	76	65	50	110	79	77	56	68	39
Ethene	mg/L	< 0.0003	0.06	< 0.0003	0.001	< 0.0003	< 0.0003	< 0.0003	0.009	< 0.0003	< 0.0003	< 0.0003	< 0.0003	< 0.0003
Ethane	mg/L	0.001	0.001	0.001	0.003	< 0.0004	< 0.0004	0.001	0.028	< 0.0004	0.004	< 0.0004	< 0.0004	< 0.0004
Methane	mg/L	0.003	1.2	0.054	0.12	0.011	0.002	0.047	1.2	0.001	0.57	0.001	0.001	0.004
Field Parameters														
DO	mg/L	0.29	0.22	1.82	0.57	0.59	2.63	1.33	0.4	NM	0.37	1.83	3.03	1.2
ORP	mV	165.9	-136.7	-32.7	130	-65.6	336.1	92.2	75	NM	-127	247.4	379.2	236.2
SC	ms/cm	0.623	0.98	0.487	1.293	2.274	0.734	1.68	1.234	NM	0.54	0.528	0.584	0.513
pH	SU	7.13	7.4	6.79	6.99	6.95	6.79	7.36	6.68	NM	6.96	7.01	6.88	7.43
Temperature	°C	14.62	16.08	18.71	16.13	17.87	13.69	17.71	14.35	NM	19.42	19.24	15.21	17.08

UG - Upgradient well.
IZ - Impacted zone.
DG - Downgradient well.
mV - Millivolts.
DO - Dissolved oxygen.
ORP - Oxidation reduction potential.
SC - Specific conductivity.
mg/L - Milligrams per liter.
ms/cm - millisiemens per centimeter.
SU - Standard units.
°C - Degrees Celcius.
BOD - Biological oxygen demand.
TOC - Total organic carbon.
< - Indicates constituent not detected above stated detection limit.

Table 5. Summary of Historical Groundwater Analytical Results, Ashland Inc., Rensselaer, New York.

All units are in micrograms per liter (ug/L)

Well ID Date	Benzene	PCE	TCE	1,1,1-TCA	cis-1,2-DCE	trans-1,2-DCE	1,1-DCE	1,1-DCA	1,2-DCA	Carbon Disulfide	Vinyl Chloride	Total VOCs
MW-1												
May 98/g	<5	1800	10000	600	5300	36	<10	5.4	5.1	<5	30	17,777
Nov 99	<250	630	5,900	400	2,500	<250	<250	<250	<250	<250	<500	9,430
May 00	<100	380	2,800	160	1,400	<100	<100	<100	<100	<100	<200	4,740
Nov 00	<50	100	1,200	<50	580	<50	<50	<50	<50	<50	<100	1,880
Jun 01	<50	470	3,800	72	2,200	<50	130	<50	<50	<50	<100	6,672
Nov 01	<100	740	3,800	450	2,400	<100	240	<100	<100	<100	<200	7,630
May 02	<25	950	4,500	330	4,000	100	150	<25	<25	<25	<25	10,030
Nov-02	<25	250	2,000	130	1,200	<25	66	<25	<25	<25	<25	3,646
Apr-03	<5	100	740	52	700	28	15	<5	<5	<5	<5	1,635
Jul-03	2.0	130	1,300	66	1,100	13	48	<10	<10	<10	14	2,673
MW-3												
May-98	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<10	ND
Nov 99	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<10	ND
May 00	<5	<5	12	7.4	59	<5	<5	31	<5	<5	<10	109.4
Nov 00	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<10	ND
Jun 01	<5	<5	<5	<5	28	<5	<5	24	<5	<5	<10	52
Nov 01	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	16	16
May 02	<1	<1	<1	<1	2.2	<1	<1	<1	<1	<1	9.8	12
Nov-02	<1	<1	<1	<1	3.1	<1	<1	<1	<1	<1	6.9	10
Apr-03	<1	<1	<1	<1	1.6	<1	<1	3.2	<1	<1	2.2	7.0
Jul-03	<1	<1	<1	<1	2.4	1.3	<1	<1	<1	<1	2.9	6.6
MW-4												
May-98	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<10	ND
Nov 99	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<10	ND
May 00	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<10	ND
Nov 00	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<10	ND
Jun 01	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<10	ND
Nov 01	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<10	ND
May 02	<1	<1	<1	<1	<1	<1	<1	1.5	<1	<1	<1	ND
Nov-02	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	ND
Apr-03	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	ND
MW-5S	Well abandoned in August 2000.											
May-98	<5	11	<5	<5	<5	<5	<5	<5	<5	<5	<10	11.0
Nov 99	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<10	ND
MW-6A	Well destroyed during soil removal action prior to October 1987 sampling event.											
May-86	100	<50	92	2100	NA	2700	140	3300	<50	NA	<50	8432
Dec-86	<3125	<3125	<3125	<3125	NA	<3125	<3125	5300	<3125	NA	<6250	5300
Apr-87	<1300	<1300	<1300	<1300	NA	<1300	<1300	<1600	<1300	NA	<2500	0
Jul-87	31	<5	28	230	NA	<5	16	1100	440	NA	290	2135

Table 5. Summary of Historical Groundwater Analytical Results, Ashland Inc., Rensselaer, New York.

All units are in micrograms per liter (ug/L)

Well ID / Date	Benzene	PCE	TCE	1,1,1-TCA	cis-1,2-DCE	trans-1,2-DCE	1,1-DCE	1,1-DCA	1,2-DCA	Carbon Disulfide	Vinyl Chloride	Total VOCs
MW-6B	Well destroyed during soil removal action prior to October 1987 sampling event.											
May-86	<12500	<12500	<12500	42000	NA	<12500	<12500	12500	42000	NA	<12500	96500
Sep-86	560	1400	5200	58000	NA	6100	280	3000	16000	NA	560	91100
Dec-86	<25000	<25000	<2500	29000	NA	<25000	<25000	<25000	<25000	NA	<25000	29000
Apr-87	<1300	<1300	<1300	3900	NA	<1300	<1300	<1300	<1300	NA	<1300	3900
Jul-87	270	2600	6200	37000	NA	3400	1500	1600	1600	NA	270	54440
MW -7	Well destroyed during soil removal action prior to October 1987 sampling event.											
May-86	<5000	<5000	<5200	49000	NA	<5000	6200	9400	260000	NA	<5000	324600
Sep-86	1100	1200	4900	62000	NA	7400	700	19000	430000	NA	<500	526300
Dec-86	<10000	<10000	<10000	28000	NA	<10000	<10000	10000	290000	NA	<20000	328000
Apr-87	<13000	<13000	<13000	39000	NA	<13000	<13000	<13000	180000	NA	<25000	219000
Jul-87	630	2900	9500	96000	NA	8800	3600	29000	310000	NA	530	460960
MW-9												
May-86	<5	<5	<5	<5	NA	<5	<5	<5	<5	NA	<5	ND
Dec-86	<5	<5	<5	<5	NA	<5	<5	<5	<5	NA	<10	ND
Apr-87	<5	<5	<5	<5	NA	<5	<5	<5	<5	NA	<10	ND
Jul-87/h	<5	<5	<5	<5	NA	<5	<5	<5	<5	NA	<5	ND
Oct-87	<1	<1	<1	<1	NA	<1	<1	<1	<1	NA	<1	ND
Jan-88	<1	<1	<1	<1	NA	<1	<1	<1	<1	NA	<1	ND
May-98	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<10	ND
Nov 99	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<10	ND
May 00	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<10	ND
Nov 00	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<10	ND
Jun 01	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<10	ND
Nov 01	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<10	ND
May 02/a	<1	<1	<1	<1	<1	<1	<1	2.0	<1	<1	<1	2
Nov-02	<1	<1	<1	<1	1.4	<1	<1	5.8	<1	<1	<1	7.2
Apr-03	<1	<1	<1	<1	<1	<1	<1	1.2	<1	<1	<1	1.2
MW-10												
Sep-86	<5	<5	<5	<5	NA	<5	<5	<5	<5	<5	<10	ND
Dec-86	<5	<5	<5	<5	NA	<5	<5	<5	<5	<5	<10	ND
Apr-87	<5	<5	<5	<5	NA	<5	<5	<5	<5	<5	<10	ND
Jul-87	<1	<1	<1	<1	NA	<1	<1	<1	<1	<1	<1	ND
Oct-87	<1	<1	<1	<1	NA	<1	<1	<1	<1	<1	<1	ND
Jan-88	<1	<1	<1	<1	NA	<1	<1	<1	<1	<1	<1	ND
May-98	<5	<5	<5	<5	24	<5	<5	<5	<5	<5	<10	24
Nov 99	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<10	ND
May 00	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<10	ND
Nov 00	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<10	ND
Jun 01	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<10	ND
Nov 01	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<10	ND
May 02	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	ND
Nov-02	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	ND
Apr-03	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	ND
Jul-03	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	ND

Table 5. Summary of Historical Groundwater Analytical Results, Ashland Inc., Rensselaer, New York.

All units are in micrograms per liter (ug/L)

Well ID / Date	Benzene	PCE	TCE	1,1,1-TCA	cis-1,2-DCE	trans-1,2-DCE	1,1-DCE	1,1-DCA	1,2-DCA	Carbon Disulfide	Vinyl Chloride	Total VOCs
MW-11												
Dec-86	<5	<5	<5	<5	NA	<5	<5	<5	<5	NA	<10	ND
Apr-87	<5	<5	<5	<5	NA	<5	<5	<5	<5	NA	<10	ND
Jul-87	<1	<1	<1	<1	NA	<1	<1	<1	<1	NA	<1	ND
Oct-87	<1	<1	<1	<1	NA	<1	<1	<1	<1	NA	<1	ND
Jan-88	<1	<1	<1	<1	NA	<1	<1	<1	<1	NA	<1	ND
May-98	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<10	ND
Nov 99	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<10	ND
May 00	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<10	ND
Nov 00	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<10	ND
Jun 01	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<10	ND
Nov 01	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<10	ND
May 02	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	ND
Nov-02	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	ND
Apr-03	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	ND
Jul-03	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	ND
MW-12S												
Nov 99	<5	<5	<5	<5	<5	<5	<5	<5	<5	9.9	<10	ND
May 00	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<10	ND
Nov 00	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<10	ND
Jun 01	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<10	ND
Nov 01	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<10	ND
May 02	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	ND
Nov-02	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	ND
Apr-03	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	ND
Jul-03	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	ND
MW-12D												
Nov 99	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<10	ND
May 00	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<10	ND
Nov 00	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<10	ND
Jun 01	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<10	ND
Nov 01	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<10	ND
May 02	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	ND
Nov-02	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	ND
Apr-03	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	ND
MW-13												
May-98	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<10	ND
Nov 99	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<10	ND
May 00	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<10	ND
Nov 00	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<10	ND
Jun 01	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<10	ND
Nov 01	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<10	ND
May 02	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	ND
Nov-02	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	ND
Apr-03	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	ND
Jul-03	<1	<1	<1	<1	<1	1.1	<1	<1	<1	<1	<1	1.1

Table 5. Summary of Historical Groundwater Analytical Results, Ashland Inc., Rensselaer, New York.

All units are in micrograms per liter (ug/L)

Well ID / Date	Benzene	PCE	TCE	1,1,1-TCA	cis-1,2-DCE	trans-1,2-DCE	1,1-DCE	1,1-DCA	1,2-DCA	Carbon Disulfide	Vinyl Chloride	Total VOCs
MW-14												
May-98	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<10	ND
Nov 99	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<10	ND
May 00	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<10	ND
Nov 00	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<10	ND
Jun 01	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<10	ND
Nov 01	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<10	ND
May 02	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	ND
Nov-02	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	ND
Apr-03	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	ND
Jul-03	<1	1.3	<1	<1	<1	<1	<1	<1	<1	<1	<1	1.3
MW-15												
May-98/f	29	60	28	<5	510	<5	<5	<5	<5	<5	170	797
Nov 99	19	5.7	8.7	<5	44	<5	<5	<5	<5	<5	24	101.4
May 00	62	78	<5	<5	87	<5	<5	<5	<5	<5	<10	227
Nov 00	10	19	26	<5	40	<5	<5	<5	<5	<5	<10	ND
Jun 01	<5	63	80	<5	88	<5	<5	<5	<5	<5	<10	231
Nov 01	40	6	7.3	<5	38	<5	<5	<5	<5	<5	16	107.3
May 02	3.4	24	32	<1	31	<1	<1	1.1	<1	<1	2	93.5
Nov-02	9.1	24	36	<1	34	<1	<1	2	<1	<1	13	118.1
Apr-03	6.6	12	16	<1	35	<1	<1	<1	<1	<1	13	82.6
Jul-03	12	43	55	<1	59	1.5	<1	3.0	<1	<1	6.2	180
MW-16	Well installed May 2001.											
Jun 01	<5	<5	<5	<5	22	<5	<5	<5	<5	<5	<10	ND
July 01	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<10	ND
Nov 01	<5	<5	8.9	<5	83	<5	<5	<5	<5	<5	<10	91.9
May 02	<1	<1	6.9	<1	63	<1	<1	<1	1.3	<1	4.2	75.4
Nov-02	<1	<1	15	<1	200	<1	<1	<1	4.5	<1	23	242.5
Apr-03	<1	<1	5.1	<1	50	<1	<1	<1	<1	<1	<1	55.1
MW-17	Well installed May 2001.											
Jun 01	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<10	ND
July 01	<5	<5	<5	<5	8	<5	<5	<5	<5	<5	<10	ND
Nov 01	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<10	ND
May 02	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	ND
Nov-02	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	ND
Apr-03	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	ND
MW-18	Well installed May 2001.											
Jun 01	<5	<5	<5	<5	390	23	<5	<5	180	<5	210	803
July 01	<5	<5	<5	<5	370	5.1	<5	<5	130	<5	150	655.1
Nov 01	<20	<20	<20	<20	600	<20	<20	100	<20	<20	190	890
May 02	<5	<5	<5	<5	790	11	<5	<5	110	<5	250	1161
Nov-02	<1	<1	<1	<1	1000	27	13	91	<1	<1	240	1371
Apr-03	<10	<10	<10	<10	860	<10	<10	<10	41	<10	180	1081
MW-19	Well installed May 2001.											
Jun 01	<50	82	360	<50	870	<50	<50	100	<50	<50	520	1932
July 01/b	15	57	330	34	820	7.3	<5	100	<5	<5	490	1853.3
Nov 01	<50	66	340	<50	1400	<50	<50	<50	100	<50	540	2446
May 02/c	6	63	370	16	540	<5	<5	34	<5	<5	230	1259
Nov-02	16	41	170	29	1200	12	<1	91	<10	<25	860	2419
Apr-03	<10	150	520	33	1100	12	<10	52	<10	<10	320	2187
Jul-03	12	21	96	16	740	15	<10	49	<10	<10	270	1,219

Table 5. Summary of Historical Groundwater Analytical Results, Ashland Inc., Rensselaer, New York.

All units are in micrograms per liter (ug/L)

Well ID Date	Benzene	PCE	TCE	1,1,1-TCA	cis-1,2-DCE	trans-1,2-DCE	1,1-DCE	1,1-DCA	1,2-DCA	Carbon Disulfide	Vinyl Chloride	Total VOCs
DEEP SUMP												
May-98/ e	<5	7	25	26	540	<5	<5	30	<5	<5	130	758
Nov 99	<5	<5	<5	<5	29	<5	<5	<5	<5	<5	15	44
May 00	<5	<5	<5	<5	28	<5	<5	<5	<5	<5	<10	28
Nov 00	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	ND
Jun 01	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	ND
July 01	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	ND
Nov 01	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	ND
May 02/d	<1	1.6	6.8	7.1	42	<1	<1	10	2.8	<1	6.3	76.6
Nov-02	<1	1.5	6.1	5.7	30	<1	1.8	<1	8	<1	<1	53.1
Apr-03	<1	<1	1.7	2.7	72	<1	<1	3.8	3	<1	2.7	85.9
Jul-03	<1	3.4	10	12	160	4.0	<1	16	2.8	<1.0	2.5	210.7

All units are in micrograms per liter (ug/L). NS = Not sampled ND = Not detected
PCE = Tetrachloroethene TCE = Trichloroethene 1,1,1-TCA = 1,1,1-trichloroethane
1,1-DCA = 1,1-dichloroethane 1,1-DCE = 1,1-dichloroethene cis-1,2-DCE = cis-1,2-dichloroethene
t rans-1,2-DCE = trans-1,2-dichloroethene 1,2-DCA = 1,2-dichloroethane
a - Other constituents detected in MW-9 during this sampling event include 2-butanone (12 ug/L).
b - Other constituents detected in MW-19 during this sampling event include chloroform (16 ug/L) & chloroethane (16 ug/L).
c - Other constituents detected in MW-19 during this sampling event include chloroform (17 ug/L) & chloroethane (7.7 ug/L).
d - Other constituents detected in the Deep Sump during this sampling event include Carbon tetrachloride (1.1 ug/L).
e - Other constituents detected in Deep sump during this samplin event include Toluene (81 ug/L).
f - Other constituents detected in MW-15 during this sampling event include Ethyl Benzene (5.2 ug/L).
g - Other constituents detected in MW-1 during this sampling event include Chloroform (9.1 ug/L).
h - Other constituents detected in MW-9 during this sampling event include Toluene (11 ug/L).
i - Other constituents detected in MW-19 during this sampling event include Chloroform (100 ug/L).
j - Other constituents detected in the Deep Sump during this sampling event include Chloroethane (3.4 ug/L) & Chloroform (1.8 ug/L).
k - Other constituents detected in MW-1 during this sampling event include Carbon Tetrachloride (20 ug/L).

Table 6. Summary of Supplemental Soil Sample Analytical Results, November 2003, Ashland Inc., Rensselaer, New York

	SOUTHERN PORTION						CENTRAL PORTION						NORTHERN PORTION									
Location	**SSB-1**	**SSB-2**	**SSB-3**	***DUP-11/17/03**	**SSB-4**	**SSB-5**	**SSB-6**	**SSB-6**	**SSB-7**	**SSB-7**	**SSB-8**	**SSB-8**	**SSB-9**	**SSB-9**	**SSB-10**	**SSB-10**	***DUP-11/18/03**	**SSB-11**	**SSB-11**	**SSB-12**	**SSB-12**	**SSB-13**	**SSB-13**
Sampling Interval (ft bls)	0.5-2	0.5-1.5	0.5-2		0.5-1.5	0-1.5	1-2	2-3	0.5-1.5	2-3.5	0.5-2	5-6.5	1-2	9.5-10.5	1-2	10.5-12		1-2	7-8	1-2	5.5-6.5	1-2	3-4
Constituent																							
Chloromethane	<1.7	<9	<340	<7.9	<8.5	<1.6	<31	<1.5	<7.9	<32	<7.4	<1.6	<0.75	<1.3	<1.6	<1.3	<1.5	<1.5	<1.4	<1.4	<1.6	<1.6	<200000
Bromomethane	<4.2	<22	<420	<19	<21	<3.8	<38	<3.7	<19	<40	<18	<4	<1.8	<3.1	<3.8	<3.2	<3.7	<3.7	<3.3	<3.5	<3.9	<4	<240000
Vinyl Chloride	**1.8**	**110**	**1,400**	**250**	**1,500**	**3.0**	**55**	**12**	**320**	**480**	**33**	**2.7**	<0.75	<1.3	<1.6	<1.3	<1.5	<1.5	<1.4	<1.4	<1.6	<1.6	<140000
Chloroethane	<2.1	<11	<250	<9.6	<10	<1.9	<22	<1.8	<9.6	<23	<9	<2	<0.91	<1.6	<1.9	<1.6	<1.9	<1.8	<1.6	<1.8	<2	<2	<140000
Methylene chloride	<3	<15	<250	<13	<15	**9.3**	**23**	<2.6	<13	<23	<13	<2.8	<1.3	<2.2	<2.7	<2.2	<2.6	<2.6	<2.3	<2.5	<2.8	<2.8	<140000
Acetone	**21**	**140**	<1000	**57**	**13,000**	<9	**640**	**320**	**78**	<240	<42	<9.4	<4.3	<7.4	<839	<7.5	<8.8	<8.6	<7.8	<8.3	<9.2	**42**	<580000
Carbon disulfide	<2.5	<13	<160	**25**	**21**	**5.9**	**18**	**2**	<11	<15	<11	<2.3	<1.1	<1.8	<2.2	<1.9	<2.2	<2.2	<1.9	<2.1	<2.3	<2.3	<92000
1,1-Dichloroethene	<2.1	<11	<250	<9.6	**40**	<1.9	<22	<1.8	<9.6	<23	<9	<2	<0.91	<1.6	<1.9	<1.6	<1.9	<1.8	<1.6	<1.8	<2	<2	<140000
1,1 Dichloroethane	<1.2	<6.4	**880**	<5.6	**220**	**6.4**	<10	<1.1	**7.2**	**100**	<5.3	**2.3**	<0.54	<0.92	<1.1	<0.93	<1.1	<1.1	<0.97	<1	<1.2	**1.6**	<66000
cis-1,2 Dichloroethene	**8.7**	**630**	**82,000**	**12,000**	**41,000**	**43**	**610**	**120**	**710**	**22,000**	**620**	**29**	**18**	**21**	**7.4**	**30**	**45**	**7.2**	**2.1**	<1.1	**7.7**	**12**	<75000
trans-1,2-Dichloroethene	<1.5	**23**	**650**	**110**	**880**	**3.6**	**21**	**2.3**	**24**	**260**	**24**	<1.4	<0.64	<1.1	<1.3	<1.1	<1.3	<1.3	<1.2	<1.2	<1.4	<1.4	<58000
Chloroform	<1.5	<7.7	<250	<6.7	<7.3	**13**	<22	<1.3	<6.7	<23	<6.4	<1.4	<0.64	<1.1	<1.3	<1.1	<1.3	<1.3	<1.2	<1.2	<1.4	<1.4	<140000
1,2-Dichloroethane	<1.9	<9.6	<100	<8.4	<9.1	<1.7	<9.4	<1.6	<8.4	<9.8	<8	<1.8	<0.81	<1.4	<1.7	<1.4	<1.6	<1.6	<1.4	<1.6	<1.7	<1.8	<59000
2 Butanone (MEK)	<5.8	<30	<1600	<26	<29	<5.3	**280**	**39**	<26	**230**	<25	<5.5	**2.7**	<4.3	<5.2	<4.4	<5.2	<5.1	<4.6	<4.8	<5.4	<5.5	<940000
1,1,1-Trichloroethane	**1.5**	<5.2	<86	**7.4**	**13**	**26**	<7.9	**7.3**	<4.6	<8.1	<4.3	**3.2**	**0.9**	**1.0**	**1.2**	<0.76	<0.89	<0.87	<0.79	<0.84	<0.94	<0.95	<49000
Carbon tetrachloride	<1.2	<6	<79	<5.3	<5.7	**4.2**	<7.2	<1	<5.3	<7.4	<5	<1.1	<0.5	<0.87	<1	<0.88	<1	<1	<0.91	<0.97	<1.1	<1.1	<45000
Bromodichloromethane	<1.6	<8.3	<79	<7.3	<7.9	<1.5	<7.2	<1.4	<7.3	<7.4	<6.9	<1.5	<0.7	<1.2	<1.4	<1.2	<1.4	<1.4	<1.3	<1.3	<1.5	<1.5	<45000
1,1,2,2-Tetrachloroethane	<2.5	<13	<100	<11	<12	<2.3	<9.2	<2.2	<11	<9.5	<11	<2.3	<1.1	<1.8	<2.2	<1.9	<2.2	<2.2	<1.9	<2.1	<2.3	<2.3	<58000
1,2-Dichloropropane	<1.5	<7.7	<89	<6.7	<7.3	<1.4	<8.1	<1.3	<6.7	<8.4	<6.4	<1.4	<0.64	<1.1	<1.3	<1.1	<1.3	<1.3	<1.2	<1.2	<1.4	<1.4	<51000
trans-1,3-Dichloropropene	<2	<10	<64	<9	<9.8	<1.8	<5.8	<1.7	<9	<6	<8.5	<1.9	<0.86	<1.5	<1.8	<1.5	<1.8	<1.7	<1.6	<1.6	<1.8	<1.9	<37000
Trichloroethene	**9.4**	**320**	**3,000**	**6,100**	**800**	**170**	**220**	**53**	**210**	**350**	**100**	**28**	**23**	**17**	**17**	**14**	**24**	**27**	**6.4**	**8.1**	**20**	**20**	<140000
Dibromochloromethane	<1.7	<9	<250	<7.9	<8.5	<1.6	<22	<1.5	<7.9	<23	<7.4	<1.6	<0.75	<1.3	<1.6	<1.3	<1.5	<1.5	<1.4	<1.4	<1.6	<1.6	<140000
1,1,2-Trichloroethane	<2.2	<12	<110	<10	<11	<2	<9.9	<1.9	<10	<10	<9.6	<2.1	<0.97	<1.7	<2	<1.7	<2.0	<1.9	<1.7	<1.98	<2.1	<2.1	<62000
Benzene	**8.1**	**38**	**6,800**	**680**	**120**	**7.7**	**46**	**34**	**23**	**26**	**29**	**8.6**	**11**	**7.1**	**11**	**4.8**	**8.7**	**10**	<1.1	**6.4**	**12**	**8.8**	<39000
cis-1,3-Dichloropropene	<1.5	<7.7	<89	<6.7	<7.3	<1.4	<8.1	<1.3	<6.7	<8.4	<6.4	<1.4	<0.64	<1.1	<1.3	<1.1	<1.3	<1.3	<1.2	<1.2	<1.4	<1.4	<51000
Bromoform	<2.1	<11	<250	<9.6	<10	<1.9	<22	<1.8	<9.6	<23	<9	<2	<0.91	<1.6	<1.9	<1.6	<1.9	<1.8	<1.6	<1.8	<2	<2	<140000
2-Hexanone	<6.3	<33	<440	<29	<31	<5.8	<40	**76**	<29	<42	<27	<6	<2.7	<4.7	<5.6	< 4.8	<5.6	<5.5	<4.9	<5.3	<5.9	<6	<250000
4-Methyl-2-pentanone (MIBK)	<6.2	<32	<1200	<28	**32**	<5.6	<110	<5.4	<28	<120	<26	<5.8	<2.7	<4.6	<5.5	< 4.7	<5.5	<5.4	<4.8	<5.2	<5.8	<5.8	<700000
Tetrachloroethene	**5.0**	**74**	**280**	**440**	**10**	**4,700**	**750**	**410**	**20**	**61**	**36**	<1.8	**11**	**9.3**	**7.5**	**6.3**	**9.2**	**11**	<1.4	**2.9**	**7.6**	**11**	<80000
Toluene	<2.2	<12	**370**	**120**	**2.9**	**8.0**	**33**	**5.5**	<10	**17**	**16**	<2.1	**3.3**	**5.8**	**2.2**	<1.7	<2.0	**7.9**	<1.7	<1.9	<2.1	**30**	**4,600,000**
Chlorobenzene	**2.1**	<8.3	<100	<7.3	<7.9	<1.5	**18**	**8.4**	<7.3	**11**	<6.9	**1.6**	**5.3**	<1.2	**3.0**	<1.2	**1.5**	**9.2**	<1.3	**1.6**	**2.9**	**4.5**	<59000
Ethylbenzene	<1.2	<6.4	<86	**19**	**150**	**77**	**18**	**3.1**	<5.6	<8.1	<5.3	<1.2	**0.8**	<0.92	<1.1	<0.93	<1.1	**1.2**	<0.97	<1	<1.2	**4.0**	**410,000**
Styrene	<1.4	<7	<74	<6.2	<6.7	**1.7**	**9.2**	**2.4**	<6.2	<7	<5.8	<1.3	**0.7**	<1	<1.2	<1	<1.2	<1.2	<1.1	<1.1	<1.3	<1.3	<42000
Xylenes, Total	<3.7	<19	**370**	**120**	**510**	**94**	**230**	**36**	<17	<23	**5.2**	<3.5	**2.4**	<2.8	<3.3	<2.8	<3.3	**3.3**	<2.9	<3.1	<3.5	**23**	**2,300,000**

All units in micrograms per kilogram (ug/kg).

< indicates constituent not detection above stated detection limit.

Bold type indicates constituent detection above the stated detection limit.

* DUP-11/17/03 is a duplicate sample of SSB-3 (0.5-2)

* DUP-11/18/03 is a duplicate sample of SSB-10 (10.5-12).

Table 7
Summary of Physical Parameter Soil Data
November 2003
Ashland Inc.
Rensselaer, New York

Sample Identification	**SSB-3**	**SSB-6**	**SSB-13**
Sample Interval (ft bls)	**14-15.5**	**6-8**	**4.5-6.5**
Depth to Water (ft bls)	2	4	4.3
Moisture Content (%)	22.1	34.6	38.1
Bulk Density (pcf)	105.6	90.3	81
pH (s.u.)	8.1	8.1	7.1
Organic Content (%)	0.7	3.1	7.5
Average K (cm/sec)	3.00E-07	6.80E-07	1.40E-07
Partical Size Analysisis (%)			
Clay	21	67	32
Silt	51	31	29
Fine Sand	7	0	14
Med. Sand	4	1	6
Coarse Sand	4	0	10
Fine Gravel	4	1	4
Med. Gravel	9	0	5
Coarse Gravel	0	0	0

Table 8. Mean Concentrations and Confidence Intervals on the Mean Ashland Inc., Rensselaer, New York.

Note: Based on a 95% confidence level

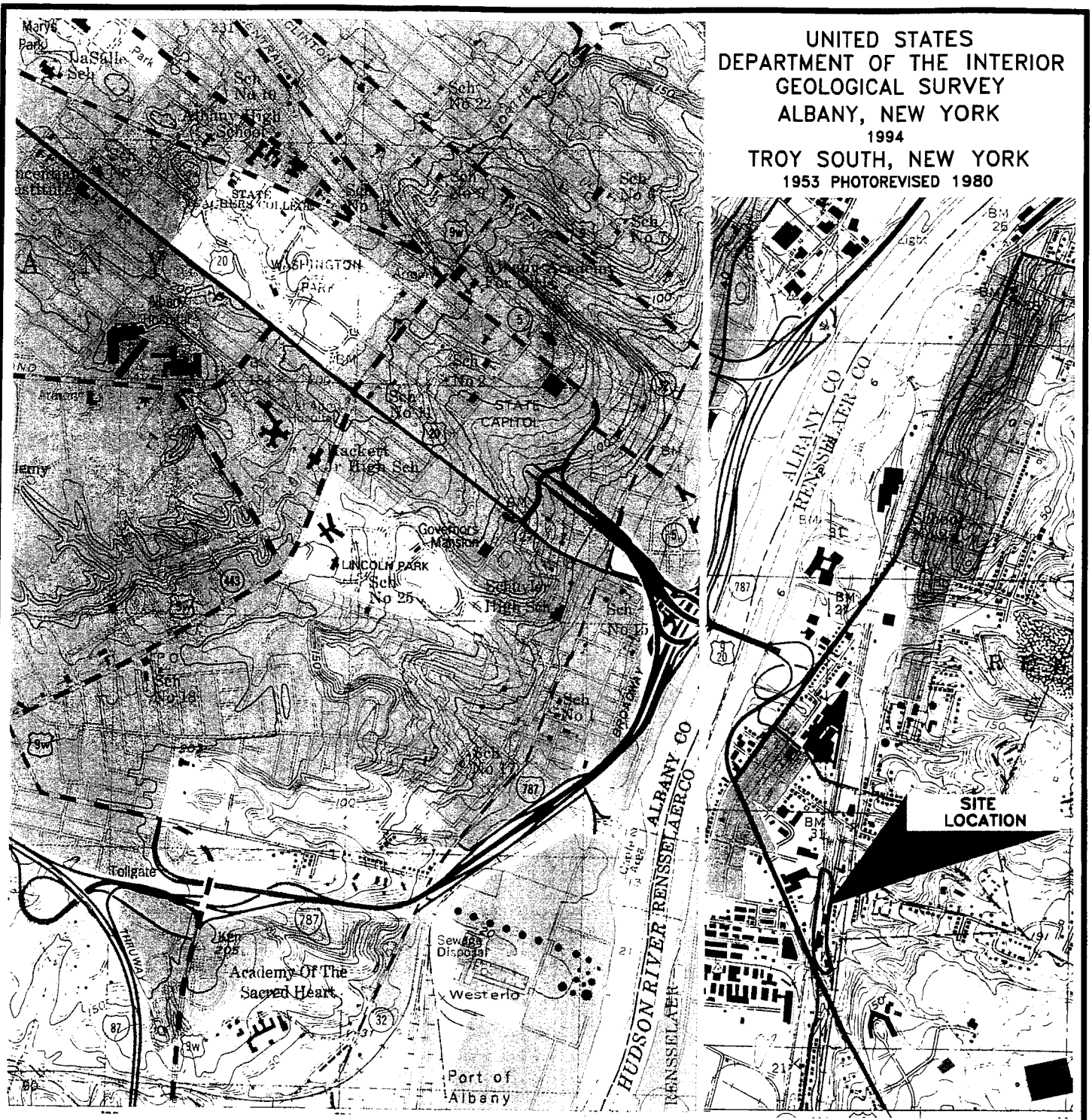
Well	COC	Concentrations (ug/L)		
		Lower Limit	Mean	Upper Limit
MW-19	PCE	38.3	68.6	98.8
	TCE	208.9	312.3	415.7
	DCE	734.2	952.9	1171.6
	VC	301.5	461.4	621.3
	TCA	22.2	32.6	42.9
	DCA	47.3	68.0	88.7
MW-15	PCE	13.8	30.5	47.2
	TCE	13.3	29.6	45.8
	DCE	36.0	50.7	65.3
	VC	7.5	11.6	15.6
	TCA	1.8	3.2	4.6
	DCA	2.4	3.6	4.7
MW-16	PCE	1.7	3.3	4.9
	TCE	3.8	11.1	18.4
	DCE	8.6	124.7	240.9
	VC	5.3	11.2	17.0
	TCA	1.7	3.3	4.9
	DCA	1.7	3.3	4.9
MW-17	PCE	1.1	2.7	4.3
	TCE	1.1	2.7	4.3
	DCE	1.0	3.1	5.3
	VC	1.3	4.9	8.4
	TCA	1.1	2.7	4.3
	DCA	1.1	2.7	4.3
MW-1	PCE	216.7	416.7	616.6
	TCE	1759.0	2893.3	4027.6
	DCE	1072.6	1786.7	2500.7
	VC	26.7	129.9	233.1
	TCA	85.7	190.0	294.3
	DCA	18.3	68.3	118.3
MW-18	PCE	3.4	8.0	12.6
	TCE	3.4	8.0	12.6
	DCE	518.1	715.7	913.3
	VC	179.7	205.7	231.7

Well	COC	Concentrations (ug/L)		
		Lower Limit	Mean	Upper Limit
	TCA	3.4	8.0	12.6
	DCA	0.2	32.3	64.4

Table 9. Western Property Boundary Long-Term COC Concentrations, Ashland Inc., Rensselaer, New York.

COC	South Plume Concentration at Property Boundary (ug/L)	Central Plume Concentration at Property Boundary (ug/L)
PCE	1,000	25
TCE	300	125
DCE	1,000	80
VC	460	30
TCA	43	15
DCA	89	6

FIGURES



GENERAL LOCATION MAP

ASHLAND DISTRIBUTION COMPANY FACILITY - RENSSELAER, NEW YORK

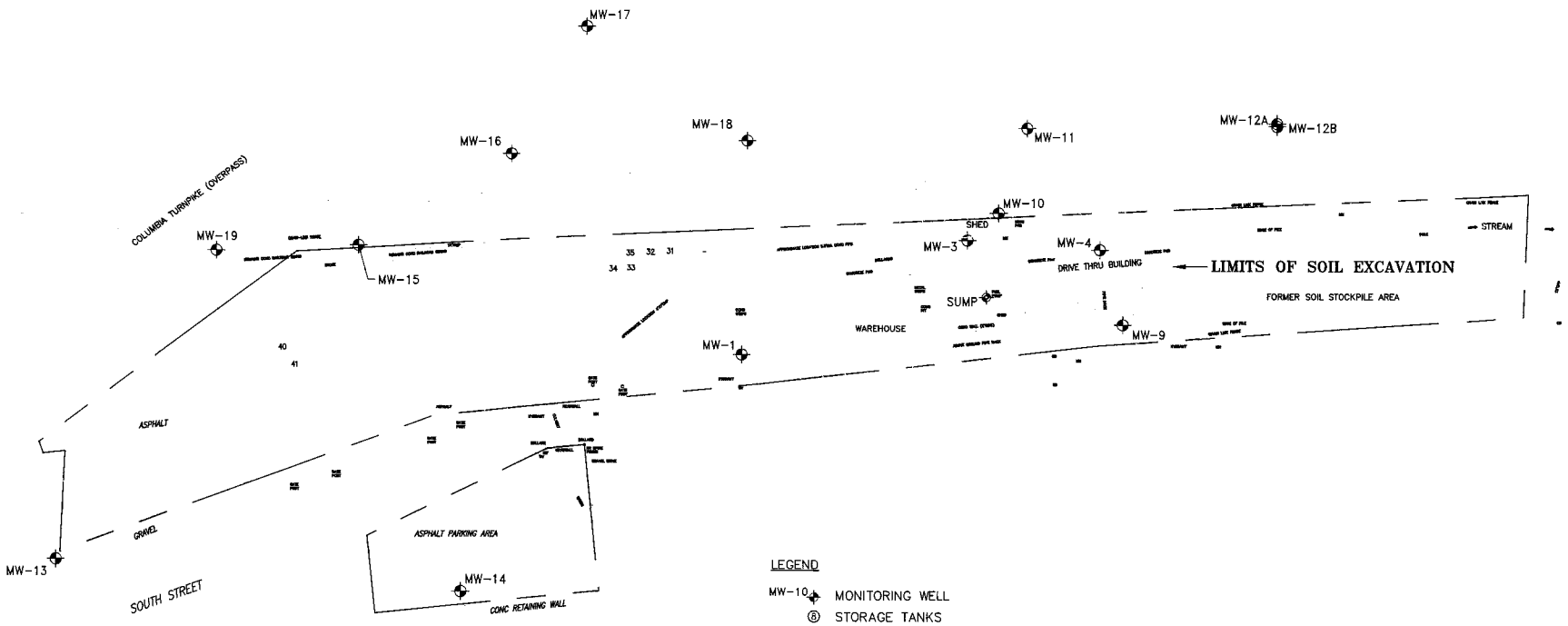
DRAWN BY: ERB	CHECKED BY: SS	PROJECT NUMBER: 02300097.00	DATE: 5/7/02	FIGURE NO: 1

R:\AshalndChem\2300123\RENSSELAER.dwg

URS

NOTES:

1. Base mapping prepared by ABD Engineers & Surveyors from a July 1996 field survey.
2. Survey shown is subject to any subsurface easements, restrictions or conditions that exist, if any.
3. Underground utilities are shown from field location if possible. Others are shown from record data. Their exact location may be different from that as shown and others may exist.
4. This survey has been prepared in accordance with the code of practice for land surveys adopted by the New York State Association of Professional Land Surveyors as last revised January, 1993
5. Elevations based on USGS datum.
6. This survey was prepared without the benefit of an up to date abstract of title or title report and is subject to any statement of fact that such abstract of title or title report may reveal.



LEGEND

MW-10 ⊕ MONITORING WELL

Ⓢ STORAGE TANKS

SCALE: 1" = 100'

0 100

SCALE 1" = 100'

NOTE:
REVISION MADE BY MDO,
CATLETTSBURG URS-DIAMOND OFFICE
ON FEBRUARY 25, 2003.

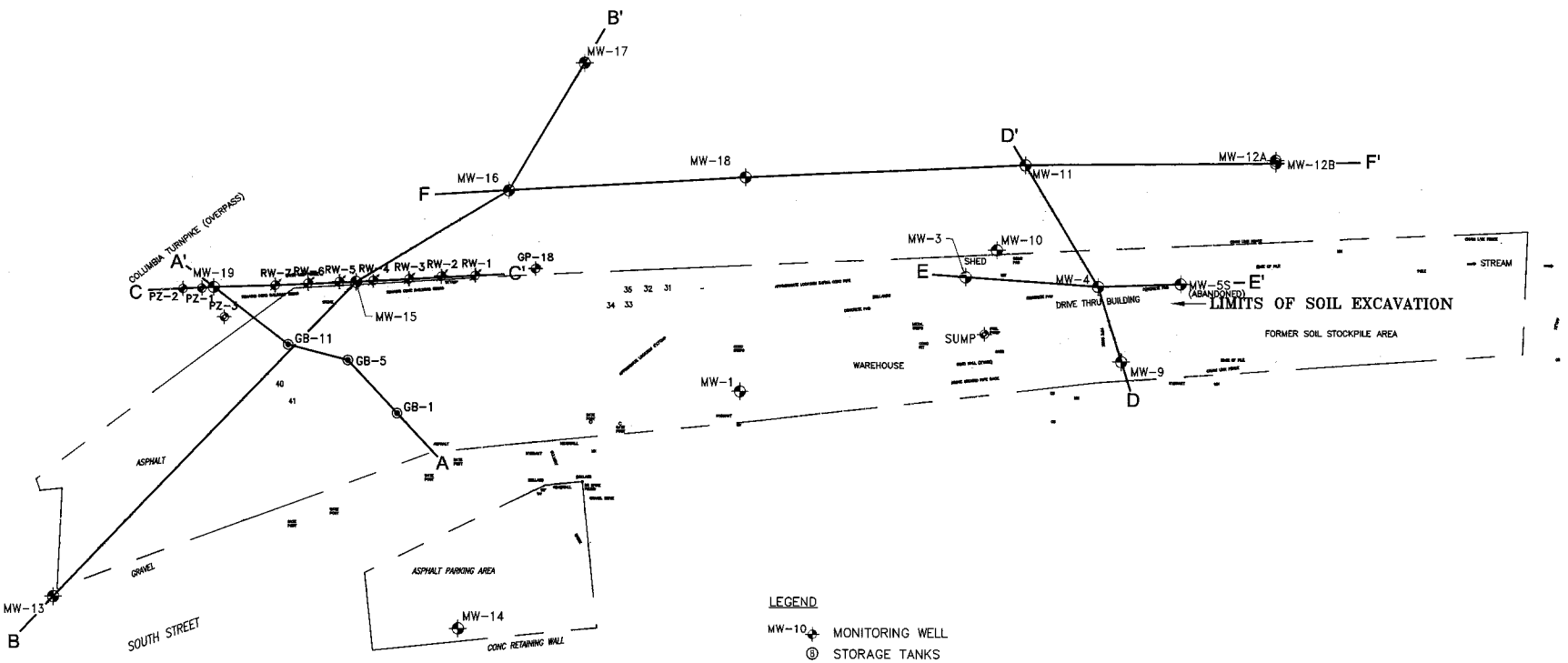
ASHLAND INC. FACILITY
Rensselaer, New York

Figure 2
Site Layout

URS

NOTES:

1. Base mapping prepared by ABD Engineers & Surveyors from a July 1996 field survey.
2. Survey shown is subject to any subsurface easements, restrictions or conditions that exist, if any.
3. Underground utilities are shown from field location if possible. Others are shown from record data. Their exact location may be different from that as shown and others may exist.
4. This survey has been prepared in accordance with the code of practice for land surveys adopted by the New York State Association of Professional Land Surveyors as last revised January, 1993
5. Elevations based on USGS datum.
6. This survey was prepared without the benefit of an up to date abstract of title or title report and is subject to any statement of fact that such abstract of title or title report may reveal.



LEGEND

- MW-10 — MONITORING WELL
- (S) — STORAGE TANKS
- RW-3 — RECOVERY WELL
- GP-33 — *IN-SITU* GROUNDWATER SAMPLE LOCATION (MAY 2001)
- GB-11 — APPROXIMATE SOIL BORING LOCATION FROM T.M. GATES (1990)
- CROSS SECTION LOCATIONS

SCALE: 1" = 100'

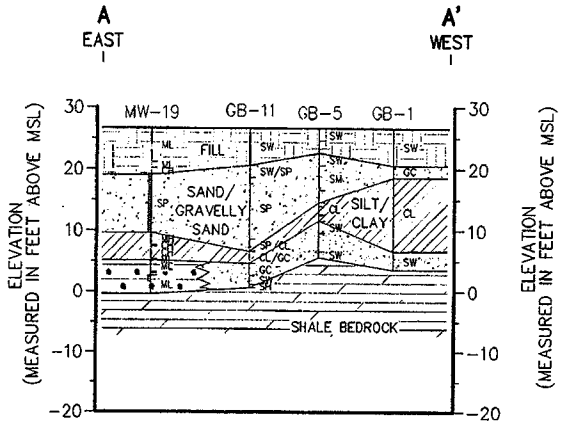
0 100
SCALE 1" = 100'

NOTE:
REVISION MADE BY MDO,
CATLETTSBURG URS-DIAMOND OFFICE
ON FEBRUARY 25, 2003.

ASHLAND INC. FACILITY
Rensselaer, New York

Figure 3
Key to Geologic Cross Sections

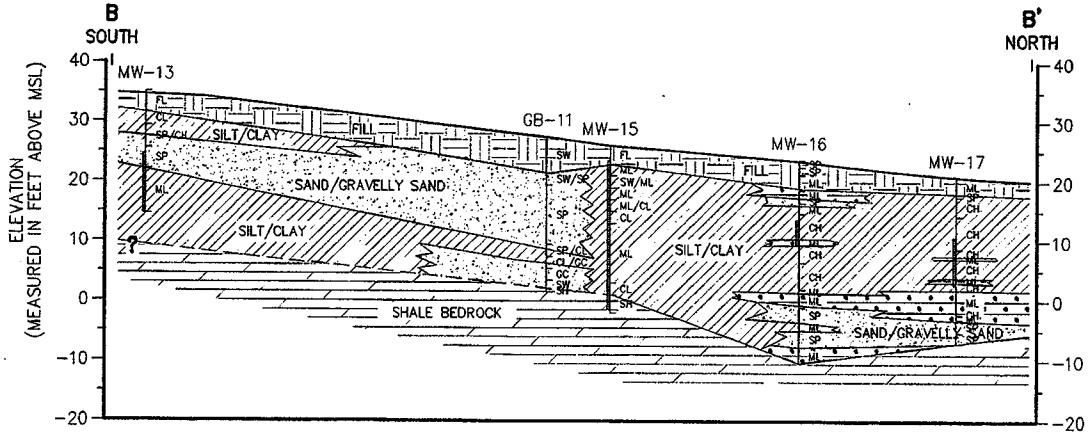
URS



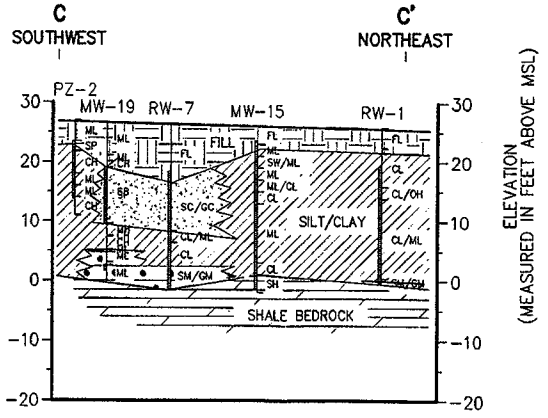
GENERALIZED GEOLOGIC CROSS SECTION A–A'

LEGEND

- FILL
- SILT/CLAY
- SAND/GRAVELLY SAND
- SILTY SAND/SILTY GRAVEL
- SHALE BEDROCK



GENERALIZED GEOLOGIC CROSS SECTION B–B'



GENERALIZED GEOLOGIC CROSS SECTION C–C'

REFERENCE DRAWING:
DRAWING REFERENCED FROM
ESC GENERALIZED CROSS SECTION
A-A', B-B', & C-C' (MARCH 13, 2002)

5:1 VERTICAL EXAGGERATION

VERTICAL SCALE (FEET)
20 0 20

HORIZONTAL SCALE (FEET)
100 0 100

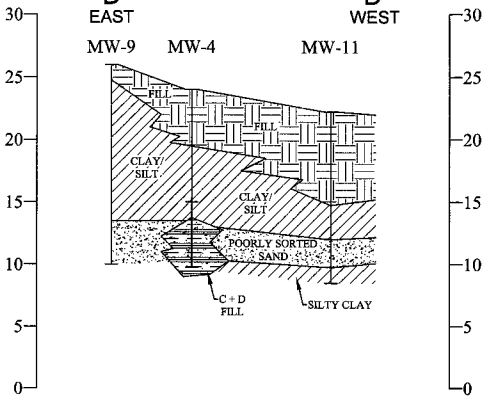
URS

FIGURE 4
GENERALIZED CROSS SECTIONS
A - A', B - B', AND C - C'

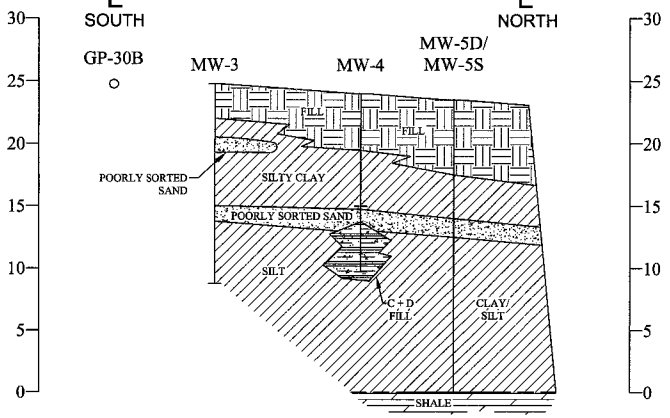
ASHLAND INC. FACILITY
RENSSELAER, NEW YORK

DRAWN BY: MDO	DATE DRAWN: 03/24/03
REVIEWED BY: JR	DATE REVIEWED: 03/24/03
SCALE: AS SHOWN	PLOT DATE:
NOTES: SCAN FROM ESC CROSS SECTION A-A', B-B', & C-C'	
REVISED BY:	REV. DATE:
REVISED BY:	REV. DATE:

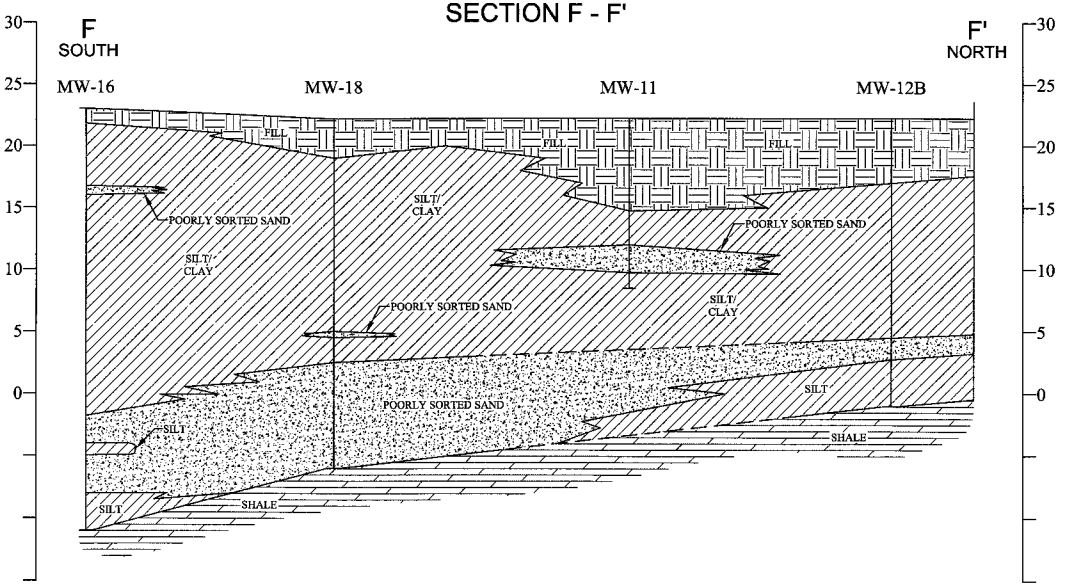
SECTION D - D'



SECTION E - E'



SECTION F - F'



LEGEND

- FILL
- SILT / CLAY
- SAND / GRAVELLY SAND
- SILTY SAND / SILTY GRAVEL
- SHALE BEDROCK
- C AND D FILL

VERTICAL SCALE (FEET)

20 0 20

HORIZONTAL SCALE (FEET)

100 0 100

URS

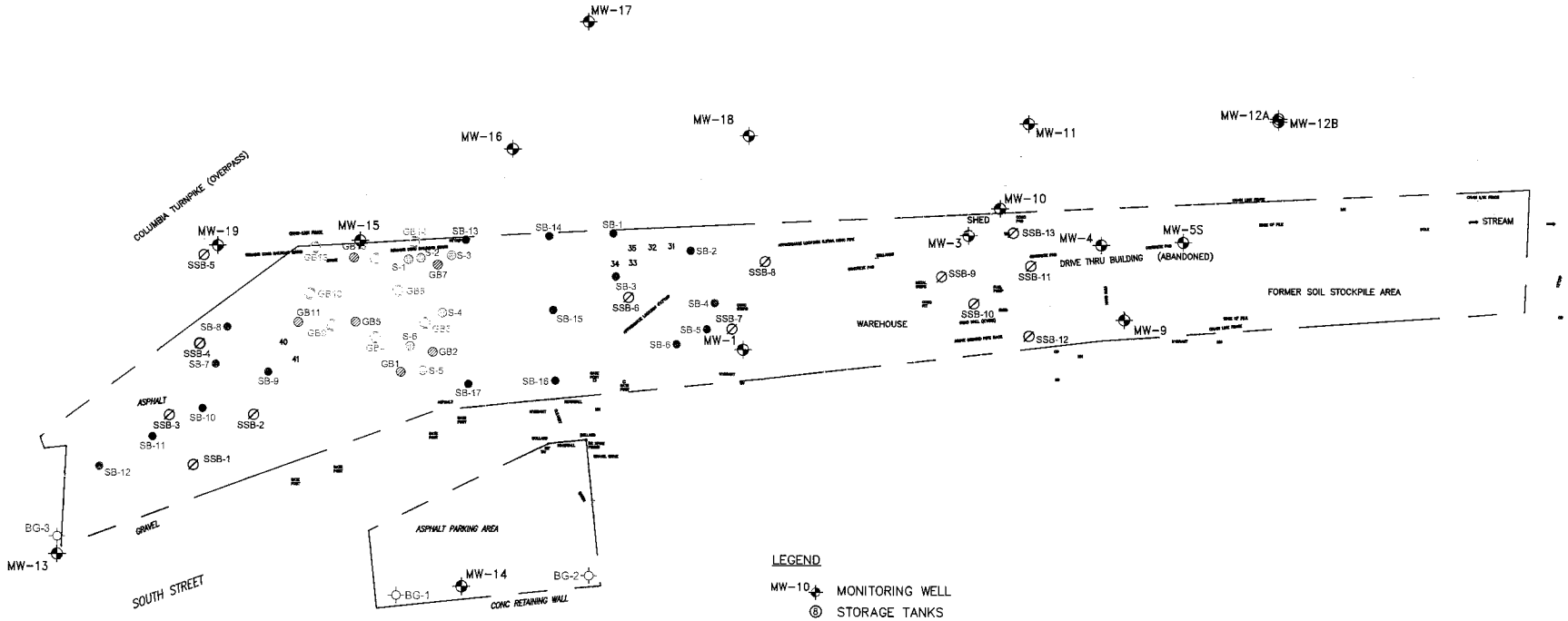
FIGURE 5
GENERALIZED CROSS SECTION
D - D', E - E', AND F - F'

ASHLAND INC. FACILITY
RENSSELEAR, NEW YORK

DRAWN BY: MDO	DATE DRAWN: 03/17/03
REVIEWED BY: JR	DATE REVIEWED: ??/??/??
SCALE: AS SHOWN	PLOT DATE: ??/??/??
NOTES:	
REVISED BY:	REV. DATE:
REVISED BY:	REV. DATE:

NOTES:

1. Base mapping prepared by ABD Engineers & Surveyors from a July 1996 field survey.
2. Survey shown is subject to any subsurface easements, restrictions or conditions that exist, if any.
3. Underground utilities are shown from field location if possible. Others are shown from record data. Their exact location may be different from that as shown and others may exist.
4. This survey has been prepared in accordance with the code of practice for land surveys adopted by the New York State Association of Professional Land Surveyors as last revised January, 1993
5. Elevations based on USGS datum.
6. This survey was prepared without the benefit of an up to date abstract of title or title report and is subject to any statement of fact that such abstract of title or title report may reveal.



LEGEND

- MW-10 MONITORING WELL
- (8) STORAGE TANKS
- STOCKPILE SOIL SAMPLE
- BACKGROUND SOIL SAMPLE
- SHALLOW SOIL SAMPLE
- 1991 SOIL SAMPLE
- 1991 SHALLOW SOIL SAMPLE
- 1991 BEDROCK SOIL SAMPLE
- SUPPLEMENTAL SOIL SAMPLE

SCALE: 1" = 100'

0 100

SCALE 1" = 100'

NOTE:
REVISION MADE BY MDO,
CATLETTSBURG URS-DIAMOND OFFICE
ON FEBRUARY 25, 2003.

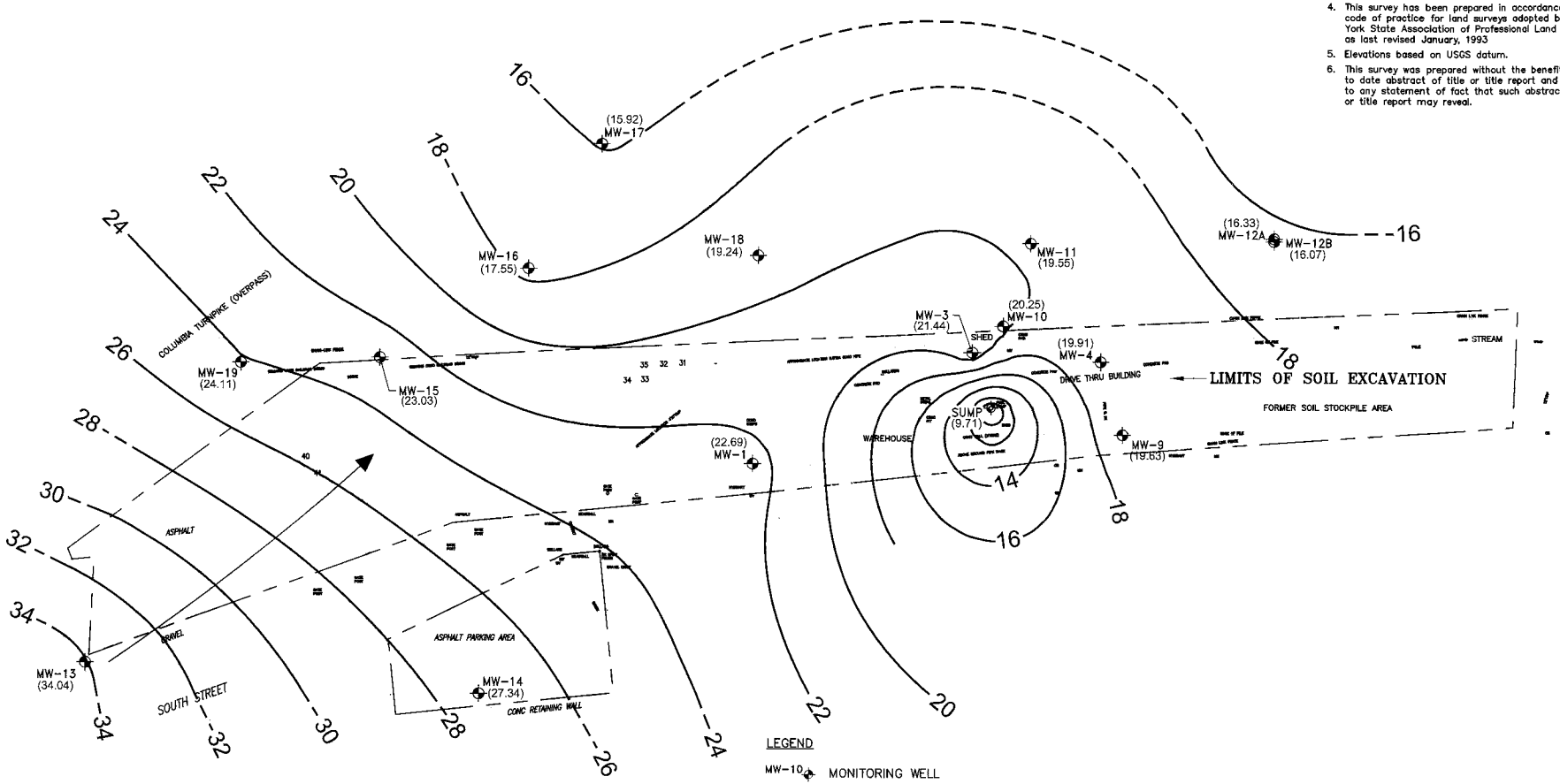
ASHLAND INC. FACILITY
Rensselaer, New York

Figure 6
Historic Sampling Locations

URS

NOTES:

1. Base mapping prepared by ABD Engineers & Surveyors from a July 1996 field survey.
2. Survey shown is subject to any subsurface easements, restrictions or conditions that exist, if any.
3. Underground utilities are shown from field location if possible. Others are shown from record data. Their exact location may be different from that as shown and others may exist.
4. This survey has been prepared in accordance with the code of practice for land surveys adopted by the New York State Association of Professional Land Surveyors as last revised January, 1993
5. Elevations based on USGS datum.
6. This survey was prepared without the benefit of an up to date abstract of title or title report and is subject to any statement of fact that such abstract of title or title report may reveal.



LEGEND

MW-10 ⊕ MONITORING WELL

Ⓢ STORAGE TANKS

(22.69) GROUNDWATER ELEVATION (07/14/03)

— 32 — GROUNDWATER CONTOUR LINE (Dashed Where Infered)

REFERENCE:
T.M. GATES, INC.,'s STATUS REPORT FOR ASHLAND CHEMICAL IC&S FACILITY, DATED SEPTEMBER 15, 1987. DRAWING TITLED, "FACILITY PLOT PLAN," FIGURE 2. SCALE: 1" = 100'

0 100
SCALE 1" = 100'

NOTE:
REVISION MADE BY MDO, CATLETTSBURG URS-DIAMOND OFFICE ON JULY 10, 2003.

ASHLAND INC. FACILITY
Rensselaer, New York

Figure 7
Groundwater Elevation Contour Map
JULY 14, 2003

URS

APPENDIX A

GROUNDWATER SAMPLING DATA SHEET

WELL NO: MW1

Field Personnel: TS, BG

Date: 7/16/03
Job No.: 37679253
Location: Ashland

Total Well Depth (from top of casing): 15.02 feet

Depth to Water Surface Before Purging (from top of casing): - 6.87 feet

Height of Water Column: = 8.15 feet

Well Diameter (d): 2 inches

Gals per ft: (d^2 x 0.0408) = x .1632

Volume of Water Column Before Purging: = 1.33 gallons

Volume of Water Equal to Three Well Volumes: 3.99 gallons

Purging Method: Bailer or ~~Peristaltic Pump~~ START 0810

Time	Well Volumes (Gallons)	Spec. Cond. (µmhos/cm)	Temp (°C)	pH (SU)	Turbidity (NTU)	ORP (mV)	DO (mg/L)	Depth to Water (ft.)
0819	0.4	1.613	17.0	7.03	527	105.9	1.35	7.81
0827	—	1.643	17.28	7.25	214	88	1.39	—
0832	1.5	1.698	17.37	7.31	103.2	89.2	1.19	8.77
0843	1.9	1.705	17.8	7.35	32.4	93.5	1.30	9.21
0851	2.2	1.682	17.71	7.36	28.3	92.2	1.33	9.49

Total Volume of Water Purged: ~2.5 gallons

Sampling Data:

14 BOTTLES
13

- Sampling Method: Bailer or Peristaltic Pump
- Sampling Depth: 12 feet
- Sample Date/Time: 7/16/03 0900
- Color: CLEAR
- Odor:
- Sheen/Appearance: CLEAR

Notes: BROKE 2 DISS. GASES 40mL BOTTLE UNPRESERVED

GROUNDWATER SAMPLING DATA SHEET

WELL NO: MW 3

Field Personnel:
TS
BG

Date: 7/15/03
Job No.: 37679253
Location: Ashland

Total Well Depth (from top of casing): 15.19 feet

Depth to Water Surface Before Purging (from top of casing): - 3.91 feet

Height of Water Column: = 11.28 feet

Well Diameter (d): 2 inches

Gals per ft: (d^2 x 0.0408) = x .1632

Volume of Water Column Before Purging: = 1.84 gallons

Volume of Water Equal to Three Well Volumes: 5.52 gallons

Purging Method: Bailer or Peristaltic Pump

Time	Well Volumes (Gallons)	Spec. Cond. (µmhos/cm)	Temp (°C)	pH (SU)	Turbidity (NTU)	ORP (mV)	DO (mg/L)	Depth to Water (ft.)
1503	0.01	0.602	21.82	7.04	36.5	-76.5	1.83	3.98
1508	0.3	0.566	19.45	6.95	27.9	-109.3	0.62	3.96
1514	1.0	0.550	18.88	6.92	15.9	-121.1	0.43	4.00
1518	1.3	0.537	18.82	6.95	16.2	-125.9	0.39	3.99
1522	1.6	0.540	19.23	6.96	15.2	-127.8	0.38	3.99
1526	2.0	0.547	19.42	6.96	15.5	-127.0	0.37	3.99

Total Volume of Water Purged: ~2.0 gallons

Sampling Data:

- Sampling Method: Bailer or Peristaltic Pump
- Sampling Depth: ~14.0 feet
- Sample Date/Time: 7/15/03 1530
- Color: CLEAR
- Odor: NONE
- Sheen/Appearance: CLEAR

Notes:

GROUNDWATER SAMPLING DATA SHEET

WELL NO: MW-10

Field Personnel: TH, BG

Date: 16 JULY 03
Job No.: 37679253
Location: Ashland

Total Well Depth (from top of casing): 15.82 feet

Depth to Water Surface Before Purging (from top of casing): - 4.88 feet

Height of Water Column: = 10.94 feet

Well Diameter (d): 2 inches

Gals per ft: (d^2 x 0.0408) = x 0.163

Volume of Water Column Before Purging: = 1.79 gallons

Volume of Water Equal to Three Well Volumes: 5.37 gallons

Purging Method: Bailer or ~~Peristaltic Pump~~ PUMP ON 1440

Time	Well Volumes (Gallons)	Spec. Cond. (µmhos/cm)	Temp (°C)	pH (SU)	Turbidity (NTU)	ORP (mV)	DO (mg/L)	Depth to Water (ft.)
1448	0.3	0.556	20.93	7.06	168.1	218.1	0.81	NA
1456	1.0	0.533	18.89	7.00	107.4	226.4	0.88	
1502	1.3	0.526	18.75	7.00	74.0	232.4	1.35	
1507	1.8	0.527	19.10	7.02	49.5	238.5	1.69	
1512	2.2	0.525	19.21	7.01	32.7	244.1	1.78	
1516	2.4	0.528	19.24	7.01	32.2	249.4	1.83	

Total Volume of Water Purged: 2.4 gallons

Sampling Data:

DUPLICATE TAKEN HERE
28 BOTTLES

- Sampling Method: Bailer or Peristaltic Pump
- Sampling Depth: ~14 feet
- Sample Date/Time: 7/16/03 1520
- Color: CLEAR
- Odor: NONE
- Sheen/Appearance: CLEAR

Notes:

GROUNDWATER SAMPLING DATA SHEET

WELL NO: MW-11

Field Personnel: TS, BG

Date: 7/14/03
Job No.: 37679253
Location: Ashland

Total Well Depth (from top of casing): 15.90 feet

Depth to Water Surface Before Purging (from top of casing): - 5.83 feet

Height of Water Column: = 10.07 feet

Well Diameter (d): 2 inches Gals per ft: (d^2 x 0.0408) = x .1632

Volume of Water Column Before Purging: = 1.64 gallons

Volume of Water Equal to Three Well Volumes: 4.92 gallons

Purging Method: Bailer or ~~Peristaltic Pump~~ START 1406

Time	Well Volumes (Gallons)	Spec. Cond. (~~µmhos/cm~~) mS/cm	Temp (°C)	pH (SU)	Turbidity (NTU)	ORP (mV)	DO (mg/L)	Depth to Water (ft.)
1416	0.5	0.487	14.91	6.91	67.5	326.8	6.12	6.68
1424	1.0	0.481	15.70	6.97	67.5	346.1	5.86	6.85
1432	1.4	0.500	15.55	6.90	32.9	352.5	5.17	7.02
1439	1.8	0.519	15.41	6.88	19.9	361.5	4.77	7.17
1445	2.1	0.539	15.27	6.86	18.4	368.8	4.46	7.34
1451	2.3	0.556	15.29	6.85	14.5	374.2	4.19	7.45
1459	2.8	0.571	15.2	6.85	14.3	380.0	3.70	7.63
1504	3.0	0.579	15.19	6.89	15.1	380.3	3.23	7.74
1509	3.2	0.584	15.21	6.88	14.4	379.2	3.03	7.82

Total Volume of Water Purged: _____ gallons

Sampling Data:

TOTAL BOTTLES = 14

- Sampling Method: Bailer or ~~Peristaltic Pump~~
- Sampling Depth: T/-13.5 ft feet
- Sample Date/Time: 14JUL03 / 1515
- Color: CLEAR / SL. BROWN TINT
- Odor: NONE
- Sheen/Appearance: NONE

Notes:

GROUNDWATER SAMPLING DATA SHEET

WELL NO: OMW-12a (S)

Field Personnel:
TS
BB

Date: 7/14/3
Job No.: 37679253
Location: Ashland

Total Well Depth (from top of casing): 17.26 feet

Depth to Water Surface Before Purging (from top of casing): - 7.92 feet

Height of Water Column: = 9.34 feet

Well Diameter (d): 2 inches

Gals per ft: (d^2 x 0.0408) = x .1632

Volume of Water Column Before Purging: = 1.52 gallons 5.75 L

Volume of Water Equal to Three Well Volumes: 4.56 gallons 17.25 L

Purging Method: Bailer or Peristaltic Pump

Time	Well Volumes (Gallons)	Spec. Cond. (~~µmhos~~/cm) mS/cm	Temp (°C)	pH (SU)	Turbidity (NTU)	ORP (mV)	DO (mg/L)	Depth to Water (ft.)
1252								
1300	1.0	0.422	14.10	7.43	20.5	232.6	4.94	11.09
1309	1.5	0.470	15.18	7.39	13.1	240.5	2.30	11.40
1316	1.8	0.498	17.06	7.46	11.8	240.0	1.57	11.38
1323	2.0	0.492	16.14	7.48	11.7	235.0	1.20	11.51
1330	2.2	0.505	16.71	7.44	11.8	235.1	1.25	11.64
1336	2.3	0.513	17.08	7.43	11.7	236.2	1.20	11.73

Total Volume of Water Purged: +/- 25 gallons

Sampling Data:

14 - TOTAL

- Sampling Method: Bailer or Peristaltic Pump
- Sampling Depth: ~ 16.0 feet
- Sample Date/Time: 14JUL03 / 1340
- Color: CLEAR
- Odor: NO ODOR
- Sheen/Appearance: NONE

Notes:

GROUNDWATER SAMPLING DATA SHEET

WELL NO: MW13

Field Personnel: TS, TO

Date: 16JUL03

Job No.: 37679253

Location: Ashland

Total Well Depth (from top of casing): 22.2 feet

Depth to Water Surface Before Purging (from top of casing): - 3.52 feet

Height of Water Column: = 18.68 feet

Well Diameter (d): 2 inches

Gals per ft: (d^2 x 0.0408) = x 0.163

Volume of Water Column Before Purging: = 3.05 gallons

Volume of Water Equal to Three Well Volumes: 9.15 gallons

Purging Method: Bailer or ~~Peristaltic Pump~~ START 1252

Time	Well Volumes (Gallons)	Spec. Cond. (µmhos/cm)	Temp (°C)	pH (SU)	Turbidity (NTU)	ORP (mV)	DO (mg/L)	Depth to Water (ft.)
1259	0.5	0.618	14.15	7.10	60.4	166.8	0.35	7.14
1306	1.2	0.628	14.55	7.09	65.3	182.0	0.31	8.27
1311	1.5	0.626	14.51	7.10	78.5	186	0.28	8.88
1320	2.2	0.625	14.6	7.11	102.1	190.3	0.27	9.91
1328	2.6	0.623	14.47	7.13	26.3	181.6	0.25	10.57
1337	3.1	0.623	14.66	7.12	35.1	168.3	0.29	11.09
1339	3.2	0.623	14.62	7.13	28.2	165.9	0.29	11.10

Total Volume of Water Purged: _____ gallons

Sampling Data: TOTAL BOTTLES = 42

- Sampling Method: Bailer or Peristaltic Pump
- Sampling Depth: ~~16JUL03~~ +/- 20 feet
- Sample Date/Time: 16JUL03 1405
- Color: CLEAR
- Odor: NONE
- Sheen/Appearance: CLEAR

Notes: MS + MSD TAKEN HERE

GROUNDWATER SAMPLING DATA SHEET

WELL NO: MW-14

Field Personnel:

Date: 15JUL03
Job No.: 37679253
Location: Ashland

Total Well Depth (from top of casing): 16.8 feet

Depth to Water Surface Before Purging (from top of casing): - 6.81 feet

Height of Water Column: = 9.99 feet

Well Diameter (d): 2" inches

Gals per ft: (d^2 x 0.0408) = x 0.163

Volume of Water Column Before Purging: = 1.628 gallons

Volume of Water Equal to Three Well Volumes: 4.885 gallons

Purging Method: Bailer or Peristaltic Pump START ~~1400~~ (13) 1407

Time (R)	Well Volumes (Gallons)	Spec. Cond. ~~(µmhos/cm)~~ mS/cm	Temp (°C)	pH (SU)	Turbidity (NTU)	ORP (mV)	DO (mg/L)	Depth to Water (ft.)
~~1407~~								
1414	0.5	0.736	13.69	6.79	101	281	2.77	7.59
1420	0.8	0.737	13.76	6.70	53	313.8	2.54	~~8.14~~ 7.75
1424	1.1	0.732	13.67	6.73	29.3	328.3	2.50	7.91
1430	1.7	0.734	13.69	6.79	28.3	336.1	2.63	8.01

Total Volume of Water Purged: ~1.7 gallons

Sampling Data:

TOTAL BOTTLES = (14)

- Sampling Method: Bailer or Peristaltic Pump
- Sampling Depth: +/- 16 Feet feet
- Sample Date/Time: 15JUL03 1435
- Color: CLEAR
- Odor: NONE
- Sheen/Appearance: CLEAR

Notes:

GROUNDWATER SAMPLING DATA SHEET

WELL NO: MW15

Field Personnel:
TS
BG

Date: 7/16/03
Job No.: 37679253
Location: Ashland

Total Well Depth (from top of casing): 18.47 feet

Depth to Water Surface Before Purging (from top of casing): - 3.06 feet

Height of Water Column: = 15.41 feet

Well Diameter (d): 2 inches

Gals per ft: (d^2 x 0.0408) = x .1632

Volume of Water Column Before Purging: = 2.51 gallons

Volume of Water Equal to Three Well Volumes: 7.53 gallons

Purging Method: Bailer or (Peristaltic Pump) START 1138

Time	Well Volumes (Gallons)	Spec. Cond. (µmhos/cm)	Temp (°C)	pH (SU)	Turbidity (NTU)	ORP (mV)	DO (mg/L)	Depth to Water (ft.)
1146	0.5	0.480	16.88	6.83	44.7	-27.5	0.97	3.24
1151	1.0	0.486	17.30	6.78	38.3	-31.8	0.37	3.27
1158	1.4	0.490	18.09	6.80	30.2	-35.3	0.52	3.25
1201	2.1	0.490	18.76	6.80	31.7	-35.4	1.28	3.25
1211	2.3	0.498	16.77	6.88	27.5	-34.9	1.53	3.25
1217	2.6	0.490	18.96	6.79	23.3	-34.1	1.76	3.25
1220	3.0	0.487	18.71	6.79	22.9	-32.7	1.82	3.25

Total Volume of Water Purged: +/- 3.5 gallons

Sampling Data:

TOTAL BOTTLES = 13 (6) (14)

- Sampling Method: Bailer or Peristaltic Pump
- Sampling Depth: +/- 14 Feet feet
- Sample Date/Time: 16 JULY 03 : 1225
- Color: CLEAR
- Odor:
- Sheen/Appearance:

Notes:

GROUNDWATER SAMPLING DATA SHEET

WELL NO: MW16

Field Personnel:
TS
BG

Date: 7/15/03
Job No.: 37679253
Location: Ashland

Total Well Depth (from top of casing): 16.72 feet

Depth to Water Surface Before Purging (from top of casing): - 8.39 feet

Height of Water Column: = 8.33 feet

Well Diameter (d): 2 inches

Gals per ft: (d^2 x 0.0408) = x .1632

Volume of Water Column Before Purging: = 1.36 gallons

Volume of Water Equal to Three Well Volumes: 4.08 gallons

Purging Method: Bailer or ~~Peristaltic Pump~~ START TIME 0941

Time	Well Volumes (Gallons)	Spec. Cond. ~~(µmhos/cm)~~ mS/cm	Temp (°C)	pH (SU)	Turbidity (NTU)	ORP (mV)	DO (mg/L)	Depth to Water (ft.)
0949	0.2	1.062	13.62	6.77	62.5	174.5	0.98	11.11
1000	1.2	1.079	13.86	6.83	61.9	201.1	1.02	12.56
1009	1.8	1.112	13.82	6.86	21.5	204.4	0.61	12.90
1020	2.3	1.137	14.03	6.91	19.6	187.9	0.64	13.31
1028	2.7	1.250	16.13	6.97	15.6	173.9	0.59	13.37
1035	2.9	1.270	16.12	6.97	14.9	143.2	0.59	13.42
1042	3.1	1.293	16.13	6.99	15.1	130.0	0.57	13.48

Total Volume of Water Purged: _____ gallons

Sampling Data:

TOTAL BOTTLES = 14

- Sampling Method: Bailer or Peristaltic Pump
- Sampling Depth: +/- 15.5 Ft feet
- Sample Date/Time: 15JULY03 1045
- Color: CLEAR
- Odor: NONE
- Sheen/Appearance: CLEAR

Notes:

GROUNDWATER SAMPLING DATA SHEET

WELL NO: MW17

Field Personnel:
TS
BL

Date: 7/15/03
Job No.: 37679253
Location: Ashland

Total Well Depth (from top of casing): 18.05 feet

Depth to Water Surface Before Purging (from top of casing): - 6.25 feet

Height of Water Column: = 11.8 feet

Well Diameter (d): 2 inches

Gals per ft: (d^2 x 0.0408) = x .1632

Volume of Water Column Before Purging: = 1.93 gallons

Volume of Water Equal to Three Well Volumes: 5.79 gallons

Purging Method: Bailer or Peristaltic Pump

START 1200

Time	Well Volumes (Gallons)	Spec. Cond. ~~(umhos/cm)~~ mS/cm	Temp (°C)	pH (SU)	Turbidity (NTU)	ORP (mV)	DO (mg/L)	Depth to Water (ft.)
1209	0.5	2.193	16.09	6.82	332	-44.7	0.48	8.5
1214	1.3	2.200	16.45	6.86	198	-45.6	0.62	9.32
1220	1.6	2.292	18.09	6.93	491	-49.8	0.69	9.26
1234	1.9	2.284	17.97	6.90	213	-55.5	0.67	9.33
1241	2.1	2.286	17.99	6.96	156	-60.3	0.64	9.43
1249	—	2.280	17.82	6.94	108	-64.9	0.61	—
1253	2.5	2.274	17.87	6.95	99.7	-65.6	0.59	9.59

Total Volume of Water Purged: +/- 17 (68) gallons +/- 3.0

Sampling Data:

TOTAL BOTTLES 14

- Sampling Method: Bailer or Peristaltic Pump
- Sampling Depth: +/- 17 feet
- Sample Date/Time: 15JUL03 1305
- Color: CLEAR/SL RED TINT
- Odor: —
- Sheen/Appearance: —

Notes:

GROUNDWATER SAMPLING DATA SHEET

WELL NO: MW18

Field Personnel:
TS
BB

Date: 7/15/03
Job No.: 37679253
Location: Ashland

Total Well Depth (from top of casing): 18.05 feet

Depth to Water Surface Before Purging (from top of casing): - 5.42 feet

Height of Water Column: = 12.63 feet

Well Diameter (d): 2 inches

Gals per ft: (d^2 x 0.0408) = x .1632

Volume of Water Column Before Purging: = 2.06 gallons

Volume of Water Equal to Three Well Volumes: 6.18 gallons

Purging Method: Bailer or ~~Peristaltic Pump~~

START 0805

Time	Well Volumes (Gallons)	Spec. Cond. (µmhos/cm)	Temp (°C)	pH (SU)	Turbidity (NTU)	ORP (mV)	DO (mg/L)	Depth to Water (ft.)
0818	0.5	~~1464.141~~	14.07	6.80	1605	156.3	0.93	7.51
0826	1.2	1.141	14.15	6.84	467	102.4	0.47	8.19
0835	1.8	1.165	13.91	6.82	165	75.0	0.41	8.73
0844	2.4	1.196	14.38	6.83	90.4	66.9	0.42	8.60
0851	2.8	1.201	14.34	6.80	54	64.5	0.41	8.57
0904	3.5	1.218	14.31	6.76	54.2	67.5	0.41	8.59
0910	3.9	1.235	14.45	6.72	30.5	73.0	0.41	8.63
0916	4.3	1.234	14.35	6.68	29.8	75.0	0.40	8.65

Total Volume of Water Purged: ~4.3 gallons

Sampling Data:

TOTAL BOTTLES 14

- Sampling Method: Bailer or ~~Peristaltic Pump~~
- Sampling Depth: ~17 feet
- Sample Date/Time: 7/15/03 0920
- Color: CLEAR
- Odor: NONE
- Sheen/Appearance: CLEAR

Notes:

GROUNDWATER SAMPLING DATA SHEET

WELL NO: MW-19

Field Personnel: TH
BO

Date: 16JUL03
Job No.: 37679253
Location: Ashland

Total Well Depth (from top of casing): 19.63 feet

Depth to Water Surface Before Purging (from top of casing): - 3.25 feet

Height of Water Column: = 16.38 feet

Well Diameter (d): 4 inches

Gals per ft: (d^2 x 0.0408) = x 0.653

Volume of Water Column Before Purging: = 10.7 gallons

Volume of Water Equal to Three Well Volumes: 32.1 gallons

Purging Method: Bailer or ~~Peristaltic Pump~~ START 0930

Time	Well Volumes (Gallons)	Spec. Cond. (µmhos/cm)	Temp (°C)	pH (SU)	Turbidity (NTU)	ORP (mV)	DO (mg/L)	Depth to Water (ft.)
0937	0.7	1.167	14.1	6.57	22.9	-47.6	0.63	3.31
0941	1.2	1.181	14.99	7.21	21.4	-102.2	0.61	3.28
0952	2.2	1.089	14.81	7.34	20.5	-120.7	0.32	3.31
1003	3.5	0.978	14.70	7.37	19.0	-121.6	0.25	3.73
1013	4.5	0.968	15.23	7.38	152.0	-125.1	0.24	3.5
1024	6.0	0.968	15.72	7.38	28.9	-129.0	0.24	3.5
1033	7.5	0.968	15.87	7.40	57	-132	0.23	3.49
1039	8.5	0.972	15.99	7.40	23.7	-133	0.22	3.5
1045	9.0	0.975	16.08	7.39	20.4	-134.0	0.22	3.57
1056	10.8	0.980	16.08	7.40	22.5	-136.7	0.22	3.6

Total Volume of Water Purged: _____ gallons

Sampling Data:

TOTAL BOTTLES 14

- Sampling Method: Bailer or ~~Peristaltic Pump~~
- Sampling Depth: ~~16JUL03~~ +/- 18.5 feet
- Sample Date/Time: 16JUL03 1103
- Color: CLEAR
- Odor: SL SOLVENT ODOR
- Sheen/Appearance: SLIGHTLY OF SHEEN

Notes:

GROUNDWATER SAMPLING DATA SHEET

WELL NO: SUMP

Field Personnel:
TS
BE

Date: 7/15/03
Job No.: 37679253
Location: Ashland

Total Well Depth (from top of casing): _____ feet

Depth to Water Surface Before Purging (from top of casing): - _____ feet

Height of Water Column: = _____ feet

Well Diameter (d): _____ inches Gals per ft: (d^2 x 0.0408) = x _____

Volume of Water Column Before Purging: = _____ gallons

Volume of Water Equal to Three Well Volumes: _____ gallons

Purging Method: (Bailer) or Peristaltic Pump

Time	Well Volumes (Gallons)	Spec. Cond. (µmhos/cm)	Temp (°C)	pH (SU)	Turbidity (NTU)	ORP (mV)	DO (mg/L)	Depth to Water (ft.)

NO PARAMETERS TAKEN

Total Volume of Water Purged: _____ gallons

Sampling Data:

14 BOTTLES

- Sampling Method: (Bailer) or Peristaltic Pump
- Sampling Depth: NA feet
- Sample Date/Time: 7/15/03 1515
- Color: CLEAR + DARK TAN + TURBID / HITTING BOTTOM
- Odor: NO
- Sheen/Appearance: NO

Notes: _____

APPENDIX B

LOG OF BORING

URS
Clifton Park, New York

ASHLAND CHEMICAL
Rensselaer, New York

PROJECT:	Ashland Chemical	**BORING NO.:**	SSB-1
DATE:	11/13/03	**ELEVATION:**	Not Surveyed
BORING LOCATION:	Not Surveyed	**SAMPLE TYPE:**	2"x2' Split Spoon
BORING DIAMETER:	4.25 inches	**METHOD OF DRILLING:**	Hollow Stem Auger
BORING DEPTH:	2.5 feet	**SURFACE CONDITIONS:**	Asphalt

Depth	Soil Symbols	Soil Description	Sample Depth (ft bg)	Driven/ Recovery (in.)	PID (ppm)	Blows per 6 in.	Well Construction	Well Description
0		ASPHALT Brown fine to coarse SAND, trace gravel, tree roots.	0.5-2.5	24/8	0	6,5,4,2		**Soil boring - no well installed.**

LOG OF BORING

URS
Clifton Park, New York

ASHLAND CHEMICAL
Rensselaer, New York

PROJECT: Ashland Chemical
DATE: 11/14/03
BORING LOCATION: Not Surveyed
BORING DIAMETER: 4.25 inches
BORING DEPTH: 2.5 feet

BORING NO.: SSB-2
ELEVATION: Not Surveyed
SAMPLE TYPE: 2"x2' Split Spoon
METHOD OF DRILLING: Hollow Stem Auger
SURFACE CONDITIONS: Asphalt

Depth	Soil Symbols	Soil Description	Sample Depth (ft bg)	Driven/ Recovery (in.)	PID (ppm)	Blows per 6 in.	Well Construction	Well Description
0		ASPHALT GRAVEL, some fine to coarse sand, wet.	0.5-2.5	24/6	NA	7,2,1,7		**Soil boring - no well installed.**

LOG OF BORING

URS
Clifton Park, New York

ASHLAND CHEMICAL
Rensselaer, New York

PROJECT: Ashland Chemical
DATE: 11/13/03
BORING LOCATION: Not Surveyed
BORING DIAMETER: 4.25 inches
BORING DEPTH: 15.5 feet

BORING NO.: SSB-3
ELEVATION: Not Surveyed
SAMPLE TYPE: 2"x2' Split Spoon
METHOD OF DRILLING: Hollow Stem Auger
SURFACE CONDITIONS: Asphalt

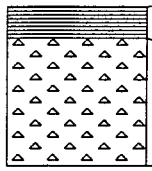
Depth	Soil Symbols	Soil Description	Sample Depth (ft bg)	Driven/ Recovery (in.)	PID (ppm)	Blows per 6 in.	Well Construction	Well Description
0		ASPHALT						
		FILL. Fine to coarse grey to brown SAND, some gravel, woodchips, brick fragments, strong chemical odor. Wet at 2 ft.	0.5-2.5	24/16	>1,000	17,24, 15,11		**Soil boring - no well installed.**
		NO SAMPLE						
5		Grey fine to coarse GRAVELLY SAND, wet.	6-8	24/8	NA	2,2,5,6		
		Grey fine to coarse SAND, some gravel, wet.	8-10	24/6	70.7	3,4,6,4		
10		Shelby Tube from 10'-12' unsuccessful.						
		Same as 8'-10'.	12-14	24/18	78	4,4,3,4		
		Brown SILT, trace clay, wet.						
		Shelby Tube sample collected from 14'-15.5'.						
15								

LOG OF BORING

URS
Clifton Park, New York

ASHLAND CHEMICAL
Rensselaer, New York

PROJECT:	Ashland Chemical	**BORING NO.:**	SSB-4
DATE:	11/13/03	**ELEVATION:**	Not Surveyed
BORING LOCATION:	Not Surveyed	**SAMPLE TYPE:**	2"x2' Split Spoon
BORING DIAMETER:	4.25 inches	**METHOD OF DRILLING:**	Hollow Stem Auger
BORING DEPTH:	2.5 feet	**SURFACE CONDITIONS:**	Asphalt

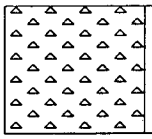
Depth	Soil Symbols	Soil Description	Sample Depth (ft bg)	Driven/ Recovery (in.)	PID (ppm)	Blows per 6 in.	Well Construction	Well Description
0		ASPHALT FILL. Grey fine to coarse SAND, trace gravel, woodchips, brick, wire, chemical odor. Wet at 2.15'.	0.5-2.5	24/18	>1,000	10,7,4,8		**Soil boring - no well installed.**

LOG OF BORING

URS
Clifton Park, New York

ASHLAND CHEMICAL
Rensselaer, New York

PROJECT:	Ashland Chemical	**BORING NO.:**	SSB-5
DATE:	11/13/03	**ELEVATION:**	Not Surveyed
BORING LOCATION:	Not Surveyed	**SAMPLE TYPE:**	2"x2' Split Spoon
BORING DIAMETER:	4.25 inches	**METHOD OF DRILLING:**	Hollow Stem Auger
BORING DEPTH:	2 feet	**SURFACE CONDITIONS:**	Gravel

Depth	Soil Symbols	Soil Description	Sample Depth (ft bg)	Driven/ Recovery (in.)	PID (ppm)	Blows per 6 in.	Well Construction	Well Description
0		FILL. Brown fine to medium SAND, some concrete and brick fragments, trace fine rounded gravel, damp at 1'.	0-2	24/15	0	9,8,9,3		**Soil boring - no well installed.**

LOG OF BORING

URS
Clifton Park, New York

ASHLAND CHEMICAL
Rensselaer, New York

PROJECT:	Ashland Chemical	**BORING NO.:**	SSB-6
DATE:	11/14/03	**ELEVATION:**	Not Surveyed
BORING LOCATION:	Not Surveyed	**SAMPLE TYPE:**	2"x2' Split Spoon
BORING DIAMETER:	4.25 inches	**METHOD OF DRILLING:**	Hollow Stem Auger
BORING DEPTH:	8 feet	**SURFACE CONDITIONS:**	Asphalt

Depth	Soil Symbols	Soil Description	Sample Depth (ft bg)	Driven/ Recovery (in.)	PID (ppm)	Blows per 6 in.	Well Construction	Well Description
0		ASPHALT						
		GRAVEL, some medium to coarse sand, dry.	0.5-2.5	24/16	43	58,112 29,15		**Soil boring - no well installed.**
		Brown fine to coarse SAND, trace gravel, dry.						
		Grey fine to coarse SAND, trace gravel and coal, damp.	2.5-4.5	24/12	55.3	10,11,8,6		
	▽	Grey fine to coarse SAND, trace gravel, wet.						
5		Grey CLAY, trace silt and coarse sand, wet.	4.5-6.5	24/16	3.1	3,2,5,3		
		Shleby Tube collected from 6'-8'.						

LOG OF BORING

URS
Clifton Park, New York

ASHLAND CHEMICAL
Rensselaer, New York

PROJECT:	Ashland Chemical	**BORING NO.:**	SSB-7
DATE:	11/18/03	**ELEVATION:**	Not Surveyed
BORING LOCATION:	Not Surveyed	**SAMPLE TYPE:**	2"x2' Split Spoon
BORING DIAMETER:	4.25 inches	**METHOD OF DRILLING:**	Hollow Stem Auger
BORING DEPTH:	4.5 feet	**SURFACE CONDITIONS:**	Asphalt

Depth	Soil Symbols	Soil Description	Sample Depth (ft bg)	Driven/ Recovery (in.)	PID (ppm)	Blows per 6 in.	Well Construction	Well Description
0		ASPHALT						
		Fine to coarse SAND and GRAVEL, some concrete chips. dry.	0.5-2.5	24/20	16	30,29 17,16		**Soil boring - no well installed.**
		Brown fine to coarse SAND, trace gravel, damp.						
		Same as above.	2.5-4.5	24/11	157	10,10,10,7		
		Same as above, wet.						

LOG OF BORING

URS
Clifton Park, New York

ASHLAND CHEMICAL
Rensselaer, New York

PROJECT: Ashland Chemical
DATE: 11/18/03
BORING LOCATION: Not Surveyed
BORING DIAMETER: 4.25 inches
BORING DEPTH: 8.5 feet

BORING NO.: SSB-8
ELEVATION: Not Surveyed
SAMPLE TYPE: 2"x2' Split Spoon
METHOD OF DRILLING: Hollow Stem Auger
SURFACE CONDITIONS: Asphalt

Depth	Soil Symbols	Soil Description	Sample Depth (ft bg)	Driven/ Recovery (in.)	PID (ppm)	Blows per 6 in.	Well Construction	Well Description
0		ASPHALT						
		FILL. Grey fine to coarse SAND and GRAVEL, trace brick fragments and concrete chips, dry. Large orange pink cobble at 7".	0.5-2.5	24/12	4.3	27,84 34,30		**Soil boring - no well installed.**
		Brown fine to coarse SAND, dry.						
		Brown fine to coarse SAND, trace gravel, dry.	2.5-4.5	24/8	11.6	19,15 51,24		
		Same as above, damp.						
5		Brown fine to coarse SAND, trace gravel, damp.	4.5-6.5	24/11	4.3	20,9,9,8		
		Same as above.						
	▽	Brown fine to medium SAND, wet.	6.5-8.5	24/10	5.8	9,9,8,10		
		Brown CLAY, wet.						

LOG OF BORING

URS
Clifton Park, New York

ASHLAND CHEMICAL
Rensselaer, New York

PROJECT: Ashland Chemical
DATE: 11/18/03
BORING LOCATION: Not Surveyed
BORING DIAMETER: 4.25 inches
BORING DEPTH: 12.5 feet

BORING NO.: SSB-9
ELEVATION: Not Surveyed
SAMPLE TYPE: 2"x2' Split Spoon
METHOD OF DRILLING: Hollow Stem Auger
SURFACE CONDITIONS: Asphalt

Depth	Soil Symbols	Soil Description	Sample Depth (ft bg)	Driven/ Recovery (in.)	PID (ppm)	Blows per 6 in.	Well Construction	Well Description
0		ASPHALT						
		Angular GRAVEL, trace brown coarse sand, dry.	0.5-2.5	24/16	13.1	26,20 25,33		**Soil boring - no well installed.**
		Brown fine to coarse SAND, trace gravel, dry.						
		Brown medium to coarse SAND and GRAVEL, dry.	2.5-4.5	24/10	8.7	40,34 25,21		
5		Same as above.	4.5-6.5	24/7	5.8	10,9,7,8		
		Same as above.	6.5-8.5	24/8	4.3	13,9,7,7		
		Same as above, damp.	8.5-10.5	24/7	5.2	6,3,3,1		
10	▽	Brown to grey medium to coarse SAND and GRAVEL, wet.	10.5-12.5	24/8	7.2	3,3,6,7		

LOG OF BORING

URS
Clifton Park, New York

ASHLAND CHEMICAL
Rensselaer, New York

PROJECT: Ashland Chemical
DATE: 11/18/03
BORING LOCATION: Not Surveyed
BORING DIAMETER: 4.25 inches
BORING DEPTH: 12.5 feet

BORING NO.: SSB-10
ELEVATION: Not Surveyed
SAMPLE TYPE: 2"x2' Split Spoon
METHOD OF DRILLING: Hollow Stem Auger
SURFACE CONDITIONS: Asphalt

Depth	Soil Symbols	Soil Description	Sample Depth (ft bg)	Driven/ Recovery (in.)	PID (ppm)	Blows per 6 in.	Well Construction	Well Description
0		ASPHALT						
		FILL. Angular GRAVEL, trace fine to coarse sand, dry.	0.5-2.5	24/16	10.2	32,36 61,30		**Soil boring - no well installed.**
		FILL. Brown fine to coarse SAND and GRAVEL, dry.						
		FILL. Brown fine to coarse SAND, trace gravel, damp.	2.5-4.5	24/14	5.3	42,31 33,30		
		FILL. Same as above, damp.						
		FILL. Brown fine to coarse SAND and rounded GRAVEL, damp.						
5		FILL. Same as above, black felt at 6.5'.	4.5-6.5	24/16	8.7	8,19,15,14		
		Coarse SAND and GRAVEL, trace brown fine to medium sand, damp.	6.5-8.5	24/8	2.9	15,13 12,11		
		Same as above.	8.5-10.5	24/7	1.4	24,14,12,8		
10		Same as above.	10.5-12.5	24/14	20.4	7,5,5,4		
▽		Round GRAVEL and coarse SAND, wet.						
		Grey fine to medium SAND, wet.						

LOG OF BORING

URS
Clifton Park, New York

ASHLAND CHEMICAL
Rensselaer, New York

PROJECT:	Ashland Chemical	**BORING NO.:**	SSB-11
DATE:	11/19/03	**ELEVATION:**	Not Surveyed
BORING LOCATION:	Not Surveyed	**SAMPLE TYPE:**	2"x2' Split Spoon
BORING DIAMETER:	4.25 inches	**METHOD OF DRILLING:**	Hollow Stem Auger
BORING DEPTH:	18.5 feet	**SURFACE CONDITIONS:**	Asphalt

Depth	Soil Symbols	Soil Description	Sample Depth (ft bg)	Driven/ Recovery (in.)	PID (ppm)	Blows per 6 in.	Well Construction	Well Description
0		ASPHALT						
		FILL. Round GRAVEL and brown coarse SAND, dry.	0.5-2.5	24/18	0	25,23 20,18		**Soil boring - no well installed.**
		FILL. Brown fine to coarse SAND, trace gravel, dry.						
		FILL. Same as above.	2.5-4.5	24/14	0	18,29 24,40		
		FILL. Large purple rock and concrete chips.						
		FILL. Brown fine to coarse SAND and GRAVEL, dry.						
5		FILL. Brown fine to coarse SAND, trace gravel, damp.	4.5-6.5	24/13	0.4	6,11,11,13		
		FILL. Brown CLAY, trace medium to coarse sand, damp.						
		FILL. Same as above.	6.5-8.5	24/11	3.8	11,10,2,4		
		FILL. Small rounded multi-colored GRAVEL, some felt, damp.						
		Grey CLAY, trace sand, damp.						
	▽	Brown fine to coarse SAND, trace gravel, wet.	8.5-10.5	24/14	3.7	11,7,2,4		
		Grey CLAY, trace silt, wet.						
10		GRAVEL, trace grey clay, wet.	10.5-12.5	24/4	10.7	15,12,11,8		
		Grey CLAY, trace rounded gravel, wet.	12.5-14.5	24/5	6.4	15,6,8,8		
15		Same as above.	14.5-16.5	24/11	5.5	5,5,6,9		
		Shelby Tube sample from 16.5'-18.5' unsuccessful.						

LOG OF BORING

URS
Clifton Park, New York

ASHLAND CHEMICAL
Rensselaer, New York

PROJECT: Ashland Chemical
DATE: 11/18/03
BORING LOCATION: Not Surveyed
BORING DIAMETER: 4.25 inches
BORING DEPTH: 6.5 feet

BORING NO.: SSB-12
ELEVATION: Not Surveyed
SAMPLE TYPE: 2"x2' Split Spoon
METHOD OF DRILLING: Hollow Stem Auger
SURFACE CONDITIONS: Asphalt

Depth	Soil Symbols	Soil Description	Sample Depth (ft bg)	Driven/ Recovery (in.)	PID (ppm)	Blows per 6 in.	Well Construction	Well Description
0		ASPHALT						
		Brown medium to coarse SAND and GRAVEL, dry.	0.5-2.5	24/15	5.6	13,19 20,13		**Soil boring - no well installed.**
		Same as above.	2.5-4.5	24/14	8.7	28,35 34,37		
		Brown fine to medium SAND, damp.						
5		Brown fine to medium SAND and GRAVEL, damp.	4.5-6.5	24/15	14.5	15,17 13,14		
	▽	Same as above, wet.						

LOG OF BORING

URS
Clifton Park, New York

ASHLAND CHEMICAL
Rensselaer, New York

PROJECT:	Ashland Chemical	**BORING NO.:**	SSB-13
DATE:	11/19/03	**ELEVATION:**	Not Surveyed
BORING LOCATION:	Not Surveyed	**SAMPLE TYPE:**	2"x2' Split Spoon
BORING DIAMETER:	4.25 inches	**METHOD OF DRILLING:**	Hollow Stem Auger
BORING DEPTH:	6.5 feet	**SURFACE CONDITIONS:**	Asphalt

Depth	Soil Symbols	Soil Description	Sample Depth (ft bg)	Driven/ Recovery (in.)	PID (ppm)	Blows per 6 in.	Well Construction	Well Description
0		ASPHALT						
		Brown fine to coarse SAND, some orange gravel, dry.	0.5-2.5	24/19	4.7	17,20 13,11		**Soil boring - no well installed.**
		Grey fine to coarse SAND, damp.						
		Same as above.						
		Grey silty CLAY, strong chemical odor, damp. Wet at 4.3'.	2.5-4.5	24/17	1,811	11,10,10,8		
5		Shelby Tube sample collected from 4.5'-6.5'.						

APPENDIX C

Quality Assurance Review
Ashland Inc.
Rennselaer, New York
July 14, 15, and 16, 2003

This quality assurance (QA) review is for 14 groundwater samples (including 1 duplicate) and 1 deep sump sample collected on at the Ashland Inc. facility in Rennselaer, New York. The samples were analyzed for VOCs using EPA Method 8260B; Ammonia by EPA Method 350.1; Biochemical Oxygen Demand by EPA 405.1; Chloride (325.2); Ferris Iron by SM3500; Total and Dissolved Iron by EPA Method 6010; Total and Dissolved Manganese by EPA Method 6010; Nitrate and Nitrite by EPA Method 353.2; Sulfide by EPA Method 376.1; Alkalinity by EPA Method 310.1 and Sodium by EPA Method 6010. STL, Inc. of Savannah, Georgia performed the analyses. The QA/QC review was performed following EPA guidelines (USEPA, 1999).

Sample Transit
The samples arrived at the laboratory in good condition, in the chilled state.

Holding Times
All samples were reviewed for holding time from time of collection until time of analysis. All samples were analyzed within the required method holding time.

Blanks
Analytical results for three trip blanks and three laboratory method blanks were reviewed for concentrations of target analytes above the reporting limit. Styrene was detected in all the trip blanks and the trichloroethene (TCE) was detected in the trip blank shipped with the samples collected on July 15, 2003. Results for styrene in all the samples are considered undetected as probable blank contamination. The results for TCE in samples MW-16 and SUMP are considered real results because TCE was detected in these samples at a concentration greater than 5 times the level detected in the blank. TCE was not detected in the other samples associated with these blanks. The laboratory method blanks were free of target analyte contamination.

Field Duplicate Samples
One field duplicate sample pair was collected during this groundwater sampling event. Sample DUP030716 was a blind field duplicate of sample MW-13. The duplicate relative percent differences (RPDs) were reviewed to evaluate field sampling and laboratory precision and sample matrix heterogeneity.

Detected analyte concentrations for the duplicate pair were compared in the following table.

Compound	MW-13	DUP	RPD
Styrene	2	2	0.0%
Nitrate	0.12	0.076	57.9%
BOD	6.2	<2	NC
Chloride	19	3	140.8%
Iron	0.22	<0.05	NC
Magnesium	0.59	<0.01	NC
Alkalinity	330	270.0	20.0%
Sodium	23	13.0	55.6%
Calcium	90	100.0	10.5%
Potassium	1.5	3.6	82.4%
Manganese	41	12.0	109.4%
Sulfate	61	26.0	80.5%
Methane	3.3	0.74	126.7%
TOC	3.6	<1.0	NC

The results indicate good general agreement between the duplicate pairs. Compounds detected at or near the detection limit often exhibit high RPDs due to the inherent variability in the analysis at this level. This is the case with the result for nitrate, chloride, sodium, potassium, manganese, sulfate, methane, and TOC . Generally, RPDs of 30 or less indicate good field and laboratory precision and a relatively homogeneous sample matrix. No qualification of the data were necessary based on these findings.

Laboratory Control Sample (LCS) and Laboratory Control Sample Duplicate (LCSD)

LCS/LCSD samples were spiked with known concentrations of target analytes. LCS/LCSD recoveries and relative percent differences (RPDs) were reviewed to evaluate analytical accuracy and precision.

The LCS/LCSD recoveries and RPDs for all parameters were within laboratory control limits, indicating acceptable analytical accuracy and precision.

Surrogate Recoveries

Surrogate compounds were spiked into all field samples, trip blanks, method blanks, and LCS/LCSD samples for all parameters. The surrogate recoveries were reviewed to evaluate sample-specific accuracy.

All surrogate recoveries were within acceptable QC limits indicating acceptable sample-specific accuracy.

Matrix Spike/Matrix Spike Duplicate Recoveries and Precision
Sample MW-13 was chosen as the MS/MSD. Representative analytes were spiked into a portion of this sample and the analytical recovery and precision were measured.

The MS/MSD recoveries for ammonia and calcium were outside of QC limits as shown below.

Analyte	MS	MSD	RPD	Recovery Limits	RPD Recovery Limits
Ammonia	68*	68*	0	75-125	25
Calcium	139*	87	0	75-125	25

Results for ammonia and calcium in the corresponding samples are considered estimated values.

Reporting Limits
The data were reviewed to identify results reported as non-detect at elevated reporting limits. The samples summarized below required dilution due to high target analyte concentrations. The standard reporting limit range for VOCs of 1 to 25 ug/L was used for the undiluted samples.

Sample	Dilution Factor	Reporting Limit Range	Reason for Dilution
MW-1	10	10 – 250	cis-1,2-dichloroethene
MW-19	10	10 – 250	cis-1,2-dichloroethene
MW-19	5	NA	nitrate, ammonia
MW-16	5	5 – 125	cis-1,2-dichloroethene
MW-13	5	NA	nitrate
MW-18S	10	10 – 250	vinyl chloride, cis-1,2-dichloroethene,

Non-detect results for the above samples are reported with their analyte reporting limits elevated (e.g., <1,000 ug/L).

QA/QC Summary
Calcium and ammonia are considered estimated values because the matrix spike recoveries are outside of QC limits.

Styrene and TCE were detected in trip blanks. Corresponding results were considered undetected for styrene and real for TCE. All other QC criteria were within acceptable limits.
The QA/QC review indicated that the data are of acceptable quality for evaluating monitored natural attenuation of groundwater contamination at the site.

Reference

US Environmental Protection Agency, 1999. USEPA Contract Laboratory Program National Functional Guidelines for Organic Data Review. EPA540/R-99/008. October.

SEVERN TRENT STL

STL Savannah 5102 LaRoche Avenue - Savannah GA 31404 Telephone:(912) 354-7858 Fax:(912) 351-3673

Analytical Report

For: Mr. Greg Gilbertsen
Ashland Inc.
5200 Blazer Parkway
Dublin, OH 43017
CC: Dave Blaushild

Order Number: S385495
SDG Number:
Client Project ID: 37679253
Project: Ashland - Rensselaer, Ny
Report Date: 07/31/2003
Sampled By: Client
Sample Received Date: 07/17/2003
Requisition Number:

Steven J. White, Project Manager
swhite@stl-inc.com

The test results in this report meet all NELAP requirements for parameters for which accreditation is required or available. Any exceptions to NELAP requirements are noted in this report. Pursuant to NELAP, this report may not be reproduced, except in full, without the written approval of the laboratory.

Sample Summary

Order: S385495
Date Received: 07/17/2003

Client: Ashland Inc.
Project: Ashland - Rensselaer, Ny

Client Sample ID	Lab Sample ID	Matrix	Date Sampled
MW-1	S385495*1	Liquid	07/16/2003 09:00
MW-19	S385495*2	Liquid	07/16/2003 11:03
MW-15	S385495*3	Liquid	07/16/2003 12:25
MW-13	S385495*4	Liquid	07/16/2003 14:05
DUP030716	S385495*5	Liquid	07/16/2003
MW-10	S385495*6	Liquid	07/16/2003 15:20
Trip Blank 030716	S385495*7	Liquid	07/16/2003

Analytical Data Report

Lab Sample ID	Description	Matrix	Date Received	Date Sampled	SDG#
85495-1	MW-1	Liquid	07/17/03	07/16/03 09:00	
85495-2	MW-19	Liquid	07/17/03	07/16/03 11:03	
85495-3	MW-15	Liquid	07/17/03	07/16/03 12:25	
85495-4	MW-13	Liquid	07/17/03	07/16/03 14:05	
85495-5	DUP030716	Liquid	07/17/03	07/16/03	

Parameter	Units	Lab Sample IDs 85495-1	85495-2	85495-3	85495-4	85495-5
Volatiles by GC/MS (8260)						
Chloromethane	ug/l	<10	<10	<1.0	<1.0	<1.0
Bromomethane (Methyl bromide)	ug/l	<10	<10	<1.0	<1.0	<1.0
Vinyl chloride	ug/l	14	270	6.2	<1.0	<1.0
Chloroethane	ug/l	<10	<10	<1.0	<1.0	<1.0
Methylene chloride (Dichloromethane)	ug/l	<50	<50	<5.0	<5.0	<5.0
Acetone	ug/l	<250	<250	<25	<25	<25
Carbon disulfide	ug/l	<10	<10	<1.0	<1.0	<1.0
1,1-Dichloroethene	ug/l	48	<10	<1.0	<1.0	<1.0
1,1-Dichloroethane	ug/l	<10	49	3.0	<1.0	<1.0
cis-1,2-Dichloroethene	ug/l	1100	740	59	<1.0	<1.0
trans-1,2-Dichloroethene	ug/l	13	15	1.5	1.1	<1.0
Chloroform	ug/l	<10	20	2.1	<1.0	<1.0
1,2-Dichloroethane	ug/l	<10	<10	<1.0	<1.0	<1.0
2-Butanone (MEK)	ug/l	<100	<100	<10	<10	<10
1,1,1-Trichloroethane	ug/l	66	16	<1.0	<1.0	<1.0
Carbon tetrachloride	ug/l	<10	<10	<1.0	<1.0	<1.0
Bromodichloromethane	ug/l	<10	<10	<1.0	<1.0	<1.0
1,1,2,2-Tetrachloroethane	ug/l	19	<10	<1.0	<1.0	<1.0
1,2-Dichloropropane	ug/l	<10	<10	<1.0	<1.0	<1.0
trans-1,3-Dichloropropene	ug/l	<10	<10	<1.0	<1.0	<1.0
Trichloroethene	ug/l	1300	96	55	<1.0	<1.0
Dibromochloromethane	ug/l	<10	<10	<1.0	<1.0	<1.0
1,1,2-Trichloroethane	ug/l	<10	<10	<1.0	<1.0	<1.0
Benzene	ug/l	<10	12	12	<1.0	<1.0
cis-1,3-Dichloropropene	ug/l	<10	<10	<1.0	<1.0	<1.0
Bromoform	ug/l	10	<10	<1.0	<1.0	<1.0
2-Hexanone	ug/l	<100	<100	<10	<10	<10
4-Methyl-2-pentanone (MIBK)	ug/l	<100	<100	<10	<10	<10
Tetrachloroethene	ug/l	130	21	43	<1.0	<1.0
Toluene	ug/l	<10	<10	<1.0	<1.0	<1.0
Chlorobenzene	ug/l	<10	<10	<1.0	<1.0	<1.0

Analytical Data Report

Lab Sample ID	Description	Matrix	Date Received	Date Sampled	SDG#
85495-1	MW-1	Liquid	07/17/03	07/16/03 09:00	
85495-2	MW-19	Liquid	07/17/03	07/16/03 11:03	
85495-3	MW-15	Liquid	07/17/03	07/16/03 12:25	
85495-4	MW-13	Liquid	07/17/03	07/16/03 14:05	
85495-5	DUP030716	Liquid	07/17/03	07/16/03	

Parameter	Units	Lab Sample IDs 85495-1	85495-2	85495-3	85495-4	85495-5
Volatiles by GC/MS (8260)						
Ethylbenzene	ug/l	<10	<10	<1.0	<1.0	<1.0
Styrene	ug/l	23	20	2.2	2.0	2.0
Xylenes, Total	ug/l	<20	<20	<2.0	<2.0	<2.0
Surrogate - Toluene-d8 *	%	84 %	84 %	84 %	98 %	84 %
Surrogate - 4-Bromofluorobenzene *	%	100 %	98 %	100 %	96 %	100 %
Surrogate - Dibromofluoromethane *	%	102 %	96 %	100 %	102 %	102 %
Dilution Factor		10	10	1	1	1
Prep Date		07/22/03	07/22/03	07/21/03	07/21/03	07/21/03
Analysis Date		07/22/03	07/22/03	07/21/03	07/21/03	07/21/03
Batch ID		1P0721	1P0721	1P0721	1P0721	1P0721
Ammonia (as N) (350.1)						
Ammonia (as N)	mg/l	0.094	6.0	0.36	0.12	0.076
Dilution Factor		1	5	1	1	1
Prep Date		07/21/03	07/21/03	07/21/03	07/21/03	07/21/03
Analysis Date		07/21/03	07/21/03	07/21/03	07/21/03	07/21/03
Batch ID		0721A	0721A	0721A	0721A	0721A
Biochemical Oxygen Demand (5 Day) (405.1/5210B)						
Biochemical Oxygen Demand (5 Day)	mg/l	<2.0	<2.0	<2.0	6.2	<2.0
Dilution Factor		1	1	1	1	1
Prep Date		07/17/03	07/17/03	07/17/03	07/17/03	07/17/03
Analysis Date		07/17/03	07/17/03	07/17/03	07/17/03	07/17/03
Batch ID		0717A	0717A	0717A	0717A	0717A

Analytical Data Report

Lab Sample ID	Description	Matrix	Date Received	Date Sampled	SDG#
85495-1	MW-1	Liquid	07/17/03	07/16/03 09:00	
85495-2	MW-19	Liquid	07/17/03	07/16/03 11:03	
85495-3	MW-15	Liquid	07/17/03	07/16/03 12:25	
85495-4	MW-13	Liquid	07/17/03	07/16/03 14:05	
85495-5	DUP030716	Liquid	07/17/03	07/16/03	

Parameter	Units	Lab Sample IDs 85495-1	85495-2	85495-3	85495-4	85495-5
Chloride (325.2)						
Chloride	mg/l	130	63	13	19	3.3
Dilution Factor		5	2	1	1	1
Prep Date		07/24/03	07/24/03	07/24/03	07/24/03	07/24/03
Analysis Date		07/24/03	07/24/03	07/24/03	07/24/03	07/24/03
Batch ID		0724B	0724B	0724B	0724B	0724B
Iron, Ferrous (2+) (SM3500)						
Iron, Ferrous (2+)	mg/l	<0.10	0.24	<0.10	<0.10	<0.10
Dilution Factor		1	1	1	1	1
Prep Date		07/17/03	07/17/03	07/17/03	07/18/03	07/17/03
Analysis Date		07/17/03	07/17/03	07/17/03	07/18/03	07/17/03
Batch ID		0717A	0717A	0717A	0718A	0717A
Iron (6010)						
Iron	mg/l	0.34	2.2	3.0	0.22	<0.050
Dilution Factor		1	1	1	1	1
Prep Date		07/18/03	07/18/03	07/18/03	07/18/03	07/18/03
Analysis Date		07/22/03	07/22/03	07/22/03	07/22/03	07/23/03
Batch ID		0718L	0718L	0718L	0718L	0718L
Iron (Dissolved) (6010)						
Iron (Dissolved)	mg/l	<0.050	0.058	<0.050	<0.050	<0.050
Dilution Factor		1	1	1	1	1
Prep Date		07/18/03	07/18/03	07/18/03	07/18/03	07/18/03
Analysis Date		07/22/03	07/22/03	07/22/03	07/23/03	07/23/03
Batch ID		0718L	0718L	0718L	0718L	0718L

Analytical Data Report

Lab Sample ID	Description	Matrix	Date Received	Date Sampled	SDG#
85495-1	MW-1	Liquid	07/17/03	07/16/03 09:00	
85495-2	MW-19	Liquid	07/17/03	07/16/03 11:03	
85495-3	MW-15	Liquid	07/17/03	07/16/03 12:25	
85495-4	MW-13	Liquid	07/17/03	07/16/03 14:05	
85495-5	DUP030716	Liquid	07/17/03	07/16/03	

Parameter	Units	Lab Sample IDs 85495-1	85495-2	85495-3	85495-4	85495-5
Manganese (6010)						
Manganese	mg/l	0.011	2.3	0.19	0.59	<0.010
Dilution Factor		1	1	1	1	1
Prep Date		07/18/03	07/18/03	07/18/03	07/18/03	07/18/03
Analysis Date		07/22/03	07/22/03	07/22/03	07/22/03	07/23/03
Batch ID		0718L	0718L	0718L	0718L	0718L
Manganese (Dissolved) (6010)						
Manganese (Dissolved)	mg/l	0.011	2.2	0.18	0.35	<0.010
Dilution Factor		1	1	1	1	1
Prep Date		07/18/03	07/18/03	07/18/03	07/18/03	07/18/03
Analysis Date		07/22/03	07/22/03	07/22/03	07/23/03	07/23/03
Batch ID		0718L	0718L	0718L	0718L	0718L
Nitrate-N (353.2)						
Nitrate-N	mg/l	2.4	<0.050	1.6	<0.050	4.2
Dilution Factor		1	1	1	1	5
Prep Date		07/18/03	07/18/03	07/18/03	07/18/03	07/18/03
Analysis Date		07/28/03	07/18/03	07/18/03	07/18/03	07/18/03
Batch ID		0728A	0728A	0728A	0728A	0728A
Nitrite-N (353.2)						
Nitrite-N	mg/l	<0.050	<0.050	<0.050	<0.050	<0.050
Dilution Factor		1	1	1	1	1
Prep Date		07/18/03	07/18/03	07/18/03	07/18/03	07/18/03
Analysis Date		07/18/03	07/18/03	07/18/03	07/18/03	07/18/03
Batch ID		0718A	0718A	0718A	0718A	0718A

Analytical Data Report

Lab Sample ID	Description	Matrix	Date Received	Date Sampled	SDG#
85495-1	MW-1	Liquid	07/17/03	07/16/03 09:00	
85495-2	MW-19	Liquid	07/17/03	07/16/03 11:03	
85495-3	MW-15	Liquid	07/17/03	07/16/03 12:25	
85495-4	MW-13	Liquid	07/17/03	07/16/03 14:05	
85495-5	DUP030716	Liquid	07/17/03	07/16/03	

Parameter	Units	Lab Sample IDs 85495-1	85495-2	85495-3	85495-4	85495-5
Sulfide (376.1)						
Sulfide	mg/l	<1.0	<1.0	<1.0	<1.0	<1.0
Dilution Factor		1	1	1	1	1
Prep Date		07/17/03	07/17/03	07/17/03	07/17/03	07/17/03
Analysis Date		07/17/03	07/17/03	07/17/03	07/17/03	07/17/03
Batch ID		0717A	0717A	0717A	0717A	0717A
Alkalinity (to pH 4.5) as CaCO3 (310.1)						
Alkalinity (to pH 4.5) as CaCO3	mg/l	260	330	260	330	270
Dilution Factor		1	1	1	1	1
Prep Date		07/24/03	07/24/03	07/24/03	07/24/03	07/24/03
Analysis Date		07/24/03	07/24/03	07/24/03	07/24/03	07/24/03
Batch ID		0724A	0724A	0724A	0724A	0724A
Sodium (6010)						
Sodium	mg/l	150	110	19	23	13
Dilution Factor		5	5	1	1	1
Prep Date		07/18/03	07/18/03	07/18/03	07/18/03	07/18/03
Analysis Date		07/23/03	07/23/03	07/22/03	07/22/03	07/23/03
Batch ID		0718L	0718L	0718L	0718L	0718L
Calcium (6010)						
Calcium	mg/l	100	100	84	90	100
Dilution Factor		1	1	1	1	1
Prep Date		07/18/03	07/18/03	07/18/03	07/18/03	07/18/03
Analysis Date		07/22/03	07/22/03	07/22/03	07/22/03	07/23/03
Batch ID		0718L	0718L	0718L	0718L	0718L

Analytical Data Report

Lab Sample ID	Description	Matrix	Date Received	Date Sampled	SDG#
85495-1	MW-1	Liquid	07/17/03	07/16/03 09:00	
85495-2	MW-19	Liquid	07/17/03	07/16/03 11:03	
85495-3	MW-15	Liquid	07/17/03	07/16/03 12:25	
85495-4	MW-13	Liquid	07/17/03	07/16/03 14:05	
85495-5	DUP030716	Liquid	07/17/03	07/16/03	

Parameter	Units	Lab Sample IDs 85495-1	85495-2	85495-3	85495-4	85495-5
Potassium (6010)						
Potassium	mg/l	2.2	11	3.7	1.5	3.6
Dilution Factor		1	1	1	1	1
Prep Date		07/18/03	07/18/03	07/18/03	07/18/03	07/18/03
Analysis Date		07/22/03	07/22/03	07/22/03	07/22/03	07/23/03
Batch ID		0718L	0718L	0718L	0718L	0718L
Magnesium (6010)						
Magnesium	mg/l	71	18	8.6	41	12
Dilution Factor		1	1	1	1	1
Prep Date		07/18/03	07/18/03	07/18/03	07/18/03	07/18/03
Analysis Date		07/22/03	07/22/03	07/22/03	07/22/03	07/23/03
Batch ID		0718L	0718L	0718L	0718L	0718L
Sulfate as SO4 (375.4)						
Sulfate as SO4	mg/l	28	<5.0	27	61	26
Dilution Factor		1	1	1	5	2
Prep Date		07/24/03	07/24/03	07/24/03	07/24/03	07/24/03
Analysis Date		07/24/03	07/24/03	07/24/03	07/24/03	07/24/03
Batch ID		0724A	0724A	0724A	0724A	0724A
Dissolved Gases (RSK-175)						
Methane	ug/l	47	1200	54	3.3	0.74
Ethene	ug/l	<0.33	60	<0.33	<0.33	<0.33
Carbon Dioxide	ug/l	50000	44000	69000	41000	47000
Total Nitrogen	ug/l	2300	4700	4800	4000	4500
Carbon Monoxide	ug/l	<82	<82	<82	<82	<82
Ethane	ug/l	1.4	190	12	<0.35	<0.35
Dilution Factor		1	1	1	1	1
Prep Date		07/23/03	07/28/03	07/28/03	07/28/03	07/28/03
Analysis Date		07/23/03	07/28/03	07/28/03	07/28/03	07/28/03
Batch ID		2C0722	1C0728	1C0728	1C0728	1C0728

Analytical Data Report

Lab Sample ID	Description	Matrix	Date Received	Date Sampled	SDG#
85495-1	MW-1	Liquid	07/17/03	07/16/03 09:00	
85495-2	MW-19	Liquid	07/17/03	07/16/03 11:03	
85495-3	MW-15	Liquid	07/17/03	07/16/03 12:25	
85495-4	MW-13	Liquid	07/17/03	07/16/03 14:05	
85495-5	DUP030716	Liquid	07/17/03	07/16/03	

		Lab Sample IDs				
Parameter	Units	85495-1	85495-2	85495-3	85495-4	85495-5
Total Organic Carbon (415.1)						
Total Organic Carbon	mg/l	<1.0	6.3	1.9	3.6	<1.0
Dilution Factor		1	1	1	1	1
Prep Date		07/27/03	07/27/03	07/27/03	07/27/03	07/27/03
Analysis Date		07/28/03	07/28/03	07/28/03	07/28/03	07/28/03
Batch ID		0727B	0727B	0727B	0727B	0727B

Analytical Data Report

Lab Sample ID	Description	Matrix	Date Received	Date Sampled	SDG#
85495-6	MW-10	Liquid	07/17/03	07/16/03 15:20	

Parameter	Units	Lab Sample IDs 85495-6
Volatiles by GC/MS (8260)		
Chloromethane	ug/l	<1.0
Bromomethane (Methyl bromide)	ug/l	<1.0
Vinyl chloride	ug/l	<1.0
Chloroethane	ug/l	<1.0
Methylene chloride (Dichloromethane)	ug/l	<5.0
Acetone	ug/l	<25
Carbon disulfide	ug/l	<1.0
1,1-Dichloroethene	ug/l	<1.0
1,1-Dichloroethane	ug/l	<1.0
cis-1,2-Dichloroethene	ug/l	<1.0
trans-1,2-Dichloroethene	ug/l	<1.0
Chloroform	ug/l	<1.0
1,2-Dichloroethane	ug/l	<1.0
2-Butanone (MEK)	ug/l	<10
1,1,1-Trichloroethane	ug/l	<1.0
Carbon tetrachloride	ug/l	<1.0
Bromodichloromethane	ug/l	<1.0
1,1,2,2-Tetrachloroethane	ug/l	<1.0
1,2-Dichloropropane	ug/l	<1.0
trans-1,3-Dichloropropene	ug/l	<1.0
Trichloroethene	ug/l	<1.0
Dibromochloromethane	ug/l	<1.0
1,1,2-Trichloroethane	ug/l	<1.0
Benzene	ug/l	<1.0
cis-1,3-Dichloropropene	ug/l	<1.0
Bromoform	ug/l	<1.0
2-Hexanone	ug/l	<10
4-Methyl-2-pentanone (MIBK)	ug/l	<10
Tetrachloroethene	ug/l	<1.0
Toluene	ug/l	<1.0
Chlorobenzene	ug/l	<1.0
Ethylbenzene	ug/l	<1.0
Styrene	ug/l	3.0
Xylenes, Total	ug/l	<2.0
Surrogate - Toluene-d8 *	%	98 %

Analytical Data Report

Lab Sample ID	Description	Matrix	Date Received	Date Sampled	SDG#
85495-6	MW-10	Liquid	07/17/03	07/16/03 15:20	

Parameter	Units	Lab Sample IDs 85495-6
Volatiles by GC/MS (8260)		
Surrogate - 4-Bromofluorobenzene *	%	98 %
Surrogate - Dibromofluoromethane *	%	102 %
Dilution Factor		1
Prep Date		07/21/03
Analysis Date		07/21/03
Batch ID		1P0721
Ammonia (as N) (350.1)		
Ammonia (as N)	mg/l	0.10
Dilution Factor		1
Prep Date		07/21/03
Analysis Date		07/21/03
Batch ID		0721A
Biochemical Oxygen Demand (5 Day) (405.1/5210B)		
Biochemical Oxygen Demand (5 Day)	mg/l	<2.0
Dilution Factor		1
Prep Date		07/17/03
Analysis Date		07/17/03
Batch ID		0717A
Chloride (325.2)		
Chloride	mg/l	3.3
Dilution Factor		1
Prep Date		07/24/03
Analysis Date		07/24/03
Batch ID		0724B

Analytical Data Report

Lab Sample ID	Description	Matrix	Date Received	Date Sampled	SDG#
85495-6	MW-10	Liquid	07/17/03	07/16/03 15:20	

Parameter	Units	Lab Sample IDs 85495-6
Iron, Ferrous (2+) (SM3500)		
Iron, Ferrous (2+)	mg/l	<0.10
Dilution Factor		1
Prep Date		07/17/03
Analysis Date		07/17/03
Batch ID		0717A
Iron (6010)		
Iron	mg/l	0.069
Dilution Factor		1
Prep Date		07/18/03
Analysis Date		07/23/03
Batch ID		0718L
Iron (Dissolved) (6010)		
Iron (Dissolved)	mg/l	<0.050
Dilution Factor		1
Prep Date		07/18/03
Analysis Date		07/23/03
Batch ID		0718L
Manganese (6010)		
Manganese	mg/l	<0.010
Dilution Factor		1
Prep Date		07/18/03
Analysis Date		07/23/03
Batch ID		0718L
Manganese (Dissolved) (6010)		
Manganese (Dissolved)	mg/l	<0.010
Dilution Factor		1
Prep Date		07/18/03
Analysis Date		07/23/03
Batch ID		0718L

Analytical Data Report

Lab Sample ID	Description	Matrix	Date Received	Date Sampled	SDG#
85495-6	MW-10	Liquid	07/17/03	07/16/03 15:20	

Parameter	Units	Lab Sample IDs 85495-6
Nitrate-N (353.2)		
Nitrate-N	mg/l	3.8
Dilution Factor		5
Prep Date		07/18/03
Analysis Date		07/18/03
Batch ID		0728A
Nitrite-N (353.2)		
Nitrite-N	mg/l	<0.050
Dilution Factor		1
Prep Date		07/18/03
Analysis Date		07/18/03
Batch ID		0718A
Sulfide (376.1)		
Sulfide	mg/l	<1.0
Dilution Factor		1
Prep Date		07/17/03
Analysis Date		07/17/03
Batch ID		0717A
Alkalinity (to pH 4.5) as CaCO3 (310.1)		
Alkalinity (to pH 4.5) as CaCO3	mg/l	260
Dilution Factor		1
Prep Date		07/24/03
Analysis Date		07/24/03
Batch ID		0724A
Sodium (6010)		
Sodium	mg/l	13
Dilution Factor		1
Prep Date		07/18/03
Analysis Date		07/23/03
Batch ID		0718L

Analytical Data Report

Lab Sample ID	Description	Matrix	Date Received	Date Sampled	SDG#
85495-6	MW-10	Liquid	07/17/03	07/16/03 15:20	

Parameter	Units	Lab Sample IDs 85495-6
Calcium (6010)		
Calcium	mg/l	97
Dilution Factor		1
Prep Date		07/18/03
Analysis Date		07/23/03
Batch ID		0718L
Potassium (6010)		
Potassium	mg/l	3.4
Dilution Factor		1
Prep Date		07/18/03
Analysis Date		07/23/03
Batch ID		0718L
Magnesium (6010)		
Magnesium	mg/l	11
Dilution Factor		1
Prep Date		07/18/03
Analysis Date		07/23/03
Batch ID		0718L
Sulfate as SO4 (375.4)		
Sulfate as SO4	mg/l	26
Dilution Factor		2
Prep Date		07/24/03
Analysis Date		07/24/03
Batch ID		0724A
Dissolved Gases (RSK-175)		
Methane	ug/l	0.72
Ethene	ug/l	<0.33
Carbon Dioxide	ug/l	56000
Total Nitrogen	ug/l	5000

Analytical Data Report

Lab Sample ID	Description	Matrix	Date Received	Date Sampled	SDG#
85495-6	MW-10	Liquid	07/17/03	07/16/03 15:20	

Parameter	Units	Lab Sample IDs 85495-6
Dissolved Gases (RSK-175)		
Carbon Monoxide	ug/l	<82
Ethane	ug/l	<0.35
Dilution Factor		1
Prep Date		07/28/03
Analysis Date		07/28/03
Batch ID		1C0728
Total Organic Carbon (415.1)		
Total Organic Carbon	mg/l	<1.0
Dilution Factor		1
Prep Date		07/27/03
Analysis Date		07/28/03
Batch ID		0727B

Analytical Data Report

Lab Sample ID	Description	Matrix	Date Received	Date Sampled	SDG#
85495-7	Trip Blank 030716	Liquid	07/17/03	07/16/03	

Parameter	Units	Lab Sample IDs 85495-7
Volatiles by GC/MS (8260)		
Chloromethane	ug/l	<1.0
Bromomethane (Methyl bromide)	ug/l	<1.0
Vinyl chloride	ug/l	<1.0
Chloroethane	ug/l	<1.0
Methylene chloride (Dichloromethane)	ug/l	<5.0
Acetone	ug/l	<25
Carbon disulfide	ug/l	<1.0
1,1-Dichloroethene	ug/l	<1.0
1,1-Dichloroethane	ug/l	<1.0
cis-1,2-Dichloroethene	ug/l	<1.0
trans-1,2-Dichloroethene	ug/l	<1.0
Chloroform	ug/l	<1.0
1,2-Dichloroethane	ug/l	<1.0
2-Butanone (MEK)	ug/l	<10
1,1,1-Trichloroethane	ug/l	<1.0
Carbon tetrachloride	ug/l	<1.0
Bromodichloromethane	ug/l	<1.0
1,1,2,2-Tetrachloroethane	ug/l	<1.0
1,2-Dichloropropane	ug/l	<1.0
trans-1,3-Dichloropropene	ug/l	<1.0
Trichloroethene	ug/l	<1.0
Dibromochloromethane	ug/l	<1.0
1,1,2-Trichloroethane	ug/l	<1.0
Benzene	ug/l	<1.0
cis-1,3-Dichloropropene	ug/l	<1.0
Bromoform	ug/l	<1.0
2-Hexanone	ug/l	<10
4-Methyl-2-pentanone (MIBK)	ug/l	<10
Tetrachloroethene	ug/l	<1.0
Toluene	ug/l	<1.0
Chlorobenzene	ug/l	<1.0
Ethylbenzene	ug/l	<1.0
Styrene	ug/l	3.2
Xylenes, Total	ug/l	<2.0
Surrogate - Toluene-d8 *	%	98 %

Analytical Data Report

Lab Sample ID	Description	Matrix	Date Received	Date Sampled	SDG#
85495-7	Trip Blank 030716	Liquid	07/17/03	07/16/03	

Parameter	Units	Lab Sample IDs 85495-7
Volatiles by GC/MS (8260)		
Surrogate - 4-Bromofluorobenzene *	%	98 %
Surrogate - Dibromofluoromethane *	%	100 %
Dilution Factor		1
Prep Date		07/22/03
Analysis Date		07/22/03
Batch ID		1P0722

Analytical Data Report

Lab Sample ID	Description	Matrix	Date Received	Date Sampled	SDG#
85495-8	Method Blank	Liquid	07/17/03		
85495-9	Lab Control Standard % Recovery	Liquid	07/17/03		
85495-10	LCS Accuracy Control Limit (%R)	Liquid	07/17/03		

Parameter	Units	Lab Sample IDs 85495-8	85495-9	85495-10
Volatiles by GC/MS (8260)				
Chloromethane	ug/l	<1.0		
Bromomethane (Methyl bromide)	ug/l	<1.0		
Vinyl chloride	ug/l	<1.0		
Chloroethane	ug/l	<1.0		
Methylene chloride (Dichloromethane)	ug/l	<5.0		
Acetone	ug/l	<25		
Carbon disulfide	ug/l	<1.0		
1,1-Dichloroethene	ug/l	<1.0	98 %	53-144 %
1,1-Dichloroethane	ug/l	<1.0		
cis-1,2-Dichloroethene	ug/l	<1.0		
trans-1,2-Dichloroethene	ug/l	<1.0		
Chloroform	ug/l	<1.0		
1,2-Dichloroethane	ug/l	<1.0		
2-Butanone (MEK)	ug/l	<10		
1,1,1-Trichloroethane	ug/l	<1.0		
Carbon tetrachloride	ug/l	<1.0		
Bromodichloromethane	ug/l	<1.0		
1,1,2,2-Tetrachloroethane	ug/l	<1.0		
1,2-Dichloropropane	ug/l	<1.0		
trans-1,3-Dichloropropene	ug/l	<1.0		
Trichloroethene	ug/l	<1.0	98 %	70-123 %
Dibromochloromethane	ug/l	<1.0		
1,1,2-Trichloroethane	ug/l	<1.0		
Benzene	ug/l	<1.0	96 %	69-128 %
cis-1,3-Dichloropropene	ug/l	<1.0		
Bromoform	ug/l	<1.0		
2-Hexanone	ug/l	<10		
4-Methyl-2-pentanone (MIBK)	ug/l	<10		
Tetrachloroethene	ug/l	<1.0		
Toluene	ug/l	<1.0	80 %	71-129 %
Chlorobenzene	ug/l	<1.0	100 %	72-126 %
Ethylbenzene	ug/l	<1.0		
Styrene	ug/l	<1.0		

Analytical Data Report

Lab Sample ID	Description	Matrix	Date Received	Date Sampled	SDG#
85495-8	Method Blank	Liquid	07/17/03		
85495-9	Lab Control Standard % Recovery	Liquid	07/17/03		
85495-10	LCS Accuracy Control Limit (%R)	Liquid	07/17/03		

Parameter	Units	Lab Sample IDs 85495-8	85495-9	85495-10
Volatiles by GC/MS (8260)				
Xylenes, Total	ug/l	<2.0		
Surrogate - Toluene-d8 *	%	100 %	74 %	74-122 %
Surrogate - 4-Bromofluorobenzene *	%	102 %	98 %	70-119 %
Surrogate - Dibromofluoromethane *	%	98 %	98 %	68-129 %
Dilution Factor		1	1	
Prep Date		07/21/03	07/21/03	
Analysis Date		07/21/03	07/21/03	
Batch ID		1P0721	1P0721	
Ammonia (as N) (350.1)				
Ammonia (as N)	mg/l	<0.030	97 %	85-115 %
Dilution Factor		1	1	
Prep Date		07/21/03	07/21/03	
Analysis Date		07/21/03	07/21/03	
Batch ID		0721A	0721A	
Biochemical Oxygen Demand (5 Day) (405.1/5210B)				
Biochemical Oxygen Demand (5 Day)	mg/l	<2.0	93 %	85-115 %
Dilution Factor		1	1	
Prep Date		07/17/03	07/17/03	
Analysis Date		07/17/03	07/17/03	
Batch ID		0717A	0717A	
Chloride (325.2)				
Chloride	mg/l	<1.0	96 %	85-115 %
Dilution Factor		1	1	
Prep Date		07/24/03	07/24/03	
Analysis Date		07/24/03	07/24/03	
Batch ID		0724B	0724B	

Analytical Data Report

Lab Sample ID	Description	Matrix	Date Received	Date Sampled	SDG#
85495-8	Method Blank	Liquid	07/17/03		
85495-9	Lab Control Standard % Recovery	Liquid	07/17/03		
85495-10	LCS Accuracy Control Limit (%R)	Liquid	07/17/03		

Parameter	Units	Lab Sample IDs 85495-8	85495-9	85495-10
Iron, Ferrous (2+) (SM3500)				
Iron, Ferrous (2+)	mg/l	<0.10	109 %	85-115 %
Dilution Factor		1	1	
Prep Date		07/17/03	07/17/03	
Analysis Date		07/17/03	07/17/03	
Batch ID		0717A	0717A	
Iron (6010)				
Iron	mg/l	<0.050	104 %	75-125 %
Dilution Factor		1	1	
Prep Date		07/18/03	07/18/03	
Analysis Date		07/22/03	07/22/03	
Batch ID		0718L	0718L	
Iron (Dissolved) (6010)				
Iron (Dissolved)	mg/l	<0.050	104 %	75-125 %
Dilution Factor		1	1	
Prep Date		07/18/03	07/18/03	
Analysis Date		07/22/03	07/22/03	
Batch ID		0718L	0718L	
Manganese (6010)				
Manganese	mg/l	<0.010	110 %	75-125 %
Dilution Factor		1	1	
Prep Date		07/18/03	07/18/03	
Analysis Date		07/22/03	07/22/03	
Batch ID		0718L	0718L	
Manganese (Dissolved) (6010)				
Manganese (Dissolved)	mg/l	<0.010	110 %	75-125 %
Dilution Factor		1	1	
Prep Date		07/18/03	07/18/03	
Analysis Date		07/22/03	07/22/03	
Batch ID		0718L	0718L	

Analytical Data Report

Lab Sample ID	Description	Matrix	Date Received	Date Sampled	SDG#
85495-8	Method Blank	Liquid	07/17/03		
85495-9	Lab Control Standard % Recovery	Liquid	07/17/03		
85495-10	LCS Accuracy Control Limit (%R)	Liquid	07/17/03		

Parameter	Units	Lab Sample IDs 85495-8	85495-9	85495-10
Nitrate-N (353.2)				
Nitrate-N	mg/l	<0.050	104 %	80-120 %
Dilution Factor		1	1	
Prep Date		07/18/03	07/18/03	
Analysis Date		07/28/03	07/28/03	
Batch ID		0728A	0728A	
Nitrite-N (353.2)				
Nitrite-N	mg/l	<0.050	98 %	80-120 %
Dilution Factor		1	1	
Prep Date		07/18/03	07/18/03	
Analysis Date		07/18/03	07/18/03	
Batch ID		0718A	0718A	
Sulfide (376.1)				
Sulfide	mg/l	<1.0	95 %	75-125 %
Dilution Factor		1	1	
Prep Date		07/17/03	07/17/03	
Analysis Date		07/17/03	07/17/03	
Batch ID		0717A	0717A	
Alkalinity (to pH 4.5) as CaCO3 (310.1)				
Alkalinity (to pH 4.5) as CaCO3	mg/l as CaCO	<1.0	102 %	80-120 %
Dilution Factor		1	1	
Prep Date		07/24/03	07/24/03	
Analysis Date		07/24/03	07/24/03	
Batch ID		0724A	0724A	

Analytical Data Report

Lab Sample ID	Description	Matrix	Date Received	Date Sampled	SDG#
85495-8	Method Blank	Liquid	07/17/03		
85495-9	Lab Control Standard % Recovery	Liquid	07/17/03		
85495-10	LCS Accuracy Control Limit (%R)	Liquid	07/17/03		

Parameter	Units	Lab Sample IDs 85495-8	85495-9	85495-10
Sodium (6010)				
Sodium	mg/l	<0.50	103 %	75-125 %
Dilution Factor		1	1	
Prep Date		07/18/03	07/18/03	
Analysis Date		07/22/03	07/22/03	
Batch ID		0718L	0718L	
Calcium (6010)				
Calcium	mg/l	<0.50	106 %	75-125 %
Dilution Factor		1	1	
Prep Date		07/18/03	07/18/03	
Analysis Date		07/22/03	07/22/03	
Batch ID		0718L	0718L	
Potassium (6010)				
Potassium	mg/l	<1.0	108 %	75-125 %
Dilution Factor		1	1	
Prep Date		07/18/03	07/18/03	
Analysis Date		07/22/03	07/22/03	
Batch ID		0718L	0718L	
Magnesium (6010)				
Magnesium	mg/l	<0.50	104 %	75-125 %
Dilution Factor		1	1	
Prep Date		07/18/03	07/18/03	
Analysis Date		07/22/03	07/22/03	
Batch ID		0718L	0718L	
Sulfate as SO4 (375.4)				
Sulfate as SO4	mg/l	<5.0	113 %	75-125 %
Dilution Factor		1	1	
Prep Date		07/24/03	07/24/03	
Analysis Date		07/24/03	07/24/03	
Batch ID		0724A	0724A	

Analytical Data Report

Lab Sample ID	Description	Matrix	Date Received	Date Sampled	SDG#
85495-8	Method Blank	Liquid	07/17/03		
85495-9	Lab Control Standard % Recovery	Liquid	07/17/03		
85495-10	LCS Accuracy Control Limit (%R)	Liquid	07/17/03		

Parameter	Units	Lab Sample IDs 85495-8	85495-9	85495-10
Dissolved Gases (RSK-175)				
Methane	ug/l	<0.19	86 %	75-125 %
Ethene	ug/l	<0.33	100 %	75-125 %
Carbon Dioxide	ug/l	<2600	95 %	75-125 %
Total Nitrogen	ug/l	<2000	*	*
Carbon Monoxide	ug/l	<82	*	*
Ethane	ug/l	<0.35		
Dilution Factor		1	1	
Prep Date		07/22/03	07/22/03	
Analysis Date		07/22/03	07/22/03	
Batch ID		2C0722	2C0722	
Total Organic Carbon (415.1)				
Total Organic Carbon	mg/l	<1.0	87 %	80-120 %
Dilution Factor		1	1	
Prep Date		07/27/03	07/27/03	
Analysis Date		07/27/03	07/27/03	
Batch ID		0727B	0727B	

Analytical Data Report

Lab Sample ID	Description	Matrix	Date Received	Date Sampled	SDG#
85495-11	Matrix Spike % Recovery (MW-13)	Liquid	07/17/03		
85495-12	Matrix Spike Duplicate % Recovery (MW-13)	Liquid	07/17/03		

Parameter	Units	Lab Sample IDs 85495-11	85495-12
Volatiles by GC/MS (8260)			
1,1-Dichloroethene	%	102 %	108 %
Trichloroethene	%	108 %	110 %
Benzene	%	108 %	108 %
Toluene	%	86 %	112 %
Chlorobenzene	%	106 %	112 %
Surrogate - Toluene-d8 *	%	76 %	102 %
Surrogate - 4-Bromofluorobenzene *	%	102 %	106 %
Surrogate - Dibromofluoromethane *	%	104 %	108 %
Dilution Factor		1	1
Prep Date		07/21/03	07/21/03
Analysis Date		07/21/03	07/21/03
Batch ID		1P0721	1P0721
Ammonia (as N) (350.1)			
Ammonia (as N)	%	68 %*F73	68 %*F73
Dilution Factor		1	1
Prep Date		07/21/03	07/21/03
Analysis Date		07/21/03	07/21/03
Batch ID		0721A	0721A
Chloride (325.2)			
Chloride	%	100 %	100 %
Dilution Factor		1	1
Prep Date		07/24/03	07/24/03
Analysis Date		07/24/03	07/24/03
Batch ID		0724B	0724B
Iron, Ferrous (2+) (SM3500)			
Iron, Ferrous (2+)	%	98%	98%
Dilution Factor		1	1
Prep Date		07/18/03	07/18/03
Analysis Date		07/18/03	07/18/03
Batch ID		0718A	0718A

Analytical Data Report

Lab Sample ID	Description	Matrix	Date Received	Date Sampled	SDG#
85495-11	Matrix Spike % Recovery (MW-13)	Liquid	07/17/03		
85495-12	Matrix Spike Duplicate % Recovery (MW-13)	Liquid	07/17/03		

Parameter	Units	Lab Sample IDs 85495-11	85495-12
Iron (6010)			
Iron	%	103 %	102 %
Dilution Factor		1	1
Prep Date		07/18/03	07/18/03
Analysis Date		07/23/03	07/23/03
Batch ID		0718L	0718L
Iron (Dissolved) (6010)			
Iron (Dissolved)	%	102 %	102 %
Dilution Factor		1	1
Prep Date		07/18/03	07/18/03
Analysis Date		07/23/03	07/23/03
Batch ID		0718L	0718L
Manganese (6010)			
Manganese	%	108 %	105 %
Dilution Factor		1	1
Prep Date		07/18/03	07/18/03
Analysis Date		07/23/03	07/23/03
Batch ID		0718L	0718L
Manganese (Dissolved) (6010)			
Manganese (Dissolved)	%	109 %	111 %
Dilution Factor		1	1
Prep Date		07/18/03	07/18/03
Analysis Date		07/23/03	07/23/03
Batch ID		0718L	0718L
Nitrate-N (353.2)			
Nitrate-N	%	97 %	96 %
Dilution Factor		1	1
Prep Date		07/18/03	07/18/03
Analysis Date		07/28/03	07/28/03
Batch ID		0728A	0728A

Analytical Data Report

Lab Sample ID	Description	Matrix	Date Received	Date Sampled	SDG#
85495-11	Matrix Spike % Recovery (MW-13)	Liquid	07/17/03		
85495-12	Matrix Spike Duplicate % Recovery (MW-13)	Liquid	07/17/03		

Parameter	Units	Lab Sample IDs 85495-11	85495-12
Nitrite-N (353.2)			
Nitrite-N	%	102 %	102 %
Dilution Factor		1	1
Prep Date		07/18/03	07/18/03
Analysis Date		07/18/03	07/18/03
Batch ID		0718A	0718A
Sulfide (376.1)			
Sulfide	%	86 %	93 %
Dilution Factor		1	1
Prep Date		07/17/03	07/17/03
Analysis Date		07/17/03	07/17/03
Batch ID		0717A	0717A
Sodium (6010)			
Sodium	%	117 %	110 %
Dilution Factor		1	1
Prep Date		07/18/03	07/18/03
Analysis Date		07/23/03	07/23/03
Batch ID		0718L	0718L
Calcium (6010)			
Calcium	%	139 %*F61	87 %
Dilution Factor		1	1
Prep Date		07/18/03	07/18/03
Analysis Date		07/23/03	07/23/03
Batch ID		0718L	0718L
Potassium (6010)			
Potassium	%	112 %	112 %
Dilution Factor		1	1
Prep Date		07/18/03	07/18/03
Analysis Date		07/23/03	07/23/03
Batch ID		0718L	0718L

Analytical Data Report

Lab Sample ID	Description	Matrix	Date Received	Date Sampled	SDG#
85495-11	Matrix Spike % Recovery (MW-13)	Liquid	07/17/03		
85495-12	Matrix Spike Duplicate % Recovery (MW-13)	Liquid	07/17/03		

Parameter	Units	Lab Sample IDs 85495-11	85495-12
Magnesium (6010)			
Magnesium	%	120 %	97 %
Dilution Factor		1	1
Prep Date		07/18/03	07/18/03
Analysis Date		07/23/03	07/23/03
Batch ID		0718L	0718L
Sulfate as SO4 (375.4)			
Sulfate as SO4	%	74 %	78 %
Dilution Factor		5	5
Prep Date		07/24/03	07/24/03
Analysis Date		07/24/03	07/24/03
Batch ID		0724A	0724A
Dissolved Gases (RSK-175)			
Methane	%	86 %	91 %
Ethene	%	125 %	131 %
Carbon Dioxide	%	*	*
Total Nitrogen	%	*	*
Carbon Monoxide	%	*	*
Ethane	%	190 %	210 %
Dilution Factor		1	1
Prep Date		07/29/03	07/29/03
Analysis Date		07/29/03	07/29/03
Batch ID		1C0728	1C0728
Total Organic Carbon (415.1)			
Total Organic Carbon	%	100 %	100 %
Dilution Factor		1	1
Prep Date		07/27/03	07/27/03
Analysis Date		07/28/03	07/28/03
Batch ID		0727B	0727B

These test results meet all the requirements of NELAC. All questions regarding this test report should be directed to the STL Project Manager who signed this test report.

New York Lab ID#10842

*F61 = The recoveries of the matrix spikes are outside advisory limits due to the abundance of the target analyte in the sample.ú

*F73 = Matrix spike recoveries were outside advisory limits due to matrix interference present in the sample.ú

Serial Number 09961

ANALYSIS REQUES **O CHAIN OF CUSTODY RECORD**

SEVERN TRENT **STL**

ST Savannah
51? LaRoche Avenue
Savnnah, GA 31404
Website: www.stl-inm
Phone: (912) 354-3
Fax: (912) 352-01?

○ Alternate Laboratory Name/Location
Phone:
Fax:

PROJECT REFERENCE: RENSSELAER	PROJECT: 376	PROJECT LOCATION (STATE): NY	
STL (LAB) PROJECT MANAGER: KARL HALL	P.O. NUM:	CONTRACT NO.:	
CLIENT (SITE) PM: RICK CENTRY	CLIENT PH: 614-7?	CLIENT FAX: 614 790 6232	
CLIENT NAME: ASHLAND CHEMICAL	CLIENT E-M: RGENTR	SHLAND.COM	
CLIENT ADDRESS: 5200 BLAZER PK WAY DUBL		OHIO	
COMPANY CONTRACTING THIS WORK (if applicable)			

SAMPLE DATE	SAMPLE TIME	SAM	NTIFICATION	MATRIX TYPE: COMPOSITE (C) OR GRAB (G) INDICATE	AQUEOUS (WATER)	SOIL OR SEMISOLID	AIR	NONAQUEOUS (OIL, SOLVENT,...)	REQUIRED ANALYSIS: ICP Diss Mn,Fe	ICP Diss Fe+2	Alkalinity T.Mn, Fe, N, Ca, K, Mg	ICP Diss Ca,Na,Mn,Alk,Cl,SO4	HCL TDC	ICP Diss Cl,SO4	Sulfide H2S	ICP 300	HCL Vol's (8260)	H2SO4/HNO3/NaOH	PAG	CF
16JUL03	0900	MW-1		G					1	1	1	1	1	1	1	1	3	2		
16JUL03	1103	MW-19		G	X				1	1	1	1	1	1	1	1	3	3		
16JUL03	1225	MW-15		G	X				1	1	1	1	1	1	1	1	3	2		
16JUL03	1405	MW-13		G	X				1	1	1	1	1	1	1		3	3		
16JUL03	1405	MS030716		G	X				1	1	1	1	1	1	1	1	3	3		
16JUL03	1405	MSD030716		G	X				1	1	1	1	1	1	1	1	3	3		
16JUL03	—	DUP030716		G	X				1	1	1	1	1	1	1	1	3	3		
—	—	TRIP BLANK-030716		G	X												3			
16JUL03	1520	MW-1		G	X				1	1	1	1	1	1	1	1	3	3		

STANDARD REPORT DELIVERY ●
DATE DUE 2WKS M.L
EXPEDITED REPORT DELIVERY (SURCHARGE) ○
DATE DUE
NUMBER OF COOLERS SUBMITTED PER SHIPMENT

REMARKS
BRUCE VAL FOR
DISS Mn, FE
MW-1
MS/MSD FOR MW13
QUESTIONS REGARDING
CONTACT JOHN SHIVE
OF US AT
CELL 518-791-3733
OFFICE 518-464-0015

RELINQUISHED BY: (SIGNATURE)	DATE	TIME	RELINQUISHED BY: (SIGNATURE)	DATE	TIME	RELINQUISHED BY: (SIGNATURE)	DATE	TIME
				16JUL03	1600			
RECEIVED BY: (SIGNATURE)	DATE	TIME	RECEIVED BY: (SIGNATURE)	DATE	TIME	RECEIVED BY: (SIGNATURE)	DATE	TIME
	16JUL03	1600						

LABORATORY USE ONLY

RECEIVED FOR LABORATORY BY: (SIGNATURE)	DATE	TIME	CUSTODY INTACT YES ○ NO ○	CUSTODY SEAL NO.	STL SAVANNAH LOG NO.	LABORATORY REMARKS
M.Hanley	7/17/03	921			5385495	

SEVERN TRENT STL

STL Savannah 5102 LaRoche Avenue - Savannah GA 31404 Telephone:(912) 354-7858 Fax:(912) 351-3673

Analytical Report

For: Mr. Greg Gilbertsen
Ashland Inc.
5200 Blazer Parkway
Dublin, OH 43017
CC: Dave Blaushild

Order Number: S385445
SDG Number:
Client Project ID: 37679253
Project: Ashland - Rensselaer, Ny
Report Date: 07/29/2003
Sampled By: Client
Sample Received Date: 07/16/2003
Requisition Number:

Steven J. White, Project Manager
swhite@stl-inc.com

The test results in this report meet all NELAP requirements for parameters for which accreditation is required or available. Any exceptions to NELAP requirements are noted in this report. Pursuant to NELAP, this report may not be reproduced, except in full, without the written approval of the laboratory.

Sample Summary

Order: S385445
Date Received: 07/16/2003

Client: Ashland Inc.
Project: Ashland - Rensselaer, Ny

Client Sample ID	Lab Sample ID	Matrix	Date Sampled
MW-18S	S385445*1	Liquid	07/15/2003 09:20
MW-16	S385445*2	Liquid	07/15/2003 10:45
MW-17	S385445*3	Liquid	07/15/2003 13:05
MW-14	S385445*4	Liquid	07/15/2003 14:35
SUMP	S385445*5	Liquid	07/15/2003 15:15
MW-3	S385445*6	Liquid	07/15/2003 15:30
TB030715	S385445*7	Liquid	07/15/2003

Analytical Data Report

Lab Sample ID	Description	Matrix	Date Received	Date Sampled	SDG#
85445-1	MW-18S	Liquid	07/16/03	07/15/03 09:20	
85445-2	MW-16	Liquid	07/16/03	07/15/03 10:45	
85445-3	MW-17	Liquid	07/16/03	07/15/03 13:05	
85445-4	MW-14	Liquid	07/16/03	07/15/03 14:35	
85445-5	SUMP	Liquid	07/16/03	07/15/03 15:15	

Parameter	Units	Lab Sample IDs 85445-1	85445-2	85445-3	85445-4	85445-5
Volatiles by GC/MS (8260)						
Chloromethane	ug/l	<10	<5.0	<1.0	<1.0	<1.0
Bromomethane (Methyl bromide)	ug/l	<10	<5.0	<1.0	<1.0	<1.0
Vinyl chloride	ug/l	220	20	<1.0	<1.0	2.5
Chloroethane	ug/l	<10	<5.0	<1.0	<1.0	<1.0
Methylene chloride (Dichloromethane)	ug/l	<50	<25	<5.0	<5.0	<5.0
Acetone	ug/l	<250	<120	<25	<25	<25
Carbon disulfide	ug/l	<10	<5.0	<1.0	<1.0	<1.0
1,1-Dichloroethene	ug/l	<10	<5.0	<1.0	<1.0	<1.0
1,1-Dichloroethane	ug/l	<10	<5.0	<1.0	<1.0	16
cis-1,2-Dichloroethene	ug/l	1000	450	<1.0	<1.0	160
trans-1,2-Dichloroethene	ug/l	23	9.1	<1.0	<1.0	4.0
Chloroform	ug/l	<10	<5.0	<1.0	<1.0	<1.0
1,2-Dichloroethane	ug/l	58	6.1	<1.0	<1.0	2.8
2-Butanone (MEK)	ug/l	<100	<50	<10	<10	<10
1,1,1-Trichloroethane	ug/l	<10	<5.0	<1.0	<1.0	12
Carbon tetrachloride	ug/l	<10	<5.0	<1.0	<1.0	<1.0
Bromodichloromethane	ug/l	<10	<5.0	<1.0	<1.0	<1.0
1,1,2,2-Tetrachloroethane	ug/l	<10	<5.0	<1.0	<1.0	<1.0
1,2-Dichloropropane	ug/l	<10	<5.0	<1.0	<1.0	<1.0
trans-1,3-Dichloropropene	ug/l	<10	<5.0	<1.0	<1.0	<1.0
Trichloroethene	ug/l	<10	32	<1.0	<1.0	10
Dibromochloromethane	ug/l	<10	<5.0	<1.0	<1.0	<1.0
1,1,2-Trichloroethane	ug/l	<10	<5.0	<1.0	<1.0	<1.0
Benzene	ug/l	<10	<5.0	<1.0	<1.0	<1.0
cis-1,3-Dichloropropene	ug/l	<10	<5.0	<1.0	<1.0	<1.0
Bromoform	ug/l	<10	<5.0	<1.0	<1.0	<1.0
2-Hexanone	ug/l	<100	<50	<10	<10	<10
4-Methyl-2-pentanone (MIBK)	ug/l	<100	<50	<10	<10	<10
Tetrachloroethene	ug/l	<10	<5.0	<1.0	1.3	3.4
Toluene	ug/l	<10	<5.0	<1.0	<1.0	<1.0
Chlorobenzene	ug/l	<10	<5.0	<1.0	<1.0	<1.0

Analytical Data Report

Lab Sample ID	Description	Matrix	Date Received	Date Sampled	SDG#
85445-1	MW-18S	Liquid	07/16/03	07/15/03 09:20	
85445-2	MW-16	Liquid	07/16/03	07/15/03 10:45	
85445-3	MW-17	Liquid	07/16/03	07/15/03 13:05	
85445-4	MW-14	Liquid	07/16/03	07/15/03 14:35	
85445-5	SUMP	Liquid	07/16/03	07/15/03 15:15	

Parameter	Units	Lab Sample IDs 85445-1	85445-2	85445-3	85445-4	85445-5
Volatiles by GC/MS (8260)						
Ethylbenzene	ug/l	<10	<5.0	<1.0	<1.0	<1.0
Styrene	ug/l	19	10	<1.0	2.0	2.2
Xylenes, Total	ug/l	<20	<10	<2.0	<2.0	<2.0
Surrogate - Toluene-d8 *	%	84 %	84 %	76 %	80 %	80 %
Surrogate - 4-Bromofluorobenzene *	%	98 %	98 %	100 %	98 %	98 %
Surrogate - Dibromofluoromethane *	%	104 %	102 %	102 %	104 %	102 %
Dilution Factor		10	5	1	1	1
Prep Date		07/21/03	07/21/03	07/21/03	07/21/03	07/21/03
Analysis Date		07/21/03	07/21/03	07/21/03	07/21/03	07/21/03
Batch ID		1P0721	1P0721	1P0721	1P0721	1P0721
Ammonia (as N) (350.1)						
Ammonia (as N)	mg/l	0.47	0.10	0.41	0.086	0.21
Dilution Factor		1	1	1	1	1
Prep Date		07/21/03	07/21/03	07/21/03	07/21/03	07/21/03
Analysis Date		07/21/03	07/21/03	07/21/03	07/21/03	07/21/03
Batch ID		0721A	0721A	0721A	0721A	0721A
Biochemical Oxygen Demand (5 Day) (405.1/5210B)						
Biochemical Oxygen Demand (5 Day)	mg/l	<2.0	<2.0	<2.0	4.7	47
Dilution Factor		1	1	1	1	1
Prep Date		07/16/03	07/16/03	07/16/03	07/16/03	07/22/03
Analysis Date		07/16/03	07/16/03	07/16/03	07/16/03	07/22/03
Batch ID		0716B	0716B	0716B	0716B	0722A

Analytical Data Report

Lab Sample ID	Description	Matrix	Date Received	Date Sampled	SDG#
85445-1	MW-18S	Liquid	07/16/03	07/15/03 09:20	
85445-2	MW-16	Liquid	07/16/03	07/15/03 10:45	
85445-3	MW-17	Liquid	07/16/03	07/15/03 13:05	
85445-4	MW-14	Liquid	07/16/03	07/15/03 14:35	
85445-5	SUMP	Liquid	07/16/03	07/15/03 15:15	

Parameter	Units	Lab Sample IDs 85445-1	85445-2	85445-3	85445-4	85445-5
Chloride (325.2)						
Chloride	mg/l	79	92	24	39	46
Dilution Factor		1	1	1	1	1
Prep Date		07/18/03	07/18/03	07/18/03	07/18/03	07/18/03
Analysis Date		07/18/03	07/18/03	07/18/03	07/18/03	07/18/03
Batch ID		0718A	0718A	0718A	0718A	0718A
Dissolved Ferrous Iron (+2) (SM3500)						
Dissolved Ferrous Iron (+2)	mg/l	<0.10	<0.10	<0.10	<0.10	<0.10
Dilution Factor		1	1	1	1	1
Prep Date		07/17/03	07/17/03	07/17/03	07/17/03	07/17/03
Analysis Date		07/17/03	07/17/03	07/17/03	07/17/03	07/17/03
Batch ID		0717A	0717A	0717A	0717A	0717A
Iron (6010)						
Iron	mg/l	0.78	0.35	13	0.23	15
Dilution Factor		1	1	1	1	1
Prep Date		07/18/03	07/18/03	07/18/03	07/18/03	07/18/03
Analysis Date		07/22/03	07/22/03	07/22/03	07/22/03	07/22/03
Batch ID		0718I	0718I	0718I	0718I	0718I
Iron (Dissolved) (6010)						
Iron (Dissolved)	mg/l	<0.050	<0.050	0.070	<0.050	<0.050
Dilution Factor		1	1	1	1	1
Prep Date		07/18/03	07/18/03	07/18/03	07/18/03	07/18/03
Analysis Date		07/22/03	07/22/03	07/22/03	07/22/03	07/22/03
Batch ID		0718I	0718I	0718I	0718I	0718I

Analytical Data Report

Lab Sample ID	Description	Matrix	Date Received	Date Sampled	SDG#
85445-1	MW-18S	Liquid	07/16/03	07/15/03 09:20	
85445-2	MW-16	Liquid	07/16/03	07/15/03 10:45	
85445-3	MW-17	Liquid	07/16/03	07/15/03 13:05	
85445-4	MW-14	Liquid	07/16/03	07/15/03 14:35	
85445-5	SUMP	Liquid	07/16/03	07/15/03 15:15	

Parameter	Units	Lab Sample IDs 85445-1	85445-2	85445-3	85445-4	85445-5
Manganese (6010)						
Manganese	mg/l	2.9	0.54	1.1	0.027	1.4
Dilution Factor		1	1	1	1	1
Prep Date		07/18/03	07/18/03	07/18/03	07/18/03	07/18/03
Analysis Date		07/22/03	07/22/03	07/22/03	07/22/03	07/22/03
Batch ID		0718I	0718I	0718I	0718I	0718I
Manganese (Dissolved) (6010)						
Manganese (Dissolved)	mg/l	2.8	0.40	1.2	<0.010	0.66
Dilution Factor		1	1	1	1	1
Prep Date		07/18/03	07/18/03	07/18/03	07/18/03	07/18/03
Analysis Date		07/22/03	07/22/03	07/22/03	07/22/03	07/22/03
Batch ID		0718I	0718I	0718I	0718I	0718I
Nitrate-N (353.2)						
Nitrate-N	mg/l	<0.050	<0.050	<0.050	0.55	0.050
Dilution Factor		1	1	1	1	1
Prep Date		07/16/03	07/16/03	07/16/03	07/16/03	07/16/03
Analysis Date		07/16/03	07/16/03	07/16/03	07/16/03	07/16/03
Batch ID		0725A	0725A	0725A	0725A	0725A
Nitrite-N (353.2)						
Nitrite-N	mg/l	<0.050	<0.050	<0.050	<0.050	<0.050
Dilution Factor		1	1	1	1	1
Prep Date		07/16/03	07/16/03	07/16/03	07/16/03	07/16/03
Analysis Date		07/16/03	07/16/03	07/16/03	07/16/03	07/16/03
Batch ID		0716A	0716A	0716A	0716A	0716A

Analytical Data Report

Lab Sample ID	Description	Matrix	Date Received	Date Sampled	SDG#
85445-1	MW-18S	Liquid	07/16/03	07/15/03 09:20	
85445-2	MW-16	Liquid	07/16/03	07/15/03 10:45	
85445-3	MW-17	Liquid	07/16/03	07/15/03 13:05	
85445-4	MW-14	Liquid	07/16/03	07/15/03 14:35	
85445-5	SUMP	Liquid	07/16/03	07/15/03 15:15	

Parameter	Units	Lab Sample IDs 85445-1	85445-2	85445-3	85445-4	85445-5
Sulfide (376.1)						
Sulfide	mg/l	<1.0	<1.0	<1.0	<1.0	<1.0
Dilution Factor		1	1	1	1	1
Prep Date		07/16/03	07/16/03	07/16/03	07/16/03	07/16/03
Analysis Date		07/16/03	07/16/03	07/16/03	07/16/03	07/16/03
Batch ID		0716A	0716A	0716A	0716A	0716A
Alkalinity (to pH 4.5) as CaCO3 (310.1)						
Alkalinity (to pH 4.5) as CaCO3	mg/l	70	58	520	310	440
Dilution Factor		10	1	1	1	10
Prep Date		07/22/03	07/22/03	07/22/03	07/22/03	07/22/03
Analysis Date		07/22/03	07/22/03	07/22/03	07/22/03	07/22/03
Batch ID		0722A	0722A	0722A	0722A	0722A
Sodium (6010)						
Sodium	mg/l	84	78	130	17	63
Dilution Factor		2	1	5	1	1
Prep Date		07/18/03	07/18/03	07/18/03	07/18/03	07/18/03
Analysis Date		07/22/03	07/22/03	07/22/03	07/22/03	07/22/03
Batch ID		0718I	0718I	0718I	0718I	0718I
Calcium (6010)						
Calcium	mg/l	210	190	230	150	160
Dilution Factor		1	1	1	1	1
Prep Date		07/18/03	07/18/03	07/18/03	07/18/03	07/18/03
Analysis Date		07/22/03	07/22/03	07/22/03	07/22/03	07/22/03
Batch ID		0718I	0718I	0718I	0718I	0718I

Analytical Data Report

Lab Sample ID	Description	Matrix	Date Received	Date Sampled	SDG#
85445-1	MW-18S	Liquid	07/16/03	07/15/03 09:20	
85445-2	MW-16	Liquid	07/16/03	07/15/03 10:45	
85445-3	MW-17	Liquid	07/16/03	07/15/03 13:05	
85445-4	MW-14	Liquid	07/16/03	07/15/03 14:35	
85445-5	SUMP	Liquid	07/16/03	07/15/03 15:15	

Parameter	Units	Lab Sample IDs 85445-1	85445-2	85445-3	85445-4	85445-5
Potassium (6010)						
Potassium	mg/l	2.9	2.1	3.0	2.8	3.6
Dilution Factor		1	1	1	1	1
Prep Date		07/18/03	07/18/03	07/18/03	07/18/03	07/18/03
Analysis Date		07/22/03	07/22/03	07/22/03	07/22/03	07/22/03
Batch ID		0718I	0718I	0718I	0718I	0718I
Magnesium (6010)						
Magnesium	mg/l	50	52	220	39	100
Dilution Factor		1	1	1	1	1
Prep Date		07/18/03	07/18/03	07/18/03	07/18/03	07/18/03
Analysis Date		07/22/03	07/22/03	07/22/03	07/22/03	07/22/03
Batch ID		0718I	0718I	0718I	0718I	0718I
Sulfate as SO4 (375.4)						
Sulfate as SO4	mg/l	190	220	870	90	240
Dilution Factor		10	10	40	6	10
Prep Date		07/21/03	07/21/03	07/21/03	07/21/03	07/21/03
Analysis Date		07/21/03	07/21/03	07/21/03	07/21/03	07/21/03
Batch ID		0721A	0721A	0721A	0721A	0721A
Dissolved Gases (RSK-175)						
Methane	ug/l	1200	120	11	1.5	0.49
Ethene	ug/l	9.3	0.77	<0.33	<0.33	<0.33
Carbon Dioxide, Free	ug/l	110000	50000	76000	65000	79000
Total Nitrogen	ug/l	<2000	<2000	<2000	2100	2800
Carbon Monoxide	ug/l	<82	<82	<82	<82	<82
Ethane	ug/l	28	3.2	<0.35	<0.35	<0.35
Dilution Factor		1	1	1	1	1
Prep Date		07/23/03	07/23/03	07/23/03	07/23/03	07/23/03
Analysis Date		07/23/03	07/23/03	07/23/03	07/23/03	07/23/03
Batch ID		2C0722	2C0722	2C0722	2C0722	2C0722

Analytical Data Report

Lab Sample ID	Description	Matrix	Date Received	Date Sampled	SDG#
85445-1	MW-18S	Liquid	07/16/03	07/15/03 09:20	
85445-2	MW-16	Liquid	07/16/03	07/15/03 10:45	
85445-3	MW-17	Liquid	07/16/03	07/15/03 13:05	
85445-4	MW-14	Liquid	07/16/03	07/15/03 14:35	
85445-5	SUMP	Liquid	07/16/03	07/15/03 15:15	

Parameter	Units	Lab Sample IDs 85445-1	85445-2	85445-3	85445-4	85445-5
Total Organic Carbon (415.1)						
Total Organic Carbon	mg/l	1.8	<0.10	<0.10	2.4	1.1
Dilution Factor		1	1	1	1	1
Prep Date		07/25/03	07/25/03	07/25/03	07/25/03	07/25/03
Analysis Date		07/25/03	07/25/03	07/25/03	07/25/03	07/25/03
Batch ID		0725A	0725A	0725A	0725A	0725A

Analytical Data Report

Lab Sample ID	Description	Matrix	Date Received	Date Sampled	SDG#
85445-6	MW-3	Liquid	07/16/03	07/15/03 15:30	

Parameter	Units	Lab Sample IDs 85445-6
Volatiles by GC/MS (8260)		
Chloromethane	ug/l	<1.0
Bromomethane (Methyl bromide)	ug/l	<1.0
Vinyl chloride	ug/l	2.9
Chloroethane	ug/l	<1.0
Methylene chloride (Dichloromethane)	ug/l	<5.0
Acetone	ug/l	<25
Carbon disulfide	ug/l	<1.0
1,1-Dichloroethene	ug/l	<1.0
1,1-Dichloroethane	ug/l	<1.0
cis-1,2-Dichloroethene	ug/l	2.4
trans-1,2-Dichloroethene	ug/l	1.3
Chloroform	ug/l	<1.0
1,2-Dichloroethane	ug/l	<1.0
2-Butanone (MEK)	ug/l	<10
1,1,1-Trichloroethane	ug/l	<1.0
Carbon tetrachloride	ug/l	<1.0
Bromodichloromethane	ug/l	<1.0
1,1,2,2-Tetrachloroethane	ug/l	<1.0
1,2-Dichloropropane	ug/l	<1.0
trans-1,3-Dichloropropene	ug/l	<1.0
Trichloroethene	ug/l	<1.0
Dibromochloromethane	ug/l	<1.0
1,1,2-Trichloroethane	ug/l	<1.0
Benzene	ug/l	<1.0
cis-1,3-Dichloropropene	ug/l	<1.0
Bromoform	ug/l	<1.0
2-Hexanone	ug/l	<10
4-Methyl-2-pentanone (MIBK)	ug/l	<10
Tetrachloroethene	ug/l	<1.0
Toluene	ug/l	<1.0
Chlorobenzene	ug/l	<1.0
Ethylbenzene	ug/l	<1.0
Styrene	ug/l	2.1
Xylenes, Total	ug/l	<2.0
Surrogate - Toluene-d8 *	%	78 %

Analytical Data Report

Lab Sample ID	Description	Matrix	Date Received	Date Sampled	SDG#
85445-6	MW-3	Liquid	07/16/03	07/15/03 15:30	

Parameter	Units	Lab Sample IDs 85445-6
Volatiles by GC/MS (8260)		
Surrogate - 4-Bromofluorobenzene *	%	100 %
Surrogate - Dibromofluoromethane *	%	102 %
Dilution Factor		1
Prep Date		07/21/03
Analysis Date		07/21/03
Batch ID		1P0721
Ammonia (as N) (350.1)		
Ammonia (as N)	mg/l	0.60
Dilution Factor		1
Prep Date		07/21/03
Analysis Date		07/21/03
Batch ID		0721A
Biochemical Oxygen Demand (5 Day) (405.1/5210B)		
Biochemical Oxygen Demand (5 Day)	mg/l	<2.0
Dilution Factor		1
Prep Date		07/16/03
Analysis Date		07/16/03
Batch ID		0716B
Chloride (325.2)		
Chloride	mg/l	14
Dilution Factor		1
Prep Date		07/18/03
Analysis Date		07/18/03
Batch ID		0718A

Analytical Data Report

Lab Sample ID	Description	Matrix	Date Received	Date Sampled	SDG#
85445-6	MW-3	Liquid	07/16/03	07/15/03 15:30	

Parameter	Units	Lab Sample IDs 85445-6
Dissolved Ferrous Iron (+2) (SM3500)		
Dissolved Ferrous Iron (+2)	mg/l	<0.10
Dilution Factor		1
Prep Date		07/17/03
Analysis Date		07/17/03
Batch ID		0717A
Iron (6010)		
Iron	mg/l	4.4
Dilution Factor		1
Prep Date		07/18/03
Analysis Date		07/22/03
Batch ID		0718I
Iron (Dissolved) (6010)		
Iron (Dissolved)	mg/l	<0.050
Dilution Factor		1
Prep Date		07/18/03
Analysis Date		07/22/03
Batch ID		0718I
Manganese (6010)		
Manganese	mg/l	0.95
Dilution Factor		1
Prep Date		07/18/03
Analysis Date		07/22/03
Batch ID		0718I
Manganese (Dissolved) (6010)		
Manganese (Dissolved)	mg/l	0.96
Dilution Factor		1
Prep Date		07/18/03
Analysis Date		07/22/03
Batch ID		0718I

Analytical Data Report

Lab Sample ID	Description	Matrix	Date Received	Date Sampled	SDG#
85445-6	MW-3	Liquid	07/16/03	07/15/03 15:30	

Parameter	Units	Lab Sample IDs 85445-6
Nitrate-N (353.2)		
Nitrate-N	mg/l	<0.050
Dilution Factor		1
Prep Date		07/16/03
Analysis Date		07/16/03
Batch ID		0725A
Nitrite-N (353.2)		
Nitrite-N	mg/l	<0.050
Dilution Factor		1
Prep Date		07/16/03
Analysis Date		07/16/03
Batch ID		0716A
Sulfide (376.1)		
Sulfide	mg/l	<1.0
Dilution Factor		1
Prep Date		07/16/03
Analysis Date		07/16/03
Batch ID		0716A
Alkalinity (to pH 4.5) as CaCO3 (310.1)		
Alkalinity (to pH 4.5) as CaCO3	mg/l	390
Dilution Factor		1
Prep Date		07/22/03
Analysis Date		07/22/03
Batch ID		0722A
Sodium (6010)		
Sodium	mg/l	26
Dilution Factor		1
Prep Date		07/18/03
Analysis Date		07/22/03
Batch ID		0718I

Analytical Data Report

Lab Sample ID	Description	Matrix	Date Received	Date Sampled	SDG#
85445-6	MW-3	Liquid	07/16/03	07/15/03 15:30	

Parameter	Units	Lab Sample IDs 85445-6
Calcium (6010)		
Calcium	mg/l	87
Dilution Factor		1
Prep Date		07/18/03
Analysis Date		07/22/03
Batch ID		0718I
Potassium (6010)		
Potassium	mg/l	3.7
Dilution Factor		1
Prep Date		07/18/03
Analysis Date		07/22/03
Batch ID		0718I
Magnesium (6010)		
Magnesium	mg/l	11
Dilution Factor		1
Prep Date		07/18/03
Analysis Date		07/22/03
Batch ID		0718I
Sulfate as SO4 (375.4)		
Sulfate as SO4	mg/l	23
Dilution Factor		1
Prep Date		07/21/03
Analysis Date		07/21/03
Batch ID		0721A
Dissolved Gases (RSK-175)		
Methane	ug/l	570
Ethene	ug/l	<0.33
Carbon Dioxide, Free	ug/l	77000
Total Nitrogen	ug/l	2200

Analytical Data Report

Lab Sample ID	Description	Matrix	Date Received	Date Sampled	SDG#
85445-6	MW-3	Liquid	07/16/03	07/15/03 15:30	

Parameter	Units	Lab Sample IDs 85445-6
Dissolved Gases (RSK-175)		
Carbon Monoxide	ug/l	<82
Ethane	ug/l	4
Dilution Factor		1
Prep Date		07/23/03
Analysis Date		07/23/03
Batch ID		2C0722
Total Organic Carbon (415.1)		
Total Organic Carbon	mg/l	1.9
Dilution Factor		1
Prep Date		07/25/03
Analysis Date		07/25/03
Batch ID		0725A

Analytical Data Report

Lab Sample ID	Description	Matrix	Date Received	Date Sampled	SDG#
85445-7	TB030715	Liquid	07/16/03	07/15/03	

Parameter	Units	Lab Sample IDs 85445-7
Volatiles by GC/MS (8260)		
Chloromethane	ug/l	<1.0
Bromomethane (Methyl bromide)	ug/l	<1.0
Vinyl chloride	ug/l	<1.0
Chloroethane	ug/l	<1.0
Methylene chloride (Dichloromethane)	ug/l	<5.0
Acetone	ug/l	<25
Carbon disulfide	ug/l	<1.0
1,1-Dichloroethene	ug/l	<1.0
1,1-Dichloroethane	ug/l	<1.0
cis-1,2-Dichloroethene	ug/l	1.5
trans-1,2-Dichloroethene	ug/l	<1.0
Chloroform	ug/l	<1.0
1,2-Dichloroethane	ug/l	<1.0
2-Butanone (MEK)	ug/l	<10
1,1,1-Trichloroethane	ug/l	<1.0
Carbon tetrachloride	ug/l	<1.0
Bromodichloromethane	ug/l	<1.0
1,1,2,2-Tetrachloroethane	ug/l	<1.0
1,2-Dichloropropane	ug/l	<1.0
trans-1,3-Dichloropropene	ug/l	<1.0
Trichloroethene	ug/l	2.8
Dibromochloromethane	ug/l	<1.0
1,1,2-Trichloroethane	ug/l	<1.0
Benzene	ug/l	<1.0
cis-1,3-Dichloropropene	ug/l	<1.0
Bromoform	ug/l	<1.0
2-Hexanone	ug/l	<10
4-Methyl-2-pentanone (MIBK)	ug/l	<10
Tetrachloroethene	ug/l	<1.0
Toluene	ug/l	<1.0
Chlorobenzene	ug/l	<1.0
Ethylbenzene	ug/l	<1.0
Styrene	ug/l	2.3
Xylenes, Total	ug/l	<2.0
Surrogate - Toluene-d8 *	%	78 %

Analytical Data Report

Lab Sample ID	Description	Matrix	Date Received	Date Sampled	SDG#
85445-7	TB030715	Liquid	07/16/03	07/15/03	

Parameter	Units	Lab Sample IDs 85445-7
Volatiles by GC/MS (8260)		
Surrogate - 4-Bromofluorobenzene *	%	98 %
Surrogate - Dibromofluoromethane *	%	96 %
Dilution Factor		1
Prep Date		07/21/03
Analysis Date		07/21/03
Batch ID		1P0721

Analytical Data Report

Lab Sample ID	Description	Matrix	Date Received	Date Sampled	SDG#
85445-8	Method Blank	Liquid	07/16/03		
85445-9	Lab Control Standard % Recovery	Liquid	07/16/03		
85445-10	LCS Accuracy Control Limit (%R)	Liquid	07/16/03		

Parameter	Units	Lab Sample IDs 85445-8	85445-9	85445-10
Volatiles by GC/MS (8260)				
Chloromethane	ug/l	<1.0		
Bromomethane (Methyl bromide)	ug/l	<1.0		
Vinyl chloride	ug/l	<1.0		
Chloroethane	ug/l	<1.0		
Methylene chloride (Dichloromethane)	ug/l	<5.0		
Acetone	ug/l	<25		
Carbon disulfide	ug/l	<1.0		
1,1-Dichloroethene	ug/l	<1.0	98 %	53-144 %
1,1-Dichloroethane	ug/l	<1.0		
cis-1,2-Dichloroethene	ug/l	<1.0		
trans-1,2-Dichloroethene	ug/l	<1.0		
Chloroform	ug/l	<1.0		
1,2-Dichloroethane	ug/l	<1.0		
2-Butanone (MEK)	ug/l	<10		
1,1,1-Trichloroethane	ug/l	<1.0		
Carbon tetrachloride	ug/l	<1.0		
Bromodichloromethane	ug/l	<1.0		
1,1,2,2-Tetrachloroethane	ug/l	<1.0		
1,2-Dichloropropane	ug/l	<1.0		
trans-1,3-Dichloropropene	ug/l	<1.0		
Trichloroethene	ug/l	<1.0	98 %	70-123 %
Dibromochloromethane	ug/l	<1.0		
1,1,2-Trichloroethane	ug/l	<1.0		
Benzene	ug/l	<1.0	96 %	69-128 %
cis-1,3-Dichloropropene	ug/l	<1.0		
Bromoform	ug/l	<1.0		
2-Hexanone	ug/l	<10		
4-Methyl-2-pentanone (MIBK)	ug/l	<10		
Tetrachloroethene	ug/l	<1.0		
Toluene	ug/l	<1.0	80 %	71-129 %
Chlorobenzene	ug/l	<1.0	100 %	72-126 %
Ethylbenzene	ug/l	<1.0		
Styrene	ug/l	<1.0		

Analytical Data Report

Lab Sample ID	Description	Matrix	Date Received	Date Sampled	SDG#
85445-8	Method Blank	Liquid	07/16/03		
85445-9	Lab Control Standard % Recovery	Liquid	07/16/03		
85445-10	LCS Accuracy Control Limit (%R)	Liquid	07/16/03		

Parameter	Units	Lab Sample IDs 85445-8	85445-9	85445-10
Volatiles by GC/MS (8260)				
Xylenes, Total	ug/l	<2.0		
Surrogate - Toluene-d8 *	%	100 %	74 %	74-122 %
Surrogate - 4-Bromofluorobenzene *	%	102 %	98 %	70-119 %
Surrogate - Dibromofluoromethane *	%	98 %	98 %	68-129 %
Dilution Factor		1	1	
Prep Date		07/21/03	07/21/03	
Analysis Date		07/21/03	07/21/03	
Batch ID		1P0721	1P0721	
Ammonia (as N) (350.1)				
Ammonia (as N)	mg/l	<0.030	97 %	85-115 %
Dilution Factor		1	1	
Prep Date		07/21/03	07/21/03	
Analysis Date		07/21/03	07/21/03	
Batch ID		0721A	0721A	
Biochemical Oxygen Demand (5 Day) (405.1/5210B)				
Biochemical Oxygen Demand (5 Day)	mg/l	<2.0	91 %	85-115 %
Dilution Factor		1	1	
Prep Date		07/16/03	07/16/03	
Analysis Date		07/16/03	07/16/03	
Batch ID		0716B	0716B	
Chloride (325.2)				
Chloride	mg/l	<1.0	101 %	85-115 %
Dilution Factor		1	1	
Prep Date		07/18/03	07/18/03	
Analysis Date		07/18/03	07/18/03	
Batch ID		0718A	0718A	

Analytical Data Report

Lab Sample ID	Description	Matrix	Date Received	Date Sampled	SDG#
85445-8	Method Blank	Liquid	07/16/03		
85445-9	Lab Control Standard % Recovery	Liquid	07/16/03		
85445-10	LCS Accuracy Control Limit (%R)	Liquid	07/16/03		

Parameter	Units	Lab Sample IDs 85445-8	85445-9	85445-10
Dissolved Ferrous Iron (+2) (SM3500)				
Dissolved Ferrous Iron (+2)	mg/l	<0.10	109%	85-115 %
Dilution Factor		1	1	
Prep Date		07/17/03	07/17/03	
Analysis Date		07/17/03	07/17/03	
Batch ID		0717A	0717A	
Iron (6010)				
Iron	mg/l	<0.050	103 %	75-125 %
Dilution Factor		1	1	
Prep Date		07/18/03	07/18/03	
Analysis Date		07/22/03	07/22/03	
Batch ID		0718I	0718I	
Iron (Dissolved) (6010)				
Iron (Dissolved)	mg/l	<0.050	103 %	75-125 %
Dilution Factor		1	1	
Prep Date		07/18/03	07/18/03	
Analysis Date		07/22/03	07/22/03	
Batch ID		0718I	0718I	
Manganese (6010)				
Manganese	mg/l	<0.010	108 %	75-125 %
Dilution Factor		1	1	
Prep Date		07/18/03	07/18/03	
Analysis Date		07/22/03	07/22/03	
Batch ID		0718I	0718I	
Manganese (Dissolved) (6010)				
Manganese (Dissolved)	mg/l	<0.010	108 %	75-125 %
Dilution Factor		1	1	
Prep Date		07/18/03	07/18/03	
Analysis Date		07/22/03	07/22/03	
Batch ID		0718I	0718I	

Analytical Data Report

Lab Sample ID	Description	Matrix	Date Received	Date Sampled	SDG#
85445-8	Method Blank	Liquid	07/16/03		
85445-9	Lab Control Standard % Recovery	Liquid	07/16/03		
85445-10	LCS Accuracy Control Limit (%R)	Liquid	07/16/03		

Parameter	Units	Lab Sample IDs 85445-8	85445-9	85445-10
Nitrate-N (353.2)				
Nitrate-N	mg/l	<0.050	107 %	80-120 %
Dilution Factor		1	1	
Prep Date		07/16/03	07/16/03	
Analysis Date		07/16/03	07/16/03	
Batch ID		0725A	0725A	
Nitrite-N (353.2)				
Nitrite-N	mg/l	<0.050	102 %	80-120 %
Dilution Factor		1	1	
Prep Date		07/16/03	07/16/03	
Analysis Date		07/16/03	07/16/03	
Batch ID		0716A	0716A	
Sulfide (376.1)				
Sulfide	mg/l	<1.0	93 %	75-125 %
Dilution Factor		1	1	
Prep Date		07/16/03	07/16/03	
Analysis Date		07/16/03	07/16/03	
Batch ID		0716A	0716AA	
Alkalinity (to pH 4.5) as CaCO3 (310.1)				
Alkalinity (to pH 4.5) as CaCO3	mg/l as CaCO	<1.0	106 %	80-120 %
Dilution Factor		1	1	
Prep Date		07/22/03	07/22/03	
Analysis Date		07/22/03	07/22/03	
Batch ID		0722A	0722A	

Analytical Data Report

Lab Sample ID	Description	Matrix	Date Received	Date Sampled	SDG#
85445-8	Method Blank	Liquid	07/16/03		
85445-9	Lab Control Standard % Recovery	Liquid	07/16/03		
85445-10	LCS Accuracy Control Limit (%R)	Liquid	07/16/03		

Parameter	Units	Lab Sample IDs 85445-8	85445-9	85445-10
Sodium (6010)				
Sodium	mg/l	<0.50	103 %	75-125 %
Dilution Factor		1	1	
Prep Date		07/18/03	07/18/03	
Analysis Date		07/22/03	07/22/03	
Batch ID		0718I	0718I	
Calcium (6010)				
Calcium	mg/l	<0.50	105 %	75-125 %
Dilution Factor		1	1	
Prep Date		07/18/03	07/18/03	
Analysis Date		07/22/03	07/22/03	
Batch ID		0718I	0718I	
Potassium (6010)				
Potassium	mg/l	<1.0	105 %	75-125 %
Dilution Factor		1	1	
Prep Date		07/18/03	07/18/03	
Analysis Date		07/22/03	07/22/03	
Batch ID		0718I	0718I	
Magnesium (6010)				
Magnesium	mg/l	<0.50	102 %	75-125 %
Dilution Factor		1	1	
Prep Date		07/18/03	07/18/03	
Analysis Date		07/22/03	07/22/03	
Batch ID		0718I	0718I	
Sulfate as SO4 (375.4)				
Sulfate as SO4	mg/l	<5.0	87 %	75-125 %
Dilution Factor		1	1	
Prep Date		07/21/03	07/21/03	
Analysis Date		07/21/03	07/21/03	
Batch ID		0721A	0721A	

Analytical Data Report

Lab Sample ID	Description	Matrix	Date Received	Date Sampled	SDG#
85445-8	Method Blank	Liquid	07/16/03		
85445-9	Lab Control Standard % Recovery	Liquid	07/16/03		
85445-10	LCS Accuracy Control Limit (%R)	Liquid	07/16/03		

Parameter	Units	Lab Sample IDs 85445-8	85445-9	85445-10
Dissolved Gases (RSK-175)				
Methane	ug/l	<0.19	86 %	75-125 %
Ethene	ug/l	<0.33	100 %	75-125 %
Carbon Dioxide, Free	ug/l	<2600	95 %	75-125 %
Total Nitrogen	ug/l	<2000	*	*
Carbon Monoxide	ug/l	<82	*	*
Ethane	ug/l	<0.35		
Dilution Factor		1	1	
Prep Date		07/22/03	07/22/03	
Analysis Date		07/22/03	07/22/03	
Batch ID		2C0722	2C0722	
Total Organic Carbon (415.1)				
Total Organic Carbon	mg/l	<1.0	89 %	80-120 %
Dilution Factor		1	1	
Prep Date		07/25/03	07/25/03	
Analysis Date		07/25/03	07/25/03	
Batch ID		0725A	0725A	

These test results meet all the requirements of NELAC. All questions regarding this test report should be directed to the STL Project Manager who signed this test report.

New York Lab ID#10842

Serial Number 09960

ANALYSIS REQUEST AND CHAIN OF CUSTODY RECORD

SEVERN TRENT **STL**

STL Savannah
5102 LaRoche Avenue
Savannah, GA 31404
Website: www.stl-inc.com
Phone: (912) 354-7858
Fax: (912) 352-0165

Alternate Laboratory Name/Location
Phone:
Fax:

PROJECT REFERENCE	PROJECT NO.	PROJECT LOCATION (STATE)
PENNSYLVANIA	37679253	NY
STL (LAB) PROJECT MANAGER	P.O. NUMBER	CONTRACT NO.
	—	—
CLIENT (SITE) PM	CLIENT PHONE	CLIENT FAX
RICK GENTRY	614-790-26277	—
CLIENT NAME	CLIENT E-MAIL	
ASHLAND CHEMICAL	RGENTRY@ASHLAND.COM	
CLIENT ADDRESS		
5200 BLAZER PKWY DUBLIN, OHIO		
COMPANY CONTRACTING THIS WORK (if applicable)		
URS CORP, 646 PLANK RD, SUITE 202, CLIFTON PARK, NY		

PAGE 1 OF 1

STANDARD REPORT DELIVERY ●
DATE DUE _____
EXPEDITED REPORT DELIVERY (SURCHARGE) ○
DATE DUE _____
NUMBER OF COOLERS SUBMITTED PER SHIPMENT:

SAMPLE DATE	SAMPLE TIME	SAMPLE IDENTIFICATION	MATRIX: COMPOSITE (C) OR GRAB (G) INDICATE	AQUEOUS (WATER)	SOLID OR SEMISOLID	AIR	NONAQUEOUS LIQUID (OIL, SOLVENT,...)	REQUIRED ANALYSIS: NUMBER OF CONTAINERS SUBMITTED										REMARKS
								ICE: DISS GASES	HCl: VOC's (8260)	H_2SO_4: NO_3, NH_3	ICE: DISS Fe^{+2}	ICE: Cl, NO_2, Alk, SO_4	ZnAc: H_2S	HNO_3: Mn, Fe, Na, Ca, K, Mg	HCl: TOC	ICE: DISS Mn, Fe	ICE: BOD	
15JUL03	0920	MW-18	G	X				3	3	1	1	1	1	1	1	1	1	
15JUL03	1045	MW-16	G	X				3	3	1	1	1	1	1	1	1	1	
15JUL03	1305	MW-17	G	X				3	3	1	1	1	1	1	1	1	1	
15JUL03	1435	MW-14	G	X				3	3	1	1	1	1	1	1	1	1	
15JUL03	1515	SUMP	G	X				3	3	1	1	1	1	1	1	1	1	
15JUL03	1530	MW-3	G	X				3	3	1	1	1	1	1	1	1	1	
—	—	TB030715	—	X					3									ALL QUESTIONS
																		PLEASE CONTACT
																		TOM SHINE (URS)
																		CELL-518-791-3733
																		OFFICE-518-688-~~0022~~ 0015

RELINQUISHED BY: (SIGNATURE)	DATE	TIME	RELINQUISHED BY: (SIGNATURE)	DATE	TIME	RELINQUISHED BY: (SIGNATURE)	DATE	TIME
				15JUL03	1600			
RECEIVED BY: (SIGNATURE)	DATE	TIME	RECEIVED BY: (SIGNATURE)	DATE	TIME	RECEIVED BY: (SIGNATURE)	DATE	TIME
	16JUL03	1600						

LABORATORY USE ONLY

RECEIVED FOR LABORATORY BY: (SIGNATURE)	DATE	TIME	CUSTODY INTACT	CUSTODY SEAL NO.	STL SAVANNAH LOG NO.	LABORATORY REMARKS
	071603	0921	YES ○ NO ○		53854/45	

STL8240-680 (12/02)

SEVERN TRENT STL

STL Savannah 5102 LaRoche Avenue - Savannah GA 31404 Telephone:(912) 354-7858 Fax:(912) 351-3673

Analytical Report

For: Mr. Greg Gilbertsen
Ashland Inc.
5200 Blazer Parkway
Dublin, OH 43017
CC: Dave Blaushild

Order Number: S385422
SDG Number:
Client Project ID: 37679253
Project: Ashland - Rensselaer, Ny
Report Date: 07/29/2003
Sampled By: Client
Sample Received Date: 07/15/2003
Requisition Number:

Steven J. White, Project Manager
swhite@stl-inc.com

The test results in this report meet all NELAP requirements for parameters for which accreditation is required or available. Any exceptions to NELAP requirements are noted in this report. Pursuant to NELAP, this report may not be reproduced, except in full, without the written approval of the laboratory.

Sample Summary

Order: S385422
Date Received: 07/15/2003

Client: Ashland Inc.
Project: Ashland - Rensselaer, Ny

Client Sample ID	Lab Sample ID	Matrix	Date Sampled
MW-12S	S385422*1	Liquid	07/14/2003 13:40
MW-11	S385422*2	Liquid	07/14/2003 15:15
Trip Blank 326-C	S385422*3	Liquid	07/14/2003

Analytical Data Report

Lab Sample ID	Description	Matrix	Date Received	Date Sampled	SDG#
85422-1	MW-12S	Liquid	07/15/03	07/14/03 13:40	
85422-2	MW-11	Liquid	07/15/03	07/14/03 15:15	

Parameter	Units	Lab Sample IDs 85422-1	85422-2
Volatiles by GC/MS (8260)			
Chloromethane	ug/l	<1.0	<1.0
Bromomethane (Methyl bromide)	ug/l	<1.0	<1.0
Vinyl chloride	ug/l	<1.0	<1.0
Chloroethane	ug/l	<1.0	<1.0
Methylene chloride (Dichloromethane)	ug/l	<5.0	<5.0
Acetone	ug/l	<25	<25
Carbon disulfide	ug/l	<1.0	<1.0
1,1-Dichloroethene	ug/l	<1.0	<1.0
1,1-Dichloroethane	ug/l	<1.0	<1.0
cis-1,2-Dichloroethene	ug/l	<1.0	<1.0
trans-1,2-Dichloroethene	ug/l	<1.0	<1.0
Chloroform	ug/l	<1.0	<1.0
1,2-Dichloroethane	ug/l	<1.0	<1.0
2-Butanone (MEK)	ug/l	<10	<10
1,1,1-Trichloroethane	ug/l	<1.0	<1.0
Carbon tetrachloride	ug/l	<1.0	<1.0
Bromodichloromethane	ug/l	<1.0	<1.0
1,1,2,2-Tetrachloroethane	ug/l	<1.0	<1.0
1,2-Dichloropropane	ug/l	<1.0	<1.0
trans-1,3-Dichloropropene	ug/l	<1.0	<1.0
Trichloroethene	ug/l	<1.0	<1.0
Dibromochloromethane	ug/l	<1.0	<1.0
1,1,2-Trichloroethane	ug/l	<1.0	<1.0
Benzene	ug/l	<1.0	<1.0
cis-1,3-Dichloropropene	ug/l	<1.0	<1.0
Bromoform	ug/l	<1.0	<1.0
2-Hexanone	ug/l	<10	<10
4-Methyl-2-pentanone (MIBK)	ug/l	<10	<10
Tetrachloroethene	ug/l	<1.0	<1.0
Toluene	ug/l	<1.0	<1.0
Chlorobenzene	ug/l	<1.0	<1.0
Ethylbenzene	ug/l	<1.0	<1.0
Styrene	ug/l	2.4	2.2
Xylenes, Total	ug/l	<2.0	<2.0

Analytical Data Report

Lab Sample ID	Description	Matrix	Date Received	Date Sampled	SDG#
85422-1	MW-12S	Liquid	07/15/03	07/14/03 13:40	
85422-2	MW-11	Liquid	07/15/03	07/14/03 15:15	

Parameter	Units	Lab Sample IDs 85422-1	85422-2
Volatiles by GC/MS (8260)			
Surrogate - Toluene-d8 *	%	90 %	96 %
Surrogate - 4-Bromofluorobenzene *	%	100 %	102 %
Surrogate - Dibromofluoromethane *	%	100 %	102 %
Dilution Factor		1	1
Prep Date		07/19/03	07/19/03
Analysis Date		07/19/03	07/19/03
Batch ID		2P0718	2P0718
Ammonia (as N) (350.1)			
Ammonia (as N)	mg/l	0.098	0.095
Dilution Factor		1	1
Prep Date		07/16/03	07/16/03
Analysis Date		07/16/03	07/16/03
Batch ID		0716B	0716B
Biochemical Oxygen Demand (5 Day) (405.1/5210B)			
Biochemical Oxygen Demand (5 Day)	mg/l	<2.0	<2.0
Dilution Factor		1	1
Prep Date		07/15/03	07/15/03
Analysis Date		07/15/03	07/15/03
Batch ID		0715B	0715B
Chloride (325.2)			
Chloride	mg/l	2.9	17
Dilution Factor		1	1
Prep Date		07/18/03	07/18/03
Analysis Date		07/18/03	07/18/03
Batch ID		0718A	0718A

Analytical Data Report

Lab Sample ID	Description	Matrix	Date Received	Date Sampled	SDG#
85422-1	MW-12S	Liquid	07/15/03	07/14/03 13:40	
85422-2	MW-11	Liquid	07/15/03	07/14/03 15:15	

Parameter	Units	Lab Sample IDs 85422-1	85422-2
Iron, Ferrous (2+) (SM3500)			
Iron, Ferrous (2+)	mg/l	<0.10	<0.10
Dilution Factor		1	1
Prep Date		07/17/03	07/17/03
Analysis Date		07/17/03	07/17/03
Batch ID		0717A	0717A
Iron (6010)			
Iron	mg/l	0.079	0.85
Dilution Factor		1	1
Prep Date		07/16/03	07/16/03
Analysis Date		07/19/03	07/19/03
Batch ID		0716G	0716G
Iron (Dissolved) (6010)			
Iron (Dissolved)	mg/l	<0.050	<0.050
Dilution Factor		1	1
Prep Date		07/16/03	07/16/03
Analysis Date		07/19/03	07/19/03
Batch ID		0716G	0716G
Manganese (6010)			
Manganese	mg/l	0.14	1.1
Dilution Factor		1	1
Prep Date		07/16/03	07/16/03
Analysis Date		07/19/03	07/19/03
Batch ID		0716G	0716G
Manganese (Dissolved) (6010)			
Manganese (Dissolved)	mg/l	0.12	1.0
Dilution Factor		1	1
Prep Date		07/16/03	07/16/03
Analysis Date		07/19/03	07/19/03
Batch ID		0716G	0716G

Analytical Data Report

Lab Sample ID	Description	Matrix	Date Received	Date Sampled	SDG#
85422-1	MW-12S	Liquid	07/15/03	07/14/03 13:40	
85422-2	MW-11	Liquid	07/15/03	07/14/03 15:15	

Parameter	Units	Lab Sample IDs 85422-1	85422-2
Nitrate-N (353.2)			
Nitrate-N	mg/l	0.31	<0.050
Dilution Factor		1	1
Prep Date		07/15/03	07/15/03
Analysis Date		07/15/03	07/15/03
Batch ID		0725A	0725A
Nitrite-N (353.2)			
Nitrite-N	mg/l	<0.050	<0.050
Dilution Factor		1	1
Prep Date		07/15/03	07/15/03
Analysis Date		07/15/03	07/15/03
Batch ID		0715C	0715C
Sulfide (376.1)			
Sulfide	mg/l	<1.0	<1.0
Dilution Factor		1	1
Prep Date		07/16/03	07/16/03
Analysis Date		07/16/03	07/16/03
Batch ID		0716A	0716A
Alkalinity (to pH 4.5) as CaCO3 (310.1)			
Alkalinity (to pH 4.5) as CaCO3	mg/l	320	310
Dilution Factor		1	1
Prep Date		07/22/03	07/22/03
Analysis Date		07/22/03	07/22/03
Batch ID		0722A	0722A
Sodium (6010)			
Sodium	mg/l	5.4	7.9
Dilution Factor		1	1
Prep Date		07/16/03	07/16/03
Analysis Date		07/19/03	07/19/03
Batch ID		0716G	0716G

Analytical Data Report

Lab Sample ID	Description	Matrix	Date Received	Date Sampled	SDG#
85422-1	MW-12S	Liquid	07/15/03	07/14/03 13:40	
85422-2	MW-11	Liquid	07/15/03	07/14/03 15:15	

Parameter	Units	Lab Sample IDs 85422-1	85422-2
Calcium (6010)			
Calcium	mg/l	100	150
Dilution Factor		1	1
Prep Date		07/16/03	07/16/03
Analysis Date		07/19/03	07/19/03
Batch ID		0716G	0716G
Potassium (6010)			
Potassium	mg/l	3.3	1.6
Dilution Factor		1	1
Prep Date		07/16/03	07/16/03
Analysis Date		07/19/03	07/19/03
Batch ID		0716G	0716G
Magnesium (6010)			
Magnesium	mg/l	18	17
Dilution Factor		1	1
Prep Date		07/16/03	07/16/03
Analysis Date		07/19/03	07/19/03
Batch ID		0716G	0716G
Sulfate as SO4 (375.4)			
Sulfate as SO4	mg/l	26	110
Dilution Factor		1	6
Prep Date		07/21/03	07/21/03
Analysis Date		07/21/03	07/21/03
Batch ID		0721A	0721A
Dissolved Gases (RSK-175)			
Methane	ug/l	4.4	0.88
Ethene	ug/l	<0.33	<0.33
Carbon Dioxide	ug/l	39000	68000

Analytical Data Report

Lab Sample ID	Description	Matrix	Date Received	Date Sampled	SDG#
85422-1	MW-12S	Liquid	07/15/03	07/14/03 13:40	
85422-2	MW-11	Liquid	07/15/03	07/14/03 15:15	

Parameter	Units	Lab Sample IDs 85422-1	85422-2
Dissolved Gases (RSK-175)			
Total Nitrogen	ug/l	<2000	<2000
Carbon Monoxide	ug/l	<82	<82
Ethane	ug/l	<0.35	<0.35
Dilution Factor		1	1
Prep Date		07/23/03	07/23/03
Analysis Date		07/23/03	07/23/03
Batch ID		2C0722	2C0722
Total Organic Carbon (415.1)			
Total Organic Carbon	mg/l	<1.0	1.2
Dilution Factor		1	1
Prep Date		07/27/03	07/27/03
Analysis Date		07/27/03	07/27/03
Batch ID		0727A	0727A

Analytical Data Report

Lab Sample ID	Description	Matrix	Date Received	Date Sampled	SDG#
85422-3	Trip Blank 326-C	Liquid	07/15/03	07/14/03	

Parameter	Units	Lab Sample IDs 85422-3
Volatiles by GC/MS (8260)		
Chloromethane	ug/l	<1.0
Bromomethane (Methyl bromide)	ug/l	<1.0
Vinyl chloride	ug/l	<1.0
Chloroethane	ug/l	<1.0
Methylene chloride (Dichloromethane)	ug/l	<5.0
Acetone	ug/l	<25
Carbon disulfide	ug/l	<1.0
1,1-Dichloroethene	ug/l	<1.0
1,1-Dichloroethane	ug/l	<1.0
cis-1,2-Dichloroethene	ug/l	<1.0
trans-1,2-Dichloroethene	ug/l	<1.0
Chloroform	ug/l	<1.0
1,2-Dichloroethane	ug/l	<1.0
2-Butanone (MEK)	ug/l	<10
1,1,1-Trichloroethane	ug/l	<1.0
Carbon tetrachloride	ug/l	<1.0
Bromodichloromethane	ug/l	<1.0
1,1,2,2-Tetrachloroethane	ug/l	<1.0
1,2-Dichloropropane	ug/l	<1.0
trans-1,3-Dichloropropene	ug/l	<1.0
Trichloroethene	ug/l	<1.0
Dibromochloromethane	ug/l	<1.0
1,1,2-Trichloroethane	ug/l	<1.0
Benzene	ug/l	<1.0
cis-1,3-Dichloropropene	ug/l	<1.0
Bromoform	ug/l	<1.0
2-Hexanone	ug/l	<10
4-Methyl-2-pentanone (MIBK)	ug/l	<10
Tetrachloroethene	ug/l	<1.0
Toluene	ug/l	<1.0
Chlorobenzene	ug/l	<1.0
Ethylbenzene	ug/l	<1.0
Styrene	ug/l	2.7
Xylenes, Total	ug/l	<2.0
Surrogate - Toluene-d8 *	%	82 %

Analytical Data Report

Lab Sample ID	Description	Matrix	Date Received	Date Sampled	SDG#
85422-3	Trip Blank 326-C	Liquid	07/15/03	07/14/03	

Parameter	Units	Lab Sample IDs 85422-3
Volatiles by GC/MS (8260)		
Surrogate - 4-Bromofluorobenzene *	%	98 %
Surrogate - Dibromofluoromethane *	%	100 %
Dilution Factor		1
Prep Date		07/22/03
Analysis Date		07/22/03
Batch ID		1P0722

Analytical Data Report

Lab Sample ID	Description	Matrix	Date Received	Date Sampled	SDG#
85422-4	Method Blank	Liquid	07/15/03		
85422-5	Lab Control Standard % Recovery	Liquid	07/15/03		
85422-6	LCS Accuracy Control Limit (%R)	Liquid	07/15/03		

Parameter	Units	Lab Sample IDs 85422-4	85422-5	85422-6
Volatiles by GC/MS (8260)				
Chloromethane	ug/l	<1.0		
Bromomethane (Methyl bromide)	ug/l	<1.0		
Vinyl chloride	ug/l	<1.0		
Chloroethane	ug/l	<1.0		
Methylene chloride (Dichloromethane)	ug/l	<5.0		
Acetone	ug/l	<25		
Carbon disulfide	ug/l	<1.0		
1,1-Dichloroethene	ug/l	<1.0	108 %	53-144 %
1,1-Dichloroethane	ug/l	<1.0		
cis-1,2-Dichloroethene	ug/l	<1.0		
trans-1,2-Dichloroethene	ug/l	<1.0		
Chloroform	ug/l	<1.0		
1,2-Dichloroethane	ug/l	<1.0		
2-Butanone (MEK)	ug/l	<10		
1,1,1-Trichloroethane	ug/l	<1.0		
Carbon tetrachloride	ug/l	<1.0		
Bromodichloromethane	ug/l	<1.0		
1,1,2,2-Tetrachloroethane	ug/l	<1.0		
1,2-Dichloropropane	ug/l	<1.0		
trans-1,3-Dichloropropene	ug/l	<1.0		
Trichloroethene	ug/l	<1.0	108 %	70-123 %
Dibromochloromethane	ug/l	<1.0		
1,1,2-Trichloroethane	ug/l	<1.0		
Benzene	ug/l	<1.0	108 %	69-128 %
cis-1,3-Dichloropropene	ug/l	<1.0		
Bromoform	ug/l	<1.0		
2-Hexanone	ug/l	<10		
4-Methyl-2-pentanone (MIBK)	ug/l	<10		
Tetrachloroethene	ug/l	<1.0		
Toluene	ug/l	<1.0	90 %	71-129 %
Chlorobenzene	ug/l	<1.0	110 %	72-126 %
Ethylbenzene	ug/l	<1.0		
Styrene	ug/l	<1.0		

Analytical Data Report

Lab Sample ID	Description	Matrix	Date Received	Date Sampled	SDG#
85422-4	Method Blank	Liquid	07/15/03		
85422-5	Lab Control Standard % Recovery	Liquid	07/15/03		
85422-6	LCS Accuracy Control Limit (%R)	Liquid	07/15/03		

Parameter	Units	Lab Sample IDs 85422-4	85422-5	85422-6
Volatiles by GC/MS (8260)				
Xylenes, Total	ug/l	<2.0		
Surrogate - Toluene-d8 *	%	96 %	80 %	74-122 %
Surrogate - 4-Bromofluorobenzene *	%	100 %	108 %	70-119 %
Surrogate - Dibromofluoromethane *	%	104 %	108 %	68-129 %
Dilution Factor		1	1	
Prep Date		07/18/03	07/18/03	
Analysis Date		07/18/03	07/18/03	
Batch ID		2P0718	2P0718	
Ammonia (as N) (350.1)				
Ammonia (as N)	mg/l	<0.030	103 %	85-115 %
Dilution Factor		1	1	
Prep Date		07/16/03	07/16/03	
Analysis Date		07/16/03	07/16/03	
Batch ID		0716B	0716B	
Biochemical Oxygen Demand (5 Day) (405.1/5210B)				
Biochemical Oxygen Demand (5 Day)	mg/l	<2.0	92 %	85-115 %
Dilution Factor		1	1	
Prep Date		07/15/03	07/15/03	
Analysis Date		07/15/03	07/15/03	
Batch ID		0715B	0715B	
Chloride (325.2)				
Chloride	mg/l	<1.0	101 %	85-115 %
Dilution Factor		1	1	
Prep Date		07/18/03	07/18/03	
Analysis Date		07/18/03	07/18/03	
Batch ID		0718A	0718A	

Analytical Data Report

Lab Sample ID	Description	Matrix	Date Received	Date Sampled	SDG#
85422-4	Method Blank	Liquid	07/15/03		
85422-5	Lab Control Standard % Recovery	Liquid	07/15/03		
85422-6	LCS Accuracy Control Limit (%R)	Liquid	07/15/03		

Parameter	Units	Lab Sample IDs 85422-4	85422-5	85422-6
Iron, Ferrous (2+) (SM3500)				
Iron, Ferrous (2+)	mg/l	<0.10	109 %	85-115 %
Dilution Factor		1	1	
Prep Date		07/17/03	07/17/03	
Analysis Date		07/17/03	07/17/03	
Batch ID		0717A	0717A	
Iron (6010)				
Iron	mg/l	<0.050	105 %	75-125 %
Dilution Factor		1	1	
Prep Date		07/16/03	07/16/03	
Analysis Date		07/18/03	07/18/03	
Batch ID		0716G	0716G	
Iron (Dissolved) (6010)				
Iron (Dissolved)	mg/l	<0.050	105 %	75-125 %
Dilution Factor		1	1	
Prep Date		07/16/03	07/16/03	
Analysis Date		07/18/03	07/18/03	
Batch ID		0716G	0716G	
Manganese (6010)				
Manganese	mg/l	<0.010	103 %	75-125 %
Dilution Factor		1	1	
Prep Date		07/16/03	07/16/03	
Analysis Date		07/18/03	07/18/03	
Batch ID		0716G	0716G	
Manganese (Dissolved) (6010)				
Manganese (Dissolved)	mg/l	<0.010	103 %	75-125 %
Dilution Factor		1	1	
Prep Date		07/16/03	07/16/03	
Analysis Date		07/18/03	07/18/03	
Batch ID		0716G	0716G	

Analytical Data Report

Lab Sample ID	Description	Matrix	Date Received	Date Sampled	SDG#
85422-4	Method Blank	Liquid	07/15/03		
85422-5	Lab Control Standard % Recovery	Liquid	07/15/03		
85422-6	LCS Accuracy Control Limit (%R)	Liquid	07/15/03		

Parameter	Units	Lab Sample IDs 85422-4	85422-5	85422-6
Nitrate-N (353.2)				
Nitrate-N	mg/l	<0.050	107 %	80-120 %
Dilution Factor		1	1	
Prep Date		07/15/03	07/15/03	
Analysis Date		07/15/03	07/15/03	
Batch ID		0725A	0725A	
Nitrite-N (353.2)				
Nitrite-N	mg/l	<0.050	81 %	80-120 %
Dilution Factor		1	1	
Prep Date		07/15/03	07/15/03	
Analysis Date		07/15/03	07/15/03	
Batch ID		0715C	0715C	
Sulfide (376.1)				
Sulfide	mg/l	<1.0	93 %	75-125 %
Dilution Factor		1	1	
Prep Date		07/16/03	07/16/03	
Analysis Date		07/16/03	07/16/03	
Batch ID		0716A	0716A	
Alkalinity (to pH 4.5) as CaCO3 (310.1)				
Alkalinity (to pH 4.5) as CaCO3	mg/l as CaCO	<1.0	106 %	80-120 %
Dilution Factor		1	1	
Prep Date		07/22/03	07/22/03	
Analysis Date		07/22/03	07/22/03	
Batch ID		0722A	0722A	

Analytical Data Report

Lab Sample ID	Description	Matrix	Date Received	Date Sampled	SDG#
85422-4	Method Blank	Liquid	07/15/03		
85422-5	Lab Control Standard % Recovery	Liquid	07/15/03		
85422-6	LCS Accuracy Control Limit (%R)	Liquid	07/15/03		

Parameter	Units	Lab Sample IDs 85422-4	85422-5	85422-6
Sodium (6010)				
Sodium	mg/l	<0.50	107 %	75-125 %
Dilution Factor		1	1	
Prep Date		07/16/03	07/16/03	
Analysis Date		07/18/03	07/18/03	
Batch ID		0716G	0716G	
Calcium (6010)				
Calcium	mg/l	<0.50	100 %	75-125 %
Dilution Factor		1	1	
Prep Date		07/16/03	07/16/03	
Analysis Date		07/18/03	07/18/03	
Batch ID		0716G	0716G	
Potassium (6010)				
Potassium	mg/l	<1.0	108 %	75-125 %
Dilution Factor		1	1	
Prep Date		07/16/03	07/16/03	
Analysis Date		07/18/03	07/18/03	
Batch ID		0716G	0716G	
Magnesium (6010)				
Magnesium	mg/l	<0.50	104 %	75-125 %
Dilution Factor		1	1	
Prep Date		07/16/03	07/16/03	
Analysis Date		07/18/03	07/18/03	
Batch ID		0716G	0716G	
Sulfate as SO4 (375.4)				
Sulfate as SO4	mg/l	<5.0	87 %	75-125 %
Dilution Factor		1	1	
Prep Date		07/21/03	07/21/03	
Analysis Date		07/21/03	07/21/03	
Batch ID		0721A	0721A	

Analytical Data Report

Lab Sample ID	Description	Matrix	Date Received	Date Sampled	SDG#
85422-4	Method Blank	Liquid	07/15/03		
85422-5	Lab Control Standard % Recovery	Liquid	07/15/03		
85422-6	LCS Accuracy Control Limit (%R)	Liquid	07/15/03		

Parameter	Units	Lab Sample IDs 85422-4	85422-5	85422-6
Dissolved Gases (RSK-175)				
Methane	ug/l	<0.19	86 %	75-125 %
Ethene	ug/l	<0.33	100 %	75-125 %
Carbon Dioxide	ug/l	<2600	95 %	75-125 %
Total Nitrogen	ug/l	<2000	*	*
Carbon Monoxide	ug/l	<82	*	*
Ethane	ug/l	<0.35		
Dilution Factor		1	1	
Prep Date		07/22/03	07/22/03	
Analysis Date		07/22/03	07/22/03	
Batch ID		2C0722	2C0722	
Total Organic Carbon (415.1)				
Total Organic Carbon	mg/l	<1.0	87 %	80-120%
Dilution Factor		1	1	
Prep Date		07/27/03	07/27/03	
Analysis Date		07/27/03	07/27/03	
Batch ID		0727A	0727A	

These test results meet all the requirements of NELAC. All questions regarding this test report should be directed to the STL Project Manager who signed this test report.

New York Lab ID#10842

Serial Number 09959

ANALYSIS REQUEST AND CHAIN OF CUSTODY RECORD

SEVERN TRENT **STL**

STL Savannah
5102 LaRoche Avenue
Savannah, GA 31404
Website: www.stl-inc.com
Phone: (912) 354-7858
Fax: (912) 352-0165

○ Alternate Laboratory Name/Location
Phone:
Fax:

PROJECT REFERENCE: RENSSELAER, NEW YORK	PROJECT NO.: 376 79253	PROJECT LOCATION (STATE): NY	PAGE 1 OF 1
STL (LAB) PROJECT MANAGER: KARL HALL	P.O. NUMBER: —	CONTRACT NO.: —	STANDARD REPORT DELIVERY ●
CLIENT (SITE) PM: RICK GENTRY	CLIENT PHONE: 614-790-6900	CLIENT FAX: 614-790-6232	DATE DUE: NORMAL
CLIENT NAME: ASHLAND CHEMICAL	CLIENT E-MAIL: RGENTRY@ASHLAND.COM		EXPEDITED REPORT DELIVERY (SURCHARGE) ○
CLIENT ADDRESS: 5200 BLAZER PARKWAY, DUBLIN, OHIO			DATE DUE: —
COMPANY CONTRACTING THIS WORK (if applicable): URS CORP, 646 PLANK RD, SUITE 202, CLIFTON PARK, NY			NUMBER OF COOLERS SUBMITTED PER SHIPMENT:

SAMPLE DATE	SAMPLE TIME	SAMPLE IDENTIFICATION	MATRIX: COMPOSITE (C) OR GRAB (G) INDICATE	AQUEOUS (WATER)	SOLID OR SEMISOLID	AIR	NONAQUEOUS LIQUID (OIL, SOLVENT,...)	REQUIRED ANALYSIS: Diss Mn, Fe (1 HNO3)	Diss Fe^{+2} (1 HNO3)	T. Mn, Fe, Na, Ca, K, Mg (1 HNO3)	Li, NO3, Alk, SO4, Cl (1 H2O)	TOC (1 HCl)	Diss Gases (1 H2O)	ZnAc, H2S (1 NaOH)	BOD (1 H2O)	VOC's (8260) (3 HCl)	NO3 / NH3 (1 H2SO4)	REMARKS
								NUMBER OF CONTAINERS SUBMITTED										
14JUL03	1340	MW-12S	G	X				1	1	1	1	1	3	1	1	3	1	BOTTLES LABELED 12A
14JUL03	1515	MW-11	G	X				1	1	1	1	1	3	1	1	3	1	
—	—	TRIP BLANK 326-C	G	X												3		
																		ANY QUESTIONS PLEASE CALL TOM SHINE URS CORP 518-791-3735 (CELL) 518-688-0015 (OFFICE)

RELINQUISHED BY: (SIGNATURE)	DATE	TIME	RELINQUISHED BY: (SIGNATURE)	DATE	TIME	RELINQUISHED BY: (SIGNATURE)	DATE	TIME
				14JUL03	1600			
RECEIVED BY: (SIGNATURE)	DATE	TIME	RECEIVED BY: (SIGNATURE)	DATE	TIME	RECEIVED BY: (SIGNATURE)	DATE	TIME
	8JUL03	1600						

LABORATORY USE ONLY

RECEIVED FOR LABORATORY BY: (SIGNATURE)	DATE	TIME	CUSTODY INTACT	CUSTODY SEAL NO.	STL SAVANNAH LOG NO.	LABORATORY REMARKS
	7/15/03	9:37	YES ○ NO ○		53-85422	

APPENDIX D

Quality Assurance Review
Ashland Inc.
Rensselaer, New York
November 17, 18, 19, 2003

This quality assurance (QA) review is for 23 soil samples (including 2 duplicates) collected on November 17, 18, and 19, 2003 at the Ashland Inc. facility in Rensselaer, New York. The samples were analyzed for VOCs using EPA Method 8260B. STL, Inc. of Savannah, Georgia performed the analyses. The QA/QC review was performed following EPA guidelines (USEPA, 1999).

Sample Transit
The samples arrived at the laboratory in good condition, in the chilled state.

Holding Times
All samples were reviewed for holding time from time of collection until time of analysis. All samples were analyzed within the required method holding time.

Blanks
Analytical results for one trip blank, one equipment blank and four laboratory method blanks were reviewed for concentrations of target analytes above the reporting limit.

The trip and equipment blanks were free of target compound concentrations. Acetone and 2-butanone were detected in one of the laboratory method blanks. No action was taken on the data because these compounds were not detected in the corresponding samples. All other laboratory method blanks were free of target compound contamination.

Field Duplicate Samples
Two field duplicate sample pairs were collected during this sampling event. Sample DUP-11/17/03 was a blind field duplicate of sample SSB-3 0.5-2.0. Sample DUP-11/18/03 was a blind field duplicate of SSB-10 10.5-12. The duplicate relative percent differences (RPDs) were reviewed to evaluate field sampling and laboratory precision and sample matrix heterogeneity.

Detected analyte concentrations for the duplicate pairs are compared in the following table.

Compound	SSB-3 0.5-2.0	DUP-11/17/03	RPD
Vinyl chloride	1,400.0	250.0	139.4%
Acetone	<1000	57.0	NC
Carbon disulfide	<160	25.0	NC
cis-1,2-dichloroethene	82,000	12,000	148.9%
trans-1,2-dichloroethene	650.0	110.0	142.1%
1,1,1-trichloroethane	<86	7.4	NC
Benzene	6,800	680	163.6%
Trichloroethene	3,000	6,100	68.1%
Tetrachloroethene	280	440	44.4%
Toluene	370	110	108.3%
Ethylbenzene	<86	19	NC
Xylenes	370	120	102.0%

Compound	SSB-10 10.5-12	DUP-11/18/03	RPD
cis-1,2-dichloroethene	30	45	40.0%
Trichloroethene	14	24	52.6%
Benzene	4.8	8.7	57.8%
Tetrachloroethene	6.3	9.2	37.4%

Generally, RPDs of 50 or less for a duplicate soil sample indicate good field and laboratory precision and a relatively homogeneous sample matrix. These results indicate a heterogeneous sample matrix. No qualification of the data were necessary based on these findings.

Laboratory Control Sample (LCS) and Laboratory Control Sample Duplicate (LCSD)

LCS/LCSD samples were spiked with known concentrations of target analytes. LCS/LCSD recoveries and relative percent differences (RPDs) were reviewed to evaluate analytical accuracy and precision.

The LCS/LCSD recoveries and RPDs for all parameters were within laboratory control limits, indicating acceptable analytical accuracy and precision.

Surrogate Recoveries
Surrogate compounds were spiked into all field samples, trip blanks, method blanks, and LCS/LCSD samples for all parameters. The surrogate recoveries were reviewed to evaluate sample-specific accuracy.

Sample	Surrogate	Recovery	QC Limits
SSB-9 1-2	Dibromofluoromethane	136*	68-129%
SSB-9 1-2 RE	Dibromofluoromethane	111	68-129%

The recovery for the surrogate dibromofluoromethane in sample SSB-9 1-2 was outside of QC limits. The sample was reanalyzed resulting in all surrogates recovering within acceptable QC limits. All other surrogate recoveries were within acceptable QC limits indicating acceptable sample-specific accuracy.

Matrix Spike/Matrix Spike Duplicate Recoveries and Precision
MS/MSD samples were collected to evaluate the effect of the matrix on sample analysis accuracy and precision. Representative analytes were spiked into a sample and the analytical recovery and precision were measured. All MS/MSD recoveries and precision were within; acceptable QC limits.

Reporting Limits
The data were reviewed to identify results reported as non-detect at elevated reporting limits. The samples summarized below required dilution due to high target analyte concentrations. The standard reporting limit range for VOCs of 0.5 to 12.5 ug/kg was used for the undiluted samples.

Sample	Dilution Factor	Reporting Limit Range/Result	Reason for Dilution
SSB-5 0-1.5	40	240-1,200	tetrachloroethene
SSB-6 1-2	40	220-1,100	acetone, cis-1,2-dichloroethene, trichloroethene, tetrachloroethene, xylenes
SSB-6 2-3	2	12-58	tetrachloroethene
SSB-4 0.5-1.5	5	8.5-440	vinyl chloride, acetone, cis-1,2-dicloroethene, trans-1,2-dichloroethene, trichloroethene, tetrachloroethene, toluene, xylenes
SSB-4 0.5-1.5	400	NA	acetone, cis-1,2-dichloroethene
SSB-2 0.5-1.5	5	7-33	cis-1,2-dichloroethene, trichloroethene
DUP 11/17/03	5	5.6-11	vinyl chloride, trichloroethene, tetrachloroethene
DUP 11/17/03	400	NA	cis-1,2-dichloroethene, trichloroethene
SSB-7 0.5-1.5	5	7.5-29	cis-1,2-dichloroethene, trichloroethene, benzene, tetrachloroethene
SSB-7 2.0-3.5	40	6-120	vinyl chloride, cis-1,2-dichloroethene, trichloroethene
SSB-7 2.0-3.5	100	NA	cis-1,2-dichloroethene
SSB-8 0.5-2.0	5	5.3-27	cis-1,2-dichloroethene

SSB-13 3-4	200,000	140,000-700,000	toluene, ethyl benzene, xylenes

Lower detection limits for SSB-13 3-4 could not be reported because the concentration of toluene at 2,300,000 ug/kg interferes with the measurement of all other compounds in this sample.

Non-detect results for the above samples are reported with their analyte reporting limits elevated (e.g., <1,000 ug/kg).

QA/QC Summary

Several results were reported from a secondary dilution due to high concentrations of target compounds in the samples.

One surrogate was outside of QC limits. The sample was reanalyzed and all QC limits for surrogate recoveries were met.

The QA/QC review indicated that the data are of acceptable quality for evaluating VOC soil contamination at the site.

Reference

US Environmental Protection Agency, 1999. USEPA Contract Laboratory Program National Functional Guidelines for Organic Data Review. EPA540/R-99/008. October.

SEVERN TRENT STL

STL Savannah 5102 LaRoche Avenue - Savannah GA 31404 Telephone:(912) 354-7858 Fax:(912) 351-3673

Analytical Report

For: Mr. Greg Gilbertsen
Ashland Inc.
5200 Blazer Parkway
Dublin, OH 43017
CC: Dave Blaushild

Order Number: S389482
SDG Number:
Client Project ID: 37679253
Project: Ashland - Rensselaer, Ny
Report Date: 12/15/2003
Sampled By: Client
Sample Received Date: 11/20/2003
Requisition Number:
Purchase Order:
Revised Date: 01/09/2004

Steven J. White

Steven J. White, Project Manager
swhite@stl-inc.com
01/09/2004

The test results in this report meet all NELAP requirements for parameters for which accreditation is required or available. Any exceptions to NELAP requirements are noted in this report. Pursuant to NELAP, this report may not be reproduced, except in full, without the written approval of the laboratory.

Sample Summary

Order: S389482
Date Received: 11/20/2003

Client: Ashland Inc.
Project: Ashland - Rensselaer, Ny

Client Sample ID	Lab Sample ID	Matrix	Date Sampled
SSB-5 (0-1.5)	S389482*1	Solid	11/17/2003 14:42
SSB-5 (0-1.5)	S389482*1-DL	Solid	11/17/2003 14:42
SSB-6 (1-2)	S389482*2	Solid	11/14/2003 13:25
SSB-6 (2-3)	S389482*3	Solid	11/14/2003 13:32
SSB-6 (2-3)	S389482*3-DL	Solid	11/14/2003 13:32
SSB-4 (0.5-1.5)	S389482*4	Solid	11/17/2003 15:07
SSB-4 (0.5-1.5)	S389482*4-DL	Solid	11/17/2003 15:07
SSB-3 (0.5-2.0)	S389482*5	Solid	11/17/2003 15:30
SSB-1 (0.5-2.0)	S389482*6	Solid	11/17/2003 15:50
SSB-2 (0.5-1.5)	S389482*7	Solid	11/17/2003 16:05
DUP-11/17/03	S389482*8	Solid	11/17/2003
DUP-11/17/03	S389482*8-DL	Solid	11/17/2003
SSB-7 (0.5-1.5)	S389482*9	Solid	11/18/2003 08:04
SSB-7 (2.0-3.5)	S389482*10	Solid	11/18/2003 08:15
SSB-7 (2.0-3.5)	S389482*10-DL	Solid	11/18/2003 08:15
SSB-8 (0.5-2.0)	S389482*11	Solid	11/18/2003 09:00
SSB-8 (5.0-6.5)	S389482*12	Solid	11/18/2003 09:45
SSB-12 (1-2)	S389482*13	Solid	11/18/2003 10:43
SSB-12 (5.5-6.5)	S389482*14	Solid	11/18/2003 11:20
SSB-10 (1-2)	S389482*15	Solid	11/18/2003 12:14
DUP-1118103	S389482*16	Solid	11/18/2003
SSB-10 (10.5-12)	S389482*17	Solid	11/18/2003 13:30
SSB-9 (1-2)	S389482*18	Solid	11/18/2003 14:12
SSB-9 (9.5-10.5)	S389482*19	Solid	11/18/2003 15:20
SSB-11 (1-2)	S389482*20	Solid	11/19/2003 11:30
SSB-11 (7-8)	S389482*21	Solid	11/19/2003 12:25
SSB-13 (1-2)	S389482*22	Solid	11/19/2003 14:24
SSB-13 (3-4)	S389482*23	Solid	11/19/2003 14:36
TB111803	S389482*24	Liquid	11/18/2003
EB111803	S389482*25	Liquid	11/18/2003 09:00

Analytical Data Report

Lab Sample ID	Description	Matrix	Date Received	Date Sampled	SDG#
89482-1	SSB-5 (0-1.5)	Solid	11/20/03	11/17/03 14:42	
89482-1-DL	SSB-5 (0-1.5)	Solid	11/20/03	11/17/03 14:42	
89482-2	SSB-6 (1-2)	Solid	11/20/03	11/14/03 13:25	
89482-3	SSB-6 (2-3)	Solid	11/20/03	11/14/03 13:32	
89482-3-DL	SSB-6 (2-3)	Solid	11/20/03	11/14/03 13:32	

Parameter	Units	Lab Sample IDs 89482-1	89482-1-DL	89482-2	89482-3	89482-3-DL
Volatiles by GC/MS (8260)						
Chloromethane	ug/kg dw	<1.6	<33	<31	<1.5	<3.2
Bromomethane (Methyl bromide)	ug/kg dw	<3.8	<40	<38	<3.7	<7.9
Vinyl chloride	ug/kg dw	3.0	<24	55	12	15D
Chloroethane	ug/kg dw	<1.9	<24	<22	<1.8	<4.0
Methylene chloride (Dichloromethane)	ug/kg dw	9.3	27D	23B	<2.6	<5.6
Acetone	ug/kg dw	<9.0	<96	640	320	320D
Carbon disulfide	ug/kg dw	5.9	18D	18	2.2	<4.6
1,1-Dichloroethene	ug/kg dw	<1.9	<24	<22	<1.8	<4.0
1,1-Dichloroethane	ug/kg dw	6.4	22D	<10	<1.1	<2.3
cis-1,2-Dichloroethene	ug/kg dw	43	100D	610	120	120D
trans-1,2-Dichloroethene	ug/kg dw	3.6	<9.6	21	2.3	2.9D
Chloroform	ug/kg dw	13	<24	<22	<1.3	<2.8
1,2-Dichloroethane	ug/kg dw	<1.7	<9.9	<9.4	<1.6	<3.5
2-Butanone (MEK)	ug/kg dw	<5.3	220DB	280B	39	37D
1,1,1-Trichloroethane	ug/kg dw	26	210D	<7.9	7.3	<1.9
Carbon tetrachloride	ug/kg dw	4.2	29D	<7.2	<1.0	<2.2
Bromodichloromethane	ug/kg dw	<1.5	<7.5	<7.2	<1.4	<3.0
1,1,2,2-Tetrachloroethane	ug/kg dw	<2.3	<9.6	<9.2	<2.2	<4.6
1,2-Dichloropropane	ug/kg dw	<1.4	<8.5	<8.1	<1.3	<2.8
trans-1,3-Dichloropropene	ug/kg dw	<1.8	<6.1	<5.8	<1.7	<3.7
Trichloroethene	ug/kg dw	170	580D	220	53	49D
Dibromochloromethane	ug/kg dw	<1.6	<24	<22	<1.5	<3.2
1,1,2-Trichloroethane	ug/kg dw	<2.0	<10	<9.9	<1.9	<4.2
Benzene	ug/kg dw	7.7	32D	46	34	35D
cis-1,3-Dichloropropene	ug/kg dw	<1.4	<8.5	<8.1	<1.3	<2.8

Analytical Data Report

Lab Sample ID	Description	Matrix	Date Received	Date Sampled	SDG#
89482-1	SSB-5 (0-1.5)	Solid	11/20/03	11/17/03 14:42	
89482-1-DL	SSB-5 (0-1.5)	Solid	11/20/03	11/17/03 14:42	
89482-2	SSB-6 (1-2)	Solid	11/20/03	11/14/03 13:25	
89482-3	SSB-6 (2-3)	Solid	11/20/03	11/14/03 13:32	
89482-3-DL	SSB-6 (2-3)	Solid	11/20/03	11/14/03 13:32	

Parameter	Units	Lab Sample IDs 89482-1	89482-1-DL	89482-2	89482-3	89482-3-DL
Volatiles by GC/MS (8260)						
Bromoform	ug/kg dw	<1.9	<24	<22	<1.8	<4.0
2-Hexanone	ug/kg dw	<5.8	<42	<40	76	480D
4-Methyl-2-pentanone (MIBK)	ug/kg dw	<5.6	<120	<110	<5.4	<12
Tetrachloroethene	ug/kg dw	1200E	4700D	750	230E	410D
Toluene	ug/kg dw	8.0	36DB	33	5.5	5.6D
Chlorobenzene	ug/kg dw	<1.5	15DB	18	8.4	4.5D
Ethylbenzene	ug/kg dw	77	400D	18	3.1	<2.3
Styrene	ug/kg dw	1.7	14DB	9.2	2.4	<2.6
Xylenes, Total	ug/kg dw	94	690DB	230	36	76D
Surrogate - Toluene-d8 *	%	91 %	72 %	86 %	92 %	92 %
Surrogate - 4-Bromofluorobenzene *	%	71 %	83 %	96 %	74 %	77 %
Surrogate - Dibromofluoromethane *	%	98 %	93 %	111 %	91 %	92 %
Percent Solids		85	85	89	86	86
Dilution Factor		1	40	40	1	2
Prep Date		11/24/03	12/01/03	11/25/03	11/24/03	11/24/03
Analysis Date		11/24/03	12/01/03	11/25/03	11/24/03	11/24/03
Batch ID		1L1124	1M1201	2M1125	1L1124	1L1124

Analytical Data Report

Lab Sample ID	Description	Matrix	Date Received	Date Sampled	SDG#
89482-4	SSB-4 (0.5-1.5)	Solid	11/20/03	11/17/03 15:07	
89482-4-DL	SSB-4 (0.5-1.5)	Solid	11/20/03	11/17/03 15:07	
89482-5	SSB-3 (0.5-2.0)	Solid	11/20/03	11/17/03 15:30	
89482-6	SSB-1 (0.5-2.0)	Solid	11/20/03	11/17/03 15:50	
89482-7	SSB-2 (0.5-1.5)	Solid	11/20/03	11/17/03 16:05	

		Lab Sample IDs				
Parameter	Units	89482-4	89482-4-DL	89482-5	89482-6	89482-7
Volatiles by GC/MS (8260)						
Chloromethane	ug/kg dw	<8.5	<340	<340	<1.7	<9.0
Bromomethane (Methyl bromide)	ug/kg dw	<21	<410	<420	<4.2	<22
Vinyl chloride	ug/kg dw	2700E	1500D	1400	1.8	110
Chloroethane	ug/kg dw	<10	<240	<250	<2.1	<11
Methylene chloride (Dichloromethane)	ug/kg dw	<15	390D	<250	<3.0	<15
Acetone	ug/kg dw	5200E	13000DB	<1000	21	140
Carbon disulfide	ug/kg dw	21	270D	<160	<2.5	<13
1,1-Dichloroethene	ug/kg dw	40	<240	<250	<2.1	<11
1,1-Dichloroethane	ug/kg dw	220	400D	880	<1.2	<6.4
cis-1,2-Dichloroethene	ug/kg dw	27000E	41000D	82000	8.7	630
trans-1,2-Dichloroethene	ug/kg dw	880	730D	650	<1.5	23
Chloroform	ug/kg dw	<7.3	<240	<250	<1.5	<7.7
1,2-Dichloroethane	ug/kg dw	<9.1	<100	<100	<1.9	<9.6
2-Butanone (MEK)	ug/kg dw	<29	<1600	<1600	<5.8	<30
1,1,1-Trichloroethane	ug/kg dw	13	<85	<86	1.5	<5.2
Carbon tetrachloride	ug/kg dw	<5.7	<78	<79	<1.2	<6.0
Bromodichloromethane	ug/kg dw	<7.9	<78	<79	<1.6	<8.3
1,1,2,2-Tetrachloroethane	ug/kg dw	<12	<100	<100	<2.5	<13
1,2-Dichloropropane	ug/kg dw	<7.3	<88	<89	<1.5	<7.7
trans-1,3-Dichloropropene	ug/kg dw	<9.8	<63	<64	<2.0	<10
Trichloroethene	ug/kg dw	800	880D	3000	9.4	320
Dibromochloromethane	ug/kg dw	<8.5	<240	<250	<1.7	<9.0
1,1,2-Trichloroethane	ug/kg dw	<11	<110	<110	<2.2	<12
Benzene	ug/kg dw	120	150D	6800	8.1	38
cis-1,3-Dichloropropene	ug/kg dw	<7.3	<88	<89	<1.5	<7.7

Analytical Data Report

Lab Sample ID	Description	Matrix	Date Received	Date Sampled	SDG#
89482-4	SSB-4 (0.5-1.5)	Solid	11/20/03	11/17/03 15:07	
89482-4-DL	SSB-4 (0.5-1.5)	Solid	11/20/03	11/17/03 15:07	
89482-5	SSB-3 (0.5-2.0)	Solid	11/20/03	11/17/03 15:30	
89482-6	SSB-1 (0.5-2.0)	Solid	11/20/03	11/17/03 15:50	
89482-7	SSB-2 (0.5-1.5)	Solid	11/20/03	11/17/03 16:05	

		Lab Sample IDs				
Parameter	Units	89482-4	89482-4-DL	89482-5	89482-6	89482-7
Volatiles by GC/MS (8260)						
Bromoform	ug/kg dw	<10	<240	<250	<2.1	<11
2-Hexanone	ug/kg dw	<31	<440	<440	<6.3	<33
4-Methyl-2-pentanone (MIBK)	ug/kg dw	32	<1200	<1200	<6.2	<32
Tetrachloroethene	ug/kg dw	9.5	<140	280	5.0	74
Toluene	ug/kg dw	290	300DB	370B	<2.2	<12
Chlorobenzene	ug/kg dw	<7.9	<100	<100	2.1	<8.3
Ethylbenzene	ug/kg dw	150	190D	<86	<1.2	<6.4
Styrene	ug/kg dw	<6.7	<73	<74	<1.4	<7.0
Xylenes, Total	ug/kg dw	510	630DB	370B	<3.7	<19
Surrogate - Toluene-d8 *	%	90 %	90 %	84 %	92 %	94 %
Surrogate - 4-Bromofluorobenzene *	%	77 %	107 %	90 %	84 %	94 %
Surrogate - Dibromofluoromethane *	%	97 %	120 %	100 %	121 %	119 %
Percent Solids		82	82	81	82	78
Dilution Factor		5	400	400	1	5
Prep Date		11/24/03	12/01/03	12/01/03	12/01/03	12/01/03
Analysis Date		11/24/03	12/01/03	12/01/03	12/01/03	12/01/03
Batch ID		1L1124	1M1201	1M1201	1M1201	1M1201

Analytical Data Report

Lab Sample ID	Description	Matrix	Date Received	Date Sampled	SDG#
89482-8	DUP-11/17/03	Solid	11/20/03	11/17/03	
89482-8-DL	DUP-11/17/03	Solid	11/20/03	11/17/03	
89482-9	SSB-7 (0.5-1.5)	Solid	11/20/03	11/18/03 08:04	
89482-10	SSB-7 (2.0-3.5)	Solid	11/20/03	11/18/03 08:15	
89482-10-DL	SSB-7 (2.0-3.5)	Solid	11/20/03	11/18/03 08:15	

Parameter	Units	Lab Sample IDs 89482-8	89482-8-DL	89482-9	89482-10	89482-10-DL
Volatiles by GC/MS (8260)						
Chloromethane	ug/kg dw	<7.9	<310	<7.9	<32	<81
Bromomethane (Methyl bromide)	ug/kg dw	<19	<380	<19	<40	<99
Vinyl chloride	ug/kg dw	250	<220	320	480	1600D
Chloroethane	ug/kg dw	<9.6	<220	<9.6	<23	<58
Methylene chloride (Dichloromethane)	ug/kg dw	<13	250D	<13	<23	<58
Acetone	ug/kg dw	57	<920	78	480B	<240
Carbon disulfide	ug/kg dw	25	<150	<11	<15	<38
1,1-Dichloroethene	ug/kg dw	<9.6	<220	<9.6	<23	<58
1,1-Dichloroethane	ug/kg dw	<5.6	<100	7.2	100	180D
cis-1,2-Dichloroethene	ug/kg dw	15000E	12000D	710	13000E	22000D
trans-1,2-Dichloroethene	ug/kg dw	110	<92	24	260	410D
Chloroform	ug/kg dw	<6.7	<220	<6.7	<23	<58
1,2-Dichloroethane	ug/kg dw	<8.4	<94	<8.4	<9.8	<24
2-Butanone (MEK)	ug/kg dw	<26	<1500	<26	230B	460D
1,1,1-Trichloroethane	ug/kg dw	7.4	<79	<4.6	<8.1	<20
Carbon tetrachloride	ug/kg dw	<5.3	<72	<5.3	<7.4	<19
Bromodichloromethane	ug/kg dw	<7.3	<72	<7.3	<7.4	<19
1,1,2,2-Tetrachloroethane	ug/kg dw	<11	<92	<11	<9.5	<24
1,2-Dichloropropane	ug/kg dw	<6.7	<81	<6.7	<8.4	<21
trans-1,3-Dichloropropene	ug/kg dw	<9.0	<58	<9.0	<6.0	<15
Trichloroethene	ug/kg dw	7000E	6100D	210	350	630D
Dibromochloromethane	ug/kg dw	<7.9	<220	<7.9	<23	<58
1,1,2-Trichloroethane	ug/kg dw	<10	<99	<10	<10	<26
Benzene	ug/kg dw	680	600D	23	26	37D
cis-1,3-Dichloropropene	ug/kg dw	<6.7	<81	<6.7	<8.4	<21

Analytical Data Report

Lab Sample ID	Description	Matrix	Date Received	Date Sampled	SDG#
89482-8	DUP-11/17/03	Solid	11/20/03	11/17/03	
89482-8-DL	DUP-11/17/03	Solid	11/20/03	11/17/03	
89482-9	SSB-7 (0.5-1.5)	Solid	11/20/03	11/18/03 08:04	
89482-10	SSB-7 (2.0-3.5)	Solid	11/20/03	11/18/03 08:15	
89482-10-DL	SSB-7 (2.0-3.5)	Solid	11/20/03	11/18/03 08:15	

Parameter	Units	Lab Sample IDs 89482-8	89482-8-DL	89482-9	89482-10	89482-10-DL
Volatiles by GC/MS (8260)						
Bromoform	ug/kg dw	<9.6	<220	<9.6	<23	<58
2-Hexanone	ug/kg dw	<29	<400	<29	<42	220D
4-Methyl-2-pentanone (MIBK)	ug/kg dw	<28	<1100	<28	<120	<290
Tetrachloroethene	ug/kg dw	440	640D	20	61	140D
Toluene	ug/kg dw	120	200DB	<10	17B	38D
Chlorobenzene	ug/kg dw	<7.3	<94	<7.3	11B	<24
Ethylbenzene	ug/kg dw	19	<79	<5.6	<8.1	<20
Styrene	ug/kg dw	<6.2	<67	<6.2	<7.0	<17
Xylenes, Total	ug/kg dw	120	310DB	<17	<23	<58
Surrogate - Toluene-d8 *	%	100 %	82 %	93 %	79 %	83 %
Surrogate - 4-Bromofluorobenzene *	%	78 %	93 %	86 %	96 %	90 %
Surrogate - Dibromofluoromethane *	%	93 %	104 %	114 %	107 %	103 %
Percent Solids		89	89	89	86	86
Dilution Factor		5	400	5	40	100
Prep Date		11/24/03	12/01/03	12/01/03	12/01/03	12/03/03
Analysis Date		11/24/03	12/01/03	12/01/03	12/01/03	12/03/03
Batch ID		1L1124	1M1201	1M1201	1M1201	1M1203

Analytical Data Report

Lab Sample ID	Description	Matrix	Date Received	Date Sampled	SDG#
89482-11	SSB-8 (0.5-2.0)	Solid	11/20/03	11/18/03 09:00	
89482-12	SSB-8 (5.0-6.5)	Solid	11/20/03	11/18/03 09:45	
89482-13	SSB-12 (1-2)	Solid	11/20/03	11/18/03 10:43	
89482-14	SSB-12 (5.5-6.5)	Solid	11/20/03	11/18/03 11:20	
89482-15	SSB-10 (1-2)	Solid	11/20/03	11/18/03 12:14	

Parameter	Units	Lab Sample IDs 89482-11	89482-12	89482-13	89482-14	89482-15
Volatiles by GC/MS (8260)						
Chloromethane	ug/kg dw	<7.4	<1.6	<1.4	<1.6	<1.6
Bromomethane (Methyl bromide)	ug/kg dw	<18	<4.0	<3.5	<3.9	<3.8
Vinyl chloride	ug/kg dw	33	2.7	<1.4	<1.6	<1.6
Chloroethane	ug/kg dw	<9.0	<2.0	<1.8	<2.0	<1.9
Methylene chloride (Dichloromethane)	ug/kg dw	<13	<2.8	<2.5	<2.8	<2.7
Acetone	ug/kg dw	<42	<9.4	<8.3	<9.2	<8.9
Carbon disulfide	ug/kg dw	<11	<2.3	<2.1	<2.3	<2.2
1,1-Dichloroethene	ug/kg dw	<9.0	<2.0	<1.8	<2.0	<1.9
1,1-Dichloroethane	ug/kg dw	<5.3	2.3	<1.0	<1.2	<1.1
cis-1,2-Dichloroethene	ug/kg dw	620	29	<1.1	7.7	7.4
trans-1,2-Dichloroethene	ug/kg dw	24	<1.4	<1.2	<1.4	<1.3
Chloroform	ug/kg dw	<6.4	<1.4	<1.2	<1.4	<1.3
1,2-Dichloroethane	ug/kg dw	<8.0	<1.8	<1.6	<1.7	<1.7
2-Butanone (MEK)	ug/kg dw	<25	<5.5	<4.8	<5.4	<5.2
1,1,1-Trichloroethane	ug/kg dw	<4.3	3.2	<0.84	<0.94	1.2
Carbon tetrachloride	ug/kg dw	<5.0	<1.1	<0.97	<1.1	<1.0
Bromodichloromethane	ug/kg dw	<6.9	<1.5	<1.3	<1.5	<1.4
1,1,2,2-Tetrachloroethane	ug/kg dw	<11	<2.3	<2.1	<2.3	<2.2
1,2-Dichloropropane	ug/kg dw	<6.4	<1.4	<1.2	<1.4	<1.3
trans-1,3-Dichloropropene	ug/kg dw	<8.5	<1.9	<1.6	<1.8	<1.8
Trichloroethene	ug/kg dw	100	28	8.1	20	17
Dibromochloromethane	ug/kg dw	<7.4	<1.6	<1.4	<1.6	<1.6
1,1,2-Trichloroethane	ug/kg dw	<9.6	<2.1	<1.9	<2.1	<2.0
Benzene	ug/kg dw	29	8.6	6.4	12	11
cis-1,3-Dichloropropene	ug/kg dw	<6.4	<1.4	<1.2	<1.4	<1.3

Analytical Data Report

Lab Sample ID	Description	Matrix	Date Received	Date Sampled	SDG#
89482-11	SSB-8 (0.5-2.0)	Solid	11/20/03	11/18/03 09:00	
89482-12	SSB-8 (5.0-6.5)	Solid	11/20/03	11/18/03 09:45	
89482-13	SSB-12 (1-2)	Solid	11/20/03	11/18/03 10:43	
89482-14	SSB-12 (5.5-6.5)	Solid	11/20/03	11/18/03 11:20	
89482-15	SSB-10 (1-2)	Solid	11/20/03	11/18/03 12:14	

Parameter	Units	Lab Sample IDs 89482-11	89482-12	89482-13	89482-14	89482-15
Volatiles by GC/MS (8260)						
Bromoform	ug/kg dw	<9.0	<2.0	<1.8	<2.0	<1.9
2-Hexanone	ug/kg dw	<27	<6.0	<5.3	<5.9	<5.6
4-Methyl-2-pentanone (MIBK)	ug/kg dw	<26	<5.8	<5.2	<5.8	<5.5
Tetrachloroethene	ug/kg dw	36	<1.8	2.9	7.6	7.5
Toluene	ug/kg dw	16	<2.1	<1.9	<2.1	2.2
Chlorobenzene	ug/kg dw	<6.9	1.6	1.6	2.9	3.0
Ethylbenzene	ug/kg dw	<5.3	<1.2	<1.0	<1.2	<1.1
Styrene	ug/kg dw	<5.8	<1.3	<1.1	<1.3	<1.2
Xylenes, Total	ug/kg dw	5.2	<3.5	<3.1	<3.5	<3.3
Surrogate - Toluene-d8 *	%	96 %	91 %	96 %	95 %	96 %
Surrogate - 4-Bromofluorobenzene *	%	100 %	86 %	100 %	98 %	93 %
Surrogate - Dibromofluoromethane *	%	119 %	121 %	112 %	116 %	116 %
Percent Solids		94	89	93	90	92
Dilution Factor		5	1	1	1	1
Prep Date		12/01/03	12/01/03	12/02/03	12/02/03	12/02/03
Analysis Date		12/01/03	12/01/03	12/02/03	12/02/03	12/02/03
Batch ID		1M1201	1M1201	2M1202	2M1202	2M1202

Analytical Data Report

Lab Sample ID	Description	Matrix	Date Received	Date Sampled	SDG#
89482-16	DUP-1118103	Solid	11/20/03	11/18/03	
89482-17	SSB-10 (10.5-12)	Solid	11/20/03	11/18/03 13:30	
89482-18	SSB-9 (1-2)	Solid	11/20/03	11/18/03 14:12	
89482-19	SSB-9 (9.5-10.5)	Solid	11/20/03	11/18/03 15:20	
89482-20	SSB-11 (1-2)	Solid	11/20/03	11/19/03 11:30	

Parameter	Units	Lab Sample IDs 89482-16	89482-17	89482-18	89482-19	89482-20
Volatiles by GC/MS (8260)						
Chloromethane	ug/kg dw	<1.5	<1.3	<0.75	<1.3	<1.5
Bromomethane (Methyl bromide)	ug/kg dw	<3.7	<3.2	<1.8	<3.1	<3.7
Vinyl chloride	ug/kg dw	<1.5	<1.3	<0.75	<1.3	<1.5
Chloroethane	ug/kg dw	<1.9	<1.6	<0.91	<1.6	<1.8
Methylene chloride (Dichloromethane)	ug/kg dw	<2.6	<2.2	<1.3	<2.2	<2.6
Acetone	ug/kg dw	<8.8	<7.5	<4.3	<7.4	<8.6
Carbon disulfide	ug/kg dw	<2.2	<1.9	<1.1	<1.8	<2.2
1,1-Dichloroethene	ug/kg dw	<1.9	<1.6	<0.91	<1.6	<1.8
1,1-Dichloroethane	ug/kg dw	<1.1	<0.93	<0.54	<0.92	<1.1
cis-1,2-Dichloroethene	ug/kg dw	45	30	18	21	7.2
trans-1,2-Dichloroethene	ug/kg dw	<1.3	<1.1	<0.64	<1.1	<1.3
Chloroform	ug/kg dw	<1.3	<1.1	<0.64	<1.1	<1.3
1,2-Dichloroethane	ug/kg dw	<1.6	<1.4	<0.81	<1.4	<1.6
2-Butanone (MEK)	ug/kg dw	<5.2	<4.4	2.7	<4.3	<5.1
1,1,1-Trichloroethane	ug/kg dw	<0.89	<0.76	0.85	1.0	<0.87
Carbon tetrachloride	ug/kg dw	<1.0	<0.88	<0.50	<0.87	<1.0
Bromodichloromethane	ug/kg dw	<1.4	<1.2	<0.70	<1.2	<1.4
1,1,2,2-Tetrachloroethane	ug/kg dw	<2.2	<1.9	<1.1	<1.8	<2.2
1,2-Dichloropropane	ug/kg dw	<1.3	<1.1	<0.64	<1.1	<1.3
trans-1,3-Dichloropropene	ug/kg dw	<1.8	<1.5	<0.86	<1.5	<1.7
Trichloroethene	ug/kg dw	24	14	23	17	27
Dibromochloromethane	ug/kg dw	<1.5	<1.3	<0.75	<1.3	<1.5
1,1,2-Trichloroethane	ug/kg dw	<2.0	<1.7	<0.97	<1.7	<1.9
Benzene	ug/kg dw	8.7	4.8	11	7.1	9.8
cis-1,3-Dichloropropene	ug/kg dw	<1.3	<1.1	<0.64	<1.1	<1.3

Analytical Data Report

Lab Sample ID	Description	Matrix	Date Received	Date Sampled	SDG#
89482-16	DUP-1118103	Solid	11/20/03	11/18/03	
89482-17	SSB-10 (10.5-12)	Solid	11/20/03	11/18/03 13:30	
89482-18	SSB-9 (1-2)	Solid	11/20/03	11/18/03 14:12	
89482-19	SSB-9 (9.5-10.5)	Solid	11/20/03	11/18/03 15:20	
89482-20	SSB-11 (1-2)	Solid	11/20/03	11/19/03 11:30	

Parameter	Units	Lab Sample IDs 89482-16	89482-17	89482-18	89482-19	89482-20
Volatiles by GC/MS (8260)						
Bromoform	ug/kg dw	<1.9	<1.6	<0.91	<1.6	<1.8
2-Hexanone	ug/kg dw	<5.6	<4.8	<2.7	<4.7	<5.5
4-Methyl-2-pentanone (MIBK)	ug/kg dw	<5.5	<4.7	<2.7	<4.6	<5.4
Tetrachloroethene	ug/kg dw	9.2	6.3	11	9.3	11
Toluene	ug/kg dw	<2.0	<1.7	3.3	5.8	7.9
Chlorobenzene	ug/kg dw	1.5	<1.2	5.3	<1.2	9.2
Ethylbenzene	ug/kg dw	<1.1	<0.93	0.81	<0.92	1.2
Styrene	ug/kg dw	<1.2	<1.0	0.67	<1.0	<1.2
Xylenes, Total	ug/kg dw	<3.3	<2.8	2.4	<2.8	3.3
Surrogate - Toluene-d8 *	%	94 %	91 %	89 %	96 %	104 %
Surrogate - 4-Bromofluorobenzene *	%	87 %	89 %	89 %	100 %	89 %
Surrogate - Dibromofluoromethane *	%	114 %	115 %	111 %	115 %	96 %
Percent Solids		93	94	93	95	91
Dilution Factor		1	1	1	1	1
Prep Date		12/02/03	12/02/03	12/03/03	12/02/03	12/04/03
Analysis Date		12/02/03	12/02/03	12/03/03	12/02/03	12/04/03
Batch ID		2M1202	2M1202	1M1203	2M1202	2M1204

Analytical Data Report

Lab Sample ID	Description	Matrix	Date Received	Date Sampled	SDG#
89482-21	SSB-11 (7-8)	Solid	11/20/03	11/19/03 12:25	
89482-22	SSB-13 (1-2)	Solid	11/20/03	11/19/03 14:24	
89482-23	SSB-13 (3-4)	Solid	11/20/03	11/19/03 14:36	

Parameter	Units	Lab Sample IDs 89482-21	89482-22	89482-23
Volatiles by GC/MS (8260)				
Chloromethane	ug/kg dw	<1.4	<1.6	<200000
Bromomethane (Methyl bromide)	ug/kg dw	<3.3	<4.0	<240000
Vinyl chloride	ug/kg dw	<1.4	<1.6	<140000
Chloroethane	ug/kg dw	<1.6	<2.0	<140000
Methylene chloride (Dichloromethane)	ug/kg dw	<2.3	<2.8	<140000
Acetone	ug/kg dw	<7.8	42	<580000
Carbon disulfide	ug/kg dw	<1.9	<2.3	<92000
1,1-Dichloroethene	ug/kg dw	<1.6	<2.0	<140000
1,1-Dichloroethane	ug/kg dw	<0.97	1.6	<66000
cis-1,2-Dichloroethene	ug/kg dw	2.1	12	<75000
trans-1,2-Dichloroethene	ug/kg dw	<1.2	<1.4	<58000
Chloroform	ug/kg dw	<1.2	<1.4	<140000
1,2-Dichloroethane	ug/kg dw	<1.4	<1.8	<59000
2-Butanone (MEK)	ug/kg dw	<4.6	<5.5	<940000
1,1,1-Trichloroethane	ug/kg dw	<0.79	<0.95	<49000
Carbon tetrachloride	ug/kg dw	<0.91	<1.1	<45000
Bromodichloromethane	ug/kg dw	<1.3	<1.5	<45000
1,1,2,2-Tetrachloroethane	ug/kg dw	<1.9	<2.3	<58000
1,2-Dichloropropane	ug/kg dw	<1.2	<1.4	<51000
trans-1,3-Dichloropropene	ug/kg dw	<1.6	<1.9	<37000
Trichloroethene	ug/kg dw	6.4	20	<140000
Dibromochloromethane	ug/kg dw	<1.4	<1.6	<140000
1,1,2-Trichloroethane	ug/kg dw	<1.7	<2.1	<62000
Benzene	ug/kg dw	<1.1	8.8	<39000
cis-1,3-Dichloropropene	ug/kg dw	<1.2	<1.4	<51000
Bromoform	ug/kg dw	<1.6	<2.0	<140000
2-Hexanone	ug/kg dw	<4.9	<6.0	<250000

Analytical Data Report

Lab Sample ID	Description	Matrix	Date Received	Date Sampled	SDG#
89482-21	SSB-11 (7-8)	Solid	11/20/03	11/19/03 12:25	
89482-22	SSB-13 (1-2)	Solid	11/20/03	11/19/03 14:24	
89482-23	SSB-13 (3-4)	Solid	11/20/03	11/19/03 14:36	

Parameter	Units	Lab Sample IDs 89482-21	89482-22	89482-23
Volatiles by GC/MS (8260)				
4-Methyl-2-pentanone (MIBK)	ug/kg dw	<4.8	<5.8	<700000
Tetrachloroethene	ug/kg dw	<1.4	11	<80000
Toluene	ug/kg dw	<1.7	30	4600000
Chlorobenzene	ug/kg dw	<1.3	4.5	<59000
Ethylbenzene	ug/kg dw	<0.97	4.0	410000
Styrene	ug/kg dw	<1.1	<1.3	<42000
Xylenes, Total	ug/kg dw	<2.9	23	2300000
Surrogate - Toluene-d8 *	%	90 %	91 %	* F33
Surrogate - 4-Bromofluorobenzene *	%	92 %	95 %	* F33
Surrogate - Dibromofluoromethane *	%	114 %	114 %	* F33
Percent Solids		92	89	71
Dilution Factor		1	1	200000
Prep Date		12/03/03	12/03/03	12/03/03
Analysis Date		12/03/03	12/03/03	12/03/03
Batch ID		1M1203	1M1203	1M1203

Analytical Data Report

Lab Sample ID	Description	Matrix	Date Received	Date Sampled	SDG#
89482-24	TB111803	Liquid	11/20/03	11/18/03	
89482-25	EB111803	Liquid	11/20/03	11/18/03 09:00	

Parameter	Units	Lab Sample IDs 89482-24	89482-25
Volatiles by GC/MS (8260)			
Chloromethane	ug/l	<1.0	<1.0
Bromomethane (Methyl bromide)	ug/l	<1.0	<1.0
Vinyl chloride	ug/l	<1.0	<1.0
Chloroethane	ug/l	<1.0	<1.0
Methylene chloride (Dichloromethane)	ug/l	<5.0	<5.0
Acetone	ug/l	<25	<25
Carbon disulfide	ug/l	<1.0	<1.0
1,1-Dichloroethene	ug/l	<1.0	<1.0
1,1-Dichloroethane	ug/l	<1.0	<1.0
cis-1,2-Dichloroethene	ug/l	<1.0	<1.0
trans-1,2-Dichloroethene	ug/l	<1.0	<1.0
Chloroform	ug/l	<1.0	<1.0
1,2-Dichloroethane	ug/l	<1.0	<1.0
2-Butanone (MEK)	ug/l	<10	<10
1,1,1-Trichloroethane	ug/l	<1.0	<1.0
Carbon tetrachloride	ug/l	<1.0	<1.0
Bromodichloromethane	ug/l	<1.0	<1.0
1,1,2,2-Tetrachloroethane	ug/l	<1.0	<1.0
1,2-Dichloropropane	ug/l	<1.0	<1.0
trans-1,3-Dichloropropene	ug/l	<1.0	<1.0
Trichloroethene	ug/l	<1.0	<1.0
Dibromochloromethane	ug/l	<1.0	<1.0
1,1,2-Trichloroethane	ug/l	<1.0	<1.0
Benzene	ug/l	<1.0	<1.0
cis-1,3-Dichloropropene	ug/l	<1.0	<1.0
Bromoform	ug/l	<1.0	<1.0
2-Hexanone	ug/l	<10	<10
4-Methyl-2-pentanone (MIBK)	ug/l	<10	<10

Analytical Data Report

Lab Sample ID	Description	Matrix	Date Received	Date Sampled	SDG#
89482-24	TB111803	Liquid	11/20/03	11/18/03	
89482-25	EB111803	Liquid	11/20/03	11/18/03 09:00	

Parameter	Units	Lab Sample IDs 89482-24	89482-25
Volatiles by GC/MS (8260)			
Tetrachloroethene	ug/l	<1.0	<1.0
Toluene	ug/l	<1.0	<1.0
Chlorobenzene	ug/l	<1.0	<1.0
Ethylbenzene	ug/l	<1.0	<1.0
Styrene	ug/l	<1.0	<1.0
Xylenes, Total	ug/l	<2.0	<2.0
Surrogate - Toluene-d8 *	%	86 %	86 %
Surrogate - 4-Bromofluorobenzene *	%	96 %	96 %
Surrogate - Dibromofluoromethane *	%	82 %	82 %
Dilution Factor		1	1
Prep Date		12/01/03	12/01/03
Analysis Date		12/01/03	12/01/03
Batch ID		101201C1	101201C1

Analytical Data Report

Lab Sample ID	Description	Matrix	Date Received	Date Sampled	SDG#
89482-26	Method Blank	Solid	11/20/03		
89482-27	Lab Control Standard % Recovery	Solid	11/20/03		
89482-28	LCS Accuracy Control Limit (%R)	Solid	11/20/03		
89482-32	Method Blank	Solid	11/20/03		
89482-33	Lab Control Standard Result	Solid	11/20/03		

Parameter	Units	Lab Sample IDs 89482-26	89482-27	89482-28	89482-32	89482-33
Volatiles by GC/MS (8260)						
Chloromethane	ug/kg dw	<1.4			<1.4	
Bromomethane (Methyl bromide)	ug/kg dw	<3.4			<3.4	
Vinyl chloride	ug/kg dw	<1.4			<1.4	
Chloroethane	ug/kg dw	<1.7			<1.7	
Methylene chloride (Dichloromethane)	ug/kg dw	<2.4			<2.4	
Acetone	ug/kg dw	<8.0			<8.0	
Carbon disulfide	ug/kg dw	<2.0			<2.0	
1,1-Dichloroethene	ug/kg dw	<1.7	124 %	46-142 %	<1.7	51
1,1-Dichloroethane	ug/kg dw	<1.0			<1.0	
cis-1,2-Dichloroethene	ug/kg dw	<1.1			<1.1	
trans-1,2-Dichloroethene	ug/kg dw	<1.2			<1.2	
Chloroform	ug/kg dw	<1.2			<1.2	
1,2-Dichloroethane	ug/kg dw	<1.5			<1.5	
2-Butanone (MEK)	ug/kg dw	<4.7			<4.7	
1,1,1-Trichloroethane	ug/kg dw	<0.81			<0.81	
Carbon tetrachloride	ug/kg dw	<0.94			<0.94	
Bromodichloromethane	ug/kg dw	<1.3			<1.3	
1,1,2,2-Tetrachloroethane	ug/kg dw	<2.0			<2.0	
1,2-Dichloropropane	ug/kg dw	<1.2			<1.2	
trans-1,3-Dichloropropene	ug/kg dw	<1.6			<1.6	
Trichloroethene	ug/kg dw	<1.1	100 %	64-126 %	<1.1	41
Dibromochloromethane	ug/kg dw	<1.4			<1.4	
1,1,2-Trichloroethane	ug/kg dw	<1.8			<1.8	
Benzene	ug/kg dw	<1.1	86 %	65-130 %	<1.1	35
cis-1,3-Dichloropropene	ug/kg dw	<1.2			<1.2	

Analytical Data Report

Lab Sample ID	Description	Matrix	Date Received	Date Sampled	SDG#
89482-26	Method Blank	Solid	11/20/03		
89482-27	Lab Control Standard % Recovery	Solid	11/20/03		
89482-28	LCS Accuracy Control Limit (%R)	Solid	11/20/03		
89482-32	Method Blank	Solid	11/20/03		
89482-33	Lab Control Standard Result	Solid	11/20/03		

Parameter	Units	Lab Sample IDs 89482-26	89482-27	89482-28	89482-32	89482-33
Volatiles by GC/MS (8260)						
Bromoform	ug/kg dw	<1.7			<1.7	
2-Hexanone	ug/kg dw	<5.1			<5.1	
4-Methyl-2-pentanone (MIBK)	ug/kg dw	<5.0			<5.0	
Tetrachloroethene	ug/kg dw	<1.5			<1.5	
Toluene	ug/kg dw	<1.8	94 %	63-133 %	<1.8	38
Chlorobenzene	ug/kg dw	<1.3	110 %	69-128 %	<1.3	45
Ethylbenzene	ug/kg dw	<1.0			<1.0	
Styrene	ug/kg dw	<1.1			<1.1	
Xylenes, Total	ug/kg dw	<3.0			<3.0	
Surrogate - Toluene-d8 *	%	92 %	92 %	64-136 %	92 %	39
Surrogate - 4-Bromofluorobenzene *	%	92 %	106 %	63-135 %	104 %	44
Surrogate - Dibromofluoromethane *	%	114 %	112 %	58-142 %	112 %	48
Dilution Factor		1	1		1	1
Prep Date		12/02/03	12/02/03		12/03/03	12/03/03
Analysis Date		12/02/03	12/02/03		12/03/03	12/03/03
Batch ID		2M1202	2M1202		1M1203	1M1203

Analytical Data Report

Lab Sample ID	Description	Matrix	Date Received	Date Sampled	SDG#
89482-34	Lab Control Standard % Recovery	Solid	11/20/03		
89482-35	Method Blank	Solid	11/20/03		
89482-36	Lab Control Standard Result	Solid	11/20/03		
89482-37	Lab Control Standard % Recovery	Solid	11/20/03		
89482-38	Method Blank	Solid	11/20/03		

		Lab Sample IDs				
Parameter	Units	89482-34	89482-35	89482-36	89482-37	89482-38
Volatiles by GC/MS (8260)						
1,1-Dichloroethene	%	102 %	<1.7	48	96 %	<20
Trichloroethene	%	82 %	<1.1	49	98 %	<20
Benzene	%	70 %	<1.1	48	96 %	<5.6
Toluene	%	76 %	<1.8	50	100 %	<7.0
Chlorobenzene	%	90 %	<1.3	50	100 %	<8.4
Surrogate - Toluene-d8 *	%	78 %	100 %	50	100 %	104 %
Surrogate - 4-Bromofluorobenzene *	%	88 %	92 %	51	102 %	92 %
Surrogate - Dibromofluoromethane *	%	96 %	94 %	48	96 %	120 %
Chloromethane	ug/kg dw		<1.4			<28
Bromomethane (Methyl bromide)	ug/kg dw		<3.4			<34
Vinyl chloride	ug/kg dw		<1.4			<20
Chloroethane	ug/kg dw		<1.7			<20
Methylene chloride (Dichloromethane)	ug/kg dw		<2.4			23
Acetone	ug/kg dw		<8.0			<82
Carbon disulfide	ug/kg dw		<2.0			<13
1,1-Dichloroethane	ug/kg dw		<1.0			<9.4
cis-1,2-Dichloroethene	ug/kg dw		<1.1			<11
trans-1,2-Dichloroethene	ug/kg dw		<1.2			<8.2
Chloroform	ug/kg dw		<1.2			<20
1,2-Dichloroethane	ug/kg dw		<1.5			<8.4
2-Butanone (MEK)	ug/kg dw		<4.7			220
1,1,1-Trichloroethane	ug/kg dw		<0.81			<7.0
Carbon tetrachloride	ug/kg dw		<0.94			<6.4

Analytical Data Report

Lab Sample ID	Description	Matrix	Date Received	Date Sampled	SDG#
89482-34	Lab Control Standard % Recovery	Solid	11/20/03		
89482-35	Method Blank	Solid	11/20/03		
89482-36	Lab Control Standard Result	Solid	11/20/03		
89482-37	Lab Control Standard % Recovery	Solid	11/20/03		
89482-38	Method Blank	Solid	11/20/03		

Parameter	Units	Lab Sample IDs 89482-34	89482-35	89482-36	89482-37	89482-38
Volatiles by GC/MS (8260)						
Bromodichloromethane	ug/kg dw		<1.3			<6.4
1,1,2,2-Tetrachloroethane	ug/kg dw		<2.0			<8.2
1,2-Dichloropropane	ug/kg dw		<1.2			<7.2
trans-1,3-Dichloropropene	ug/kg dw		<1.6			<5.2
Dibromochloromethane	ug/kg dw		<1.4			<20
1,1,2-Trichloroethane	ug/kg dw		<1.8			<8.8
cis-1,3-Dichloropropene	ug/kg dw		<1.2			<7.2
Bromoform	ug/kg dw		<1.7			<20
2-Hexanone	ug/kg dw		<5.1			<36
4-Methyl-2-pentanone (MIBK)	ug/kg dw		<5.0			<100
Tetrachloroethene	ug/kg dw		<1.5			<11
Ethylbenzene	ug/kg dw		<1.0			<7.0
Styrene	ug/kg dw		<1.1			<6.0
Xylenes, Total	ug/kg dw		<3.0			<20
Dilution Factor		1	1	1	1	40
Prep Date		12/03/03	12/04/03	12/04/03	12/04/03	11/25/03
Analysis Date		12/03/03	12/04/03	12/04/03	12/04/03	11/25/03
Batch ID		1M1203	2M1204	2M1204	2M1204	2M1125

Analytical Data Report

Lab Sample ID	Description	Matrix	Date Received	Date Sampled	SDG#
89482-39	Lab Control Standard Result	Solid	11/20/03		
89482-40	Lab Control Standard % Recovery	Solid	11/20/03		
89482-41	Method Blank	Solid	11/20/03		
89482-42	Lab Control Standard Result	Solid	11/20/03		
89482-43	Lab Control Standard % Recovery	Solid	11/20/03		

Parameter	Units	Lab Sample IDs 89482-39	89482-40	89482-41	89482-42	89482-43
Volatiles by GC/MS (8260)						
1,1-Dichloroethene	ug/kg dw	2600	104 %	<1.7	36	72 %
Trichloroethene	ug/kg dw	2300	92 %	<1.1	51	102 %
Benzene	ug/kg dw	2200	88 %	<1.1	52	104 %
Toluene	ug/kg dw	2200	88 %	<1.8	56	112 %
Chlorobenzene	ug/kg dw	2400	96 %	<1.3	53	106 %
Surrogate - Toluene-d8 *	ug/kg dw	2200	88 %	94 %	57	114 %
Surrogate - 4-Bromofluorobenzene *	ug/kg dw	2200	88 %	92 %	52	104 %
Surrogate - Dibromofluoromethane *	ug/kg dw	2700	108 %	90 %	43	86 %
Chloromethane	ug/kg dw			<1.4		
Bromomethane (Methyl bromide)	ug/kg dw			<3.4		
Vinyl chloride	ug/kg dw			<1.4		
Chloroethane	ug/kg dw			<1.7		
Methylene chloride (Dichloromethane)	ug/kg dw			<2.4		
Acetone	ug/kg dw			<8.0		
Carbon disulfide	ug/kg dw			<2.0		
1,1-Dichloroethane	ug/kg dw			<1.0		
cis-1,2-Dichloroethene	ug/kg dw			<1.1		
trans-1,2-Dichloroethene	ug/kg dw			<1.2		
Chloroform	ug/kg dw			<1.2		
1,2-Dichloroethane	ug/kg dw			<1.5		
2-Butanone (MEK)	ug/kg dw			<4.7		
1,1,1-Trichloroethane	ug/kg dw			<0.81		
Carbon tetrachloride	ug/kg dw			<0.94		

Analytical Data Report

Lab Sample ID	Description	Matrix	Date Received	Date Sampled	SDG#
89482-39	Lab Control Standard Result	Solid	11/20/03		
89482-40	Lab Control Standard % Recovery	Solid	11/20/03		
89482-41	Method Blank	Solid	11/20/03		
89482-42	Lab Control Standard Result	Solid	11/20/03		
89482-43	Lab Control Standard % Recovery	Solid	11/20/03		

Parameter	Units	Lab Sample IDs 89482-39	89482-40	89482-41	89482-42	89482-43
Volatiles by GC/MS (8260)						
Bromodichloromethane	ug/kg dw			<1.3		
1,1,2,2-Tetrachloroethane	ug/kg dw			<2.0		
1,2-Dichloropropane	ug/kg dw			<1.2		
trans-1,3-Dichloropropene	ug/kg dw			<1.6		
Dibromochloromethane	ug/kg dw			<1.4		
1,1,2-Trichloroethane	ug/kg dw			<1.8		
cis-1,3-Dichloropropene	ug/kg dw			<1.2		
Bromoform	ug/kg dw			<1.7		
2-Hexanone	ug/kg dw			<5.1		
4-Methyl-2-pentanone (MIBK)	ug/kg dw			<5.0		
Tetrachloroethene	ug/kg dw			<1.5		
Ethylbenzene	ug/kg dw			<1.0		
Styrene	ug/kg dw			<1.1		
Xylenes, Total	ug/kg dw			<3.0		
Dilution Factor		40	40	1	1	1
Prep Date		11/25/03	11/25/03	11/24/03	11/24/03	11/24/03
Analysis Date		11/25/03	11/25/03	11/24/03	11/24/03	11/24/03
Batch ID		2M1125	2M1125	1L1124	1L1124	1L1124

Analytical Data Report

Lab Sample ID	Description	Matrix	Date Received	Date Sampled	SDG#
89482-44	Method Blank	Solid	11/20/03		
89482-45	Lab Control Standard Result	Solid	11/20/03		
89482-46	Lab Control Standard % Recovery	Solid	11/20/03		
89482-47	Method Blank	Solid	11/20/03		
89482-48	Lab Control Standard Result	Solid	11/20/03		

Parameter	Units	Lab Sample IDs 89482-44	89482-45	89482-46	89482-47	89482-48
Volatiles by GC/MS (8260)						
Chloromethane	ug/kg dw	<1.4			<28	
Bromomethane (Methyl bromide)	ug/kg dw	<3.4			<34	
Vinyl chloride	ug/kg dw	<1.4			<20	
Chloroethane	ug/kg dw	<1.7			<20	
Methylene chloride (Dichloromethane)	ug/kg dw	<2.4			<20	
Acetone	ug/kg dw	<8.0			550	
Carbon disulfide	ug/kg dw	<2.0			<13	
1,1-Dichloroethene	ug/kg dw	<1.7	50	100 %	<20	3200
1,1-Dichloroethane	ug/kg dw	<1.0			<9.4	
cis-1,2-Dichloroethene	ug/kg dw	<1.1			<11	
trans-1,2-Dichloroethene	ug/kg dw	<1.2			<8.2	
Chloroform	ug/kg dw	<1.2			<20	
1,2-Dichloroethane	ug/kg dw	<1.5			<8.4	
2-Butanone (MEK)	ug/kg dw	<4.7			270	
1,1,1-Trichloroethane	ug/kg dw	<0.81			<7.0	
Carbon tetrachloride	ug/kg dw	<0.94			<6.4	
Bromodichloromethane	ug/kg dw	<1.3			<6.4	
1,1,2,2-Tetrachloroethane	ug/kg dw	<2.0			<8.2	
1,2-Dichloropropane	ug/kg dw	<1.2			<7.2	
trans-1,3-Dichloropropene	ug/kg dw	<1.6			<5.2	
Trichloroethene	ug/kg dw	<1.1	42	84 %	<20	2400
Dibromochloromethane	ug/kg dw	<1.4			<20	
1,1,2-Trichloroethane	ug/kg dw	<1.8			<8.8	
Benzene	ug/kg dw	<1.1	37	74 %	<5.6	2100
cis-1,3-Dichloropropene	ug/kg dw	<1.2			<7.2	

Analytical Data Report

Lab Sample ID	Description	Matrix	Date Received	Date Sampled	SDG#
89482-44	Method Blank	Solid	11/20/03		
89482-45	Lab Control Standard Result	Solid	11/20/03		
89482-46	Lab Control Standard % Recovery	Solid	11/20/03		
89482-47	Method Blank	Solid	11/20/03		
89482-48	Lab Control Standard Result	Solid	11/20/03		

Parameter	Units	Lab Sample IDs 89482-44	89482-45	89482-46	89482-47	89482-48
Volatiles by GC/MS (8260)						
Bromoform	ug/kg dw	<1.7			<20	
2-Hexanone	ug/kg dw	<5.1			<36	
4-Methyl-2-pentanone (MIBK)	ug/kg dw	<5.0			<100	
Tetrachloroethene	ug/kg dw	<1.5			<11	
Toluene	ug/kg dw	<1.8	40	80 %	9.1	2300
Chlorobenzene	ug/kg dw	<1.3	49	98 %	9.5	2700
Ethylbenzene	ug/kg dw	<1.0			<7.0	
Styrene	ug/kg dw	<1.1			11	
Xylenes, Total	ug/kg dw	<3.0			17	
Surrogate - Toluene-d8 *	%	96 %	40	80 %	88 %	2200
Surrogate - 4-Bromofluorobenzene *	%	104 %	46	92 %	108 %	2400
Surrogate - Dibromofluoromethane *	%	118 %	48	96 %	120 %	2900
Dilution Factor		1	1	1	40	40
Prep Date		12/01/03	12/01/03	12/01/03	12/01/03	12/01/03
Analysis Date		12/01/03	12/01/03	12/01/03	12/01/03	12/01/03
Batch ID		1M1201	1M1201	1M1201	1M1201	1M1201

Analytical Data Report

Lab Sample ID	Description	Matrix	Date Received	Date Sampled	SDG#
89482-49	Lab Control Standard % Recovery	Solid	11/20/03		
89482-50	Method Blank	Solid	11/20/03		
89482-51	Lab Control Standard Result	Solid	11/20/03		
89482-52	Lab Control Standard % Recovery	Solid	11/20/03		

Parameter	Units	Lab Sample IDs 89482-49	89482-50	89482-51	89482-52
Volatiles by GC/MS (8260)					
1,1-Dichloroethene	%	128 %	<20	2800	112 %
Trichloroethene	%	96 %	<20	2500	100 %
Benzene	%	84 %	<5.6	2100	84 %
Toluene	%	92 %	<7.0	2200	88 %
Chlorobenzene	%	108 %	<8.4	2800	112 %
Surrogate - Toluene-d8 *	%	88 %	92 %	2200	88 %
Surrogate - 4-Bromofluorobenzene *	%	96 %	116 %	2600	104 %
Surrogate - Dibromofluoromethane *	%	116 %	120 %	2600	104 %
Chloromethane	ug/kg dw		<28		
Bromomethane (Methyl bromide)	ug/kg dw		<34		
Vinyl chloride	ug/kg dw		<20		
Chloroethane	ug/kg dw		<20		
Methylene chloride (Dichloromethane)	ug/kg dw		<20		
Acetone	ug/kg dw		470J		
Carbon disulfide	ug/kg dw		<13		
1,1-Dichloroethane	ug/kg dw		<9.4		
cis-1,2-Dichloroethene	ug/kg dw		<11		
trans-1,2-Dichloroethene	ug/kg dw		<8.2		
Chloroform	ug/kg dw		<20		
1,2-Dichloroethane	ug/kg dw		<8.4		
2-Butanone (MEK)	ug/kg dw		230J		
1,1,1-Trichloroethane	ug/kg dw		<7.0		
Carbon tetrachloride	ug/kg dw		<6.4		
Bromodichloromethane	ug/kg dw		<6.4		

Analytical Data Report

Lab Sample ID	Description	Matrix	Date Received	Date Sampled	SDG#
89482-49	Lab Control Standard % Recovery	Solid	11/20/03		
89482-50	Method Blank	Solid	11/20/03		
89482-51	Lab Control Standard Result	Solid	11/20/03		
89482-52	Lab Control Standard % Recovery	Solid	11/20/03		

Parameter	Units	Lab Sample IDs 89482-49	89482-50	89482-51	89482-52
Volatiles by GC/MS (8260)					
1,1,2,2-Tetrachloroethane	ug/kg dw		<8.2		
1,2-Dichloropropane	ug/kg dw		<7.2		
trans-1,3-Dichloropropene	ug/kg dw		<5.2		
Dibromochloromethane	ug/kg dw		<20		
1,1,2-Trichloroethane	ug/kg dw		<8.8		
cis-1,3-Dichloropropene	ug/kg dw		<7.2		
Bromoform	ug/kg dw		<20		
2-Hexanone	ug/kg dw		<36		
4-Methyl-2-pentanone (MIBK)	ug/kg dw		<100		
Tetrachloroethene	ug/kg dw		<11		
Ethylbenzene	ug/kg dw		<7.0		
Styrene	ug/kg dw		<6.0		
Xylenes, Total	ug/kg dw		<20		
Dilution Factor		40	40	40	40
Prep Date		12/01/03	12/03/03	12/03/03	12/03/03
Analysis Date		12/01/03	12/03/03	12/03/03	12/03/03
Batch ID		1M1201	1M1203	1M1203	1M1203

Analytical Data Report

Lab Sample ID	Description	Matrix	Date Received	Date Sampled	SDG#
89482-29	Method Blank	Liquid	11/20/03		
89482-30	Lab Control Standard % Recovery	Liquid	11/20/03		
89482-31	LCS Accuracy Control Limit (%R)	Liquid	11/20/03		

Parameter	Units	Lab Sample IDs 89482-29	89482-30	89482-31
Volatiles by GC/MS (8260)				
Chloromethane	ug/l	<1.0		
Bromomethane (Methyl bromide)	ug/l	<1.0		
Vinyl chloride	ug/l	<1.0		
Chloroethane	ug/l	<1.0		
Methylene chloride (Dichloromethane)	ug/l	<5.0		
Acetone	ug/l	<25		
Carbon disulfide	ug/l	<1.0		
1,1-Dichloroethene	ug/l	<1.0	84 %	53-144 %
1,1-Dichloroethane	ug/l	<1.0		
cis-1,2-Dichloroethene	ug/l	<1.0		
trans-1,2-Dichloroethene	ug/l	<1.0		
Chloroform	ug/l	<1.0		
1,2-Dichloroethane	ug/l	<1.0		
2-Butanone (MEK)	ug/l	<10		
1,1,1-Trichloroethane	ug/l	<1.0		
Carbon tetrachloride	ug/l	<1.0		
Bromodichloromethane	ug/l	<1.0		
1,1,2,2-Tetrachloroethane	ug/l	<1.0		
1,2-Dichloropropane	ug/l	<1.0		
trans-1,3-Dichloropropene	ug/l	<1.0		
Trichloroethene	ug/l	<1.0	84 %	70-123 %
Dibromochloromethane	ug/l	<1.0		
1,1,2-Trichloroethane	ug/l	<1.0		
Benzene	ug/l	<1.0	88 %	69-128 %
cis-1,3-Dichloropropene	ug/l	<1.0		
Bromoform	ug/l	<1.0		
2-Hexanone	ug/l	<10		

Analytical Data Report

Lab Sample ID	Description	Matrix	Date Received	Date Sampled	SDG#
89482-29	Method Blank	Liquid	11/20/03		
89482-30	Lab Control Standard % Recovery	Liquid	11/20/03		
89482-31	LCS Accuracy Control Limit (%R)	Liquid	11/20/03		

		Lab Sample IDs		
Parameter	Units	89482-29	89482-30	89482-31
Volatiles by GC/MS (8260)				
4-Methyl-2-pentanone (MIBK)	ug/l	<10		
Tetrachloroethene	ug/l	<1.0		
Toluene	ug/l	<1.0	96 %	71-129 %
Chlorobenzene	ug/l	<1.0	88 %	72-126 %
Ethylbenzene	ug/l	<1.0		
Styrene	ug/l	<1.0		
Xylenes, Total	ug/l	<2.0		
Surrogate - Toluene-d8 *	%	90 %	88 %	74-122 %
Surrogate - 4-Bromofluorobenzene *	%	104 %	100 %	70-119 %
Surrogate - Dibromofluoromethane *	%	86 %	88 %	68-129 %
Dilution Factor		1	1	
Prep Date		12/01/03	12/01/03	
Analysis Date		12/01/03	12/01/03	
Batch ID		101201C1	101201C1	

These test results meet all the requirements of NELAC. All questions regarding this test report should be directed to the STL Project Manager who signed this test report.

New York Lab ID#10842

These test results meet all the requirements of NELAC. All questions regarding this test report should be directed to the STL Project Manager who signed this test report.

*F33 = Control limits are established only for surrogate concentration levels specified by EPA methods. Because the sample was diluted prior to analysis, surrogate recoveries are not reported.

*F54 = Because surrogate recoveries were outside established limits, the sample was re-extracted and/or reanalyzed. Both sets of data are provided.

Serial Number 20867

ANALYSIS REQUEST AND CHAIN OF CUSTODY RECORD

SEVERN TRENT **STL**

(✓) **STL Savannah**
5102 LaRoche Avenue
Savannah, GA 31404
Website: www.stl-inc.com
Phone: (912) 354-7858
Fax: (912) 352-0165

( ) Alternate Laboratory Name/Location
Phone:
Fax:

PROJECT REFERENCE	PROJECT NO.	PROJECT LOCATION (STATE)
Ashland Rensselaer	37679253.04400	NY
STL (LAB) PROJECT MANAGER	**P.O. NUMBER**	**CONTRACT NO.**
Steve White		
CLIENT (SITE) PM	**CLIENT PHONE**	**CLIENT FAX**
Rick Centy/Greg Gilbertson	614-790-4302	614-790-6233
CLIENT NAME	**CLIENT E-MAIL**	
URS		
CLIENT ADDRESS		
5200 Blazer Parkway Dublin, OH 43017		
COMPANY CONTRACTING THIS WORK (if applicable)		

PAGE 2 OF 3

STANDARD REPORT DELIVERY (✓)
DATE DUE STANDARD
EXPEDITED REPORT DELIVERY (SURCHARGE) ( )
DATE DUE _____
NUMBER OF COOLERS SUBMITTED PER SHIPMENT: 1

SAMPLE DATE	SAMPLE TIME	SAMPLE IDENTIFICATION	MATRIX: COMPOSITE (C) OR GRAB (G) INDICATE	AQUEOUS (WATER)	SOLID OR SEMISOLID	AIR	NONAQUEOUS LIQUID (OIL, SOLVENT,...)	REQUIRED ANALYSIS: ice EPA 8260	NUMBER OF CONTAINERS SUBMITTED	REMARKS
11/18/03	9:00	SSB-8 (0.5-2.0)	6		X				1	
11/18/03	9:45	SSB-8 (5.0-6.5)	6		X				1	
11/18/03	10:43	SSB-12 (1-2)	6		X				1	
11/18/03	11:20	SSB-12 (5.5-6.5)	6		X				1	
11/18/03	12:14	SSB-10 (1-2)	6		X				1	
11/18/03	—	DUP-11/18/03	6		X				1	
11/18/03	13:30	SSB-10 (10.5-12)	6		X				1	
11/18/03	14:12	SSB-9 (1-2)	6		X				1	
11/18/03	15:20	SSB-9 (9.5-10.5)	6		X				1	
11/19/03	11:30	SSB-11 (1-2)	6		X				1	
11/19/03	12:25	SSB-11 (7-8)	6		X				1	
11/19/03	14:24	SSB-13 (1-2)	6		X				1	

RELINQUISHED BY: (SIGNATURE)	DATE	TIME	RELINQUISHED BY: (SIGNATURE)	DATE	TIME	RELINQUISHED BY: (SIGNATURE)	DATE	TIME
			Jennifer Miller	11/19/03	15:04			
RECEIVED BY: (SIGNATURE)	**DATE**	**TIME**	**RECEIVED BY: (SIGNATURE)**	**DATE**	**TIME**	**RECEIVED BY: (SIGNATURE)**	**DATE**	**TIME**

LABORATORY USE ONLY

RECEIVED FOR LABORATORY BY: (SIGNATURE)	DATE	TIME	CUSTODY INTACT	CUSTODY SEAL NO.	STL SAVANNAH LOG NO.	LABORATORY REMARKS
Lisa Wilson	11/20/03	9:15	YES ( ) NO ( )		5389482	

Serial Number 20868

ANALYSIS REQUEST AND CHAIN OF CUSTODY RECORD

SEVERN TRENT **STL**

✓ STL Savannah
5102 LaRoche Avenue
Savannah, GA 31404
Website: www.stl-inc.com
Phone: (912) 354-7858
Fax: (912) 352-0165

○ Alternate Laboratory Name/Location
Phone:
Fax:

PROJECT REFERENCE	PROJECT NO.	PROJECT LOCATION (STATE)
Ashland Rensselaer	37679253.044 06	NY
STL (LAB) PROJECT MANAGER	P.O. NUMBER	CONTRACT NO.
Steve White		
CLIENT (SITE) PM	CLIENT PHONE	CLIENT FAX
Rick Gentry / Greg Gilbertson	614-790-4302	614-790-623
CLIENT NAME	CLIENT E-MAIL	
URS		
CLIENT ADDRESS		
5200 Blazer Parkway Dublin, OH 43017		
COMPANY CONTRACTING THIS WORK (if applicable)		

PAGE 1 OF 3

STANDARD REPORT DELIVERY ✓ DATE DUE STANDARD

EXPEDITED REPORT DELIVERY (SURCHARGE) ○ DATE DUE _____

NUMBER OF COOLERS SUBMITTED PER SHIPMENT: 1

SAMPLE DATE	SAMPLE TIME	SAMPLE IDENTIFICATION	MATRIX: COMPOSITE (C) OR GRAB (G) INDICATE	AQUEOUS (WATER)	SOLID OR SEMISOLID	AIR	NONAQUEOUS LIQUID (OIL, SOLVENT,...)	REQUIRED ANALYSIS: EPA 8260	EPA 8260								REMARKS
								ice	HCl								NUMBER OF CONTAINERS SUBMITTED
11/17/03	14:42	SSB-5 (0-1.5)	6		X			1									
11/14/03	13:25	SSB-6 (1-2)	6		X			1									no sample date
11/14/03	13:32	SSB-6 (2-3)	6		X			1									no sample date
11/17/03	15:07	SSB-4 (0.5-1.5)	6		X			1									High PID reading >1000 ppm
11/17/03	15:30	SSB-3 (0.5-2.0)	6		X			1									High PID reading >1000 ppm
11/17/03	15:50	SSB-1 (0.5-2.0)	6		X→			1									
11/17/03	16:05	SSB-2 (0.5-1.5)	6		X			1									
11/17/03	—	DUP-11/17/03	6	X→				1									
11/18/03	8:04	SSB-7 (0.5-1.5)	6		X			1									
11/18/03	8:15	SSB-7 (2.0-3.5)	6		X			1									
11/18/03	—	TB111803	-	X					3								
11/18/03	9:20	EB111803	6	X					3								

RELINQUISHED BY: (SIGNATURE)	DATE	TIME	RELINQUISHED BY: (SIGNATURE)	DATE	TIME	RELINQUISHED BY: (SIGNATURE)	DATE	TIME
			Jennifer Hollis	11/19/03	15:04			
RECEIVED BY: (SIGNATURE)	DATE	TIME	RECEIVED BY: (SIGNATURE)	DATE	TIME	RECEIVED BY: (SIGNATURE)	DATE	TIME

LABORATORY USE ONLY

RECEIVED FOR LABORATORY BY: (SIGNATURE)	DATE	TIME	CUSTODY INTACT	CUSTODY SEAL NO.	STL SAVANNAH LOG NO.	LABORATORY REMARKS
Lisa Wilson	11/20/03	9:15	YES ○ NO ○		38948 2	

STL8240-680 (12/02)

CHAIN OF CUSTODY RECORD

URS

PROJECT NO. 37679253.0440

SITE NAME Ashland Rensrelaer

SAMPLERS (PRINT/SIGNATURE) Jenn Gillies

LAB STL Savannah

COOLER 1 of 1

PAGE 3 of 3

DELIVERY SERVICE: _____ AIRBILL NO.: _____

TESTS: EPA 8260

BOTTLE TYPE AND PRESERVATIVE: 40 RJar ice

LOCATION IDENTIFIER	DATE	TIME	COMP/ GRAB	SAMPLE ID	MATRIX	TOTAL NO.# OF CONTAINERS	40 RJar ice	REMARKS	SAMPLE TYPE	BEGINNING DEPTH (IN FEET)	ENDING DEPTH (IN FEET)	FIELD LOT NO. # (ERPIMS)
	11/19/03	14:36	G	SSB-13 (3-4)	Soil	1	X	High PID reading >1000ppm				

MATRIX CODES

AA - AMBIENT AIR; SE - SEDIMENT; SH - HAZARDOUS SOLID WASTE; SL - SLUDGE; WP - DRINKING WATER; WW - WASTE WATER; WG - GROUND WATER; SO - SOIL; DC - DRILL CUTTINGS; WL - LEACHATE; GS - SOIL GAS; WC - DRILLING WATER; WO - OCEAN WATER; WS - SURFACE WATER; WQ - WATER FIELD QC; LH - HAZARDOUS LIQUID WASTE; LF - FLOATING/FREE PRODUCT ON GW TABLE

SAMPLE TYPE CODES

TB# - TRIP BLANK; SD# - MATRIX SPIKE DUPLICATE; RB# - RINSE BLANK; FR# - FIELD REPLICATE; N# - NORMAL ENVIRONMENTAL SAMPLE; MS# - MATRIX SPIKE

(# - SEQUENTIAL NUMBER (FROM 1 TO 9) TO ACCOMMODATE MULTIPLE SAMPLES IN A SINGLE DAY)

RELINQUISHED BY (SIGNATURE)	DATE	TIME	RECEIVED BY (SIGNATURE)	DATE	TIME
Jennifer Gillies	11/19/03	15:04			
RELINQUISHED BY (SIGNATURE)	DATE	TIME	RECEIVED FOR LAB BY (SIGNATURE)	DATE	TIME
			Lisa Olsen	11/20/03	9:15

SPECIAL INSTRUCTIONS

S389482

Distribution: Original accompanies shipment, copy to coordinator field files

URSF-075C/1 OF 1/CofCR/GCM

CHAIN OF CUSTODY RECORD

URS

PROJECT NO. 37679253.0440

SITE NAME Ashland Rensselaer

SAMPLERS (PRINT/SIGNATURE) Jenn Gillies

LAB STL Savannah

COOLER 1 of 1

PAGE 3 of 3

DELIVERY SERVICE: _____ AIRBILL NO.: _____

LOCATION IDENTIFIER	DATE	TIME	COMP/ GRAB	SAMPLE ID	MATRIX	TOTAL NO.# OF CONTAINERS	TESTS: EPA 8260	BOTTLE TYPE AND PRESERVATIVE: 4oz jar ice	REMARKS	SAMPLE TYPE	BEGINNING DEPTH (IN FEET)	ENDING DEPTH (IN FEET)	FIELD LOT NO. # (ERPIMS)
	11/19/03	14:36	G	SSB-13(3-4)	Soil	1	X		High PID reading >1000ppm				

MATRIX CODES

AA - AMBIENT AIR; SE - SEDIMENT; SH - HAZARDOUS SOLID WASTE; SL - SLUDGE; WP - DRINKING WATER; WW - WASTE WATER; WG - GROUND WATER; SO - SOIL; DC - DRILL CUTTINGS; WL - LEACHATE; GS - SOIL GAS; WC - DRILLING WATER; WO - OCEAN WATER; WS - SURFACE WATER; WQ - WATER FIELD QC; LH - HAZARDOUS LIQUID WASTE; LF - FLOATING/FREE PRODUCT ON GW TABLE

SAMPLE TYPE CODES

TB# - TRIP BLANK; SD# - MATRIX SPIKE DUPLICATE; RB# - RINSE BLANK; FR# - FIELD REPLICATE; N# - NORMAL ENVIRONMENTAL SAMPLE; MS# - MATRIX SPIKE

(# - SEQUENTIAL NUMBER (FROM 1 TO 9) TO ACCOMMODATE MULTIPLE SAMPLES IN A SINGLE DAY)

RELINQUISHED BY (SIGNATURE)	DATE	TIME	RECEIVED BY (SIGNATURE)	DATE	TIME
Jennifer Gillies	11/19/03	15:04			
RELINQUISHED BY (SIGNATURE)	DATE	TIME	RECEIVED FOR LAB BY (SIGNATURE)	DATE	TIME
			Lisa Wilson	11/20/03	9:15

SPECIAL INSTRUCTIONS

S389482

Distribution: Original accompanies shipment, copy to coordinator field files

URSF-075C/1 OF 1/CofCR/GCM

APPENDIX E

atl | ATLANTIC TESTING LABORATORIES, Limited

Albany
22 Corporate Drive
Clifton Park, NY 12065
518/383-9144 (T)
518/383-9166 (F)

TRANSMITTAL

December 10, 2003

URS Corporation
28 Corporate Drive
Suite 200
Clifton Park, NY 12065

Attn: Mr. Stephen Le Fevre

Re: Laboratory Test Results
Ashland Facility – Rensselaer, NY
ATL Project No. AT657

Ladies/Gentlemen:

Enclosed please find the following reports:

AT657SL-01-11-03	Particle Size Analysis Hydraulic Conductivity	(November 14, 2003)
AT657SL-02-11-03	Particle Size Analysis Hydraulic Conductivity	(November 20, 2003)
AT657SL-03-11-03	Particle Size Analysis Hydraulic Conductivity Letter Report	(November 20, 2003)

Please contact our office should you have any questions or if we may be of further service.

Respectfully,
ATLANTIC TESTING LABORATORIES

Justin W. Rathman
Laboratory Supervisor

JWR/jwr

Enclosures

ATLANTIC TESTING LABORATORIES, Limited

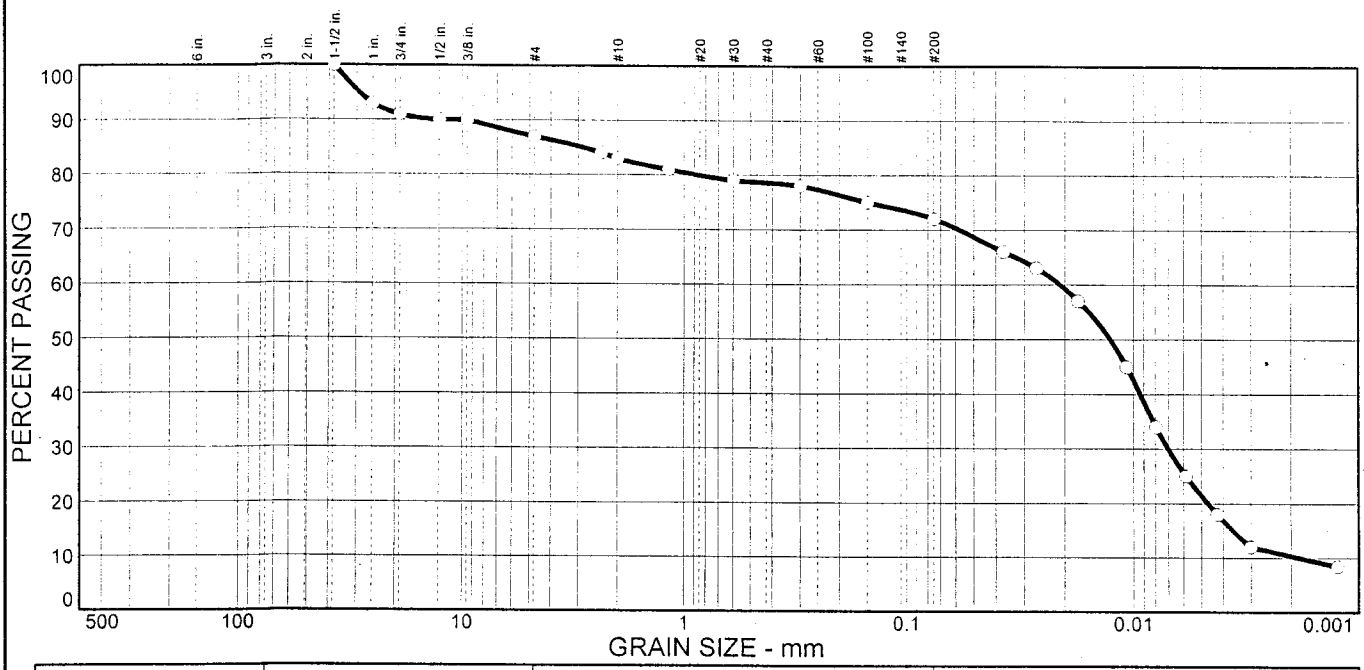
Particle Size Distribution Report

Project: Laboratory Analysis **Report No.:** AT657SL-1-11-03

Client: URS Corporation **Date:** 12/3/03

Sample No: AT657S1 **Source of Sample:** Ashland - Rensselaer

Location: SSB-3 **Elev./Depth:** 14.0'-15.5'



% COBBLES	% GRAVEL		% SAND			% FINES	
	CRS.	FINE	CRS.	MEDIUM	FINE	SILT	CLAY
0	9	4	4	4	7	51	21

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	OUT OF SPEC. (X)
1.5 in.	100		
1 in.	93		
.75 in.	91		
.5 in.	90		
.375 in.	90		
#4	87		
#8	84		
#10	83		
#16	81		
#30	79		
#50	78		
#100	75		
#200	72		

* (no specification provided)

Soil Description

Brown SILT, some CLAY, little cmf SAND, little cmf GRAVEL

Atterberg Limits

PL= N/A LL= N/A PI= N/A

Coefficients

D_{85}= 2.86 D_{60}= 0.0210 D_{50}= 0.0127
D_{30}= 0.0070 D_{15}= 0.0036 D_{10}= 0.0018
C_u= 11.39 C_c= 1.28

Classification

USCS= AASHTO=

Remarks

Sample delivered on 11/14/03
ASTM D 422 Particle Size Analysis (with hydrometer)

ATLANTIC TESTING LABORATORIES, LIMITED

Reviewed by: Date: 12/8/03

ATLANTIC TESTING LABORATORIES, *Limited*

HYDRAULIC CONDUCTIVITY TEST REPORT NO. AT657SL-01-11-03
ASTM D 5084

PROJECT INFORMATION

Client:	URS	Date:	November 21, 2003
Project:	CMS Soil Investigation	Delivered by:	Client
	Ashland Facility – Rensselaer, NY	Date Delivered:	November 14, 2003

SAMPLE INFORMATION

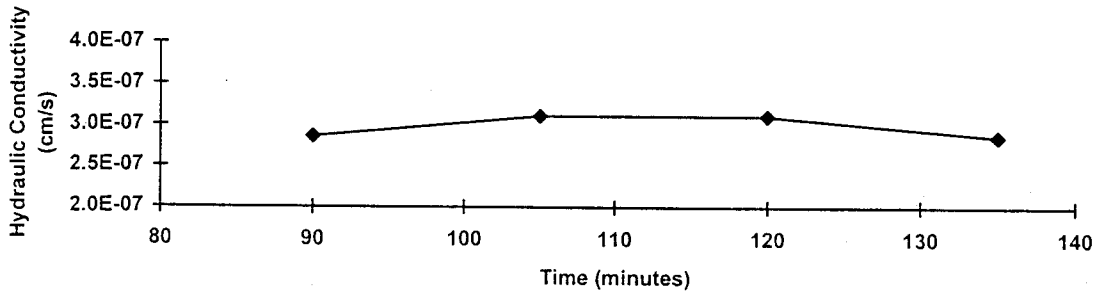
ATL Sample No.:	AT657S01
Sample Location:	SSB-3
Soil Description:	Brown silt and clay with some sand and a few dropstones (visual)

INITIAL		FINAL		PARAMETERS	
Sample Diameter (in.):	2.853	Sample Diameter (in.):	2.854	Permeant Liquid:	Water
Sample Height (in.):	5.557	Sample Height (in.):	5.554	B Value (%):	98
Moisture Content (%):	22.1	Moisture Content (%):	12.0		
Dry Unit Weight (pcf):	105.6	Dry Unit Weight (pcf):	112.7		

TEST DATA

Back Pressure (psi)	Confining Pressure (psi)	Maximum Effective Stress (psi)	Minimum Effective Stress (psi)	Range of Hydraulic Gradient (psi)	Average K (cm/sec)
50.0	5.0	6.0	4.0	2.0	3.0×10^{-7}

HYDRAULIC CONDUCTIVITY vs. TIME



REMARKS

Bottom ~10 inches of the Shelby tube contained good sample, the rest of the sample was very wet and flattened after being extruded. Very wet portion discarded at the request of URS.

Reviewed By: J. Kh

Date: 12/9/03

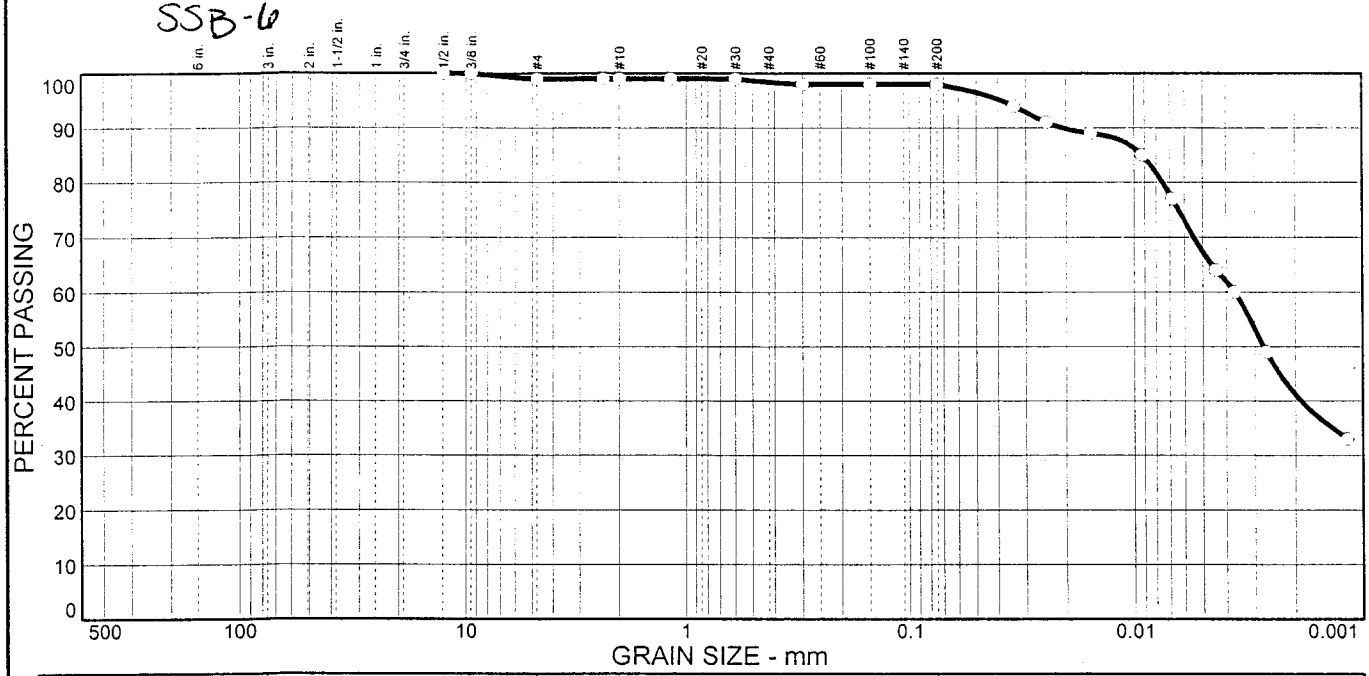
Particle Size Distribution Report

Project: Laboratory Analysis **Report No.:** AT657SL-2-11-03

Client: URS Corporation **Date:** 12/3/03

Sample No: AT657S2 **Source of Sample:** Ashland - Rensselaer

Location: ~~B-6A~~ SSB-6 **Elev./Depth:** 6.0'-8.0'



% COBBLES	% GRAVEL		% SAND			% FINES	
	CRS.	FINE	CRS.	MEDIUM	FINE	SILT	CLAY
0	0	1	0	1	0	31	67

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	OUT OF SPEC. (X)
.5 in.	100		
.375 in.	100		
#4	99		
#8	99		
#10	99		
#16	99		
#30	99		
#50	98		
#100	98		
#200	98		

* (no specification provided)

Soil Description

Brown CLAY, some SILT, trace SAND, trace GRAVEL

Atterberg Limits

PL= N/A LL= N/A PI= N/A

Coefficients

D_{85}= 0.0093 D_{60}= 0.0037 D_{50}= 0.0027

D_{30}= D_{15}= D_{10}=

C_u= C_c=

Classification

USCS= AASHTO=

Remarks

Sample delivered on 11/20/03

ASTM D 422 Particle Size Analysis (with hydrometer)

ATLANTIC TESTING LABORATORIES, LIMITED

Reviewed by: _____ Date: 12/8/03

ATLANTIC TESTING LABORATORIES, *Limited*

HYDRAULIC CONDUCTIVITY TEST REPORT NO. AT657SL-02-11-03
ASTM D 5084

PROJECT INFORMATION

Client:	URS	Date:	November 24, 2003
Project:	CMS Soil Investigation	Delivered by:	Client
	Ashland Facility – Rensselaer, NY	Date Delivered:	November 20, 2003

SAMPLE INFORMATION

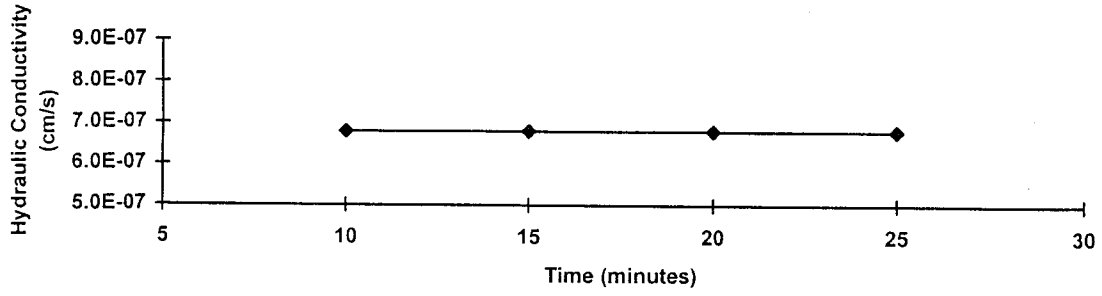
ATL Sample No.:	AT657S02
Sample Location:	B-6A
Soil Description:	Brown clay with a few silty lenses running through the sample (visual)

INITIAL		FINAL		PARAMETERS	
Sample Diameter (in.):	2.861	Sample Diameter (in.):	2.859	Permeant Liquid:	Water
Sample Height (in.):	5.455	Sample Height (in.):	5.457	B Value (%):	98
Moisture Content (%):	34.6	Moisture Content (%):	25.7		
Dry Unit Weight (pcf):	90.3	Dry Unit Weight (pcf):	96.9		

TEST DATA

Back Pressure (psi)	Confining Pressure (psi)	Maximum Effective Stress (psi)	Minimum Effective Stress (psi)	Range of Hydraulic Gradient (psi)	Average K (cm/sec)
50.0	5.0	6.0	4.0	2.0	6.8×10^{-7}

HYDRAULIC CONDUCTIVITY vs. TIME



REMARKS

Top 5 inches of sample a black clay with much sand and fine gravel. This portion of the sample was not used in testing.

Reviewed By: J. Kh

Date: 12/9/03

ATLANTIC TESTING LABORATORIES, Limited

Particle Size Distribution Report

Project: Laboratory Analysis

Report No.: AT657SL-3-11-03

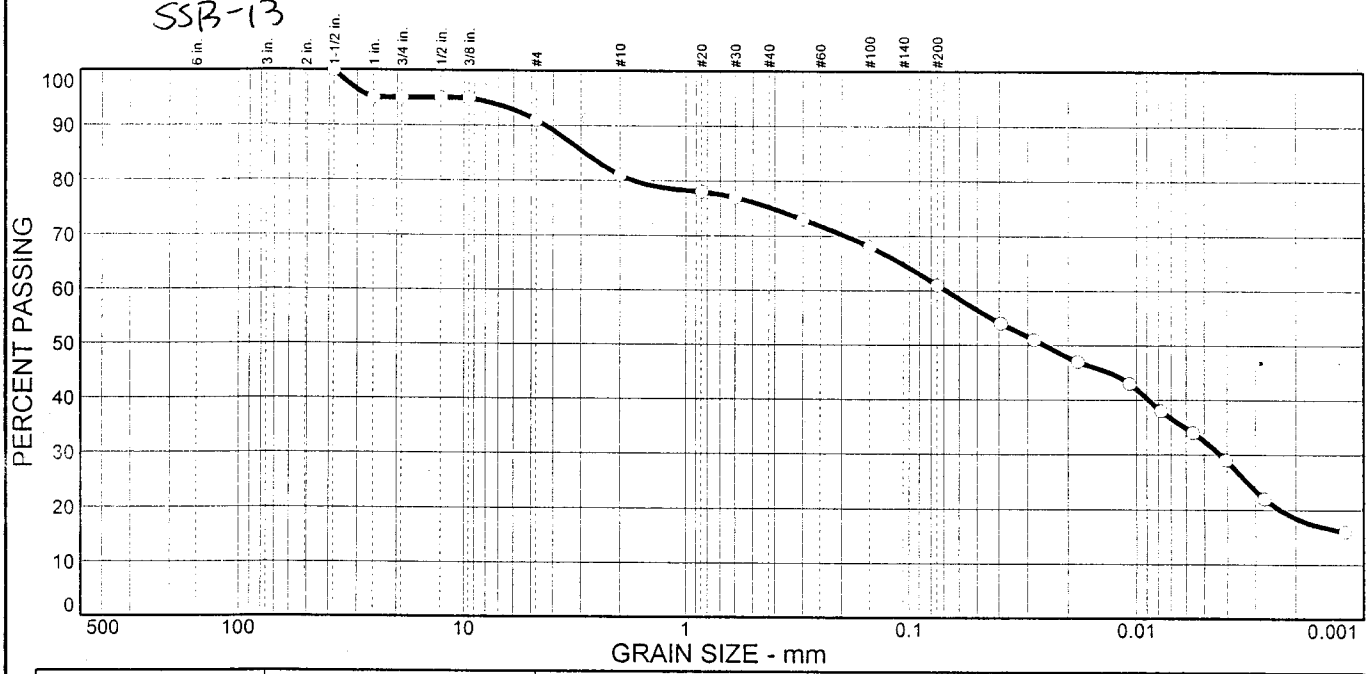
Client: URS Corporation

Date: 12/8/03

Sample No: AT657S3 **Source of Sample:** Ashland - Rensselaer

Location: ~~B-13~~ SSB-13

Elev./Depth: 4.5' - 6.5'



% COBBLES	% GRAVEL		% SAND			% FINES	
	CRS.	FINE	CRS.	MEDIUM	FINE	SILT	CLAY
0	5	4	10	6	14	29	32

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	OUT OF SPEC. (X)
1.5 in.	100		
1 in.	95		
.75 in.	95		
.5 in.	95		
.375 in.	95		
#4	91		
#10	81		
#20	78		
#30	77		
#50	73		
#100	68		
#200	61		

* (no specification provided)

Soil Description

Grey CLAY, some cmf SAND, some SILT, trace GRAVEL

Atterberg Limits

PL= N/A LL= N/A PI= N/A

Coefficients

D_{85}= 2.88 D_{60}= 0.0687 D_{50}= 0.0254

D_{30}= 0.0043 D_{15}= D_{10}=

C_u= C_c=

Classification

USCS= AASHTO=

Remarks

Sample delivered on 11/20/03

ASTM D 422 Particle Size Analysis (with hydrometer)

ATLANTIC TESTING LABORATORIES, LIMITED

Reviewed by: _____ Date: 12/10/03

ATLANTIC TESTING LABORATORIES, *Limited*

HYDRAULIC CONDUCTIVITY TEST REPORT NO. AT657SL-03-11-03
ASTM D 5084

PROJECT INFORMATION

Client:	URS	Date:	December 1, 2003
Project:	CMS Soil Investigation	Delivered by:	Client
	Ashland Facility – Rensselaer, NY	Date Delivered:	November 20, 2003

SAMPLE INFORMATION

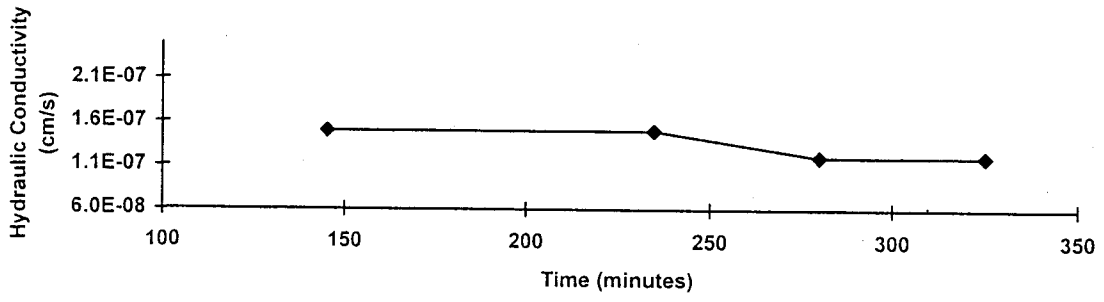
ATL Sample No.:	AT657S03
Sample Location:	B-13
Soil Description:	Grey silt and clay with some sand and a few dropstones (visual)

INITIAL		FINAL		PARAMETERS	
Sample Diameter (in.):	2.854	Sample Diameter (in.):	2.853	Permeant Liquid:	Water
Sample Height (in.):	6.360	Sample Height (in.):	6.360	B Value (%):	98
Moisture Content (%):	38.1	Moisture Content (%):	31.5		
Dry Unit Weight (pcf):	81.0	Dry Unit Weight (pcf):	83.9		

TEST DATA

Back Pressure (psi)	Confining Pressure (psi)	Maximum Effective Stress (psi)	Minimum Effective Stress (psi)	Range of Hydraulic Gradient (psi)	Average K (cm/sec)
50.0	5.0	6.0	4.0	2.0	1.4×10^{-7}

HYDRAULIC CONDUCTIVITY vs. TIME



REMARKS

Reviewed By: J. Kh

Date: 12/9/03

URS Diamond/Ashland Inc.
5200 Blazer Parkway
EH&S, DS-4
Dublin, Ohio 43017
614-790-6900 (phone)
614-790-6232 (facsimile)

URS Corporation

Fax

To:	CHRIS REED	**From:**	GREG GILBERTSEN
Fax:	850-576-3676	**Pages:**	9
Phone:			12/11/03
Re:		**cc:**	

Urgent **X For Review** **Please Comment** **Please Reply** **☐ Please Recycle**

Geotech results for soil samples collected at the Ashland Rensselaer, NY site for fate and transport modeling.

ATLANTIC TESTING LABORATORIES, Limited

Albany
22 Corporate Drive
Clifton Park, NY 12065
518/383-9144 (T)
518/383-9166 (F)

December 10, 2003

URS Corporation
28 Corporate Drive
Suite 200
Clifton Park, NY 12065

Attn: Mr. Stephen Le Fevre

Re: Laboratory Test Results
Ashland Facility – Rensselaer, NY
ATL Report No. AT657SL-3-11-03

Ladies/Gentlemen:

On November 14, 2003, one Shelby Tube (SSB-3) was delivered to our Clifton Park, New York facility for testing. On November 20, 2003, an additional two Shelby Tubes (B-6A and B-13) were delivered. The following tests were performed on samples cut from each tube: Natural Moisture Content test in accordance with ASTM D 2216; Bulk Density test in accordance with ASTM C 29; pH test in accordance with ASTM D 4972; Organic Content test in accordance with ASTM D 2974; Particle Size Analysis in accordance with ASTM D 422; and Triaxial Permeability test in accordance with ASTM D 5084.

Natural Moisture Content, Bulk Density, pH, and Organic Content
ASTM D 2216, ASTM C 29, ASTM D 4972, ASTM D 2974

ATL Sample Number	Alternate ID	Moisture Content (%)	Bulk Density (pcf)	pH	Organic Content (%)
AT657S1	SSB-3	22.1	105.6	8.1	0.7
AT657S2	SS B-6A SS	34.6	90.3	8.1	3.1
AT657S3	SS B-13 SS	38.1	81.0	7.1	7.5

Please contact our office should you have any questions or if we may be of further service.

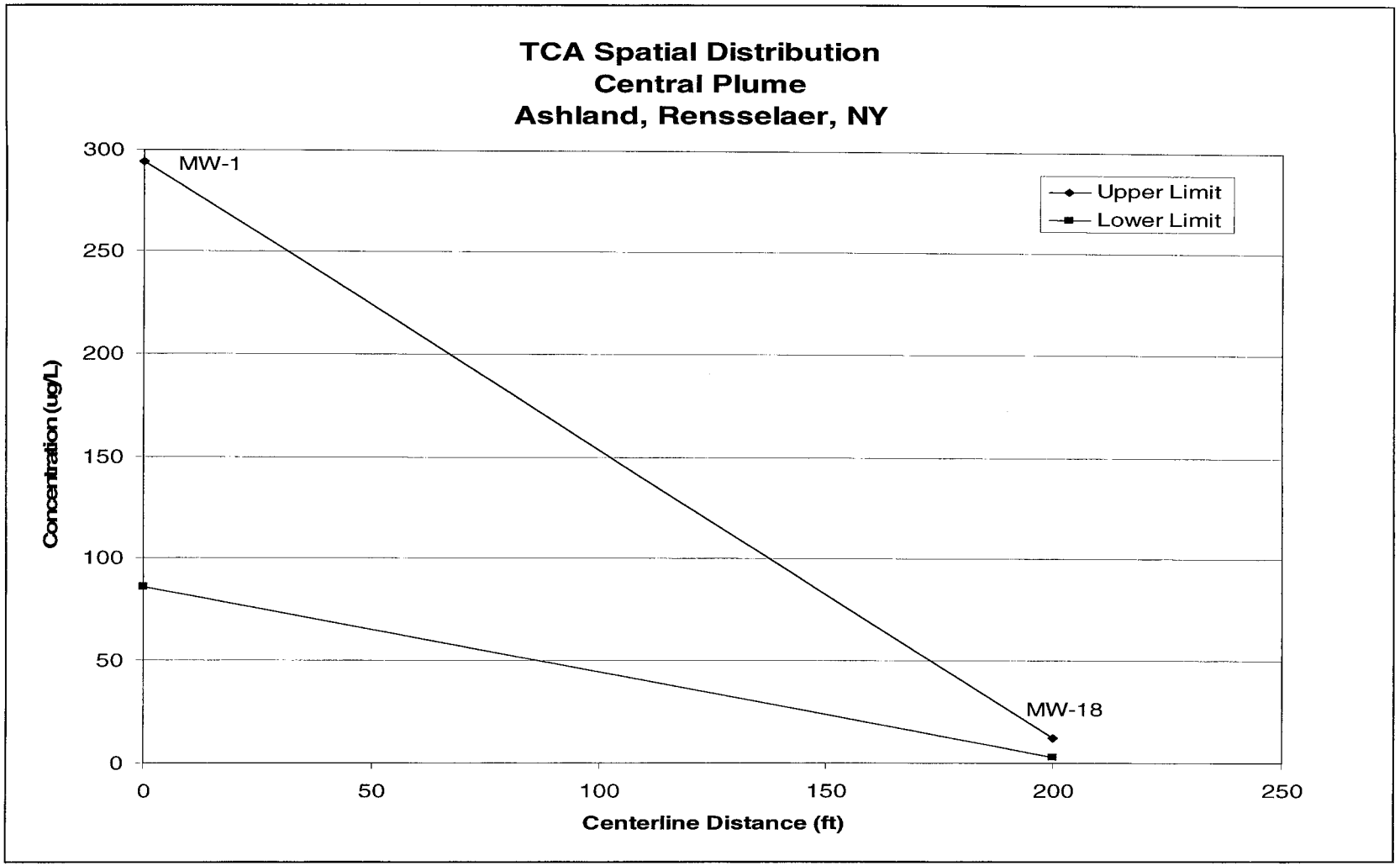
Respectfully,

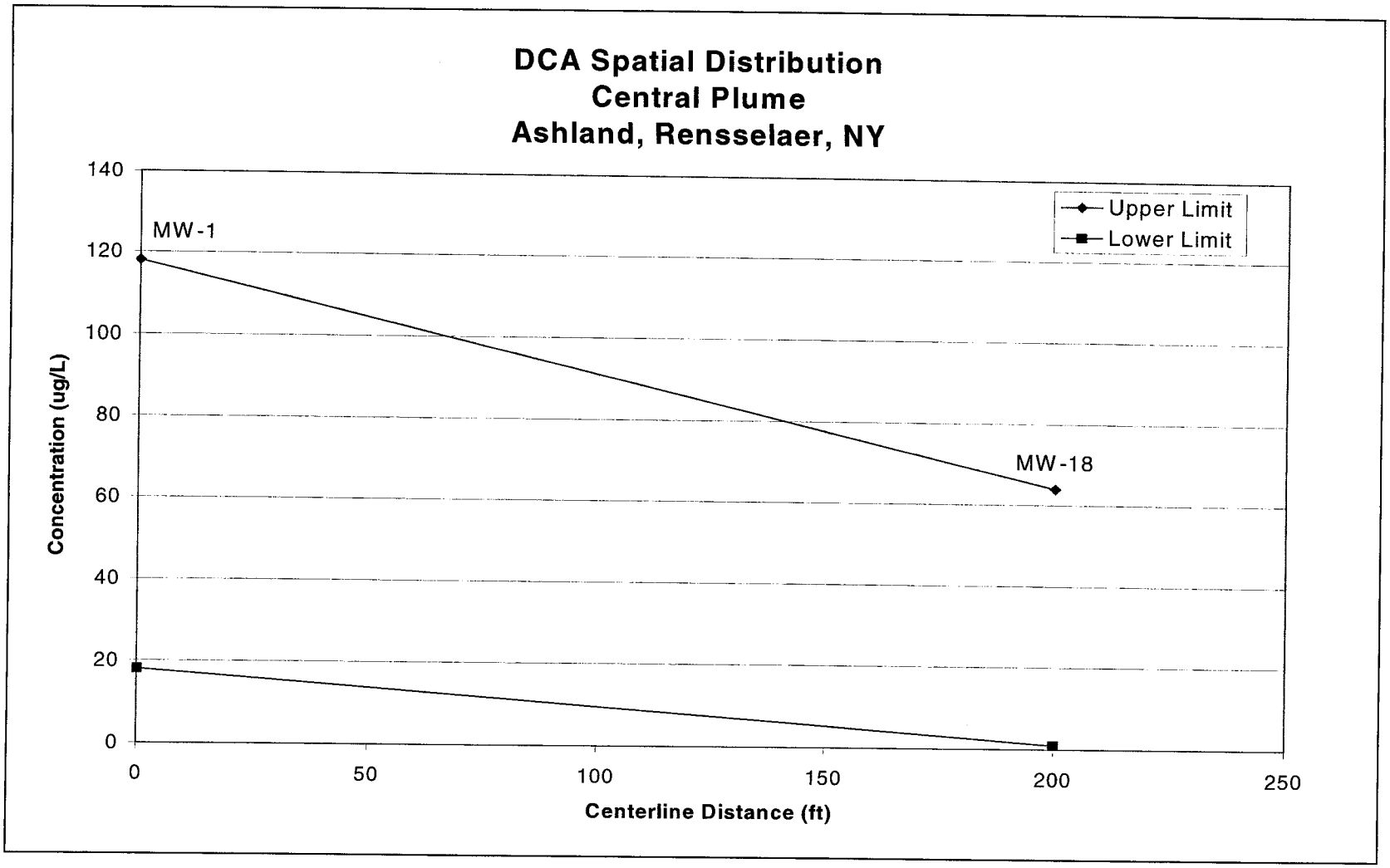
Justin W. Rathman
Laboratory Supervisor

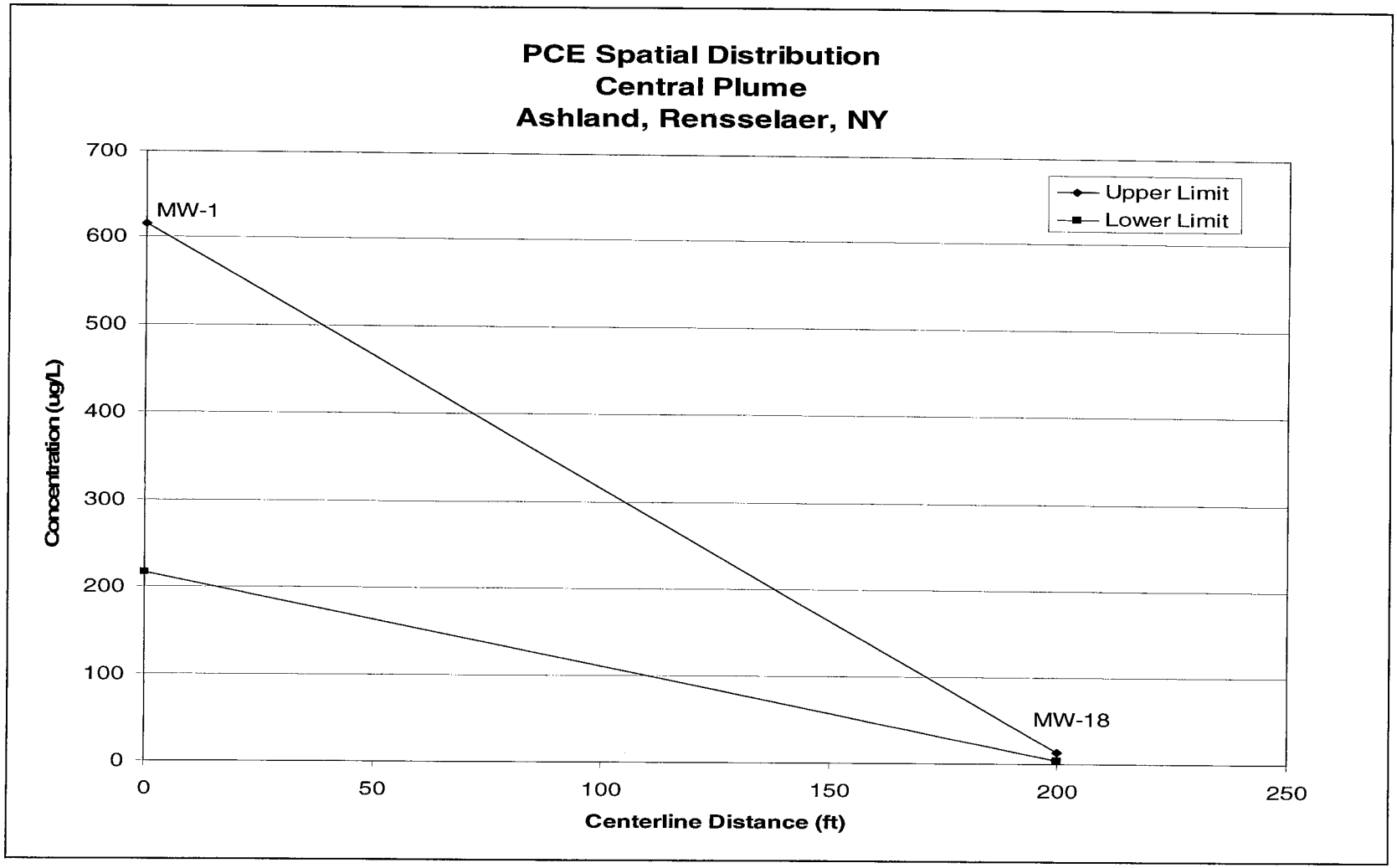
JWR/jwr

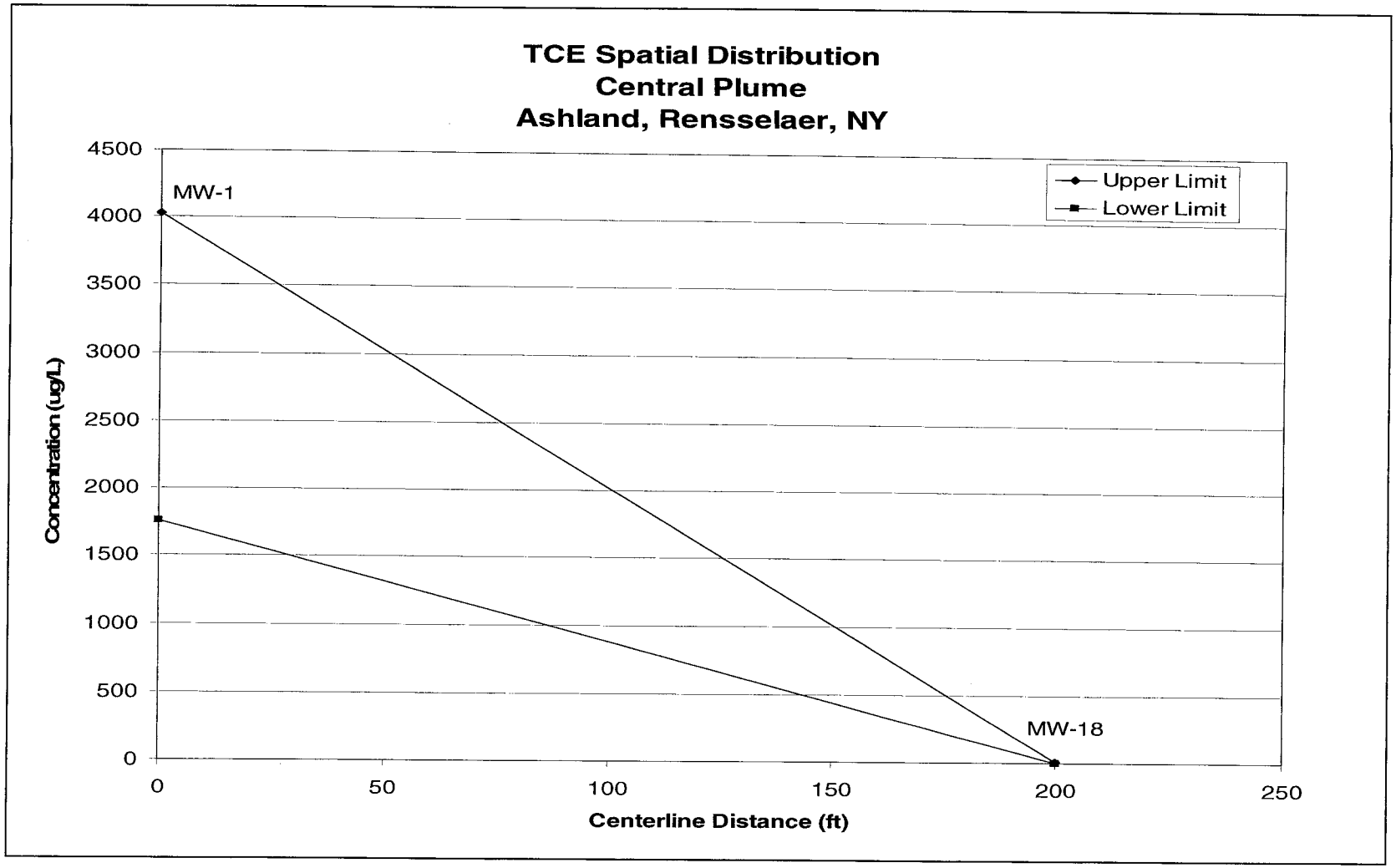
Enclosures

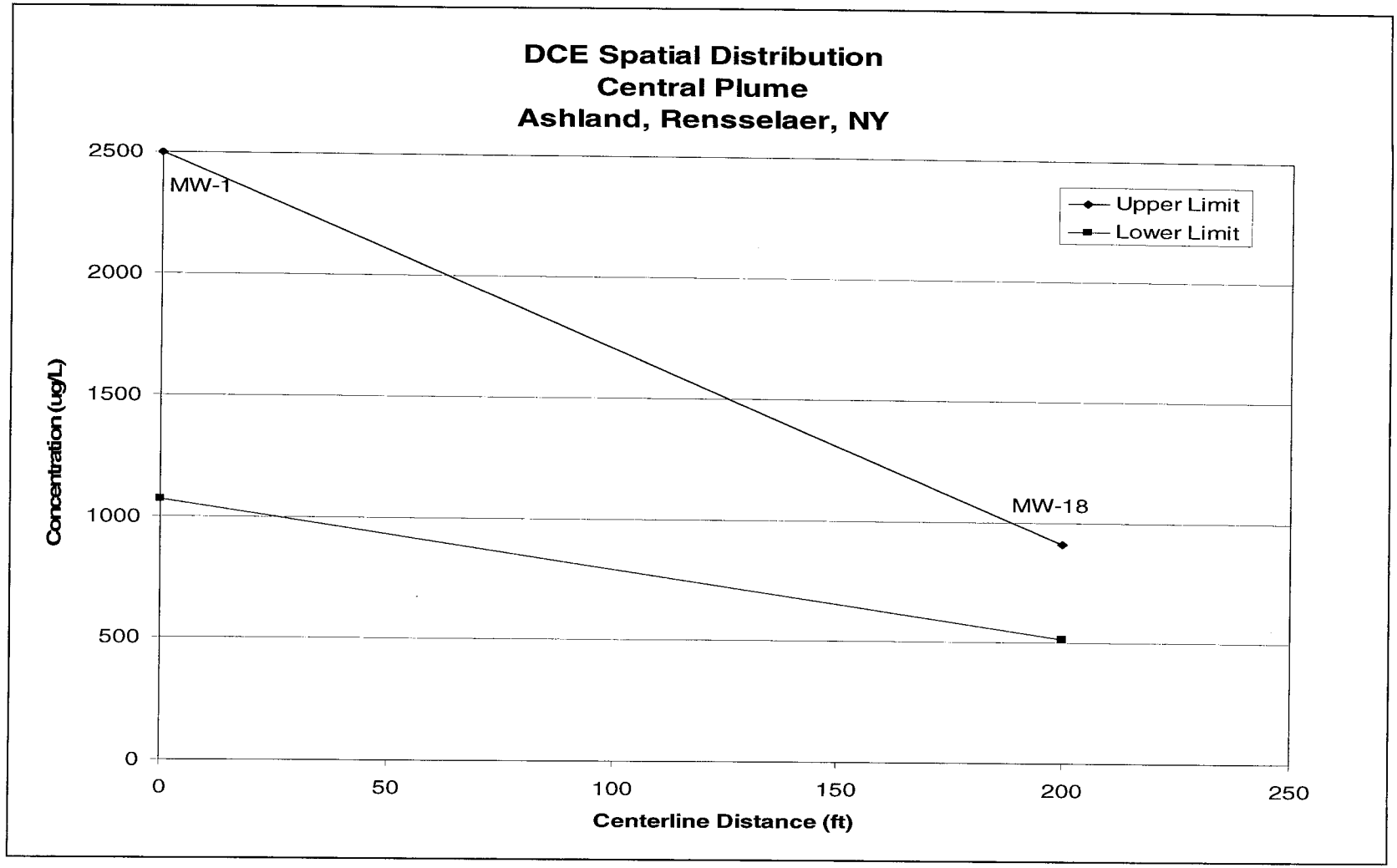
APPENDIX F

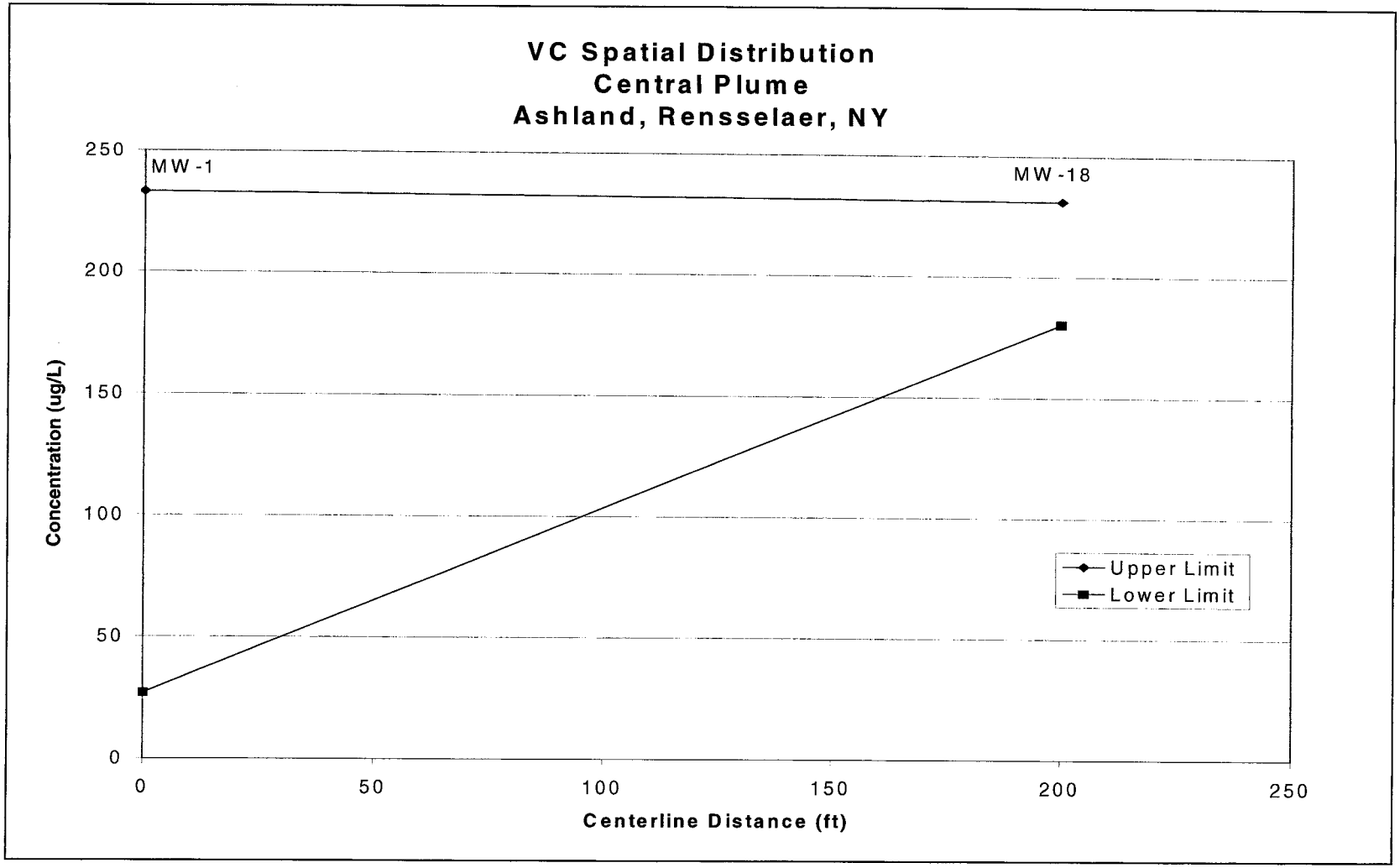

TCA Spatial Distribution
Central Plume
Ashland, Rensselaer, NY
MW-1
MW-18
Upper Limit
Lower Limit
Concentration (ug/L)
Centerline Distance (ft)
300
250
200
150
100
50
0
0
50
100
150
200
250

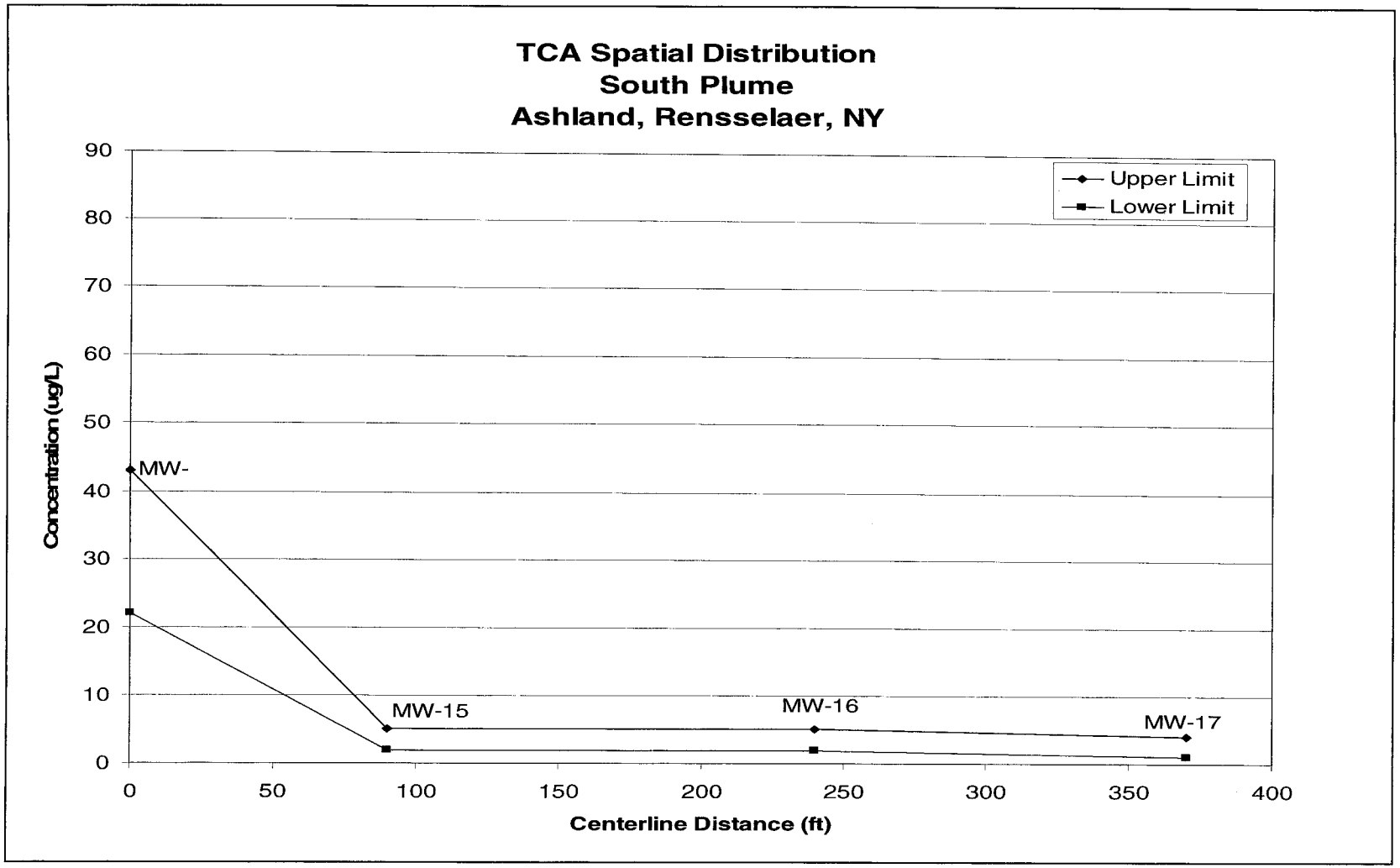

DCA Spatial Distribution
Central Plume
Ashland, Rensselaer, NY
Concentration (ug/L)
140
120
100
80
60
40
20
0
MW-1
MW-18
Upper Limit
Lower Limit
0
50
100
150
200
250
Centerline Distance (ft)

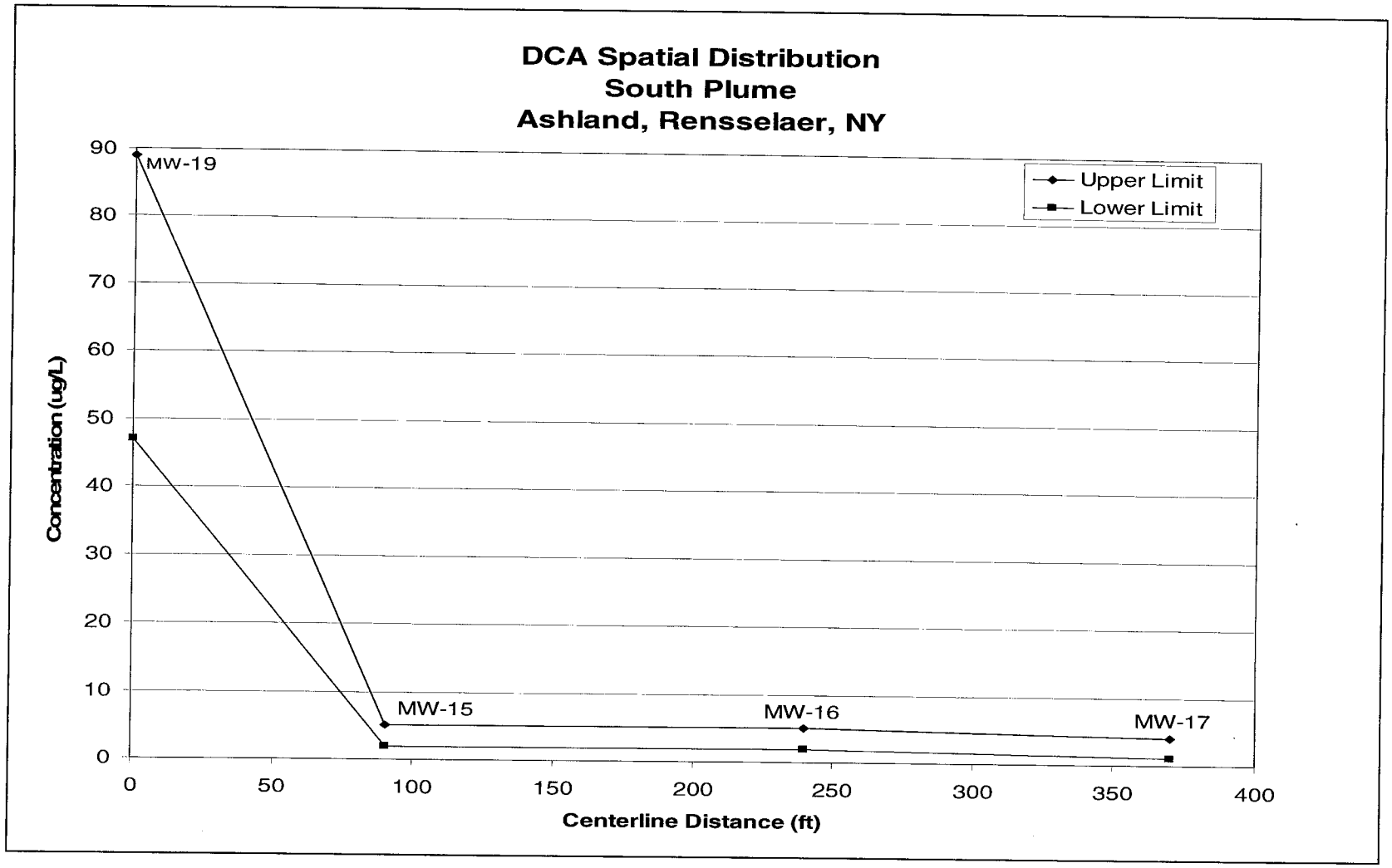

PCE Spatial Distribution
Central Plume
Ashland, Rensselaer, NY
Upper Limit
Lower Limit
MW-1
MW-18
Concentration (ug/L)
700
600
500
400
300
200
100
0
0
50
100
150
200
250
Centerline Distance (ft)

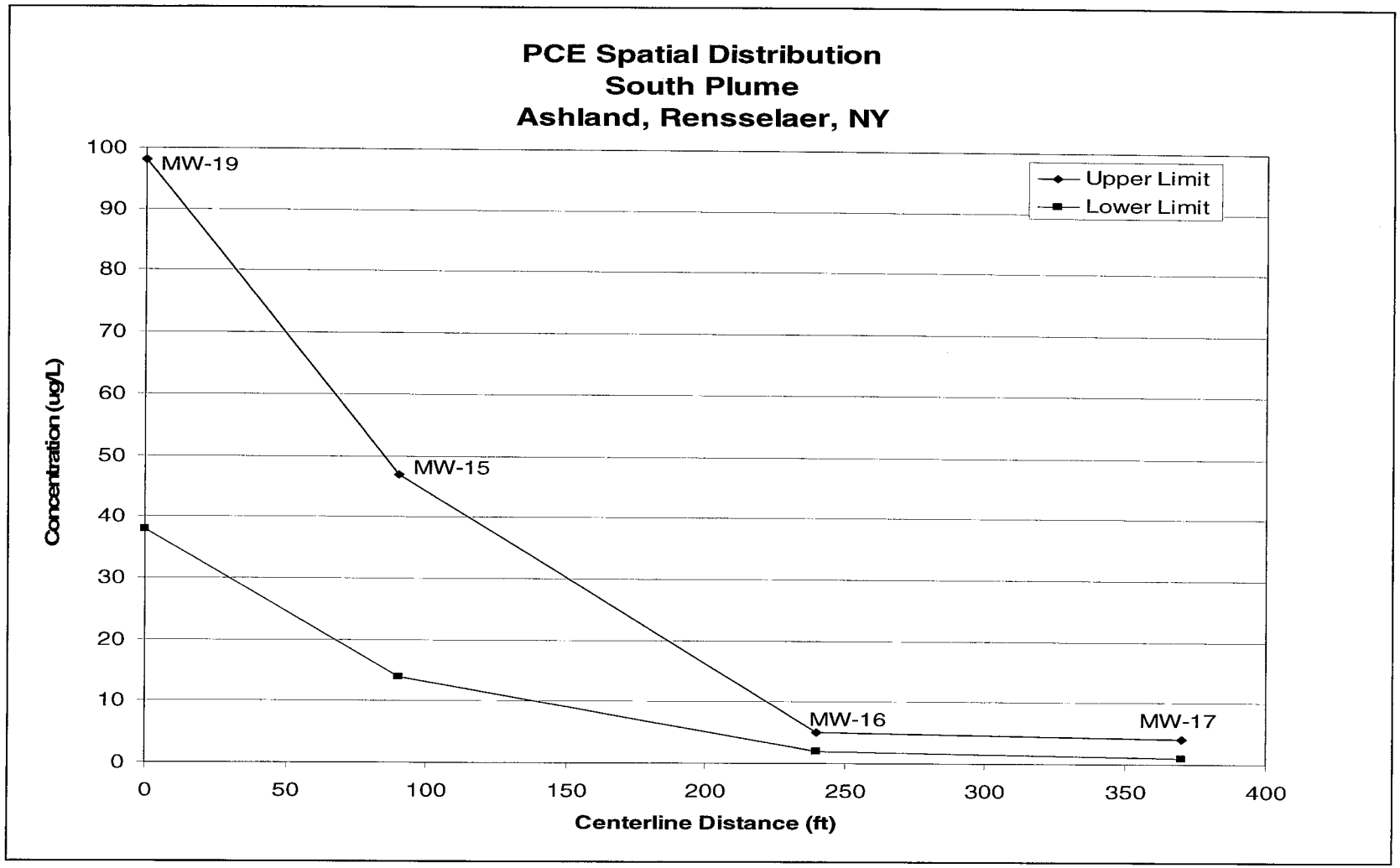

TCE Spatial Distribution
Central Plume
Ashland, Rensselaer, NY
Concentration (ug/L)
4500
4000
3500
3000
2500
2000
1500
1000
500
0
MW-1
MW-18
Upper Limit
Lower Limit
0
50
100
150
200
250
Centerline Distance (ft)

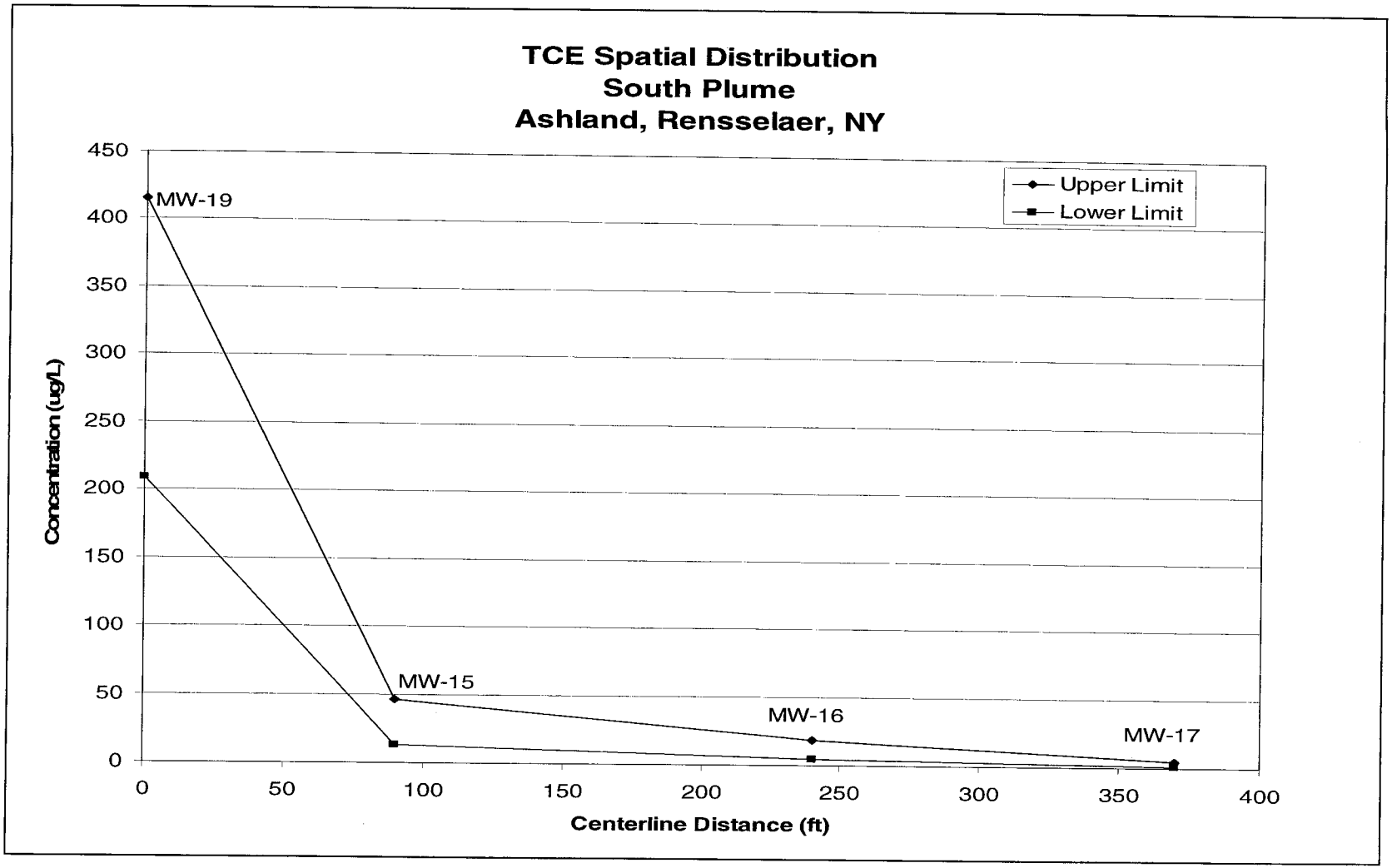

DCE Spatial Distribution
Central Plume
Ashland, Rensselaer, NY
2500
2000
1500
1000
500
0
Concentration (ug/L)
MW-1
MW-18
Upper Limit
Lower Limit
0
50
100
150
200
250
Centerline Distance (ft)

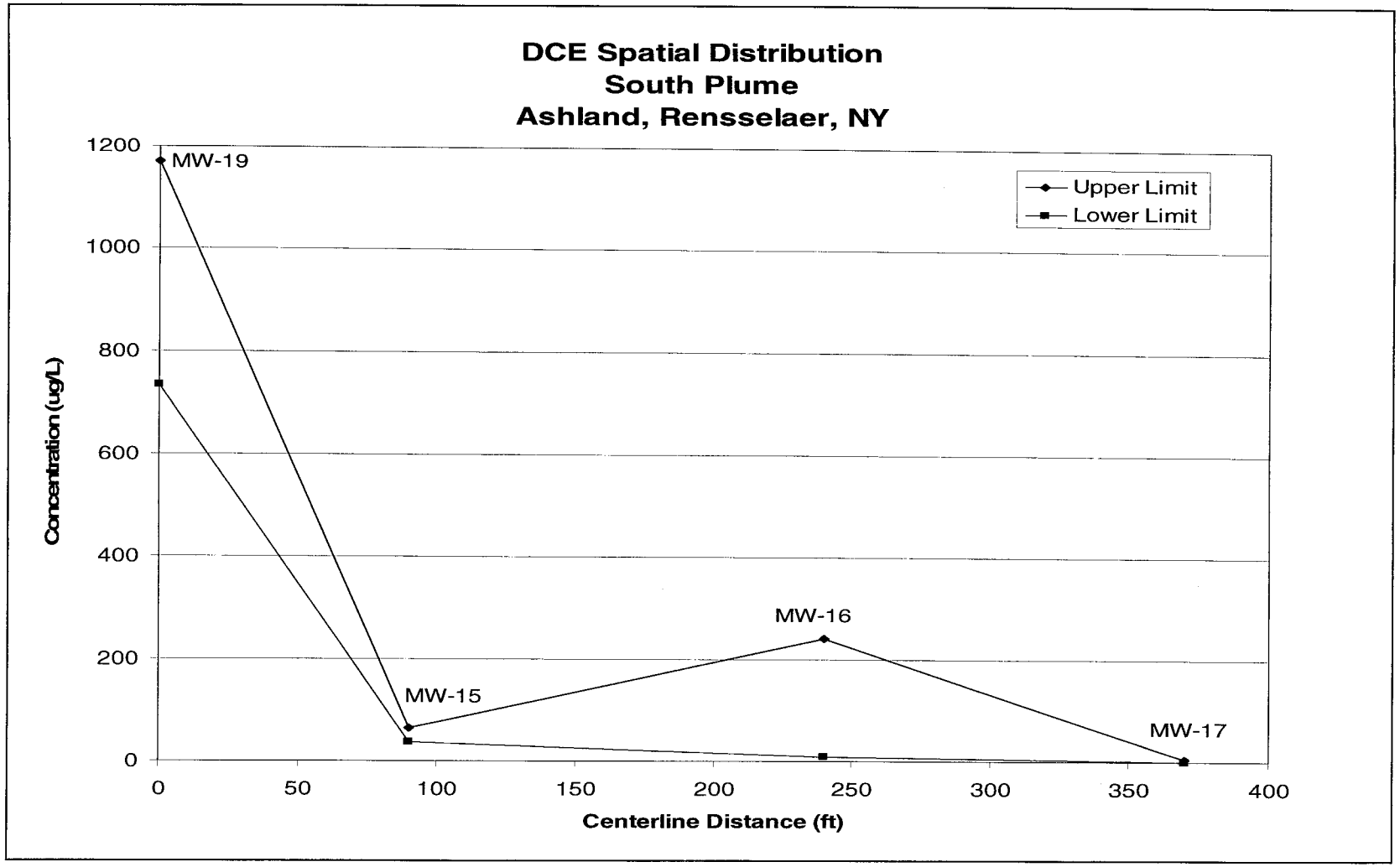

VC Spatial Distribution
Central Plume
Ashland, Rensselaer, NY
MW-1
MW-18
250
200
150
100
50
0
Concentration (ug/L)
0
50
100
150
200
250
Centerline Distance (ft)
Upper Limit
Lower Limit

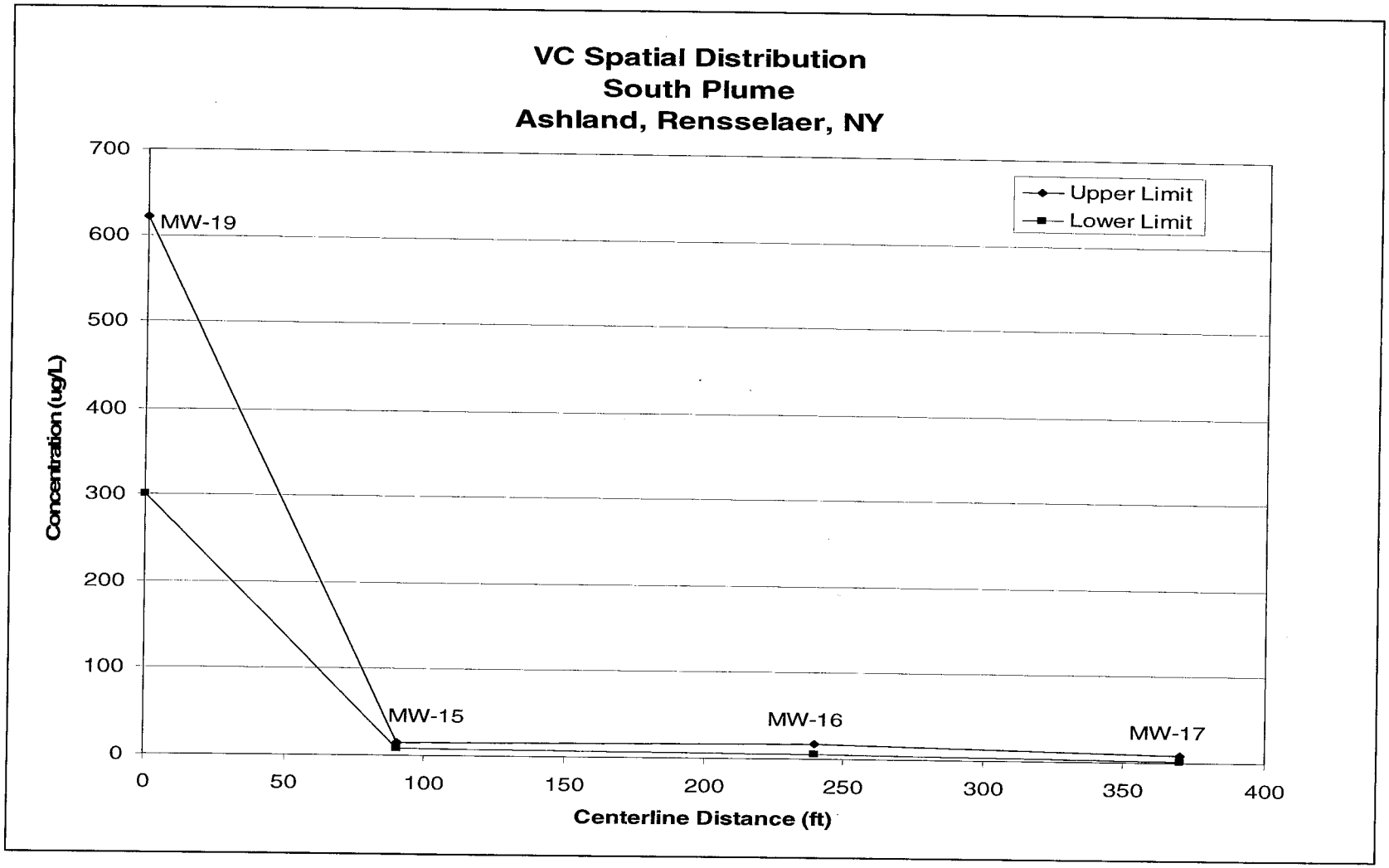

TCA Spatial Distribution
South Plume
Ashland, Rensselaer, NY
Upper Limit
Lower Limit
Concentration (ug/L)
90
80
70
60
50
40
30
20
10
0
MW-
MW-15
MW-16
MW-17
0
50
100
150
200
250
300
350
400
Centerline Distance (ft)


DCA Spatial Distribution
South Plume
Ashland, Rensselaer, NY
Concentration (ug/L)
Centerline Distance (ft)
Upper Limit
Lower Limit
MW-19
MW-15
MW-16
MW-17
0
10
20
30
40
50
60
70
80
90
0
50
100
150
200
250
300
350
400


PCE Spatial Distribution
South Plume
Ashland, Rensselaer, NY
Concentration (ug/L)
Centerline Distance (ft)
Upper Limit
Lower Limit
MW-19
MW-15
MW-16
MW-17
100
90
80
70
60
50
40
30
20
10
0
0
50
100
150
200
250
300
350
400


TCE Spatial Distribution
South Plume
Ashland, Rensselaer, NY
Concentration (ug/L)
450
400
350
300
250
200
150
100
50
0
0
50
100
150
200
250
300
350
400
Centerline Distance (ft)
MW-19
MW-15
MW-16
MW-17
Upper Limit
Lower Limit


DCE Spatial Distribution
South Plume
Ashland, Rensselaer, NY
Concentration (ug/L)
1200
1000
800
600
400
200
0
MW-19
MW-15
MW-16
MW-17
Upper Limit
Lower Limit
0
50
100
150
200
250
300
350
400
Centerline Distance (ft)


VC Spatial Distribution
South Plume
Ashland, Rensselaer, NY
Upper Limit
Lower Limit
MW-19
MW-15
MW-16
MW-17
Concentration (ug/L)
Centerline Distance (ft)
700
600
500
400
300
200
100
0
0
50
100
150
200
250
300
350
400

APPENDIX G

BIOCHLOR Natural Attenuation Decision Support System

Version 2.2
Excel '97

Ashland Rennselaer
Central Plume
Run Name

Data Input Instructions:
115 ← 1. Enter value directly....or
↑ or ↓ 2. Calculate by filling in gray
0.02 cells. Press Enter, then C
(To restore formulas, hit "Restore Formulas" button)
Variable* ← Data used directly in model.

Test if Biotransformation is Occurring → Natural Attenuation Screening Protocol

TYPE OF CHLORINATED SOLVENT: Ethenes ○ Ethanes ◉

1. ADVECTION

Seepage Velocity*	Vs	30.0	(ft/yr)
or		↑	
Hydraulic Conductivity	K	1.8E-02	(cm/sec)
Hydraulic Gradient	i	0.0012	(ft/ft)
Effective Porosity	n	0.3	(-)

2. DISPERSION

Alpha x*	100	(ft)	Calc. Alpha x
(Alpha y) / (Alpha x)*	0.1	(-)	
(Alpha z) / (Alpha x)*	1.E-07	(-)	

3. ADSORPTION

Retardation Factor* ← R
or

Soil Bulk Density, rho	1.7	(kg/L)		
FractionOrganicCarbon, foc	3.0E-3	(-)		
Partition Coefficient	Koc	↘	↓	
TCA	426	(L/kg)	8.24	(-)
DCA	130	(L/kg)	3.21	(-)
CA	125	(L/kg)	3.13	(-)

Common R (used in model)* = ↘ 3.21 ↙

4. BIOTRANSFORMATION -1st Order Decay Coefficient*

Zone 1	λ (1/yr)	half-life (yrs)	Yield
TCA → DCA	0.050 ←		0.74
DCA → CA	0.200 ←		0.65
CA → Ethane	0.300 ←		0.47

Zone 2	λ (1/yr)	half-life (yrs)	
TCA → DCA	0.000 ←		λ HELP
DCA → CA	0.000 ←		
CA → Ethane	0.000 ←		

5. GENERAL

Simulation Time*	30	(yr)	← L →
Modeled Area Width*	200	(ft)	W
Modeled Area Length*	1000	(ft)	
Zone 1 Length*	1000	(ft)	
Zone 2 Length*	0	(ft)	Zone 2= L - Zone 1

6. SOURCE DATA TYPE: Continuous Single Planar

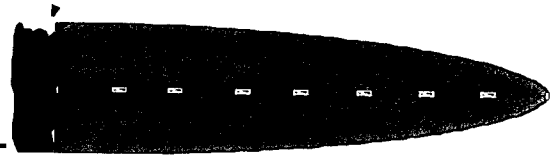
Source Options

Source Thickness in Sat. Zone* 22 (ft)

Y1
Width* (ft) 10

Conc. (mg/L)*	C1	k_s* (1/yr)
TCA	.19	0
DCA	.068	0
CA	.0	0

Vertical Plane Source: Determine Source Well Location and Input Solvent Concentrations



View of Plume Looking Down

Observed Centerline Conc. at Monitoring Wells

7. FIELD DATA FOR COMPARISON

TCA Conc. (mg/L)	.294	.086	.012	.003							
DCA Conc. (mg/L)	.118	.018	.064	.001							
CA Conc. (mg/L)	.0	.0	.0	.0							
Distance from Source (ft)	0	1	200	201							
Date Data Collected	2003										

8. CHOOSE TYPE OF OUTPUT TO SEE:

RUN CENTERLINE | RUN ARRAY | *Help* | Restore Formulas | RESET | *SEE OUTPUT* | Paste Example

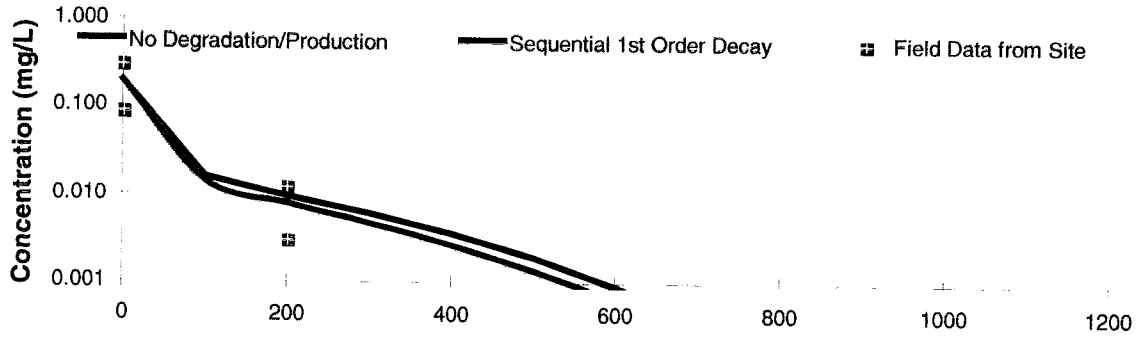
DISSOLVED CHLORINATED SOLVENT CONCENTRATIONS ALONG PLUME CENTERLINE (mg/L) at Z=0

Distance from Source (ft)

TCA	0	100	200	300	400	500	600	700	800	900	1000
No Degradation	0.190	0.016	0.009	0.006	0.004	0.002	0.001	0.000	0.000	0.000	0.000
Biotransformation	0.1900	0.014	0.008	0.005	0.003	0.001	0.001	0.000	0.000	0.000	0.000

Monitoring Well Locations (ft)

	0	1	200	201							
Field Data from Site	0.294	0.086	0.012	0.003							



See TCA

See DCA

See CA

Prepare Animation

Time:

30.0 Years

Log ⇔ Linear

Return to Input

To All

To Array

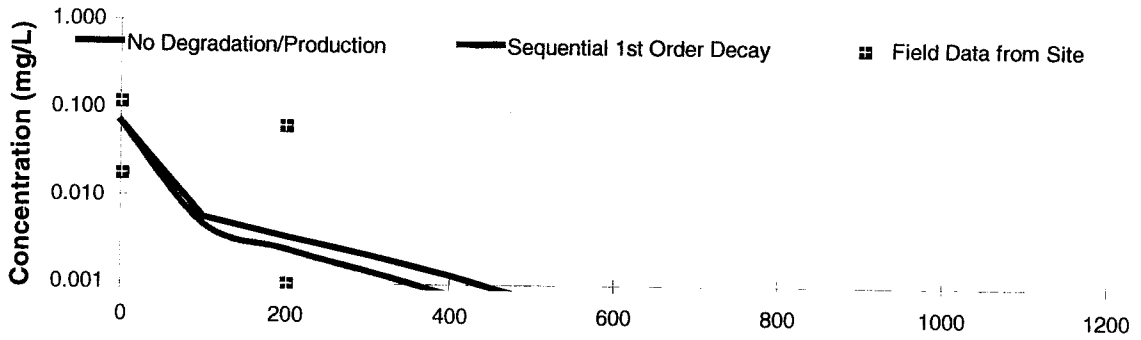
DISSOLVED CHLORINATED SOLVENT CONCENTRATIONS ALONG PLUME CENTERLINE (mg/L) at Z=0

Distance from Source (ft)

DCA	0	100	200	300	400	500	600	700	800	900	1000
No Degradation	0.068	0.006	0.003	0.002	0.001	0.001	0.000	0.000	0.000	0.000	0.000
Biotransformation	0.0680	0.005	0.002	0.001	0.001	0.000	0.000	0.000	0.000	0.000	0.000

Monitoring Well Locations (ft)

	0	1	200	201							
Field Data from Site	0.118	0.018	0.064	0.001							



See TCA

See DCA

See CA

Prepare Animation

Time:

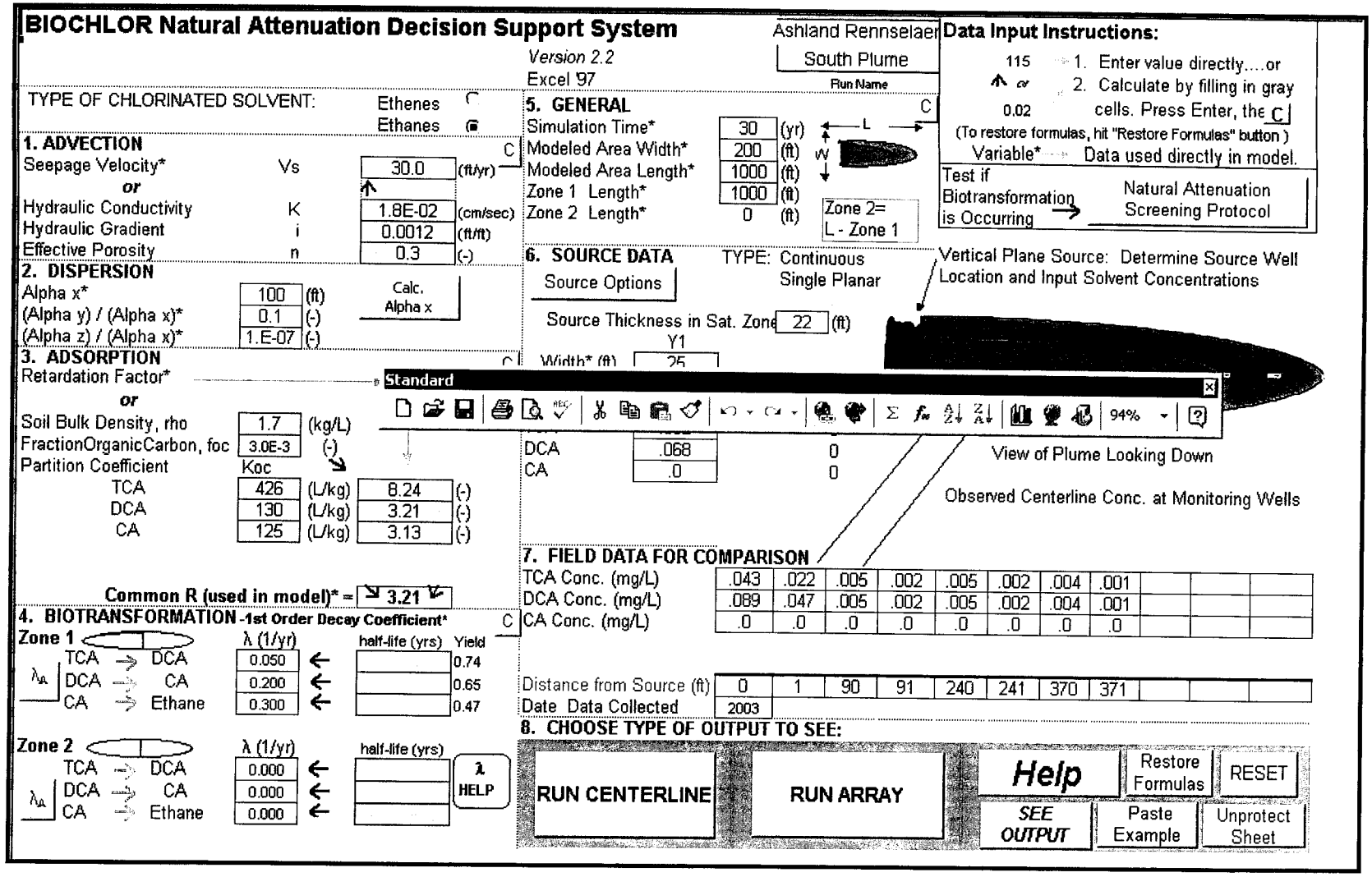
30.0 Years

Log ⟺ Linear

Return to Input

To All

To Array


BIOCHLOR Natural Attenuation Decision Support System
Version 2.2
Excel '97
Ashland Rennselaer
South Plume
Run Name
Data Input Instructions:
1. Enter value directly....or
2. Calculate by filling in gray cells. Press Enter, the C
(To restore formulas, hit "Restore Formulas" button)
Variable* → Data used directly in model.
Test if Biotransformation is Occurring
Natural Attenuation Screening Protocol
TYPE OF CHLORINATED SOLVENT:
Ethenes
Ethanes
1. ADVECTION
Seepage Velocity* Vs 30.0 (ft/yr)
or
Hydraulic Conductivity K 1.8E-02 (cm/sec)
Hydraulic Gradient i 0.0012 (ft/ft)
Effective Porosity n 0.3 (-)
2. DISPERSION
Alpha x* 100 (ft)
(Alpha y) / (Alpha x)* 0.1 (-)
(Alpha z) / (Alpha x)* 1.E-07 (-)
Calc. Alpha x
3. ADSORPTION
Retardation Factor*
or
Soil Bulk Density, rho 1.7 (kg/L)
FractionOrganicCarbon, foc 3.0E-3 (-)
Partition Coefficient Koc
TCA 426 (L/kg) 8.24 (-)
DCA 130 (L/kg) 3.21 (-)
CA 125 (L/kg) 3.13 (-)
Common R (used in model)* = 3.21
4. BIOTRANSFORMATION -1st Order Decay Coefficient*
Zone 1
λ (1/yr) half-life (yrs) Yield
TCA → DCA 0.050 0.74
DCA → CA 0.200 0.65
CA → Ethane 0.300 0.47
Zone 2
λ (1/yr) half-life (yrs)
TCA → DCA 0.000
DCA → CA 0.000
CA → Ethane 0.000
λ HELP
5. GENERAL
Simulation Time* 30 (yr)
Modeled Area Width* 200 (ft)
Modeled Area Length* 1000 (ft)
Zone 1 Length* 1000 (ft)
Zone 2 Length* 0 (ft)
Zone 2= L - Zone 1
6. SOURCE DATA
Source Options
TYPE: Continuous
Single Planar
Source Thickness in Sat. Zone 22 (ft)
Y1
Width* (ft) 25
DCA .068 0
CA .0 0
Vertical Plane Source: Determine Source Well Location and Input Solvent Concentrations
Standard
94%
View of Plume Looking Down
Observed Centerline Conc. at Monitoring Wells
7. FIELD DATA FOR COMPARISON
TCA Conc. (mg/L) .043 .022 .005 .002 .005 .002 .004 .001
DCA Conc. (mg/L) .089 .047 .005 .002 .005 .002 .004 .001
CA Conc. (mg/L) .0 .0 .0 .0 .0 .0 .0 .0
Distance from Source (ft) 0 1 90 91 240 241 370 371
Date Data Collected 2003
8. CHOOSE TYPE OF OUTPUT TO SEE:
RUN CENTERLINE
RUN ARRAY
Help
Restore Formulas
RESET
SEE OUTPUT
Paste Example
Unprotect Sheet

DISSOLVED CHLORINATED SOLVENT CONCENTRATIONS ALONG PLUME CENTERLINE (mg/L) at Z=0

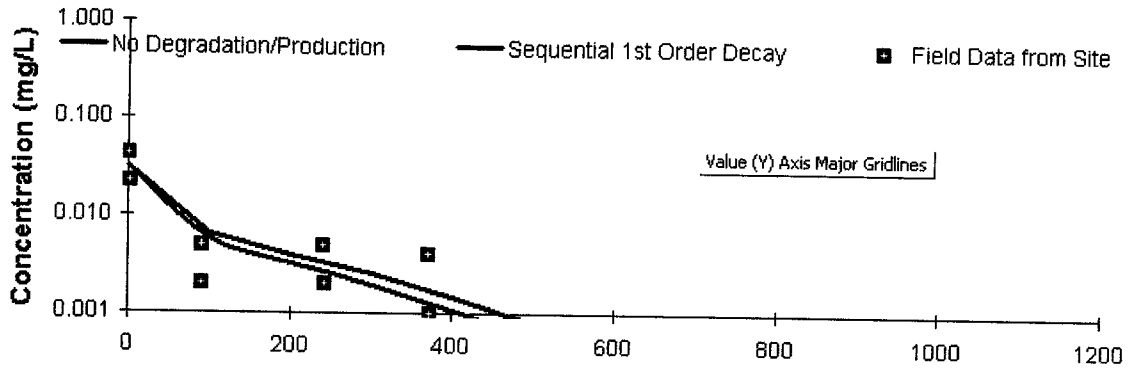
TCA

Distance from Source (ft)

	0	100	200	300	400	500	600	700	800	900	1000
No Degradation	0.032	0.007	0.004	0.003	0.001	0.001	0.000	0.000	0.000	0.000	0.000
Biotransformation	0.0320	0.006	0.003	0.002	0.001	0.001	0.000	0.000	0.000	0.000	0.000

Monitoring Well Locations (ft)

	0	1	90	91	240	241	370	371			
Field Data from Site	0.043	0.022	0.005	0.002	0.005	0.002	0.004	0.001			



See TCA

See DCA

See CA

Prepare Animation

Time:

30.0 Years

Log ⟺ Linear

Unprotect Sheet

Return to Input

To All

To Array

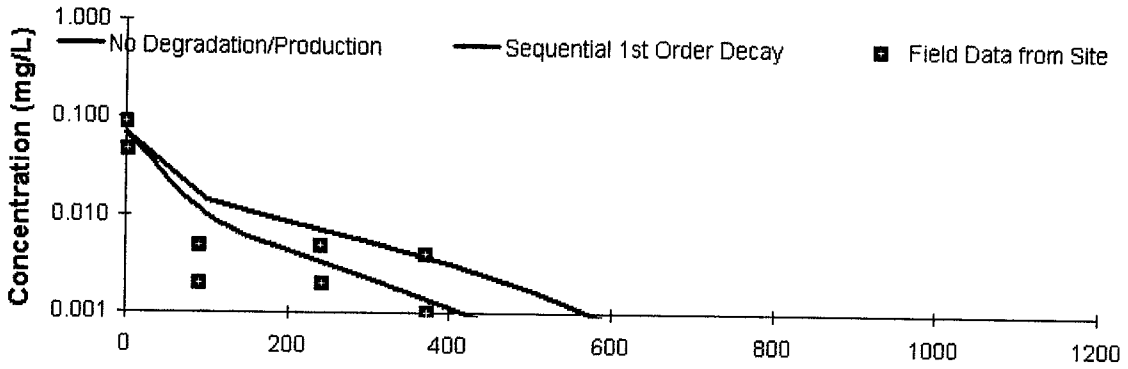
DISSOLVED CHLORINATED SOLVENT CONCENTRATIONS ALONG PLUME CENTERLINE (mg/L) at Z=0

Distance from Source (ft)

DCA	0	100	200	300	400	500	600	700	800	900	1000
No Degradation	0.068	0.014	0.008	0.005	0.003	0.002	0.001	0.000	0.000	0.000	0.000
Biotransformation	0.0680	0.010	0.004	0.002	0.001	0.001	0.000	0.000	0.000	0.000	0.000

Monitoring Well Locations (ft)

	0	1	90	91	240	241	370	371			
Field Data from Site	0.089	0.047	0.005	0.002	0.005	0.002	0.004	0.001			



See TCA

See DCA

See CA

Prepare Animation

Time:

30.0 Years

Log ⟺ Linear

Unprotect Sheet

Return to Input

To All

To Array

BIOCHLOR Natural Attenuation Decision Support System

Version 2.2

Excel '97

Ashland Rennselaer
Central Plume
Run Name

Data Input Instructions:

115 ← 1. Enter value directly....or
↑ or ↓ 2. Calculate by filling in gray
0.02 cells. Press Enter, then C
(To restore formulas, hit "Restore Formulas" button)
Variable* = Data used directly in model.

Test if Biotransformation is Occurring → Natural Attenuation Screening Protocol

TYPE OF CHLORINATED SOLVENT: Ethenes ◉ Ethanes ○

1. ADVECTION

Seepage Velocity*	Vs	30.0	(ft/yr)
or			
Hydraulic Conductivity	K	1.8E-02	(cm/sec)
Hydraulic Gradient	i	0.0012	(ft/ft)
Effective Porosity	n	0.3	(-)

2. DISPERSION

Alpha x*	100	(ft)	Calc. Alpha x
(Alpha y) / (Alpha x)*	0.1	(-)	
(Alpha z) / (Alpha x)*	1.E-07	(-)	

3. ADSORPTION

Retardation Factor* R

or

Soil Bulk Density, rho	1.7	(kg/L)		
FractionOrganicCarbon, foc	3.0E-3	(-)		
Partition Coefficient	Koc			
PCE	426	(L/kg)	8.24	(-)
TCE	130	(L/kg)	3.21	(-)
DCE	125	(L/kg)	3.13	(-)
VC	30	(L/kg)	1.50	(-)
ETH	302	(L/kg)	6.13	(-)
Common R (used in model)*			3.21	

4. BIOTRANSFORMATION -1st Order Decay Coefficient*

	λ (1/yr)	half-life (yrs)	Yield
Zone 1			
PCE → TCE	0.150		0.79
TCE → DCE	0.400		0.74
DCE → VC	0.800		0.64
VC → ETH	1.200		0.45
Zone 2	λ (1/yr)	half-life (yrs)	
PCE → TCE	0.000		
TCE → DCE	0.000		
DCE → VC	0.000		
VC → ETH	0.000		

λ HELP

5. GENERAL

Simulation Time*	30	(yr)	← L →
Modeled Area Width*	200	(ft)	W
Modeled Area Length*	1000	(ft)	
Zone 1 Length*	1000	(ft)	
Zone 2 Length*	0	(ft)	Zone 2= L - Zone 1

6. SOURCE DATA TYPE: Continuous Single Planar

Source Options

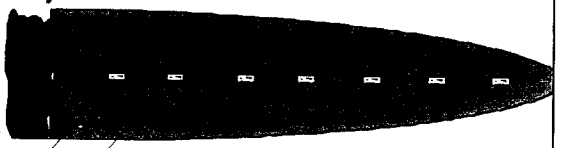
Source Thickness in Sat. Zone* 22 (ft)

Y1

Width* (ft) 10

Conc. (mg/L)*	C1	k_s* (1/yr)
PCE	.4	0
TCE	2.9	0
DCE	1.8	0
VC	.13	0
ETH	0.1	0

Vertical Plane Source: Determine Source Well Location and Input Solvent Concentrations



View of Plume Looking Down

Observed Centerline Conc. at Monitoring Wells

7. FIELD DATA FOR COMPARISON

PCE Conc. (mg/L)	.616	.216	.013	.004							
TCE Conc. (mg/L)	4.027	1.759	.013	.004							
DCE Conc. (mg/L)	2.5	1.072	.913	.518							
VC Conc. (mg/L)	0.233	.027	.231	.18							
ETH Conc. (mg/L)	0.0	.0	.0	.0							
Distance from Source (ft)	0	1	200	201							
Date Data Collected	2003										

8. CHOOSE TYPE OF OUTPUT TO SEE:

RUN CENTERLINE | RUN ARRAY | *Help* | Restore Formulas | RESET | *SEE OUTPUT* | Paste Example

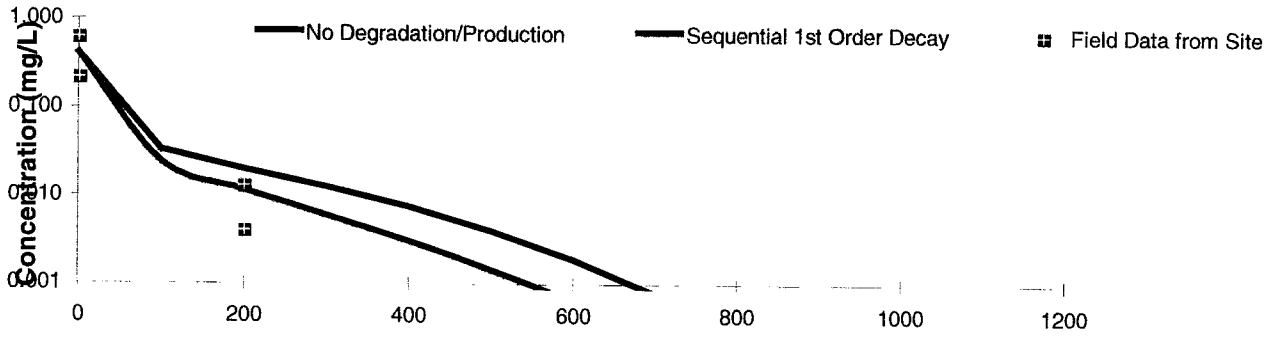
DISSOLVED CHLORINATED SOLVENT CONCENTRATIONS ALONG PLUME CENTERLINE (mg/L) at Z=0

Distance from Source (ft)

PCE	0	100	200	300	400	500	600	700	800	900	1000
No Degradation	0.400	0.033	0.020	0.013	0.007	0.004	0.002	0.001	0.000	0.000	0.000
Biotransformation	0.4000	0.024	0.011	0.006	0.003	0.001	0.001	0.000	0.000	0.000	0.000

Monitoring Well Locations (ft)

	0	1	200	201							
Field Data from Site	0.616	0.216	0.013	0.004							



See PCE | See TCE | See DCE | See VC | See ETH

Distance From Source (ft.)

Prepare Animation

Time: 30.0 Years

Log ⟺ Linear

Return to Input | To All | To Array

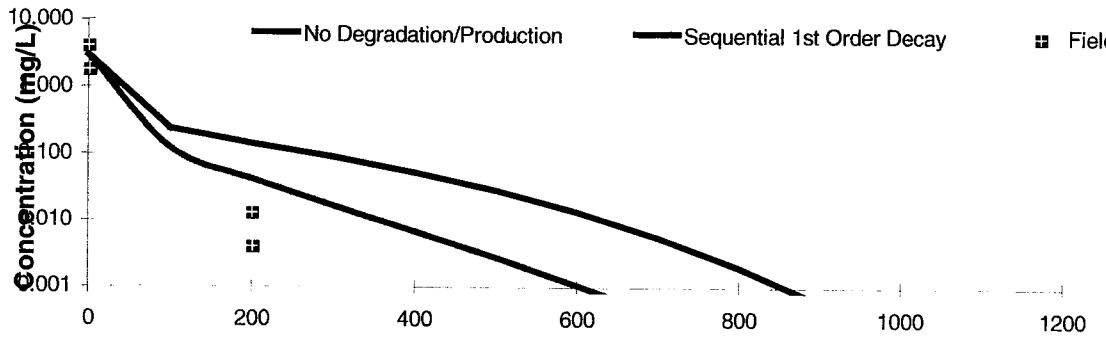
DISSOLVED CHLORINATED SOLVENT CONCENTRATIONS ALONG PLUME CENTERLINE (mg/L) at Z=0

Distance from Source (ft)

TCE	0	100	200	300	400	500	600	700	800	900	1000
No Degradation	2.900	0.239	0.144	0.091	0.054	0.029	0.014	0.006	0.002	0.001	0.000
Biotransformation	2.9000	0.124	0.043	0.017	0.007	0.003	0.001	0.000	0.000	0.000	0.000

Monitoring Well Locations (ft)

	0	1	200	201							
Field Data from Site	4.027	1.759	0.013	0.004							



Distance From Source (ft.)

See PCE | See TCE | See DCE | See VC | See ETH

Prepare Animation

Time: 30.0 Years

Log ⟺ Linear

Return to Input | To All | To Array

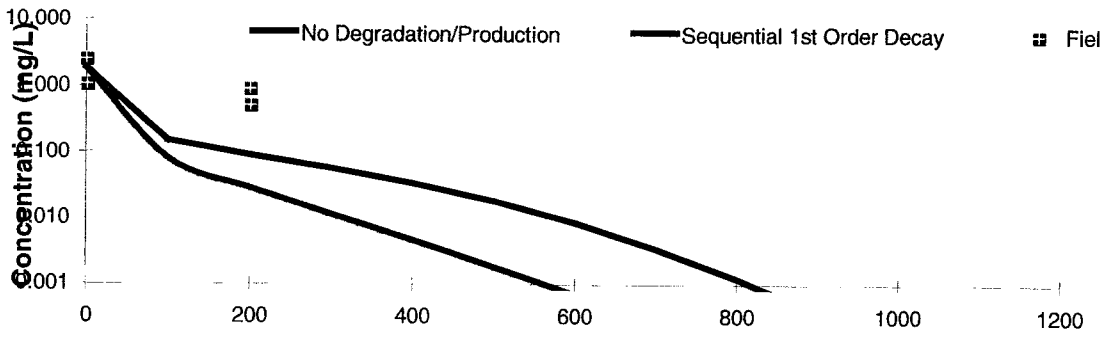
DISSOLVED CHLORINATED SOLVENT CONCENTRATIONS ALONG PLUME CENTERLINE (mg/L) at Z=0

Distance from Source (ft)

DCE	0	100	200	300	400	500	600	700	800	900	1000
No Degradation	1.800	0.148	0.090	0.057	0.034	0.018	0.008	0.003	0.001	0.000	0.000
Biotransformation	1.8000	0.081	0.028	0.011	0.005	0.002	0.001	0.000	0.000	0.000	0.000

Monitoring Well Locations (ft)

	0	1	200	201							
Field Data from Site	2.500	1.072	0.913	0.518							



See PCE

See TCE

See DCE

See VC

See ETH

Prepare Animation

Time:

30.0 Years

Log ⟺ Linear

Return to Input

To All

To Array

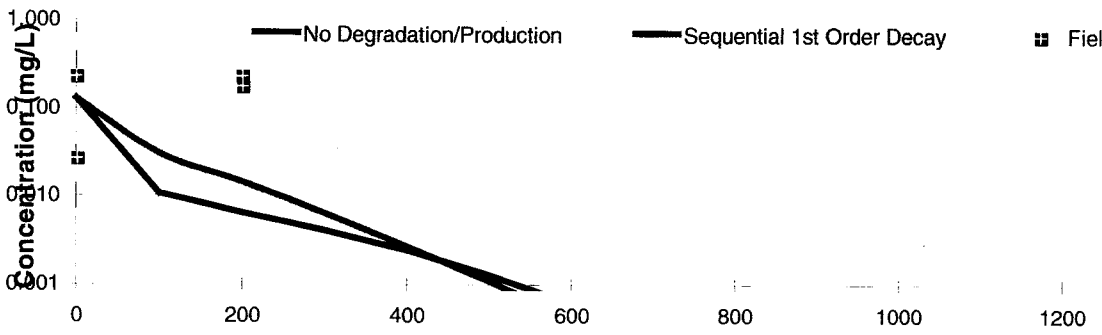
DISSOLVED CHLORINATED SOLVENT CONCENTRATIONS ALONG PLUME CENTERLINE (mg/L) at Z=0

Distance from Source (ft)

VC	0	100	200	300	400	500	600	700	800	900	1000
No Degradation	0.130	0.011	0.006	0.004	0.002	0.001	0.001	0.000	0.000	0.000	0.000
Biotransformation	0.1300	0.031	0.015	0.006	0.003	0.001	0.000	0.000	0.000	0.000	0.000

Monitoring Well Locations (ft)

	0	1	200	201							
Field Data from Site	0.233	0.027	0.231	0.180							



See PCE | See TCE | See DCE | See VC | See ETH

Distance From Source (ft.)

Prepare Animation

Time: 30.0 Years

Log ⟺ Linear

Return to Input | To All | To Array

BIOCHLOR Natural Attenuation Decision Support System

Version 2.2
Excel '97

Ashland Rennselaer
South Plume
Run Name

Data Input Instructions:
115 ← 1. Enter value directly....or
↑ or ← 2. Calculate by filling in gray
0.02 cells. Press Enter, then C
(To restore formulas, hit "Restore Formulas" button)
Variable* ▷ Data used directly in model.

Test if Biotransformation is Occurring → Natural Attenuation Screening Protocol

TYPE OF CHLORINATED SOLVENT: Ethenes ◉ Ethanes ○

1. ADVECTION

Seepage Velocity*	Vs	30.0	(ft/yr)
or			
Hydraulic Conductivity	K	1.8E-02	(cm/sec)
Hydraulic Gradient	i	0.0012	(ft/ft)
Effective Porosity	n	0.3	(-)

2. DISPERSION

Alpha x*	100	(ft)	Calc. Alpha x
(Alpha y) / (Alpha x)*	0.1	(-)	
(Alpha z) / (Alpha x)*	1.E-07	(-)	

3. ADSORPTION

Retardation Factor* ▷ R
or

Soil Bulk Density, rho	1.7	(kg/L)		
FractionOrganicCarbon, foc	3.0E-3	(-)		
Partition Coefficient	Koc			
PCE	426	(L/kg)	8.24	(-)
TCE	130	(L/kg)	3.21	(-)
DCE	125	(L/kg)	3.13	(-)
VC	30	(L/kg)	1.50	(-)
ETH	302	(L/kg)	6.13	(-)
Common R (used in model)*=			3.21	

4. BIOTRANSFORMATION -1st Order Decay Coefficient*

	λ (1/yr)	half-life (yrs)	Yield
Zone 1			
PCE → TCE	0.150		0.79
TCE → DCE	0.400		0.74
DCE → VC	0.800		0.64
VC → ETH	1.200		0.45
Zone 2	λ (1/yr)	half-life (yrs)	
PCE → TCE	0.000		
TCE → DCE	0.000		
DCE → VC	0.000		
VC → ETH	0.000		

λ HELP

5. GENERAL

Simulation Time*	30	(yr)	← L →
Modeled Area Width*	200	(ft)	W
Modeled Area Length*	1000	(ft)	
Zone 1 Length*	1000	(ft)	
Zone 2 Length*	0	(ft)	Zone 2= L - Zone 1

6. SOURCE DATA TYPE: Continuous Single Planar

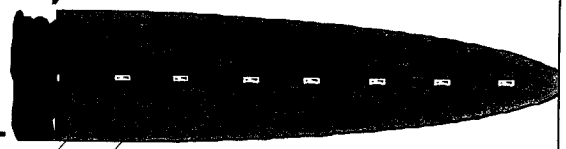
Source Options

Source Thickness in Sat. Zone* 22 (ft)

Y1
Width* (ft) 25

Conc. (mg/L)*	C1	k_s* (1/yr)
PCE	.068	0
TCE	.31	0
DCE	.95	0
VC	.46	0
ETH	0	0

Vertical Plane Source: Determine Source Well Location and Input Solvent Concentrations



View of Plume Looking Down

Observed Centerline Conc. at Monitoring Wells

7. FIELD DATA FOR COMPARISON

PCE Conc. (mg/L)	.098	.038	.047	.014	.005	.002	.004	.001			
TCE Conc. (mg/L)	.415	.209	.046	.013	.018	.004	.004	.001			
DCE Conc. (mg/L)	1.171	.734	.065	.036	.24	.009	.004	.001			
VC Conc. (mg/L)	0.621	.301	.015	.008	.017	.005	.008	.001			
ETH Conc. (mg/L)	0.0	.0	.0	.0	.0	.0	.0	.0			
Distance from Source (ft)	0	1	90	91	240	241	370	371			
Date Data Collected	2003										

8. CHOOSE TYPE OF OUTPUT TO SEE:

RUN CENTERLINE | RUN ARRAY | *Help* | Restore Formulas | RESET | *SEE OUTPUT* | Paste Example

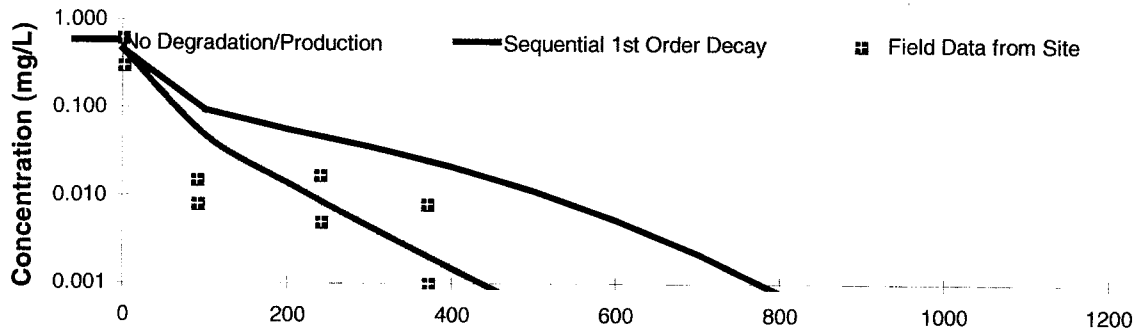
DISSOLVED CHLORINATED SOLVENT CONCENTRATIONS ALONG PLUME CENTERLINE (mg/L) at Z=0

Distance from Source (ft)

VC	0	100	200	300	400	500	600	700	800	900	1000
No Degradation	0.460	0.094	0.057	0.036	0.021	0.011	0.005	0.002	0.001	0.000	0.000
Biotransformation	0.4600	0.048	0.014	0.004	0.001	0.001	0.000	0.000	0.000	0.000	0.000

Monitoring Well Locations (ft)

	0	1	90	91	240	241	370	371			
Field Data from Site	0.621	0.301	0.015	0.008	0.017	0.005	0.008	0.001			



See PCE | See TCE | See DCE | See VC | See ETH

Prepare Animation

Time: 30.0 Years

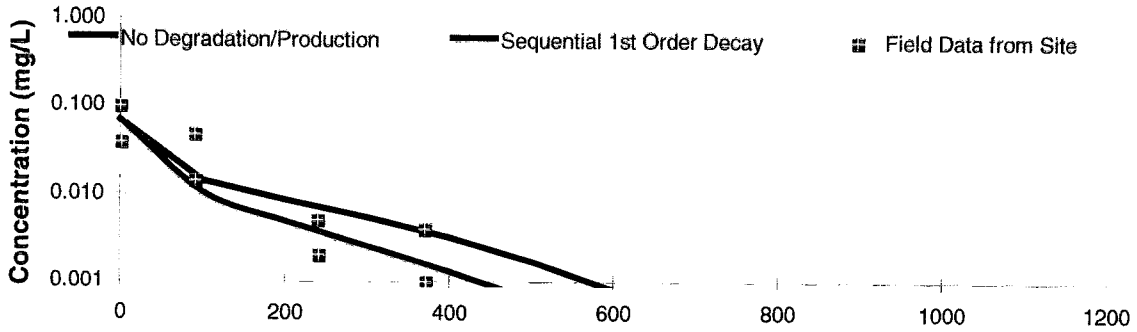
Log ⟺ Linear

Return to Input | To All | To Array

DISSOLVED CHLORINATED SOLVENT CONCENTRATIONS ALONG PLUME CENTERLINE (mg/L) at Z=0

PCE	Distance from Source (ft)										
	0	100	200	300	400	500	600	700	800	900	1000
No Degradation	0.068	0.014	0.008	0.005	0.003	0.002	0.001	0.000	0.000	0.000	0.000
Biotransformation	0.0680	0.010	0.005	0.003	0.001	0.001	0.000	0.000	0.000	0.000	0.000

	Monitoring Well Locations (ft)										
	0	1	90	91	240	241	370	371			
Field Data from Site	0.098	0.038	0.047	0.014	0.005	0.002	0.004	0.001			



See PCE

See TCE

See DCE

See VC

See ETH

Prepare Animation

Time:

30.0 Years

Log ⟺ Linear

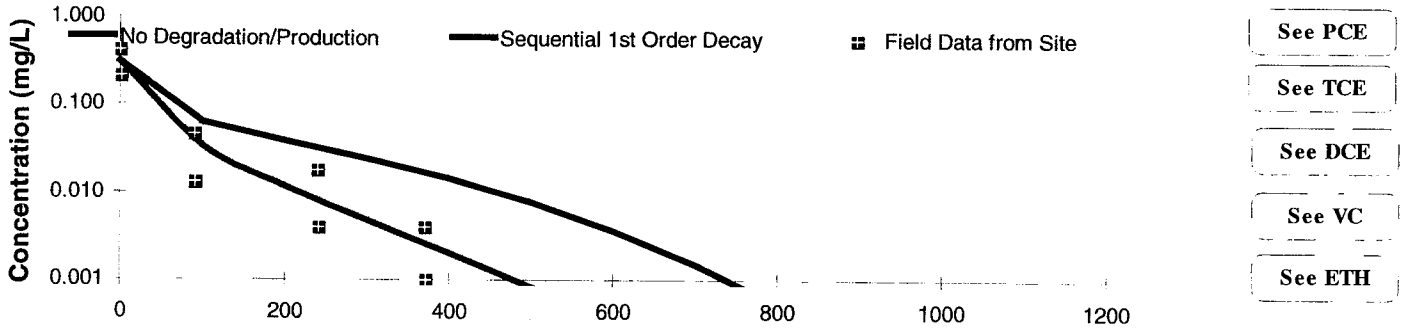
Return to Input

To All

To Array

DISSOLVED CHLORINATED SOLVENT CONCENTRATIONS ALONG PLUME CENTERLINE (mg/L) at Z=0

TCE	Distance from Source (ft)										
	0	100	200	300	400	500	600	700	800	900	1000
No Degradation	0.310	0.063	0.038	0.024	0.014	0.008	0.004	0.001	0.001	0.000	0.000
Biotransformation	0.3100	0.033	0.012	0.005	0.002	0.001	0.000	0.000	0.000	0.000	0.000
	Monitoring Well Locations (ft)										
	0	1	90	91	240	241	370	371			
Field Data from Site	0.415	0.209	0.046	0.013	0.018	0.004	0.004	0.001			



See PCE | See TCE | See DCE | See VC | See ETH

Prepare Animation

Time: 30.0 Years

Log ⟺ Linear

Return to Input | To All | To Array

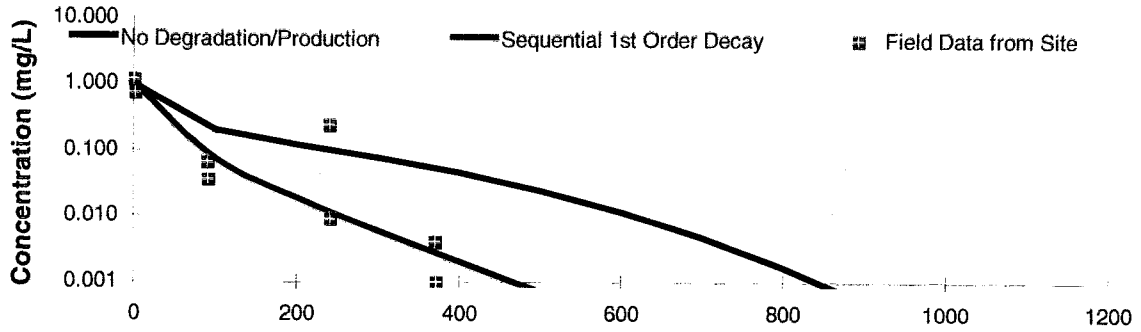
DISSOLVED CHLORINATED SOLVENT CONCENTRATIONS ALONG PLUME CENTERLINE (mg/L) at Z=0

Distance from Source (ft)

DCE	0	100	200	300	400	500	600	700	800	900	1000
No Degradation	0.950	0.193	0.118	0.074	0.044	0.024	0.011	0.005	0.002	0.000	0.000
Biotransformation	0.9500	0.071	0.018	0.006	0.002	0.001	0.000	0.000	0.000	0.000	0.000

Monitoring Well Locations (ft)

	0	1	90	91	240	241	370	371			
Field Data from Site	1.171	0.734	0.065	0.036	0.240	0.009	0.004	0.001			



See PCE | See TCE | See DCE | See VC | See ETH

Distance From Source (ft.)

Prepare Animation

Time: 30.0 Years

Log ⟺ Linear

Return to Input | To All | To Array

BIOCHLOR Natural Attenuation Decision Support System

Version 2.2
Excel '97

Ashland Rennselaer
Central Plume
Run Name

Data Input Instructions:
115 ← 1. Enter value directly....or
↑ or ↓ 2. Calculate by filling in gray
0.02 cells. Press Enter, then C
(To restore formulas, hit "Restore Formulas" button)
Variable* ← Data used directly in model.

Test if Biotransformation is Occurring → Natural Attenuation Screening Protocol

TYPE OF CHLORINATED SOLVENT: Ethenes ○ Ethanes ◉

1. ADVECTION

Seepage Velocity*	Vs	30.0	(ft/yr)
or			
Hydraulic Conductivity	K	1.8E-02	(cm/sec)
Hydraulic Gradient	i	0.0012	(ft/ft)
Effective Porosity	n	0.3	(-)

2. DISPERSION

Alpha x*	100	(ft)	Calc. Alpha x
(Alpha y) / (Alpha x)*	0.1	(-)	
(Alpha z) / (Alpha x)*	1.E-07	(-)	

3. ADSORPTION

Retardation Factor*			← R	
or				
Soil Bulk Density, rho	1.7	(kg/L)		
FractionOrganicCarbon, foc	3.0E-3	(-)		
Partition Coefficient	Koc			
TCA	426	(L/kg)	8.24	(-)
DCA	130	(L/kg)	3.21	(-)
CA	125	(L/kg)	3.13	(-)

Common R (used in model)* = 3.21

4. BIOTRANSFORMATION -1st Order Decay Coefficient*

Zone 1	λ (1/yr)	half-life (yrs)	Yield
TCA → DCA	0.050		0.74
DCA → CA	0.200		0.65
CA → Ethane	0.300		0.47

Zone 2	λ (1/yr)	half-life (yrs)
TCA → DCA	0.000	
DCA → CA	0.000	
CA → Ethane	0.000	

λ HELP

5. GENERAL

Simulation Time*	100	(yr)	← L →
Modeled Area Width*	200	(ft)	W
Modeled Area Length*	1000	(ft)	
Zone 1 Length*	1000	(ft)	
Zone 2 Length*	0	(ft)	Zone 2= L - Zone 1

6. SOURCE DATA TYPE: Continuous Single Planar

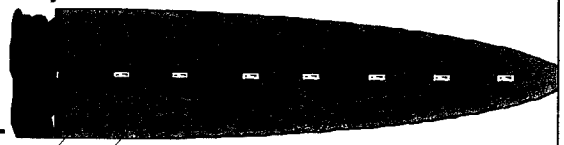
Source Options

Source Thickness in Sat. Zone* 22 (ft)

Y1
Width* (ft) 10

Conc. (mg/L)*	C1	k_s* (1/yr)
TCA	.19	0
DCA	.068	0
CA	.0	0

Vertical Plane Source: Determine Source Well Location and Input Solvent Concentrations



View of Plume Looking Down

Observed Centerline Conc. at Monitoring Wells

7. FIELD DATA FOR COMPARISON

TCA Conc. (mg/L)	.294	.086	.012	.003								
DCA Conc. (mg/L)	.118	.018	.064	.001								
CA Conc. (mg/L)	.0	.0	.0	.0								
Distance from Source (ft)	0	1	200	201								
Date Data Collected	2003											

8. CHOOSE TYPE OF OUTPUT TO SEE:

RUN CENTERLINE | RUN ARRAY | Help | Restore Formulas | RESET | SEE OUTPUT | Paste Example

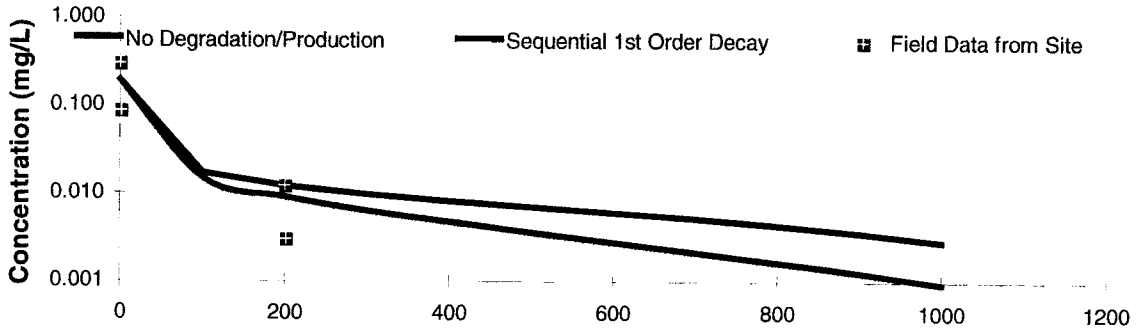
DISSOLVED CHLORINATED SOLVENT CONCENTRATIONS ALONG PLUME CENTERLINE (mg/L) at Z=0

Distance from Source (ft)

TCA	0	100	200	300	400	500	600	700	800	900	1000
No Degradation	0.190	0.017	0.012	0.010	0.008	0.007	0.006	0.005	0.004	0.004	0.003
Biotransformation	0.1900	0.015	0.009	0.006	0.005	0.004	0.003	0.002	0.002	0.001	0.001

Monitoring Well Locations (ft)

	0	1	200	201							
Field Data from Site	0.294	0.086	0.012	0.003							



See TCA

See DCA

See CA

Prepare Animation

Time:

100.0 Years

Log ⟺ Linear

Return to Input

To All

To Array

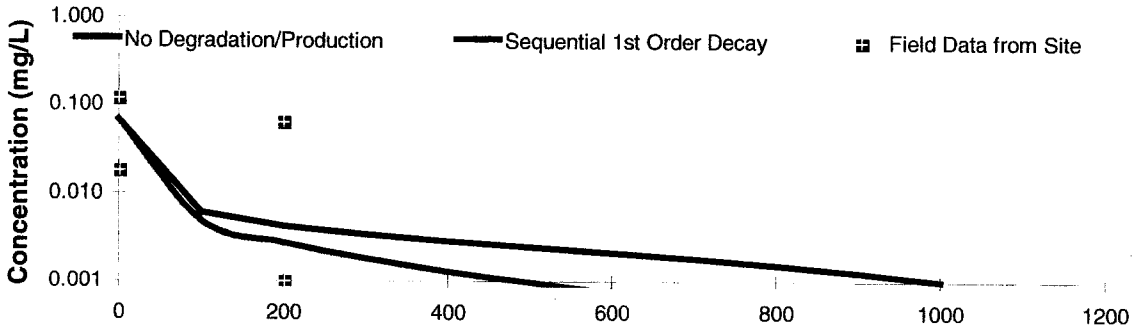
DISSOLVED CHLORINATED SOLVENT CONCENTRATIONS ALONG PLUME CENTERLINE (mg/L) at Z=0

Distance from Source (ft)

DCA	0	100	200	300	400	500	600	700	800	900	1000
No Degradation	0.068	0.006	0.004	0.003	0.003	0.002	0.002	0.002	0.002	0.001	0.001
Biotransformation	0.0680	0.005	0.003	0.002	0.001	0.001	0.001	0.001	0.000	0.000	0.000

Monitoring Well Locations (ft)

	0	1	200	201							
Field Data from Site	0.118	0.018	0.064	0.001							



See TCA

See DCA

See CA

Prepare Animation

Time:

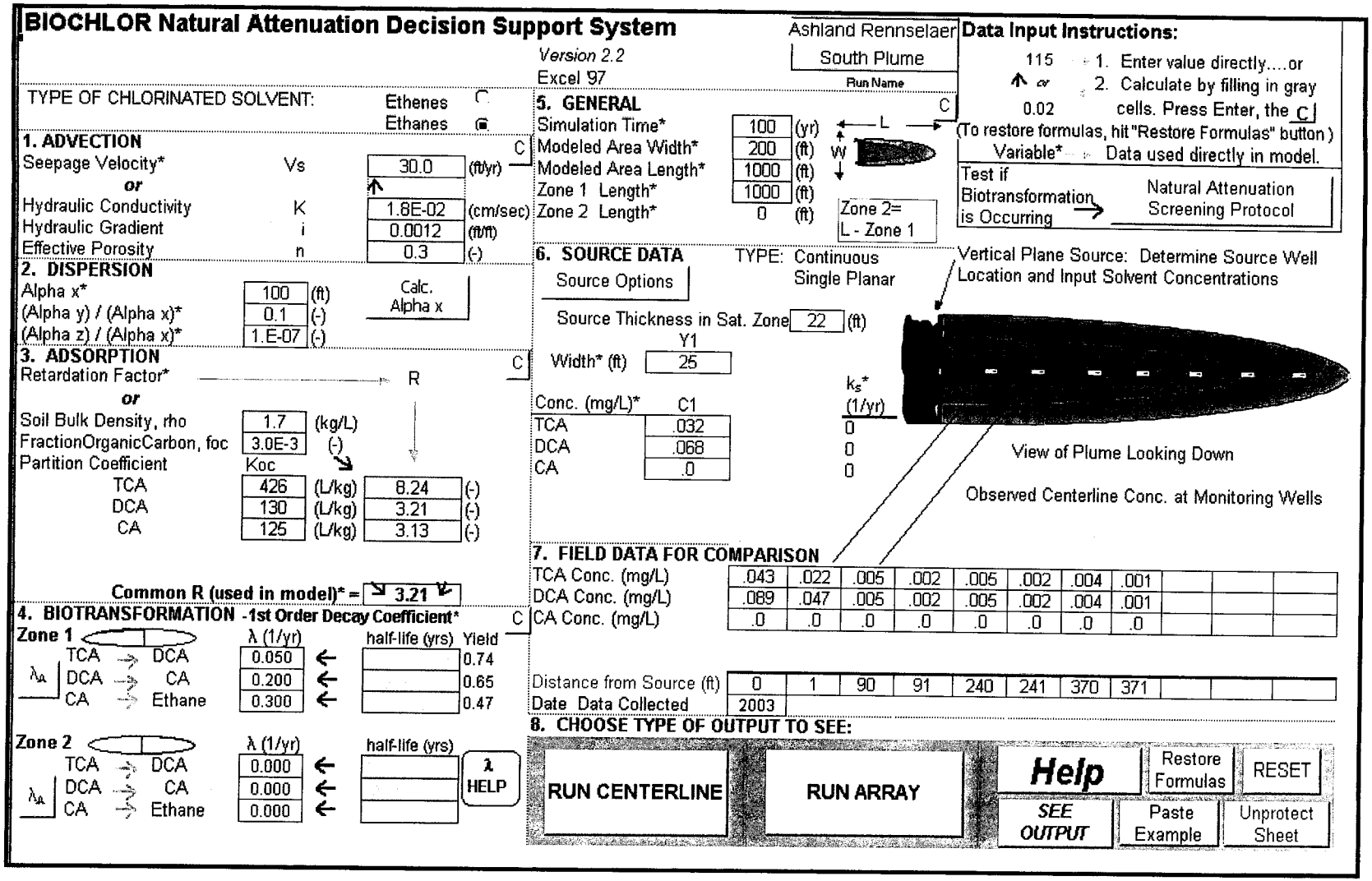
100.0 Years

Log ⟺ Linear

Return to Input

To All

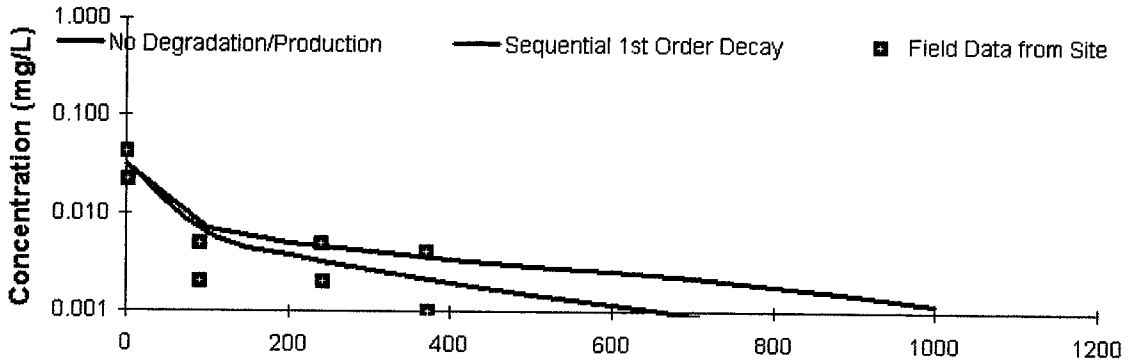
To Array


BIOCHLOR Natural Attenuation Decision Support System
Version 2.2
Excel 97
Ashland Rennselaer
South Plume
Run Name
Data Input Instructions:
115 1. Enter value directly....or
cr 2. Calculate by filling in gray
0.02 cells. Press Enter, the C
(To restore formulas, hit "Restore Formulas" button)
Variable* Data used directly in model.
Test if Biotransformation is Occurring
Natural Attenuation Screening Protocol
TYPE OF CHLORINATED SOLVENT:
Ethenes
Ethanes
1. ADVECTION
Seepage Velocity* Vs 30.0 (ft/yr)
or
Hydraulic Conductivity K 1.8E-02 (cm/sec)
Hydraulic Gradient i 0.0012 (ft/ft)
Effective Porosity n 0.3 (-)
2. DISPERSION
Alpha x* 100 (ft)
(Alpha y) / (Alpha x)* 0.1 (-)
(Alpha z) / (Alpha x)* 1.E-07 (-)
Calc. Alpha x
3. ADSORPTION
Retardation Factor* R
or
Soil Bulk Density, rho 1.7 (kg/L)
FractionOrganicCarbon, foc 3.0E-3 (-)
Partition Coefficient Koc
TCA 426 (L/kg) 8.24 (-)
DCA 130 (L/kg) 3.21 (-)
CA 125 (L/kg) 3.13 (-)
Common R (used in model)* = 3.21
4. BIOTRANSFORMATION -1st Order Decay Coefficient*
Zone 1
λ (1/yr) half-life (yrs) Yield
TCA → DCA 0.050 0.74
DCA → CA 0.200 0.65
CA → Ethane 0.300 0.47
Zone 2
λ (1/yr) half-life (yrs)
TCA → DCA 0.000
DCA → CA 0.000
CA → Ethane 0.000
λ HELP
5. GENERAL
Simulation Time* 100 (yr)
Modeled Area Width* 200 (ft)
Modeled Area Length* 1000 (ft)
Zone 1 Length* 1000 (ft)
Zone 2 Length* 0 (ft)
L
W
Zone 2= L - Zone 1
6. SOURCE DATA
TYPE: Continuous Single Planar
Source Options
Source Thickness in Sat. Zone 22 (ft)
Y1
Width* (ft) 25
Conc. (mg/L)* C1 ks* (1/yr)
TCA .032 0
DCA .068 0
CA .0 0
Vertical Plane Source: Determine Source Well Location and Input Solvent Concentrations
View of Plume Looking Down
Observed Centerline Conc. at Monitoring Wells
7. FIELD DATA FOR COMPARISON
TCA Conc. (mg/L) .043 .022 .005 .002 .005 .002 .004 .001
DCA Conc. (mg/L) .089 .047 .005 .002 .005 .002 .004 .001
CA Conc. (mg/L) .0 .0 .0 .0 .0 .0 .0 .0
Distance from Source (ft) 0 1 90 91 240 241 370 371
Date Data Collected 2003
8. CHOOSE TYPE OF OUTPUT TO SEE:
RUN CENTERLINE
RUN ARRAY
Help
Restore Formulas
RESET
SEE OUTPUT
Paste Example
Unprotect Sheet

DISSOLVED CHLORINATED SOLVENT CONCENTRATIONS ALONG PLUME CENTERLINE (mg/L) at Z=0

TCA	Distance from Source (ft)										
	0	100	200	300	400	500	600	700	800	900	1000
No Degradation	0.032	0.007	0.005	0.004	0.003	0.003	0.002	0.002	0.002	0.001	0.001
Biotransformation	0.0320	0.006	0.004	0.003	0.002	0.001	0.001	0.001	0.001	0.001	0.000

	Monitoring Well Locations (ft)										
	0	1	90	91	240	241	370	371			
Field Data from Site	0.043	0.022	0.005	0.002	0.005	0.002	0.004	0.001			



See TCA

See DCA

See CA

Prepare Animation

Time:

100.0 Years

Log ⟺ Linear

Unprotect Sheet

Return to Input

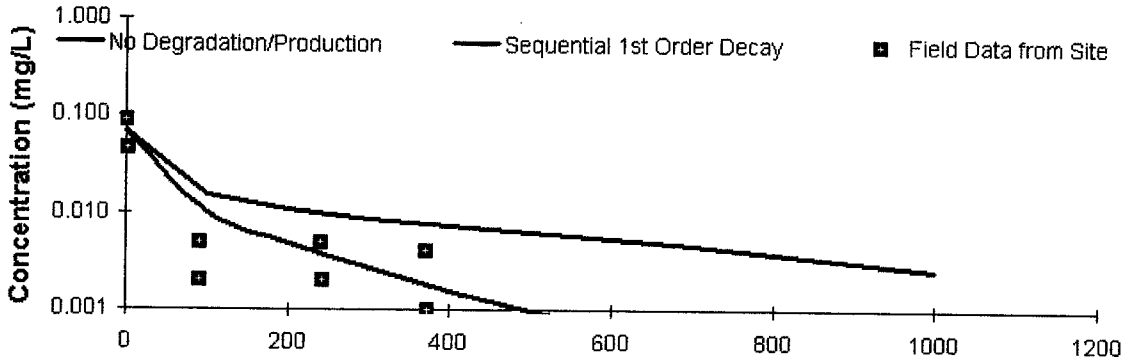
To All

To Array

DISSOLVED CHLORINATED SOLVENT CONCENTRATIONS ALONG PLUME CENTERLINE (mg/L) at Z=0

DCA	Distance from Source (ft)										
	0	100	200	300	400	500	600	700	800	900	1000
No Degradation	0.068	0.015	0.011	0.008	0.007	0.006	0.005	0.005	0.004	0.003	0.003
Biotransformation	0.0680	0.010	0.005	0.003	0.002	0.001	0.001	0.000	0.000	0.000	0.000

	Monitoring Well Locations (ft)										
	0	1	90	91	240	241	370	371			
Field Data from Site	0.089	0.047	0.005	0.002	0.005	0.002	0.004	0.001			



See TCA

See DCA

See CA

Prepare Animation

Time:

100.0 Years

Log ⇔ Linear

Unprotect Sheet

Return to Input

To All

To Array

BIOCHLOR Natural Attenuation Decision Support System

Version 2.2
Excel '97

Ashland Rennselaer
Central Plume
Run Name

Data Input Instructions:
115 ▸ 1. Enter value directly....or
↑ or ▸ 2. Calculate by filling in gray
0.02 cells. Press Enter, then (C
(To restore formulas, hit "Restore Formulas" button)
Variable* ▸ Data used directly in model.

Test if Biotransformation is Occurring → Natural Attenuation Screening Protocol

TYPE OF CHLORINATED SOLVENT: Ethenes ◉ Ethanes ○

1. ADVECTION

Seepage Velocity*	Vs	30.0	(ft/yr)
or			
Hydraulic Conductivity	K	1.8E-02	(cm/sec)
Hydraulic Gradient	i	0.0012	(ft/ft)
Effective Porosity	n	0.3	(-)

2. DISPERSION

Alpha x*	100	(ft)	Calc. Alpha x
(Alpha y) / (Alpha x)*	0.1	(-)	
(Alpha z) / (Alpha x)*	1.E-07	(-)	

3. ADSORPTION

Retardation Factor*			R	
or				
Soil Bulk Density, rho	1.7	(kg/L)		
FractionOrganicCarbon, foc	3.0E-3	(-)		
Partition Coefficient	Koc			
PCE	426	(L/kg)	8.24	(-)
TCE	130	(L/kg)	3.21	(-)
DCE	125	(L/kg)	3.13	(-)
VC	30	(L/kg)	1.50	(-)
ETH	302	(L/kg)	6.13	(-)
Common R (used in model)* =			3.21	

4. BIOTRANSFORMATION -1st Order Decay Coefficient*

Zone 1	λ (1/yr)	half-life (yrs)	Yield
PCE → TCE	0.150		0.79
TCE → DCE	0.400		0.74
DCE → VC	0.800		0.64
VC → ETH	1.200		0.45
Zone 2	**λ (1/yr)**	**half-life (yrs)**	
PCE → TCE	0.000		
TCE → DCE	0.000		
DCE → VC	0.000		
VC → ETH	0.000		

λ HELP

5. GENERAL

Simulation Time*	100	(yr)	← L →
Modeled Area Width*	200	(ft)	W
Modeled Area Length*	1000	(ft)	
Zone 1 Length*	1000	(ft)	
Zone 2 Length*	0	(ft)	Zone 2= L - Zone 1

6. SOURCE DATA TYPE: Continuous / Single Planar

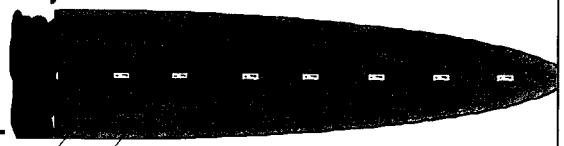
Source Options

Source Thickness in Sat. Zone* 22 (ft)

Width* (ft) Y1 = 10

Conc. (mg/L)*	C1	k_s* (1/yr)
PCE	.4	0
TCE	2.9	0
DCE	1.8	0
VC	.13	0
ETH	0.1	0

Vertical Plane Source: Determine Source Well Location and Input Solvent Concentrations



View of Plume Looking Down

Observed Centerline Conc. at Monitoring Wells

7. FIELD DATA FOR COMPARISON

PCE Conc. (mg/L)	.616	.216	.013	.004							
TCE Conc. (mg/L)	4.027	1.759	.013	.004							
DCE Conc. (mg/L)	2.5	1.072	.913	.518							
VC Conc. (mg/L)	0.233	.027	.231	.18							
ETH Conc. (mg/L)	0.0	.0	.0	.0							
Distance from Source (ft)	0	1	200	201							
Date Data Collected	2003										

8. CHOOSE TYPE OF OUTPUT TO SEE:

RUN CENTERLINE **RUN ARRAY** ***Help*** Restore Formulas RESET

SEE OUTPUT Paste Example

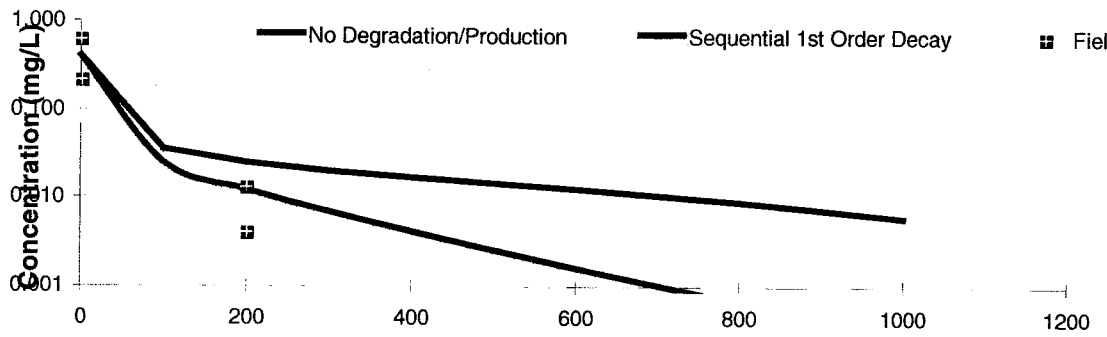
DISSOLVED CHLORINATED SOLVENT CONCENTRATIONS ALONG PLUME CENTERLINE (mg/L) at Z=0

Distance from Source (ft)

PCE	0	100	200	300	400	500	600	700	800	900	1000
No Degradation	0.400	0.035	0.025	0.020	0.017	0.015	0.012	0.011	0.009	0.007	0.006
Biotransformation	0.4000	0.025	0.012	0.007	0.004	0.003	0.002	0.001	0.001	0.000	0.000

Monitoring Well Locations (ft)

	0	1	200	201							
Field Data from Site	0.616	0.216	0.013	0.004							



Distance From Source (ft.)

See PCE | See TCE | See DCE | See VC | See ETH

Prepare Animation

Time: 100.0 Years

Log ⟺ Linear

Return to Input | To All | To Array

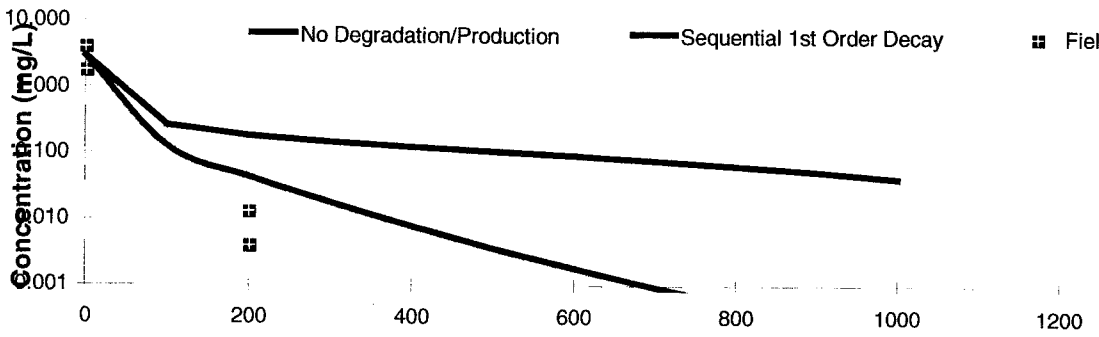
DISSOLVED CHLORINATED SOLVENT CONCENTRATIONS ALONG PLUME CENTERLINE (mg/L) at Z=0

Distance from Source (ft)

TCE	0	100	200	300	400	500	600	700	800	900	1000
No Degradation	2.900	0.257	0.180	0.145	0.122	0.105	0.091	0.077	0.065	0.054	0.043
Biotransformation	2.9000	0.125	0.043	0.018	0.008	0.004	0.002	0.001	0.001	0.000	0.000

Monitoring Well Locations (ft)

	0	1	200	201							
Field Data from Site	4.027	1.759	0.013	0.004							



See PCE | See TCE | See DCE | See VC | See ETH

Prepare Animation

Time: 100.0 Years

Log ⇔ Linear

Return to Input | To All | To Array

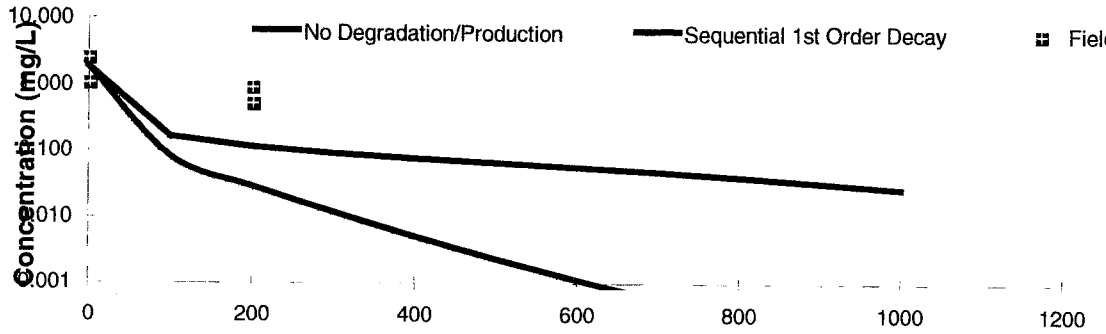
DISSOLVED CHLORINATED SOLVENT CONCENTRATIONS ALONG PLUME CENTERLINE (mg/L) at Z=0

Distance from Source (ft)

DCE	0	100	200	300	400	500	600	700	800	900	1000
No Degradation	1.800	0.160	0.112	0.090	0.076	0.065	0.056	0.048	0.040	0.033	0.027
Biotransformation	1.8000	0.081	0.029	0.012	0.005	0.002	0.001	0.001	0.000	0.000	0.000

Monitoring Well Locations (ft)

	0	1	200	201							
Field Data from Site	2.500	1.072	0.913	0.518							



Distance From Source (ft.)

See PCE | See TCE | See DCE | See VC | See ETH

Prepare Animation

Time: 100.0 Years

Log ⟺ Linear

Return to Input | To All | To Array

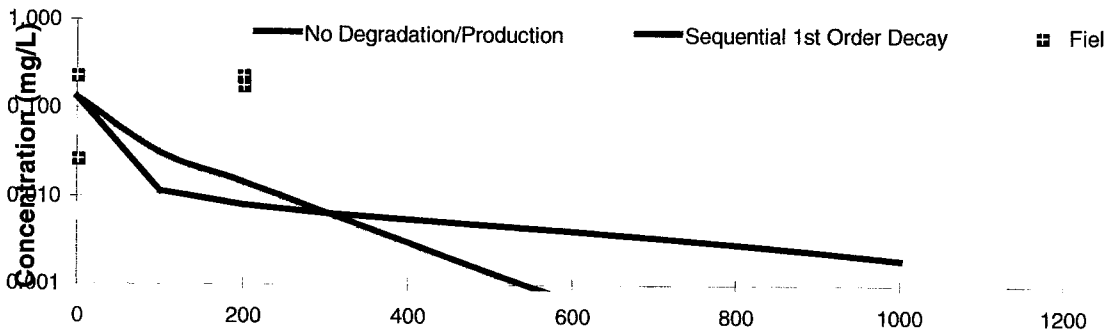
DISSOLVED CHLORINATED SOLVENT CONCENTRATIONS ALONG PLUME CENTERLINE (mg/L) at Z=0

Distance from Source (ft)

VC	0	100	200	300	400	500	600	700	800	900	1000
No Degradation	0.130	0.012	0.008	0.007	0.005	0.005	0.004	0.003	0.003	0.002	0.002
Biotransformation	0.1300	0.031	0.015	0.007	0.003	0.001	0.001	0.000	0.000	0.000	0.000

Monitoring Well Locations (ft)

	0	1	200	201							
Field Data from Site	0.233	0.027	0.231	0.180							



Distance From Source (ft.)

See PCE | See TCE | See DCE | See VC | See ETH

Prepare Animation

Time:
100.0 Years
Log ⟺ Linear

Return to Input | To All | To Array

BIOCHLOR Natural Attenuation Decision Support System

Version 2.2
Excel '97

Ashland Rennselaer South Plume
Run Name

Data Input Instructions:
115 ↑ or 0.02 — 1. Enter value directly....or 2. Calculate by filling in gray cells. Press Enter, then C
(To restore formulas, hit "Restore Formulas" button)
Variable* = Data used directly in model.

Test if Biotransformation is Occurring → Natural Attenuation Screening Protocol

TYPE OF CHLORINATED SOLVENT: Ethenes ◉ Ethanes ○

1. ADVECTION

Seepage Velocity*	Vs	30.0	(ft/yr)
or			
Hydraulic Conductivity	K	1.8E-02	(cm/sec)
Hydraulic Gradient	i	0.0012	(ft/ft)
Effective Porosity	n	0.3	(-)

2. DISPERSION

Alpha x*	100	(ft)	Calc. Alpha x
(Alpha y) / (Alpha x)*	0.1	(-)	
(Alpha z) / (Alpha x)*	1.E-07	(-)	

3. ADSORPTION

Retardation Factor*			R	
or				
Soil Bulk Density, rho	1.7	(kg/L)		
FractionOrganicCarbon, foc	3.0E-3	(-)		
Partition Coefficient	Koc			
PCE	426	(L/kg)	8.24	(-)
TCE	130	(L/kg)	3.21	(-)
DCE	125	(L/kg)	3.13	(-)
VC	30	(L/kg)	1.50	(-)
ETH	302	(L/kg)	6.13	(-)
Common R (used in model)* =			3.21	

4. BIOTRANSFORMATION -1st Order Decay Coefficient*

	λ (1/yr)	half-life (yrs)	Yield
Zone 1			
PCE → TCE	0.150		0.79
TCE → DCE	0.400		0.74
DCE → VC	0.800		0.64
VC → ETH	1.200		0.45
Zone 2	λ (1/yr)	half-life (yrs)	
PCE → TCE	0.000		
TCE → DCE	0.000		
DCE → VC	0.000		
VC → ETH	0.000		

λ HELP

5. GENERAL

Simulation Time*	100	(yr)	L
Modeled Area Width*	200	(ft)	W
Modeled Area Length*	1000	(ft)	
Zone 1 Length*	1000	(ft)	
Zone 2 Length*	0	(ft)	Zone 2 = L - Zone 1

6. SOURCE DATA TYPE: Continuous Single Planar

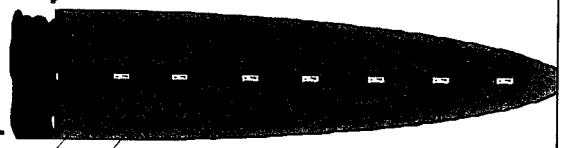
Source Options

Source Thickness in Sat. Zone* 22 (ft)

Y1
Width* (ft) 25

Conc. (mg/L)*	C1	k_s* (1/yr)
PCE	.068	0
TCE	.31	0
DCE	.95	0
VC	.46	0
ETH	0	0

Vertical Plane Source: Determine Source Well Location and Input Solvent Concentrations



View of Plume Looking Down

Observed Centerline Conc. at Monitoring Wells

7. FIELD DATA FOR COMPARISON

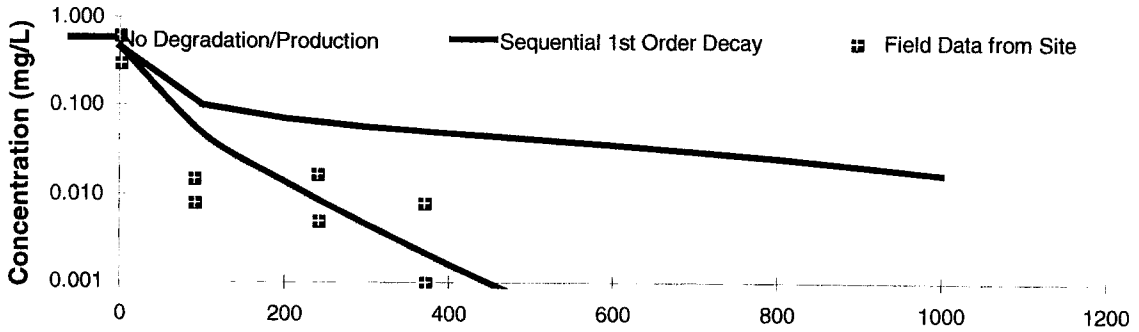
PCE Conc. (mg/L)	.098	.038	.047	.014	.005	.002	.004	.001			
TCE Conc. (mg/L)	.415	.209	.046	.013	.018	.004	.004	.001			
DCE Conc. (mg/L)	1.171	.734	.065	.036	.24	.009	.004	.001			
VC Conc. (mg/L)	0.621	.301	.015	.008	.017	.005	.008	.001			
ETH Conc. (mg/L)	0.0	.0	.0	.0	.0	.0	.0	.0			
Distance from Source (ft)	0	1	90	91	240	241	370	371			
Date Data Collected	2003										

8. CHOOSE TYPE OF OUTPUT TO SEE:

RUN CENTERLINE | RUN ARRAY | *Help* | Restore Formulas | RESET | *SEE OUTPUT* | Paste Example

DISSOLVED CHLORINATED SOLVENT CONCENTRATIONS ALONG PLUME CENTERLINE (mg/L) at Z=0

VC	Distance from Source (ft)										
	0	100	200	300	400	500	600	700	800	900	1000
No Degradation	0.460	0.101	0.071	0.057	0.048	0.042	0.036	0.031	0.026	0.021	0.017
Biotransformation	0.4600	0.048	0.014	0.005	0.002	0.001	0.000	0.000	0.000	0.000	0.000
	Monitoring Well Locations (ft)										
	0	1	90	91	240	241	370	371			
Field Data from Site	0.621	0.301	0.015	0.008	0.017	0.005	0.008	0.001			



See PCE

See TCE

See DCE

See VC

See ETH

Prepare Animation

Time:

100.0 Years

Log ⟺ Linear

Return to Input

To All

To Array

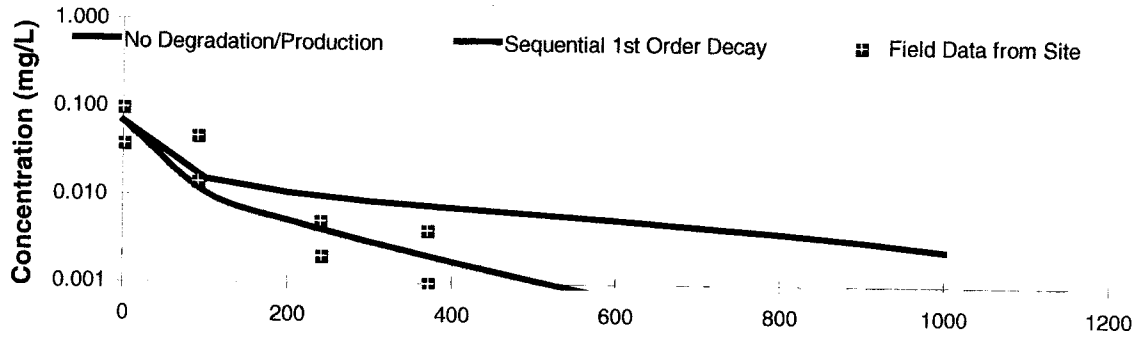
DISSOLVED CHLORINATED SOLVENT CONCENTRATIONS ALONG PLUME CENTERLINE (mg/L) at Z=0

Distance from Source (ft)

PCE	0	100	200	300	400	500	600	700	800	900	1000
No Degradation	0.068	0.015	0.011	0.008	0.007	0.006	0.005	0.005	0.004	0.003	0.003
Biotransformation	0.0680	0.010	0.005	0.003	0.002	0.001	0.001	0.000	0.000	0.000	0.000

Monitoring Well Locations (ft)

	0	1	90	91	240	241	370	371			
Field Data from Site	0.098	0.038	0.047	0.014	0.005	0.002	0.004	0.001			



See PCE | See TCE | See DCE | See VC | See ETH

Prepare Animation

Time: *100.0 Years*

Log ⟺ Linear

Return to Input | To All | To Array

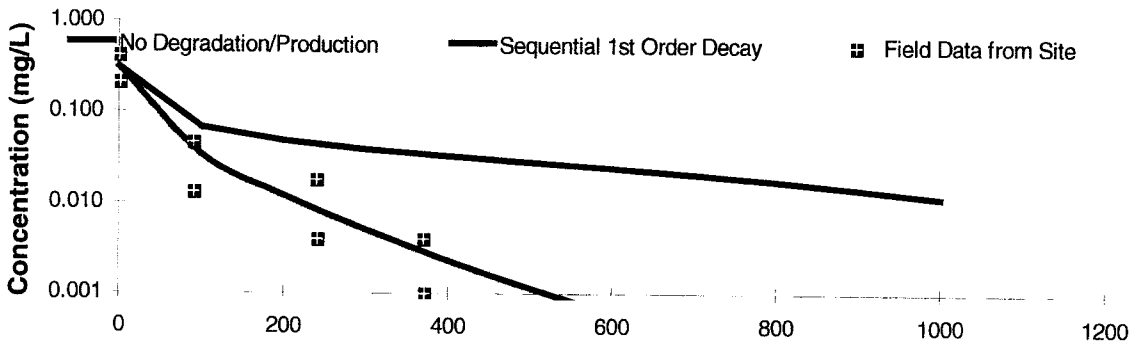
DISSOLVED CHLORINATED SOLVENT CONCENTRATIONS ALONG PLUME CENTERLINE (mg/L) at Z=0

Distance from Source (ft)

TCE	0	100	200	300	400	500	600	700	800	900	1000
No Degradation	0.310	0.068	0.048	0.039	0.033	0.028	0.024	0.021	0.017	0.014	0.011
Biotransformation	0.3100	0.034	0.012	0.005	0.002	0.001	0.001	0.000	0.000	0.000	0.000

Monitoring Well Locations (ft)

	0	1	90	91	240	241	370	371			
Field Data from Site	0.415	0.209	0.046	0.013	0.018	0.004	0.004	0.001			



See PCE

See TCE

See DCE

See VC

See ETH

Prepare Animation

Time:

100.0 Years

Log ⟺ Linear

Return to Input

To All

To Array

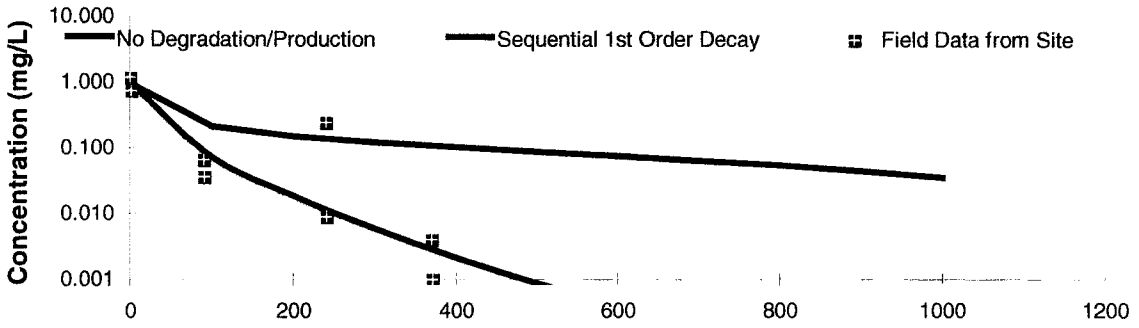
DISSOLVED CHLORINATED SOLVENT CONCENTRATIONS ALONG PLUME CENTERLINE (mg/L) at Z=0

Distance from Source (ft)

DCE	0	100	200	300	400	500	600	700	800	900	1000
No Degradation	0.950	0.208	0.147	0.118	0.100	0.086	0.074	0.063	0.053	0.044	0.035
Biotransformation	0.9500	0.071	0.018	0.006	0.002	0.001	0.000	0.000	0.000	0.000	0.000

Monitoring Well Locations (ft)

	0	1	90	91	240	241	370	371			
Field Data from Site	1.171	0.734	0.065	0.036	0.240	0.009	0.004	0.001			



See PCE

See TCE

See DCE

See VC

See ETH

Prepare Animation

Time:

100.0 Years

Log ⟺ Linear

Return to Input

To All

To Array

Appendix A-4 – Human Health Risk Assessment

HUMAN HEALTH RISK ASSESSMENT
FORMER ASHLAND DISTRIBUTION FACILITY
RENSSELAER, NY

Prepared for

Ashland
5200 Blazer Parkway
Dublin, Ohio 43017

September 2005

URS

2020 East First Street, Suite 400
Santa Ana, California 92705

TABLE OF CONTENTS

SECTION PAGE

1.0 INTRODUCTION 1-1
1.1 Site Background 1-1
1.2 Scope 1-2
1.2.1 South and Central Area 1-3
1.2.2 North Area 1-3
1.2.3 On Site Groundwater 1-3
1.2.4 Off-Site Groundwater 1-3
1.3 Objectives of Risk Assessment 1-4

2.0 SITE BACKGROUND 2-1
2.1 Location and Land Use 2-1
2.2 Geology And Hydrogeology 2-2
2.3 Summary of Previous Investigations 2-2

3.0 CURRENT SITE CONDITIONS 3-1
3.1 Soil Conditions 3-1
3.1.1 Soil Geophysical Conditions 3-2
3.2 Groundwater Conditions 3-2

4.0 HAZARD IDENTIFICATION / DATA EVALUATION 4-1
4.1 Chemicals of Potential Concern 4-1
4.2 Source Term Concentrations 4-2

5.0 EXPOSURE ASSESSMENT 5-1
5.1 Site Conceptual Exposure Model 5-1
5.1.1 Exposure Pathways and Media of Concern 5-1
5.1.2 Receptors Evaluated 5-4
5.1.3 Exposure Pathways Evaluated 5-6
5.2 Fate and Transport Assessment and Modeling 5-7
5.2.1 Vapor Intrusion - to - Indoor Air Assessment 5-8
5.2.2 Outdoor Air Evaluation 5-9
5.3 Exposure Point Concentrations 5-9
5.4 Dose Estimation 5-10

6.0 TOXICITY ASSESSMENT 6-1
6.1 Noncarcinogenic Dose-Response Criteria 6-1
6.2 Carcinogenic Dose-Response Criteria 6-1

7.0 RISK CHARACTERIZATION 7-1

7.1 Noncarcinogenic Effects 7-1
7.2 Carcinogenic Effects 7-1
7.3 Risk Characterization Results 7-2
7.3.1 Results for Current Land Use 7-2
7.3.2 Results for Future Land Use 7-3

8.0 UNCERTAINTY ANALYSIS 8-1

8.1 Site Conditions 8-1
8.2 Site Data 8-1
8.3 Exposure Assessment 8-1
8.4 Toxicity Assessment 8-2
8.5 Risk Characterization 8-2

9.0 CONCLUSIONS AND RECOMMENDATIONS 9-1

9.1 HRA Conclusions 9-1
9.2 Recommendations 9-2

10.0 REFERENCES 10-1

List of Tables

1 Summary of Soil Sample Analytical Data – November 2003
2 Summary of Groundwater Analytical Data – October 2004
3 Source Term Concentrations for Chemicals of Potential Concern
4 Summary of Exposure Point Concentrations (EPCs)
5 Exposure Parameters for On site and Off site Workers
6 Exposure Parameters for Hypothetical Residential Receptors
7 Chemical Specific Toxicity Data
8 Summary of Noncancer Hazard and Cancer Risk for On Site Workers (Current Use)
9 Summary of Noncancer Hazard and Cancer Risk for Off Site Workers (Current Use)
10 Summary of Noncancer Hazard and Cancer Risk for On site Residents (Hypothetical Future Use)
11 Summary of Noncancer Hazard and Cancer Risk for Off Site Residents (Hypothetical Future Use)

List of Figures

1 Site Location Map
2 Site Plan with Soil Boring and Monitoring Well Locations
3 Key to Geologic Cross-Sections
4 Generalized Cross-Sections A-A', B-B', and C-C'
5 Generalized Cross-Sections D-D', E-E', and F-F'
6 Generalized Cross-Sections G-G' and H-H'
7 Groundwater Elevation Contour Map – October 12, 2004
8 Site Conceptual Exposure Model

List of Appendices

A Fate and Transport Modeling Results and Risk Assessment Calculations

1.0 INTRODUCTION

On behalf of Ashland, URS Corporation (URS) has conducted a human health risk assessment (HRA) for soils and groundwater impacted by volatile organic compounds (VOCs) at the former Ashland Distribution Company facility in Rensselaer, New York. This HRA will support the Corrective Measures Study (CMS) being conducted under Administrative Order on Consent (AOC) docket number II RCRA-92-3008(h)-0201. The site is the former location of a chemical distribution facility that encompassed approximately 4 acres of land in an area zoned for commercial/industrial and residential use. Ashland ceased distribution facility operations in 2000. Currently, a portion of the site is used by a tenant for warehousing and distribution of advertisement inserts.

This HRA was performed in accordance with the CMS Work Plan (URS, 2003) submitted by Ashland to United States Environmental Protection Agency, Region 2 (referred to hereafter as EPA). The purpose of this HRA was to evaluate conditions at the site in order to facilitate development of risk based remedial objectives and selection of a remedial approach. As part of this process the following tasks were performed.

- Identified chemicals of interest that would become the focus of future remedial actions;
- Developed a conceptual site model of potentially complete chemical migration and human exposure pathways that must be considered and addressed as part of the CMS process;
- Evaluated the applicability of published media protection standards to site condition and development of site cleanup levels if necessary with consideration of site risk drivers for determination of remedial endpoints and remedial timeframes.

In accordance with USEPA protocol, this HRA includes evaluations under both the current site use scenario, and a hypothetical future residential land use scenario. The site background and scope and objectives of this HRA are summarized below.

1.1 SITE BACKGROUND

In accordance with the AOC, Ashland is conducting a CMS at the former Ashland Distribution Company facility in Rensselaer, New York (Figure 1). The CMS Workplan and a letter responding to EPA's comments, dated June 27, 2003, were approved by EPA in a letter dated July 24, 2003. This followed EPA's approval of the site RCRA Facility Investigation (RFI) report per its letter to Ashland dated January 15, 2003. Specifically, the CMS Workplan established a framework to evaluate potential remedial measures needed to address contaminated groundwater in the southern and central portions of the site and other offsite areas adjacent to the Ashland facility.

Environmental investigations and/or remedial actions have been conducted at the site since 1984 (refer Section 3). Based on the current site conditions and potential VOC migration pathways, the site

conceptual model indicates that the primary potential exposure route for VOCs from the site is inhalation via indoor air – the vapor intrusion pathway. The potential for exposure to VOCs from direct contact under current conditions is limited and may be controlled through implementation of a site soil management plan or other remedial alternatives to be considered in the CMS. However, the vapor intrusion pathway was not previously identified as a potential pathway for consideration in the CMS.

A preliminary evaluation of the indoor air exposure pathway was conducted to assess the potential for the vapor intrusion pathway to be complete. Comparison of VOC concentrations detected in groundwater with the generic groundwater screening values in the USEPA subsurface vapor intrusion guidance (USEPA, 2002a) showed that concentrations of VOCs detected in groundwater (including trichloroethene (TCE), cis-1,2-dichloroethene (DCE), and vinyl chloride) exceeded the generic screening levels. This information was communicated to EPA, and a risk assessment was proposed to more accurately determine potential health risks posed by VOCs at the site. As requested by EPA, this HRA evaluates potential risks under both the current land use scenario and a hypothetical future residential land use. It should be noted that the current site conditions do not meet all assumptions and criteria for application of the screening evaluations outlined in the guidance, namely:

- No soil gas or sub-slab vapor data is available from the site.
- The site is currently in commercial use (residential screening values may not be applicable) and VOCs are present in vadose zone soil above the impacted groundwater, which is not considered in the derivation of the vapor intrusion guidance screening values for groundwater.
- Groundwater is present at less than 5 feet below ground surface (bgs).

However, the intention of this preliminary evaluation was to consider whether there is a potential for the vapor intrusion pathway to be complete. To determine whether the vapor intrusion pathway is complete, and evaluate potential risks from this pathway, it will be necessary to conduct vapor sampling.

At the time this HRA was performed, as mentioned above no soil gas or indoor air sampling data were available. Given the limitations of the EPA vapor intrusion screening values and their applicability to the site conditions, the preliminary risk evaluation for indoor air should be considered qualitative and used only to assess the potential for the vapor intrusion pathway to be complete.

1.2 SCOPE

The areas of potential concern (AOPCs) addressed in this HRA include the southern and central (occupied) portions of the site, the northern (primarily unoccupied) portion of the site, impacted groundwater beneath the site (referred to herein as On Site Groundwater), and impacted groundwater beneath the adjacent property to the west (referred to herein as Off Site Groundwater). Additional information pertaining to the HRA scope for AOPCs addressed herein is provided below and in Section 5.1. The site layout and locations of AOPCs are illustrated on Figure 2.

1.2.1 South and Central Area

The South and Central Area of the site is developed with warehouse and office buildings, constructed of slab on grade foundation with wood or sheet metal walls and roofs, and a former truck rack comprising a concrete slab covered by an overhead canopy open on three sides. The area outside the buildings is paved with asphalt or concrete. Small vegetated areas are located along the northern site border between the building and property fence line. The facility is currently leased to a tenant who occupies and uses the facilities in this area for warehousing and distribution of paper advertisements inserts. VOC impacted soils and groundwater (refer Section 1.2.3) are present in this occupied area and are included in the South and Central Area AOPC.

1.2.2 North Area

The North Area of the site includes an above ground storage tank (AST) farm, a small equipment building, and a vacant, unpaved area. The tank farm contains out of service ASTs. The equipment building houses groundwater extraction and treatment equipment and is located in the paved area. The paved area is not currently in full-time use. The only activity conducted in this area of the site is periodic site visits by outdoor workers for short intervals to conduct maintenance and operation activities on the groundwater treatment system. The unpaved area on the northern-most end of the site is not in use. VOC-impacted soils and groundwater (refer Section 1.2.3) are present in this area and are included in the North Area AOPC.

1.2.3 On Site Groundwater

Based on historical environmental data, there is evidence that groundwater beneath the site is impacted by VOCs. The data indicates that groundwater was impacted by separate sources located in the South and Central Area and in the North Area. Historical remedial actions in the North Area (i.e., soils excavation and groundwater extraction and treatment, refer Section 3) have reduced dissolved phase VOCs in groundwater in the North Area. VOC-impacted groundwater in the South and Central Area extends off site to monitoring wells MW-16 and MW-18, located just west of the site border. Due to natural attenuation and chemical degradation processes, there is variance in the distribution of VOCs, such as PCE and TCE, relative to degradation products in groundwater on site and off site. On this basis and for the purposes of defining AOPC boundaries, On Site Groundwater is characterized by on site monitoring wells. For this HRA groundwater in the South and Central Area is characterized by wells in this AOPC, while groundwater in the North Area is characterized by wells in the North Area AOPC.

1.2.4 Off-Site Groundwater

As noted above, VOC-impacted groundwater in the South and Central Area extends off site to monitoring wells MW-16 and MW-18 (Figure 2). Due to natural attenuation and chemical degradation processes, there is variance in the distribution of VOCs, such as PCE and TCE, relative to degradation products in groundwater on site and off site. On this basis and for the purposes of defining AOPC boundaries, Off Site Groundwater encompasses the VOC plume characterized by off site monitoring wells, and is identified as a separate AOPC.

1.3 OBJECTIVES OF RISK ASSESSMENT

The objectives of this HRA is to evaluate whether VOCs detected in soil and groundwater may pose a risk to human health under current and hypothetical future residential land use scenarios, and to identify the primary exposure pathways and COPCs which drive potential risk at the site to support the CMS and selection of a final remedy for the site. As discussed above, based on the current site conceptual model vapor intrusion appears to be the most significant potential exposure pathway for VOCs detected at the site. At the time of this HRA no soil gas, sub-slab vapor, or indoor air sampling data were available for the site and given the limitation of vapor intrusion models and applicability to site specific conditions, the vapor intrusion pathway was evaluated qualitatively and through comparison of site data with USEPA (2002a) generic screening levels. The evaluation of the vapor intrusion pathway is intended only to assess the potential for the vapor intrusion pathway to be complete.

This HRA was prepared in general accordance with applicable USEPA risk assessment guidance for Superfund (USEPA, 1989 *et seq.*). This assessment incorporates recent improvements and refinements in the practice of risk assessment. Current regulatory guidance requires risk assessments to be conservative with the intent that risk assessments will result in overestimates of potential health risks. Therefore, actual risks associated with conditions evaluated in this risk assessment may be lower than those described herein.

2.0 SITE BACKGROUND

The site setting, as it pertains to chemicals of potential concern (COPCs) impacts to environmental media, is described in this section. Results from previous environmental site investigations are summarized in Section 3.0.

2.1 LOCATION AND LAND USE

The site is located on South Street in Rensselaer, New York (Figure 1). The approximately 4-acre site occupies a narrow strip of land in an industrial and residential area. The site is bordered on the east by South Street, across which lie residences and an AMTRAK rail bed. The site is bordered to the south by Columbia Avenue, to the west by the CSX Transportation, Inc. (CSXT) right-of-way (used as a rail transport line), and to the north by vacant land (Figure 2). The property west of the CSXT right of way is developed with commercial buildings and paved with asphalt/concrete. An unnamed tributary of the Hudson River flows westward through the middle of the site and then north along the western property boundary. This tributary has been isolated in a concrete culvert where it passes through the site. (This tributary was incorrectly referenced in previous reports as "Mill Creek" or "tributary of Mill Creek".)

The main features of the site include warehouses, aboveground storage tanks, an office complex, parking areas, and a truck loading rack (Figure 2). The buildings are constructed of wood and/or sheet metal walls and roofs on concrete slab foundations. The majority of the site is paved with asphalt and concrete. A relatively small area on the northern portion of the site is vacant and unpaved.

The Ashland facility formerly received bulk shipments of industrial chemicals and solvents, and distributed them in smaller quantities to local industrial users. Historical activities at the site have included a slaughter house, the manufacturing of resin size paste, and the distribution of solvents, corrosives, sodium silicate, linseed oil, turpentine, and antifreeze (ESC 2002). In general, the operations of the previous site owners were restricted to the southern portion of the property. Ashland purchased the site from Eastern Chemical in 1969 and continued the distribution of various chemicals, including solvents, acids, and caustics. Since 1969, Ashland made several modifications and improvements to the site, including the re-location of the solvent tank farm and installation of a catastrophic release collection system, replacement of the acid neutralization pit, and installation of dikes at truck transfer locations. Ashland ceased operation at the site in December 2000.

Currently, the site is leased by a company for the storage and distribution of advertising inserts for newspapers. The lessee utilizes the warehouses, office buildings and parking lot on the south area of the site. The central area is used occasionally for truck parking/loading. The north area is not in use, except for occasional visits by personnel to conduct maintenance activities on the groundwater treatment system.

2.2 GEOLOGY AND HYDROGEOLOGY

The geology of the Rensselaer Facility generally consists of fill materials mixed with or overlying alluvial (river) sediments, which overlie glacial-lacustrine (lake) silt deposits. All of these unconsolidated materials overlie shale bedrock. Borings drilled at the site show that the different unconsolidated materials are heterogeneous with no consistent units identified site-wide. Significant heterogeneity in the types of unconsolidated materials is consistent with these two different depositional environments. A key to cross-sections is presented on Figure 3, and the subsurface lithology beneath the site is depicted in cross sections on Figures 4 through 6.

Water bearing zones have been identified within both types of unconsolidated deposits. Some of these zones have been found to occur over significant areas of the site, while others are restricted by the heterogeneity of the unconsolidated materials, which create vertical barriers within the water bearing zones. These barriers tend to prevent or hinder the mixing and off site migration of groundwater. Based on the groundwater elevations, groundwater flow in both water bearing zones is northerly at a gradient of approximately 0.01 ft/ft (1 foot vertical change over 100 horizontal feet). Groundwater equipotential lines (contours) based on groundwater elevation data collected in October 2004 are illustrated on Figure 7.

2.3 SUMMARY OF PREVIOUS INVESTIGATIONS

Environmental investigations have been conducted at the site since 1984 to assess the nature and extent of VOC impacts to soils and groundwater. The VOC impacts are believed to have results from historic chemical handling operations and a former underground storage tank that was removed from the North Area of the site in 1981. An underground tank farm was formerly located on the North Area of the site and warehouses and bulk chemical handling facilities were located on the South and Central Area of the site. Historical investigations conducted included hydrogeologic investigations in the Central, South and North Areas of the site to assess the nature and extent of VOCs in soils and groundwater. Off site groundwater investigations have also been conducted at the site.

Historical data show that soil and groundwater at the site are impacted by VOCs. The depth to impacted groundwater beneath the site [upper shallow groundwater zone (USGZ)] and to the off site groundwater plume ranges between three feet and nine feet bgs, and soil in the unsaturated zone generally consists of silt, sand, and gravelly fill. VOCs have been detected in unsaturated soil at depths as shallow as 0.5 feet bgs. The VOC concentrations detected in unsaturated soil and in groundwater during investigation and monitoring activities conducted in November 2003 and October 2004 are summarized in Tables 1 and 2, respectively. Though no historical soil gas data exists for the site, based on the nature of the VOC compounds detected in soil and groundwater beneath the site, it is assumed that VOCs are also present in soil vapor beneath the site.

Based on the historical data, VOC impacts to soils are limited to the site, and groundwater impacts are limited to the site and CSXT property adjacent to the west. Remedial actions conducted at the site

include removal and treatment of VOC-impacted soils and extraction and treatment of VOC-impacted groundwater from beneath the site. The remedial activities conducted to date included the following.

- In 1984 a groundwater recovery system was installed in the North Area of the site to collect and treat impacted groundwater. The groundwater treatment system was operated intermittently until 1999, and re-started in 2002.
- In 1984 a concrete culvert was installed to isolate water in the unnamed tributary of the Hudson River that flows beneath the site from groundwater.
- 1987, VOC-impacted soils in the North Area (former tank farm) were removed by excavation and treated on site in an engineered stockpile using vacuum extraction and carbon adsorbtion. Following confirmatory sampling and concurrence by UEPA that risk based clean-up objectives were met, the treated soils were incorporated into grading activities conducted on the northern-most end of the site under the EPA approved site restoration plan. A sump installed during the excavation activities (for de-watering) was left in place to serve as a groundwater recovery well.
- In 1990, as part of a facility modification plan the warehouse on the south end of the site was removed. Subsequent hydrogeological investigations in the area showed VOC-impacted soil and groundwater were present in the area. A soil vapor extraction system was installed and operated from 1992 until 1998 when it was shut down due to very low mass recovery rates. EPA has agreed that the system will remain shutdown until a final remedy for the site is selected.

Groundwater monitoring has been conducted at the site since 1984. Semi-annual groundwater monitoring is ongoing utilizing the existing groundwater monitoring well network which encompasses on site and off site impacted groundwater. In 2003, a groundwater natural attenuation assessment was performed (URS 2004) which indicated that natural attenuation and chemical degradation processes are occurring in the subsurface. In November 2003, a subsurface soil investigation was conducted to assess current (post remedial actions) site soil conditions to support this risk assessment. The current site conditions based on existing site data and findings from recent groundwater monitoring and soil investigations are summarized in Section 3.

3.0 CURRENT SITE CONDITIONS

Historical investigations and remedial actions have been conducted at the site to address VOC impacted soils and groundwater. The predominant VOCs detected at the site are tetrachloroethene (PCE), trichloroethene (TCE), and related degradation products including 1,2,-dichloroethene(DCE), 1,2-dichloroethane (DCA), and vinyl chloride. In addition, benzene, toluene, ethylbenzenes, and xylenes have been detected on site. VOCs detected in site soils have also been detected in groundwater. The current soil and groundwater conditions based on results from the most recent investigations and historical remedial actions are summarized below.

3.1 SOIL CONDITIONS

In November 2003, soil samples were collected to assess current site conditions and provide data for conducting this HRA. The predominantly detected VOCs in site soils included PCE, TCE, 1,2,-DCE, vinyl chloride, and benzene. Other prevalent VOCs detected in the samples included toluene, ethylbenzene, xylenes, acetone, 1,1,1-trichloroethane (TCA), 1,1-DCA, and chlorobenzene. The analytical results from the investigation are summarized in Table 1. The sampling locations are illustrated on Figure 2.

Soil samples (collected between 0.5 and 2 feet bgs) from the South Area of the site (SSB-1 through SSB-5) contained the following constituents within the listed concentration ranges, in micrograms per kilogram (ug/kg) .

PCE, 5 - 4,700

TCE, 9.4 - 3,000

cis-1,2-DCE, 8.7 - 82,000

vinyl chloride, 1.8 - 1,500

benzene, 7.7 – 6,800

Soil samples from the Central Area of the site (SSB-6 through SSB-8) were collected at depths ranging from 0.5 to 6.5 feet bgs. The following constituents were detected in these soil samples within the listed concentration ranges, in ug/kg.

PCE, 20 - 750

TCE, 28 - 350

cis-1,2-DCE, 29 - 22,000

vinyl chloride, 2.7 - 480

benzene, 8.6 – 46

Soil samples from the North Area of the site (SSB-9 through SSB-13) were collected at depths ranging from 1 foot to 12 feet bgs (deepest samples collected from dewatered zone in former tank excavation).

The following constituents were detected in these soil samples within the listed concentration ranges, in ug/kg.

PCE, 2.9 - 11

TCE, 6.4 - 23

cis-1,2-DCE, 2.1 - 30

benzene, 4.8 – 12

In sample SSB-13 (3–4 feet bgs), three constituents were detected at relatively high concentrations: toluene at 4,600,000 ug/kg, ethylbenzene at 410,000 ug/kg, and xylenes at 2,300,000 ug/kg. These analyte concentrations resulted in elevated detection limits for the other constituents; therefore, it is unknown whether other constituents were present in this sample. The concentrations detected in this sample were orders of magnitude higher than those in other samples from the North Area, including shallower samples from this boring, indicating a limited 'hot spot' of VOC impacted soils is present.

The results of the investigation show that generally the highest concentrations were detected in the South and Central Area of the site. VOC concentrations in the North Area were reduced by the removal action conducted in 1987, and are generally orders of magnitude less than those in the South and Central Area. When correlated with groundwater data, the results indicate that soil in the South and Central Area may be acting as secondary sources to groundwater impacts.

3.1.1 Soil Geophysical Conditions

During the November 2003 soil investigation, three Shelby tube samples were collected from fine-grained soil units underlying surficial units. Shelby tubes were unable to penetrate coarse gravel and cobbles in the surficial units, therefore, samples were not collected for physical parameters from the surficial units.

Physical parameter analyses shows that fine-grained lithologic units, underlying surficial units, had components of clay and silt ranging from 61% to 98%. Hydraulic conductivity values ranged from 1.4E-07 to 6.8E-07 cm/sec in the fine-grained units. Fraction of organic carbon ranged from 0.7% to 7.5% and pH ranged from 7.1 to 8.1 s.u. in these same stratigraphic units.

The physical parameter results reveal that the fine-grained soil underlying the surficial sand and gravel are sufficiently impermeable to restrict the movement of groundwater through them.

3.2 GROUNDWATER CONDITIONS

Based on current and historical groundwater investigation data, groundwater occurs at depths ranging between three feet and nine feet bgs. Groundwater generally flows to the north at a gradient of approximately 0.01 ft/ft (Figure 7).

Analytical results from groundwater investigations conducted indicate that the extent of affected groundwater has been defined and is restricted to the USGZ beneath the site and adjacent CSXT property.

Chemicals detected in groundwater at the site include predominantly xylenes, toluene, ethylbenzene, PCE, TCE, 1,2,-DCE, 1,1-DCA, 1,1,1–TCA and vinyl chloride (Table 2). The investigation results also indicate that naturally occurring biological and chemical attenuation processes are degrading the chlorinated VOCs in groundwater beneath the site. However, the severely anaerobic subsurface environment is not conducive to the degradation of vinyl chloride. The shallow nature of groundwater on and off site and the proximity of structures to the groundwater plume create a potential for indoor air exposure to VOCs, particularly vinyl chloride.

The highest concentrations of total VOCs have been detected in groundwater monitoring wells screened in the USGZ in the South and Central Area of the site. Analytical results for groundwater samples collected from site monitoring wells in October 2004 show that the highest concentrations of total VOCs were detected in wells MW-1 (3,974 micrograms per liter [ug/L]) in the central portion of the site, and MW-19 (3,892 ug/L) at the south end of the site. The highest concentrations of vinyl chloride were detected in wells MW-19 (2,100 ug/L) , at the southwest corner of the site, and MW-18 (230 ug/L), located on the CSXT right-of-way, downgradient of the site.

The distribution of chlorinated VOCs, such as PCE and TCE, relative to their degradation products (cis-1,2-DCE, 1,1-DCA, vinyl chloride, etc.) indicates that naturally occurring biological and chemical attenuation processes are degrading the chlorinated VOCs in groundwater beneath the site. The potential source-area wells (MW-1 and MW-19) contain large percentages of PCE and TCE; however, they also contain significant proportions of degradation compounds. Wells located hydraulically downgradient of the potential source area (South and Central Area) that contain VOCs have large proportions of degradation compounds and small components, if any, of the parent compounds.

Groundwater impacts appear confined to the immediate vicinity of the site by the presence of low permeability soil downgradient of the site (beneath the CSXT property) and the organic carbon content of the soil. Impacts in the southwest corner of the site are contained by natural vertical hydraulic barriers, where coarse grained sand units transition into fine grained silts and clays on the down gradient property.

The presence of these low permeability units between the USGZ and the lower shallow groundwater zone (LSGZ) appear to have also limited the vertical migration of these chemicals. All groundwater samples collected from the LSGZ yielded only trace to non-detectable concentrations of VOCs.

4.0 HAZARD IDENTIFICATION / DATA EVALUATION

4.1 CHEMICALS OF POTENTIAL CONCERN

Chemicals of potential concern (COPCs) were selected for the site so that the most prevalent, mobile, persistent, and toxic compounds detected at the site (i.e., those chemicals likely to represent the greatest potential threat to human health) could be qualitatively and quantitatively evaluated in the risk assessment. Based on the site history and analytical data, the COPCs for the site appear to be limited to VOCs present in soil and groundwater as a result of releases from former chemical handling and distribution operations.

As discussed in Sections 1.0 and 3.0, the primary migration pathway associated with potential adverse health affects for VOCs beneath the site is volatilization to indoor air. The potential for exposure to VOCs from direct contact are limited and may be controlled through implementation of a site soil management plan or other remedial alternatives to be considered in the CMS. However, the vapor intrusion pathway was not previously identified as a potential pathway for consideration in the CMS. A preliminary screening of VOC concentrations detected in soil and groundwater at the site indicated that several VOCs (TCE, PCE, and vinyl chloride) were detected at concentrations that may pose a potential health risk under residential use. This information was communicated to EPA, and a HRA was proposed to more accurately determine the potential health risks posed by VOCs under current site use conditions and a hypothetical future residential site use.

VOC data were collected for soils during the November 2003 soil investigation in the South and Central Area, and the North Area on site (Table 1), and for on site and off site groundwater during the semi-annual groundwater monitoring event conducted in October 2004 (Table 2). These data sets are considered to represent current conditions at the subject AOPCs. All VOCs that were detected in soil and/or groundwater are considered COPCs for purposes of this HRA. The COPCs for each media are listed below. The approaches used in evaluating representative source term concentrations and exposure point concentrations (EPCs) are discussed in Sections 4.2 and 5.3, respectively.

VOCs in Soil Matrix	VOCs in Groundwater
1,1,1-trichloroethane	1,1,1-trichloroethane
1,1-dichloroethane	1,1-dichloroethane
1,1-dichloroethene	1,1-dichloroethene
2-butanone (MEK)	1,2-dichloroethane
4-methyl-2-pentanone (MIBK)	benzene
acetone	cis-1,2-dichloroethene
benzene	tetrachloroethene
carbon disulfide	trans-1,2-dichloroethene
carbon tetrachloride	trichloroethene
chlorobenzene	vinyl chloride
chloroform	

VOCs in Soil Matrix	VOCs in Groundwater
cis-1,2-dichloroethene	
ethylbenzene	
Methylene chloride	
styrene	
tetrachloroethene	
toluene	
trans-1,2-dichloroethene	
trichloroethene	
vinyl chloride	
xylenes, Total	

4.2 SOURCE TERM CONCENTRATIONS

In order to obtain representative source term concentrations for soil matrix and groundwater in each exposure area, the data sets described above were statistically analyzed following USEPA guidance (1989, 2002b). Several of the analyses were based on Statistical Methods for Environmental Pollution Monitoring (Gilbert, 1987), which is recommended by the USEPA. A statistical analysis of the data was conducted to define the average concentration, the 95% upper confidence limit (95% UCL) of the mean for soil and the maximum concentration for groundwater for each COPC.

The USEPA (1992) recommends that the one-sided upper 95% confidence limit of the arithmetic mean (95% UCL) be used as an upper bound chemical concentration that can be expected to be found in source media within an exposure area. The 95% UCL provides reasonable confidence that the true exposure area average COPC concentration will not be underestimated (USEPA, 1992). In accordance with USEPA (1989) guidance, exposure point concentrations used for this HRA are estimated based on the 95% UCL (or maximum, when lower) source term concentration for each COPC. The 95% UCL can exceed the maximum detected concentration for several reasons, including small sample sizes and large sample variances. Where the 95% UCL exceeds the maximum detected concentration, the maximum detected concentration was used as the upper limit exposure concentration (USEPA, 1989). For sampling points where COPCs were not detected, one-half the detection limit value was assumed to represent the concentration there (USEPA, 1989).

The individual AOPCs were considered representative of potential exposure areas for current land use conditions. To evaluate potential exposure under future land use conditions, the exposure area sizes are difficult to define accurately since the spatial layouts of future development are currently unknown. Given the limited number of data points for groundwater in each AOPC, the point-by-point locations of maximum detected COPC concentrations in groundwater in each AOPC were used to represent the smallest possible exposure areas for current and future land use (a highly conservative assumption, since spatial exposure averaging is not performed).

For soil, the representative 95% UCL or maximum (where applicable) detected source term concentrations calculated for each COPC in each AOPC are summarized in Table 3. One soil sample from the North Area (SSB-13, 3-4) was not used in calculating the 95% UCL as the detection limits for most chemicals were too high for the data to be useable in risk assessment. There were high levels of ethylbenzene, toluene, and xylenes in this sample indicating a 'hot spot' which will need to be addressed in the CMS. The results of the statistical analysis of source term concentrations for soil in each AOPC are included in Appendix A (Tables A-1 and A-2). For groundwater, the maximum concentration detected in each AOPC during the October 2004 (most recent) monitoring event was selected as the source term concentration. These COPC concentrations from groundwater sources on site and off site are also presented in Table 3.

It is important to understand that the source term concentration is not always the same as the exposure point concentration (EPA). This is because chemicals can migrate among and between environmental media, and exposure may occur as a result of contact with secondary media. For direct contact exposure pathways (uptake by dermal absorption and incidental ingestion), the source term concentration may be used to estimate the exposure point concentration. For exposures that may occur as a result of intermedia transfers (e.g., inhalation of vapors in air that volatilize from a soil matrix), chemical fate and transport modeling is performed to estimate the exposure point concentration using the source term concentration as one of the input parameters (see Section 5.2).

5.0 EXPOSURE ASSESSMENT

The Site Conceptual Exposure Model (SCEM) developed to assess potential exposure pathways, and the methodologies used to evaluate fate and transport of COPCs and estimation of EPCs at the site are discussed in this section.

5.1 SITE CONCEPTUAL EXPOSURE MODEL

A SCEM was developed to define the chemical sources, release mechanisms, transport media, exposure routes and human receptors to be evaluated for site AOPCs. A pictorial representation of the SCEM is presented on Figure 8, and an explanation of the reasons why various elements were included or excluded from consideration is provided in the remainder of this section.

As a preface to the discussion of potential receptors at the site, it is important to note that there are currently no plans for site redevelopment or a change in property use. Given that the site is under an AOC and the ongoing CMS, redevelopment for residential use in the near future is unlikely. However, the SCEM considers both the current commercial land use and a hypothetical future residential land use scenario. Discussions regarding the development of the SCEM are presented in this section.

5.1.1 Exposure Pathways and Media of Concern

All exposure pathways considered in the evaluation of health risks for the site are included on Figure 8. Discussions to explain the basis for including or excluding exposure pathways in the HRA are provided below,. The potential for on site and off site receptors to be exposed to chemicals residing in soil and groundwater at the site is influenced by at least four factors:

- The types of chemicals present at the site,
- Chemical and physical interaction between the chemicals and the environment that act to move and transform the chemicals,
- Location and activities of human and/or ecological receptors that may place them in contact with either on site or migrated chemicals, and
- Specific behaviors of these receptors that allow uptake of the chemical(s), either currently or in the future.

The SCEM developed for this HRA evaluates those exposure pathways that link the chemical sources and types of releases with human receptor locations. An exposure pathway is considered complete if all of the following components are present.

- A chemical source
- A release and transport (i.e., chemical migration) mechanism
- An exposure pathway (i.e., a chemical uptake route such as ingestion, inhalation, or dermal contact)
- An exposure point at a receptor location (i.e., chemicals are present where receptors are located)

Each of these components and their interactions that may result in complete or incomplete exposure pathways at the site are discussed below.

5.1.1.1 Chemical Sources

For the purposes of this HRA, residual COPCs detected in soil and groundwater in the South and Central Area and the North Area, and COPCs detected within Off Site Groundwater were considered as current sources. Because many of the site COPCs will degrade naturally in the environment over time, some of the detected chemicals may represent degradation products of the chemicals originally introduced to the soil/groundwater. However, further degradation of these chemicals over time has not been considered in this HRA. The selection and identification of COPCs is discussed in Section 4.

5.1.1.2 Chemical Release and Transport Mechanisms

For exposures that may occur as a result of intermedia transfers (e.g., inhalation of vapors in air that volatilize from a soil matrix), chemical fate and transport must be accounted for. Air, soil, and groundwater can all serve as transport pathways for chemicals to migrate from source areas into potential exposure media. However, the movement of a chemical in environmental media will not necessarily result in actual human exposure. The rate of chemical movement and resulting concentration at a potential exposure point is dependent upon the characteristics of the chemical and the environmental media through which the chemical passes.

The following discussion outlines fate and transport mechanisms that could affect chemical exposure at the site, including the potential for the site chemicals to migrate, persist, or be degraded in the environment.

5.1.1.2.1 Migration In Air

Chemicals can migrate from soil and groundwater by volatilization, which is the mass transfer of a chemical from a specific medium to air. The potential for this transfer to occur is dependent on the physiochemical properties of the chemicals, such as water solubility, vapor pressure, and Henry's Law constant (air-water partition coefficient), as well as the chemical concentrations present at the site. The volatilization potential of the COPCs is evaluated in Appendix A.

The COPCs identified at the site are volatile (Henry's Law Constant greater than 10^{-5}) and will partition between the vapor phase (soil gas), dissolved phase (soil pore water/groundwater), and sorbed phase (on soil particles). The equilibrium phase distribution is dependent on the factors noted above and the site soil characteristics (e.g., porosity, organic carbon content). The primary COPCs at the site (e.g., TCE) are highly volatile and are likely present in the vapor phase. Therefore volatilization into air is considered to be a complete transport mechanism at the site. Volatilization to indoor air and outdoor air were evaluated for the HRA.

Fugitive dusts (airborne soil particles) also may constitute an air migration pathway for certain chemicals. Chemicals that adsorb strongly to soil may potentially impact ambient air quality in the form of dust particles, particularly where there is no surface cover during high wind conditions and/or during

movement of vehicular traffic over exposed ground surfaces. The high volatility of VOCs causes them to not be retained on dust particles. Therefore potential exposures from COPCs via dust emissions were not considered in this HRA.

5.1.1.2.2 Migration from Soil to Groundwater

Chemical migration from site soils to groundwater can occur by the infiltration of irrigation/rain water and by downward dispersion of chemicals in soil gas. The downward movement of COPCs in soil at the site is expected to be controlled largely by infiltration. Historical monitoring data has shown that chemicals have migrated from soil down to groundwater. Leaching is considered a potentially complete chemical migration pathway at the site; however given that the majority of the site is paved, the site lithology, and the shallow depth to groundwater the downward movement of VOCs in soil at the site is expected to be largely equilibrated and existing monitoring data representative of groundwater conditions at the site. Therefore, further leaching is not considered in this HRA.

5.1.1.2.3 Migration in Groundwater

VOCs have been detected in groundwater beneath the site and off site. The primary VOCs detected are generally characterized as volatile with moderate solubility in water. Dissolved phase VOCs may be transported in groundwater. When dissolved, some of the VOC compounds have adsorption affinity to organic carbon naturally present in soil. Therefore, the migration of non-conservative chemicals (i.e., chemicals that sorb to solid organic material in the aquifer matrix) will occur at a slower rate than the local groundwater migrates. Dispersion of solutes in groundwater also may lead to the attenuation of concentrations with distance away from the source. Evidence of these phenomena are evident in patterns that can be observed in historical groundwater monitoring data, which show decreasing concentrations of parent compounds (i.e., TCE) with distance from source areas and an overall decrease in groundwater concentrations over time.

Dissolved phase VOCs in groundwater appear to have migrated off site with groundwater flow but their rate of movement is limited by fine-grained lithologic units beneath the CSXT railroad right-of-way, adjacent to the site. Due to the site lithology, the vertical migration of VOCs in groundwater is inhibited and not considered to be significant; however, horizontal flow is considered to be a complete migration pathway.

5.1.1.2.4 Biological and Chemical Fate

Biological processes that occur in soil and groundwater can influence the ultimate fate of COPCs and, thus, the potential chemical exposures (USEPA, 1998). For example, under anaerobic (oxygen-depleted) conditions, PCE and TCE can be transformed by reductive dechlorination to cis-1,2-DCE, trans-1,2-DCE, vinyl chloride, ethylene, and ethane, depending upon site conditions. Biodegradation of PCE and TCE to the non-toxic products ethylene and ethane represents detoxification and a reduction in risk of the COPC. However, incomplete biodegradation to DCE and vinyl chloride does not represent a reduction in risk. The rates and extent of biodegradation of PCE and TCE under anaerobic conditions are highly variable, and strongly depend upon site-specific conditions. PCE does not biodegrade under aerobic conditions.

TCE may biodegrade under certain aerobic conditions, but only when a sufficient amount of organic carbon and inducers, such as methane or toluene, are present. Again, the likelihood and the rates of biodegradation under aerobic conditions are highly variable, depending upon site conditions. Natural attenuation of chlorinated solvents due to biodegradation is unlikely to change the chemical concentrations over a short duration. Therefore, biological transformation of the COPCs was not considered in this HRA.

5.1.2 Receptors Evaluated

The receptors for each AOPCs and exposure media pathways are evaluated below and summarized on Figure 8.

5.1.2.1 Potential Receptors Under Current Land Use

Receptors applicable to each AOPC under current land use conditions were evaluated as discussed below. The receptors evaluated relative to future land use conditions are described in Section 5.1.2.2.

5.1.2.1.1 South and Central Area

VOC-impacted soil in the South and Central Area encompass the parking lot, offices and warehouse buildings. Human receptors that may be temporarily exposed to VOCs in this area include indoor (warehouse/office) workers. The parking area, personnel entrance and loading areas around the warehouses and office are paved, therefore no direct contact with soils/groundwater occurs for current site workers. Warehousing and office activities are primarily conducted indoors; minimal time is spent outdoors by current site workers (i.e., walking between warehouse and office building/vehicles). Inhalation of vapor from soils/groundwater in indoor and outdoor air are considered potentially complete pathways. The age profiles and potential exposure media for each receptor are listed below.

Adult Indoor Worker - Inhalation of vapor emissions (indoor air exposures)

Adult Indoor Worker - Inhalation of vapor emissions (outdoor air exposures)

5.1.2.1.2 North Area

VOC-impacted soil in the North Area encompass the former tank farm, truck rack, equipment shed, and vacant unpaved area. Human receptors that may be temporarily exposed to VOCs in this area include outdoor workers conducting maintenance on the groundwater remediation system. Appropriate personal protection equipment is utilized by personnel when conducted work on the remedial system. Site access is gained through the gate in the South and Central Area. The area visited by site workers is paved therefore no incidental direct contact with soils/groundwater occurs during equipment maintenance visits. The northern-most area that is unpaved is currently not occupied or used for any purpose. Maintenance activities are conducted on average once per week. The age profiles and potential exposure media for each receptor are listed below.

Adult Maintenance Worker (outdoors) - Inhalation of vapor emissions (outdoor air exposures).

5.1.2.1.3 On-Site Groundwater

VOC impacted groundwater on site encompasses the South and Central Area, and the North Area. Potential receptors that may be exposed to groundwater chemicals (via intermedia transfers) on site under the current land use scenario include indoor warehouse/office workers (South and Central Area), and outdoor workers (North Area). The age profiles and potential exposure pathways for each On-Site Groundwater receptor are listed below.

Adult Indoor Worker (South and Central Area) - Inhalation of vapor emissions (indoor air and outdoor air exposures).

Adult Outdoor Worker (North Area) - Inhalation of vapor emissions (outdoor air exposures).

Beneficial groundwater use – Groundwater beneath the site is not used for any purpose. Therefore, potential exposures by drinking impacted groundwater, showering, or other municipal use were not considered relevant to current land use in this HRA.

5.1.2.1.4 Off-Site Groundwater

VOC impacted groundwater off site encompasses the CSXT property adjacent to the western site border. At the time of this HRA the building and property in close proximity (within 100 feet) of VOC-impacted groundwater was unoccupied, however, the area is developed for commercial use. The areas around the buildings are generally covered with asphalt/concrete. Potential receptors that may be exposed to groundwater chemicals (via intermedia transfers) off site under the current land use scenario include indoor commercial workers, and outdoor workers. The age profiles and potential exposure pathways for each Off-site Groundwater receptor are listed below.

Adult Site Worker (Indoor/Outdoor)- Inhalation of vapor emissions (indoor air/outdoor air exposures).

Beneficial groundwater use –Groundwater in the area is not used for any purpose. Therefore, potential exposures from drinking impacted groundwater, indoor water use, or other municipal uses were not considered in this HRA.

5.1.2.2 Potential Receptors Under Future Land Use

Under hypothetical future land use conditions, risks to adult and child residents living above soils and groundwater on site potentially could occur as a result of COPC volatilization and transport from soils and groundwater to indoor air or outdoor ambient air, and by direct contact (dermal contact or incidental ingestion) of COPCs in surface soils. Potential exposure pathways for future residential receptors off site could occur as a result of COPC volatilization and transport from soils and groundwater to indoor air or outdoor ambient air. The exposure pathways for future residents considered in this HRA are listed below.

Future Residents in South and Central Area, and North Area - Inhalation of vapor emissions (indoor exposures); inhalation of vapor emissions (outdoor exposures); incidental ingestion of surface soil (outdoor exposures); and dermal contact with surface soil (outdoor exposures).

Future Residents above Off-Site Groundwater - Inhalation of vapor emissions (indoor exposures); inhalation of vapor emissions (outdoor exposures).

Beneficial groundwater use – Currently, groundwater beneath the site is not used for any purpose. Since the site is currently under an AOC, an assumption was made that the extraction and beneficial

use of on site groundwater will not occur in the near future, during the CMS and implementation of the selected final remedy. Therefore, potential future on site exposures from drinking impacted groundwater, indoor water use, or other municipal uses were not considered in this HRA.

5.1.3 Exposure Pathways Evaluated

5.1.3.1 Air Exposure Pathways

Several VOCs have been detected in soil and groundwater at the site. Exposure to these VOCs may occur via vapor migration from the subsurface and subsequent inhalation of chemicals in indoor and outdoor air. Exposure to chemicals in air under current and future land use scenarios was evaluated in the following manner.

- Outdoor air exposures, and exposure from dermal contact/incidental ingestion of soils were evaluated using the most recent (November 2003) soil investigation data considered to be representative of current site soil conditions.
- Outdoor air exposures were evaluated for VOCs detected in groundwater samples collected from On Site Groundwater and Off Site Groundwater during the most recent site-wide sampling event conducted in October 2004.
- Indoor air exposures were evaluated qualitatively and through comparison of October 2004 groundwater data with screening criteria in the USEPA vapor intrusion guidance (USEPA 2002a).

The volatilization potential of detected VOCs was evaluated because this class of chemicals is known to have the ability to produce vapor emissions to indoor and outdoor air under normal environmental temperatures and pressures. Air pathway fate and transport modeling performed for this HRA is discussed in Section 5.2.

5.1.3.2 Soil Pathways

The highest VOC concentrations are present in the South and Central Area, with lesser residual VOC concentrations present in the North Area. Given that the site is currently developed such that impacted soil in occupied areas is covered by buildings, pavement, and landscaped areas, direct contact with COPCs in soils is unlikely under current conditions for on site workers. However, it is possible that construction workers and/or hypothetical future residents may contact COPCs in shallow soils. There are no current plans for construction activities at the site, and given that the site is undergoing a CMS required by the AOC, future earthworks at the subject site could be managed through institutional controls (e.g., soils management plan) such that personnel are notified of potential chemical hazards and their employers should consider the possibility of requiring personal protective equipment to protect workers' health and safety, per applicable laws and standards. Under the current land use, direct contact with soils and/or groundwater is considered an incomplete pathway for site workers. Under a hypothetical future residential land use scenario exposure to these VOCs may occur via dermal contact with and incidental ingestion of VOC-impacted shallow soils. Exposure to chemicals in shallow soils under a hypothetical future residential land use scenario was evaluated in the following manner.

- Direct contact exposures via dermal contact/incidental ingestion of soils were evaluated using the most recent (November 2003) soil investigation data considered to be representative of current site soil conditions.

Exposure to VOCs detected at the subject AOPCs may also occur via inhalation of vapors. Therefore inhalation of vapors in outdoor air and indoor air was evaluated for residential receptors as noted above (for current use receptors).

5.1.3.3 Water Pathways

As mentioned above, several VOCs have been detected in groundwater beneath the site. The nature and extent of VOCs in groundwater both on and off site has been evaluated (ESC 2002 and URS 2005). Exposure to VOCs present in groundwater beneath the site may occur via inhalation of vapor emissions as discussed in Section 5.1.3.1. Potential exposure from direct contact with VOCs in groundwater via surface water and/or groundwater extraction are discussed below.

5.1.3.3.1 Surface Water Pathways

No surface water bodies exist at the site. As discussed in Sections 1 and 3, water from the unnamed tributary of the Hudson River has been isolated from groundwater via construction of a concrete culvert. Temporary discharges of groundwater into excavations or trenches could occur during future earthwork activities. There are no current plans for construction activities at the site, and given that the site is undergoing a CMS required by the AOC, future earthworks at the subject site could be managed through institutional controls (e.g., soil management plan) such that personnel are notified of potential chemical hazards and their employers should consider the possibility of requiring personal protective equipment to protect workers' health and safety, per applicable laws and standards.

5.1.3.3.2 Groundwater Pathways

As mentioned above, groundwater is currently not used for any purpose. Since the site is expected to either remain under an AOC until such time as all beneficial groundwater uses are no longer degraded, an assumption was made that exposures will not occur as a result of future extraction and beneficial use of groundwater. Therefore, potential future exposures from drinking impacted groundwater, indoor water use, or other municipal uses were not considered in this HRA.

5.2 Fate and Transport Assessment and Modeling

Based on the most recent sampling data, VOCs are present in soils and groundwater in the South and Central Area and North Area, and in off site groundwater. Though no historical soil gas data exists for the site, based on the nature of the VOCs detected in soil and groundwater, it is assumed that VOCs are also present in soil vapor beneath the site. Impacted groundwater encompasses the site and a portion of the CSXT property adjacent to the western site border (Figure 2). Because they may be mobile when present in fluid phases (i.e., liquids and vapors), VOCs can migrate through environmental media from source areas to points where human receptors may be exposed. Therefore, given their concentrations and physical/chemical properties, and soil physical characteristics the site COPCs potentially could migrate

from subsurface source areas to ground surface or indoor environments where human receptors may be exposed. As noted previously site conditions exist which limit the application of a quantitative vapor intrusion model for this HRA, however this pathway was qualitatively assessed as described in Section 5.2.1. Evaluation of potential risks and hazards from outdoor air were quantitatively assessed as described in Section 5.2.2.

5.2.1 Vapor Intrusion - to - Indoor Air Assessment

The potential for COPC migration from soil and groundwater to indoor air was evaluated qualitatively with reference to screening criteria in the USEPA 2002 vapor intrusion guidance. The vapor intrusion guidance is intended to assist in identifying whether the vapor intrusion pathway is complete and if so whether it poses an unacceptable risk to human health. The guidance screening process is designed for evaluation of soil gas and groundwater data with screening levels developed for residential land use. The site conditions do not meet all the assumptions and criteria to complete the quantitative/site specific evaluation outlined in the guidance. The primary conditions inhibiting quantitative evaluation are (1) impacted soil and groundwater are encountered at less than 5 feet bgs, and (2) no soil gas, sub-slab vapor or indoor air data are available for the site. A qualitative evaluation of the indoor air pathway was completed to assess the potential for the vapor intrusion pathway to be complete. This evaluation is presented below.

- The COPCs detected in groundwater and soils were reviewed to assess whether the COPCs are of sufficient volatility and toxicity to result in an unacceptable indoor air inhalation risk. Chemicals with Henry's Law constant of $1x10^{-5}$ or greater are considered sufficiently volatile, and those for which the pure component vapor concentration (maximum possible) exceeds target indoor air concentrations corresponding to an incremental lifetime cancer risk greater than $1x10^{-6}$ or a noncancer hazard index greater than 1. Based on criteria in Table 1 of the vapor intrusion guidance, each of the COPCs detected meet this criteria.

- Existing site conditions and hypothetical future residential use conditions were considered to ascertain if inhabited buildings are or may be located above or in close proximity (within 100 feet) to media impacted by COPCs. Existing buildings on site and one commercial building off site (near well MW-18) are located above soil and/or groundwater impacted by COPCs. Given that COPCs were detected in soils and groundwater in each AOPC, and since the spatial layouts of hypothetical future developments are unknown it was assumed that under a hypothetical residential land use scenario occupied buildings would be located above/proximal to COPC impacted media.

- Maximum COPC groundwater concentrations in on site and off site groundwater were compared with the residential screening values in the vapor intrusion guidance. In the South and Central Area, groundwater concentrations for PCE, TCE, vinyl chloride, and cis-1,2-DCE exceeded screening criteria based on both MCLs and the target concentrations corresponding to a $1x10^{-4}$ incremental lifetime cancer risk/hazard quotient of 1. Groundwater concentrations of COPCs (cis-1,2-DCE, 1,1-DCA and vinyl chloride) in the North Area were below the respective screening

levels correlating to a target cancer risk of $1x10^{-6}$ or target hazard quotient of 1. Groundwater concentrations of COPCs in Off-Site Groundwater, including TCE, cis-1,2-DCE, and vinyl chloride exceeded their MCL and target concentrations corresponding to $1x10^{-4}$ incremental cancer risk or hazard quotient of 1. The concentrations of COPCs detected in groundwater do not exceed 50 times the screening levels outlined in the vapor intrusion guidance.

It should be noted that the groundwater screening levels in the vapor intrusion guidance do not account for VOC-impacted soils above groundwater, and as such may underestimate risk for the site conditions. Based on this review and the chemical and physical properties of the COPCs detected in soil and groundwater on site it is believed that the vapor intrusion pathway may be complete. To quantitatively assess whether the vapor intrusion pathway poses a potential risk or hazard to human health under the current site use scenario, vapor sampling will need to be conducted.

5.2.2 Outdoor Air Evaluation

Potential emissions of COPCs from soil to outdoor air, and the resulting exposure point concentrations, were estimated using Equation 8: *Derivation of the Volatilization Factor*, as presented in Section 2.5.2 of the *Soil Screening Guidance: User's Guide* (USEPA, 1996). Default parameters for the Philadelphia Area were used (e.g., the Q/C term, which is the dispersion coefficient in units of grams per square meter-second per kilogram per cubic meter [g/m^2-s per kg/m^3]). The Q/C term was generated using the Industrial Source Complex model and varies depending on the source area, city, and climatic zone. The default Q/C value of 70.14 g/m^2-s per kg/m^3 was selected for modeling air mixing. This generic default value represents the inverse of the mean concentration at the center of a 2-acre square source (similar to AOPC areas) in Philadelphia (located in a similar area and climatic zone as site) (USEPA, 1996). Using this Q/C term, volatilization factors (VFs) were calculated for each COPC. Default model input parameters, including soil physical parameters (e.g., soil bulk density, total soil porosity, and water-filled soil porosity) were estimated based on typical values for loamy sand for use in the model (representative of site soil type, refer Section 3.1.1). The calculated soil-to-outdoor air, VFs (Table A-4) were used to estimate outdoor exposure point concentrations for outdoor workers and residents.

Outdoor air exposure point concentrations that potentially could result from emission of COPCs from groundwater to outdoor air were estimated using the groundwater to ambient (outdoor) air volatilization factor presented in Table A-5 of the American Society for Testing and Materials *Standard Guide for Risk Based Corrective Action at Chemical Release Sites* (ASTM, 2000). Default model input parameters, including soil physical parameters (e.g., soil bulk density, total soil porosity, and water-filled soil porosity) and air mixing factors, were estimated based on conservative default values (see Appendix A). The groundwater-to-outdoor air VFs calculated as described here were used to estimate outdoor exposure point concentrations for site workers and residents.

5.3 Exposure Point Concentrations

Exposure point concentrations for direct contact pathways (soil incidental ingestion and dermal contact) at each AOPC were estimated using representative source term concentrations. For exposures that may

occur via intermedia transfers (i.e., outdoor air vapor inhalation), exposure point concentrations were estimated using the results of the fate and transport modeling described above. For outdoor air, exposure point concentrations are estimated as the product of the soil-to-outdoor air and groundwater to outdoor air VF values calculated in Appendix A (Tables A-4 and A-5). The exposure point concentrations for each exposure medium considered in the HRA are summarized in Table 4.

5.4 DOSE ESTIMATION

The methods used to quantify the dose received by the human receptors evaluated in this risk assessment are described below. A dose of a chemical is the amount of chemical that is absorbed by the body per kilogram of body weight. The dose received is expressed in milligrams of chemical absorbed per kilogram of body weight per day (mg/kg-day). Intake assumptions, including absorption and bioavailability factors, exposure route and duration, age of receptor(s), body weight(s), and contact rates, were used to calculate the average daily dose received. The average daily dose (intake) was then used in the risk characterization (Section 7) to estimate the potential for carcinogenic health risks and noncarcinogenic adverse health effects from exposure to COPCs.

In this exposure assessment, two types of intake values were calculated. Determining which value to use depends on the nature of the health effect being evaluated (USEPA, 1989). For noncarcinogenic health effects, the applicable measure of intake for chronic toxicants is referred to as the chronic daily intake (CDI) and for most receptors is a less-than-lifetime exposure. For chemicals that produce carcinogenic effects, CDIs are averaged over an entire lifetime. A generalized form of the equation that is used to calculate the CDI for each COPC is given below:

$$CDInc\ or\ CDIc = EPC\ x\ \frac{IF\ x\ ET\ x\ EF\ x\ ED}{BW\ x\ (ATnc\ or\ ATc)}$$

where:

CDInc or CDIc	=	Chronic daily intake (mg/kg-day) for noncarcinogens(nc) or carcinogens(c)
EPC	=	Exposure Point Concentration (mg/m^3 air, mg/kg soil, or ug/l groundwater)
IF	=	Intake factor* (mg/day)
EF	=	Exposure frequency (days/year)
ET	=	Exposure time (hours/day)
ED	=	Exposure duration (years)
BW	=	Body weight (kg)
ATnc or ATc	=	Averaging time (days) for noncarcinogens(nc) or carcinogens(c).

* The intake factor is a product of several medium- and receptor-specific variables that, when multiplied by the exposure point concentration and other human exposure factors, results in an estimate of the chemical intake in mg/kg-day for that receptor population and exposure pathway. The terms used to calculate the intake factor for each exposure pathway are presented in Tables 5 and 6, and with the risk assessment calculation tables in Appendix A.

The exposure assessment performed as part of this HRA follows USEPA (1997) recommendations to develop "reasonable maximum exposure" (RME or upper-bound) estimates. RME incorporates several conservative assumptions in estimating chemical intake rates and characteristics of the receptor population. RME is thus an estimate of the highest exposure that is reasonably expected to occur at the site and may overestimate the actual risk for most of the population. RME is typically defined as a combination of upper-bound and average values that reflect exposures somewhere between the 90th and 98th percentile of the range of possible exposures that is reasonably expected to occur at the site for a given population. The human exposure factors used to calculate dose rates for site workers (indoor and outdoor) and residential receptors are presented in Tables 5 and 6, respectively.

6.0 TOXICITY ASSESSMENT

In order to evaluate the potential adverse effects associated with exposure to chemicals, the relationship between the dose of each chemical and the probability of an adverse health effect in an exposed population must be determined. This is known as dose-response assessment and is based on data collected from animal studies and theoretical precepts about what might occur in humans.

This HRA considers both carcinogenic and noncarcinogenic health effects associated with chemical exposures based on dose-response criteria published by various regulatory agencies. In this HRA, chronic toxicity criteria were selected (in order of preference) from the following sources:

1. USEPA's (USEPA, 2002c) Integrated Risk Information System (IRIS);
2. EPA National Center for Environmental Assessments (NCEA) Superfund Technical Support Center Provisions Values
3. USEPA (USEPA, 1997b) Health Effects Assessment Summary Tables (HEAST), as referenced in the Region IX Preliminary Remedial Goals table (USEPA, 2002d); and
4. Selected route-to-route extrapolations.

6.1 NONCARCINOGENIC DOSE-RESPONSE CRITERIA

It is widely accepted that most biological effects of chemical substances occur only after a threshold dose is reached. For the purpose of establishing noncarcinogenic criteria levels, this threshold dose is usually derived from either the no-observed adverse effect level (NOAEL) or the lowest-observed adverse effect level (LOAEL) as determined in chronic animal exposure studies. The NOAEL is defined as the highest dose at which no adverse effects occur, while the LOAEL is defined as the lowest dose at which adverse effects begin to appear. NOAELs and LOAELs are used by the USEPA to establish reference doses (RfDs) for acceptable levels of human intake.

An RfD is the dose of a chemical that is not expected to cause adverse health effects over a lifetime of daily exposure in the most sensitive population. Uncertainty factors are used to set RfDs, representing an attempt to account for limitations in the quality or quantity of available data. Most RfDs include a 100-fold safety factor that is based on: 1) a factor of 10 to account for uncertainties in extrapolating animal data to human health effects, and 2) another 10-fold safety factor to account for differences in sensitivity within the human population. Furthermore, if an available database is incomplete, or if the involved chemical is persistent or bioaccumulative, additional 10-fold safety factors may be applied. The RfDs used in this HRA to estimate noncarcinogenic chronic health hazards are presented in Table 7.

6.2 CARCINOGENIC DOSE-RESPONSE CRITERIA

Select COPCs at the site are considered by the USEPA to be potential carcinogens. The currently accepted regulatory approach assumes that all potentially carcinogenic chemicals should be treated as if

they do not have thresholds. This regulatory approach was used to evaluate carcinogenic risks for this document. This approach assumes that the dose-response curve for carcinogens allows for zero risk at zero dose (i.e., for all doses, some cancer risk is assumed to be present). Since animal testing is performed at relatively high doses for the purposes of eliciting a carcinogenic response, various mathematical models are used to estimate the theoretically plausible response at low doses. The accuracy of the projected risk depends on how well the model predicts the true relationship between dose and risk at levels where this relationship cannot actually be measured.

Health risks for exposures to carcinogens are defined in terms of probabilities. The probabilities quantify the likelihood of a carcinogenic response in an individual that receives a given dose of a particular compound. For this HRA, cancer risk probabilities were calculated based on estimates of the potential dose and the cancer slope factor (SF) for each COPC. The SF, which is expressed in units of inverse milligrams per kilogram-day $(mg/kg\text{-}day)^{-1}$, is the 95 percent upper confidence limit of the probability of carcinogenic response per unit daily intake of a chemical over a lifetime. The SF multiplied by the lifetime average daily intake of the chemical (dose) provides an estimated upper bound theoretical cancer risk. The SFs used in this HRA to estimate carcinogenic dose-assessment risks are presented in Table 7.

7.0 RISK CHARACTERIZATION

The risk characterization process integrates the quantitative and qualitative results of the data evaluation, exposure and toxicity assessments. The purpose is to estimate the likelihood, incidence, and magnitude of the potential human health effects from exposure to the COPCs under study and make judgments about the nature of the health threat to the defined receptor populations.

Risk assessment calculation worksheets for the South and Central Area, North Area, and Off-Site Groundwater are presented in Appendix A. Calculations were performed using the 95% UCL (or maximum if lower) COPC concentrations to represent the soil matrix, and maximum groundwater COPC concentration source terms.

7.1 NONCARCINOGENIC EFFECTS

The potential for non-cancer effects resulting from exposure to a particular chemical is expressed as the hazard quotient (HQ). A HQ is the ratio of the estimated intake or CDI of a chemical to the corresponding chemical-specific toxicity value or RfD. The following equation is used to estimate the HQ:

$$Hazard\ Quotient = \frac{CDInc}{RfD}$$

Chemical- and pathway-specific HQs may be combined to form a hazard index (HI), which is then compared to a typically accepted benchmark level of 1.0. If the HI exceeds 1.0, then site-specific exposure exceeds the RfD, meaning that there is potential for non-cancer adverse effects to result from exposure to site COPCs under the evaluated receptor scenario(s).

7.2 CARCINOGENIC EFFECTS

Cancer risks are expressed as the upper-bound, increased likelihood of an individual developing cancer because of exposure to a particular chemical. For example, a cancer risk of 1×10^{-4} refers to an upper-bound increased chance of one in ten thousand individuals exposed of developing cancer over a lifetime (0.01 percent risk). The following equation is used to estimate the excess cancer risk (a unitless probability):

$$Excess\ Cancer\ Risk = CDIc \times CSF$$

In the National Oil and Hazardous Substances Pollution Contingency Plan (NCP) (40 CFR Part 300), USEPA states that: "For known or suspected carcinogens, acceptable exposure levels are generally concentration levels that represent an excess upper-bound lifetime cancer risk to an individual between 10^{-4} and 10^{-6}." Cancer risks less than 1×10^{-6} are generally considered *de minimus*.

7.3 RISK CHARACTERIZATION RESULTS

Potential health risks to on site workers (current land use) and residential receptors (hypothetical future land use) were evaluated for COPCs detected in soil matrix and groundwater. Quantitative evaluations for direct contact (dermal contact and incidental ingestion of soils) and inhalation of outdoor air were completed for each scenario and AOPC, as applicable. Only a qualitative evaluation of the vapor intrusion migration pathway was conducted for this HRA due to existing site conditions which limit the use of quantitative application of the USEPA (2002a) vapor intrusion model/screening levels. Detailed presentations of the chemical-specific and pathway-specific cancer risks and non-cancer hazard calculation results are included in Appendix A.

Cancer risks and non-cancer hazards were calculated for each receptor using 95%UCL (or maximum where applicable) EPC estimates for soil matrix and maximum EPC estimates for groundwater. Results from these soil and groundwater EPC COPC concentrations under the current land use scenario are presented in Tables 8 and 9. Results from these soil and groundwater EPC COPC concentrations under a hypothetical future residential land use scenario are presented in Tables 10 and 11. The findings from these quantitative and qualitative evaluations are summarized below.

7.3.1 Results for Current Land Use

Receptors evaluated for the South and Central Area, North Area, and Off-Site Groundwater under the current land use scenario included indoor and outdoor workers. Potentially complete pathways quantitatively evaluated for workers in this HRA include inhalation of COPCs in outdoor air, dermal contact, and incidental ingestion from soils and/or groundwater, as applicable. The results for the on site and off site worker evaluations are summarized below.

The cumulative cancer risk and non-cancer hazard levels, based on multi-pathway risk estimates for site workers at each AOPC are listed below.

Receptors Under Current Land Use	*South and Central Area Indoor Workers*	*North Area Outdoor Workers*	*Off-Site Groundwater Outdoor Workers*
Cancer Risk	8×10^{-5}	5×10^{-7}	5×10^{-7}
Noncancer Hazard	2.0×10^{-1}	6.1×10^{-4}	2.6×10^{-3}

The primary COPC risk drivers on site are PCE, TCE, vinyl chloride, and benzene in the South and Central Area. The primary COPC risk driver off site is vinyl chloride.

Based on current site uses and the volatility and toxicity of the COPCs detected in soils and groundwater on site and in off site groundwater, it appears that the vapor intrusion pathway is potentially complete. COPC concentrations detected in groundwater on site and off site exceed screening levels in the USEPA vapor intrusion guidance which correlate to acceptable levels of risk or noncancer hazard, providing further evidence that this pathway may be complete. It is noted however that existing site conditions (i.e.,

depth to impacted soil/groundwater less than 5 feet bgs, commercial use) do not meet all the assumptions and criteria used to derive the screening levels or to quantitatively evaluate potential risks from this pathway. To quantitatively evaluate this potential exposure pathway vapor sampling will need to be conducted.

7.3.2 Results for Future Land Use

Hypothetical residents were the only receptors evaluated for the South and Central Area, North Area, and Off-Site Groundwater under the future land use scenario. Potentially complete pathways quantitatively evaluated for on site and off site hypothetical future residential receptors in this HRA include inhalation of COPCs in outdoor air, dermal contact, and incidental ingestion from soils and/or groundwater, as applicable. The results for the on site and off site worker evaluations are summarized below.

The cumulative cancer risk and non-cancer hazard levels calculated for these receptors at each AOPC are listed below.

Receptors Under Future Land Use	*South and Central Area Future Residents*	*North Area Future Residents*	*Off-Site Groundwater Future Residents*
Cancer Risk	2×10^{-4}	1×10^{-6}	1×10^{-6}
Noncancer Hazard	9.7×10^{-1}	3.4×10^{-3}	8.5×10^{-3}

The primary COPC risk drivers on site are PCE, TCE, vinyl chloride, and benzene in the South and Central Area. The primary COPC risk driver off site is vinyl chloride.

The qualitative evaluation conducted for this HRA, indicates that the vapor intrusion pathway is potentially complete for hypothetical residents on site and off site. Due to the limited applicability of the vapor intrusion model under existing site conditions in order to quantitatively evaluate this potential exposure pathway vapor sampling will need to be conducted.

Receptors for future on site use could include construction workers for whom the "current conditions" commercial assessment would not be applicable. Future exposure to workers whose activities involve penetration of the ground surface (e.g., utility or excavation workers) will need to be addressed in the CMS. It is anticipated that a soil management plan can be used to mitigate risks to these receptors.

8.0 UNCERTAINTY ANALYSIS

This risk assessment has been prepared in a manner consistent with that generally used in the consulting community and agency guidance at the time it was prepared, and is based on recently collected data using the current available risk assessment methodology. The assessment is based on site-specific data, laboratory analytical results, area-specific weather data, and assumed values and conditions. Site-specific data and laboratory results were validated and are supported by quality control and quality assurance documentation. Although professional judgment was used in the selection of each exposure assumption, some argument can be made about the validity of each assumption. The purpose of this section is to provide information concerning the validity of each assumption, including the effect of each assumption on the overall risk, the major data gaps, and the effect of these data gaps on the accuracy or reasonableness of the risk assessment.

8.1 SITE CONDITIONS

The reasonably anticipated land use scenario is commercial/industrial for the foreseeable future; therefore, on site workers are the only population that could potentially be impacted by existing site conditions. The site is also undergoing a CMS to address impacted media that may pose a threat to human health, thus the assumption of residential use in the HRA likely represents an overestimation of risks.

8.2 SITE DATA

Chemical analytical data are subject to uncertainty associated with sampling and analysis. In the risk assessment, it was assumed that samples collected were representative of conditions to which various populations may be exposed. However, the collected samples may not be completely representative due to biases in sampling and due to random variability of samples. In general, sampling was biased toward areas of suspected elevated chemical concentrations, which will lead to an overestimation of risk.

Sample analysis is also subject to uncertainty associated with precision, accuracy and detection of chemicals at low concentrations. These uncertainties may lead to over- or under-estimation of risks. These errors are typically of low magnitude compared to other sources of uncertainty in the risk assessment.

8.3 EXPOSURE ASSESSMENT

Risk assessments require assumptions in order to assess potential human exposure. This risk assessment includes assumptions about general characteristics and potential patterns of human exposure of the population in the vicinity of the site. The assumptions made in this assessment were based on USEPA guidance.

There is always some doubt as to how well an exposure model or its mathematical expression approximates true relationships between environmental media and site-specific conditions. Ideally, one

would like to use a fully validated model that accounts for all the known factors involved. At present, however, only simple, partially validated models are available and commonly used.

8.4 Toxicity Assessment

In order to evaluate the potential adverse effects associated with exposure to chemicals, the relationship between the dose of each chemical and the probability of an adverse health effect in an exposed population must be determined. This is known as dose-response assessment and is based on data collected from animal studies and theoretical precepts about what might occur in humans. This HRA considers both carcinogenic and noncarcinogenic health effects associated with chemical exposures based on dose-response criteria published by various regulatory agencies. Sources of uncertainty related directly to toxicity data include:

- The use of dose-response data from experiments on homogeneous, sensitive animal populations to predict effects in heterogeneous human populations with a wide range of sensitivities.
- Extrapolation of data from: (1) high-dose animal studies to low-dose human exposures; (2) acute or sub-chronic to chronic exposure; and (3) one exposure route to another (e.g. from ingestion to inhalation or dermal absorption).
- Use of single-chemical test data that do not account for multiple exposures or synergistic and antagonistic responses.

8.5 Risk Characterization

As there are uncertainties in each step of the risk assessment process, these uncertainties may be magnified in the final risk characterization. To minimize the consequences of uncertainty in the estimation of health risk, conservative assumptions were used in every step of the process (exposure assumptions, toxicity assessment and risk characterization) so as not to underestimate potential risks. Due to the multiple conservative assumptions used, the overall results of the assessment are more likely to overestimate than underestimate actual risks.

9.0 CONCLUSIONS AND RECOMMENDATIONS

This HRA evaluated the potential threats to human health posed by the presence of VOCs in soil and groundwater in on site AOPCs and in Off Site Groundwater at the former Ashland Distribution facility site in Renssalaer, New York. Potential health risks were evaluated for receptors that may be present at the South and Central Area, North Area, and Off Site Groundwater AOPCs under both current and future land use scenarios. Potential cancer risks and non-cancer hazards were evaluated quantitatively for potentially complete exposure pathways except for vapor intrusion-to-indoor air. At the time of the HRA no soil gas, sub-slab vapor, or indoor air data were available for the site. Due to existing site conditions and limitations on application of the USEPA vapor intrusion model and screening levels (USEPA 2002a), the vapor intrusion pathway was evaluated qualitatively. The findings from this assessment are summarized below. Recommendations based on the existing site conditions and findings from this HRA are presented in Section 9.2.

9.1 HRA CONCLUSIONS

Direct contact (dermal contact and incidental ingestion) and outdoor air inhalation exposure pathways were quantitatively evaluated for COPCs in soils and groundwater in each AOPC. The results of the quantitative evaluations conducted for this HRA include estimated cancer risk and non-cancer hazard levels for each receptor. Under current land use exposure assumptions, cancer risks calculated based on exposure to RME (95% UCL) estimated COPC concentrations in each AOPC were 8×10^{-5} in the South and Central Area5 $\times 10^{-7}$ in both the North Area and Off Site Groundwater. Under future residential land use assumptions, cancer risks calculated based on exposure to RME COPC concentrations in the North Area and Off-Site Groundwater were 1×10^{-6}. Cancer risks for the South and Central Area under the hypothetical residential land use scenario was $2x10^{-4}$. In the National Oil and Hazardous Substances Pollution Contingency Plan (NCP) (40 CFR Part 300), USEPA states that: "For known or suspected carcinogens, acceptable exposure levels are generally concentration levels that represent an excess upper-bound lifetime cancer risk to an individual between 10^{-4} and 10^{-6}." Cancer risks less than 1×10^{-6} are generally considered *de minimus*. Estimated non-cancer hazard levels calculated based on RME COPC concentrations for all receptors under the current and hypothetical future land use scenarios are less than 1.0, which is considered the threshold level of significance.

Total risks and noncancer hazards calculated under the current land use scenarios are within the USEPA acceptable risk range, however these values do not account for potential risks or hazards that may be contributed from the vapor intrusion pathway. Typically, direct contact pathways are of lesser significance than inhalation pathways for VOCs. This is evident in comparison of risk/hazard levels for inhalation of outdoor air versus dermal contact/incidental ingestion evaluated in this HRA. Based on the qualitative evaluation of the vapor intrusion pathway conducted for this HRA, the COPCs at the site are considered sufficiently volatile and toxic to pose a potential threat to human health through inhalation pathways. The concentrations of COPCs in groundwater on site exceed the residential screening limits in the vapor intrusion guidance, further suggesting that the vapor intrusion pathway may be complete. However the site does not meet all the assumptions and criteria applicable to development of the

screening levels which introduces uncertainty and may underestimate potential risk from shallow groundwater.

All evaluated receptors were assumed to be exposed to COPCs for the quantitative assessments, even though some of the exposure pathways may not actually be complete. In an effort to prevent underestimation of potential risk, the modeling parameters used in estimating human exposures and health risks were selected using conservative assumptions. Under the current land use scenario, the cumulative risk calculated for the non-vapor intrusion potentially complete exposure pathways are within EPAs acceptable risk range. While cumulative risks for hypothetical residential use is $1x10^{-6}$ in the North Area and Off-Site Groundwater, and is $2x10^{-4}$ in the South and Central Area. Given that potential risks resulting from exposure to VOCs through the direct contact and outdoor inhalation pathways may be less significant than risks from the vapor intrusion pathway; potential risks may be higher if the vapor intrusion pathway is complete. Therefore the vapor intrusion pathway should be addressed in the CMS. Also, potential future subsurface construction/excavation work should be addressed in the CMS (e.g., soil management plan).

9.2 RECOMMENDATIONS

On the basis of the above risk assessment findings, URS recommends the following be considered as part of developing the remedial goals and objectives for the CMS process.

- The primary COPCs in groundwater that drive risk on site are PCE, TCE, vinyl chloride, and to a lesser degree benzene.
- The primary COPC in groundwater immediately downgradient of the site is vinyl chloride.
- The potentially complete pathways onsite for the current land use are inhalation of vapors in outdoor/indoor air, dermal contact and incidental ingestion.
- The potentially complete pathways off site under current land use are inhalation of indoor/outdoor air.
- The elevated concentrations of toluene, ethylbenzene, and xylenes in the area of boring SSB-13 should be evaluated in the CMS.
- Receptors for future on site use could include construction workers for whom the "current conditions" commercial assessment would not be applicable. Potential future exposure to workers that could result from penetration of the ground surface (e.g., utility or excavation workers) may be addressed in the CMS.
- The indoor air exposure pathway was not quantitatively evaluated in this HRA as existing site conditions, primarily shallow (less than 5 feet) depth to impacted soil/groundwater, and absence of soil gas data, limit the applicability of current vapor intrusion models and screening guidance used to assess this pathway. Additional data is needed to quantitatively evaluate the indoor air

10.0 REFERENCES

American Society of Testing and Materials (ASTM). 2000. Standard Guide for Risk-Based Corrective Action Applied at Petroleum Release Sites. E:2081-00. West Conshohocken, PA.

Environmental Strategies Corporation (ESC). 2002. Resource Conservation and Recovery Act Facility Investigation Report for the Ashland Distribution Company Facility, Renssalaer, New York.

Feenstra, S., D. M. Mackay, and J.A. Cherry, Spring 1991. A Method for Assessing the Presence of Residual NAPL Based on Organic Chemical Concentrations in Soil Samples. Ground Water Monitoring Review, 11(2), 128-136.

Gilbert, R.O. 1987. Statistical Methods for Environmental Pollution Monitoring. Van Nostrand Reinhold, New York, New York.

Johnson, P. C. and R. A. Ettinger. 1991. Heuristic Model for Predicting the Intrusion Rate of Contaminant Vapors into Buildings. Environmental Science and Technology 25:1445-1452.

URS Diamond (URS). 2003. Corrective Measures Study Work Plan Former Ashland Distribution Facility, Rensselaer, New York. April 14.

URS Diamond (URS). 2004. Groundwater Natural Attenuation Study Former Ashland Distribution Facility, Rensselaer, New York. January 30.

URS Diamond (URS). 2005. Summary of Site Conditions, Rensselaer, New York. January 20.

USEPA. 2004. Risk Assessment Guidance for Superfund Volume I: Human Health Evaluation Manual (Part E, Supplemental Guidance for Dermal Risk Assessment). Final. EPA/540/R/99/005. July.

USEPA 2002a. Draft Guidance for Evaluating the Vapor Intrusion to Indoor Air Pathway from Groundwater and Soils (Subsurface Vapor Intrusion Guidance). Office of Solid Waste and Emergency Response. (EPA 530-f-02-052). November.

USEPA. 2002b. Calculating Upper Confidence Limits for Exposure Point Concentrations at Hazardous Waste Sites. Office of Research and Development. Office of Emergency and Remedial Response. EPA 540/R-97/036. July.

U.S. Environmental Protection Agency (EPA). 2002c. Integrated Risk Information System (IRIS). National Center for Environmental Assessment (NCEA). Online Database (www.epa.gov/iris).

U.S. Environmental Protection Agency (EPA). 2002d. Region 9 Preliminary Remediation Goals (PRGs). On-line database (www.epa.gov/region09/waste/sfund/prg).

USEPA. 1998. Technical Protocol for Evaluating Natural Attenuation of Chlorinated Solvents in Ground Water, USEPA, Office of Research and Development, September 1998, EPA/600/R-98/128/

USEPA. 1997a. Exposure Factors Handbook, General, Food Ingestion, Activity. Volumes I, II, III. EPA/600/P-95/002B. Office of Research and Development (ORD), Washington, D.C.

exposure pathway. Based on the data collected as part of the RFI and the qualitative evaluation in this HRA, this pathway appears to be potentially complete and may be a primary potential exposure pathway of concern on site.

- It is recommended that a combination of institutional and management controls (e.g., deed restriction and soil management plan) be evaluated as needed to maintain commercial/industrial site usage while mitigating risk associated with dermal contact and incidental ingestion from potential on site intrusive activities (i.e., construction/maintenance work). Long-term remedial technologies evaluated should also consider issues associated with indoor and outdoor air exposure from COCs and management of any potential off site migration of the plume that would not be addressed by these risk management options.

- MCLs have been proposed as an interim cleanup goal for the primary COPCs (PCE, TCE, vinyl chloride) in groundwater. These interim clean-up criteria were not selected due to potential ingestion of groundwater, but rather as a clean-up goal that is sufficiently conservative to consider the potential indoor air exposure pathway. It is proposed that additional investigations be conducted to quantify subsurface vapor concentrations and facilitate development of site specific clean-up criteria with consideration of the vapor intrusion pathway.

10.0 REFERENCES

American Society of Testing and Materials (ASTM). 2000. Standard Guide for Risk-Based Corrective Action Applied at Petroleum Release Sites. E:2081-00. West Conshohocken, PA.

Environmental Strategies Corporation (ESC). 2002. Resource Conservation and Recovery Act Facility Investigation Report for the Ashland Distribution Company Facility, Renssalaer, New York.

Feenstra, S., D. M. Mackay, and J.A. Cherry, Spring 1991. A Method for Assessing the Presence of Residual NAPL Based on Organic Chemical Concentrations in Soil Samples. Ground Water Monitoring Review, 11(2), 128-136.

Gilbert, R.O. 1987. Statistical Methods for Environmental Pollution Monitoring. Van Nostrand Reinhold, New York, New York.

Johnson, P. C. and R. A. Ettinger. 1991. Heuristic Model for Predicting the Intrusion Rate of Contaminant Vapors into Buildings. Environmental Science and Technology 25:1445-1452.

URS Diamond (URS). 2003. Corrective Measures Study Work Plan Former Ashland Distribution Facility, Rensselaer, New York. April 14.

URS Diamond (URS). 2004. Groundwater Natural Attenuation Study Former Ashland Distribution Facility, Rensselaer, New York. January 30.

URS Diamond (URS). 2005. Summary of Site Conditions, Rensselaer, New York. January 20.

USEPA. 2004. Risk Assessment Guidance for Superfund Volume I: Human Health Evaluation Manual (Part E, Supplemental Guidance for Dermal Risk Assessment). Final. EPA/540/R/99/005. July.

USEPA 2002a. Draft Guidance for Evaluating the Vapor Intrusion to Indoor Air Pathway from Groundwater and Soils (Subsurface Vapor Intrusion Guidance). Office of Solid Waste and Emergency Response. (EPA 530-f-02-052). November.

USEPA. 2002b. Calculating Upper Confidence Limits for Exposure Point Concentrations at Hazardous Waste Sites. Office of Research and Development. Office of Emergency and Remedial Response. EPA 540/R-97/036. July.

U.S. Environmental Protection Agency (EPA). 2002c. Integrated Risk Information System (IRIS). National Center for Environmental Assessment (NCEA). Online Database (www.epa.gov/iris).

U.S. Environmental Protection Agency (EPA). 2002d. Region 9 Preliminary Remediation Goals (PRGs). On-line database (www.epa.gov/region09/waste/sfund/prg).

USEPA. 1998. Technical Protocol for Evaluating Natural Attenuation of Chlorinated Solvents in Ground Water, USEPA, Office of Research and Development, September 1998, EPA/600/R-98/128/

USEPA. 1997a. Exposure Factors Handbook, General, Food Ingestion, Activity. Volumes I, II, III. EPA/600/P-95/002B. Office of Research and Development (ORD), Washington, D.C.

USEPA. 1997b. Health Effects Assessment Summary Tables (HEAST) FY-1997 Updated. Office of Research and Development. Office of Emergency and Remedial Response. EPA 540/R-97/036. July.

U.S. Environmental Protection Agency (EPA). 1996. Soil Screening Guidance: User's Guide. EPA/540/R-96/018. Office of Emergency and Remedial Response, Washington DC. NTIS PB 96.9634501.

U.S. Environmental Protection Agency (EPA). 1992. Guidance for Data Usability in Risk Assessment. Final. Office of Emergency and Remedial Response. Washington D.C.

U.S. Environmental Protection Agency (EPA). 1991. Risk Assessment Guidance for Superfund: Volume 1 – Human Health Manual. Supplemental Guidance: Standard Default Exposure Factors. Interim Final. OSWER Directive: 9285.6-03, March.

U.S. Environmental Protection Agency (EPA). 1989. Risk Assessment Guidance for Superfund: Volume I – Human Health Evaluation Manual (Part A). Office of Emergency and Remedial Response. WashingtonD.C.

TABLES

TABLE 1
Summary of Soil Sample Analytical Results - November 2003
Former Ashland Distribution Facility, Rensselaer, New York

Area	SOUTHERN PORTION						CENTRAL PORTION					
Boring ID	SSB-1	SSB-2	SSB-3	*DUP-11/17/03	SSB-4	SSB-5	SSB-6	SSB-6	SSB-7	SSB-7	SSB-8	SSB-8
Sampling Interval (ft bgs)	0.5-2	0.5-1.5	0.5-2		0.5-1.5	0-1.5	1-2	2-3	0.5-1.5	2-3.5	0.5-2	5-6.5
Constituent	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg
1,1 Dichloroethane	<1.2	<6.4	**880**	<5.6	**220**	**6.4**	<10	<1.1	**7.2**	**100**	<5.3	**2.3**
1,1,1-Trichloroethane	**1.5**	<5.2	<86	**7.4**	**13**	**26**	<7.9	**7.3**	<4.6	<8.1	<4.3	**3.2**
1,1,2,2-Tetrachloroethane	<2.5	<13	<100	<11	<12	<2.3	<9.2	<2.2	<11	<9.5	<11	<2.3
1,1,2-Trichloroethane	<2.2	<12	<110	<10	<11	<2	<9.9	<1.9	<10	<10	<9.6	<2.1
1,1-Dichloroethene	<2.1	<11	<250	<9.6	**40**	<1.9	<22	<1.8	<9.6	<23	<9	<2
1,2-Dichloroethane	<1.9	<9.6	<100	<8.4	<9.1	<1.7	<9.4	<1.6	<8.4	<9.8	<8	<1.8
1,2-Dichloropropane	<1.5	<7.7	<89	<6.7	<7.3	<1.4	<8.1	<1.3	<6.7	<8.4	<6.4	<1.4
2 Butanone (MEK)	<5.8	<30	<1600	<26	<29	<5.3	**280**	**39**	<26	**230**	<25	<5.5
2-Hexanone	<6.3	<33	<440	<29	<31	<5.8	<40	**76**	<29	<42	<27	<6
4-Methyl-2-pentanone (MIBK)	<6.2	<32	<1200	<28	**32**	<5.6	<110	<5.4	<28	<120	<26	<5.8
Acetone	**21**	**140**	<1000	**57**	**13,000**	<9	**640**	**320**	**78**	<240	<42	<9.4
Benzene	**8.1**	**38**	**6,800**	**680**	**120**	**7.7**	**46**	**34**	**23**	**26**	**29**	**8.6**
Bromodichloromethane	<1.6	<8.3	<79	<7.3	<7.9	<1.5	<7.2	<1.4	<7.3	<7.4	<6.9	<1.5
Bromoform	<2.1	<11	<250	<9.6	<10	<1.9	<22	<1.8	<9.6	<23	<9	<2
Bromomethane	<4.2	<22	<420	<19	<21	<3.8	<38	<3.7	<19	<40	<18	<4
Carbon disulfide	<2.5	<13	<160	**25**	**21**	**5.9**	**18**	**2**	<11	<15	<11	<2.3
Carbon tetrachloride	<1.2	<6	<79	<5.3	<5.7	**4.2**	<7.2	<1	<5.3	<7.4	<5	<1.1
Chlorobenzene	**2.1**	<8.3	<100	<7.3	<7.9	<1.5	**18**	**8.4**	<7.3	**11**	<6.9	**1.6**
Chloroethane	<2.1	<11	<250	<9.6	<10	<1.9	<22	<1.8	<9.6	<23	<9	<2
Chloroform	<1.5	<7.7	<250	<6.7	<7.3	**13**	<22	<1.3	<6.7	<23	<6.4	<1.4
Chloromethane	<1.7	<9	<340	<7.9	<8.5	<1.6	<31	<1.5	<7.9	<32	<7.4	<1.6
cis-1,2 Dichloroethene	**8.7**	**630**	**82,000**	**12,000**	**41,000**	**43**	**610**	**120**	**710**	**22,000**	**620**	**29**
cis-1,3-Dichloropropene	<1.5	<7.7	<89	<6.7	<7.3	<1.4	<8.1	<1.3	<6.7	<8.4	<6.4	<1.4
Dibromochloromethane	<1.7	<9	<250	<7.9	<8.5	<1.6	<22	<1.5	<7.9	<23	<7.4	<1.6
Ethylbenzene	<1.2	<6.4	<86	**19**	**150**	**77**	**18**	**3.1**	<5.6	<8.1	<5.3	<1.2
Methylene chloride	<3	<15	<250	<13	<15	**9.3**	**23**	<2.6	<13	<23	<13	<2.8
Styrene	<1.4	<7	<74	<6.2	<6.7	**1.7**	**9.2**	**2.4**	<6.2	<7	<5.8	<1.3
Tetrachloroethene	**5.0**	**74**	**280**	**440**	**10**	**4,700**	**750**	**410**	**20**	**61**	**36**	<1.8
Toluene	<2.2	<12	**370**	**120**	**2.9**	**8.0**	**33**	**5.5**	<10	**17**	**16**	<2.1
trans-1,2-Dichloroethene	<1.5	**23**	**650**	**110**	**880**	**3.6**	**21**	**2.3**	**24**	**260**	**24**	<1.4
trans-1,3-Dichloropropene	<2	<10	<64	<9	<9.8	<1.8	<5.8	<1.7	<9	<6	<8.5	<1.9
Trichloroethene	**9.4**	**320**	**3,000**	**6,100**	**800**	**170**	**220**	**53**	**210**	**350**	**100**	**28**
Vinyl Chloride	**1.8**	**110**	**1,400**	**250**	**1,500**	**3.0**	**55**	**12**	**320**	**480**	**33**	**2.7**
Xylenes, Total	<3.7	<19	**370**	**120**	**510**	**94**	**230**	**36**	<17	<23	**5.2**	<3.5

ug/kg = micrograms per kilogram
< indicates constituent not detected above detection limit shown
Bold type indicates constituent detected in sample

* DUP-11/17/03 is a duplicate sample of SSB-3 (0.5-2)
* DUP-11/18/03 is a duplicate sample of SSB-10 (10.5-12).

TABLE 1
Summary of Soil Sample Analytical Results - November 2003
Former Ashland Distribution Facility, Rensselaer, New York

Area	NORTHERN PORTION										
Boring ID	SSB-9	SSB-9	SSB-10	SSB-10	*DUP-11/18/03	SSB-11	SSB-11	SSB-12	SSB-12	SSB-13	SSB-13
Sampling Interval (ft bgs)	1-2	9.5-10.5	1-2	10.5-12		1-2	7-8	1-2	5.5-6.5	1-2	3-4
Constituent	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg
1,1 Dichloroethane	<0.54	<0.92	<1.1	<0.93	<1.1	<1.1	<0.97	<1	<1.2	**1.6**	<66000
1,1,1-Trichloroethane	**0.9**	**1.0**	**1.2**	<0.76	<0.89	<0.87	<0.79	<0.84	<0.94	<0.95	<49000
1,1,2,2-Tetrachloroethane	<1.1	<1.8	<2.2	<1.9	<2.2	<2.2	<1.9	<2.1	<2.3	<2.3	<58000
1,1,2-Trichloroethane	<0.97	<1.7	<2	<1.7	<2.0	<1.9	<1.7	<1.98	<2.1	<2.1	<62000
1,1-Dichloroethene	<0.91	<1.6	<1.9	<1.6	<1.9	<1.8	<1.6	<1.8	<2	<2	<140000
1,2-Dichloroethane	<0.81	<1.4	<1.7	<1.4	<1.6	<1.6	<1.4	<1.6	<1.7	<1.8	<59000
1,2-Dichloropropane	<0.64	<1.1	<1.3	<1.1	<1.3	<1.3	<1.2	<1.2	<1.4	<1.4	<51000
2 Butanone (MEK)	**2.7**	<4.3	<5.2	<4.4	<5.2	<5.1	<4.6	<4.8	<5.4	<5.5	<940000
2-Hexanone	<2.7	<4.7	<5.6	< 4.8	<5.6	<5.5	<4.9	<5.3	<5.9	<6	<250000
4-Methyl-2-pentanone (MIBK)	<2.7	<4.6	<5.5	< 4.7	<5.5	<5.4	<4.8	<5.2	<5.8	<5.8	<700000
Acetone	<4.3	<7.4	<839	<7.5	<8.8	<8.6	<7.8	<8.3	<9.2	**42**	<580000
Benzene	**11**	**7.1**	**11**	**4.8**	**8.7**	**10**	<1.1	**6.4**	**12**	**8.8**	<39000
Bromodichloromethane	<0.7	<1.2	<1.4	<1.2	<1.4	<1.4	<1.3	<1.3	<1.5	<1.5	<45000
Bromoform	<0.91	<1.6	<1.9	<1.6	<1.9	<1.8	<1.6	<1.8	<2	<2	<140000
Bromomethane	<1.8	<3.1	<3.8	<3.2	<3.7	<3.7	<3.3	<3.5	<3.9	<4	<240000
Carbon disulfide	<1.1	<1.8	<2.2	<1.9	<2.2	<2.2	<1.9	<2.1	<2.3	<2.3	<92000
Carbon tetrachloride	<0.5	<0.87	<1	<0.88	<1	<1	<0.91	<0.97	<1.1	<1.1	<45000
Chlorobenzene	**5.3**	<1.2	**3.0**	<1.2	**1.5**	**9.2**	<1.3	**1.6**	**2.9**	**4.5**	<59000
Chloroethane	<0.91	<1.6	<1.9	<1.6	<1.9	<1.8	<1.6	<1.8	<2	<2	<140000
Chloroform	<0.64	<1.1	<1.3	<1.1	<1.3	<1.3	<1.2	<1.2	<1.4	<1.4	<140000
Chloromethane	<0.75	<1.3	<1.6	<1.3	<1.5	<1.5	<1.4	<1.4	<1.6	<1.6	<200000
cis-1,2 Dichloroethene	**18**	**21**	**7.4**	**30**	**45**	**7.2**	**2.1**	<1.1	**7.7**	**12**	<75000
cis-1,3-Dichloropropene	<0.64	<1.1	<1.3	<1.1	<1.3	<1.3	<1.2	<1.2	<1.4	<1.4	<51000
Dibromochloromethane	<0.75	<1.3	<1.6	<1.3	<1.5	<1.5	<1.4	<1.4	<1.6	<1.6	<140000
Ethylbenzene	**0.8**	<0.92	<1.1	<0.93	<1.1	**1.2**	<0.97	<1	<1.2	**4.0**	**410,000**
Methylene chloride	<1.3	<2.2	<2.7	<2.2	<2.6	<2.6	<2.3	<2.5	<2.8	<2.8	<140000
Styrene	**0.7**	<1	<1.2	<1	<1.2	<1.2	<1.1	<1.1	<1.3	<1.3	<42000
Tetrachloroethene	**11**	**9.3**	**7.5**	**6.3**	**9.2**	**11**	<1.4	**2.9**	**7.6**	**11**	<80000
Toluene	**3.3**	**5.8**	**2.2**	<1.7	<2.0	**7.9**	<1.7	<1.9	<2.1	**30**	**4,600,000**
trans-1,2-Dichloroethene	<0.64	<1.1	<1.3	<1.1	<1.3	<1.3	<1.2	<1.2	<1.4	<1.4	<58000
trans-1,3-Dichloropropene	<0.86	<1.5	<1.8	<1.5	<1.8	<1.7	<1.6	<1.6	<1.8	<1.9	<37000
Trichloroethene	**23**	**17**	**17**	**14**	**24**	**27**	**6.4**	**8.1**	**20**	**20**	<140000
Vinyl Chloride	<0.75	<1.3	<1.6	<1.3	<1.5	<1.5	<1.4	<1.4	<1.6	<1.6	<140000
Xylenes, Total	**2.4**	<2.8	<3.3	<2.8	<3.3	**3.3**	<2.9	<3.1	<3.5	**23**	**2,300,000**

ug/kg = micrograms per kilogram
< indicates constituent not detected above detection limit shown
Bold type indicates constituent detected in sample

* DUP-11/17/03 is a duplicate sample of SSB-3 (0.5-2)
* DUP-11/18/03 is a duplicate sample of SSB-10 (10.5-12).

TABLE 2
SUMMARY OF GROUNDWATER ANALYTICAL DATA -OCTOBER 2004
Former Ashland Distribution Facility - Renssalaer, NY

Well ID	Sample Date	Benzene	PCE	TCE	1,1,1-TCA	cis-1,2-DCE	trans-1,2-DCE	1,1-DCE	1,1-DCA	1,2-DCA	Carbon Disulfide	Vinyl Chloride	Total VOCs
ON-SITE WELLS - SOUTH AND CENTRAL AREA													
MW-1	Oct-04	<25	2,300	260	150	1,200	<25	64	<25	<25	<25	<25	3,974
MW-13	Oct-04	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	ND
MW-15	Oct-04	19	4.3	9.2	<1	46	<1	<1	1.4	<1	<1	47	127
MW-19	Oct-04	<25	<25	62	<25	1600	<25	<25	130	<25	<25	2100	3892
MAX DETECTED		19	2,300	260	150	1,600	NA	64	130	NA	NA	2,100	NA
ON-SITE WELLS - NORTH AREA													
MW-3	Oct-04	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	1.2	1
MW-4	Oct-04	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	ND
MW-9	Oct-04	<1	<1	<1	<1	<1	<1	<1	2.2	<1	<1	<1	2
MW-10	Oct-04	<1	<1	<1	<1	1.5	<1	<1	<1	<1	<1	<1	1.5
MAX DETECTED		NA	NA	NA	NA	1.5	NA	NA	2.2	NA	NA	1.2	NA
OFF-SITE WELLS - DOWNGRADIENT													
MW-11	Oct-04	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	ND
MW-12S	Oct-04	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	ND
MW-12D	Oct-04	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	ND
MW-16	Oct-04	<1	<1	14	<1	340	<1	<1	<1	<1	<1	31	385
MW-17	Oct-04	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	ND
MW-18	Oct-04	<10	<10	<10	<10	830	15	<10	<10	36	<10	230	1111
MAX DETECTED		NA	NA	14	NA	830	15	NA	NA	36	NA	230	NA
OFF-SITE WELL - UPGRADIENT													
MW-14	Oct-04	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	ND

Definintions
All units are in micrograms per liter (ug/L).
NA = not applicable
Abbreviations:
1,1,1-TCA = 1,1,1-trichloroethane
1,1-DCA = 1,1-dichloroethane
1,1-DCE = 1,1-dichloroethene
1,2-DCA = 1,2-dichloroethane
cis-1,2-DCE = cis-1,2-dichloroethene
PCE = Tetrachloroethene
TCE = Trichloroethene
trans-1,2-DCE = trans-1,2-dichloroethene

TABLE 3

SOURCE TERM CONCENTRATIONS FOR CHEMICALS OF POTENTIAL CONCERN
Former Ashland Distribution Company Facility - Rensselaer, NY

Chemical of Potential Concern (COPC)	Media Specific Source Term Concentration		
	South and Central Area	North Area	Off-Site Groundwater
Soil (95% UCL)	**(mg/kg)**		
1,1,1-Trichloroethane	1.80E-02	7.86E-04	NA
1,1-Dichloroethane	2.70E-01	8.29E-04	NA
1,1-Dichloroethene	4.32E-02	NA	NA
Methyl Ethyl Keytone	6.89E-01	2.62E-03	NA
4-Methyl-2-pentanone (MIBK)	2.83E-01	NA	NA
Acetone	2.98E+00	4.20E-01*	NA
Benzene	6.24E+00	1.00E-02	NA
Carbon disulfide	3.01E-02	NA	NA
Carbon tetrachloride	4.20E-03	NA	NA
Chlorobenzene	2.65E-02	4.57E-03	NA
Chloroform	3.39E-02	NA	NA
cis-1,2-Dichloroethene	6.07E+01	2.31E-02	NA
Ethylbenzene	7.99E-02	2.47E-03	NA
Methylene chloride	3.88E-02	NA	NA
Styrene	1.24E-02	6.28E-04	NA
Tetrachloroethene	2.13E+00	9.69E-03	NA
Toluene	2.46E-01	1.25E-02	NA
trans-1,2-Dichloroethene	6.19E-01	NA	NA
Trichloroethene	2.91E+00	2.15E-02	NA
Vinyl Chloride	1.19E+00	NA	NA
Xylenes, Total	3.52E-01	1.32E-02	NA
Groundwater (max)**	**(ug/L)**		
1,1,1-Trichloroethane	1.50E+02	NA	NA
1,1-Dichloroethane	1.30E+02	2.20E+00	NA
1,1-Dichloroethene	6.40E+01	NA	NA
1,2-Dichloroethane	NA	NA	3.60E+01
Benzene	1.90E+01	NA	NA
cis-1,2-Dichloroethene	1.60E+03	1.50E+00	8.30E+02
trans-1,2-Dichloroethene	NA	NA	1.50E+01
Tetrachloroethene	2.30E+03	NA	NA
Trichloroethene	2.60E+02	NA	1.40E+01
Vinyl Chloride	2.10E+03	1.20E+00	2.30E+02

Notes:

*Maximum Concentration in Area (less than 95% UCL)
**Concentration is maximum detected in Area during October 2004 sampling event.
mg/kg = milligrams per kilogram
NA = Not applicable
ug/l = micrograms per liter

TABLE 4

EXPOSURE POINT CONCENTRATIONS FOR CHEMICALS OF POTENTIAL CONCERN
Former Ashland Distribution Company Facility - Rensselaer, NY

Chemical of Potential Concern (COPC)	Outdoor Air			Dermal Contact and Incidental Ingestion		
	South and Central Area	North Area	Off-Site Groundwater	South and Central Area	North Area	Off-Site Groundwater
Soil (95% UCL)	(mg/m^3)			(mg/kg)		
1,1,1-Trichloroethane	1.71E-05	7.49E-07	NA	1.80E-02	7.86E-04	NA
1,1-Dichloroethane	2.45E-04	7.52E-07	NA	2.70E-01	8.29E-04	NA
1,1-Dichloroethene	5.89E-05	NA	NA	4.32E-02	NA	NA
Methyl Ethyl Keytone	1.12E-04	4.28E-07	NA	6.89E-01	2.62E-03	NA
4-Methyl-2-pentanone (MIBK)	6.21E-05	NA	NA	2.83E-01	NA	NA
Acetone	5.19E-04	7.32E-05	NA	2.98E+00	4.20E-01*	NA
Benzene	5.29E-03	8.52E-06	NA	6.24E+00	1.00E-02	NA
Carbon disulfide	4.77E-05	NA	NA	3.01E-02	NA	NA
Carbon tetrachloride	4.48E-06	NA	NA	4.20E-03	NA	NA
Chlorobenzene	1.08E-05	1.86E-06	NA	2.65E-02	4.57E-03	NA
Chloroform	2.94E-05	NA	NA	3.39E-02	NA	NA
cis-1,2-Dichloroethene	4.75E-02	1.81E-05	NA	6.07E+01	2.31E-02	NA
Ethylbenzene	3.74E-05	1.15E-06	NA	7.99E-02	2.47E-03	NA
Methylene chloride	3.40E-05	NA	NA	3.88E-02	NA	NA
Styrene	2.39E-06	1.21E-07	NA	1.24E-02	6.28E-04	NA
Tetrachloroethene	1.92E-03	8.71E-06	NA	2.13E+00	9.69E-03	NA
Toluene	1.69E-04	8.53E-06	NA	2.46E-01	1.25E-02	NA
trans-1,2-Dichloroethene	5.86E-04	NA	NA	6.19E-01	NA	NA
Trichloroethene	2.15E-03	1.59E-05	NA	2.91E+00	2.15E-02	NA
Vinyl Chloride	2.02E-03	NA	NA	1.19E+00	NA	NA
Xylenes, Total	1.59E-04	5.99E-06	NA	3.52E-01	1.32E-02	NA
Groundwater** (max)	(mg/m^3)			(ug/L)		
1,1,1-Trichloroethane	1.06E-04	NA	NA	1.50E+02	NA	NA
1,1-Dichloroethane	2.91E-05	4.92E-07	NA	1.30E+02	2.20E+00	NA
1,1-Dichloroethene	7.91E-05	NA	NA	6.40E+01	NA	NA
1,2-Dichloroethane	NA	NA	2.11E-06	NA	NA	3.60E+01
Benzene	4.97E-06	NA	NA	1.90E+01	NA	NA
cis-1,2-Dichloroethene	2.61E-04	2.45E-07	1.35E-04	1.60E+03	1.50E+00	8.30E+02
trans-1,2-Dichloroethene	NA	NA	5.31E-06	NA	NA	1.50E+01
Tetrachloroethene	1.61E-03	NA	NA	2.30E+03	NA	NA
Trichloroethene	1.12E-04	NA	6.03E-03	2.60E+02	NA	1.40E+01
Vinyl Chloride	3.44E-04	1.80E-06	3.44E-04	2.10E+03	1.20E+00	2.30E+02

Notes:

*Based on Maximum Concentration in Area (less than 95% UCL)
**Based on maximum concentration in Area during October 2004 sampling event.
mg/kg = milligrams per kilogram
mg/m3 = milligrams per cubic meter
NA = Not applicable
ug/l = micrograms per liter

TABLE 5
EXPOSURE PARAMETERS FOR ON-SITE AND OFF-SITE WORKERS
Former Ashland Distribution Facility - Renssalaer, NY

Exposure Parameters	Units	INDOOR WORKER EXPOSURE SCENARIO	
		Worker	Source
Inhalation Rate of Air (IhR)	m^3/hour	0.833	USEPA 1989[1]
Exposure Frequency (EF)	days/year	250	USEPA 1991
Exposure Duration (ED)	years	25	USEPA 1991
Exposure Time (ET)	hours/day	8	Default
Body Weight (BW)	kg	70	USEPA 1991
Averaging Time for Noncarcinogens (AT_{nc})	days	9,125	USEPA 1989 (ED*365 dys/yr)
Averaging Time for Carcinogens (AT_c)	days	25,550	USEPA 1989
Inhalation Intake factor, carcinogens (IhIFc)	m3/kg-day	2.33E-02	Calculated
Inhalation Intake factor, noncarcinogens (IhIFnc)	m3/kg-day	6.52E-02	Calculated

Equations used:
IhIFc = (IhR * ET * EF * ED) / (BW * ATc)
IhIFnc = (IhR * ET * EF * ED) / (BW * ATnc)

[1] adult breathing rate (20 m^3/day) pro-rated over 24 hours

TABLE 6
EXPOSURE PARAMETERS FOR HYPOTHETICAL RESIDENTIAL RECEPTORS
Former Ashland Distribution Facility - Renssalaer, NY

Exposure Parameters	Units	RESIDENTIAL EXPOSURE SCENARIO		
		Adult	Child	Source
Inhalation Rate of Air (IhR)	m^3/hour	0.833	0.417	USEPA 1989[1]
Exposure Frequency (EF)	days/year	350	350	USEPA 1991
Exposure Duration (ED)	years	24	6	USEPA 1991
Exposure Time (ET)	hours/day	24	24	USEPA 1991
Body Weight (BW)	kg	70	15	USEPA 1991
Averaging Time for Noncarcinogens (ATnc)	days	8,760	2,190	USEPA 1989 (ED*365 dys/yr)
Averaging Time for Carcinogens (ATc)	days	25,550	25,550	USEPA 1989
Ingestion Rate of Soil (IgR)	mg/day	100	200	USEPA 1991
Skin Surface Area (SA)	cm^2/day	5,700	2,800	USEPA 2004
Adherence Factor (AF)	mg/cm^2	0.07	0.20	USEPA 2004
Soil-to-Skin Absorption Factor (ABS)	unitless	0.15	0.15	USEPA 2004
Conversion Factor I (CF1)	kg/mg	1.E-06	1.E-06	Conversion Factor
Conversion Factor 2 (CF2)	day/hr	4.17E-02	4.17E-02	Conversion Factor
Inhalation Intake factor, carcinogens (IhIFc)	m^3/kg-day	9.39E-02	5.48E-02	Calculated
Inhalation Intake factor, noncarcinogens (IhIFnc)	m^3/kg-day	2.74E-01	6.40E-01	Calculated
Ingestion Intake factor, carcinogens (IngFc)	kg/kg-day	4.70E-07	1.10E-06	Calculated
Ingestion Intake factor, noncarcinogens (IngFnc)	kg/kg-day	1.37E-06	1.28E-05	Calculated
Dermal Intake factor, carcinogens (DerFc)	kg/kg-day	2.81E-07	4.60E-07	Calculated
Dermal Intake factor, noncarcinogens (DerFnc)	kg/kg-day	8.20E-07	5.37E-06	Calculated

Equations used:
IhIFc = (IhR * ET * EF * ED) / (BW * ATc)
IhIFnc = (IhR * ET * EF * ED) / (BW * ATnc)
IngFc = (IgR * ET * EF * ED * CF1 * CF2) / (BW * ATc)
IngFnc = (IgR * ET * EF * ED * CF1 * CF2) / (BW * ATnc)
DerFc = (SA * AF * ABS * ET * EF * ED * CF1 * CF2) / (BW * ATc)
DerFnc = (SA * AF * ABS * ET * EF * ED * CF1 * CF2) / (BW * ATnc)

[1] adult and child breathing rates (20 m^3/day and 10 m^3/day) prorated over 24 hours

TABLE 7
CHEMICAL SPECIFIC TOXICITY DATA

Compound	RfDo mg/kg/d	ref.	RfDi mg/kg/d	ref.	CSFo 1/mg/kg/d	ref.	CSFi 1/mg/kg/d	ref.
VOCs								
1,1,1-Trichloroethane	2.80E-01	E	6.30E-01	P	NA		NA	
1,1-Dichloroethane	2.00E-01	P	1.40E-01	A	NA		NA	
1,1-Dichloroethene	5.00E-02	I	6.00E-02	I	NA		NA	
1,2-Dichloroethane	2.00E-02	P	7.00E-01	M	9.10E-02	I	9.10E-02	I
1,2-Dichloroethylene (cis)	1.00E-02	P	NA		NA		NA	
1,2-Dichloroethylene (trans)	2.00E-02	I	1.7E-02	P	NA		NA	
Acetone	9.00E-01	I	NA		NA		NA	
Benzene	4.00E-03	I	8.6E-03	I	5.5E-02	I	2.7E-02	I
Carbon Disulfide	1.00E-01	I	2.00E-01	I	NA		NA	
Carbon Tetrachloride	7.00E-04	I	5.00E-02	M	1.30E-01	I	5.30E-02	I
Chlorobenzene	2.00E-02	I	1.7E-02	E	NA		NA	
Ethylbenzene	1.00E-01	I	2.90E-01	I	NA		NA	
Methyl Ethyl Keytone	6.00E-01	I	1.40E+00	I	NA		NA	
Methylene Chloride	6.00E-02	I	3.00E-01	M	7.50E-03	I	1.65E-03	I
MIBK	NA		8.60E-01	I	NA		NA	
Styrene	2.00E-01	I	2.86E-01	I	NA		NA	
Tetrachloroethylene	1.00E-02	I	1.4E-01	E	5.4E-01	O	2.00E-02	O
Toluene	2.00E-01	I	1.14E-01	I	NA		NA	
Trichloroethylene	3.00E-04	E	1.00E-02	E	4.00E-01	E	4.00E-01	E
Vinyl Chloride[1]	3.00E-03	I	2.8E-02	I	1.40E+00	I	3.00E-02	I
Vinyl Chloride[2]	3.00E-03	I	2.8E-02	I	7.20E-01	I	1.5E-02	I
Xylenes, total	2.00E-01	I	3.00E-02	I	NA		NA	

1 = in early life
2 = adult
A = HEAST
E = EPA-NCEA provisional value
I = IRIS
M = ATSDR MRL (chronic)
O = Other
P = EPA provisional peer-reviewed value

TABLE 8
SUMMARY OF NONCANCER HAZARD AND CANCER RISK FOR ON-SITE WORKERS (CURRENT USE)
Former Ashland Distribution Company Facility - Renssalaer, KY

Exposure Route	Inhalation Soil Vapor (Outdoor Air)		Incidental Ingestion Soil		Dermal Contact Soil		Inhalation GW Vapor (Outdoor Air)		Receptor Total	
CURRENT USE	Noncancer Hazard	Cancer Risk	Noncancer Hazard	Cancer Risk	Noncancer Hazard	Cancer Risk	Noncancer Hazard	Cancer Risk	Noncancer Hazard	Cancer Risk
Indoor Worker - South and Central Area										
1,1,1-Trichloroethane	5.3E-06	NA	NA	NA	NA	NA	3.3E-05	NA	3.8E-05	NA
1,1-Dichloroethane	3.4E-04	NA	NA	NA	NA	NA	4.1E-05	NA	3.8E-04	NA
1,1-Dichloroethene	1.9E-04	NA	NA	NA	NA	NA	2.6E-04	NA	4.5E-04	NA
Methyl Ethyl Keytone	1.6E-05	NA	NA	NA	NA	NA	NA	NA	1.6E-05	NA
4-Methyl-2-pentanone (MIBK)	1.4E-05	NA	NA	NA	NA	NA	NA	NA	1.4E-05	NA
Acetone	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Benzene	1.2E-01	1E-05	NA	NA	NA	NA	1.1E-04	9E-09	1.2E-01	1E-05
Carbon disulfide	4.7E-05	NA	NA	NA	NA	NA	NA	NA	4.7E-05	NA
Carbon Tetrachloride	1.8E-05	2E-08	NA	NA	NA	NA	NA	NA	1.8E-05	2E-08
Chlorobenzene	1.2E-04	NA	NA	NA	NA	NA	NA	NA	1.2E-04	NA
Chloroform	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
cis-1,2-Dichloroethene	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Ethylbenzene	2.5E-05	NA	NA	NA	NA	NA	NA	NA	2.5E-05	NA
Methylene chloride	2.2E-05	4E-09	NA	NA	NA	NA	NA	NA	2.2E-05	4E-09
Styrene	1.6E-06	NA	NA	NA	NA	NA	NA	NA	1.6E-06	NA
Tetrachloroethene	2.7E-03	3E-06	NA	NA	NA	NA	2.2E-03	2E-06	4.9E-03	5E-06
Toluene	2.9E-04	NA	NA	NA	NA	NA	NA	NA	2.9E-04	NA
trans-1,2-Dichloroethene	6.7E-03	NA	NA	NA	NA	NA	NA	NA	6.7E-03	NA
Trichloroethene	4.2E-02	6E-05	NA	NA	NA	NA	2.2E-03	3E-06	4.4E-02	6E-05
Vinyl Chloride	1.4E-02	2E-06	NA	NA	NA	NA	2.4E-03	4E-07	1.7E-02	2E-06
Xylenes, Total	1.0E-03	NA	NA	NA	NA	NA	NA	NA	1.0E-03	NA
Receptor Total =	**1.9E-01**	**7E-05**					**7.3E-03**	**6E-06**		
							Cumulative Noncancer Hazard (all pathways) =		2.0E-01	
							Cumulative cancer risk (all pathways) =			**8E-05**
Outdoor Worker - North Area										
1,1,1-Trichloroethane	2.3E-07	NA	NA	NA	NA	NA	NA	NA	2.3E-07	NA
1,1-Dichloroethane	1.1E-06	NA	NA	NA	NA	NA	6.9E-07	NA	1.7E-06	NA
Methyl Ethyl Keytone	6.0E-08	NA	NA	NA	NA	NA	NA	NA	6.0E-08	NA
Acetone	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Benzene	1.9E-04	2E-08	NA	NA	NA	NA	NA	NA	1.9E-04	2E-08
Chlorobenzene	2.1E-05	NA	NA	NA	NA	NA	NA	NA	2.1E-05	NA
cis-1,2-Dichloroethene	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Ethylbenzene	7.8E-07	NA	NA	NA	NA	NA	NA	NA	7.8E-07	NA
Styrene	8.3E-08	NA	NA	NA	NA	NA	NA	NA	8.3E-08	NA
Tetrachloroethene	1.2E-05	1E-08	NA	NA	NA	NA	NA	NA	1.2E-05	1E-08
Toluene	1.5E-05	NA	NA	NA	NA	NA	NA	NA	1.5E-05	NA
Trichloroethene	3.1E-04	4E-07	NA	NA	NA	NA	NA	NA	3.1E-04	4E-07
Xylenes, Total	3.9E-05	NA	NA	NA	NA	NA	NA	NA	3.9E-05	NA
Vinyl Chloride	NA	NA	NA	NA	NA	NA	1.3E-05	2E-09	1.3E-05	2E-09
Receptor Total =	**5.9E-04**	**5E-07**	**NA**	**NA**	**NA**	**NA**	**1.3E-05**	**2E-09**		
							Cumulative Noncancer Hazard (all pathways) =		6.1E-04	
							Cumulative cancer risk (all pathways) =			**5E-07**

TABLE 9

SUMMARY OF NONCANCER HAZARD AND CANCER RISK FOR OFF-SITE WORKERS (CURRENT USE)

Former Ashland Distribution Company Facility - Renssalaer, KY

Exposure Route	Inhalation Soil Vapor (Outdoor Air)		Incidental Ingestion Soil		Dermal Contact Soil		Inhalation GW Vapor (Outdoor Air)		Receptor Total	
CURRENT USE	Noncancer Hazard	Cancer Risk	Noncancer Hazard	Cancer Risk	Noncancer Hazard	Cancer Risk	Noncancer Hazard	Cancer Risk	Noncancer Hazard	Cancer Risk
Outdoor Worker - Off-Site Groundwater										
1,2-dichloroethane	NA	NA	NA	NA	NA	NA	5.9E-07	1E-08	5.9E-07	1E-08
cis-1,2-Dichloroethene	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
trans-1,2-Dichloroethene	NA	NA	NA	NA	NA	NA	1.2E-04	2E-07	1.2E-04	2E-07
Trichloroethene							6.1E-05	NA	6.1E-05	NA
Vinyl Chloride	NA	NA	NA	NA	NA	NA	2.4E-03	4E-07	2.4E-03	4E-07
Receptor Total =	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**2.6E-03**	**5E-07**		
							Cumulative Noncancer Hazard (all pathways) =		**2.6E-03**	
							Cumulative cancer risk (all pathways) =			**5E-07**

TABLE 10

SUMMARY OF NONCANCER HAZARD AND CANCER RISK FOR ON-SITE RESIDENTS (HYPOTHETICAL FUTURE USE)

Former Ashland Distribution Facility - Renssalaer, KY

Exposure Route	Inhalation Soil Vapor (Outdoor Air)		Incidental Ingestion Soil		Dermal Contact Soil		Inhalation GW Vapor (Outdoor Air)		Receptor Total	
HYPOTHETICAL FUTURE RESIDENT	Noncancer Child Hazard	Cancer Risk	Noncancer Child Hazard	Cancer Risk	Noncancer Child Hazard	Cancer Risk	Noncancer Hazard	Cancer Risk	Noncancer Hazard	Cancer Risk
Hypothetical Resident - South and Central Area										
1,1,1-Trichloroethane	1.7E-05	NA	8.2E-07	NA	3.5E-07	NA	1.1E-04	NA	1E-04	NA
1,1-Dichloroethane	1.1E-03	NA	1.7E-05	NA	7.3E-06	NA	1.3E-04	NA	1E-03	NA
1,1-Dichloroethene	6.3E-04	NA	1.1E-05	NA	4.6E-06	NA	8.4E-04	NA	1E-03	NA
Methyl Ethyl Keytone	5.1E-05	NA	1.5E-05	NA	6.2E-06	NA	NA	NA	7E-05	NA
4-Methyl-2-pentanone (MIBK)	4.6E-05	NA	NA	NA	NA	NA	NA	NA	5E-05	NA
Acetone	NA	NA	4.2E-05	NA	1.8E-05	NA	NA	NA	6E-05	NA
Benzene	3.9E-01	2E-05	2.0E-02	5E-07	8.4E-03	3E-07	3.7E-04	2E-08	4E-01	2E-05
Carbon disulfide	1.5E-04	NA	3.8E-06	NA	1.6E-06	NA	NA	NA	2E-04	NA
Carbon Tetrachloride	5.7E-05	4E-08	7.7E-05	9E-10	3.2E-05	4E-10	NA	NA	2E-04	4E-08
Chlorobenzene	4.1E-04	NA	1.7E-05	NA	7.1E-06	NA	NA	NA	4E-04	NA
Chloroform	NA	NA	4.3E-05	NA	1.8E-05	NA	NA	NA	6E-05	NA
cis-1,2-Dichloroethene	NA	NA	7.8E-02	NA	3.3E-02	NA	NA	NA	1E-01	NA
Ethylbenzene	8.3E-05	NA	1.0E-05	NA	4.3E-06	NA	NA	NA	1E-04	NA
Methylene chloride	7.3E-05	8E-09	8.3E-06	5E-10	3.5E-06	2E-10	NA	NA	8E-05	9E-09
Styrene	5.3E-06	NA	7.9E-07	NA	3.3E-07	NA	NA	NA	6E-06	NA
Tetrachloroethene	8.8E-03	6E-06	2.7E-03	2E-06	1.1E-03	9E-07	7.3E-03	5E-06	2E-02	1E-05
Toluene	9.5E-04	NA	1.6E-05	NA	6.6E-06	NA	NA	NA	1E-03	NA
trans-1,2-Dichloroethene	2.2E-02	NA	4.0E-04	NA	1.7E-04	NA	NA	NA	2E-02	NA
Trichloroethene	1.4E-01	1E-04	1.2E-01	2E-06	5.2E-02	9E-07	7.2E-03	7E-06	3E-01	1E-04
Vinyl Chloride	4.6E-02	6E-06	5.1E-03	2E-06	2.1E-03	1E-06	7.9E-03	1E-06	6E-02	1E-05
Xylenes, Total	3.4E-03	NA	2.2E-05	NA	9.4E-06	NA	NA	NA	3E-03	NA
Total for Pathway	**6.2E-01**	**2E-04**	**2.3E-01**	**6E-06**	**9.7E-02**	**3E-06**	**2.4E-02**	**1E-05**		
							Cumulative Noncancer Hazard (all pathways) =		9.7E-01	
							Cumulative cancer risk (all pathways) =			**2E-04**
Hypothetical Resident - North Area										
1,1,1-Trichloroethane	7.6E-07	NA	3.6E-08	NA	1.5E-08	NA	NA	NA	8.1E-07	NA
1,1-Dichloroethane	3.4E-06	NA	5.3E-08	NA	2.2E-08	NA	2.2E-06	NA	5.8E-06	NA
Methyl Ethyl Keytone	2.0E-07	NA	5.6E-08	NA	2.3E-08	NA	NA	NA	2.7E-07	NA
Acetone	NA	NA	6.0E-06	NA	2.5E-06	NA	NA	NA	8.5E-06	NA
Benzene	6.3E-04	3.E-08	3.2E-05	9.E-10	1.3E-05	4.E-10	NA	NA	6.8E-04	4.E-08
Chlorobenzene	7.0E-05	NA	2.9E-06	NA	1.2E-06	NA	NA	NA	7.4E-05	NA
cis-1,2-Dichloroethene	NA	NA	3.0E-05	NA	1.2E-05	NA	NA	NA	4.2E-05	NA
Ethylbenzene	2.5E-06	NA	3.2E-07	NA	1.3E-07	NA	NA	NA	3.0E-06	NA
Styrene	2.7E-07	NA	4.0E-08	NA	1.7E-08	NA	NA	NA	3.3E-07	NA
Tetrachloroethene	4.0E-05	3.E-08	1.2E-05	8.E-09	5.2E-06	4.E-09	NA	NA	5.7E-05	4.E-08
Toluene	4.8E-05	NA	8.0E-07	NA	3.3E-07	NA	NA	NA	4.9E-05	NA
Trichloroethene	1.0E-03	9.E-07	9.2E-04	1.E-08	3.9E-04	6.E-09	NA	NA	2.3E-03	1.E-06
Vinyl Chloride	NA	NA	NA	NA	NA	NA	4.1E-05	5.E-09	4.1E-05	5.E-09
Xylenes, Total	1.3E-04	NA	8.4E-07	NA	3.5E-07	NA	NA	NA	1.3E-04	NA
Total for Pathway	**1.9E-03**	**1E-06**	**1.0E-03**	**2E-08**	**4.2E-04**	**1E-08**	**4.3E-05**	**5E-09**		
							Cumulative Noncancer Hazard (all pathways) =		3.4E-03	
							Cumulative cancer risk (all pathways) =			1E-06

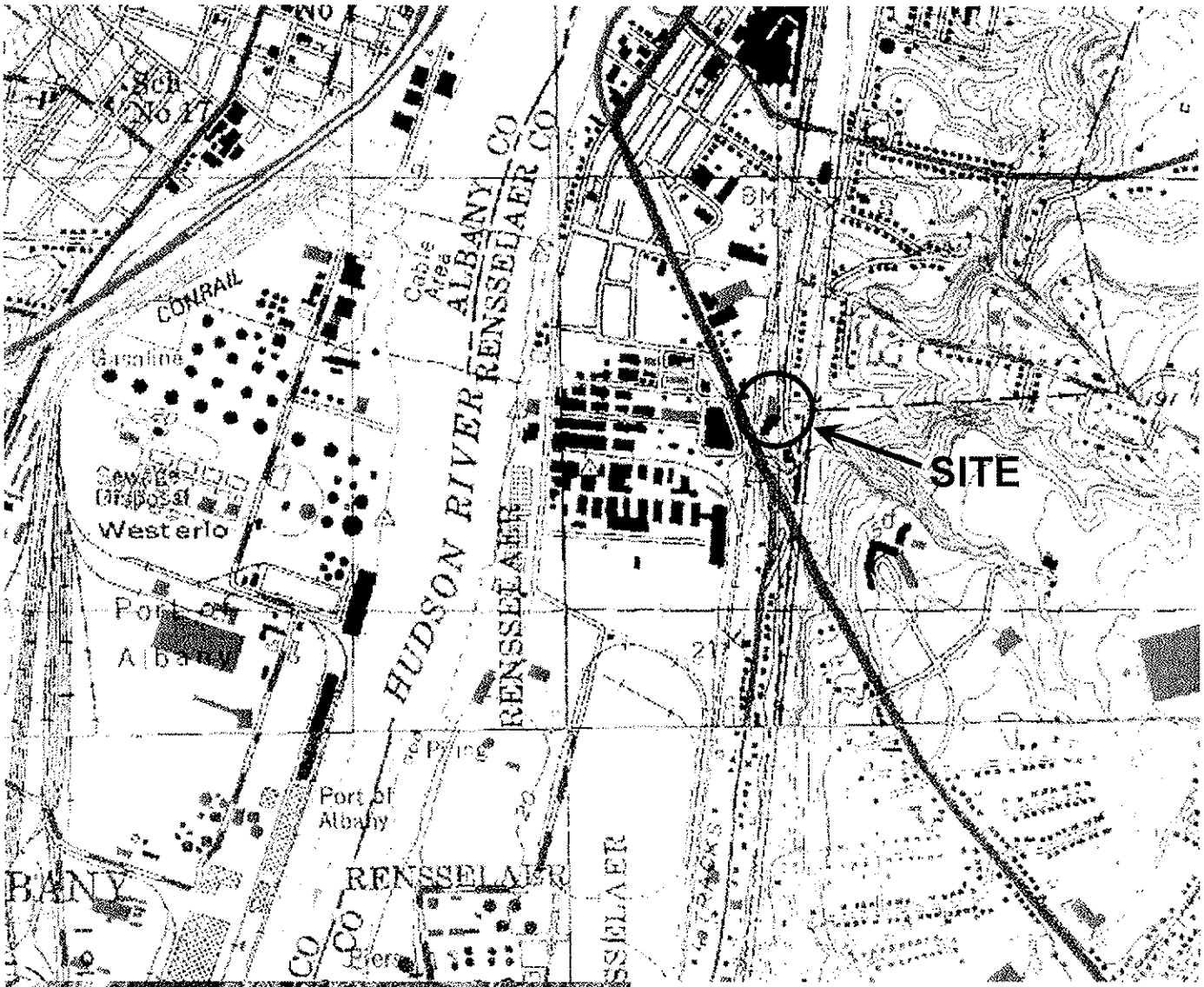
TABLE 11

SUMMARY OF NONCANCER HAZARD AND CANCER RISKS - OFF-SITE RESIDENTS (HYPOTHETICAL FUTURE USE)

Former Ashland Distribution Company Facility - Renssalaer, KY

Exposure Route	Inhalation Soil Vapor (Outdoor Air)		Incidental Ingestion Soil		Dermal Contact Soil		Inhalation GW Vapor (Outdoor Air)		Receptor Total	
HYPOTHETICAL FUTURE RESIDENT	Noncancer Child Hazard	Cancer Risk	Noncancer Child Hazard	Cancer Risk	Noncancer Child Hazard	Cancer Risk	Noncancer Child Hazard	Cancer Risk	Noncancer Hazard	Cancer Risk
Hypothetical Resident - Off-Site Groundwater										
1,2-dichloroethane	NA	NA	NA	NA	NA	NA	1.9E-06	3E-08	1.9E-06	3E-08
cis-1,2-Dichloroethene	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Trichloroethene	NA	NA	NA	NA	NA	NA	3.9E-04	NA	3.9E-04	NA
trans-1,2-Dichloroethene	NA	NA	NA	NA	NA	NA	2.0E-04	4E-07	2.0E-04	4E-07
Vinyl Chloride	NA	NA	NA	NA	NA	NA	7.9E-03	1E-06	7.9E-03	1E-06
Receptor Total =	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**8.5E-03**	**1E-06**		
							Cumulative Noncancer Hazard (all pathways) =		**8.5E-03**	
							Cumulative cancer risk (all pathways) =			**1E-06**

FIGURES





Topographic Map: Albany and Troy South Quadrangles.
Photorevised 1980.

0 2000 4000

SCALE IN FEET

URS

6519 Lake Bonita Road
Catlettsburg, Kentucky
Phone: 606-739-0136

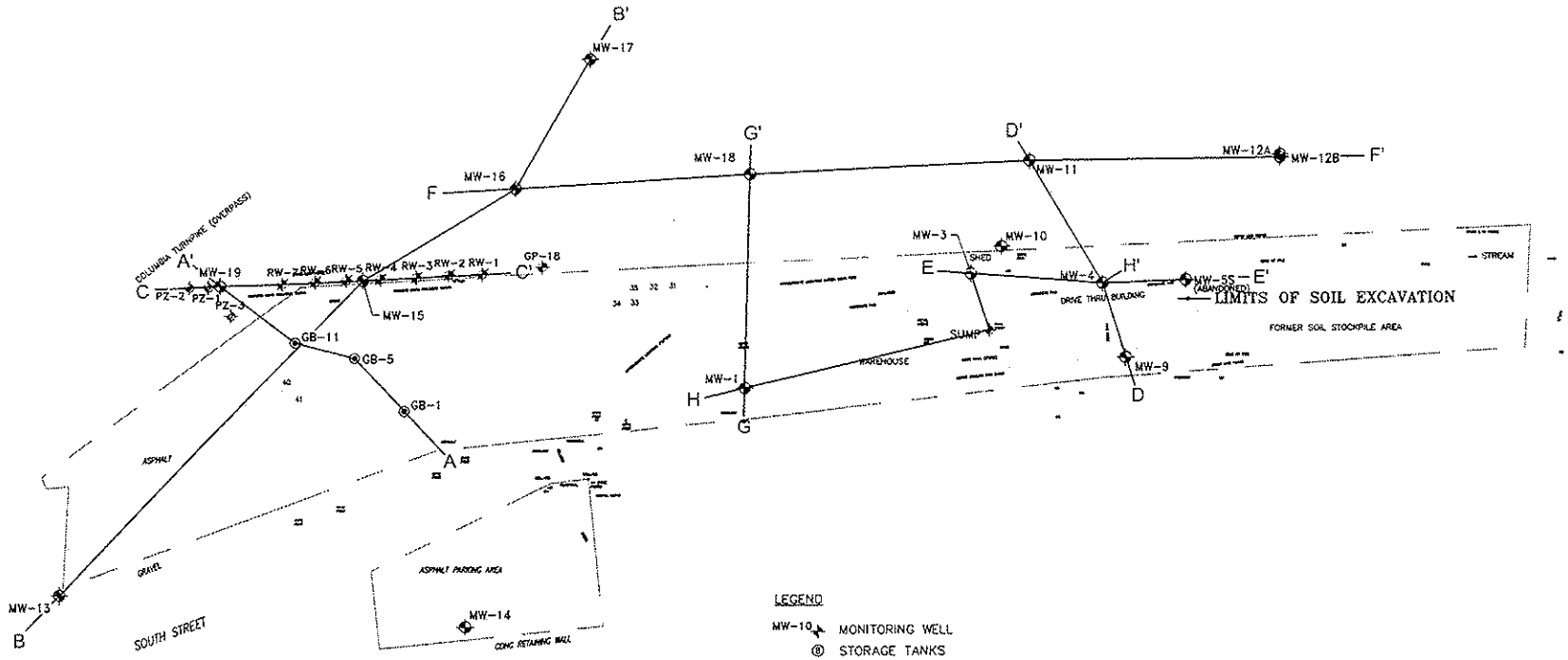
FIGURE 1

SITE LOCATION MAP

RENSSELAER, NEW YORK

NOTES:

1. Base mapping prepared by ABD Engineers & Surveyors from a July 1996 field survey.
2. Survey shown is subject to any subsurface easements, restrictions or conditions that exist, if any.
3. Underground utilities are shown from field location if possible. Others are shown from record data. Their exact location may be different from that as shown and others may exist.
4. This survey has been prepared in accordance with the code of practice for land surveys adopted by the New York State Association of Professional Land Surveyors as last revised January, 1993
5. Elevations based on USGS datum.
6. This survey was prepared without the benefit of an up to date abstract of title or title report and is subject to any statement of fact that such abstract of title or title report may reveal.



LEGEND

- MW-10 — MONITORING WELL
- (B) — STORAGE TANKS
- RW-3 — RECOVERY WELL
- GP-33 — *IN-SITU* GROUNDWATER SAMPLE LOCATION (MAY 2001)
- GB-11 — APPROXIMATE SOIL BORING LOCATION FROM T.M. GATES (1990)
- ——— CROSS SECTION LOCATIONS

SCALE: 1" = 100'

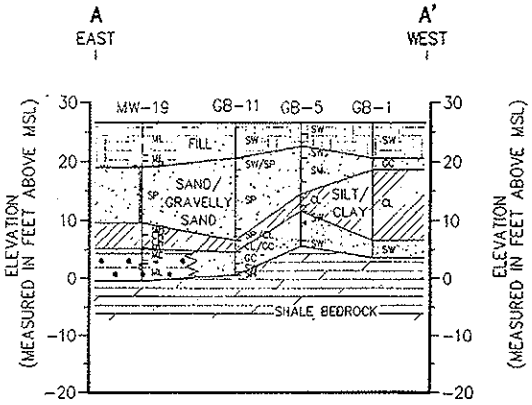
0 100
SCALE 1" = 100'

NOTE:
REVISION MADE BY MDO, CATLETTSBURG URS-DIAMOND OFFICE ON FEBRUARY 25, 2003

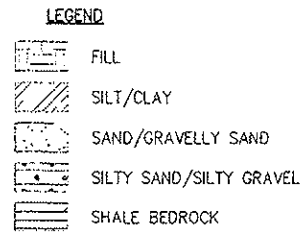
ASHLAND INC. FACILITY
Rensselaer, New York

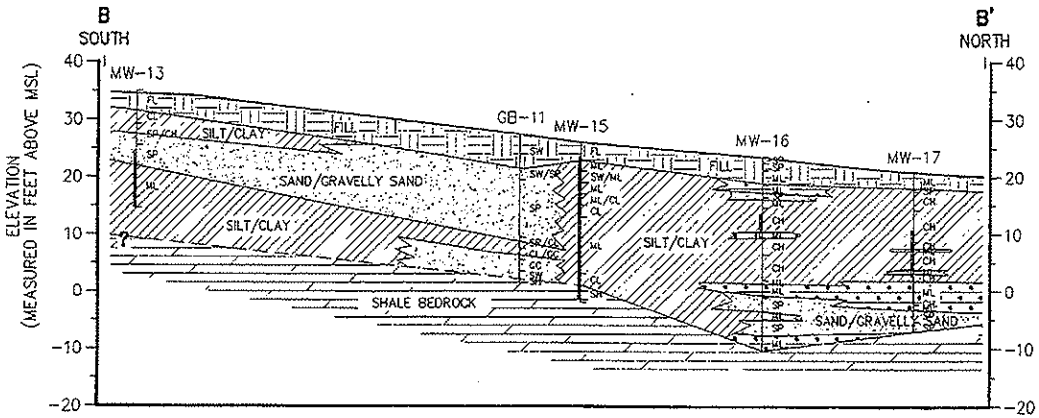
Figure 3
Key to Geologic Cross Sections

URS

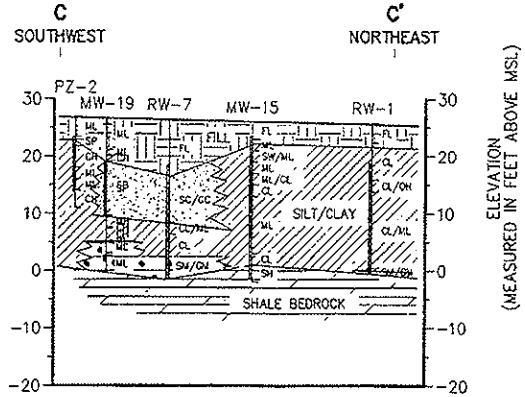


GENERALIZED GEOLOGIC CROSS SECTION A-A'





GENERALIZED GEOLOGIC CROSS SECTION B-B'



GENERALIZED GEOLOGIC CROSS SECTION C-C'

REFERENCE DRAWING:
DRAWING REFERENCED FROM
ESC GENERALIZED CROSS SECTION
A-A', B-B', & C-C' (MARCH 13, 2002)

5:1 VERTICAL EXAGGERATION

VERTICAL SCALE (FEET)
20 0 20

HORIZONTAL SCALE (FEET)
100 0 100

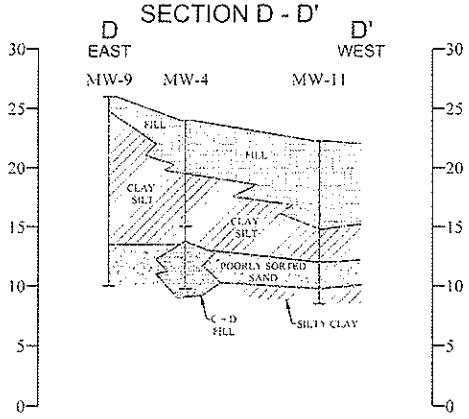
URS

FIGURE 4
GENERALIZED CROSS SECTIONS
A - A', B - B', AND C - C'

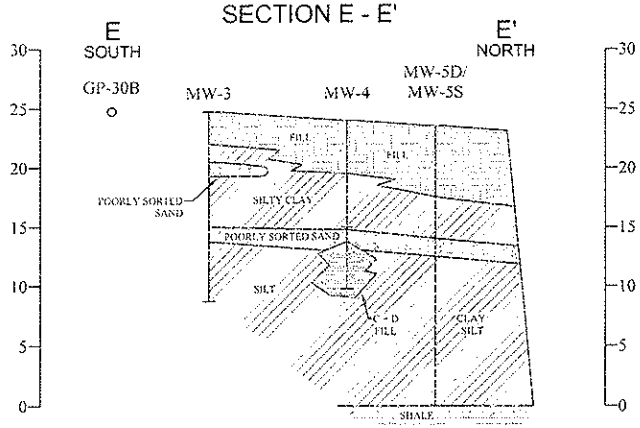
ASHLAND INC, FACILITY
RENSSELAER, NEW YORK

DRAWN BY: MDO	DATE DRAWN: 03/24/03
REVIEWED BY: JR	DATE REVIEWED: 03/24/03
SCALE: AS SHOWN	PLOT DATE:
NOTES: SCAN FROM ESC CROSS SECTION A-A', B-B', & C-C'	
REVISED BY:	REV. DATE:
REVISED BY:	REV. DATE:

SECTION D - D'



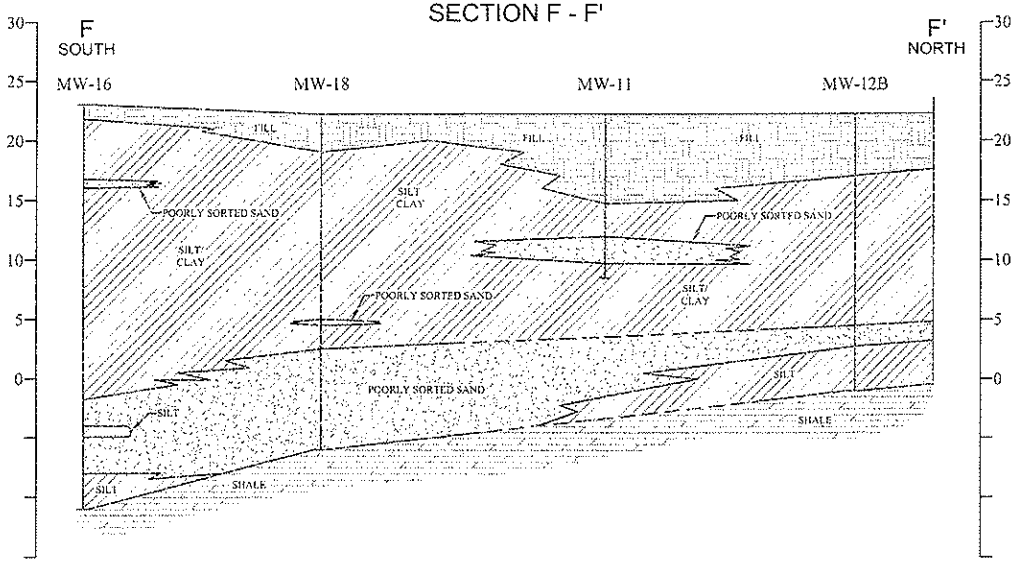
SECTION E - E'



LEGEND

- FILL
- SILT / CLAY
- SAND / GRAVELLY SAND
- SILTY SAND / SILTY GRAVEL
- SHALE BEDROCK
- C AND D FILL

SECTION F - F'



VERTICAL SCALE (FEET)

20 0 20

HORIZONTAL SCALE (FEET)

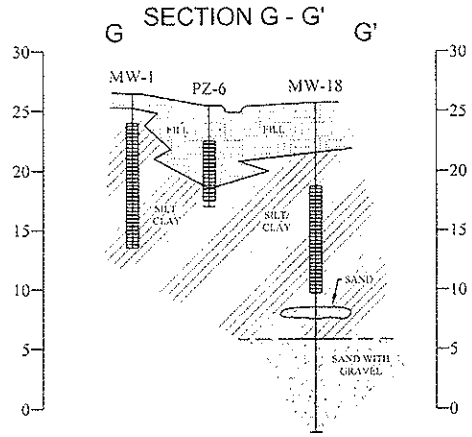
100 0 100

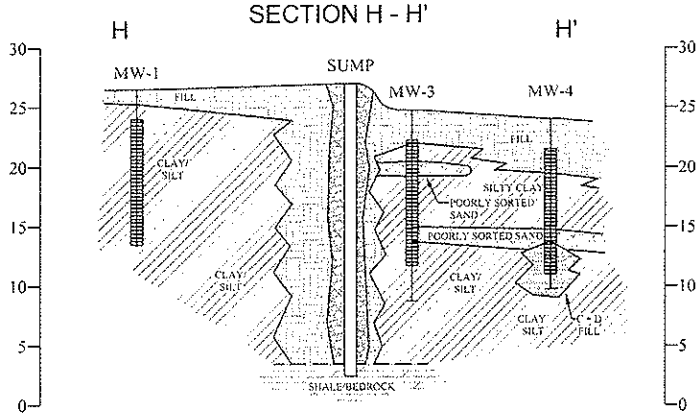
URS

FIGURE 5
GENERALIZED CROSS SECTION
D - D', E - E', AND F - F'

ASHLAND INC. FACILITY
RENSSELEAR, NEW YORK

DRAWN BY: MDO	DATE DRAWN: 03/17/03
REVIEWED BY: JR	DATE REVIEWED: ??/??/??
SCALE: AS SHOWN	PLOT DATE: ??/??/??
NOTES:	
REVISED BY:	REV. DATE:
REVISED BY:	REV. DATE:





LEGEND

- FILL
- SILT / CLAY
- SAND / GRAVELLY SAND
- SILTY SAND / SILTY GRAVEL
- SHALE BEDROCK
- C AND D FILL
- GRAVEL FILL

VERTICAL SCALE (FEET)

20 0 20

HORIZONTAL SCALE (FEET)

100 0 100

URS

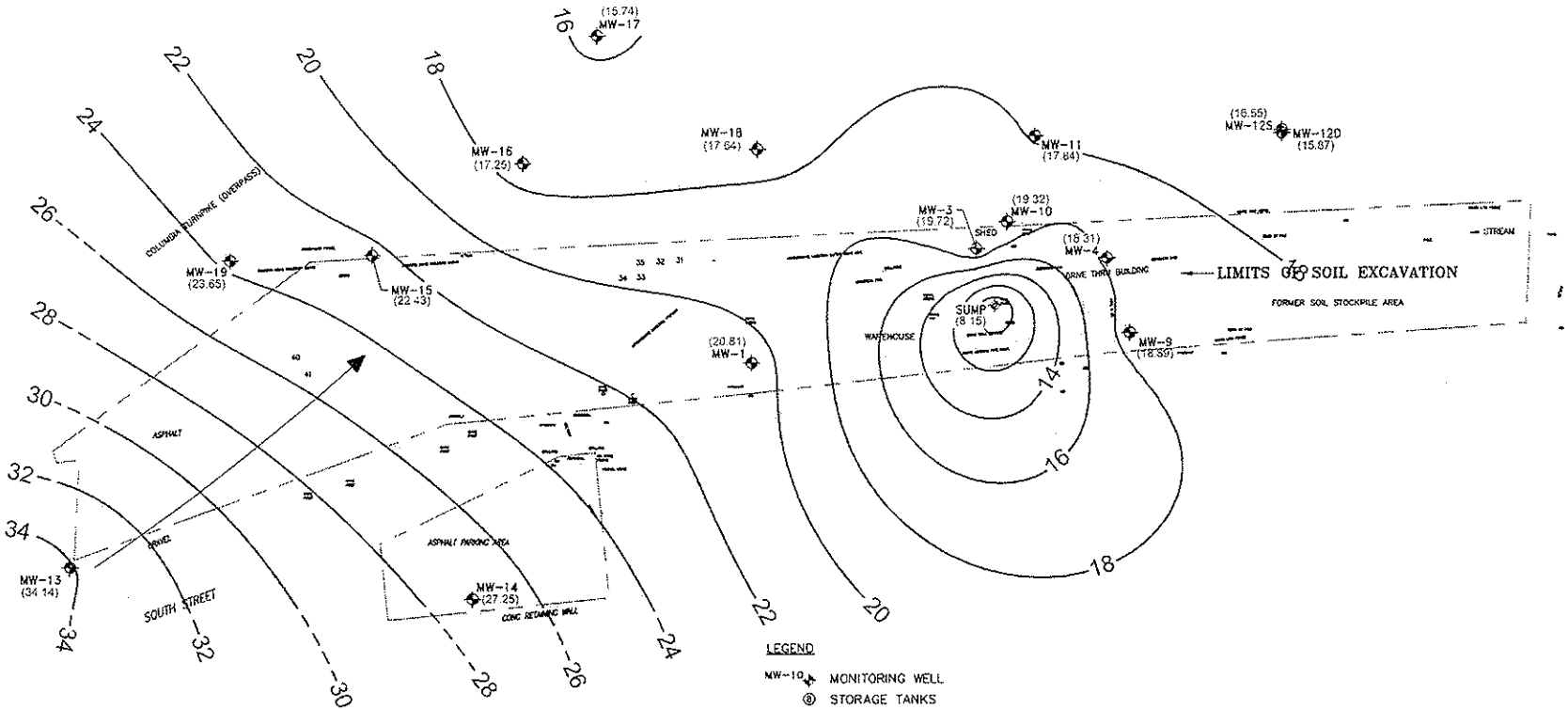
FIGURE 6
GENERALIZED CROSS SECTION
G - G' AND H - H'

ASHLAND INC. FACILITY
RENSSELEAR, NEW YORK

DRAWN BY: MDO	DATE DRAWN: 07/21/03
REVIEWED BY: JR	DATE REVIEWED:
SCALE: AS SHOWN	PLOT DATE:
NOTES:	
REVISED BY:	REV. DATE:
REVISED BY:	REV. DATE:

NOTES:

1. Base mapping prepared by ABD Engineers & Surveyors from a July 1996 field survey.
2. Survey shown is subject to any subsurface easements, restrictions or conditions that exist, if any.
3. Underground utilities are shown from field location if possible. Others are shown from record data. Their exact location may be different from that as shown and others may exist.
4. This survey has been prepared in accordance with the code of practice for land surveys adopted by the New York State Association of Professional Land Surveyors as last revised January, 1993
5. Elevations based on USGS datum.
6. This survey was prepared without the benefit of an up to date abstract of title or title report and is subject to any statement of fact that such abstract of title or title report may reveal.



LEGEND

- MW-10 ⊕ MONITORING WELL
- ⊛ STORAGE TANKS
- (20.81) GROUNDWATER ELEVATION (10/12/04)
- 24 GROUNDWATER CONTOUR LINE (Dashed Where Infered)

REFERENCE:
T.M. GATES, INC.'s STATUS REPORT FOR ASHLAND CHEMICAL (CAS FACILITY, DATED SEPTEMBER 15, 1987, DRAWING TITLED, "FACILITY PLOT PLAN," FIGURE 2. SCALE: 1" = 100'

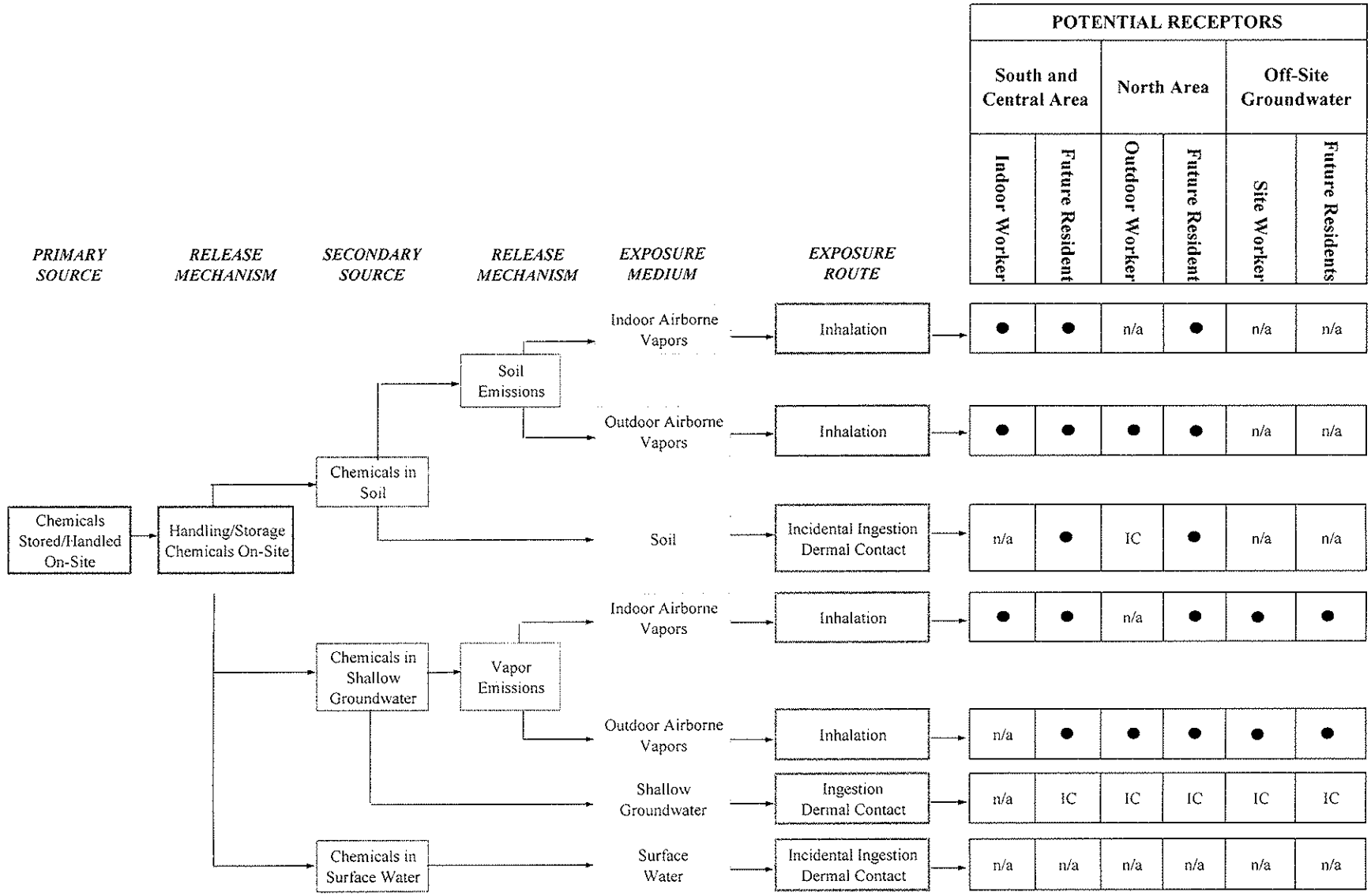
0 100
SCALE 1" = 100'

NOTE:
REVISION MADE BY MCD, CARLETTSBURG URS-DIAMOND OFFICE ON JULY 10, 2003

ASHLAND INC. FACILITY
Rensselaer, New York

Figure 7
Groundwater Elevation Contour Map
OCTOBER 12, 2004

URS



Legend:

- ● Potentially complete pathway
- ○ Minor or insignificant pathway
- IC Incomplete pathway
- na Not Applicable to the Scenario

Project No. 37679447	***Former Ashland Distribution Facility Rensselaer, NY***	***SITE CONCEPTUAL EXPOSURE MODEL***	*8*
	URS Corporation		

APPENDIX A

FATE AND TRANSPORT MODELING RESULTS

AND RISK ASSESSMENT CALCULATION

APPENDIX A

FATE AND TRANSPORT MODELING

All chemicals of potential concern (COPCs) identified for the former Ashland Chemical Distribution facility in Renssalaer, New York (the site) can be considered to be volatile at ambient temperature. Chemical migration rates to and/or concentrations at an exposure point of concern can be estimated using mathematical models or other evaluation techniques. This section examines these pathways, migration rates, and interactions.

Chemical, physical, and meteorological processes can affect the fate and transport of chemicals in water, soil, and air. The extent to which a chemical migrates in the environment is dependent on the physical and chemical properties of the individual chemicals, the physical and chemical properties of the soil, and factors such as ambient temperature and wind speed. The potential volatilization of chemicals from soil and groundwater is calculated in the following sections.

The approach described in the following sections was used to estimate the volatile emission rates of volatile organic compounds (VOCs) detected in soil and groundwater at the site. The 95 percent upper confidence limit on the mean concentration (95%UCL) in soil and maximum groundwater VOC concentrations (Tables A-3 and A-4) were used as source terms to model vapor releases.

A.1 Migration of Chemicals from Soil to Outdoor Air

Potential emissions of COPCs from soil to outdoor air, and the resulting exposure point concentrations were estimated using Equation 8: *Derivation of the Volatilization Factor*, as presented in Section 2.5.2 of the *Soil Screening Guidance: User's Guide* (USEPA, 1996). Default parameters for the Philidelphia Area (climate zone VIII) were used (e.g., the Q/C term, which is the dispersion coefficient in units of grams per square meter-second per kilogram per cubic meter [g/m^2-s per kg/m^3]). The Q/C term was generated using the Industrial Source Complex model and varies depending on the source area, city, and climatic zone. The default Q/C value of 70.14 g/m^2-s per kg/m^3 was selected for modeling air mixing. This generic default value represents the inverse of the mean concentration at the center of a 2-acre square source in Philidelphia (USEPA, 1996). Using this Q/C term, volatilization factors (VFs) were calculated for each COPC. The model input parameter values are shown in Table A-1. The calculated soil-to-outdoor air VFs were used to estimate outdoor exposure point concentrations for outdoor workers and residents.

A.2 Migration of Chemicals from Groundwater to Outdoor Air

The methods selected to estimate groundwater to outdoor air volatilization and migration were obtained from the American Society of Testing and Materials' (ASTM) Standard Guide for Risk-Based Corrective Action (RBCA; ASTM, 2000). These methods are consistent with U.S. Environmental Protection Agency (U.S. EPA) risk assessment guidance (U.S. EPA, 1992). The equations used to estimate $VF_{gw,amb}$, which represents the relationship between outdoor air and dissolved groundwater concentrations, are described in page 63 (Volatilization Factor: ground water to ambient vapor inhalation) and page 64 (1. Effective Diffusion Coefficient: averaged value – water table to soil surface; 2. Effective Diffusion Coefficient in homogeneous soil layers) of RBCA. The model input parameter values are shown in Table A-2. The calculated groundwater-to-outdoor air VFs were used to estimate outdoor exposure point concentrations for outdoor workers and residents.

A.4 References

American Society of Testing and Materials (ASTM). 2000 . Standard Guide for Risk-Based Corrective Action. E:2081-00. West Conshohocken, PA.

U.S. Environmental Protection Agency (EPA). 1992. Assessing Potential Indoor Ambient Air Impacts for Superfund Sites. Air Superfund National Technical Guidance Study Series. Research Triangle Park, North Carolina. Office of Air Quality Planning and Standards.

U.S. Environmental Protection Agency (EPA). 1996. Soil Screening Guidance: User's Guide. EPA/540/R-96/018. Office of Emergency and Remedial Response, Washington DC. NTIS PB 96.9634501.

TABLE A-1
CALCULATION OF SOIL SOURCE TERM CONCENTRATIONS - SOUTH AND CENTRAL AREA
Former Ashland Distribution Facility - Renssalaer, NY

	Location	Sampling Interval (ft bgs)	1,1 Dichloroethane	1,1,1-Trichloroethane	1,1-Dichloroethene	2 Butanone (MEK)	2-Hexanone	4-Methyl-2-pentanone (MIBK)	Acetone	Benzene	Carbon disulfide	Chlorobenzene	Chloroform	cis-1,2 Dichloroethene	Ethylbenzene	Methylene chloride	Styrene	Tetrachloroethene	Toluene	trans-1,2-Dichloroethene	Trichloroethene	Vinyl Chloride	Xylenes, Total
SOUTH AREA	SSB-1	0.5-2	<1.2	1.5	<2.1	<5.8	<6.3	<6.2	21	8.1	<2.5	2.1	<1.5	8.7	<1.2	<3	<1.4	5.0	<2.2	<1.5	9.4	1.8	<3.7
	SSB-2	0.5-1.5	<6.4	<5.2	<11	<30	<33	<32	140	38	<13	<8.3	<7.7	630	<6.4	<15	<7	74	<12	23	320	110	<19
	SSB-3	0.5-2	880	<86	<250	<1600	<440	<1200	<1000	6,800	<160	<100	<250	82,000	<86	<250	<74	280	370	650	3,000	1,400	370
	*DUP-11/17/03		<5.6	7.4	<9.6	<26	<29	<28	57	680	25	<7.3	<6.7	12,000	19	<13	<6.2	440	120	110	6,100	250	120
	SSB-4	0.5-1.5	220	13	40	<29	<31	32	13,000	120	21	<7.9	<7.3	41,000	150	<15	<6.7	10	2.9	880	800	1,500	510
	SSB-5	0-1.5	6.4	26	<1.9	<5.3	<5.8	<5.6	<9	7.7	5.9	<1.5	13	43	77	9.3	1.7	4,700	8.0	3.6	170	3.0	94
CENTRAL AREA	SSB-6	1-2	<10	<7.9	<22	280	<40	<110	640	46	18	18	<22	610	18	23	9.2	750	33	21	220	55	230
	SSB-6	2-3	<1.1	7.3	<1.8	39	76	<5.4	320	34	2	8.4	<1.3	120	3.1	<2.6	2.4	410	5.5	2.3	53	12	36
	SSB-7	0.5-1.5	7.2	<4.6	<9.6	<26	<29	<28	78	23	<11	<7.3	<6.7	710	<5.6	<13	<6.2	20	<10	24	210	320	<17
	SSB-7	2-3.5	100	<8.1	<23	230	<42	<120	<240	26	<15	11	<23	22,000	<8.1	<23	<7	61	17	260	350	480	<23
	SSB-8	0.5-2	<5.3	<4.3	<9	<25	<27	<26	<42	29	<11	<6.9	<6.4	620	<5.3	<13	<5.8	36	16	24	100	33	5.2
	SSB-8	5-6.5	2.3	3.2	<2	<5.5	<6	<5.8	<9.4	8.6	<2.3	1.6	<1.4	29	<1.2	<2.8	<1.3	<1.8	<2.1	<1.4	28	2.7	<3.5

Number of Valid Samples	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12
Number of Unique Samples	12	12	11	11	11	11	11	12	11	11	11	12	11	9	10	12	12	11	12	12	12	12
Minimum	0.55	1.5	0.9	2.65	2.9	2.7	4.5	7.7	1.15	0	0.65	8.7	0.6	1.3	0.65	0.9	1.05	0.7	9.4	1.80	1.75	
Maximum	880	43	125	800	220	600	13000	6800	80	50	125	82000	150	125	37	4700	370	880	6100	1500	510	
Mean	103	9.7	18	119	35	68	1242	652	15	9.2	15	13314	27	17	6	566	49	167	947	347	117	
Median	4.1	3.75	4.8	13.75	15	14	99	31.5	6.2	3.8	3.5	625	3.625	7	3.1	67.5	7	23.5	215	82.50	23.75	
Standard Deviation	253.47	12.57	35.51	234.42	61.36	168.71	3708.59	1945	21.97	13.77	34.91	25059	44.99	34.42	10.02	1323	106.40	293.20	1820	537.19	168.31	
95% UCL	270	18	43	689	84	283	2976	6239	30	26	34	60658	80	39	12	2132	246	619	2914	1189	352	
Recommended UCL calc. method	1	2	2	1	1	1	1	6	2	6	1	7	7	1	1	7	1	7	7	7	7	
	99%			99%		99%	99%	99%									99%					

Notes:

1 Chebyshev (MVUE)
2 Approximate Gamma
2 Approximate Gamma
4 Chebyshev (MVUE)
5 Chebyshev (MVUE)
6 Chebyshev (Mean, Sd)
7 Adjusted Gamma

TABLE A-2
CALCULATION OF SOIL SOURCE TERM CONCENTRATIONS - NORTH AREA
Former Ashland Distribution Facility - Renssalaer, NY

	Location	Sampling Interval (ft bgs)	1,1 Dichloroethane	1,1,1-Trichloroethane	2 Butanone (MEK)	Acetone	Benzene	Chlorobenzene	cis-1,2 Dichloroethene	Ethylbenzene	Styrene	Tetrachloroethene	Toluene	Trichloroethene	Xylenes, Total
N	SSB-9	1-2	<0.54	**0.9**	**2.7**	<4.3	**11**	**5.3**	**18**	**0.8**	**0.7**	**11**	**3.3**	**23**	**2.4**
O	SSB-9	9.5-10.5	<0.92	**1.0**	<4.3	<7.4	**7.1**	<1.2	**21**	<0.92	<1	**9.3**	**5.8**	**17**	<2.8
R	SSB-10	1-2	<1.1	**1.2**	<5.2	<839	**11**	**3.0**	**7.4**	<1.1	<1.2	**7.5**	**2.2**	**17**	<3.3
T	SSB-10	10.5-12	<0.93	<0.76	<4.4	<7.5	**4.8**	<1.2	**30**	<0.93	<1	**6.3**	<1.7	**14**	<2.8
H	*DUP-11/18/03		<1.1	<0.89	<5.2	<8.8	**8.7**	**1.5**	**45**	<1.1	<1.2	**9.2**	<2.0	**24**	<3.3
	SSB-11	1-2	<1.1	<0.87	<5.1	<8.6	**10**	**9.2**	**7.2**	**1.2**	<1.2	**11**	**7.9**	**27**	**3.3**
A	SSB-11	7-8	<0.97	<0.79	<4.6	<7.8	<1.1	<1.3	**2.1**	<0.97	<1.1	<1.4	<1.7	**6.4**	<2.9
	SSB-12	1-2	<1	<0.84	<4.8	<8.3	**6.4**	**1.6**	<1.1	<1	<1.1	**2.9**	<1.9	**8.1**	<3.1
R	SSB-12	5.5-6.5	<1.2	<0.94	<5.4	<9.2	**12**	**2.9**	**7.7**	<1.2	<1.3	**7.6**	<2.1	**20**	<3.5
E	SSB-13	1-2	**1.6**	<0.95	<5.5	**42**	**8.8**	**4.5**	**12**	**4.0**	<1.3	**11**	**30**	**20**	**23**
A	SSB-13	3-4	<66000	<49000	<940000	<580000	<39000	<59000	<75000	**410,000**	<42000	<80000	**4,600,000**	<140000	**2,300,000**

The following stats do NOT include SSB-13, 3-4:

Number of Valid Samples	10	10	10	10	10	10	10	10	10	10	10	10	10
Number of Unique Samples	8	10	8	10	9	9	10	9	5	8	9	8	8
Minimum	0.27	0.38	2.15	2.15	0.55	0.6	0.55	0.46	0.5	0.7	0.85	6.4	1.4
Maximum	1.6	1.2	2.75	419.5	12	9.2	45	4	0.7	11	30	27	23
Mean	0.603	0.612	2.495	49.245	8.035	2.985	15.095	0.961	0.59	7.65	5.39	17.65	3.955
Median	0.525	0.4575	2.575	4.225	8.75	2.25	9.85	0.55	0.6	8.4	1.625	18.5	1.65
Standard Deviation	0.36169	0.30095	0.21788	130.647	3.467792	2.733338	13.8484	1.091525	0.065828	3.51986	8.979662	6.66121	6.717822
95% UCL	**0.82939**	**0.78646**	**2.6213**	**460.316**	**10.04521**	**4.569465**	**23.1227**	**2.465563**	**0.628159**	**9.6904**	**12.45517**	**21.5114**	**13.21488**
Recommended UCL calc. method	1	2	2	3 ***	2	2	2	3	2	2	4	2	3

Notes:

1 Mod-t, Adjusted for skewness
2 Student's-t
3 Chebyshev (Mean, Sd)
4 Approximate Gamma
***The recommended UCL exceeds the max (419.5) for acetone.

TABLE A-3
CALCULATION OF GROUNDWATER SOURCE TERM CONCENTRATIONS
Former Ashland Distribution Facility - Renssalaer, NY

Well ID	Sample Date	Benzene	PCE	TCE	1,1,1-TCA	cis-1,2-DCE	trans-1,2-DCE	1,1-DCE	1,1-DCA	1,2-DCA	Carbon Disulfide	Vinyl Chloride	Total VOCs
ON-SITE WELLS - SOUTH AND CENTRAL AREA													
MW-1	Oct-04	<25	2,300	260	150	1,200	<25	64	<25	<25	<25	<25	3,974
MW-13	Oct-04	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	ND
MW-15	Oct-04	19	4.3	9.2	<1	46	<1	<1	1.4	<1	<1	47	127
MW-19	Oct-04	<25	<25	62	<25	1600	<25	<25	130	<25	<25	2100	3892
MAX DETECTED		19	2,300	260	150	1,600	NA	64	130	NA	NA	2,100	NA
ON-SITE WELLS - NORTH AREA													
MW-3	Oct-04	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	1.2	1
MW-4	Oct-04	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	ND
MW-9	Oct-04	<1	<1	<1	<1	<1	<1	<1	2.2	<1	<1	<1	2
MW-10	Oct-04	<1	<1	<1	<1	1.5	<1	<1	<1	<1	<1	<1	1.5
MAX DETECTED		NA	NA	NA	NA	1.5	NA	NA	2.2	NA	NA	1.2	NA
OFF-SITE WELLS - DOWNGRADIENT													
MW-11	Oct-04	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	ND
MW-12S	Oct-04	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	ND
MW-12D	Oct-04	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	ND
MW-16	Oct-04	<1	<1	14	<1	340	<1	<1	<1	<1	<1	31	385
MW-17	Oct-04	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	ND
MW-18	Oct-04	<10	<10	<10	<10	830	15	<10	<10	36	<10	230	1111
MAX DETECTED		NA	NA	14	NA	830	15	NA	NA	36	NA	230	NA
OFF-SITE WELL - UPGRADIENT													
MW-14	Oct-04	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	ND

Definintions
All units are in micrograms per liter (ug/L).
NA = not applicable
Abbreviations:
1,1,1-TCA = 1,1,1-trichloroethane
1,1-DCA = 1,1-dichloroethane
1,1-DCE = 1,1-dichloroethene
1,2-DCA = 1,2-dichloroethane
cis-1,2-DCE = cis-1,2-dichloroethene
PCE = Tetrachloroethene
TCE = Trichloroethene
trans-1,2-DCE = trans-1,2-dichloroethene

TABLE A-4
VOLATILIZATION FACTOR FOR CHEMCIALS OF POTENTIAL CONCERN IN SOIL
Former Ashland Distribution Facility - Renssalear, New York

Soil Parameters	Value Used	Units	Reference
Water filled soil porosity (Theta w)	7.60E-02	(Lwater-Lsoil)	Recommended value for LS soil in USEPA (2002) Indoor Air Guidance
Total soil porosity (n)	3.99E-01	(Lpore-Lsoil)	Recommended value for LS soil in USEPA (2002) Indoor Air Guidance
Air filled soil porosity (Theta a)	3.23E-01	(Lair-Lsoil)	Calculated (n - Theta w)
Soil particle density (ρs)	2.65E+00	g/cm^3	Default value, USEPA 1996
Exposure Interval (T)	7.88E+08	sec	Assume 25 years duration (USEPA 1991)
Soil Bulk Density (Pb)	1.59	g/cm^3	Calculated from soil porosity and solid density: $Pb = \rho_s (1 - n)$; $\rho_s = 2.65$
Fraction organic carbon in soil (foc)	2.0E-03	unitless	Use default value from spreadsheet model (no TOC samples available)
Inverse of mean concentration (Q/C)	70.14	(g/m^2-s per kg/m^3)	Default for a 2-acre site in Phillidelphia (zone VIII) (USEPA 1996)

Compound	Diffusivity in air (Di)	Henry's Law Const (H')	Diffusivity in water (Dw)	Soil-water partition coefficient (Kd)	Soil organic carbon partition coefficient (Koc)	Fraction organic content in soil (foc)	Apparent Diffusivity (Da)	Volatilization Factor (VF)
1,1,1-Trichloroethane	7.8E-02	7.1E-01	8.8E-06	2.7E-01	1.4E+02	2.0E-03	1.1E-02	1.1E+03
1,1-Dichloroethane	7.4E-02	2.3E-01	1.1E-05	6.3E-02	3.2E+01	2.0E-03	9.9E-03	1.1E+03
1,1-Dichloroethene	9.0E-02	1.1E+00	1.0E-05	1.3E-01	6.5E+01	2.0E-03	2.2E-02	7.3E+02
Methyl Ethyl Keytone	8.1E-02	2.3E-03	9.8E-06	4.6E-03	2.3E+00	2.0E-03	3.2E-04	6.1E+03
4-Methyl-2-pentanone (MIBK)	7.5E-02	5.6E-03	7.8E-06	1.8E-02	9.1E+00	2.0E-03	5.8E-04	4.6E+03
Acetone	1.2E-01	1.6E-03	1.1E-05	1.2E-03	5.8E-01	2.0E-03	3.7E-04	5.7E+03
Benzene	8.8E-02	2.3E-01	9.8E-06	1.2E-01	5.9E+01	2.0E-03	8.6E-03	1.2E+03
Carbon disulfide	1.0E-01	1.2E+00	1.0E-05	9.1E-02	4.6E+01	2.0E-03	3.0E-02	6.3E+02
Carbon Tetrachloride	7.8E-02	1.2E+00	8.8E-06	3.5E-01	1.7E+02	2.0E-03	1.4E-02	9.4E+02
Chlorobenzene	7.3E-02	1.6E-01	8.7E-06	4.4E-01	2.2E+02	2.0E-03	2.0E-03	2.5E+03
Chloroform	1.0E-01	1.5E-01	1.0E-05	8.0E-02	4.0E+01	2.0E-03	9.0E-03	1.2E+03
cis-1,2-Dichloroethene	7.4E-02	1.7E-01	1.1E-05	7.1E-02	3.6E+01	2.0E-03	7.3E-03	1.3E+03
Ethylbenzene	7.5E-02	3.2E-01	7.8E-06	7.3E-01	3.6E+02	2.0E-03	2.6E-03	2.1E+03
Methylene chloride	1.0E-01	9.0E-02	1.2E-05	2.3E-02	1.2E+01	2.0E-03	9.2E-03	1.1E+03
Styrene	7.1E-02	1.1E-01	8.0E-06	1.6E+00	7.8E+02	2.0E-03	4.5E-04	5.2E+03
Tetrachloroethene	7.2E-02	7.5E-01	8.2E-06	3.1E-01	1.6E+02	2.0E-03	9.7E-03	1.1E+03
Toluene	8.7E-02	2.7E-01	8.6E-06	2.8E-01	1.4E+02	2.0E-03	5.6E-03	1.5E+03
trans-1,2-Dichloroethene	7.1E-02	3.9E-01	1.2E-05	1.1E-01	5.3E+01	2.0E-03	1.1E-02	1.1E+03
Trichloroethene	7.9E-02	4.2E-01	9.1E-06	3.3E-01	1.7E+02	2.0E-03	6.5E-03	1.4E+03
Vinyl Chloride	1.1E-01	1.1E+00	1.2E-05	3.7E-02	1.9E+01	2.0E-03	3.5E-02	5.9E+02
Xylenes, Total	7.7E-02	3.1E-01	8.4E-06	7.8E-01	3.9E+02	2.0E-03	2.5E-03	2.2E+03

VF = Q/C * ((3.14 * Da * T)1/2 * 10-4)/(2 * Pb * Da))

Da = [(Thetaa^10/3*Di*H')+(Thetaw^10/3*Dw)/n^2]/[(Pb*Kd)+Thetaw+(Thetaa*H)]

TABLE A-5
VOLATILIZATION FACTOR FOR CHEMICALS OF POTENTIAL CONCERN IN GROUNDWATER
Former Ashland Distribution Facility - Renssalaer, NY

Soil Parameters	Value Used	Units	Reference
Total soil porosity (n)	3.99E-01	(Lpore-Lsoil)	Recommended value for LS soil in USEPA (2002) Indoor Air Guidance
Fraction of unionzed chemical in water (UF)	1.00E+00	unilless	Default model input paramter (ASTM 2000)
Ambient air velocity in mixing zone (U_{air})	2.25E+02	cm/s	Default model input paramter (ASTM 2000)
Mixing zone height (δ_{air})	2.00E+02	cm	Default model input paramter (ASTM 2000)
Source-zone area (A)	2.03E+07	cm^2	Default model input paramter (ASTM 2000)
width of source-zone area (W)	4.50E+03	cm	Default model input paramter (ASTM 2000)
Disperson factor for ambient air (DF_{amb})	1.00E+01	$(g\text{-}cm^4/s)/(g/cm^3)$	Intermediate calculation
Depth to groundwater (L_{gw})	9.14E+01	cm	Highest measured groundwater elevation (3 ft bgs)
Capillary zone thickness (h_{cap})	1.88E+01	cm	Calculated by USEPA spreadsheet model for indoor air vapor intrusion
Vadoze zone thickness (h_{vad})	7.26E+01	cm	Difference between h_{vad} and h_{cap}
Soil water content - capillary fringe region (θ_{wcap})	3.03E-01	$(cm^3\text{-water})/(cm^3\text{-soil})$	Calculated by USEPA spreadsheet model for indoor air vapor intrusion
Soil water content - vadose zone (θ_{wvad})	7.60E-02	$(cm^3\text{-water})/(cm^3\text{-soil})$	Recommended value for LS soil in USEPA (2002) Indoor Air Guidance
Soil air content - capillary fringe region (θ_{acap})	9.60E-02	$(cm^3\text{-air})/(cm^3\text{-soil})$	Difference between n and θ_{wcap}
Soil air content - vadose zone (θ_{avad})	3.23E-01	$(cm^3\text{-air})/(cm^3\text{-soil})$	Difference between n and θ_{wvad}

Compound	Diffusivity in air (Di)	Henry's Law Const (H')	Effective Henry's Law Constant (H_{eff})	Diffusivity in water (Dw)	Effective Diffusivity - Capillary Fringe Zone ($D_{eff,cap}$)	Effective Diffusivity - Vadose Zone Soil ($D_{eff,vad}$)	Effective Diffusivity - Avg. Water TableTo Surface ($D_{eff,ws}$)	Volatilization Factor (VF) (cm^3-water/ cm^3-air)
1,1,1-Trichloroethane	7.80E-02	7.05E-01	7.05E-01	8.80E-06	2.0E-04	1.1E-02	9.2E-04	7.1E-07
1,1-Dichloroethane	7.4E-02	2.3E-01	2.30E-01	1.1E-05	1.96E-04	1.08E-02	8.90E-04	2.24E-07
1,1-Dichloroethene	9.0E-02	1.1E+00	1.1E+00	1.0E-05	2.3E-04	1.3E-02	1.1E-03	1.2E-06
1,2-dichloroethane	1.0E-01	4.0E-02	4.0E-02	9.9E-06	3.0E-04	1.5E-02	1.3E-03	5.9E-08
Benzene	8.8E-02	2.3E-01	2.3E-01	9.8E-06	2.3E-04	1.3E-02	1.0E-03	2.6E-07
cis-1,2-Dichloroethene	7.4E-02	1.7E-01	1.7E-01	1.1E-05	2.0E-04	1.1E-02	8.9E-04	1.6E-07
Tetrachloroethene	7.2E-02	7.5E-01	7.5E-01	8.2E-06	1.9E-04	1.0E-02	8.5E-04	7.0E-07
trans-1,2-Dichloroethene	7.1E-02	3.9E-01	3.9E-01	1.2E-05	1.8E-04	1.0E-02	8.4E-04	3.5E-07
Trichloroethene	7.9E-02	4.2E-01	4.2E-01	9.1E-06	2.1E-04	1.2E-02	9.3E-04	4.3E-07
Vinyl Chloride	1.1E-01	1.1E+00	1.1E+00	1.2E-05	2.7E-04	1.5E-02	1.2E-03	1.5E-06

$D_{effcap} = (Di * \theta_{acap}^{10/3} / n^2) + (D_w * \theta_{wcap}^{10/3}) / (Heff * n^2)$ $H_{eff} = H' * UF$

$D_{effvad} = (Di * \theta_{avad}^{10/3} / n^2) + (D_w * \theta_{wsoil\delta}^{10/3}) / (Heff * n^2)$

$D_{effws} = L_{gw} / [(h_{vad} / D_{effvad}) + (h_{cap} / D_{effcap})]$

$VF = 1/[(1+DF_{amb} * L_{gw}/D_{effws}) * (1/H_{eff})]$

USEPA. 2002. Evaluating the Vapor Intrusion Into Indoor Air Pathway (Draft Guidance). November 2002. EPA530-F-02-052
ASTM 2000. Standard Guide for Risk-Based Corrective Action (RBCA). ASTM E2081-00. American Society forTesting and Materials. (Committee E-50.04) West Conshokochen, PA

TABLE A-6
OUTDOOR AIR EXPOSURE TO CHEMICALS IN SOIL - SOUTH AND CENTRAL AREA INDOOR WORKER
Former Ashland Distribution Facility - Renssalaer, NY

CDI = CS/VF x (IhIFnc or IhIFc)
IhIFnc or IhIFc = (IhR x ET x EF x ED x CF) / (BW x ATc or ATnc)
Hazard Quotient = CDI / RfD
Cancer Risk = SF x CDI

Where, CDI = Chronic Daily Intake (mg/kg-day)

IhIFnc or IhIFc = inhalation Intake Factor (m^3/kg-day) for noncarcinogens (nc) or carcinogens (c)

CS = Concentration in Soil (mg/kg)
VF = Volatilization Factor (m^3/kg)
IhR = Inhalation Rate of Air (m^3/hr)
BW = Body Weight (kg)
ET = Exposure Time (hours/day)
EF = Exposure Frequency (days/year)
ED = Exposure Duration (years)
CF = Conversion Factor (24 hours/day)$^{-1}$
ATnc = Averaging Time for Non-cardinogenic Effects (days)
ATc = Averaging Time for Cardinogenic Effects, based on lifetime (days)
SF = Slope Factor (mg/kg-day)$^{-1}$
RfD = Reference Dose (mg/kg-day)

Note: IhIFnc = child IhIFnc and IhIFc = child IhIFc + adult IhIFc

						INDOOR WORKER			
Chemical	CS (mg/kg)	VF (m^3/kg)	Exposure Point Conc. (CS/VF) (mg/m^3)	RfD (mg/kg-day)	SF (mg/kg-day)	Non-Carcinogenic CDI (mg/kg-day)	Hazard Quotient (unitless)	Carcinogenic CDI (mg/kg-day)	Cancer Risk (unitless)
1,1,1-Trichloroethane	1.80E-02	1.05E+03	1.71E-05	6.30E-01	NA	3.35E-06	5E-06	1.20E-06	NA
1,1-Dichloroethane	2.70E-01	1.10E+03	2.45E-04	1.40E-01	NA	4.80E-05	3E-04	1.71E-05	NA
1,1-Dichloroethene	4.32E-02	7.35E+02	5.89E-05	6.00E-02	NA	1.15E-05	2E-04	4.11E-06	NA
Methyl Ethyl Keytone	6.89E-01	6.13E+03	1.12E-04	1.40E+00	NA	2.20E-05	2E-05	7.86E-06	NA
4-Methyl-2-pentanone (MIBK)	2.83E-01	4.57E+03	6.21E-05	8.60E-01	NA	1.21E-05	1E-05	4.34E-06	NA
Acetone	2.98E+00	5.73E+03	5.19E-04	NA	NA	NA	NA	3.63E-05	NA
Benzene	6.24E+00	1.18E+03	5.29E-03	8.60E-03	2.70E-02	1.04E-03	1E-01	3.70E-04	1E-05
Carbon disulfide	3.01E-02	6.31E+02	4.77E-05	2.00E-01	NA	9.33E-06	5E-05	3.33E-06	NA
Carbon Tetrachloride	4.20E-03	9.39E+02	4.48E-06	5.00E-02	5.30E-02	8.76E-07	2E-05	3.13E-07	2E-08
Chlorobenzene	2.65E-02	2.45E+03	1.08E-05	1.70E-02	NA	2.11E-06	1E-04	7.55E-07	NA
Chloroform	3.39E-02	1.15E+03	2.94E-05	NA	NA	NA	NA	2.05E-06	NA
cis-1,2-Dichloroethene	6.07E+01	1.28E+03	4.75E-02	NA	NA	NA	NA	3.32E-03	NA
Ethylbenzene	7.99E-02	2.14E+03	3.74E-05	2.90E-01	NA	7.32E-06	3E-05	2.61E-06	NA
Methylene chloride	3.88E-02	1.14E+03	3.40E-05	3.00E-01	1.65E-03	6.65E-06	2E-05	2.38E-06	4E-09
Styrene	1.24E-02	5.18E+03	2.39E-06	2.86E-01	NA	4.67E-07	2E-06	1.67E-07	NA
Tetrachloroethene	2.13E+00	1.11E+03	1.92E-03	1.40E-01	2.00E-02	3.75E-04	3E-03	1.34E-04	3E-06
Toluene	2.46E-01	1.46E+03	1.69E-04	1.14E-01	NA	3.30E-05	3E-04	1.18E-05	NA
trans-1,2-Dichloroethene	6.19E-01	1.06E+03	5.86E-04	1.70E-02	NA	1.15E-04	7E-03	4.09E-05	NA
Trichloroethene	2.91E+00	1.36E+03	2.15E-03	1.00E-02	4.00E-01	4.21E-04	4E-02	1.50E-04	6E-05
Vinyl Chloride[2]	1.19E+00	5.90E+02	2.02E-03	2.80E-02	1.50E-02	3.95E-04	1E-02	1.41E-04	2E-06
Xylenes, Total	3.52E-01	2.20E+03	1.59E-04	3.00E-02	NA	3.12E-05	1E-03	1.11E-05	NA
						TOTAL	**2E-01**		**7E-05**

1 = in early life
2 = adult
NA = not applicable

TABLE A-7
OUTDOOR AIR EXPOSURE TO CHEMICALS IN GROUNDWATER - SOUTH AND CENTRAL AREA INDOOR WORKER
Former Ashland Distribution Facility - Renssalaer, NY

CDI = Cgw*VF x (IhIFnc or IhIFc)
IhIFnc or IhIFc = (IhR x ET x EF x ED) / (BW x ATc or ATnc)
Hazard Quotient = CDI / RfD
Cancer Risk = SF x CDI
Where, CDI = Chronic Daily Intake (mg/kg-day)
IhIFnc or IhIFc = inhalation Intake Factor (m^3/kg-day) for noncarcinogens (nc) or carcinogens (c)
Cg = Concentration in Groundwater (ug/L)
VF = Volatilization Factor (cm^3-water/cm^3-air)
IhR = Inhalation Rate of Air (m^3/hr)
BW = Body Weight (kg)
ET = Exposure Time (hours/day)
EF = Exposure Frequency (days/year)
ED = Exposure Duration (years)
ATnc = Averaging Time for Non-cardinogenic Effects (days)
ATc = Averaging Time for Cardinogenic Effects, based on lifetime (days)
SF = Slope Factor (mg/kg-day)$^{-1}$
RfD = Reference Dose (mg/kg-day)
Note: IhFnc = child IhiFnc, InIFc = child IhiFc + adult IhIFc

						INDOOR WORKER			
Chemical	Cgw (ug/L)	VF (cm^3 water /cm^3-air)	Exposure Point Conc. (Cgw*VF) (mg/m^3)	RfD (mg/kg-day)	SF (mg/kg-day)	Non-Carcinogenic CDI (mg/kg-day)	Hazard Quotient (unitless)	Carcinogenic CDI (mg/kg-day)	Cancer Risk (unitless)
1,1,1-Trichloroethane	1.50E+02	7.07E-07	1.06E-04	6.30E-01	NA	2.08E-05	3.3E-05	NA	NA
1,1-Dichloroethane	1.30E+02	2.24E-07	2.91E-05	1.40E-01	NA	5.69E-06	4.1E-05	NA	NA
1,1-Dichloroethene	6.40E+01	1.24E-06	7.91E-05	6.00E-02	NA	1.55E-05	2.6E-04	NA	NA
benzene	1.90E+01	2.62E-07	4.97E-06	8.60E-03	2.70E-02	9.73E-07	1.1E-04	3.47E-07	9E-09
cis-1,2-Dichloroethene	1.60E+03	1.63E-07	2.61E-04	NA	NA	NA	NA	NA	NA
Tetrachloroethene	2.30E+03	6.98E-07	1.61E-03	1.40E-01	2.00E-02	3.14E-04	2.2E-03	1.12E-04	2E-06
Trichloroethene	2.60E+02	4.31E-07	1.12E-04	1.00E-02	4.00E-01	2.19E-05	2.2E-03	7.83E-06	3E-06
Vinyl Chloride[2]	2.30E+02	1.50E-06	3.44E-04	2.80E-02	1.50E-02	6.73E-05	2.4E-03	2.40E-05	4E-07
					TOTAL		**7.3E-03**		**6E-06**

1 = in early life
2 = adult
NA = not applicable

TABLE A-8
OUTDOOR AIR EXPOSURE TO CHEMICALS IN SOIL - NORTH AREA OUTDOOR WORKER
Former Ashland Distribution Facility - Renssalaer, NY

CDI = CS/VF x (IhIFnc or IhIFc)
IhIFnc or IhIFc = (IhR x ET x EF x ED) / (BW x ATc or ATnc)
Hazard Quotient = CDI / RfD
Cancer Risk = SF x CDI

Where, CDI = Chronic Daily Intake (mg/kg-day)
IhIFnc or IhIFc = inhalation Intake Factor (m^3/kg-day) for noncarcinogens (nc) or carcinogens (c)
CS = Concentration in Soil (mg/kg)
VF = Volatilization Factor (m^3/kg)
IhR = Inhalation Rate of Air (m^3/hr)
ET = Exposure Time (hours/day)
EF = Exposure Frequency (days/year)
ED = Exposure Duration (years)
BW = Body Weight (kg)
ATnc = Averaging Time for Non-cardinogenic Effects (days)
ATc = Averaging Time for Cardinogenic Effects, based on lifetime (days)
SF = Slope Factor $(mg/kg\text{-}day)^{-1}$
RfD = Reference Dose (mg/kg-day)

						OUTDOOR WORKER			
Chemical	CS (mg/kg)	VF (m^3/kg)	Exposure Point Conc. (CS/VF) (mg/m^3)	RfD (mg/kg-day)	SF (mg/kg-day)	Non-Carcinogenic CDI (mg/kg-day)	Hazard Quotient (unitless)	Carcinogenic CDI (mg/kg-day)	Cancer Risk (unitless)
1,1,1-Trichloroethane	7.86E-04	1.05E+03	7.49E-07	6.30E-01	NA	1.47E-07	2.3E-07	NA	NA
1,1-Dichloroethane	8.29E-04	1.10E+03	7.52E-07	1.40E-01	NA	1.47E-07	1.1E-06	NA	NA
Methyl Ethyl Keytone	2.62E-03	6.13E+03	4.28E-07	1.40E+00	NA	8.37E-08	6.0E-08	NA	NA
Acetone	4.20E-01	5.73E+03	7.32E-05	NA	NA	NA	NA	NA	NA
Benzene	1.00E-02	1.18E+03	8.52E-06	8.60E-03	2.70E-02	1.67E-06	1.9E-04	5.96E-07	2E-08
Chlorobenzene	4.57E-03	2.45E+03	1.86E-06	1.70E-02	NA	3.65E-07	2.1E-05	NA	NA
cis-1,2-Dichloroethene	2.31E-02	1.28E+03	1.81E-05	NA	NA	NA	NA	NA	NA
Ethylbenzene	2.47E-03	2.14E+03	1.15E-06	2.90E-01	NA	2.26E-07	7.8E-07	NA	NA
Styrene	6.28E-04	5.18E+03	1.21E-07	2.86E-01	NA	2.37E-08	8.3E-08	NA	NA
Tetrachloroethene	9.69E-03	1.11E+03	8.71E-06	1.40E-01	2.00E-02	1.70E-06	1.2E-05	6.09E-07	1E-08
Toluene	1.25E-02	1.46E+03	8.53E-06	1.14E-01	NA	1.67E-06	1.5E-05	NA	NA
Trichloroethene	2.15E-02	1.36E+03	1.59E-05	1.00E-02	4.00E-01	3.11E-06	3.1E-04	1.11E-06	4E-07
Xylenes, Total	1.32E-02	2.20E+03	5.99E-06	3.00E-02	NA	1.17E-06	3.9E-05	NA	NA
						TOTAL	**5.9E-04**		**5E-07**

TABLE A-9
OUTDOOR AIR EXPOSURE TO CHEMICALS IN GROUNDWATER - NORTH AREA OOUTDOOR WORKER
Former Ashland Distribution Facility - Renssalaer, NY

CDI = Cgw*VF x (IhIFnc or IhIFc)
IhIFnc or IhIFc = (IhR x ET x EF x ED) / (BW x ATc or ATnc)
Hazard Quotient = CDI / RfD
Cancer Risk = SF x CDI

Where, CDI = Chronic Daily Intake (mg/kg-day)

IhIFnc or IhIFc = inhalation Intake Factor (m^3/kg-day) for noncarcinogens (nc) or carcinogens (c)

Cg = Concentration in Groundwater (ug/L)
VF = Volatilization Factor (cm^3-water/cm^3-air)
IhR = Inhalation Rate of Air (m^3/hr)
BW = Body Weight (kg)
ET = Exposure Time (hours/day)
EF = Exposure Frequency (days/year)
ED = Exposure Duration (years)
ATnc = Averaging Time for Non-cardinogenic Effects (days)
ATc = Averaging Time for Cardinogenic Effects, based on lifetime (days)
SF = Slope Factor $(mg/kg\text{-}day)^{-1}$
RfD = Reference Dose (mg/kg-day)

Note: IhFnc = child IhIFnc, InIFc = child IhIFc + adult IhIFc

						OUTDOOR WORKER			
Chemical	Cgw (ug/L)	VF (cm^3 water /cm^3-air)	Exposure Point Conc. (Cgw*VF) (mg/m^3)	RfD (mg/kg-day)	SF (mg/kg-day)	Non-Carcinogenic CDI (mg/kg-day)	Hazard Quotient (unitless)	Carcinogenic CDI (mg/kg-day)	Cancer Risk (unitless)
1,1-Dichloroethane	2.20E+00	2.24E-07	4.92E-07	1.40E-01	NA	9.63E-08	7E-07	NA	NA
cis-1,2-Dichloroethene	1.50E+00	1.63E-07	2.45E-07	NA	NA	NA	NA	NA	NA
Vinyl Chloride[2]	1.20E+00	1.50E-06	1.80E-06	2.80E-02	1.50E-02	3.51E-07	1E-05	1.25E-07	2E-09
						TOTAL	**1E-05**		**2E-09**

1 = in early life
2 = adult
NA = not applicable

TABLE A-10
OUTDOOR AIR EXPOSURE TO CHEMICALS IN GROUNDWATER - OFF-SITE GROUNDWATER SITE WORKER
Former Ashland Distribution Facility - Renssalaer, NY

CDI = Cgw*VF x (IhIFnc or IhIFc)
IhIFnc or IhIFc = (IhR x ET x EF x ED) / (BW x ATc or ATnc)
Hazard Quotient = CDI / RfD
Cancer Risk = SF x CDI

Where, CDI = Chronic Daily Intake (mg/kg-day)

IhIFnc or IhIFc = inhalation Intake Factor (m^3/kg-day) for noncarcinogens (nc) or carcinogens (c)

Cg = Concentration in Groundwater (ug/L)
VF = Volatilization Factor (cm^3-water/cm^3-air)
IhR = Inhalation Rate of Air (m^3/hr)
BW = Body Weight (kg)
ET = Exposure Time (hours/day)
EF = Exposure Frequency (days/year)
ED = Exposure Duration (years)
ATnc = Averaging Time for Non-cardinogenic Effects (days)
ATc = Averaging Time for Cardinogenic Effects, based on lifetime (days)
SF = Slope Factor (mg/kg-day)$^{-1}$
RfD = Reference Dose (mg/kg-day)

Note: IhFnc = child IhIFnc, InIFc = child IhIFc + adult IhIFc

						SITE WORKER			
Chemical	Cgw (ug/L)	VF (cm^3 water /cm^3-air)	Exposure Point Conc. (Cgw*VF) (mg/m^3)	RfD (mg/kg-day)	SF (mg/kg-day)	Non-Carcinogenic CDI (mg/kg-day)	Hazard Quotient (unitless)	Carcinogenic CDI (mg/kg-day)	Cancer Risk (unitless)
1,2-dichloroethane	3.60E+01	5.85E-08	2.11E-06	7.00E-01	9.10E-02	4.12E-07	6E-07	1.47E-07	1E-08
cis-1,2-Dichloroethene	8.30E+02	1.63E-07	1.35E-04	NA	NA	NA	NA	NA	NA
Trichloroethene	1.40E+01	4.31E-07	6.03E-06	1.00E-02	4.00E-01	1.18E-06	1E-04	4.22E-07	2E-07
trans-1,2-Dichloroethene	1.50E+01	3.54E-07	5.31E-06	1.70E-02	NA	1.04E-06	6E-05	3.71E-07	NA
Vinyl Chloride[2]	2.30E+02	1.50E-06	3.44E-04	2.80E-02	1.50E-02	6.73E-05	2E-03	2.40E-05	4E-07
						TOTAL	**3E-03**		**5E-07**

1 = in early life
2 = adult
NA = not applicable

TABLE A-11
OUTDOOR AIR EXPOSURE TO CHEMICALS IN SOIL - SOUTH AND CENTRAL AREA HYPOTHETICAL FUTURE RESIDENT
Former Ashland Distribution Facility - Renssalaer, NY

CDI = CS/VF x (IhIFnc or IhIFc)
IhIFnc or IhIFc = (IhR x ET x EF x ED x CF) / (BW x ATc or ATnc)
Hazard Quotient = CDI / RfD
Cancer Risk = SF x CDI

Where, CDI = Chronic Daily Intake (mg/kg-day)
IhIFnc or IhIFc = inhalation Intake Factor (m^3/kg-day) for noncarcinogens (nc) or carcinogens (c)
CS = Concentration in Soil (mg/kg)
VF = Volatilization Factor (m^3/kg)
IhR = Inhalation Rate of Air (m^3/hr)
BW = Body Weight (kg)
ET = Exposure Time (hours/day)
EF = Exposure Frequency (days/year)
ED = Exposure Duration (years)
CF = Conversion Factor (24 hours/day)$^{-1}$
ATnc = Averaging Time for Non-cardinogenic Effects (days)
ATc = Averaging Time for Cardinogenic Effects, based on lifetime (days)
SF = Slope Factor (mg/kg-day)$^{-1}$
RfD = Reference Dose (mg/kg-day)

Note: IhIFnc = child IhIFnc and IhIFc = child IhIFc + adult IhIFc

						HYPOTHETICAL FUTURE RESIDENT			
Chemical	CS (mg/kg)	VF (m^3/kg)	Exposure Point Conc. (CS/VF) (mg/m^3)	RfD (mg/kg-day)	SF (mg/kg-day)	Non-Carcinogenic CDI (mg/kg-day)	Child Hazard Quotient (unitless)	Carcinogenic CDI (mg/kg-day)	Cancer Risk (unitless)
1,1,1-Trichloroethane	1.80E-02	1.05E+03	1.71E-05	6.30E-01	NA	1.10E-05	2E-05	2.55E-06	NA
1,1-Dichloroethane	2.70E-01	1.10E+03	2.45E-04	1.40E-01	NA	1.57E-04	1E-03	3.65E-05	NA
1,1-Dichloroethene	4.32E-02	7.35E+02	5.89E-05	6.00E-02	NA	3.77E-05	6E-04	8.75E-06	NA
Methyl Ethyl Keytone	6.89E-01	6.13E+03	1.12E-04	1.40E+00	NA	7.19E-05	5E-05	1.67E-05	NA
4-Methyl-2-pentanone (MIBK)	2.83E-01	4.57E+03	6.21E-05	8.60E-01	NA	3.97E-05	5E-05	9.23E-06	NA
Acetone	2.98E+00	5.73E+03	5.19E-04	NA	NA	NA	NA	7.73E-05	NA
Benzene	6.24E+00	1.18E+03	5.29E-03	8.60E-03	2.70E-02	3.39E-03	4E-01	7.87E-04	2E-05
Carbon disulfide	3.01E-02	6.31E+02	4.77E-05	2.00E-01	NA	3.05E-05	2E-04	7.09E-06	NA
Carbon Tetrachloride	4.20E-03	9.39E+02	4.48E-06	5.00E-02	5.30E-02	2.86E-06	6E-05	6.66E-07	4E-08
Chlorobenzene	2.65E-02	2.45E+03	1.08E-05	1.70E-02	NA	6.91E-06	4E-04	1.61E-06	NA
Chloroform	3.39E-02	1.15E+03	2.94E-05	NA	NA	NA	NA	4.37E-06	NA
cis-1,2-Dichloroethene	6.07E+01	1.28E+03	4.75E-02	NA	NA	NA	NA	7.06E-03	NA
Ethylbenzene	7.99E-02	2.14E+03	3.74E-05	2.90E-01	NA	2.39E-05	8E-05	5.56E-06	NA
Methylene chloride	3.88E-02	1.14E+03	3.40E-05	3.00E-01	1.65E-03	2.18E-05	7E-05	5.06E-06	8E-09
Styrene	1.24E-02	5.18E+03	2.39E-06	2.86E-01	NA	1.53E-06	5E-06	3.55E-07	NA
Tetrachloroethene	2.13E+00	1.11E+03	1.92E-03	1.40E-01	2.00E-02	1.23E-03	9E-03	2.85E-04	6E-06
Toluene	2.46E-01	1.46E+03	1.69E-04	1.14E-01	NA	1.08E-04	9E-04	2.51E-05	NA
trans-1,2-Dichloroethene	6.19E-01	1.06E+03	5.86E-04	1.70E-02	NA	3.75E-04	2E-02	8.71E-05	NA
Trichloroethene	2.91E+00	1.36E+03	2.15E-03	1.00E-02	4.00E-01	1.38E-03	1E-01	3.20E-04	1E-04
Vinyl Chloride[1]	1.19E+00	5.90E+02	2.02E-03	2.80E-02	3.00E-02	1.29E-03	5E-02	1.11E-04	6.16E-06
Vinyl Chloride[2]	1.19E+00	5.90E+02	2.02E-03	2.80E-02	1.50E-02	NA	NA	1.89E-04	
Xylenes, Total	3.52E-01	2.20E+03	1.59E-04	3.00E-02	NA	1.02E-04	3E-03	2.37E-05	NA
						TOTAL	**6E-01**		**2E-04**

1 = in early life
2 = adult
NA = not applicable

TABLE A-12
DERMAL EXPOSURE TO CHEMICALS IN SOIL - SOUTH AND CENTRAL AREA HYPOTHETICAL FUTURE RESIDENT
Former Ashland Distribution Facility - Renssalaer, NY

CDI = CS x (DerFnc or DerFc)
DerFnc or DerFc = (CS x SA x AD x AB x ET x EF x ED x CF1 x CF2) / (BW x ATnc or ATc)
Hazard Quotient = CDI / RfD
Cancer Risk = SF x CDI

Where, CDI = Chronic Daily Intake (mg/kg-day)
DerFnc or DerFc = Dermal Intake Factor (kg/kg-day) for non-carcinogens (nc) or carcinogens (c)
CS = Chemical Concentration in Soil (mg/kg)
SA = Exposed Body Surface Area (cm^2/day)
AD = Soil Adherence to Skin (mg/cm^2)
AB = Percent Chemical Absorption Across Skin (unitless)
ET = Exposure Time (hours/day)
EF = Exposure Frequency (days/year)
ED = Exposure Duration (years)
CF1 = Conversion Factor (10^{-6} kg/mg)
CF2 = Conversion Factor (24 hours/day)$^{-1}$
BW = Body Weight (kg)
ATnc = Averaging Time for Non-cardinogenic Effects (days)
ATc = Averaging Time for Cardinogenic Effects, based on lifetime (days)
SF = Slope Factor (mg/kg-day)$^{-1}$
RfD = Reference Dose (mg/kg-day)

Note: DerIFnc = child DerIFnc and DerIFc = child DerIFc + adult DerIFc

				HYPOTHETICAL FUTURE RESIDENT			
Chemical	CS (mg/kg)	RfD (mg/kg-day)	SF (mg/kg-day)	Non-Carcinogenic CDI (mg/kg-day)	Child Hazard Quotient (unitless)	Carcinogenic CDI (mg/kg-day)	Cancer Risk (unitless)
1,1,1-Trichloroethane	1.80E-02	2.80E-01	NA	9.67E-08	3E-07	NA	NA
1,1-Dichloroethane	2.70E-01	2.00E-01	NA	1.45E-06	7E-06	NA	NA
1,1-Dichloroethene	4.32E-02	5.00E-02	NA	2.32E-07	5E-06	NA	NA
Methyl Ethyl Keytone	6.89E-01	6.00E-01	NA	3.70E-06	6E-06	NA	NA
4-Methyl-2-pentanone (MIBK)	2.83E-01	NA	NA	NA	NA	NA	NA
Acetone	2.98E+00	9.00E-01	NA	1.60E-05	2E-05	NA	NA
Benzene	6.24E+00	4.00E-03	5.50E-02	3.35E-05	8E-03	4.63E-06	3E-07
Carbon disulfide	3.01E-02	1.00E-01	NA	1.62E-07	2E-06	NA	NA
Carbon Tetrachloride	4.20E-03	7.00E-04	1.30E-01	2.26E-08	3E-05	3.11E-09	4E-10
Chlorobenzene	2.65E-02	2.00E-02	NA	1.42E-07	7E-06	NA	NA
Chloroform	3.39E-02	1.00E-02	NA	1.82E-07	2E-05	NA	NA
cis-1,2-Dichloroethene	6.07E+01	1.00E-02	NA	3.26E-04	3E-02	NA	NA
Ethylbenzene	7.99E-02	1.00E-01	NA	4.29E-07	4E-06	NA	NA
Methylene chloride	3.88E-02	6.00E-02	7.50E-03	2.08E-07	3E-06	2.87E-08	2E-10
Styrene	1.24E-02	2.00E-01	NA	6.64E-08	3E-07	NA	NA
Tetrachloroethene	2.13E+00	1.00E-02	5.40E-01	1.14E-05	1E-03	1.58E-06	9E-07
Toluene	2.46E-01	2.00E-01	NA	1.32E-06	7E-06	NA	NA
trans-1,2-Dichloroethene	6.19E-01	2.00E-02	NA	3.32E-06	2E-04	NA	NA
Trichloroethene	2.91E+00	3.00E-04	4.00E-01	1.56E-05	5E-02	2.16E-06	9E-07
Vinyl Chloride1	1.19E+00	3.00E-03	1.40E+00	6.39E-06	2E-03	5.47E-07	1.01E-06
Vinyl Chloride2	1.19E+00	3.00E-03	7.20E-01	NA	NA	3.34E-07	
Xylenes, Total	3.52E-01	2.00E-01	NA	1.89E-06	9E-06	NA	NA
				TOTAL	**1E-01**		**3E-06**

1 = in early life
2 = adult
NA = not applicable

TABLE A-13
INCIDENTAL INGESTION OF CHEMICALS IN SOIL - SOUTH AND CENTRAL AREA HYPOTHETICAL FUTURE RESIDENT
Former Ashland Distribution Facility - Renssalaer, NY

CDI = CS x (IngFnc or IngFc)
IngFnc or IngFc = (IRs x ET x EF x ED x CF1 x CF2) / (BW x ATnc or ATc)
Hazard Quotient = CDI / RfD
Cancer Risk = SF x CDI
Where, CDI = Chronic Daily Instake (mg/kg-day)
IngFnc or IngFc = Ingestion Intake Factor for non-carcinogens (nc) or carcinogens (c) in (kg/kg-day)
CS = Chemical Concentration in Soil (mg/kg)
IRs = Soil Ingestion Rate (mg/day soil)
ET = Exposure Time (hours/day)
EF = Exposure Frequency (days/year)
ED = Exposure Duration (years)
CF1 = Conversion Factor (10^{-6} kg/mg)
CF2 = Conversion Factor (24 hours/day)$^{-1}$
BW = Body Weight (kg)
ATnc = Averaging Time for Non-cardinogenic Effects (days)
ATc = Averaging Time for Cardinogenic Effects, based on lifetime (days)
SF = Slope Factor (mg/kg-day)$^{-1}$
RfD = Reference Dose (mg/kg-day)

Note: IngIFnc = child IngIFnc and IngIFc = child IngIFc + adult IngIFc

				HYPOTHETICAL FUTURE RESIDENT			
Chemical	CS (mg/kg)	RfD (mg/kg-day)	SF (mg/kg-day)	Non-Carcinogenic CDI (mg/kg-day)	Child Hazard Quotient (unitless)	Carcinogenic CDI (mg/kg-day)	Cancer Risk (unitless)
1,1,1-Trichloroethane	1.80E-02	2.80E-01	NA	2.30E-07	8.2E-07	NA	NA
1,1-Dichloroethane	2.70E-01	2.00E-01	NA	3.46E-06	1.7E-05	NA	NA
1,1-Dichloroethene	4.32E-02	5.00E-02	NA	5.53E-07	1.1E-05	NA	NA
Methyl Ethyl Keytone	6.89E-01	6.00E-01	NA	8.81E-06	1.5E-05	NA	NA
4-Methyl-2-pentanone (MIBK)	2.83E-01	NA	NA	NA	NA	NA	NA
Acetone	2.98E+00	9.00E-01	NA	3.80E-05	4.2E-05	NA	NA
Benzene	6.24E+00	4.00E-03	5.50E-02	7.98E-05	2.0E-02	9.77E-06	5E-07
Carbon disulfide	3.01E-02	1.00E-01	NA	3.85E-07	3.8E-06	NA	NA
Carbon Tetrachloride	4.20E-03	7.00E-04	1.30E-01	5.37E-08	7.7E-05	6.58E-09	9E-10
Chlorobenzene	2.65E-02	2.00E-02	NA	3.39E-07	1.7E-05	NA	NA
Chloroform	3.39E-02	1.00E-02	NA	4.33E-07	4.3E-05	NA	NA
cis-1,2-Dichloroethene	6.07E+01	1.00E-02	NA	7.76E-04	7.8E-02	NA	NA
Ethylbenzene	7.99E-02	1.00E-01	NA	1.02E-06	1.0E-05	NA	NA
Methylene chloride	3.88E-02	6.00E-02	7.50E-03	4.95E-07	8.3E-06	6.07E-08	5E-10
Styrene	1.24E-02	2.00E-01	NA	1.58E-07	7.9E-07	NA	NA
Tetrachloroethene	2.13E+00	1.00E-02	5.40E-01	2.73E-05	2.7E-03	3.34E-06	2E-06
Toluene	2.46E-01	2.00E-01	NA	3.14E-06	1.6E-05	NA	NA
trans-1,2-Dichloroethene	6.19E-01	2.00E-02	NA	7.91E-06	4.0E-04	NA	NA
Trichloroethene	2.91E+00	3.00E-04	4.00E-01	3.73E-05	1.2E-01	4.56E-06	2E-06
Vinyl Chloride[1]	1.19E+00	3.00E-03	1.40E+00	1.52E-05	5.1E-03	1.30E-06	2E-06
Vinyl Chloride[2]	1.19E+00	3.00E-03	7.20E-01	1.63E-06	NA	5.59E-07	
Xylenes, Total	3.52E-01	2.00E-01	NA	4.49E-06	2.2E-05	NA	NA
				TOTAL	**2.3E-01**		**6E-06**

TABLE A-14
OUTDOOR AIR EXPOSURE TO CHEMICALS IN GROUNDWATER - SOUTH AND CENTRAL AREA HYPOTHETICAL FUTURE RESIDENT
Former Ashland Distribution Facility - Renssalaer, NY

CDI = Cgw*VF x (IhIFnc or IhIFc)
IhIFnc or IhIFc = (IhR x ET x EF x ED) / (BW x ATc or ATnc)
Hazard Quotient = CDI / RfD
Cancer Risk = SF x CDI
Where, CDI = Chronic Daily Intake (mg/kg-day)
IhIFnc or IhIFc = inhalation Intake Factor (m^3/kg-day) for noncarcinogens (nc) or carcinogens (c)
Cg = Concentration in Groundwater (ug/L)
VF = Volatilization Factor (cm^3-water/cm^3-air)
IhR = Inhalation Rate of Air (m^3/hr)
BW = Body Weight (kg)
ET = Exposure Time (hours/day)
EF = Exposure Frequency (days/year)
ED = Exposure Duration (years)
ATnc = Averaging Time for Non-cardinogenic Effects (days)
ATc = Averaging Time for Cardinogenic Effects, based on lifetime (days)
SF = Slope Factor (mg/kg-day)$^{-1}$
RfD = Reference Dose (mg/kg-day)
Note: IhFnc = child IhIFnc, InIFc = child IhIFc + adult IhIFc

						HYPOTHETICAL FUTURE RESIDENT			
Chemical	Cgw (ug/L)	VF (cm^3 water /cm^3-air)	Exposure Point Conc. (Cgw*VF) (mg/m^3)	RfD (mg/kg-day)	SF (mg/kg-day)	Non-Carcinogenic CDI (mg/kg-day)	Child Hazard Quotient (unitless)	Carcinogenic CDI (mg/kg-day)	Cancer Risk (unitless)
1,1,1-Trichloroethane	1.50E+02	7.07E-07	1.06E-04	6.30E-01	NA	6.79E-05	1E-04	NA	NA
1,1-Dichloroethane	1.30E+02	2.24E-07	2.91E-05	1.40E-01	NA	1.86E-05	1E-04	NA	NA
1,1-Dichloroethene	6.40E+01	1.24E-06	7.91E-05	6.00E-02	NA	5.06E-05	8E-04	NA	NA
benzene	1.90E+01	2.62E-07	4.97E-06	8.60E-03	2.70E-02	3.18E-06	4E-04	7.39E-07	2E-08
cis-1,2-Dichloroethene	1.60E+03	1.63E-07	2.61E-04	NA	NA	NA	NA	NA	NA
Tetrachloroethene	2.30E+03	6.98E-07	1.61E-03	1.40E-01	2.00E-02	1.03E-03	7E-03	2.39E-04	5E-06
Trichloroethene	2.60E+02	4.31E-07	1.12E-04	1.00E-02	4.00E-01	7.17E-05	7E-03	1.67E-05	7E-06
Vinyl Chloride[1]	2.30E+02	1.50E-06	3.44E-04	2.80E-02	3.00E-02	2.20E-04	8E-03	1.89E-05	1E-06
Vinyl Chloride[2]	2.30E+02	1.50E-06	3.44E-04	2.80E-02	1.50E-02	NA	NA	3.23E-05	
					TOTAL		**2E-02**		**1E-05**

1 = in early life
2 = adult
NA = not applicable

TABLE A-15
OUTDOOR AIR EXPOSURE TO CHEMICALS IN SOIL - NORTH AREA HYPOTHETICAL FUTURE RESIDENT
Former Ashland Distribution Facility - Renssalaer, NY

CDI = CS/VF x (IhIFnc or IhIFc)
IhIFnc or IhIFc = (IhR x ET x EF x ED x CF) / (BW x ATc or ATnc)
Hazard Quotient = CDI / RfD
Cancer Risk = SF x CDI

Where, CDI = Chronic Daily Intake (mg/kg-day)

IhIFnc or IhIFc = inhalation Intake Factor (m^3/kg-day) for noncarcinogens (nc) or carcinogens (c)

CS = Concentration in Soil (mg/kg)
VF = Volatilization Factor (m^3/kg)
IhR = Inhalation Rate of Air (m^3/hr)
BW = Body Weight (kg)
ET = Exposure Time (hours/day)
EF = Exposure Frequency (days/year)
ED = Exposure Duration (years)
CF = Conversion Factor (24 hours/day)$^{-1}$
ATnc = Averaging Time for Non-cardinogenic Effects (days)
ATc = Averaging Time for Cardinogenic Effects, based on lifetime (days)
SF = Slope Factor (mg/kg-day)$^{-1}$
RfD = Reference Dose (mg/kg-day)

Note: IhIFnc = child IhIFnc and IhIFc = child IhIFc + adult IhIFc

						HYPOTHETICAL FUTURE RESIDENT			
Chemical	CS (mg/kg)	VF (m^3/kg)	Exposure Point Conc. (CS/VF) (mg/m^3)	RfD (mg/kg-day)	SF (mg/kg-day)	Non-Carcinogenic CDI (mg/kg-day)	Child Hazard Quotient (unitless)	Carcinogenic CDI (mg/kg-day)	Cancer Risk (unitless)
1,1,1-Trichloroethane	7.9E-04	1.05E+03	7.49E-07	6.30E-01	NA	4.79E-07	7.6E-07	NA	NA
1,1-Dichloroethane	8.3E-04	1.10E+03	7.52E-07	1.40E-01	NA	4.81E-07	3.4E-06	NA	NA
Methyl Ethyl Keytone	2.6E-03	6.13E+03	4.28E-07	1.40E+00	NA	2.74E-07	2.0E-07	NA	NA
Acetone	4.2E-01	5.73E+03	7.32E-05	NA	NA	NA	NA	NA	NA
Benzene	1.0E-02	1.18E+03	8.52E-06	8.60E-03	2.70E-02	5.45E-06	6.3E-04	1.27E-06	3E-08
Chlorobenzene	4.6E-03	2.45E+03	1.86E-06	1.70E-02	NA	1.19E-06	7.0E-05	NA	NA
cis-1,2-Dichloroethene	2.3E-02	1.28E+03	1.81E-05	NA	NA	NA	NA	NA	NA
Ethylbenzene	2.5E-03	2.14E+03	1.15E-06	2.90E-01	NA	7.39E-07	2.5E-06	NA	NA
Styrene	6.3E-04	5.18E+03	1.21E-07	2.86E-01	NA	7.75E-08	2.7E-07	NA	NA
Tetrachloroethene	9.7E-03	1.11E+03	8.71E-06	1.40E-01	2.00E-02	5.57E-06	4.0E-05	1.30E-06	3E-08
Toluene	1.2E-02	1.46E+03	8.53E-06	1.14E-01	NA	5.46E-06	4.8E-05	NA	NA
Trichloroethene	2.2E-02	1.36E+03	1.59E-05	1.00E-02	4.00E-01	1.02E-05	1.0E-03	2.36E-06	9E-07
Xylenes, Total	1.3E-02	2.20E+03	5.99E-06	3.00E-02	NA	3.84E-06	1.3E-04	NA	NA
						TOTAL	**1.9E-03**		**1E-06**

TABLE A-16
DERMAL EXPOSURE TO CHEMICALS IN SOIL - NORTH AREA HYPOTHETICAL FUTURE RESIDENT
Former Ashland Distribution Facility - Renssalaer, NY

CDI = CS x (DerFnc or DerFc)
DerFnc or DerFc = (CS x SA x AD x AB x ET x EF x ED x CF1 x CF2) / (BW x ATnc or ATc)
Hazard Quotient = CDI / RfD
Cancer Risk = SF x CDI

Where, CDI = Chronic Daily Intake (mg/kg-day)
DerFnc or DerFc = Dermal Intake Factor (kg/kg-day) for non-carcinogens (nc) or carcinogens (c)
CS = Chemical Concentration in Soil (mg/kg)
SA = Exposed Body Surface Area (cm^2/day)
AD = Soil Adherence to Skin (mg/cm^2)
AB = Percent Chemical Absorption Across Skin (unitless)
ET = Exposure Time (hours/day)
EF = Exposure Frequency (days/year)
ED = Exposure Duration (years)
CF1 = Conversion Factor (10^{-6} kg/mg)
CF2 = Conversion Factor (24 hours/day)$^{-1}$
BW = Body Weight (kg)
ATnc = Averaging Time for Non-cardinogenic Effects (days)
ATc = Averaging Time for Cardinogenic Effects, based on lifetime (days)
SF = Slope Factor (mg/kg-day)$^{-1}$
RfD = Reference Dose (mg/kg-day)

Note: DerIFnc = child DerIFnc and DerIFc = child DerIFc + adult DerIFc

				HYPOTHETICAL FUTURE RESIDENT			
Chemical	CS (mg/kg)	RfD (mg/kg-day)	SF (mg/kg-day)	Non-Carcinogenic CDI (mg/kg-day)	Child Hazard Quotient (unitless)	Carcinogenic CDI (mg/kg-day)	Cancer Risk (unitless)
1,1,1-Trichloroethane	7.86E-04	2.80E-01	NA	4.22E-09	1.5E-08	5.83E-10	NA
1,1-Dichloroethane	8.29E-04	2.00E-01	NA	4.45E-09	2.2E-08	6.15E-10	NA
Methyl Ethyl Keytone	2.62E-03	6.00E-01	NA	1.41E-08	2.3E-08	1.94E-09	NA
Acetone	4.20E-01	9.00E-01	NA	2.25E-06	2.5E-06	3.11E-07	NA
Benzene	1.00E-02	4.00E-03	5.50E-02	5.39E-08	1.3E-05	7.45E-09	4E-10
Chlorobenzene	4.57E-03	2.00E-02	NA	2.45E-08	1.2E-06	3.39E-09	NA
cis-1,2-Dichloroethene	2.31E-02	1.00E-02	NA	1.24E-07	1.2E-05	1.71E-08	NA
Ethylbenzene	2.47E-03	1.00E-01	NA	1.32E-08	1.3E-07	1.83E-09	NA
Styrene	6.28E-04	2.00E-01	NA	3.37E-09	1.7E-08	4.66E-10	NA
Tetrachloroethene	9.69E-03	1.00E-02	5.40E-01	5.20E-08	5.2E-06	7.18E-09	4E-09
Toluene	1.25E-02	2.00E-01	NA	6.69E-08	3.3E-07	9.23E-09	NA
Trichloroethene	2.15E-02	3.00E-04	4.00E-01	1.16E-07	3.9E-04	1.59E-08	6E-09
Xylenes, Total	1.32E-02	2.00E-01	NA	7.10E-08	3.5E-07	9.80E-09	NA
				TOTAL	**4.2E-04**		**1E-08**

TABLE A-17
INCIDENTAL INGESTION OF CHEMICALS IN SOIL - NORTH AREA HYPOTHETICAL FUTURE RESIDENT
Former Ashland Distribution Facility - Renssalaer, NY

CDI = CS x (IngFnc or IngFc)
IngFnc or IngFc = (IRs x ET x EF x ED x CF1 x CF2) / (BW x ATnc or ATc)
Hazard Quotient = CDI / RfD
Cancer Risk = SF x CDI
Where, CDI = Chronic Daily Instake (mg/kg-day)
IngFnc or IngFc = Ingestion Intake Factor for Non-carcinogens (nc) or Carcinogens (c) in (kg/kg-day)
CS = Chemical Concentration in Soil (mg/kg)
IRs = Soil Ingestion Rate (mg/day soil)
ET = Exposure Time (hours/day)
EF = Exposure Frequency (days/year)
ED = Exposure Duration (years)
CF1 = Conversion Factor (10^{-6} kg/mg)
CF2 = Conversion Factor (24 hours/day)$^{-1}$
BW = Body Weight (kg)
ATnc = Averaging Time for Non-cardinogenic Effects (days)
ATc = Averaging Time for Cardinogenic Effects, based on lifetime (days)
SF = Slope Factor (mg/kg-day)$^{-1}$
RfD = Reference Dose (mg/kg-day)

Note: IngIFnc = child IngIFnc and IngIFc = child IngIFc + adult IngIFc

				HYPOTHETICAL FUTURE RESIDENT			
Chemical	CS (mg/kg)	RfDo (mg/kg-day)	SF (mg/kg-day)	Non-Carcinogenic CDI (mg/kg-day)	Child Hazard Quotient (unitless)	Carcinogenic CDI (mg/kg-day)	Cancer Risk (unitless)
1,1,1-Trichloroethane	7.86E-04	2.80E-01	NA	1.01E-08	3.6E-08	NA	NA
1,1-Dichloroethane	8.29E-04	2.00E-01	NA	1.06E-08	5.3E-08	NA	NA
Methyl Ethyl Keytone	2.62E-03	6.00E-01	NA	3.35E-08	5.6E-08	NA	NA
Acetone	4.20E-01	9.00E-01	NA	5.36E-06	6.0E-06	NA	NA
Benzene	1.00E-02	4.00E-03	5.50E-02	1.28E-07	3.2E-05	1.57E-08	9E-10
Chlorobenzene	4.57E-03	2.00E-02	NA	5.84E-08	2.9E-06	NA	NA
cis-1,2-Dichloroethene	2.31E-02	1.00E-02	NA	2.96E-07	3.0E-05	NA	NA
Ethylbenzene	2.47E-03	1.00E-01	NA	3.15E-08	3.2E-07	NA	NA
Styrene	6.28E-04	2.00E-01	NA	8.03E-09	4.0E-08	NA	NA
Tetrachloroethene	9.69E-03	1.00E-02	5.40E-01	1.24E-07	1.2E-05	1.52E-08	8E-09
Toluene	1.25E-02	2.00E-01	NA	1.59E-07	8.0E-07	NA	NA
Trichloroethene	2.15E-02	3.00E-04	4.00E-01	2.75E-07	9.2E-04	3.37E-08	1E-08
Xylenes, Total	1.32E-02	2.00E-01	NA	1.69E-07	8.4E-07	NA	NA
				TOTAL	**1.0E-03**		**2E-08**

TABLE A-18
OUTDOOR AIR EXPOSURE TO CHEMICALS IN GROUNDWATER - NORTH AREA HYPOTHETICAL FUTURE RESIDENT
Former Ashland Distribution Facility - Renssalaer, NY

CDI = Cgw*VF x (IhIFnc or IhIFc)
IhIFnc or IhIFc = (IhR x ET x EF x ED) / (BW x ATc or ATnc)
Hazard Quotient = CDI / RfD
Cancer Risk = SF x CDI

Where, CDI = Chronic Daily Intake (mg/kg-day)
IhIFnc or IhIFc = inhalation Intake Factor (m^3/kg-day) for noncarcinogens (nc) or carcinogens (c)
Cg = Concentration in Groundwater (ug/L)
VF = Volatilization Factor (cm^3-water/cm^3-air)
IhR = Inhalation Rate of Air (m^3/hr)
BW = Body Weight (kg)
ET = Exposure Time (hours/day)
EF = Exposure Frequency (days/year)
ED = Exposure Duration (years)
ATnc = Averaging Time for Non-cardinogenic Effects (days)
ATc = Averaging Time for Cardinogenic Effects, based on lifetime (days)
SF = Slope Factor $(mg/kg\text{-}day)^{-1}$
RfD = Reference Dose (mg/kg-day)

Note: IhFnc = child IhIFnc, InIFc = child IhIFc + adult IhIFc

						HYPOTHETICAL FUTURE RESIDENT			
Chemical	Cgw (ug/L)	VF (cm^3 water /cm^3-air)	Exposure Point Conc. (Cgw*VF) (mg/m^3)	RfD (mg/kg-day)	SF (mg/kg-day)	Non-Carcinogenic CDI (mg/kg-day)	Child Hazard Quotient (unitless)	Carcinogenic CDI (mg/kg-day)	Cancer Risk (unitless)
1,1-Dichloroethane	2.20E+00	2.24E-07	4.92E-07	1.40E-01	NA	3.15E-07	2E-06	NA	NA
cis-1,2-Dichloroethene	1.50E+00	1.63E-07	2.45E-07	NA	NA	NA	NA	NA	NA
Vinyl Chloride[1]	1.20E+00	1.50E-06	1.80E-06	2.80E-02	3.00E-02	1.15E-06	4E-05	9.85E-08	5E-09
Vinyl Chloride[2]	1.20E+00	1.50E-06	1.80E-06	2.80E-02	1.50E-02	NA	NA	1.69E-07	
						TOTAL	**4E-05**		**5E-09**

1 = in early life
2 = adult
NA = not applicable

TABLE A-19
OUTDOOR AIR EXPOSURE TO CHEMICALS IN GROUNDWATER - OFF-SITE GROUNDWATER HYPOTHETICAL FUTURE RESIDENT
Former Ashland Distribution Facility - Renssalaer, NY

CDI = Cgw*VF x (IhIFnc or IhIFc)
IhIFnc or IhIFc = (IhR x ET x EF x ED) / (BW x ATc or ATnc)
Hazard Quotient = CDI / RfD
Cancer Risk = SF x CDI

Where, CDI = Chronic Daily Intake (mg/kg-day)
IhIFnc or IhIFc = inhalation Intake Factor (m^3/kg-day) for noncarcinogens (nc) or carcinogens (c)
Cg = Concentration in Groundwater (ug/L)
VF = Volatilization Factor (cm^3-water/cm^3-air)
IhR = Inhalation Rate of Air (m^3/hr)
BW = Body Weight (kg)
ET = Exposure Time (hours/day)
EF = Exposure Frequency (days/year)
ED = Exposure Duration (years)
ATnc = Averaging Time for Non-cardinogenic Effects (days)
ATc = Averaging Time for Cardinogenic Effects, based on lifetime (days)
SF = Slope Factor $(mg/kg\text{-}day)^{-1}$
RfD = Reference Dose (mg/kg-day)

Note: IhFnc = child IhIFnc, InIFc = child IhIFc + adult IhIFc

						HYPOTHETICAL FUTURE RESIDENT			
Chemical	Cgw (ug/L)	VF (cm^3 water /cm^3-air)	Exposure Point Conc. (Cgw*VF) (mg/m^3)	RfD (mg/kg-day)	SF (mg/kg-day)	Non-Carcinogenic CDI (mg/kg-day)	Child Hazard Quotient (unitless)	Carcinogenic CDI (mg/kg-day)	Cancer Risk (unitless)
1,2-dichloroethane	3.60E+01	5.85E-08	2.11E-06	7.00E-01	9.10E-02	1.35E-06	2E-06	3.13E-07	3E-08
cis-1,2-Dichloroethene	8.30E+02	1.63E-07	1.35E-04	NA	NA	NA	NA	NA	NA
trans-1,2-Dichloroethene	1.50E+01	3.54E-07	5.31E-06	1.70E-02	NA	3.40E-06	2E-04	NA	NA
Trichloroethene	1.40E+01	4.31E-07	6.03E-06	1.00E-02	4.00E-01	3.86E-06	4E-04	8.97E-07	4E-07
Vinyl Chloride[1]	2.30E+02	1.50E-06	3.44E-04	2.80E-02	3.00E-02	2.20E-04	8E-03	1.89E-05	1E-06
Vinyl Chloride[2]	2.30E+02	1.50E-06	3.44E-04	2.80E-02	1.50E-02	2.20E-04	NA	3.23E-05	
						TOTAL	**8E-03**		**1E-06**

1 = in early life
2 = adult
NA = not applicable

ARCADIS

Appendix B

Summary of Reports and Correspondence Starting with Submission of 2002 Draft RFI

Appendix B. Summary of Reports and Correspondence Starting with Submission of 2002 Draft RFI, Revised Draft RFI, Ashland Inc., Rensselaer, New York

Date of Document	Document Title	Comments/Summary	Action/Response
10/22/2002	**Draft RFI Report (ESC on behalf of Ashland)**	No soil samples were collected during the RFI; soil sampling had been completed in earlier investigations. Geoprobe groundwater samples were obtained in two phases (June 1999, March 2000) to fully delineate VOC constituent plumes. Screening level groundwater samples were obtained near the southwest boundary line. A DNAPL investigation around MW-19 suggested the potential for PCE DNAPL with 20% aqueous solubility in the vicinity of GP-4. In March 2000, GP-19 was drilled to identify low permeability layers below the potential DNAPL. Silt and clay were found at two discrete 2' thick intervals. New monitoring wells MW-16 through MW-19 were installed and subsequently sampled in 2001. Conclusions/Recommendations: VOC-affected groundwater is delineated and restricted to Ashland property and CSXT property immediately downgradient of the site. Therefore, no further groundwater investigation is warranted at the site. VOCs in the southwest corner of the site are limited, and a groundwater treatment system is not needed in the southern area. Affected groundwater in the central portion of the site will be addressed through operation of the existing deep well sump and air stripping system.	USEPA replied with several comments (see below).
11/7/2002	**RFI Report Comments (USEPA)**	Response to 10/22/02 Draft RFI: EPA considered the report "incomplete" with several comments requiring Ashland to update text, etc. The following comments are excerpts from the letter: • USEPA Comment #1: Add discussion of nature and extent of VOC sources, specifically at monitoring well MW-1. • USEPA Comment #2: Update figure with Total VOCs at each well for past 3 semi-annual events (boldface where results are showing increasing trends in that period). • USEPA Comment #3: Update conclusions/recommendations to strike "no further groundwater investigation is warranted at the site," as USEPA reserves the right under the AOC to request additional work. Contradictory language regarding the central groundwater impacts needs to be revised. • USEPA Comment #4: Recommendation for addressing southern area groundwater needs revision. Remediate VOCs in the southwest corner of the site - must be addressed in the CMS.	Comment #1 was addressed in the March 2003 Quarterly Progress Report, as discussed below. Comments #2 through 4 were addressed in the December 19, 2002 resubmittal, as discussed below.

Appendix B. Summary of Reports and Correspondence Starting with Submission of 2002 Draft RFI, Revised Draft RFI, Ashland Inc., Rensselaer, New York

Date of Document	Document Title	Comments/Summary	Action/Response
12/19/2002	**Revised Draft RFI Report (ESC on behalf of Ashland)**	Cover letter: "The EPA comments 2, 3, and 4 in its November 7, 2002 letter are incorporated in the Conclusions and Recommendations section of the revised RFI report. The EPA comment 1 will be addressed in the next quarterly progress report, which is due to the EPA by February 15, 2003." Conclusions and Recommendations update: "As part of the Corrective Measures Study, Ashland will evaluate potential remedial measures to address affected groundwater in the southern and central portions of the site in addition to other areas on and off the Rensselaer site."	
1/15/2003	**Conditional Approval of the Draft RFI Report (USEPA)**	Conditionally approved as long as Comment #1 from the November 7, 2002 is addressed in the next quarterly report (see below). "It is EPA's determination that a Corrective Measures Study (CMS) for the Ashland facility is required. . . " "As part of the CMS, Ashland will need to evaluate all potential remedial measures needed to address contaminated groundwater in the southern and central portions of the site, in addition to the other areas on and off-site of the Ashland facility."	
3/14/2003	**1st Quarter Progress Report Plan (URS on behalf of Ashland)**	Presents the data requested by EPA in the 11/7/02 letter, including discussion of sources at MW-1 (in the former drum storage area), and inclusion of a figure showing total VOC data for onsite wells, as requested. Historical soil data were discussed for the area of MW-1. Data are not compared to soil criteria, and no summary or recommendations are provided. Groundwater trends in MW-1 were discussed in detail and the conclusion at the time was that the existing groundwater system was reducing total VOC concentrations within the radius of influence of the sump and preventing off-site migration of VOCs in groundwater from the MW-1 area.	The November 2002 USEPA Comment #1 was addressed in this report. Ashland proceeded to prepare for the CMS. An official approval of the Revised Draft RFI was not provided for public comment at this time.

Appendix B. Summary of Reports and Correspondence Starting with Submission of 2002 Draft RFI, Revised Draft RFI, Ashland Inc., Rensselaer, New York

Date of Document	Document Title	Comments/Summary	Action/Response
4/13/2003	**CMS Work Plan (URS on behalf of Ashland)**	Introduction references the January 15, 2003 conditional RFI approval from USEPA. The elements of the CMS outlined in the Work Plan were: • A brief description of the purpose of the CMS • A brief discussion of the CMS objectives • A brief description of the technologies studied • A brief description of the proposed approach for evaluating potential corrective measures • A detailed description of any proposed pilot or bench-scale studies • A proposed outline for the CMS report • A brief description of the project management • A project schedule, including document submittal dates • A Public Involvement Plan	This work plan required some updates according to the Response to Comments letter below.
5/28/2003	**Comments on the CMS WP (USEPA)**	See below - comments included in response from Ashland	
6/27/2003	**Response to Comments letter re: CMS WP Plan (URS on behalf of Ashland)**	USEPA Comment #1: MNA has deficiencies as a method to achieve remedial goals in a reasonable timeframe and protect human health and the environment. Response: Ashland agrees this is not a stand alone remedy at the site. USEPA Comment #2: MW-1 total VOC concentrations in recent years suggest the existing remedial system is inadequate. Response: Ashland feels the trends at MW-1, particularly including the most recent data from April 2003; suggest the lowest levels seen since monitoring began. Determining effective treatment options at the site, including the MW-1 area, is the purpose of the CMS. USEPA Comment #3: Offsite down gradient wells MW-16 and MW-18 need more study. Response: Ashland disputes the USEPA data evaluation, given more recent data, and argues there is MNA occurring in both wells, pointing out that migration will be impacted by the low permeability soils down gradient of the site on CSXT property. USEPA Comment #4: MW-19 contaminant levels need to be brought down significantly with remedial measures. Response: Ashland believes this will be addressed in the CMS.	All comments were accepted by USEPA as stated in the letter dated July 24, 2003.

Appendix B. Summary of Reports and Correspondence Starting with Submission of 2002 Draft RFI, Revised Draft RFI, Ashland Inc., Rensselaer, New York

Date of Document	Document Title	Comments/Summary	Action/Response
7/24/2003	**CMS Work Plan - EPA Approval (USEPA)**	Approval of the CMS Work Plan, as modified by the June 27, 2003 response to comments letter.	
10/1/2003	**Addendum to CMS WP (URS on behalf of Ashland)**	Proposes additional shallow soil sampling to provide data for Human Health Risk Assessment as part of the CMS as well as for Fate and Transport analysis.	
1/30/2004	**Groundwater Natural Attenuation Study (URS on behalf of Ashland)**	Conducted to provide data to assist in the evaluation of remedial technologies as part of the CMS. Purpose: 1. Demonstrate that NA processes are occurring. 2. Verify that the plumes are not expanding. 3. Provide key input parameters for contaminant fate and transport modeling. 4. Detect environmental conditions (geochemical, biological, etc.) that may reduce the efficacy of the NA processes. Groundwater samples obtained July 14-16, 2003, at 13 monitoring well locations were analyzed for typical natural attenuation parameters (BOD, sulfate, nitrate, COD, alkalinity, etc.) as well as VOCs. Eleven shallow soil samples (three in the northern area, three in the central area, and five in the southern area) were collected and analyzed for VOCs and physical parameters (from a Shelby Tube sample) such as grain size, dry bulk density, moisture content, organic carbon, pH, and water/air permeability.	Conclusions/Recommendations: VOC-affected groundwater is delineated and restricted to Ashland property and CSXT properties immediately downgradient of the site. Therefore, no further groundwater investigation is warranted at the site. VOCs in the southwest part of the site will be addressed as part of the CMS. Natural attenuation and chemical degradation processes are occurring in the subsurface.
4/22/2004	**Groundwater Natural Attenuation Study USEPA Comments (USEPA)**	"In summary, the Study presents data that are appropriate to encourage further extensive site characterization and monitoring to assess the role of natural attenuation processes. However, the Study does not provide sufficient information to properly address the potential for natural attenuation processes to meet remedial goals."	
September 2005	**Human Health Risk Assessment (URS on behalf of Ashland)**	Objective: to evaluate whether VOCs detected in soil and groundwater may pose a risk to human health under current and hypothetical future residential land use scenarios, and to identify the primary exposure pathways and constituents which drive potential risk at the site in support of the CMS and selection of the final remedy for the site.	"Site conceptual model indicates that the primary potential exposure route for VOCs from the site is inhalation via indoor air - the vapor intrusion pathway." (pp. 1-1 to 1-2).
1/17/2006	**EOS® Pilot Study (Phase I Pilot Test) (URS on behalf of Ashland)**	In support of the Draft CMS	
6/6/2006	**iSOC® Pilot Study (Phase II) (URS on behalf of Ashland)**	In support of the Draft CMS	

Appendix B. Summary of Reports and Correspondence Starting with Submission of 2002 Draft RFI, Revised Draft RFI, Ashland Inc., Rensselaer, New York

Date of Document	Document Title	Comments/Summary	Action/Response
11/15/2006	**Draft CMS (URS on behalf of Ashland)**	Proposed remedies: 1. Installation of a phytoremediation barrier along the down gradient edge of the site property to limit further offsite volatile organic compound (VOC) migration. 2. Treatment of groundwater through stimulation of in-situ biological activity to attenuate VOCs in offsite groundwater. 3. Implementation of institutional and engineering controls at the site to eliminate potential exposure to onsite VOCs.	
2/26/2007	**Draft CMS Comments (USEPA)**	USEPA required: • Collection of indoor air, subslab vapor, and ambient air samples from a facility down gradient of the Ashland site (the former Volvo service center) • Collection of additional groundwater samples down gradient of the offsite monitoring well MW-18 • Collection of soil vapor samples along South Street on the up gradient side of the site • Completion of a pilot study to evaluate the effectiveness of a proprietary combination of vegetable oils and nutrients (enhanced oil emulsion [EOS®]) for in-situ degradation of chlorinated VOCs in the vicinity of monitoring well MW-18	A work plan to address comments was submitted in a letter to the Agencies dated March 12, 2007. The 4th bullet comment was not completed as access was not provided to implement the pilot test.
3/12/2007	**Supplemental RFI Activities Work Plan (URS on behalf of Ashland)**	Work Plan for the Supplemental RFI Activities included: • SVI/IA at former Volvo Garage west of the property • Geoprobe groundwater sample collection offsite, northwest of MW-18 • Installation of South Street permanent soil vapor points • Pilot study for EOS®	
3/22/2007	**USEPA Comments and Conditional Approval for supplemental RFI work (USEPA)**	Updates to the work plan per USEPA Comments: • Groundwater investigation north of MW-18 - add one additional geoprobe point/groundwater sample or widen the spacing to close the gap between MW-11 and MW-17. • Air sampling at the former Volvo Garage using similar methods to previous sampling. • Tracer gas sampling on all subslab sampling. • Analysis of the air samples for 1,1,1-TCA in the Volvo locations. • Clarification of the 5 foot breathing height sample - in office settings, 3' is generally used. • Qualitative analysis of the vapor intrusion pathway must be included in the RI. • Soil vapor sampling in South Street - clarification on locations (roadway or right of way?)	Response to Comments from Ashland provided March 23, 2007.

Appendix B. Summary of Reports and Correspondence Starting with Submission of 2002 Draft RFI, Revised Draft RFI, Ashland Inc., Rensselaer, New York

Date of Document	Document Title	Comments/Summary	Action/Response
3/23/2007	**Response to Comments letter re: Supplemental RFI WP (URS on behalf of Ashland)**	All comments from the March 22, 2007 USEPA conditional approval letter are positively addressed.	
5/17/2007	**Off-site Indoor Air Sampling Summary (URS on behalf of Ashland)**	Report of indoor air and subslab sampling at the former Volvo service center. Ashland conclusions: The investigations at the former Volvo service center found that VOC-impacted groundwater originating from the Ashland site does not currently pose a vapor intrusion risk to offsite structures and no immediate actions are necessary to protect human health.	
6/1/2007	**Off-site Groundwater Sampling Summary (URS on behalf of Ashland)**	Only one VOC was detected in the 3 additional downgradient geoprobe groundwater locations (toluene at 1.1 ug/L) obtained north of MW-18 between MW-11 and MW-17. "These results demonstrate that the extent of VOCs in groundwater off-site has been delineated and does not extend beyond the CSXT right-of-way."	USEPA Comments are provided in the September 12, 2007 letter below.
6/1/2007	**Off-site Soil Vapor Sampling Summary (URS on behalf of Ashland)**	Ashland conclusions: The findings of the soil vapor investigation completed along South Street, as presented to the USEPA were: 1. No further action was necessary to address potential vapor intrusion issues associated with benzene, toluene, ethylbenzene, and xylenes (BTEX) in this area. 2. Resampling of two soil vapor locations (SV-1SG and SV-2S) for trichloroethylene (TCE) was recommended within a year of the initial sampling because of the concentration of TCE which was detected at these two soil vapor locations.	This sampling was not completed, as negotiations with USEPA led to indoor air sampling in two houses along South Street in February 2008.

Appendix B. Summary of Reports and Correspondence Starting with Submission of 2002 Draft RFI, Revised Draft RFI, Ashland Inc., Rensselaer, New York

Date of Document	Document Title	Comments/Summary	Action/Response
6/20/2007	**USEPA Review of the Summary of the Off-site Indoor Air Sampling Summary (USEPA)**	General Comment with regard to the former Volvo Service Center: ". . . Low levels of volatile organic compounds in sub-slab and indoor air . . . does not indicate a public health concern nor do they appear to have migrated in soil vapor from the Ashland, Inc. site." Specific Comments: • Please revise the May 17, 2007 report to include whether a tracer gas was used during soil vapor sampling. • Compare benzene and toluene to background levels rather than NYSDOH Soil Vapor Intrusion Guidance Air Matrices, which do not include these constituents. Agencies agree that VOCs off-site in groundwater originating from the Ashland site do not pose a vapor intrusion risk in the off-site structures sampled.	The original report was submitted by Ashland May 17, 2007 and resubmitted July 19, 2007 with these comments addressed.
7/19/2007	**Off-site Indoor Air Sampling Summary (revised from the May 17, 2007 submittal)**	See above for summary in the May 17, 2007 reference.	Agency concurrence provided in a letter June 20, 2007.
8/30/2007	**Current Status Letter (ARCADIS on behalf of Ashland)**	Summarizes activities and correspondence to date, and proposes a revised remedy (enhanced reductive dechlorination - ERD) for the CMS.	Additional monitoring well installation, dye testing, and aquifer testing were performed in October 2007 to provide additional hyrogeologic data for preliminary design of the revised ERD remedy to be proposed in the January 2008 Revised Draft CMS.
9/12/2007	**USEPA Review of the 6/1/2007 Off-Site Soil Groundwater Sampling Summary**	"The Agencies agree with the conclusion in the Summary Report that the extent of VOCs in groundwater has been adequately delineated and that the plume does not extend any significant distance north of MW-18, at this time."	

Appendix B. Summary of Reports and Correspondence Starting with Submission of 2002 Draft RFI, Revised Draft RFI, Ashland Inc., Rensselaer, New York

Date of Document	Document Title	Comments/Summary	Action/Response
9/12/2007	**USEPA Review of the 6/1/2007 Off-Site Soil Vapor Sampling Summary**	"The Agencies do not agree that an assumption can be made that the further away/upgradient of the site you go, there are no impacts, and therefore no additional investigations are necessary. In addition, the data collected to date does not support these assumptions. There have also been instances at other sites where the groundwater plume flows in one direction, and the vapor plume is being pulled in the opposite direction. Therefore, the Agencies are willing to conditionally approve the Off-site Soil Vapor Sampling Summary provided the following comment is addressed: • Sub-slab and indoor air sampling in houses along South Street are warranted.	Ashland proposed offsite sampling in two houses on South Street in the October 30, 2007 work plan.
9/27/2007	**Agencies' Review of the Summary of the Current Status and Outline of the Proposed Approach for Future Activities**	USEPA Comments: • Please propose a monitoring plan to investigate and prevent exposures in the former Volvo garage. • The Agencies do not agree that the further away/upgradient of the site you go, there are no impacts, and therefore no additional investigations are necessary. Regular additional and perhaps additional monitoring will may be required at MW-11, MW-17 and MW-18 to ensure the plume is being contained and the revised remedial approach is working.	Agency comments were addressed in the 2008 Revised Draft CMS. The Agency did not object to the revised remedial approach as long as the comments were addressed.
10/30/2007	**Sub-Slab Soil Gas/Soil Vapor Intrusion (SVI) Investigation Work Plan (ARCADIS on behalf of Ashland)**	Ashland proposes to sample two houses on South Street nearest the soil vapor locations in South Street with the highest TCE results.	
11/20/2007	**Comments on the SVI WP (USEPA)**	USEPA Comments: • Take duplicate indoor air samples. • Collect indoor air at 3' above the floor. • Provide a communication plan for presenting results to homeowners. • Provide a schedule for access agreements, sampling, and reporting. • Include a list of degradation products on the table for analysis.	
1/21/2008	**Response to USEPA comments on the SVI WP (ARCADIS on behalf of Ashland)**	All USEPA comments were addressed and incorporated into the final scope of work.	
1/31/2008	**Revised Draft CMS**	Technical approach detailed in Appendix B. ERD preliminary design provided.	

Appendix B. Summary of Reports and Correspondence Starting with Submission of 2002 Draft RFI, Revised Draft RFI, Ashland Inc., Rensselaer, New York

Date of Document	Document Title	Comments/Summary	Action/Response
3/13/2008	**Comments on the Revised Draft CMS - conditionally approved**	USEPA Comments: • Update erroneous figure. • Provide a schedule for the proposed remedy. • Further explain the groundwater monitoring frequency (should be dependent on results). • Correct confusing language about an onsite source removal. • What is Ashland's proposal if the ERD doesn't work? • Evaluate the affect of the culverted stream across the site on site hydrogeology and the ultimate effectiveness of the central IRZ proposed.	Appropriately addressed in either an immediate resubmittal, the response to comments letter of April 11, 2008, and/or in the revised text of the 2009 CMS.
4/11/2008	**Response to Comments on the Revised Draft CMS (ARCADIS on behalf of Ashland)**	All USEPA comments were addressed and incorporated into the final 2009 CMS or RFI.	
4/16/2008	**USEPA CMS Approval**	The Revised Draft CMS was approved in an email from USEPA (Mike Infurna).	
6/26/2008	**Final Residential Indoor Air Report to EPA/DOH/DEC (ARCADIS on behalf of Ashland)**	Reported IA/SVI results from the March-February investigation to the Agencies. No further action (NFA) recommended by Ashland.	NFA Approved by USEPA (see below).
7/1/2008	**Notification of Groundwater Extraction System Shutdown to USEPA**	With approval of the USEPA, the existing treatment system was shutdown and mothballed in-place until the CMS remedy is deemed successful.	
8/14/08	**Residential Air Data Summary Report (USEPA)**	USEPA Approval of NFA for the residential IA/SVI on South Street	

ARCADIS

Appendix C

Photographs of Site Features Decommissioned During 2007/2008

Appendix C
Revised Draft RFI Report
Ashland Inc. – Rensselaer Property

Pre- and Post- Decommissioning Photographs



Metal Building Used for Warehouse



Former Metal Building Location

Appendix C
Revised Draft RFI Report
Ashland Inc. – Rensselaer Property

Pre- and Post- Decommissioning Photographs



Storage Tanks 1 through 20 and Drive Through Building



Storage Tank/Drive Through Building Area After Removal

Appendix C
Revised Draft RFI Report
Ashland Inc. – Rensselaer Property

Pre- and Post- Decommissioning Photographs



Storage Tanks 31 through 35



Tank Area After Removals

Appendix C
Revised Draft RFI Report
Ashland Inc. – Rensselaer Property

Pre- and Post- Decommissioning Photographs



Tanks 40 and 41


Area following Removal of Tanks 40 and 41

Appendix C
Revised Draft RFI Report
Ashland Inc. – Rensselaer Property

Pre- and Post- Decommissioning Photographs



Southern Area Demolition Currently Looking Toward Columbia Turnpike from South Street



Looking North from the Southern Area on South Street

Appendix C
Revised Draft RFI Report
Ashland Inc. – Rensselaer Property

Pre- and Post- Decommissioning Photographs



Most Recent Views of Central Area (January 2009)



Pre- and Post- Decommissioning Photographs



View Looking South Toward Columbia Turnpike from December 2008

ARCADIS

Appendix D

Boring Logs

DATE
STARTED 11/2/90
FINISHED 11/2/90
SHEET 1 OF 1

EMPIRE SOILS INVESTIGATIONS INC. — **SUBSURFACE LOG**

HOLE NO. B-2
SURF. ELEV.
G. W. DEPTH See Note #1

PROJECT Proposed Warehouse
Ashland Chemical

LOCATION South Street
Rensselaer, New York

DEPTH FT	SAMPLES	SAMPLE NO	BLOWS ON SAMPLER 0/6	6/12	12/18	N	SOIL OR ROCK CLASSIFICATION	NOTES
0		1	3	3		6	FILL: Brown fine to coarse SAND, Some Gravel, trace silt; becomes wet @ approx. 2.0'	Note #1: No measurable groundwater, but soils becomes wet @ approx. 2.0'
			3	3				
		2	2	1		6	-cinder and ash layer noted @ approx 3.8'	
			5	4			(Moist to Wet-Loose) ±6.0'	Note #2: Auger change noted @ 9.0'
5		3	2	3		8	Gray CLAY and SILT with wood fragments (Still fill) (Wet-Medium)	
			5	6				
10		4	16	15		28	Brown CLAY and SILT	
			13	14				
15		5	4	4		9	- No recovery (piece of wood prevented sample recovery)	Note #3: saturated auger cuttings (like a slurry) coming up while advancing augers from 10.0 to 20.0'
			5	6				
							(Moist to Wet-Stiff to Medium)	
20		6	9	9		17	Gray fine SAND, little silt (Wet-Firm)	Note #4: Hard auger advance noted @ 23.0' (bedrock?) advanced augers to 25.0', advanced 3 7/8" Roller Bit from 25.0' to 27.0'
			8	7				
25		7	21	21		-	Gray GLACIAL TILL: fine SAND, little silt matrix with embedded coarser sands and gravel -weathered shale @ approx. 25.8' (Wet-Compact) ±25.8'	
			50/.0					
30							-Dark Gray SHALE, severely weathered and fractured, soft and laminated bedding	Run #1: HQ Core 27.0'-29.8' Rec: 100% RQD:0%
							Unable to core bedrock. Keeps core blocking due to poor condition of rock. Advanced augers from 25.0' to 34.5'. Auger refusal @ 34.5'	
35							Dark Gray SHALE moderately weathered and fractured, medium hard and laminated bedding.	Run #2: HQ Core 34.8'-39.8' Rec: 100% RQD:46%
40							Boring Terminated @ 39.8	

N = No blows to drive 2 " spoon 12 " with 140 lb. pin wt. falling 30 "per blow.
C = No blows to drive _____ " casing _____ " with _____ lb. weight falling _____ "per blow

CLASSIFICATION Visual by Geologist

DATE
STARTED 11/5/90
FINISHED 11/6/90
SHEET 1 OF 1

EMPIRE SOILS INVESTIGATIONS INC. SUBSURFACE LOG

HOLE NO. B-11
SURF. ELEV.
G. W. DEPTH See Note #1

PROJECT Proposed Warehouse
Ashland Chemical

LOCATION South Street
Rensselaer, New York

DEPTH FT	SAMPLES	SAMPLE NO	BLOWS ON SAMPLER 0/6	6/12	12/18	N	BLOW ON CASING C	SOIL OR ROCK CLASSIFICATION	NOTES
0		1	18	50/.2				FILL: Dark Brown fine to coarse SAND and GRAVEL, trace silt; brick fragments noted	Note #1: No measurable groundwater, but soils became wet @ approx. 7.0'
		2	1	1		3			
5			2	1				-becomes Dark Gray fine SAND, little silt, trace clay; and becomes wet @ approx. 7.0'	Note #2: Hard auger advance from 0.7' to 3.0' and 23.5' to 24.0'.
		3	2	2		4			
			2	2					
		4	3	11		17		-becomes Brown @ approx. 8.5	
10			6	7					
		5	5	8		20			
			12	16					
		6	7	7		14		±13.5'	
			7	6					
15		7	8	14		28		Brown fine to coarse SAND, trace silt	
			14	8					
		8	3	5		9		(Wet-Loose to Firm) ±18.0'	
			4	3					
		9	WR	WH		2		Gray SILT and CLAY, organics noted	
20			2	3					
		10	WH	WH		8		(Wet-Very Soft) ±21.0'	
			8	5					
		11	6	11		29		GLACIAL TILL: Gray fine to coarse SAND and GRAVEL, little silt; lenses of clay noted	Note #3: Advanced augers to 35.0' before coring bedrock
			18	14					
25		12	24	20		32			
			12	14					
		13	10	19		39		-weathered shale @ approx. 27.0'	
			20	28					
30									
35								Dark Gray, SHALE, soft severely weathered and fractured; laminated bedding.	Run #1: HQ Core 35.0'-40.0' Rec: 20% RQD:0%
40								Boring Terminated @ 40.0'	

N = No. blows to drive 2 " spoon 12 " with 140 lb. pin wt. falling 30 "per blow. CLASSIFICATION Visual by

C = No. blows to drive ____ " casing ____ " with ____ lb. weight falling ____ "per blow. Geologist

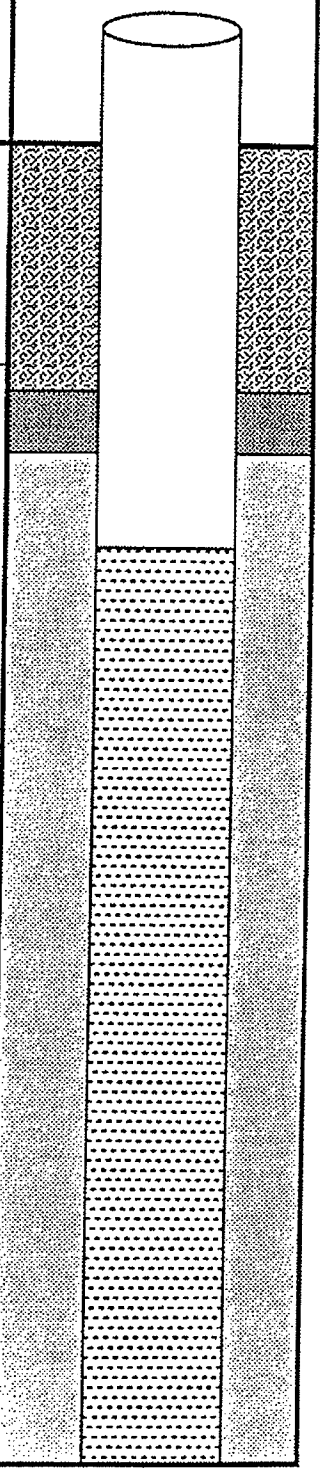
4¼" I.D. Hollow Stem Augers HQ Core Barrel

T.M. GATES, INC.	INVESTIGATIVE BORING & MONITORING WELL INSTALLATION LOG	CW-1 (WELL NO).

PROJECT: RENSSELAER, N.Y. I C & S FACILITY
CLIENT: ASHLAND CHEMICAL, INC.
BORING CONTRACTOR: EMPIRE SOIL INVESTIGATIONS, INC.
TOP OF CASING ELEVATION:
GROUND ELEVATION: DATUM: MEAN SEA LEVEL
DRILLING METHOD: 6.25" I.D. HOLLOW STEM ROTARY AUGER
SAMPLING METHOD: SPLIT SPOON BY ASTM METHOD D-1586
CORING METHOD: N/A

SHT. NO. 1 OF 2
PROJ. NO. 86-01-010
DATE START: 10-11-93
DATE FINISH: 10-12-93
DRILLER: J. LEONHARDT
TMG-REP. JNS

DEPTH FT.	SAMPLE NO.	BLOWS ON SAMPLE SPOON PER 6"	SYMBOL	IDENTIFICATION & REMARKS
1	S-1	2, 7, 6, 6		Fill - Brown, and black gravelly, sandy fill, with cinders and brick pieces, moist to wet, firm.
2				
3	S-2	6, 5, 6		
4		4	CL	Gray-green mottled silty clay, firm to very firm..
5	S-3	7, 3, 5, 8		
6				
7	S-4	3, 6, 8, 10		
8				
9	S-5	4, 4, 2, 2		
10				
11	S-6	2, 3, 3, 1	CL / CH	Gray clay, soft to firm.
12				
13	S-7	2, 4, 2, 1	CL / ML	Gray silty clay, clayey silt and clay, soft.
14				
15	S-8	2, 2, 2, 2		
16				
17	S-9	2, 4, 3, 4		
18				
19	S-10	3, 3, 4, 4		
20	S-11	1, 2, 3		
21				

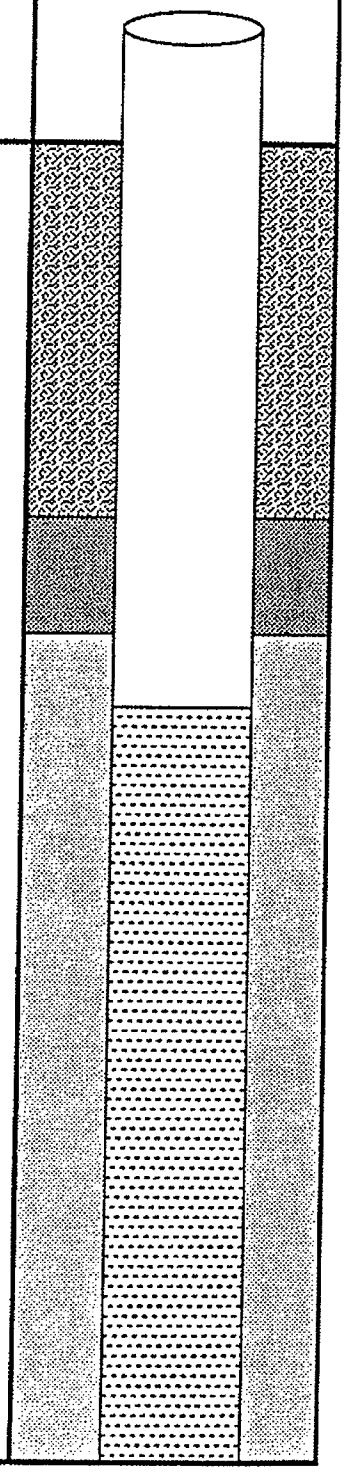


T.M. GATES, INC.	INVESTIGATIVE BORING & MONITORING WELL INSTALLATION LOG	CW-1 (WELL NO.)
PROJECT: RENSSELAER, N.Y. I C & S FACILITY		SHT. NO. 2 OF 2
CLIENT: ASHLAND CHEMICAL, INC.		PROJ. NO. 86-01-010

	SAMPLE NO.	BLOWS ON SAMPLE SPOON PER 6"	SYMBOL	IDENTIFICATION & REMARKS
22		3		
		3		
23	S-12	4	CL / ML	Gray silty clay, clayey silt and clay, soft.
		4		
24		4		
		WOR		
25	S-13	2		
		2		
26		13	SM /GM	Gray gravelly, silty sandy till, and shaley rock fragments.
	S-14	100=4"		
27				END OF BORING
28				
29				WELL INSTALLATION
30				- 0.01 INCH SLOT, 4" SCH 40 PVC, FLUSH THREAD WELL SCREEN: 26.5' - 6.5'
				- WASHED SILICA SAND: 26.5' - 5.0'
32				- BENTONITE PELLET SEAL: 5.0' - 4.0'
33				- NATIVE SOIL BACKFILL: 4.0' - 0.0'
34				
35				
36				NOTE: THIS WELL WILL BE RETROFITTED WITH A PRECAST CONCRETE MANHOLE CONE AND ASSORTED PIPING AND FITTINGS AT A LATER DATE WHEN THE RECOVERY PUMP IS INSTALLED.
37				
38				
39				
40				
41				
42				
43				
44				
45				

T.M. GATES, INC.	INVESTIGATIVE BORING & MONITORING WELL INSTALLATION LOG	CW-2 (WELL NO).
PROJECT: RENSSELAER, N.Y. I C & S FACILITY		SHT. NO. 1 OF 2
CLIENT: ASHLAND CHEMICAL, INC.		PROJ. NO. 86-01-010
BORING CONTRACTOR: EMPIRE SOIL INVESTIGATIONS, INC.		DATE START: 10-12-93
TOP OF CASING ELEVATION:		DATE FINISH: 10-12-93
GROUND ELEVATION: DATUM: MEAN SEA LEVEL		DRILLER: J. LEONHARDT
DRILLING METHOD: 6.25" I.D. HOLLOW STEM ROTARY AUGER		TMG-REP. JNS
SAMPLING METHOD: SPLIT SPOON BY ASTM METHOD D-1586		
CORING METHOD: N/A		

DEPTH FT.	SAMPLE NO.	BLOWS ON SAMPLE SPOON PER 6"	SYMBOL	IDENTIFICATION & REMARKS
1				
2				
3				
4				
5				
6				
7				
8				
9				
10				
11				
12				
13				
14				
15				
16				
17				
18				
19				
20				
21				

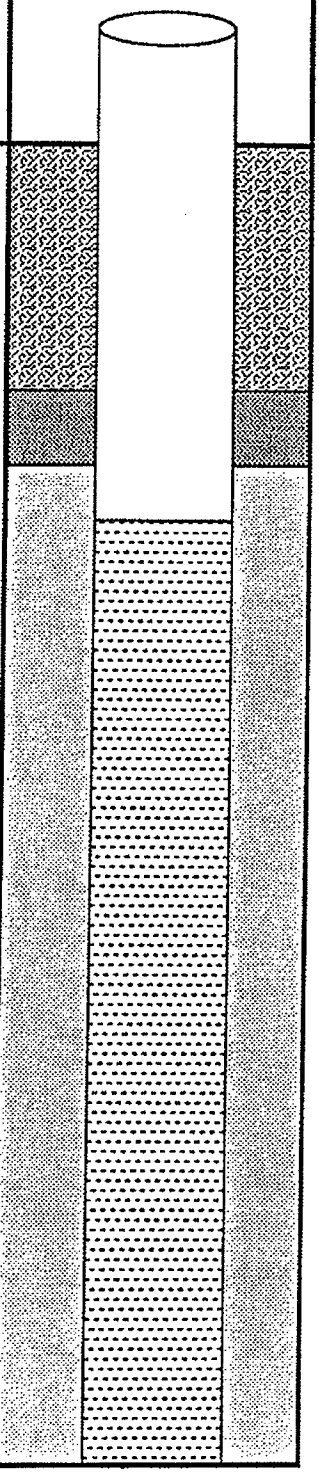


T.M. GATES, INC.	INVESTIGATIVE BORING & MONITORING WELL INSTALLATION LOG	CW-2 (WELL NO.)
PROJECT: RENSSELAER, N.Y. I C & S FACILITY		SHT. NO. 2 OF 2
CLIENT: ASHLAND CHEMICAL, INC.		PROJ. NO. 86-01-010

	SAMPLE NO.	BLOWS ON SAMPLE SPOON PER 6"	SYMBOL	IDENTIFICATION & REMARKS
22				
23				
24				
25				
26				
27				
28				
29				
30				END OF BORING
3				
32				WELL INSTALLATION
33				- 0.01 INCH SLOT, 4" SCH 40 PVC, FLUSH THREAD WELL SCREEN: 29.0' - 9.0'
34				- WASHED SILICA SAND: 29.0' - 8.0'
35				- BENTONITE PELLET SEAL: 8.0' - 6.0'
36				- NATIVE SOIL BACKFILL: 6.0' - 0.0'
37				
38				NOTE: THIS WELL WILL BE RETROFITTED WITH A PRECAST CONCRETE MANHOLE CONE AND ASSORTED PIPING AND FITTINGS AT A LATER DATE WHEN THE RECOVERY PUMP IS INSTALLED.
39				
40				
41				
42				
43				
44				
45				

T.M. GATES, INC.	INVESTIGATIVE BORING & MONITORING WELL INSTALLATION LOG	CW-3 (WELL NO).
PROJECT: RENSSELAER, N.Y. I C & S FACILITY		SHT. NO. 1 OF 2
CLIENT: ASHLAND CHEMICAL, INC.		PROJ. NO. 86-01-010
BORING CONTRACTOR: EMPIRE SOIL INVESTIGATIONS, INC.		DATE START: 10-12-93
TOP OF CASING ELEVATION:		DATE FINISH: 10-12-93
GROUND ELEVATION: DATUM: MEAN SEA LEVEL		DRILLER: J. LEONHARDT
DRILLING METHOD: 6.25" I.D. HOLLOW STEM ROTARY AUGER		TMG-REP. JNS
SAMPLING METHOD: SPLIT SPOON BY ASTM METHOD D-1586		
CORING METHOD: N/A		

DEPTH FT.	SAMPLE NO.	BLOWS ON SAMPLE SPOON PER 6"	SYMBOL	IDENTIFICATION & REMARKS
1				
2				
3				
4				
5				
6				
7				
8				
9				
10				
11				
12				
13				
14				
15				
16				
17				
18				
19				
20				
21				

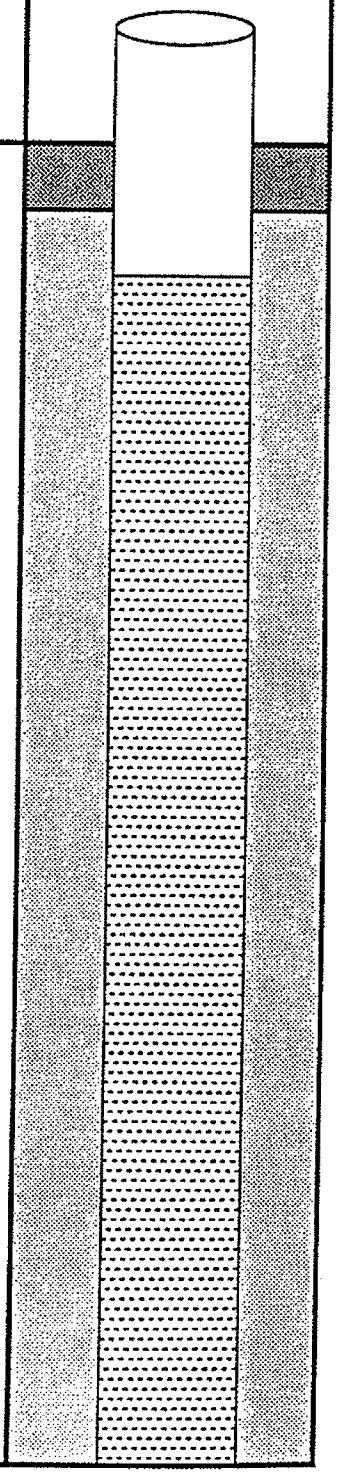


T.M. GATES, INC.	INVESTIGATIVE BORING & MONITORING WELL INSTALLATION LOG	CW-3 (WELL NO.)
PROJECT: RENSSELAER, N.Y. I C & S FACILITY		SHT. NO. 2 OF 2
CLIENT: ASHLAND CHEMICAL, INC.		PROJ. NO. 86-01-010

	SAMPLE NO.	BLOWS ON SAMPLE SPOON PER 6"	SYMBOL	IDENTIFICATION & REMARKS
22				
23				
24				
25				
26				END OF BORING
27				
28				
29				
30				WELL INSTALLATION
				- 0.01 INCH SLOT, 4" SCH 40 PVC, FLUSH THREAD WELL SCREEN: 26.0' - 6.0'
				- WASHED SILICA SAND: 26.0' - 5.0'
32				- BENTONITE PELLET SEAL: 5.0' - 4.0'
33				- NATIVE SOIL BACKFILL: 4.0' - 0.0'
34				
35				NOTE: THIS WELL WILL BE RETROFITTED WITH A PRECAST CONCRETE MANHOLE CONE AND ASSORTED PIPING AND FITTINGS AT A LATER DATE WHEN THE RECOVERY PUMP IS INSTALLED.
36				
37				
38				
39				
40				
41				
42				
43				
44				
45				

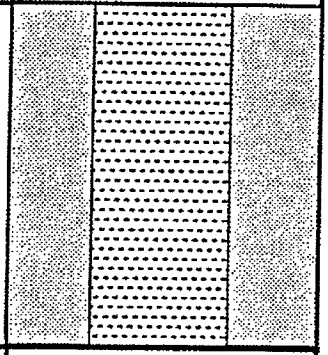
T.M. GATES, INC.	INVESTIGATIVE BORING & MONITORING WELL INSTALLATION LOG	CW-4 (PT-1) (WELL NO).
PROJECT: RENSSELAER, N.Y. I C & S FACILITY		SHT. NO. 1 OF 2
CLIENT: ASHLAND CHEMICAL, INC.		PROJ. NO. 86-01-010
BORING CONTRACTOR: EMPIRE SOIL INVESTIGATIONS, INC.		DATE START: 12-31-92
TOP OF CASING ELEVATION:		DATE FINISH: 1-4-93
GROUND ELEVATION: DATUM: MEAN SEA LEVEL		DRILLER:
DRILLING METHOD: 6.25" I.D. HOLLOW STEM ROTARY AUGER		TMG-REP. TKW
SAMPLING METHOD: SPLIT SPOON BY ASTM METHOD D-1586		
CORING METHOD: N/A		

DEPTH FT.	SAMPLE NO.	BLOWS ON SAMPLE SPOON PER 6"	SYMBOL	IDENTIFICATION & REMARKS
1				
2				
3				
4				
5				
6				
7				
8				
9				
10				
11				
12				
13				
14				
15				
16				
17				
18				
19				
20				
21				



T.M. GATES, INC.	INVESTIGATIVE BORING & MONITORING WELL INSTALLATION LOG	CW-4 (PT-1) (WELL NO.)
PROJECT: RENSSELAER, N.Y. I C & S FACILITY		SHT. NO. 2 OF 2
CLIENT: ASHLAND CHEMICAL, INC.		PROJ. NO. 86-01-010

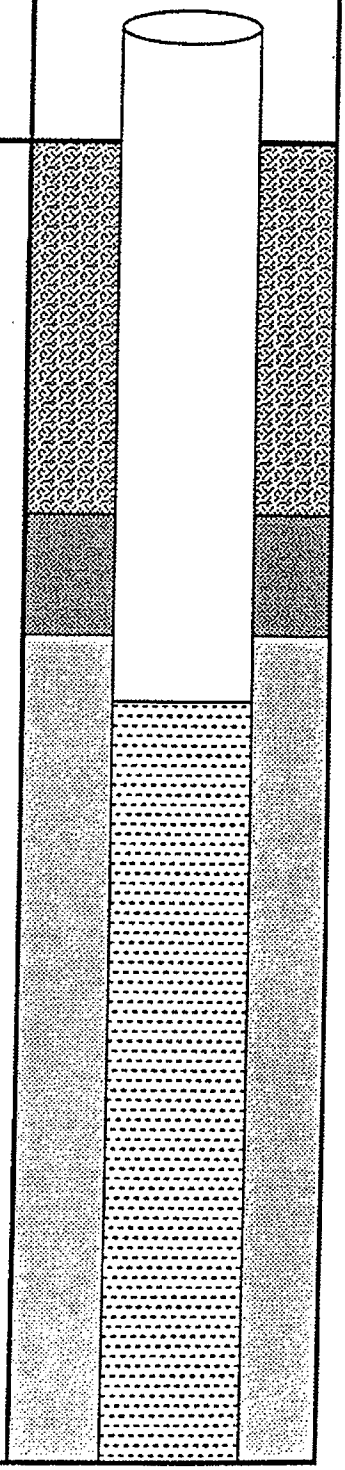
	SAMPLE NO.	BLOWS ON SAMPLE SPOON PER 6"	SYMBOL	IDENTIFICATION & REMARKS
22				
23				
24				
25				
26				
27				
28				END OF BORING
29				
30				
3				WELL INSTALLATION
32				- 0.01 INCH SLOT, 4" SCH 40 PVC, FLUSH THREAD WELL SCREEN: 27.0' - 2.0'
33				- WASHED SILICA SAND: 27.0' - 1.0'
34				- BENTONITE PELLET SEAL: 1.0' - 0.0'
35				
36				NOTE: THIS WELL WILL BE RETROFITTED WITH A PRECAST CONCRETE MANHOLE CONE AND ASSORTED PIPING AND FITTINGS AT A LATER DATE WHEN THE RECOVERY PUMP IS INSTALLED.
37				
38				
39				
40				
41				
42				
43				
4				
45				



T.M. GATES, INC.	INVESTIGATIVE BORING & MONITORING WELL INSTALLATION LOG	CW-5 (WELL NO).

PROJECT: RENSSELAER, N.Y. I C & S FACILITY	SHT. NO. 1 OF 2
CLIENT: ASHLAND CHEMICAL, INC.	PROJ. NO. 86-01-010
BORING CONTRACTOR: EMPIRE SOIL INVESTIGATIONS, INC.	DATE START: 10-13-93
TOP OF CASING ELEVATION:	DATE FINISH: 10-13-93
GROUND ELEVATION: DATUM: MEAN SEA LEVEL	DRILLER: J. LEONHARDT
DRILLING METHOD: 6.25" I.D. HOLLOW STEM ROTARY AUGER	TMG-REP. JNS
SAMPLING METHOD: SPLIT SPOON BY ASTM METHOD D-1586	
CORING METHOD: N/A	

DEPTH FT.	SAMPLE NO.	BLOWS ON SAMPLE SPOON PER 6"	SYMBOL	IDENTIFICATION & REMARKS
1				
2				
3				
4				
5				
6				
7				
8				
9				
10				
11				
12				
13				
14				
15				
16				
17				
18				
20				
21				

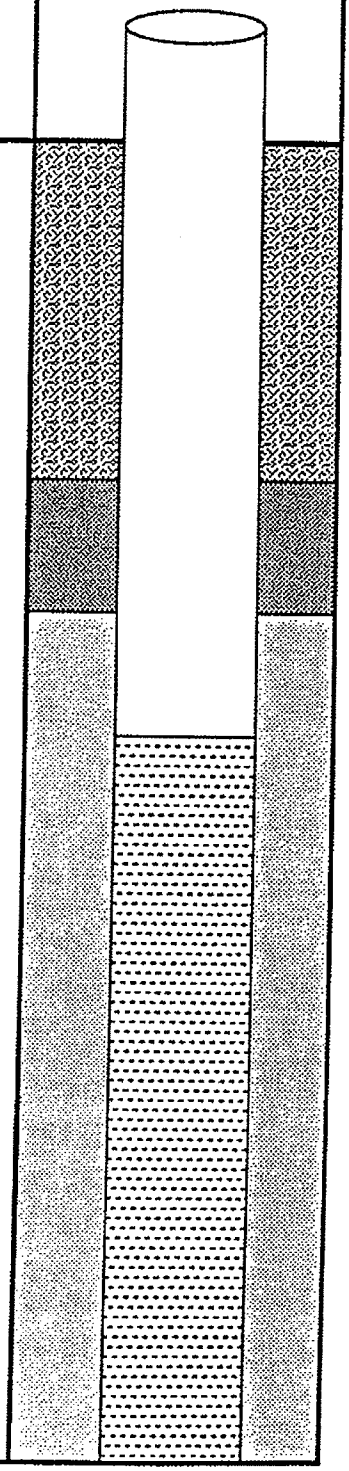


T.M. GATES, INC.	INVESTIGATIVE BORING & MONITORING WELL INSTALLATION LOG	CW-5 (WELL NO.)
PROJECT: RENSSELAER, N.Y. I C & S FACILITY		SHT. NO. 2 OF 2
CLIENT: ASHLAND CHEMICAL, INC.		PROJ. NO. 86-01-010

	SAMPLE NO.	BLOWS ON SAMPLE SPOON PER 6"	SYMBOL	IDENTIFICATION & REMARKS
22				
23				
24				END OF BORING
25				
26				
27				WELL INSTALLATION
28				- 0.01 INCH SLOT, 4" SCH 40 PVC, FLUSH THREAD WELL SCREEN: 24.0' - 9.0'
29				- WASHED SILICA SAND: 24.0' - 8.0'
30				- BENTONITE PELLET SEAL: 8.0' - 6.0'
3				- NATIVE SOIL BACKFILL: 6.0' - 0.0'
32				
33				NOTE: THIS WELL WILL BE RETROFITTED WITH A PRECAST CONCRETE MANHOLE CONE AND ASSORTED PIPING AND FITTINGS AT A LATER DATE WHEN THE RECOVERY PUMP IS INSTALLED.
34				
35				
36				
37				
38				
39				
40				
41				
42				
43				
14				
45				

T.M. GATES, INC.	INVESTIGATIVE BORING & MONITORING WELL INSTALLATION LOG	CW-6 (WELL NO.)
PROJECT: RENSSELAER, N.Y. I C & S FACILITY		SHT. NO. 1 OF 2
CLIENT: ASHLAND CHEMICAL, INC.		PROJ. NO. 86-01-010
BORING CONTRACTOR: EMPIRE SOIL INVESTIGATIONS, INC.		DATE START: 10-13-93
TOP OF CASING ELEVATION:		DATE FINISH: 10-13-93
GROUND ELEVATION: DATUM: MEAN SEA LEVEL		DRILLER: J. LEONHARDT
DRILLING METHOD: 6.25" I.D. HOLLOW STEM ROTARY AUGER		TMG-REP. JNS
SAMPLING METHOD: SPLIT SPOON BY ASTM METHOD D-1586		
CORING METHOD: N/A		

DEPTH FT.	SAMPLE NO.	BLOWS ON SAMPLE SPOON PER 6"	SYMBOL	IDENTIFICATION & REMARKS
1				
2				
3				
4				
5				
6				
7				
8				
9				
10				
11				
12				
13				
14				
15				
16				
17				
18				
19				
20				
21				



T.M. GATES, INC.	INVESTIGATIVE BORING & MONITORING WELL INSTALLATION LOG	CW-6 (WELL NO.)
PROJECT: RENSSELAER, N.Y. I C & S FACILITY		SHT. NO. 2 OF 2
CLIENT: ASHLAND CHEMICAL, INC.		PROJ. NO. 86-01-010

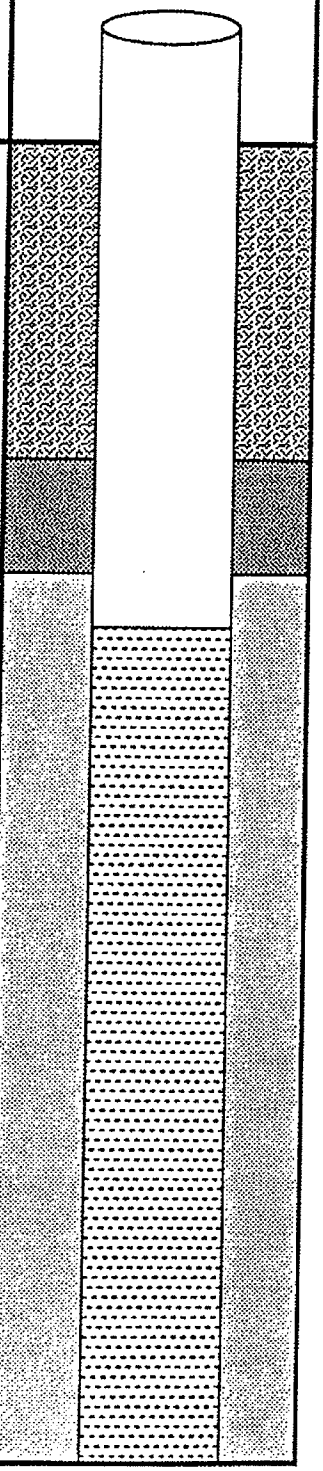
	SAMPLE NO.	BLOWS ON SAMPLE SPOON PER 6"	SYMBOL	IDENTIFICATION & REMARKS
22				
23				
24				
25				END OF BORING
26				
27				
28				WELL INSTALLATION
29				- 0.01 INCH SLOT, 4" SCH 40 PVC, FLUSH THREAD WELL SCREEN: 24.5' - 9.5'
30				- WASHED SILICA SAND: 24.5' - 7.5'
				- BENTONITE PELLET SEAL: 7.5' - 5.5'
				- NATIVE SOIL BACKFILL: 5.5' - 0.0'
32				
33				NOTE: THIS WELL WILL BE RETROFITTED WITH A PRECAST CONCRETE MANHOLE CONE AND ASSORTED PIPING AND FITTINGS AT A LATER DATE WHEN THE RECOVERY PUMP IS INSTALLED.
34				
35				
36				
37				
38				
39				
40				
41				
42				
43				
45				

T.M. GATES, INC.	INVESTIGATIVE BORING & MONITORING WELL INSTALLATION LOG	CW-7 (WELL NO).

PROJECT: RENSSELAER, N.Y. I C & S FACILITY
CLIENT: ASHLAND CHEMICAL, INC.
BORING CONTRACTOR: EMPIRE SOIL INVESTIGATIONS, INC.
TOP OF CASING ELEVATION:
GROUND ELEVATION: DATUM: MEAN SEA LEVEL
DRILLING METHOD: 6.25" I.D. HOLLOW STEM ROTARY AUGER
SAMPLING METHOD: SPLIT SPOON BY ASTM METHOD D-1586
CORING METHOD: N/A

SHT. NO. 1 OF 2
PROJ. NO. 86-01-010
DATE START: 10-13-93
DATE FINISH: 10-14-93
DRILLER: J. LEONHARDT
TMG-REP. JNS

DEPTH FT.	SAMPLE NO.	BLOWS ON SAMPLE SPOON PER 6"	SYMBOL	IDENTIFICATION & REMARKS
1	S-1	4, 5		Fill - Brown, and black gravelly, sandy fill, with cinders and brick pieces, wood chips, moist to wet, firm.
2		5, 7		
3	S-2	8, 7		
4		5, 9		
5	S-3	22, 32		
6		12, 10		
7	S-4	11, 10		
8		9, 11		
9	S-5	18, 18		
10		15, 7		
11	S-6	2, 2	SC / GC	Gray to brown, silty, clayey, gravelly sand.
12		7, 5		
13	S-7	5, 10		
14		3, 12		
15	S-8	7, 6		
16		10, 13		
17	S-9	7, 8		
18		3, 3		
19	S-10	6, 3	CL / ML	Gray silty clay, with trace to little sand and gravel, firm.
20		4, 6		
21	S-11	7, 10	CL	Gray clay, with little silt and fine sand, very firm to stiff.
		11		



T.M. GATES, INC.	INVESTIGATIVE BORING & MONITORING WELL INSTALLATION LOG	CW-7 (WELL NO.)
PROJECT: RENSSELAER, N.Y. I C & S FACILITY		SHT. NO. 2 OF 2
CLIENT: ASHLAND CHEMICAL, INC.		PROJ. NO. 86-01-010

	SAMPLE NO.	BLOWS ON SAMPLE SPOON PER 6"	SYMBOL	IDENTIFICATION & REMARKS
22		11		
		11	CL	Gray clay, with little silt and fine sand, very firm to stiff.
23	S-12	18		
		18		
24		13		
		22		
25	S-13	19		
		21		
26		28	SM / GM	Gray gravelly, silty sandy till, dense.
	S-14	48		
27		41		
		39		
28		53		
		100=1"		END OF BORING
29				
30				WELL INSTALLATION
				- 0.01 INCH SLOT, 4" SCH 40 PVC, FLUSH THREAD WELL SCREEN: 28.0' - 8.0'
32				- WASHED SILICA SAND: 28.0' - 7.0'
33				- BENTONITE PELLET SEAL: 7.0' - 5.0'
34				- NATIVE SOIL BACKFILL: 5.0' - 0.0'
35				
36				NOTE: THIS WELL WILL BE RETROFITTED WITH A PRECAST CONCRETE MANHOLE CONE AND ASSORTED PIPING AND FITTINGS AT A LATER DATE WHEN THE RECOVERY PUMP IS INSTALLED.
37				
38				
39				
40				
41				
42				
43				
44				
45				

T.M. GATES, INC	INVESTIGATIVE BORING & MONITORING WELL INSTALLATION LOG	GB-1 (BORING NO).
PROJECT: SOUTH CENTRAL RENSSELAER GEOTECHNICAL BORING		SHT. NO. 1 OF 2
CLIENT: ASHLAND CHEMICAL INC.		PROJ. NO. 86-01-010
BORING CONTRACTOR: EMPIRE SOIL INVESTIGATIONS INC.		DATE START 11-2-90
TOP OF CASING ELEVATION:		DATE FINISH 11-2-90
GROUND ELEVATION: DATUM: MEAN SEA LEVEL		DRILLER TOM FARRELL
DRILLING METHOD: HOLLOW STEM AUGER		TMG-REP. MAM
SAMPLING METHOD: SPLIT SPOON BY ASTM METHOD D-1586		
BORING METHOD:		

FT.	SAMPLE NO.	BLOWS ON SAMPLE SPOON PER 6"	SYMBOL	IDENTIFICATION & REMARKS	DEPTH
1	S-1	4 4 4 5	SW	SAND-Browm, medium to coarse grained; with some gravel (1/4"); DRY; NO ODOR	
3	S-2	4 3 2 3 4 2 8	SW	SAND as above with lenses of gravel (gravel = >2"); red brick fragment in sample; TIP WET	HNU = 0 ppm in sample
5	S-3	4 2 1 0 9 1 0	SW	1' SAND-Brown, coarse grained over 3" red brick fragments over 6" clay - gray; WET	HNU = 0 ppm in sample
	S-4	9 1 6 8 1 0	GC	GRAVEL - Gray, >1"; sandy, clayey; NO ODOR	
8	S-5	8 9 1 4 1 6	CL	CLAY - Light brown, uniform, silty; stiff to very stiff; WET	
0 1	S-6	1 0 9 1 1 1 4	CL	CLAY - as above	
2 3	S-7	1 2 1 9 2 3 1 8	CL	CLAY - as above; almost dry when broken because the silty clay exhibits very low permeability	
4 5	S-8	1 0 1 0 9 1 0	CL	CLAY - as above; becoming less silty	
6 7	S-9	8 8 1 0 2 1	CL	CLAY - as above	
8	S-10	2 8 2 4 1 8 2 2	CL	CLAY - as above; with 3" thick gravel lenses@ 19' & 20'	HNU = 0 ppm in sample
1	S-11	1 8 1 8 1 2	SC	SAND - Gray, fine to coarse, poorly sorted; clayey, with some gravel (>1")	

T.M. GATES, INC.	INVESTIGATIVE BORING & MONITORING WELL INSTALLATION LOG	GB-1 (BORING NO.)
JECT: SOUTH CENTRAL RENSSELAER GEOTECHNICAL BORING		SHT. NO. 2 OF 2
NT: ASHLAND CHEMICAL INC.		PROJ. NO. 86-01-010

	SAMPLE NO.	BLOWS ON SAMPLE SPOON PER 6"	SYMBOL	IDENTIFICATION & REMARKS	
22		17			
		12			
3	S-12	17		NO RECOVERY	
		REFUSAL			
24				INFERRED BEDROCK - END OF BORING	

CEMENT/BENTONITE GROUT TO SURFACE

T.M. GATES, INC	INVESTIGATIVE BORING & MONITORING WELL INSTALLATION LOG	GB-2 (BORING NO).
PROJECT: SOUTH CENTRAL RENSSELAER GEOTECHNICAL BORING		SHT. NO. 1 OF 2
CLIENT: ASHLAND CHEMICAL INC.		PROJ. NO. 86-01-010
BORING CONTRACTOR: EMPIRE SOIL INVESTIGATIONS INC.		DATE START 11-2-90
TOP OF CASING ELEVATION:		DATE FINISH 11-5-90
GROUND ELEVATION: DATUM: MEAN SEA LEVEL		DRILLER TOM FARRELL
DRILLING METHOD: HOLLOW STEM AUGER		TMG-REP. MAM
SAMPLING METHOD: SPLIT SPOON BY ASTM METHOD D-1586		
BORING METHOD:		

DEPTH FT.	SAMPLE NO.	BLOWS ON SAMPLE SPOON PER 6"	SYMBOL	IDENTIFICATION & REMARKS
1	S-1	3, 3, 3, 3	SW	SAND - Brown, medium grained; some silt; fill; DRY; NO ODOR
3	S-2	2, 1, 5, 4	SW	SAND - as above; WET; coal and cinders in bottom of sampler
5				
6	S-3	2, 3, 5, 6	SW / CL	SAND - as above over CLAY - gray; with wood fragments
8				
9				
10				
11	S-4	16, 15, 13, 14	CL	CLAY - Medium brown, uniform; stiff to very stiff
13				
14				
15				
16	S-5	4, 4, 5, 6		NO RECOVERY - pushing wood chip
18				
21	S-6	9, 9, 8	SC	SAND - Gray, fine grained, well sorted; clayey; NO ODOR

DEPTH

HNU = 0 ppm in sample

T.M. GATES, INC.	INVESTIGATIVE BORING & MONITORING WELL INSTALLATION LOG	GB-2 (BORING NO.)
JECT: SOUTH CENTRAL RENSSELAER GEOTECHNICAL BORING NT: ASHLAND CHEMICAL INC.		SHT. NO. 2 OF 2 PROJ. NO. 86-01-010

	SAMPLE NO.	BLOWS ON SAMPLE SPOON PER 6"	SYMBOL	IDENTIFICATION & REMARKS
22				
23				
24				
		21		GRAVEL - Gray, sandy
26	S-7	21	GC	
		REFUSAL		BEDROCK - SHALE
27				

CEMENT/BENTONITE GROUT TD-9'

T.M. GATES, INC	INVESTIGATIVE BORING & MONITORING WELL INSTALLATION LOG	GB-5 (BORING NO).
PROJECT: SOUTH CENTRAL RENSSELAER GEOTECHNICAL BORING		SHT. NO. 1 OF 1
CLIENT: ASHLAND CHEMICAL INC.		PROJ. NO. 86-01-010
BORING CONTRACTOR: EMPIRE SOIL INVESTIGATIONS INC.		DATE START 11-1-90
TOP OF CASING ELEVATION:		DATE FINISH 11-1-90
GROUND ELEVATION: DATUM: MEAN SEA LEVEL		DRILLER TOM FARRELL
DRILLING METHOD: HOLLOW STEM AUGER		TMG-REP MAM
SAMPLING METHOD: SPLIT SPOON BY ASTM METHOD D-1586		
CORING METHOD:		

DEPTH FT.	SAMPLE NO.	BLOWS ON SAMPLE SPOON PER 6"	SYMBOL	IDENTIFICATION & REMARKS
1	S-1	3, 2, 2, 3	SW	SAND - Brown, medium grained; some pea gravel - 1/4" rounded (fill); DRY
2				
3	S-2	10, 50/.1		NO RECOVERY
4				
5	S-3		SW	2" recovered - SAND - as above; WET
6				
7	S-4	40, 4, 50/.1	SM	SAND - Gray, medium grained;silty with some pea gravel; SATURATED; ODOR
8				
9	S-5	38, 42, 23, 28	SM	SAND - Gray, medium grained; abundant pea gravel up to 1.5" subrounded; ODOR
10				
11	S-6	2, 3, 6, 8		NO RECOVERY
12				
13	S-7	5, 5, 8, 10	CL	CLAY - Medium brown, uniform
14				
15				
16	S-8	4, 6, 3, 3	SW	SAND - Black, medium to coarse grained, well sorted; rounded, quartz and black (shale?); SLIGHT ODOR
17				
18				
19				
20				
21	S-9	4, 8, 16-50	SW	SAND - as above, medium grained over 3" CLAY at bottom with SHALE at 22'

HNU = 8 in sample ?

HNU = 8 in sample

T.M. GATES, INC	INVESTIGATIVE BORING & MONITORING WELL INSTALLATION LOG	GB-7 (BORING NO).
PROJECT: SOUTH CENTRAL RENSSELAER GEOTECHNICAL BORING		SHT. NO. 1 OF 2
CLIENT: ASHLAND CHEMICAL INC.		PROJ. NO. 86-01-010
BORING CONTRACTOR: EMPIRE SOIL INVESTIGATIONS INC.		DATE START 11-1-90
TOP OF CASING ELEVATION:		DATE FINISH 11-1-90
GROUND ELEVATION: DATUM: MEAN SEA LEVEL		DRILLER TOM FARRELL
DRILLING METHOD: HOLLOW STEM AUGER		TMG-REP. MAM
SAMPLING METHOD: SPLIT SPOON BY ASTM METHOD D-1586		
BORING METHOD:		

DEPTH FT.	SAMPLE NO.	BLOWS ON SAMPLE SPOON PER 6"	SYMBOL	IDENTIFICATION & REMARKS
1	S-1	4 4 6 7	SW	SAND - Brown, fine grained (fill); DRY
2				
3	S-2	9 8	SW	SAND - as above over SAND - Dark gray, fine grained; silty with gravel (>1.5"); SATURATED
4		8 7	SM	
5	S-3	4 5 9 7	SM	SAND - Dark gray as above; SLIGHT ODOR
6	S-4	4 5 16 17	SM	SAND - Dark gray as above (fill - red brick fragment)
8	S-5	14 14 10 6		NO RECOVERY
10	S-6	4 7 8 10	GC	GRAVEL - with gray clayey fine grained sand
12	S-7	6 4 5 5	GC	GRAVEL - as above
14	S-8	2 2 2 3	GC SW	GRAVEL - as above over SAND - Black, medium grained; quartz and black shale; rounded
16	S-9	2 3 3 3	SW CL	SAND - Black as above over 6" CLAY - gray
18				
20	S-10	2 6 8	SW	SAND - Black as above

HNU = 5 ppm in sample

HNU = 5 ppm in sample

HNU = 13 ppm in sample

T.M. GATES, INC.

INVESTIGATIVE BORING & MONITORING WELL INSTALLATION LOG

GB-7
(BORING NO.)

ECT: SOUTH CENTRAL RENSSELAER GEOTECHNICAL BORING
NT: ASHLAND CHEMICAL INC.

SHT. NO. 2 OF 2
PROJ. NO. 86-01-010

SAMPLE No.	BLOWS ON SAMPLE SPOON PER 6"	SYMBOL	IDENTIFICATION & REMARKS	
22	2	ML	SILT - Dark gray, very fine grained sand/silt	HNU = 0 ppm in sample
S-12	REFUSAL		INFERRED BEDROCK	
24				

T.M. GATES, INC	INVESTIGATIVE BORING & MONITORING WELL INSTALLATION LOG	GB-11 (BORING NO).
PROJECT: SOUTH CENTRAL RENSSELAER GEOTECHNICAL BORING		SHT. NO. 1 OF 2
CLIENT: ASHLAND CHEMICAL INC.		PROJ. NO. 86-01-010
BORING CONTRACTOR: EMPIRE SOIL INVESTIGATIONS INC.		DATE START 11-5-90
TOP OF CASING ELEVATION:		DATE FINISH 11-5-90
GROUND ELEVATION: DATUM: MEAN SEA LEVEL		DRILLER TOM FARRELL
DRILLING METHOD: HOLLOW STEM AUGER		TMG-REP. MAM
SAMPLING METHOD: SPLIT SPOON BY ASTM METHOD D-1586		
CORING METHOD:		

DEPTH FT.	SAMPLE NO.	BLOWS ON SAMPLE SPOON PER 6"	SYMBOL	IDENTIFICATION & REMARKS	DEPTH
1	S-1		SW	SAND - Gray, medium grained; with gravel	
2					
3	S-2		SW	NO RECOVERY	
4					
5	S-3	1, 1, 2, 1	SW	SAND with gravel as above	
6					
7	S-4	2, 2, 2, 2	SW / SP	SAND with gravel as above over SAND - Gray, fine grained; clayey; WET; SLIGHT ODOR	HNU = 2 ppm in sample ✓ HNU = 4 ppm in sample
8					
9	S-5	3, 11, 6, 7	SP	SAND with gravel - Gray, clayey; blackish discoloration in top 6"; ODOR over SAND - Brown, fine grained; clayey	
10					
11	S-6	5, 8, 12, 6	SP	SAND - Brown, medium grained, with gravel; NO ODOR	
12					
13	S-7	7, 7, 7, 6	SP	SAND - as above	
14					
15	S-8	8, 14, 14, 8	SP	SAND - as above	
16					
17	S-9	3, 5, 4, 3	SP	SAND _ as above	
18					
1	S-10	WR, WH, 2, 3	SP / CL	SAND - as above over CLAY - Gray, silty	
20					
21	S-11	WH, WH, 8	CL / GC	CLAY - Gray, silty over GRAVEL - Gray, sandy, clayey	

T.M. GATES, INC.	INVESTIGATIVE BORING & MONITORING WELL INSTALLATION LOG	GB-11 (BORING NO.)
PROJECT: SOUTH CENTRAL RENSSELAER GEOTECHNICAL BORING		SHT. NO. 2 OF 2
CLIENT: ASHLAND CHEMICAL INC.		PROJ. NO. 86-01-010

FT.	SAMPLE NO.	BLOWS ON SAMPLE SPOON PER 6"	SYMBOL	IDENTIFICATION & REMARKS
22		5		
23	S-12	24 20 12 14	GC	GRAVEL - as above
24		10		
25	S-13	19 20	SW	SAND - Black, coarse grained; shale fragments with some Quartz over 8" weathered black SHALE
26		28	SH	BEDROCK

CEMENT/BENTONITE GROUT TO SURFACE

T.M. GATES, INC	INVESTIGATIVE BORING & MONITORING WELL INSTALLATION LOG	GB-15 (BORING NO).

PROJECT: SOUTH CENTRAL RENSSELAER GEOTECHNICAL BORING
CLIENT: ASHLAND CHEMICAL INC.
BORING CONTRACTOR: EMPIRE SOIL INVESTIGATIONS INC.
TOP OF CASING ELEVATION:
GROUND ELEVATION: DATUM: MEAN SEA LEVEL
DRILLING METHOD: HOLLOW STEM AUGER
SAMPLING METHOD: SPLIT SPOON BY ASTM METHOD D-1586
CORING METHOD:

SHT. NO. 1 OF 1
PROJ. NO. 86-01-010
DATE START 11-6-90
DATE FINISH 11-6-90
DRILLER JIM NOWELL
TMG-REP. MAM

DEPTH FT.	SAMPLE NO.	BLOWS ON SAMPLE SPOON PER 6"	SYMBOL	IDENTIFICATION & REMARKS
1				
2				
3				
4				
5	S-1	4 3 2 3	SW	SAND - Brown, coarse grained; with gravel; WET; NO ODOR
6				
7	S-2	1 15 39 10	SW	SAND - Brown/black, coarse grained; shale fragments; POSSIBLE ODOR over SAND and clay with large wood (timber) fragments
8				
9	S-3	12 40 10 5	CL	CLAY - green/gray, silty; ODOR ; 3" wood fragment
10				
11	S-4	6 6 18 12	CL	3" wood over 3" clay as above; (wood in augers ?)
12				
13	S-5	6 6 5 10		NO RECOVERY
14				
15	S-6	16 14 16 7	CL	CLAY - Gray, silty; with gravel lenses
16				
17	S-7	4 4 2 2	CL	CLAY - Gray/brown, firm, with some gravel
18				
19	S-8	2 6 50/3	CL SM	CLAY as above over SILT - very fine grained sand REFUSAL
20				

HNU = 8 in sample

CEMENT/BENTONITE GROUT TO SURFACE

Boring Log: GP-19

Project: Ashland Chemical Co.

Project No.: 462690

Location: Rensselaer, NY

Geologist: David P. Bouchard

Completion Date: March 14, 2000

Surface Elevation (ft. MSL): Not determined

Total Depth (ft. bgs): 27

TOC Elevation (ft. MSL):

Borehole Diameter (in.) 2

ESC

Sample Data				SUBSURFACE PROFILE		
Depth	Sample Interval	% Recovery	PID (ppm)	Symbol	Description	Well Construction
0					Ground Surface	
1	1	25	10.2		*Gravelly silt (ML)* Dark grey to black silt and gravel, little fine-grained sand, little wood debris; loose; moist becoming wet at 3.5 feet; slight solvent-type odor.	
2						
3	2	12	35.0			
4						
5	3	75	20.3			
6					*Silt (ML)* Greenish-grey silt, little clay; very dense; dry; no odor.	
7	4	75	18.2		*Clay (CH)* Greenish-grey silt and clay, trace to little brick fragments, concrete; very stiff; medium plasticity; dry.	
8						
9	5	25	19.0			
10						
11	6	75	36		*Sand with Gravel (SP)* Dark grey to black-stained fine to medium-grained sand and gravel, some thin (less than 1 inch) medium dense, fine-grained sand and silt layers between 12.0 to 14.0 feet; loose; wet.	
12						
13	7	75	-			
14						
15	8	12	42			
16						
17	9	75	54			
18					*Silt (MH)* Dark grey silt, some clay; trace fine sand, trace woody debris; medium dense; low to medium plasticity; moist.	
19	10	50	50		*Clay (CH)* Greenish-grey clay, some silt; medium stiff; medium to high plasticity; moist.	
20						
21	11	50	9.2		*Clay (CH)* Grey clay, little to some silt; soft becoming medium stiff at 21.0 feet, sticky; moist.	
22					*Gravelly Silt (ML)* Dark grey silt and gravel, trace fine sand; loose; wet.	
23	12	25	8.2		*Gravelly Silt (ML)* Dark grey silt and gravel, little fine sand; medium dense; moist.	
24					*Poorly Graded Sand (SP)* Dark grey fine-grained sand, little to no gravel; medium dense; moist.	
25						

Subcontractor: Parrat Wolff, Inc.

Method: Direct Push

Driller/Operator: Doug Richmond/Dennis Fallon

Boring Log: GP-19

Project: Ashland Chemical Co.

Project No.: 462690

Location: Rensselaer, NY

Geologist: David P. Bouchard

Completion Date: March 14, 2000

Surface Elevation (ft. MSL): Not determined

Total Depth (ft. bgs): 27

TOC Elevation (ft. MSL):

Borehole Diameter (in.) 2

ESC

Sample Data				SUBSURFACE PROFILE		
Depth	Sample Interval	% Recovery	PID (ppm)	Symbol	Description	Well Construction
26	13	100	3.3		*Gravelly Silt with Sand (ML)* Dark grey silt and gravel, some fine-grained sand; loose becoming dense to very dense at 25 feet; wet becoming dry at 25 feet and moist at 26 feet.	
27	14	100	0		Refusal on Bedrock at 27 feet.	
28					Boring Terminated	
29						
30						
31						
32						
33						
34						
35						
36						
37						
38						
39						
40						
41						
42						
43						
44						
45						
46						
47						
48						
49						
50						

Subcontractor: Parrat Wolff, Inc.

Method: Direct Push

Driller/Operator: Doug Richmond/Dennis Fallon

Boring Log: GP-21

Project: Ashland Chemical Co.

Project No.: 462690

Location: Rensselaer, NY

Geologist: David P. Bouchard

Completion Date: March 15, 2000

Surface Elevation (ft. MSL): Not determined

Total Depth (ft. bgs): 33

Borehole Diameter (in.) 2

Depth	Sample Interval	% Recovery	PID (ppm)	Symbol	Description
0					Ground Surface
					Asphalt
1	1	25	10.2		*Gravelly Silt with Sand (ML)* Greyish-brown silt and coarse gravel, little fine to medium-grained sand; little brick, glass, asphalt; loose; moist.
2					
3	2	12	35.0		*Silt (MH)* Brown silt, some clay, medium dense to dense; low to medium plasticity; dry.
4					
5	3	75	20.3		*Clay (CH)* Brown silt and clay, stiff to very stiff; medium to high plasticity; moist.
6					
7	4	75	18.2		*Clay (CH)* Brown to greyish-brown clay, little silt; very stiff to hard; medium to high plasticity; moist.
8					
9	5	25	19.0		
10					*Clay (CH)* Brown silt and clay, stiff to very stiff; medium to high plasticity; moist.
11	6	75	36		*Clay (CH)* Brown to greyish-brown clay, little silt; very stiff to hard; medium to high plasticity; moist.
12					*Clay (CH)* Brown silt and clay, stiff to very stiff; medium to high plasticity; moist becoming wet between 10.7-10.9.
13	7	75	-		*Clay (CL)* Dark grey clay, trace silt; soft; high plasticity, sticky; moist to wet.
14					*Clay (CL)* Greyish-brown clay, very soft; high plasticity, sticky; wet.
15	8	12	42		*Silt (MH)* Dark grey silt, some clay; medium stiff; medium plasticity; moist.
16					*Clay (CH)* Dark grey silt, some clay, trace gravel; soft; medium plasticity, sticky; wet.
17	9	75	54		
18					
19	10	50	50		
20					
21	11	50	9.2		*Silty Sand (SM)* Dark grey fine-grained sand, little to some silt; loose to medium dense; wet.
22					
23	12	25	8.2		
24					
25					

Subcontractor: Parrat Wolff, Inc.

Method: Direct Push

Driller/Operator: Doug Richmond/Dennis Fallon

Boring Log: GP-21

Project: Ashland Chemical Co.

Project No.: 462690

Location: Rensselaer, NY

Geologist: David P. Bouchard

Completion Date: March 15, 2000

Surface Elevation (ft. MSL): Not determined

Total Depth (ft. bgs): 33

Borehole Diameter (in.) 2

Depth	Sample Interval	% Recovery	PID (ppm)	Symbol	Description
26	13	100	3.3		
	14	100	0		
27					*Sand (SP)* Dark grey medium to fine-grained sand, trace to little gravel; loose to medium dense; moist becoming wet at 27.2 feet.
28					
29					
30					*Sand with Gravel (SP)* Dark grey medium to coarse-grained sand, little gravel; medium dense to very dense; moist.
31					
32					Refusal on Bedrock at 33 feet.
33					
34					Boring Terminated
35					
36					
37					
38					
39					
40					
41					
42					
43					
44					
45					
46					
47					
48					
49					
50					

Subcontractor: Parrat Wolff, Inc.

Method: Direct Push

Driller/Operator: Doug Richmond/Dennis Fallon

Boring Log: GP-27

Project: Ashland Chemical Co.

Project No.: 462690

Location: Rensselaer, NY

Geologist: David P. Bouchard

Completion Date: 17 Aug 00

Surface Elevation (ft. MSL): Not determined

Total Depth (ft. bgs): 32.5

Borehole Diameter (in.) 2

Depth	Sample Interval	% Recovery	PID (ppm)	Symbol	Description
0					Ground Surface
1	1	0	-		*No recovery*
2					
3	2	0	-		
4					
5	3	0	-		
6					
7	4	12	0		
8					*Sand with Gravel (SP)* Brown medium-grained sand and gravel; loose; dry.
9	5	50	2.8		*Silt with Gravel (ML)* Brown silt, little to some gravel; medium dense; moist; some gray mottling between 9.5 and 10.0 feet.
10					
11	6	25	0		
12					
13	7	25	0		*Sand with Gravel (SP)* Grayish-brown medium-grained sand and gravel, trace brick, wood; loose; dry.
14					
15	8	100	0		*Sand with Gravel (SP)* Brown medium to coarse-grained sand and gravel; loose; wet. *Clay (CL)* Grayish-brown clay, some silt; moist; very stiff.
16					
17	9	75	0		*Silt (ML)* Grayish-brown silt, some clay; medium dense to dense; moist becoming dry at 16.5 feet.
18					
19	10	100	0		
20					
21	11	75	0		
22					
23	12	50	0		
24					
25					*Silt with gravel (ML)* Dark gray to black silt, little to some gravel; medium dense; dry.

Subcontractor: Parratt Wolff

Method: Direct Push

Driller/Operator: Rod Trask

Boring Log: GP-27

Project: Ashland Chemical Co.

Project No.: 462690

Location: Rensselaer, NY

Geologist: David P. Bouchard

Completion Date: 17 Aug 00

Surface Elevation (ft. MSL): Not determined

Total Depth (ft. bgs): 32.5

Borehole Diameter (in.) 2

Depth	Sample Interval	% Recovery	PID (ppm)	Symbol	Description
26	13	75	0		
27	14	75	0		*Silt with gravel (ML)* Dark gray to black silt, little to some gravel; medium dense; dry.
28					Wet between 24.5 and 25.0 feet.
29	15	75	0		
30					
31	16	75	0		*Silt (ML)* Dark gray silt; loose to medium dense; moist.
32					Wet between 31.0 and 31.6 feet.
	17	100	0		*Silt (ML)* Dark gray silt, little to some gravel (shale fragments); very dense; dry.
33					Boring Terminated
34					
35					
36					
37					
38					
39					
40					
41					
42					
43					
44					
45					
46					
47					
48					
49					
50					

Subcontractor: Parratt Wolff

Method: Direct Push

Driller/Operator: Rod Trask

Boring Log: GP-28

Project: Ashland Chemical Co.

Project No.: 462690

Location: Rensselaer, NY

Geologist: David P. Bouchard

Completion Date: 17 Aug 00

Surface Elevation (ft. MSL): Not determined

Total Depth (ft. bgs): 29

Borehole Diameter (in.) 2

Depth	Sample Interval	% Recovery	PID (ppm)	Symbol	Description
0					Ground Surface
1	1	0	-		*Asphalt*
2					*Sand with Gravel (SP)* Greyish-brown medium-grained sand and gravel; loose; dry.
3	2	75	-		*Sand with Gravel (SP)* Brown fine-grained sand, some gravel, trace brick, concrete, wood; medium dense; dry.
4					*Sand (SP)* Dark grey to black fine-grained sand, some cinders; loose; dry.
5	3	50	-		*Silt (ML)* Dark brown silt, some woody debris, medium dense; dry.
6					*Silty Sand with Gravel (SM)* Grayish-brown fine-grained sand, some silt, little gravel, trace brick, glass; medium dense; dry.
7	4	75	-		Water in spoon.
8					*Silt (ML)* Brownish-grey to reddish-brown silt, some clay; dense; dry.
9	5	75	-		
10					
11	6	75	-		
12					
13	7	75	-		*Clay (CL)* Greyish-brown clay, trace gravel (shale fragments); stiff; dry.
14					
15	8	75	-		Very stiff from 12 to 14 feet.
16					
17	9	0	-		
18					
19	10	25	-		*Silt (ML)* Dark grey silt, some clay, trace rock fragments; dense; moist.
20					
21	11	75	-		
22					
23	12	0	-		*Silt with Gravel (ML)* Dark grey silt and gravel; very dense; dry.
24					
25					

Subcontractor: Parratt Wolff

Method: Direct Push

Driller/Operator: Rod Trask

Boring Log: GP-28

Project: Ashland Chemical Co.

Project No.: 462690

Location: Rensselaer, NY

Geologist: David P. Bouchard

Completion Date: 17 Aug 00

Surface Elevation (ft. MSL): Not determined

Total Depth (ft. bgs): 29

Borehole Diameter (in.) 2

Depth	Sample Interval	% Recovery	PID (ppm)	Symbol	Description
26	13	75	-		*Silt (ML)* Dark gray silt, trace to no gravel; dense to very dense; dry.
27	14	75	-		Loose; moist to wet between 26.5 and 27.2 feet.
28	15	100	-		Loose; wet between 28.0 and 28.5 feet.
29					Boring Terminated
30					
31					
32					
33					
34					
35					
36					
37					
38					
39					
40					
41					
42					
43					
44					
45					
46					
47					
48					
49					
50					

Subcontractor: Parratt Wolff

Driller/Operator: Rod Trask

Method: Direct Push

URS Corporation

Dublin, Ohio

LOG OF BORING HP-1

Ashland Rennselaer
130 South Street
Rensselaer, NY
PROJECT # 37679859

Date	: 4/9/07	Sampler Type	: Macro Core
Tot. Depth of Borehole	: 12 ft.	Logged By	: J. Engels
Hole Diameter	: 2 in.	Drilling Contractor	: Zebra Environmental
Drilling Method	: Direct Push	Borehole Backfill	: Granular Bentonite
Drill Rig Type	: Geoprobe		

Depth in Feet	Type	Inches Recovered	USCS	GRAPHIC	DESCRIPTION	PID/FID Headspace (ppm)	PID/FID Background (ppm)	Sample Time	Water Level	Remarks
0					Soil Cover.					Hand Auger to 5 ft.
		NA	ML		Dark brown, SILT (ML), soft, moist, with clay, trace fine grained sand, and fine subrounded gravel.	0.0	0.0	08:50		
5		36"	CL		Brown, CLAY(CL), moist, with fine grained sand and silt, trace, gravel to 1/4" diameter, with medium dense iron oxide weathering.	0.0	0.0	09:25		
					Light brown, hard.					Water in sampler from 8-12 ft.
					Increasing silt.					
10		48"			With gravel to 1" diameter, wet.	0.0	0.0	09:11	▼	
			SC		Light brown, CLAYEY SAND (SC), moist, with gravel to 1" diameter.					
					End of Boring					
15										
20										
25										

Collect groundwater sample with geoprobe Screen Point Sampler. Set screen from 8 to 12 feet below ground surface and collect grab groundwater sample.

06-01-2007 P:\Rensselaer\Draft\Geoprobe GW Report\Attachment A_Soil Boring Logs\HP-1.bor

URS Corporation

Dublin, Ohio

LOG OF BORING HP-2

Ashland Rennselaer
130 South Street
Rensselaer, NY
PROJECT # 37679859

Date	: 4/9/07	Sampler Type	: Macro Core
Tot. Depth of Borehole	: 7 ft.	Logged By	: J. Engels
Hole Diameter	: 2 in.	Drilling Contractor	: Zebra Environmental
Drilling Method	: Direct Push	Borehole Backfill	: Granular Bentonite
Drill Rig Type	: Geoprobe		

Depth in Feet	Type	Inches Recovered	USCS	GRAPHIC	DESCRIPTION	PID/FID Headspace (ppm)	PID/FID Background (ppm)	Sample Time	Water Level	Remarks
0					Soil Cover.					Hand Auger to 5 ft.
		NA	ML		Very dark brown, SANDY SILT (ML), moist, fine to medium grained, subrounded, gravel to 1/2" diameter, wood fragments.	0.0	0.0	10:40	▼	Becomes wet at 4 ft.
5		24"			Brown, SANDY SILT (ML), wet, trace, fine to coarse grained, subrounded gravel to 1/4" diameter.	0.0	0.0	11:00		
					End of Boring					
10										
15										
20										
25										

Collect groundwater sample with Geoprobe Screen Point Sampler. Set screen from 3 to 7 feet below ground surface and collect grab groundwater sample.

06-01-2007 P:\Rensselaer\Draft\Geoprobe GW Report\Attachment A_Soil Boring Logs\HP-2.bor

URS Corporation

Dublin, Ohio

LOG OF BORING HP-3

Ashland Rennselaer
130 South Street
Rensselaer, NY
PROJECT # 37679859

Date	: 4/9/07	Sampler Type	: Macro Core
Tot. Depth of Borehole	: 8 ft.	Logged By	: J. Engels
Hole Diameter	: 2 in.	Drilling Contractor	: Zebra Environmental
Drilling Method	: Direct Push	Borehole Backfill	: Granular Bentonite
Drill Rig Type	: Geoprobe		

Depth in Feet	Type	Inches Recovered	USCS	GRAPHIC	DESCRIPTION	PID/FID Headspace (ppm)	PID/FID Background (ppm)	Sample Time	Water Level	Remarks
0					Soil Cover.					Hand Auger to 5 feet.
		NA	CH		Brown, CLAY (CH), moist, fine to medium grained, no gravel.	0.0	0.0	12:25		
5		36"	SC		Dark brown, SILTY CLAY (CH), wet, medium to coarse grained, subrounded gravel to 1/4" diameter. Brown, CLAYEY SAND (SC), moist, fine to medium grained, interval of subrounded gravel to 1.5" diameter, from 4.0' - 4.3'.	0.0	0.0	12:45	▼	
			SP		Brown, SAND (SP), with silt, wet, medium to coarse grained, subrounded, gravel to 1/2" diameter.					
					End of Boring.					
10										
15										
20										
25										

Collect groundwater sample with Geoprobe Screen Point Sampler. Set Screen from 3 to 7 feet below ground surface and collect grab groundwater.

URS
Corporation

LOG OF BORING IMP-3

Ashland Chemical
Pilot Test Borings
Renssalaer, NY

Project # 37679659

Date Started	: 2/20/2006	Sampler Type	: Macro-core
Ttl Depth of Borehole	: 16'	Logged By	: E. Lovenduski
Hole Diameter	: 2.5"	Drilling Contractor	: Aztek
Drilling Method	: Direct Push	Borehole Backfill	: Grout
Drill Rig Type	:	Groundwater Level	: N/A

Sample Condition: Remoulded; Undisturbed; Lost; Rock Core

Depth in Feet	Sample Type	Sample Number	Sample Depth Feet Bgs	Inches Driven/ Inches Recovered	USCS	GRAPHIC	MATERIAL DESCRIPTION	OVA ppm	Sample Time	REMARKS
0		1	0-4	48/36	SP/GP		Dark brown to black SAND and GRAVEL (SP/GP), trace silt and crystalline material, dry to moist.		1150	
5		2	4-8	48/32	SP/GP		SAA, moist to wet @ 7 feet below ground surface (bgs). Light brownish grey silty SAND (SM), trace fine rounded gravel, moist.		1200	
10		3	8-12	48/36	CL		Light brownish grey silty CLAY, trace fine rounded gravel, dry to moist. SAA, dry		1217	
15		4	12-16	48/40	SM		Grey silty SAND (SM), trace clay,moist.		1230	
20							Bottom of boring at 16 feet			

05-25-2006 P:\Rensselaer\Draft\ISOC Pilot Study Rpt\Soil and Well Logs\IMP-3.bor

URS Corporation

LOG OF BORING IP-1

Ashland Chemical
Pilot Test Borings
Renssalaer, NY

Project # 37679659

Date Started	: 2/20/2006	Sampler Type	: Macro-core
Ttl Depth of Borehole	: 16'	Logged By	: E. Lovenduski
Hole Diameter	: 2.5"	Drilling Contractor	: Aztek
Drilling Method	: Direct Push	Borehole Backfill	: Grout
Drill Rig Type	:	Groundwater Level	: N/A

Sample Condition: Remoulded; Undisturbed; Lost; Rock Core

Depth in Feet	Sample Type	Sample Number	Sample Depth Feet Bgs	Inches Driven/ Inches Recovered	USCS	GRAPHIC	MATERIAL DESCRIPTION	OVA ppm	Sample Time	REMARKS
0					GP		Black GRAVEL (GP), trace sand, moist.			Gravel at surface
		1	0-4	48/24	GP		Greyish black silty SAND (SM), trace fine subangular gravel,moist.	0	0932	
5		2	4-8	48/23	CL		Light greyish brown silty CLAY, trace fine rounded gravel, dry.	0	0941	
							Same as above (SAA), moist with thin wet zones.			
10		3	8-12	48/48			SAA, moist to wet	0	0953	
		4	12-16	48/48	ML		Grey SILT (ML), trace clay,moist.	0	1010	
15							Bottom of boring at 16 feet			
20										

05-25-2006 P:\RensselaerDraft\SOC Pilot Study Rpt\Soil and Well Logs\IP-1.bor

URS Corporation

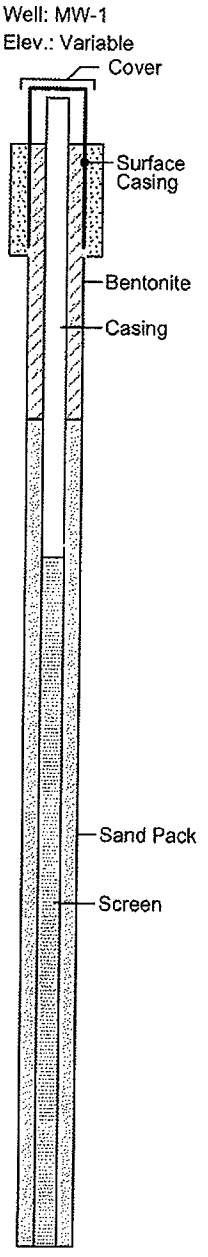
WELL CONSTRUCTION: IP-1, IMP-1, IMP-2 and IMP-3

Ashland Chemical
Pilot Test Borings
Renssalaer, NY

PROJECT # 37679659

Date Started	: 2/20/2006	Driller	: Aztek
Date Completed	: 2/20/2006	Northing Coord.	: Multiple
Hole Diameter	: 8.0"	Easting Coord.	: Multiple
Drilling Method	: Hollow Stem Auger	Survey By	: MJ Engineering
Sampling Method	: Direct-See individual logs	Logged By	: E. Lovenduski

Depth in Feet	Surf. Elev. Variable	USCS	GRAPHIC	DESCRIPTION	Pocket penetrometer (kg/cm2)	Sample ID
0	0			Riser to 2.5 feet above ground surface. Riser finished as "stick-up".		
				Cement to 1.5 for outer casing.		
				Bentonite chips from 1.5 to 4 feet bgs.		
				#0 sand from 4 to 16 feet bgs.		
5	-5					
				Screen slot size 0.010" from 6 to 16 feet bgs.		
10	-10					
15				End of boring at 16 feet bgs.		



05-26-2006 P:\Rensselaer\Draft\SOC Pilot Study Rpt\Soil and Well Logs\MW-generic.bor

Date Start/Finish: 10/1/07
Drilling Company: Atlantic Testing Laboratories
Driller's Name: Mark Childs
Drilling Method: Hollow Stem Auger
Auger Size: 8.25"
Rig Type: CME-75
Sampling Method: 2' x 2" Split Spoon

Northing: 1384402.64
Easting: 695535.01
Casing Elevation: 25.18

Borehole Depth: 20' bgs
Surface Elevation: 25.4

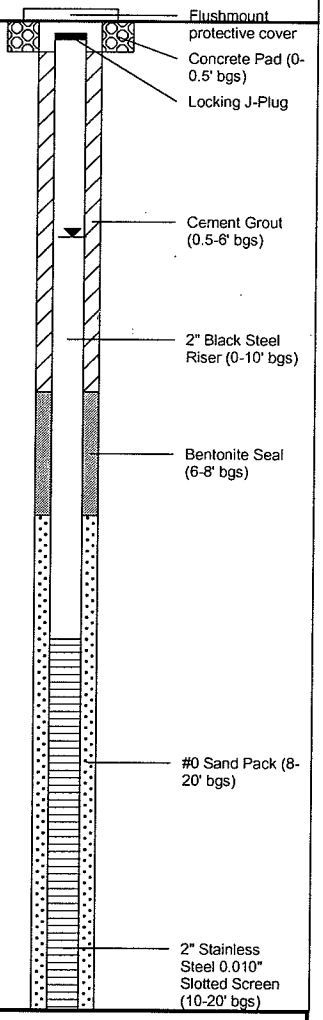
Descriptions By: Ricardo Jaimes

Well/Boring ID: IW-A1

Client: Ashland Inc.

Location: 130 South St.
Rensselaer, New York

DEPTH	ELEVATION	Sample Run Number	Sample/Int/Type	Recovery (feet)	Blow Counts	N - Value	PID Headspace (ppm)	Analytical Sample	Geologic Column	Stratigraphic Description
0	25	1	0-2	1.5	5 2 2 NA	7	5.9			Dark gray coarse SAND and SILT, some Gravel, little Glass, nonplastic, loose, moist, slight sewer like odor.
		2	2-4	1.25	3 3 6 11	9	1509			Dark gray to black SILTY SAND and fine GRAVEL, nonplastic, loose, wet.
										Olive gray SILTY CLAY, medium stiff, high plasticity, black staining, moist, sewer like odor.
5	20	3	4-6	0.75	3 3 3 3	6	1.6			Dark gray fine to coarse SAND, SILT and fine angular to subrounded GRAVEL, little Roots, loose, nonplastic, moist to wet, slight sewer like odor.
		4	6-8	NA	3 3 2 3	5	NA			No recovery.
		5	8-10	0.76	9 5 3 4	8	2.8			Dark gray fine to coarse SAND, SILT and fine angular to subrounded GRAVEL, little Roots, loose, nonplastic, moist to wet, slight sewer like odor.
10	15	6	10-12	0.5	5 5 7 6	12	6.3			Olive gray CLAY and SILT, little coarse subrounded Gravel, trace Roots, medium plasticity, medium dense, sewer like odor, moist.
		7	12-14	1.12	9 14 16 5	30	2.6			Light brown to olive gray SILTY CLAY with fine to coarse GRAVEL, some coarse Sand, very stiff, high plasticity.
15	10	8	14-16	1.25	4 13 1 1	14	57.8	X		Brown to gray SILT and CLAY with angular fine to coarse GRAVEL, some Sand, organics, low plasticity, moist to wet, slight odor. Dark gray fine to medium SAND, loose, wet, slight odor.



ARCADIS
Infrastructure, environment, facilities

Remarks: bgs = below ground surface; ags = above ground surface; NA = Not Available/Not Applicable

Soil samples obtained from the 14-16' and 16-18 'intervals and analyzed for grainsize.

Client: Ashland Inc.

Well/Boring ID: IW-A1

Borehole Depth: 20' bgs

Site Location:
130 South St.
Rensselaer, New York

DEPTH / ELEVATION	Sample Run Number	Sample/Int/Type	Recovery (feet)	Blow Counts	N - Value	PID Headspace (ppm)	Analytical Sample	Geologic Column	Stratigraphic Description	Well/Boring Construction
	9	16-18	1.09	6 4 3 5	7	31.7	X		Dark gray fine to medium SAND, loose, wet, slight odor. Gray CLAY and SILT, little Wood, medium stiff, medium plasticity, moist, slight odor.	#0 Sand Pack (8-20' bgs)
	10	18-20	1.0	1 3 5 4	8	8.9			Brown CLAYEY SILT, trace Wood, medium stiff, slight plasticity, moist, slight odor.	2" Stainless Steel 0.010" Slotted Screen (10-20' bgs)
20 / 5									End of Boring 20' bgs.	Galvanized Steel Cap
25 / 0										
30 / -5										
35 / -10										

ARCADIS
Infrastructure, environment, facilities

Remarks: bgs = below ground surface; ags = above ground surface; NA = Not Available/Not Applicable

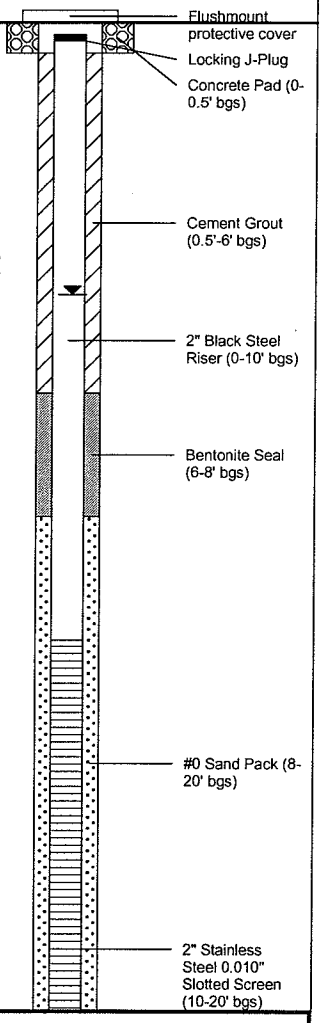
Soil samples obtained from the 14-16' and 16-18 'intervals and analyzed for grainsize.

Date Start/Finish: 10/2/07
Drilling Company: Atlantic Testing Laboratories
Driller's Name: Mark Childs
Drilling Method: Hollow Stem Auger
Auger Size: 8.25"
Rig Type: CME-75
Sampling Method: 2' x 2" Split Spoon

Northing: 1384823
Easting: 695618
Casing Elevation: 25.03
Borehole Depth: 20' bgs
Surface Elevation: 25.2
Descriptions By: Ricardo Jaimes

Well/Boring ID: IW-B1
Client: Ashland Inc.
Location: 130 South St.
Rensselaer, New York

DEPTH	ELEVATION	Sample Run Number	Sample/Int/Type	Recovery (feet)	Blow Counts	N - Value	PID Headspace (ppm)	Analytical Sample	Geologic Column	Stratigraphic Description
0	25	1	0-2	1.0	2 6 5 5	11	0.0			Dark brown to gray fine to coarse SAND and fine to coarse angular GRAVEL, little Wood, trace Silt, medium dense, nonplastic, dry, slight petroleum like odor. 2' bgs- Little Silt, slight odor.
		2	2-4	1.0	7 6 5 6	11	2.6			Brown fine to coarse SAND and SILT, some Wood and angular Gravel, nonplastic, moist, petroleum like odor.
-5	20	3	4-6	1.0	6 2 2 1	4	11			Dark gray fine to coarse SAND and SILT, loose, nonplastic, wet, petroleum like odor. 6' bgs- Very loose, wet, slight odor.
		4	6-8	1.1	WOH WOH 3 NA	WOH	7.7			Gray to olive gray SILTY CLAY, soft, high plasticity, moist, no odor.
		5	8-10	1.4	2 5 6 8	11	0.0			Brown to gray CLAY and SILT, stiff, medium plasticity, moist, no odor.
-10	15	6	10-12	1.8	6 7 6 6	13	0.0	X		Dark gray fine to coarse SAND, little subrounded to rounded fine Gravel, dense, nonplastic, wet, no odor. Dark gray SILT and fine to coarse SAND, medium dense, nonplastic, wet, no odor.
		7	12-14	2.0	WOR WOR NA NA	WOR	0.0			Gray SILT and CLAY, very soft, low plasticity, wet, no odor.
-15	10	8	14-16	2.0	WOH WOH WOH WOH	WOH	0.0	X		Gray CLAYEY SILT, very soft, slight plasticity, wet, no odor.



ARCADIS
Infrastructure, environment, facilities

Remarks: bgs = below ground surface; ags = above ground surface; NA = Not Available/Not Applicable; WOH = Weight of Hammer; WOR = Weight of Rod

Soil samples obtained from the 10-12' and14-16' intervals and analyzed for TOC, grainsize.

Client: Ashland Inc.

Well/Boring ID: IW-B1

Site Location:
130 South St.
Rensselaer, New York

Borehole Depth: 20' bgs

DEPTH	ELEVATION	Sample Run Number	Sample/Int/Type	Recovery (feet)	Blow Counts	N - Value	PID Headspace (ppm)	Analytical Sample	Geologic Column	Stratigraphic Description	Well/Boring Construction
		9	16-18	2.0	1 2 2 2	4	1.4			Gray CLAYEY SILT, soft, slight plasticity, wet, no odor.	2" Stainless Steel 0.010" Slotted Screen (10-20' bgs)
		10	18-20	1.4	2 3 3 3	6	7.5			Gray fine to coarse SAND, some Silt, trace Clay, loose, nonplastic, wet, no odor.	#0 Sand Pack (8-20' bgs)
20	5									End of Boring 20' bgs.	Galvanized Steel Cap
25	0										
30	-5										
35	-10										

ARCADIS
Infrastructure, environment, facilities

Remarks: bgs = below ground surface; ags = above ground surface; NA = Not Available/Not Applicable; WOH = Weight of Hammer; WOR = Weight of Rod

Soil samples obtained from the 10-12' and14-16' intervals and analyzed for TOC, grainsize.

Date Start/Finish: 10/2/07
Drilling Company: Atlantic Testing Laboratories
Driller's Name: Mark Childs
Drilling Method: Hollow Stem Auger
Auger Size: 8.25"
Rig Type: CME-75
Sampling Method: 2' x 2" Split Spoon

Northing: 1384392.25
Easting: 695539.64
Casing Elevation: 28.34

Borehole Depth: 20' bgs
Surface Elevation: 25.8

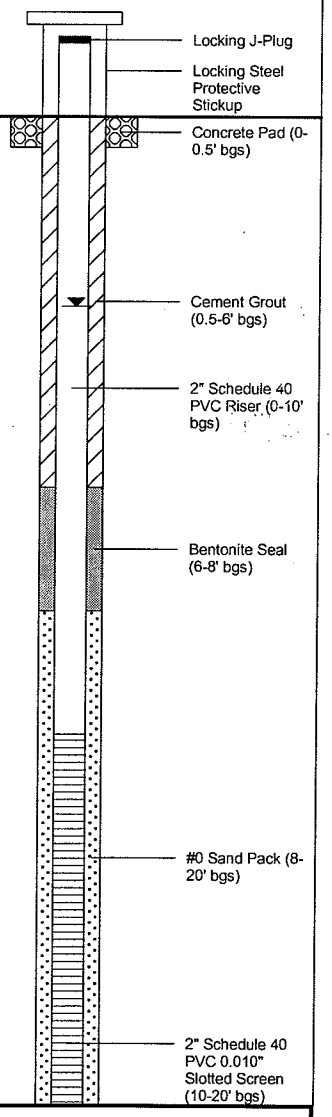
Descriptions By: Ricardo Jaimes

Well/Boring ID: MW-A1

Client: Ashland Inc.

Location: 130 South St.
Rensselaer, New York

DEPTH	ELEVATION	Sample Run Number	Sample/Int/Type	Recovery (feet)	Blow Counts	N - Value	PID Headspace (ppm)	Analytical Sample	Geologic Column	Stratigraphic Description
0										
	25	1	0-2	1.0	4 9 8 10	17	0.0			Dark gray fine to coarse SAND and fine angular GRAVEL, some coarse angular Gravel, medium dense, nonplastic, moist, no odor.
		2	2-4	0.9	5 13 1 5	>50	17			Dark gray fine to coarse SAND and fine to coarse angular GRAVEL, trace Silt and Wood, very dense, nonplastic, moist to wet, petroleum like odor.
-5		3	4-6	0.70	36 50/4" NA NA	>50	0.0			Gray ROCK fragments (sandstone), little angular to subangular, fine to coarse Gravel, very dense, nonplastic, moist, no odor.
	20	4	6-8	1.12	5 3 5 6	8	0.0			Gray to olive gray CLAY and SILT, little subrounded to angular fine to medium Gravel, little Sand, trace Brick fragments, stiff, medium plasticity, moist to wet, no odor.
		5	8-10	1.1	3 5 4 4	9	0.0			Dark gray fine to coarse SAND, little Gravel, loose, nonplastic, moist, no odor. Gray to olive gray SILT and fine to coarse SAND, some Gravel, loose, moist, slight odor.
-10	15	6	10-12	0.75	3 6 8 8	14	0.0			Gray to olive gray SILT and CLAY, trace fine to medium Sand and Organics, stiff, low plasticity, moist to wet, no odor.
		7	12-14	0.75	2 5 4 8	9	0.0			Light brown to gray fine to coarse SAND, some angular to subangular Gravel and Silt, .
-15	10	8	14-16	0.20	6 6 2 WOR	8	0.0			Fine to coarse SAND, some angular Gravel and Silt, loose, wet, no odor.



Remarks: bgs = below ground surface; ags = above ground surface; NA = Not Available/Not Applicable; WOH = Weight of Hammer; WOR = Weight of Rod

ARCADIS
Infrastructure, environment, facilities

Client: Ashland Inc.

Well/Boring ID: **MW-A1**

Borehole Depth: 20' bgs

Site Location:
130 South St.
Rensselaer, New York

DEPTH / ELEVATION	Sample Run Number	Sample/Int/Type	Recovery (feet)	Blow Counts	N - Value	PID Headspace (ppm)	Analytical Sample	Geologic Column	Stratigraphic Description	Well/Boring Construction
	9	16-18	1.3	WOR WOR WOR WOR	WOR	0.0			Brown fine to coarse SAND, some angular Gravel, some to little Silt, very loose, wet, no odor.	2" Schedule 40 PVC 0.010" Slotted Screen (10-20' bgs)
	10	18-20	1.8	2 WOH WOH WOH	WOH	0.0			Dark gray fine to coarse SAND, little Silt, very loose, nonplastic, wet, no odor. Dark gray to gray SILTY CLAY, soft, plastic, wet. SILT and fine to medium SAND, very loose, nonplastic, wet, no odor.	#0 Sand Pack (8-20' bgs)
20 / 5									End of Boring 20' bgs.	2" Schedule 40 PVC Cap
25 / 0										
30 / -5										
35 / -10										

ARCADIS
infrastructure, environment, facilities

Remarks: bgs = below ground surface; ags = above ground surface; NA = Not Available/Not Applicable; WOH = Weight of Hammer; WOR = Weight of Rod

Date Start/Finish: 10/3/07
Drilling Company: Atlantic Testing Laboratories
Driller's Name: Mark Childs
Drilling Method: Hollow Stem Auger
Auger Size: 8.25"
Rig Type: CME-75
Sampling Method: 2' x 2" Split Spoon

Northing: 1384833.93
Easting: 695618.88
Casing Elevation: 27.53

Borehole Depth: 20' bgs
Surface Elevation: 25.1

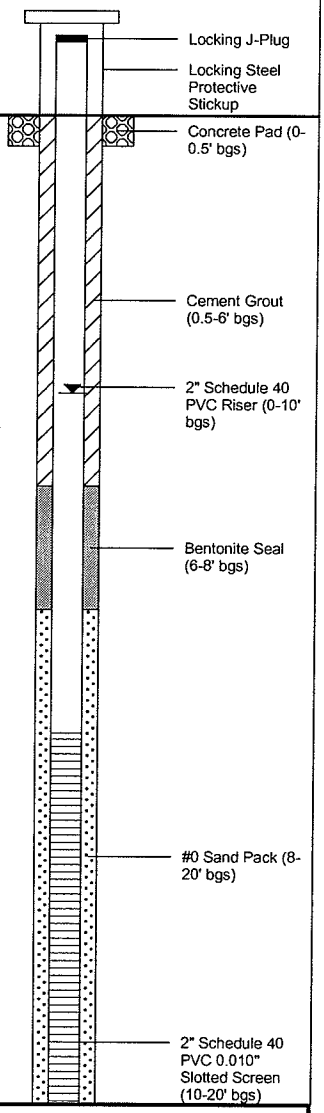
Descriptions By: Ricardo Jaimes

Well/Boring ID: MW-B1

Client: Ashland Inc.

Location: 130 South St.
Rensselaer, New York

DEPTH	ELEVATION	Sample Run Number	Sample/Int/Type	Recovery (feet)	Blow Counts	N - Value	PID Headspace (ppm)	Analytical Sample	Geologic Column	Stratigraphic Description
0	25	1	0-2	0.6	4 4 5 5	9	1.0			Dark brown to dark gray fine to coarse SAND and fine to coarse angular GRAVEL, trace Silt, loose, nonplastic, dry, no odor.
		2	2-4	0.75	6 6 6 4	12	0.7			Black COAL, loose, nonplastic, moist, slight petroleum like odor.
-5	20	3	4-6	1.75	WOH WOH WOH WOH	WOH	2.3			Dark gray to brown fine to coarse SAND and SILT, little Gravel, very loose, nonplastic, moist, slight odor.
		4	6-8	0.8	WOH WOH WOH 4	WOH	2.2			Dark gray SILT and CLAY, trace Roots, very soft, low plasticity, moist, slight odor.
-10	15	5	8-10	1.8	2 3 6 7	9	7.6			Brown to olive gray CLAY and SILT, stiff, medium plasticity, moist, no odor.
		6	10-12	2.0	2 2 WOH WOH	2	7.7			Gray SILTY CLAY, very soft, high plasticity, wet, slight odor.
		7	12-14	2.0	WOH WOH WOH WOH	WOH	1.9			Fine to coarse SAND and fine to medium subrounded GRAVEL, nonplastic, wet, no odor.
-15	10	8	14-16	2.0	WOH WOH 2 1	2	1.8			Gray CLAY and SILT, medium plasticity, moist, no odor.



Well/Boring Construction

Remarks: bgs = below ground surface; ags = above ground surface; NA = Not Available/Not Applicable; WOH = Weight of Hammer; WOR = Weight of Rod

ARCADIS
Infrastructure, environment, facilities

Client: Ashland Inc.

Well/Boring ID: **MW-B1**

Borehole Depth: 20' bgs

Site Location:
130 South St.
Rensselaer, New York

DEPTH	ELEVATION	Sample Run Number	Sample/Int/Type	Recovery (feet)	Blow Counts	N - Value	PID Headspace (ppm)	Analytical Sample	Geologic Column	Stratigraphic Description	Well/Boring Construction
		9	16-18	2.0	2 6 5 5	11	2.6			Gray CLAY and SILT, medium plasticity, wet, no odor.	2" Schedule 40 PVC 0.010" Slotted Screen (10-20' bgs)
										Gray SILT, some fine Sand, loose, nonplastic, wet, no odor.	
		10	18-20	1.4	4 6 9 5	15	1.3			Dark gray fine to coarse SAND and SILT, trace angular Gravel, dense, nonplastic, wet, no odor.	#0 Sand Pack (8-20' bgs)
20	5									End of Boring 20' bgs.	2" Schedule 40 PVC Cap
25	0										
30	-5										
35	-10										

Remarks: bgs = below ground surface; ags = above ground surface; NA = Not Available/Not Applicable; WOH = Weight of Hammer; WOR = Weight of Rod

ARCADIS
Infrastructure, environment, facilities

Date Start/Finish: 10/3/07
Drilling Company: Atlantic Testing Laboratories
Driller's Name: Mark Childs
Drilling Method: Hollow Stem Auger
Auger Size: 8.25"
Rig Type: CME-75
Sampling Method: 2' x 2" Split Spoon

Northing: 1384819.85
Easting: 695627.53
Casing Elevation: 27.40

Borehole Depth: 20' bgs
Surface Elevation: 25.2

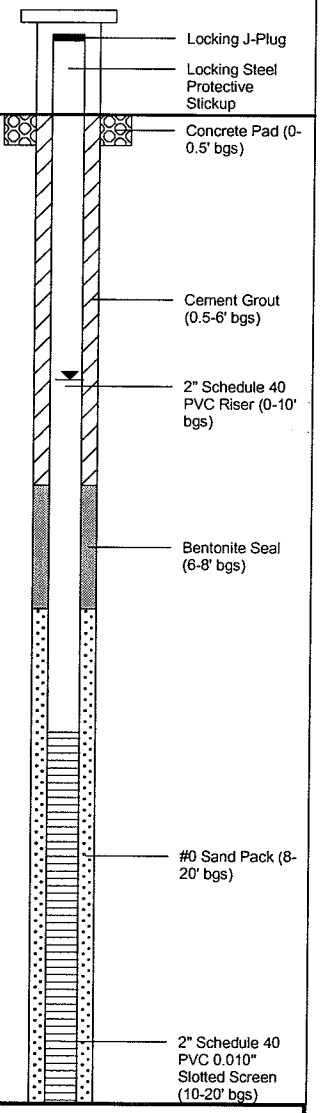
Descriptions By: Ricardo Jaimes

Well/Boring ID: MW-B2
Client: Ashland Inc.

Location: 130 South St.
Rensselaer, New York

DEPTH	ELEVATION	Sample Run Number	Sample/Int/Type	Recovery (feet)	Blow Counts	N - Value	PID Headspace (ppm)	Analytical Sample	Geologic Column	Stratigraphic Description
0	25	1	0-2	1.0	10 4 5 9	9	2.8			ASPHALT. Brown to gray fine to coarse SAND and fine to coarse angular GRAVEL, little Silt, loose, nonplastic, dry, no odor.
		2	2-4	0.2	10 11 14 8	25	1.6			Dark gray medium to coarse SAND and fine angular GRAVEL, medium dense, nonplastic, dry, no odor.
5	20	3	4-6	1.0	3 4 9 11	13	1.5			Brown fine to coarse SAND and fine to coarse angular GRAVEL, some Brick fragments, trace Silt, dense, nonplastic, wet, odor. Black COAL, wet, petroleum like odor.
		4	6-8	0.8	13 11 6 7	15	0.5			Dark gray fine to coarse SAND and fine to coarse angular GRAVEL, medium dense, set, sewer like odor.
		5	8-10	1.5	2 5 8 10	13	2.6			Brown SILT and CLAY, stiff, low plasticity, moist, slight sewer like odor.
10	15	6	10-12	1.3	2 4 5 4	9	17.9			10' bgs- No odor. Dark gray fine to medium SAND, loose, nonplastic, wet, no odor.
		7	12-14	2.0	1 1 WOH WOH	1	1.9			Gray SILT and CLAY, low plasticity, wet, no odor.
15	10	8	14-16	2.0	1 WOH WOH 1	WOH	1.7			

Well/Boring Construction



Remarks: bgs = below ground surface; ags = above ground surface; NA = Not Available/Not Applicable; WOH = Weight of Hammer; WOR = Weight of Rod

ARCADIS
Infrastructure, environment, facilities

Client: Ashland Inc.

Well/Boring ID: **MW-B2**

Borehole Depth: 20' bgs

Site Location:
130 South St.
Rensselaer, New York

DEPTH	ELEVATION	Sample Run Number	Sample/Int/Type	Recovery (feet)	Blow Counts	N - Value	PID Headspace (ppm)	Analytical Sample	Geologic Column	Stratigraphic Description	Well/Boring Construction
		9	16-18	2.0	3 2 3 7	5	0.7			Gray SILT and CLAY, low plasticity, wet, no odor.	2" Schedule 40 PVC 0.010" Slotted Screen (10-20' bgs)
		10	18-20	1.4	3 4 5 9	9	5.7			Gray SILT and fine to coarse SAND, some fine subrounded Gravel, loose, nonplastic, wet, no odor.	#0 Sand Pack (8-20' bgs)
20	5									End of Boring 20' bgs.	2" Schedule 40 PVC Cap
25	0										
30	-5										
35	-10										

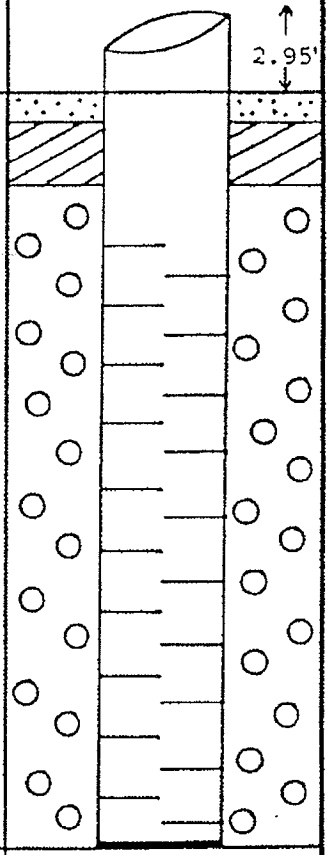
ARCADIS
Infrastructure, environment, facilities

Remarks: bgs = below ground surface; ags = above ground surface; NA = Not Available/Not Applicable; WOH = Weight of Hammer; WOR = Weight of Rod

T. M. GATES, INC.	TEST BORING LOG & MONITORING WELL INSTALLATION	WELL # MW-1 STATUS: REPLACED ?

PROJECT	ASHLAND - RENSSELAER, NEW YORK REMEDIAL INVESTIGATION								SHT. NO. 1 OF 1
CLIENT	ASHLAND CHEMICAL COMPANY								PROJ. NO. 84-01-031
BORING CONTRACTOR	EMPIRE SOIL INVESTIGATIONS, INC.								GROUND ELEV.
GROUND WATER	TOC-ELEV. 29.04				CAS.	SAMP.	CORE	TUBE	DATUM MSL 26.09
DATE	TIME	ELEV.	CASING	TYPE	HSA	S.S.			DATE START 11-14-84
11-16-84	7:30	26.00		DIA.	6"	1 1/2"			DATE FINISH 11-14-84
				WT.		140 #			DRILLER DAN RICHARDS
				FALL		30"			TMG-REP. JVK

DEPTH FT.	CASING BLOWS	SAMPLE NO.	BLOWS ON SAMPLE SPOON PER 6"	SYMBOL	IDENTIFICATION & REMARKS
1		S-1	2		Silt, clay, sand and gravel fill, loose, moist
2			3		
3			8		
				C	
			4	L	Brown fine sandy silty
4		S-2	7	M	clay, silt seams, stiff, moist
5			10	L	
6		S-3	8	C	Brown silty clay, trace gravel,
7			8	L	very stiff, wet
8			15		
9		S-4	7	C	Brown silty clay, silt
10			9	L	seams, stiff, wet
11			8		
12		S-5	4	C	Brown silty clay; overlying
13			5	L	gray silty clay; soft, wet,
14			5		trace gravel throughout
15		12.5'			END OF BORING
16					WELL CONSTRUCTION
17					0.010 inch slot, threaded flush joint, stainless steel well screen: 12.5'-2.5'
18					Stainless steel well casing used above screen
19					4Q-ROK washed, screened sand: 12.5'-1.5'
20					Bentonite pellet seal: 1.5'-0.5'
21					Concrete plug: 0.5'-0'
22					-Height of steel protective casing above ground surface is 2.95'
23					-Well developed by bailing at least 3 times the volume of water contained in the well



FOR INTERPRETATION OF SOIL ROCK AND GROUNDWATER CONDITIONS SEE TEXT

T. M. GATES, INC.	TEST BORING LOG & MONITORING WELL INSTALLATION	WELL # MW-2 (PLUGGED/ABANDONED)

PROJECT ASHLAND - RENSSELAER, NEW YORK REMEDIAL INVESTIGATION | SHT. NO. 1 OF 1
CLIENT ASHLAND CHEMICAL COMPANY | PROJ. NO. 84-01-031
BORING CONTRACTOR EMPIRE SOIL INVESTIGATIONS, INC. | GROUND ELEV. 25.44

GROUND WATER	TOC-ELEV. 27.90			CAS.	SAMP.	CORE	TUBE
DATE	TIME	ELEV.	CASING	TYPE	HSA	S.S.		
11-16-84	7:40	22.38		DIA.	6"	1 1/2"		
				WT.		140#		
				FALL		30"		

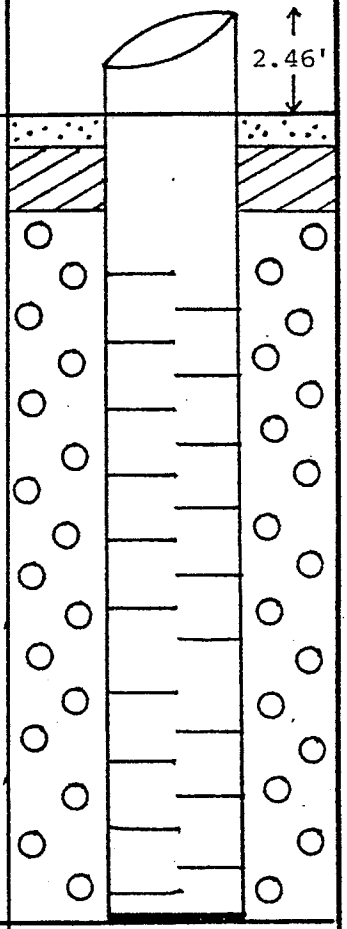
DATUM MSL
DATE START 11-14-84
DATE FINISH 11-14-84
DRILLER DAN RICHARDS
TMG-REP. JVK

DEPTH FT.	CASING BLOWS	SAMPLE NO.	BLOWS ON SAMPLE SPOON PER 6"	SYMBOL	IDENTIFICATION & REMARKS
1		S-1	56		ASPHALT
			25		Brown and gray silty, clay fill,
			20		trace gravel, moist, stiff
2					
3		S-2	9		Gray sand, gravel, silt and
			4		clay fill, loose, moist
4			7		
5					
6		S-3	4		Same as above, wet
			5		
7			5		
8		S-4	10	CL	Brown silty clay, trace gravel, very stiff,
			14	SM	moist; overlying dark gray silty clayey
			10	SC	coarse-grained sand, loose, saturated
10				CL	
11		S-5	14	SM	Brown silty clay, trace sand, trace gravel,
			8	SC	wet, firm; overlying brown silty clayey
			6		medium to coarse-grained sand, loose,
12					saturated
13		12.5'			END OF BORING

WELL CONSTRUCTION

0.010 inch slot, threaded flush joint, stainless steel well screen: 12.5'-2.5'
Stainless steel well casing used above screen
4Q-ROK washed, screened sand: 12.5'-1.5'
Bentonite pellet seal: 1.5'-0.5'
Concrete plug: 0.5'-0'

-Height of steel protective casing above ground surface is 2.46'
-Well developed by bailing at least 3 times the volume of water contained in the well.



FOR INTERPRETATION OF SOIL, ROCK AND GROUNDWATER CONDITIONS, SEE TEXT

T. M. GATES, INC. | TEST BORING LOG & MONITORING WELL INSTALLATION | WELL # MW-3 STATUS: REPLACED

PROJECT ASHLAND - RENSSELAER, NEW YORK REMEDIAL INVESTIGATION | SHT. NO. 1 OF 1

CLIENT ASHLAND CHEMICAL COMPANY | PROJ. NO. 84-01-031

BORING CONTRACTOR EMPIRE SOIL INVESTIGATIONS, INC. | GROUND ELEV. 24.51

GROUND WATER TOC-ELEV. 27.31 | DATUM MSL

DATE	TIME	ELEV.	CASING		CAS.	SAMP.	CORE	TUBE
11-16-84	7:55	21.14		TYPE	HSA	S.S.		
				DIA.	6"	1 1/2"		
				WT.		140#		
				FALL		30"		

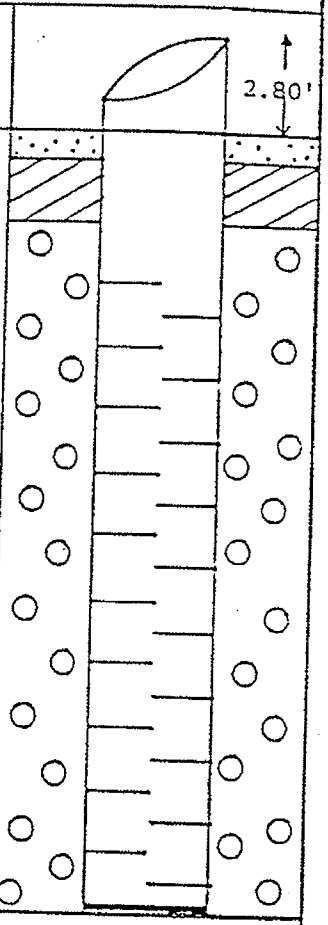
DATE START 11-14-84

DATE FINISH 11-14-84

DRILLER DAN RICHARDS

TMG-REP. JVK

DEPTH FT.	CASING BLOWS	SAMPLE NO.	BLOWS ON SAMPLE SPOON PER 6"	SYMBOL	IDENTIFICATION & REMARKS
1		S-1	6, 8, 12		Dark brown silt, clay, sand, gravel fill, loose, moist
3		S-2	6, 5, 4		Dark gray sandy silty clay fill, soft, moist
6		S-3	3, 4, 8	CL	Dark gray silty clay, soft, wet
8		S-4	3, 7, 23	CL/SM	Brown silty clay, very soft, wet; overlying dark gray silty, clayey medium grained sand, dense, saturated
11		S-5	5, 7, 8	CL	Dark gray sandy silty clay, trace rounded gravel, firm, wet
12.5'					END OF BORING



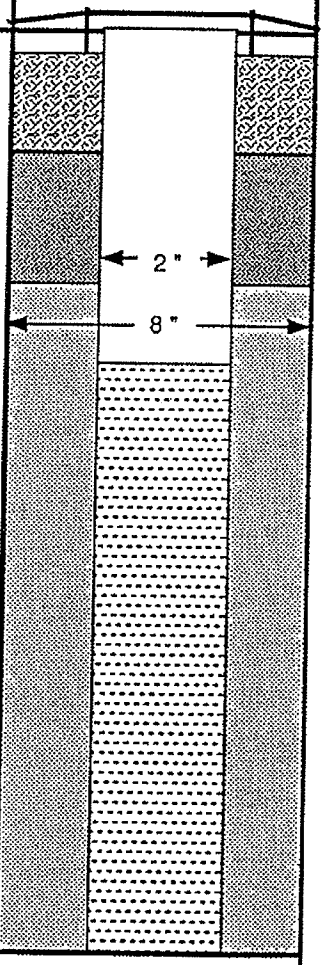
WELL CONSTRUCTION

0.010 inch slot, threaded flush joint, stainless steel well screen: 12.5'-2.5'
Stainless steel well casing used above screen
4Q-ROK washed, screened sand: 12.5'-1.5'
Bentonite pellet seal: 1.5'-0.5'
Concrete plug: 0.5'-0'

-Height of steel protective casing above ground surface is 2.80'
-Well developed by bailing at least 3 times the volume of water contained in the well.

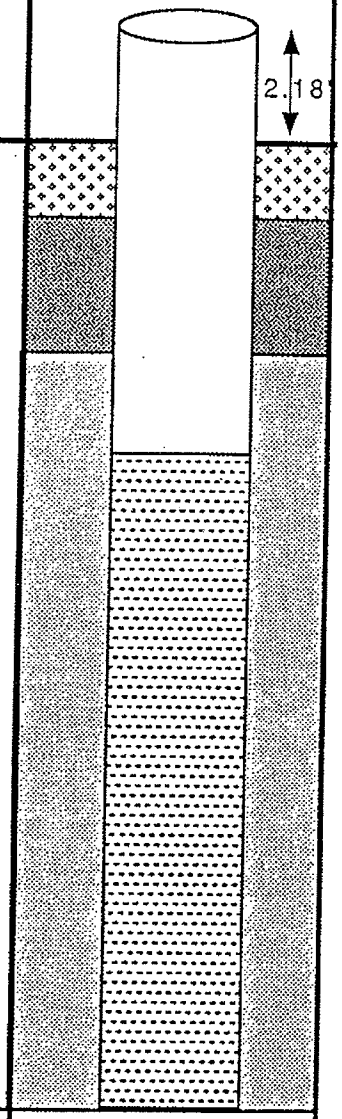
FOR INTERPRETATION OF SOIL, ROCK AND GROUNDWATER CONDITIONS, SEE TEXT

T.M. GATES, INC	INVESTIGATIVE BORING & MONITORING WELL INSTALLATION LOG	WELL # MW-3 STATUS: ACTIVE
PROJECT: ASHLAND CHEMICAL, INC. - RENSSELAER, NEW YORK		SHT. NO. 1 OF 1
CLIENT: ASHLAND CHEMICAL, INC.		PROJ. NO. 86-01-010
BORING CONTRACTOR: T.M. GATES, INC.		DATE START 10/12/92
TOP OF CASING ELEVATION:		DATE FINISH 10/12/92
GROUND ELEVATION: DATUM: MEAN SEA LEVEL		DRILLER BG
DRILLING METHOD: 4.25" I.D. HOLLOW STEM AUGER		TMG-REP. TKW
SAMPLING METHOD: SPLIT SPOON BY ASTM METHOD D-1586		
CORING METHOD:		

DEPTH FT.	SAMPLE NO.	BLOWS ON SAMPLE SPOON PER 6"	SYMBOL	IDENTIFICATION & REMARKS	FLUSH INSTALLATION
1				Replacement well - see previous log for soil sample descriptions.	
2					
3					
4					
5					
6					
7					
8					
9					
10					
11					
12					
13					
14					
15					
16				END OF BORING	
17					
18				WELL INSTALLATION	
19				2" SS .01 SLOT SCREEN: 15'-5'	
20				2" SS RISER: 5'-SURFACE	
21				CLEAN SILICA SAND: 15'-4'	
				BENTONITE SEAL: 4'-2'	
				CEMENT/BENTONITE GROUT: 2' TO SURFACE	
				FLUSH MOUNT INSTALLATION	

T.M. GATES, INC	INVESTIGATIVE BORING & MONITORING WELL INSTALLATION LOG	WELL # MW-3 STATUS: REPLACED
PROJECT: RENSSELAER, N.Y. I C & S FACILITY - SUPPLEMENTAL INVESTIGATION		SHT. NO. 1 OF 1
CLIENT: ASHLAND CHEMICAL COMPANY		PROJ. NO. 86-01-010
BORING CONTRACTOR: T. M. GATES, INC.		DATE START: 9/26/88
TOP OF CASING ELEVATION: 26.88		DATE FINISH: 9/26/88
GROUND ELEVATION: 24.7' DATUM: MEAN SEA LEVEL		DRILLER: BILL GIBSON
DRILLING METHOD: 4.25" I.D. HOLLOW STEM ROTARY AUGER		TMG-REP. BAM/JNS
SAMPLING METHOD: SPLIT SPOON BY ASTM METHOD D-1586		
CORING METHOD: N/A		

DEPTH FT.	SAMPLE NO.	BLOWS ON SAMPLE SPOON PER 6"	SYMBOL	IDENTIFICATION & REMARKS
1				
2				
3				
4	S-1	3 1	SC SP	LIGHT BROWN CLAYEY SAND OVERLYING DARK GRAY FINE GRAINED SAND WITH TRACE SILT AND CLAY, MOIST, LOOSE, EARTHY ODOR
5		1		
6				
8				
9	S-2A	5 8		GRAY-GREEN TO DARK GRAY, SANDY CLAY
10	S-2B	4		BROWN TO GRAY CLAYEY SAND, FINE TO COARSE GRAINED
11				
12				
13				
14	S-3	9 7	ML	MEDIUM GRAY SILT WITH OCCASIONAL COBBLES
15		5		
16				END OF BORING
17				WELL INSTALLATION
18				- 0.01 INCH SLOT, FLUSH JOINT, STAINLESS STEEL WELL SCREEN: 15.75' - 5.0'
19				- WASHED SILICA SAND: 15.75' - 3.3'
20				- BENTONITE PELLET SEAL: 3.3' - 1.2'
21				- CONCRETE PLUG: 1.2' - 0.0'
				- HEIGHT OF STEEL PROTECTIVE CASING ABOVE GROUND SURFACE: 2.18'



WELL INSTALLATION

WELL # MW-4
STATUS: REPLACED

PROJECT	ASHLAND - RENSSELAER, NEW YORK REMEDIAL INVESTIGATION
CLIENT	ASHLAND CHEMICAL COMPANY
BORING CONTRACTOR	EMPIRE SOIL INVESTIGATIONS, INC.
GROUND WATER	TOC-ELEV. 25.97

DATE	TIME	ELEV.	CASING
11-16-84	8:05	19.76	

	CAS.	SAMP.	CORE	TUBE
TYPE	HSA	S.S.		
DIA.	6"	1 1/2"		
WT.		140#		
FALL		30"		

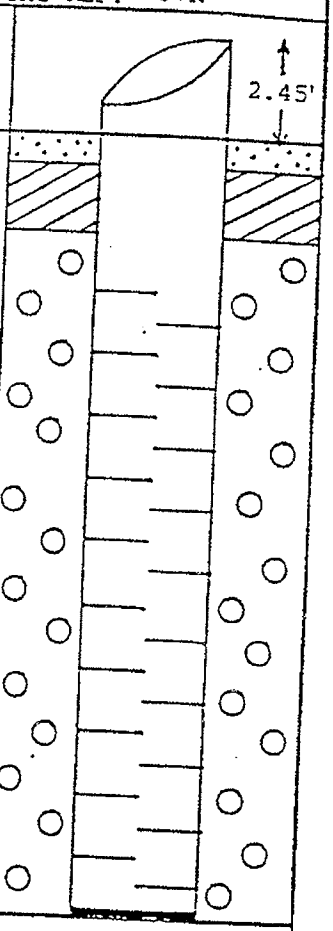
SHT. NO. 1 OF 1
PROJ. NO. 84-01-031
GROUND ELEV. 23.52
DATUM MSL
DATE START 11-15-84
DATE FINISH 11-15-84
DRILLER DAN RICHARDS
TMG-REP. JVK

DEPTH FT.	CASING BLOWS	SAMPLE NO.	BLOWS ON SAMPLE SPOON PER 6"	SYMBOL	IDENTIFICATION & REMARKS
1		S-1	8, 9, 4		Brown silt and clay fill with large gravel, soft, moist
3		S-2	7, 3, 7		Brown silty clay fill, soft, wet; overlying black silt clay and sand fill, loose, saturated
6		S-3	3, 5, 12		Black silt, clay, gravel and sand fill, red clay brick, loose, saturated
8		S-4	4, 7, 10	C	Dark gray silty clay, trace rounded gravel, stiff, wet, sewage odor
11		S-5	23, 28, 26		No Recovery
13	12.5'				END OF BORING

WELL CONSTRUCTION

0.010 inch slot, threaded flush joint, stainless steel well screen: 12.5'-2.5'
Stainless steel well casing used above screen
4Q-ROK washed, screened sand: 12.5'-1.5'
Bentonite pellet seal: 1.5'-0.5'
Concrete plug: 0.5'-0'

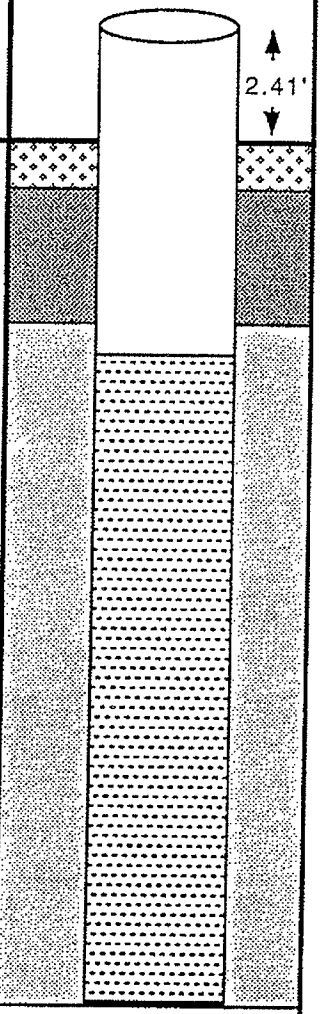
-Height of steel protective casing above ground surface is 2.45'
-Well developed by bailing at least 3 times the volume of water contained in the well.



FOR INTERPRETATION OF SOIL, ROCK AND GROUNDWATER CONDITIONS, SEE TEXT

T.M. GATES, INC	INVESTIGATIVE BORING & MONITORING WELL INSTALLATION LOG	WELL # MW-4 STATUS: ACTIVE
PROJECT: RENSSELAER, N.Y. I C & S FACILITY - SUPPLEMENTAL INVESTIGATION		SHT. NO. 1 OF 1
CLIENT: ASHLAND CHEMICAL COMPANY		PROJ. NO. 86-01-010
BORING CONTRACTOR: T. M. GATES, INC.		DATE START: 9/29/88
TOP OF CASING ELEVATION: 26.41'		DATE FINISH: 9/29/88
GROUND ELEVATION: 24.0' DATUM: MEAN SEA LEVEL		DRILLER: BILL GIBSON
DRILLING METHOD: 4.25" I.D. HOLLOW STEM ROTARY AUGER		TMG-REP. BAM/JNS
SAMPLING METHOD: SPLIT SPOON BY ASTM METHOD D-1586		
CORING METHOD: N/A		

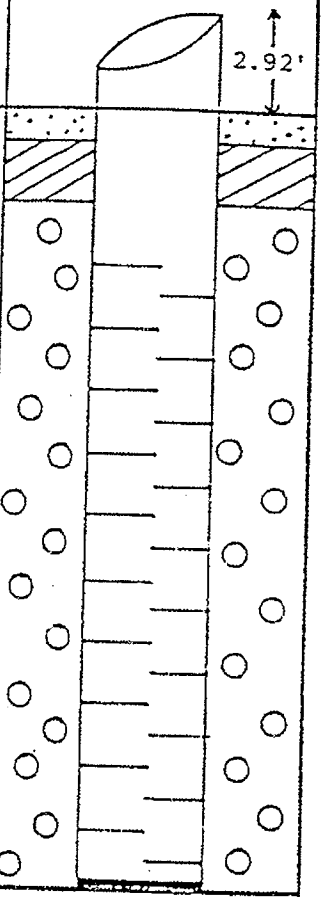
DEPTH FT.	SAMPLE NO.	BLOWS ON SAMPLE SPOON PER 6"	SYMBOL	IDENTIFICATION & REMARKS
1				
2				
3				
4	S-1	2		TAN - GRAY SILTY CLAY FILL, TRACE SAND, MIXED WITH BLACK CINDERS, SOFT, OVERLYING GRAVELLY WELL GRADED SAND FILL, LOOSE, MOIST, SLIGHT SOLVENT ODOR
5		3		
6		2		
8				
9	S-2	5	CL/SC	GRAY,SILTY, SANDY CLAY/SILT, CLAYEY FINE SAND, STIFF/DENSE, WET
10		17		
11		11		DEMO FILL/CONSTRUCTION DEBRIS
12				
13				
14				END OF BORING
15				
16				WELL INSTALLATION
17				- 0.01 INCH SLOT, FLUSH JOINT, STAINLESS STEEL WELL SCREEN: 14.0' - 3.3'
18				- WASHED SILICA SAND: 14.0' - 2.8'
19				- BENTONITE PELLET SEAL: 2.8' - 0.7'
20				- CONCRETE PLUG: 0.7' - 0.0'
21				- HEIGHT OF STEEL PROTECTIVE CASING ABOVE GROUND SURFACE: 2.41'



T. M. GATES, INC.	TEST BORING LOG & MONITORING WELL INSTALLATION	WELL # MW-5 STATUS: REPLACED
PROJECT ASHLAND - RENSSELAER, NEW YORK REMEDIAL INVESTIGATION		SHT. NO. 1 OF 1
CLIENT ASHLAND CHEMICAL COMPANY		PROJ. NO. 84-01-031
BORING CONTRACTOR EMPIRE SOIL INVESTIGATIONS, INC.		GROUND ELEV. 22.28
GROUND WATER TOC-ELEV. 25.20		DATUM MSL
DATE 11-16-84	TIME 8:15	ELEV. 19.02
		DATE START 11-15-84
		DATE FINISH 11-15-84
		DRILLER DAN RICHARDS
		TMG-REP. JVK

TYPE	CAS.	SAMP.	CORE	TUBE
DIA.	6"	1 1/2"		
WT.		140#		
FALL		30"		

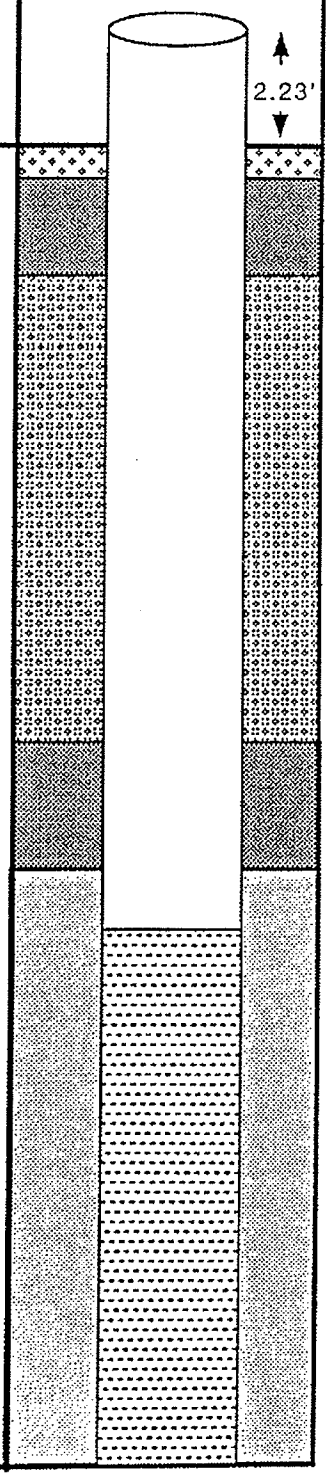
DEPTH FT.	CASING BLOWS	SAMPLE NO.	BLOWS ON SAMPLE SPOON PER 6"	SYMBOL	IDENTIFICATION & REMARKS
1		S-1	20		Silt, sand, clay, gravel fill, loose, moist
			13		
2			8		
3		S-2	5		No Recovery
			2		
4			22		
5					
6		S-3	13		Black sandy silty clay fill and silty clayey sandy fill, wet, soft, trace decaying organic material
			3		
7			8		
8		S-4	34	CL	Blue-gray silty clay, firm, wet; overlying orange-brown, gray-mottled silty clay, trace gravel, stiff, wet, high silt content
			5		
10			7		
11		S-5	5	CL	Brown silty clay, silt seams, soft, wet
			8		
12			8		
13		12.5'			END OF BORING
14					WELL CONSTRUCTION
15					0.010 inch slot, threaded flush joint, stainless steel well screen: 12.5'-2.5'
16					Stainless steel well casing used above screen
17					4Q-ROK washed, screened sand: 12.5'-1.5'
18					Bentonite pellet seal: 1.5'-0.5'
19					Concrete plug: 0.5'-0'
20					-Height of steel protective casing above ground surface is 2.92'
21					-Well developed by bailing at least 3 times the volume of water contained in the well.
22					
23					



FOR INTERPRETATION OF SOIL, ROCK AND GROUNDWATER CONDITIONS SEE TEXT

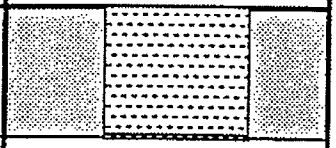
T.M. GATES, INC	INVESTIGATIVE BORING & MONITORING WELL INSTALLATION LOG	WELL # MW-5D(5B) STATUS: PLUGGED & ABANDONED
PROJECT: BENSSELAER, N.Y. I.C & S FACILITY - SUPPLEMENTAL INVESTIGATION		SHT. NO. 1 OF 2
CLIENT: ASHLAND CHEMICAL COMPANY		PROJ. NO. 86-01-010
BORING CONTRACTOR: T. M. GATES, INC.		DATE START: 9/27/88
TOP OF CASING ELEVATION: 25.43'		DATE FINISH: 9/27/88
GROUND ELEVATION: 23.2' DATUM: MEAN SEA LEVEL		DRILLER: BILL GIBSON
DRILLING METHOD: 4.25" I.D. HOLLOW STEM ROTARY AUGER		TMG-REP. BAM/JNS
SAMPLING METHOD: SPLIT SPOON BY ASTM METHOD D-1586		
CORING METHOD: N/A		

DEPTH FT.	SAMPLE NO.	BLOWS ON SAMPLE SPOON PER 6"	SYMBOL	IDENTIFICATION & REMARKS
1				
2				
3				
4	S-1	3 3 5		GRAY-GREEN SILTY CLAY FILL, SOFT, MOIST
5				
6				
8				
9	S-2	4 4 4	CL	TAN SILTY CLAY, FIRM, WET, OVERLYING MEDIUM TO COARSE GRAINED SAND
10				
11				
12				
13				
14	S-3	18 28 70	SW	BROWN, SILTY CLAY, VERY DENSE, WET
15				
16				
17				
18				
19	S-4	150-5"		GRAY TO DARK GRAY SILT, LIMESTONE BOULDER
20				
21				



T.M. GATES, INC	INVESTIGATIVE BORING & MONITORING WELL INSTALLATION LOG	MW-5D (5B) (WELL NO.)
PROJECT: RENSSELAER, N.Y. I C & S FACILITY - SUPPLEMENTAL INVESTIGATION		SHT. NO. 2 OF 2
CLIENT: ASHLAND CHEMICAL COMPANY		PROJ. NO. 86-01-010

DEPTH FT.	SAMPLE NO.	BLOWS ON SAMPLE SPOON PER 6"	SYMBOL	IDENTIFICATION & REMARKS
22				
23				GRAY SILT, SHALE FRAGMENTS
	S-5			
24		200=6"		NO RECOVERY END OF BORING
25				AUGER REFUSAL AT 23.5'
26				
27				WELL INSTALLATION
28				- 0.01 INCH SLOT, FLUSH JOINT, STAINLESS STEEL WELL SCREEN: 23.5' - 12.7'
29				- WASHED SILICA SAND: 23.5' - 11.7'
30				- BENTONITE PELLET SEAL: 11.7' - 9.6'
				- CONCRETE/BENTONITE GROUT: 9.6' - 2.1'
32				- BENTONITE PELLET SEAL: 2.1' - 0.5'
33				- CONCRETE PLUG: 0.5' - 0.0'
34				- HEIGHT OF STEEL PROTECTIVE CASING ABOVE GROUND SURFACE: 2.23'
35				
36				
37				
38				
39				
40				
41				
42				
43				
44				
45				

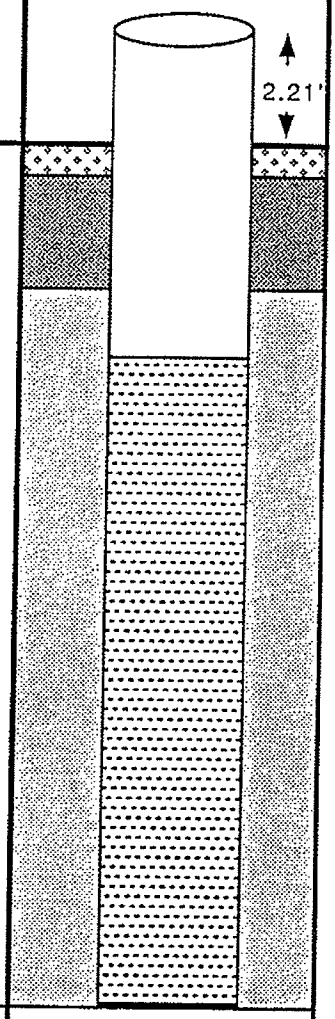


T.M. GATES, INC	INVESTIGATIVE BORING & MONITORING WELL INSTALLATION LOG	WELL # MW-5S(5A) STATUS: ACTIVE

PROJECT: RENSSELAER, N.Y. I C & S FACILITY - SUPPLEMENTAL INVESTIGATION
C NT: ASHLAND CHEMICAL COMPANY
BORING CONTRACTOR: T. M. GATES, INC.
TOP OF CASING ELEVATION: 25.51'
GROUND ELEVATION: 23.3' DATUM: MEAN SEA LEVEL
DRILLING METHOD: 4.25" I.D. HOLLOW STEM ROTARY AUGER
SAMPLING METHOD: SPLIT SPOON BY ASTM METHOD D-1586
CORING METHOD: N/A

SHT. NO. 1 OF 1
PROJ. NO. 86-01-010
DATE START: 9/27/88
DATE FINISH: 9/27/88
DRILLER: BILL GIBSON
TMG-REP. BAM/JNS

DEPTH FT.	SAMPLE NO.	BLOWS ON SAMPLE SPOON PER 6"	SYMBOL	IDENTIFICATION & REMARKS
1				
2				
3				
4	S-1	3		GRAY-GREEN SILTY CLAY FILL, SOFT, MOIST
		3		
5		5		
6				
7				
8				
9	S-2	4	C L	TAN SILTY CLAY, FIRM, WET, OVERLYING MEDIUM TO COARSE GRAINED SAND
		4		
10		4		
11				
12				
13				
14				
15				END OF BORING
16				WELL INSTALLATION
17				- 0.01 INCH SLOT, FLUSH JOINT, STAINLESS STEEL WELL SCREEN: 14.0' - 3.3'
18				- WASHED SILICA SAND: 14.0' - 2.5'
19				- BENTONITE PELLET SEAL: 2.5' - 0.5'
20				- CONCRETE PLUG: 0.5' - 0.0'
21				- HEIGHT OF STEEL PROTECTIVE CASING ABOVE GROUND SURFACE: 2.21'



T.M. GATES, INC.	INVESTIGATIVE BORING & MONITORING WELL INSTALLATION LOG	MW-5D (5B) (WELL NO.)
PROJECT: RENSSELAER, N.Y. I C & S FACILITY - SUPPLEMENTAL INVESTIGATION		SHT. NO. 2 OF 2
CLIENT: ASHLAND CHEMICAL COMPANY		PROJ. NO. 86-01-010

DEPTH FT.	SAMPLE NO.	BLOWS ON SAMPLE SPOON PER 6"	SYMBOL	IDENTIFICATION & REMARKS
22				
23				GRAY SILT, SHALE FRAGMENTS
	S-5	200=6"		NO RECOVERY END OF BORING
24				AUGER REFUSAL AT 23.5'
25				
26				WELL INSTALLATION
27				
28				- 0.01 INCH SLOT, FLUSH JOINT, STAINLESS STEEL WELL SCREEN: 23.5' - 12.7'
29				- WASHED SILICA SAND: 23.5' - 11.7'
30				- BENTONITE PELLET SEAL: 11.7' - 9.6'
				- CONCRETE/BENTONITE GROUT: 9.6' - 2.1'
32				- BENTONITE PELLET SEAL: 2.1' - 0.5'
33				- CONCRETE PLUG: 0.5' - 0.0'
34				- HEIGHT OF STEEL PROTECTIVE CASING ABOVE GROUND SURFACE: 2.23'
35				
36				
37				
38				
39				
40				
41				
42				
43				
45				

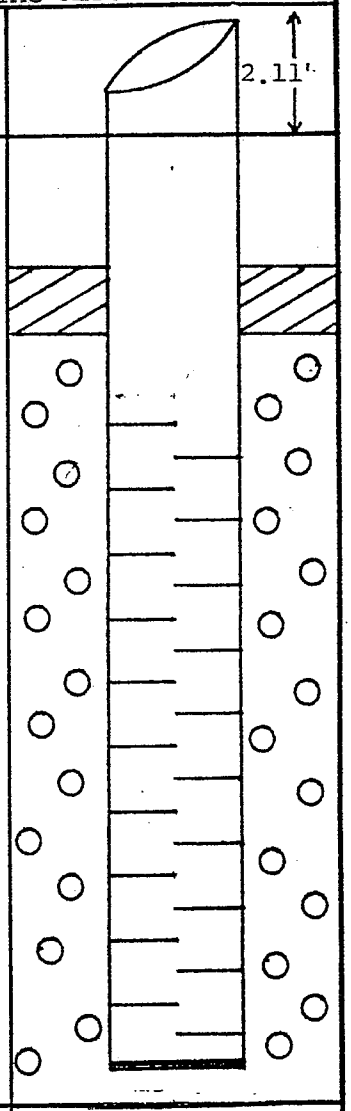
T. M. GATES, INC.	TEST BORING LOG & MONITORING WELL INSTALLATION	WELL # MW-6B(6A) (PLUGGED/ABANDONED)

PROJECT	ASHLAND - RENSSELAER, NEW YORK REMEDIAL INVESTIGATION
CLIENT	ASHLAND CHEMICAL COMPANY
BORING CONTRACTOR	EMPIRE SOIL INVESTIGATIONS, INC.

GROUND WATER	TOC-ELEV. 27.65				CAS.	SAMP.	CORE	TUBE
DATE	TIME	ELEV.	CASING	TYPE	HSA			
11-16-84	9:08	23.51		DIA..	6"			
				WT.				
				FALL				

SHT. NO.	1 OF 1
PROJ. NO.	84-01-031
GROUND ELEV.	25.54
DATUM	MSL
DATE START	11-08-84
DATE FINISH	11-08-84
DRILLER	DAN RICHARDS
TMG-REP.	JVK

DEPTH FT.	CASING BLOWS	SAMPLE NO.	BLOWS ON SAMPLE SPOON PER 6"	SYMBOL	IDENTIFICATION & REMARKS
1					Auger no sample 0-15'
2					See adjacent MW-6A for lithologic description
3					
4					
5					
6					
7					
8					
9					
10					
11					
12					
13					
14					
15		15.0'			END OF BORING
16					WELL CONSTRUCTION
17					0.010 inch slot, threaded flush joint, stainless steel well screen: 14.5'-4.5'
18					Stainless steel well casing used above screen
19					4Q-ROK washed, screened sand: 14.5'-3.0'
20					Bentonite pellet seal: 3.0'-2.0'
					Concrete plug: 2.0'-0'
					-Height of steel protective casing above ground surface is 2.11'
22					-Well developed by bailing at least 3 times the volume of water contained in the well.
23					



OR INTERPRETATION OF SOIL, ROCK AND GROUNDWATER CONDITIONS, SEE TEXT

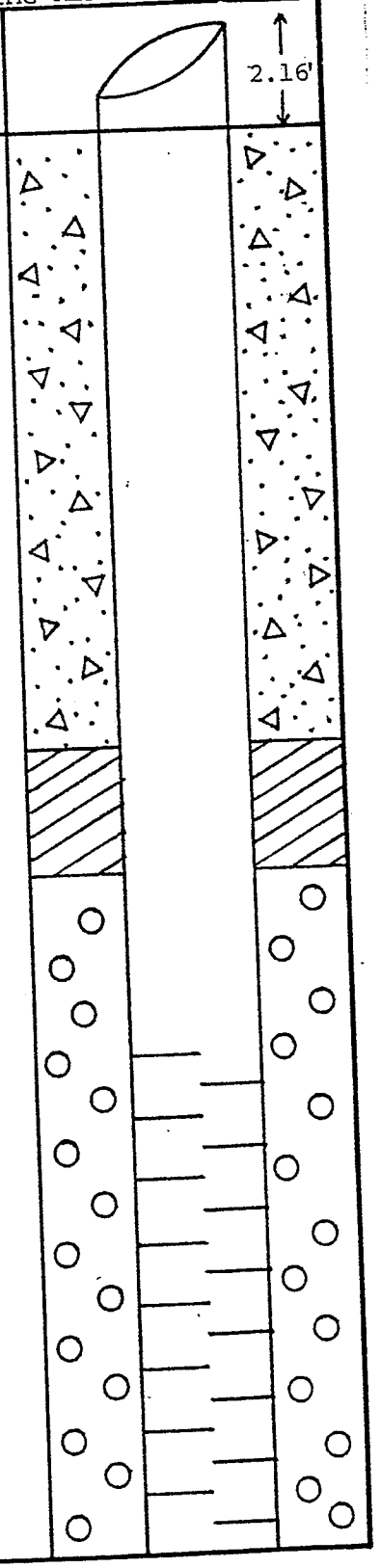
T. M. GATES, INC.	TEST BORING LOG & MONITORING WELL INSTALLATION	WELL # MW-6A(6B) (PLUGGED/ABANDONED)

PROJECT ASHLAND - RENSSELAER, NEW YORK REMEDIAL INVESTIGATION
CLIENT ASHLAND CHEMICAL COMPANY
BORING CONTRACTOR EMPIRE SOIL INVESTIGATIONS, INC.

SHT. NO. 1 OF 2
PROJ. NO. 84-01-031
GROUND ELEV. 25.38
DATUM MSL
DATE START 11-05-84
DATE FINISH 11-07-84
DRILLER DAN RICHARDS
TMG-REP. JVK

WATER	TOC-ELEV. 27.54				CAS.	SAMP.	CORE	TUBE
DATE	TIME	ELEV.	CASING	TYPE	HSA	S.S.		
11-16-84	9:00	21.69		DIA.	6"	1 1/2"		
				WT.		140#		
				FALL		30"		

FT.	CASING BLOWS	SAMPLE NO.	BLOWS ON SAMPLE SPOON PER 6"	SYMBOL	IDENTIFICATION & REMARKS
1		S-1			Dark brown silty clayey fine to medium grained sand, trace gravel, fill, moist, loose
2					
3		S-2	3		No Recovery - Chemical Odor
4			1		
5			1		
6		S-3	3		Dark brown silty clayey fine grained sand, trace gravel fill, saturated, loose, chemical odor
7			8		
8		S-4	6		Silt, clay, sand, gravel fill, moist, loose, chemical odor
9			9		
10		S-5	6		Silt, clay, sand, gravel fill, loose; overlying gray clayey silt, dense, saturated throughout, chemical odor
11			7		
12			25		
13		S-6	30		No Recovery
14			14		
15		S-7	6		Gray silt, clay fill, wet, soft, slight chemical odor
16			14		
17			15		
18		S-8	15		No Recovery
19			23		
20		S-9	16		Gray silty clay and clayey silt, stiff, moist; overlying silty clayey, gravelly medium-grained sand, moderately dense, saturated, slight chemical odor
22			11		
23			12	CL/ML/SM/SC	
			14		
			13		
			25		



FOR INTERPRETATION OF SOIL, ROCK AND GROUNDWATER CONDITIONS, SEE TEXT

T. M. GATES, INC.	TEST BORING LOG & MONITORING WELL INSTALLATION	WELL # MW-6A(6B) (PLUGGED/ABANDONED)
ASHLAND - RENSSELAER, NEW YORK		SHT. NO. 2 OF 2
ASHLAND CHEMICAL COMPANY		PROJ. NO. 84-01-031

BLOWS	SAMPL NO.	BLOWS ON SAMPLE SPOON PER 6"	SYMBOL	IDENTIFICATION & REMARKS
	S-10	20 40	CL	Gray gravelly, sandy silty clay, very stiff, moist
	25.0'			END OF BORING - SHALE BEDROCK

WELL CONSTRUCTION

0.010 inch slot, threaded flush joint, stainless steel well screen: 25.0'-15.0'
Stainless steel well casing used above screen
4Q-ROK washed, screened sand: 25.0'-12.0'
Bentonite pellet seal: 12.0'-10.0'
Concrete plug: 10.0'-0'

-Height of steel protective casing above ground surface is 2.16'
-Well developed by bailing at least 3 times the volume of water contained in the well.



IETATION OF SOIL, ROCK AND GROUNDWATER CONDITIONS SEE TEXT

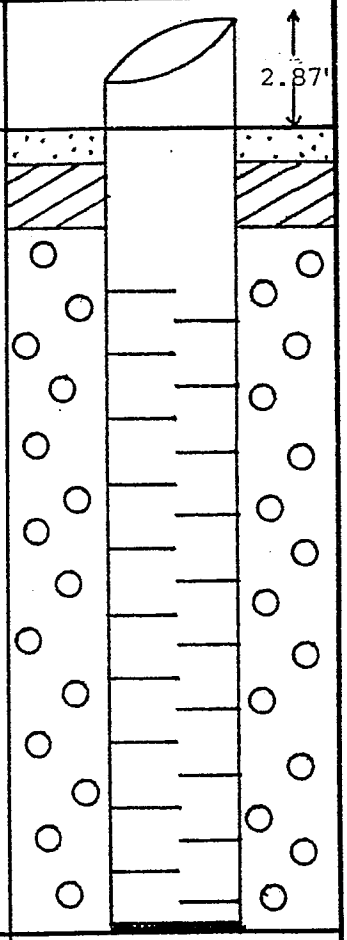
T. M. GATES, INC.	TEST BORING LOG & MONITORING WELL INSTALLATION	WELL # MW-7 (PLUGGED/ABANDONED)

PROJECT ASHLAND - RENSSELAER, NEW YORK REMEDIAL INVESTIGATION
CLIENT ASHLAND CHEMICAL COMPANY
BORING CONTRACTOR EMPIRE SOIL INVESTIGATIONS, INC.

SHT. NO. 1 OF 1
PROJ. NO. 84-01-031
GROUND ELEV. 25.04
DATUM MSL
DATE START 11-14-84
DATE FINISH 11-14-84
DRILLER DAN RICHARDS
TMG-REP. JVK

GROUND WATER	TOC-ELEV.	27.91			CAS.	SAMP.	CORE	TUBE
DATE	TIME	ELEV.	CASING	TYPE	HSA	S.S.		
11-16-84	8:50	22.83		DIA.	6"	1 1/2"		
				WT.		140#		
				FALL		30"		

DEPTH FT.	CASING BLOWS	SAMPLE NO.	BLOWS ON SAMPLE SPOON PER 6"	SYMBOL	IDENTIFICATION & REMARKS
1		S-1	12		
			10		Brown silt and clay fill, large gravel, moist, soft
			11		
2					
3		S-2	5		
			5		No Recovery
4			5		
5					
6		S-3	5	CL	
			6		Brown silty clay, trace gravel, firm, moist
			14		
7					
8		S-4	1	SM/SC	
			1		Dark brown silty clayey medium-grained sand, saturated, loose, chemical odor
			1		
10					
11		S-5	1	CL/ML	
			2		Dark gray silty clay and clayey silt, wet, soft, loose
			3		
12					
13		12.5'			END OF BORING
14					WELL CONSTRUCTION
15					0.010 inch slot, threaded flush joint, stainless steel well screen: 12.5'-2.5'
16					Stainless steel well casing used above screen
17					4Q-ROK washed, screened sand: 12.5'-1.5'
					Bentonite pellet seal: 1.5'-0.5'
18					Concrete plug: 0.5'-0'
19					-Height of steel protective casing above ground surface is 2.87'
20					-Well developed by bailing at least 3 times the volume of water contained in the well.
22					
23					



FOR INTERPRETATION OF SOIL, ROCK AND GROUNDWATER CONDITIONS, SEE TEXT

T. M. GATES, INC.	TEST BORING LOG & MONITORING WELL INSTALLATION	WELL # MW-8 (NO WELL INSTALLED)
PROJECT ASHLAND - RENSSELAER, NEW YORK REMEDIAL INVESTIGATIONS		SHT. NO. 1 OF 1
CLIENT ASHLAND CHEMICAL COMPANY		PROJ. NO. 84-01-031
BORING CONTRACTOR EMPIRE SOIL INVESTIGATIONS, INC.		GROUND ELEV.
GROUND WATER TOC-ELEV.		DATUM MSL
DATE / TIME / ELEV. / CASING	TYPE: CAS. HSA; SAMP. S.S.; CORE; TUBE	DATE START 11-07-84
	DIA.: 6"; 1 1/2"	DATE FINISH 11-07-84
	WT.: 140#	DRILLER DAN RICHARDS
	FALL: 30"	TMG-REP. JVK

DEPTH FT.	CASING BLOWS	SAMPLE NO.	BLOWS ON SAMPLE SPOON PER 6"	SYMBOL	IDENTIFICATION & REMARKS	
1		S-1	1, 3, 4		Brown silty clay fill, trace sand, trace gravel, soft, moist	
2						
3		S-2	11, 14, 20		Brown silty clay fill, trace sand, trace gravel, firm with soft seams, moist	No Well
4						
5						
6		S-3	9, 13, 16	CL	Brown silty clay, trace gravel, very stiff, moist, silt seams	
7						
8		S-4	8, 6, 4	CL	Brown silty clay, stiff, moist; overlying brown silty, clayey medium to coarse-grained sand, saturated, loose; overlying brown silty clay, trace gravel, soft, wet	
9						
10						
11		S-5	3, 3, 4	CL/ML	Brown silty clay and clayey silt; overlying blue-gray silty clay and clayey silt, wet, soft, sand seams	
12						
13		S-6	5, 10, 12	CL/ML	Blue-gray silty clay and clayey silt, soft, wet	
14						
15						
16		15.0'			END OF BORING	
17						
18						
19						
20						
21						
22						
23						

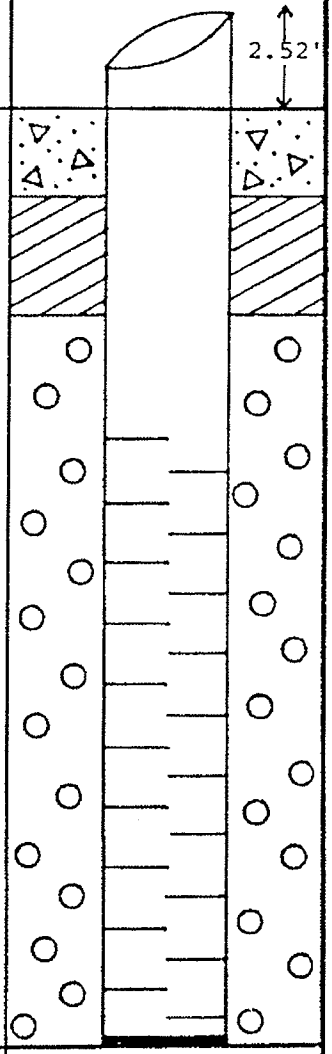
FOR INTERPRETATION OF SOIL, ROCK AND GROUNDWATER CONDITIONS, SEE TEXT

T. M. GATES, INC.	TEST BORING LOG & MONITORING WELL INSTALLATION	WELL # MW-9 STATUS: ACTIVE

PROJECT	ASHLAND - RENSSELAER, NEW YORK REMEDIAL INVESTIGATION	SHT. NO. 1 OF 1
CLIENT	ASHLAND CHEMICAL COMPANY	PROJ. NO. 84-01-031
BOF	CONTRACTOR EMPIRE SOIL INVESTIGATIONS, INC.	GROUND ELEV. 25.00
GROUND WATER	TOC-ELEV. 27.52	DATUM MSL
DATE 11-16-84	TIME 8:30	ELEV. 21.17
		DATE START 11-08-84
		DATE FINISH 11-08-84
		DRILLER DAN RICHARDS
		TMG-REP. JVK

	CASING		CAS.	SAMP.	CORE	TUBE
TYPE			HSA	S.S.		
DIA.			6"	1 1/2"		
WT.				140#		
FALL				30"		

DEPTH FT.	CASING BLOWS	SAMPLE NO.	BLOWS ON SAMPLE SPOON PER 6"	SYMBOL	IDENTIFICATION & REMARKS
1		S-1	11 13 15	CL	Brown silty clay fill, trace sand, trace gravel, trace red clay brick, firm, moist; very little recovery
2					
3		S-2	9 8 12		Brown silty clay, trace gravel, stiff, moist, silt seams
4					
5		S-3	5 7 10	CL/ML	Brown silty clay, firm, moist, clayey silt seams, loose, saturated
6					
7					
8		S-4	6 7 10	CL/ML	Brown silty clay and clayey silt, gray mottled, wet, soft
9					
10		S-5	4 5 11	ML/CL	Brown clayey silt, loose, saturated, gray silty clay, plastic, wet, very soft
11					
12					
13		S-6	4 9 25	SP	Gray silty clayey gravelly medium-grained sand, loose, saturated; very little recovery
14					
15					END OF BORING
16		15.5'			WELL CONSTRUCTION
17					0.010 inch slot, threaded flush joint, stainless steel well screen: 15.5'-5.5'
18					Stainless steel well casing used above screen
19					4Q-ROK washed, screened sand: 15.5'-3.5'
20					Bentonite pellet seal: 3.5'-1.5'
21					Concrete plug: 1.5'-0'
22					-Height of steel protective casing above ground surface is 2.52'
23					-Well developed by bailing at least 3 times the volume of water contained in the well.



OR INTERPRETATION OF SOIL ROCK AND GROUNDWATER CONDITIONS SEE TEXT

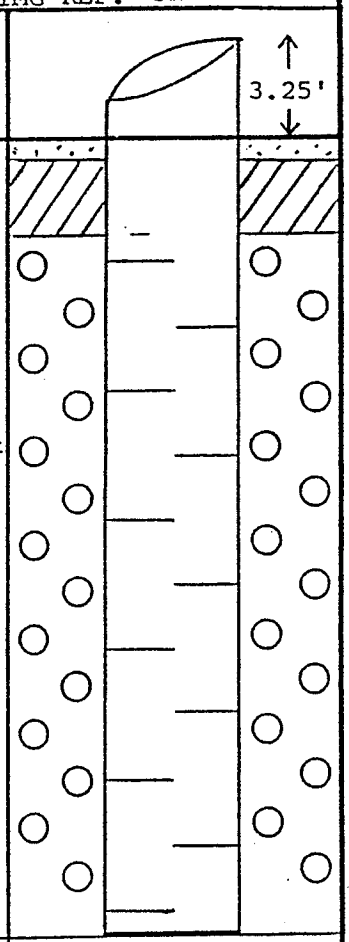
T. M. GATES, INC.	TEST BORING LOG & MONITORING WELL INSTALLATION	WELL # MW-10 STATUS: ACTIVE

PROJECT RENSSELAER, NEW YORK IC & S — SHT. NO. 1 OF 1
CLIENT ASHLAND CHEMICAL COMPANY — PROJ. NO. 85-01-032
BORING CONTRACTOR EMPIRE SOIL INVESTIGATIONS, INC. — GROUND ELEV.
GROUND WATER TOC-ELEV. 25.50 — DATUM

DATE	TIME	ELEV.	CASING		CAS.	SAMP.	CORE	TUBE
				TYPE	H.S.A.	S.S.		
				DIA.	7"	1.5"		
				WT.		140#		
				FALL		30"		

DATE START 9-24-86
DATE FINISH 9-24-86
DRILLER ED COLE
TMG-REP. JNS

DEPTH FT.	CASING BLOWS	SAMPLE NO.	BLOWS ON SAMPLE SPOON PER 6"	SYMBOL	IDENTIFICATION & REMARKS
1					Brown-black cinder surfacing with medium-coarse grained sandy fill.
2		S-1	4 8 10		Brown-black medium-coarse-grained sand, fill, loose-firm, moist
3					
4		S-2	6 8 7		Light brown and light gray clay, fill, mixed with occasional coarse sand grains, trace iron oxide stain, moist to very moist stiff, overlying red-brown fine-medium grained sands trace little clay, wet, firm
5					
6					
7		S-3	12 9 18	S C	Light brown, gravelly, fine-coarse-grained sand with trace silt and clay, wet, firm-very firm, overlying blue gray clayey, gravelly sand, wet, firm
8					
9		S-4	3 5 22	S C	Blue gray, clayey, gravelly sand, wet, loose-firm
10					
11					
12		S-5	2 2 3	S C	Blue gray, clayey, gravelly sand, wet, loose
13					END OF BORING
14					WELL INSTALLATION
15					0.010 inch slot stainless steel wire wound well screen: 12.5'-1.8'
16					2Q-ROK washed screened silica sand: 12.5'-1.5'
17					Bentonite pellet seal: 1.5'-0.3'
18					Concrete plug: 0.3'-0.0'
19					- Well screen, riser pipe and protective casing were steam cleaned prior to installation.
20					- Height of steel protective casing above the ground surface is 3.25'.
					- Well developed by bailing at least three well volumes of water.



INTERPRETATION OF SOIL, ROCK AND GROUNDWATER CONDITIONS. SEE TEXT

T. M. GATES, INC.	TEST BORING LOG & MONITORING WELL INSTALLATION	WELL # MW-11 STATUS: ACTIVE

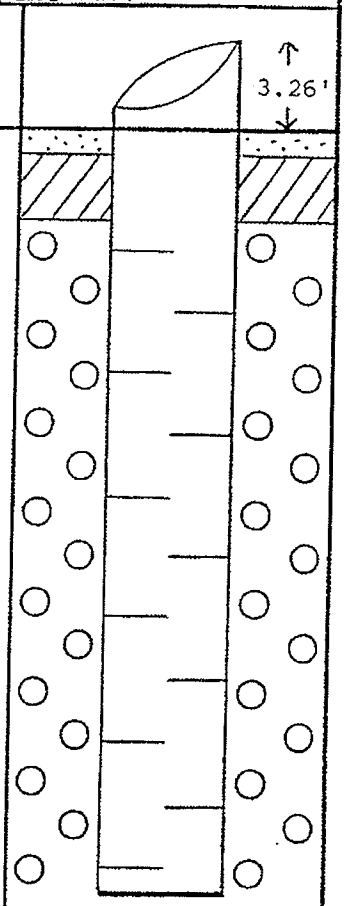
PROJECT: RENSSELAER, NEW YORK IC & S
CLIENT: ASHLAND CHEMICAL COMPANY
DRILLING CONTRACTOR: EMPIRE SOIL INVESTIGATIONS, INC.
GROUND WATER: TOC-ELEV. 24.95

DATE	TIME	ELEV.	CASING

	CAS.	SAMP.	CORE	TUBE
TYPE	H.S.A.	S.S.		
DIA.	7"	1.5"		
WT.		140#		
FALL		30"		

SHT. NO. 1 OF 1
PROJ. NO. 85-01-032
GROUND ELEV.
DATUM
DATE START 9-24-86
DATE FINISH 9-24-86
DRILLER ED COLE
TMG-REP. JNS

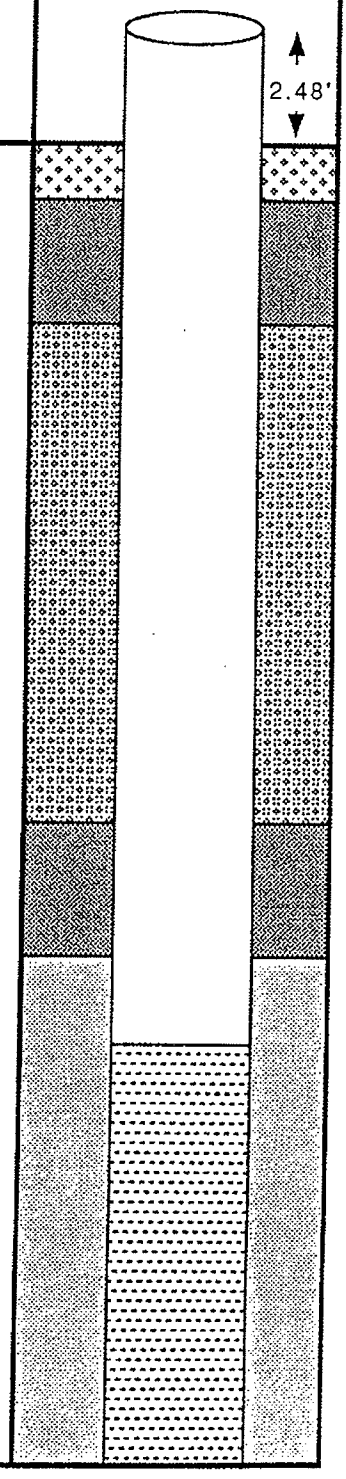
DEPTH FT.	CASING BLOWS	SAMPLE NO.	BLOWS ON SAMPLE SPOON PER 6"	SYMBOL	IDENTIFICATION & REMARKS
1					Brown-black cinder surfacing with medium-coarse grained sand
2		S-1	4 8 10		Brown-black medium-coarse grained sand with little gravel, fill, loose to firm, moist
3					
4		S-2	5 4 3		Brown-gray sandy silt with trace clay and trace to little gravel, fill, loose, wet, septic odor, overlying light brown and gray with blue-green tint silty clay fill, very moist to wet, soft
5					
6					
7		S-3	1 5 15		Light brown and gray with blue-green tint silty clay with trace to little medium-coarse-grained sand and gravel, fill, wet, soft
					Auger deflected @ 8.0 feet, boring off-set 5.0 feet
9		S-4	6 15 16		Light brown, gravelly, fine-coarse-grained sand with trace to little silt and clay, wet, firm-dense
10					
11		S-5	8 49 15	S C	Blue-gray silty, clayey very fine-grained sand with trace gravel
12			14		
13		S-6	6 10 23	S C	
14					END OF BORING
15					WELL INSTALLATION
16					Hole caved from 13.5'-12.5' 0.010 inch slot stainless steel wire-wound well screen: 12.5'-1.8' 2Q-ROK washed, screened silica sand: 12.5'-1.4' Bentonite pellet seal: 1.4'-0.3' Concrete plug: 0.3'-0.0'
17					- Well screen, riser pipe and protective casing were steam cleaned prior to installation. - Height of steel protective casing above the ground is 3.26 feet. - Well developed by bailing at least three well volumes of water.
18					
19					
20					
22					
23					



FOR INTERPRETATION OF SOIL, ROCK AND GROUNDWATER CONDITIONS, SEE TEXT

T.M. GATES, INC	INVESTIGATIVE BORING & MONITORING WELL INSTALLATION LOG	WELL # MW-12D (12B) STATUS: ACTIVE
PROJECT: RENSSELAER, N.Y. I C & S FACILITY - SUPPLEMENTAL INVESTIGATION		SHT. NO. 1 OF 2
C NT: ASHLAND CHEMICAL COMPANY		PROJ. NO. 86-01-010
BORING CONTRACTOR: T. M. GATES, INC.		DATE START: 9/27/88
TOP OF CASING ELEVATION: 24.18		DATE FINISH: 9/27/88
GROUND ELEVATION: 21.7' DATUM: MEAN SEA LEVEL		DRILLER: BILL GIBSON
DRILLING METHOD: 4.25" I.D. HOLLOW STEM ROTARY AUGER		TMG-REP. BAM/JNS
SAMPLING METHOD: SPLIT SPOON BY ASTM METHOD D-1586		
CORING METHOD: N/A		

DEPTH FT.	SAMPLE NO.	BLOWS ON SAMPLE SPOON PER 6"	SYMBOL	IDENTIFICATION & REMARKS
1				
2				
3				
4	S-1	4		GRAY CLAY FILL WITH TRACE SILT AND TRACE SAND, SOFT, MOIST
		4		
5		3		
6				
7				
8				
9	S-2	8	CL	LIGHT TAN SILTY CLAY, SILT INTERBEDED (1" BED THICKNESS), STIFF, MOIST
		7		
10		8		
11				
12				
13				
14	S-3	5	CL/ML	INTERBEDDED TAN CLAY (3" - 4" BED THICKNESS), AND TAN SILT (1" - 2" BED THICKNESS), FIRM, MOIST
		6		
15		14		
16				
17				
18				
19	S-4	7		CLAYEY WELL GRADED SAND, FIRM, WET, OVERLYING GRAY TO DARK GRAY SILT
		7		
20		11		
21				

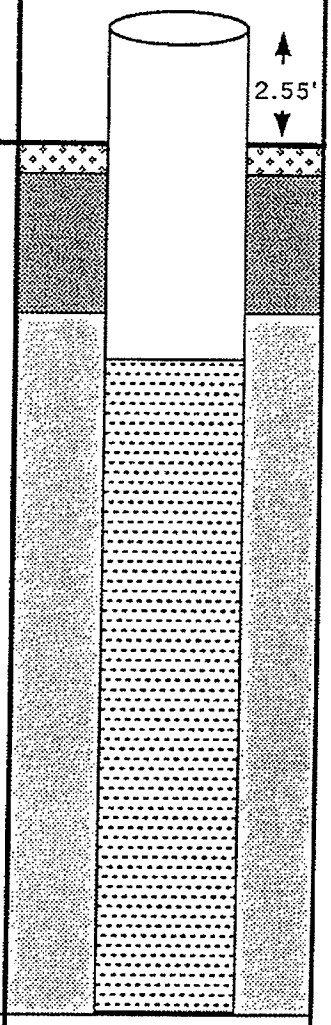


T.M. GATES, INC.	INVESTIGATIVE BORING & MONITORING WELL INSTALLATION LOG	WELL # MW-12D (12B)
PROJECT: RENSSELAER, N.Y. I C & S FACILITY - SUPPLEMENTAL INVESTIGATION		SHT. NO. 2 OF 2
CLIENT: ASHLAND CHEMICAL COMPANY		PROJ. NO. 86-01-010

DEPTH FT.	SAMPLE NO.	BLOWS ON SAMPLE SPOON PER 6"	SYMBOL	IDENTIFICATION & REMARKS
22				
23				
24	S-5	100=6"		BLACK SHALE, VERY HARD
25	S-6	120=6"		BLACK SHALE, VERY HARD, AUGER REFUSAL AT 25.5'
26				END OF BORING
27				
28				WELL INSTALLATION
29				- 0.01 INCH SLOT, FLUSH JOINT, STAINLESS STEEL WELL SCREEN: 25.5' - 14.7'
30				- WASHED SILICA SAND: 25.5' - 13.2'
				- BENTONITE PELLET SEAL: 13.2' - 11.0'
32				- CONCRETE/BENTONITE GROUT: 11.0' - 2.8'
33				- BENTONITE PELLET SEAL: 2.8' - 0.7'
34				- CONCRETE PLUG: 0.7' - 0.0'
35				- HEIGHT OF STEEL PROTECTIVE CASING ABOVE GROUND SURFACE: 2.48'
36				
37				
38				
39				
40				
41				
42				
43				
44				
45				

T.M. GATES, INC	INVESTIGATIVE BORING & MONITORING WELL INSTALLATION LOG	WELL # MW-12S (12A) STATUS: ACTIVE
PROJECT: RENSSELAER, N.Y. I.C.& S. FACILITY - SUPPLEMENTAL INVESTIGATION		SHT. NO. 1 OF 1
CLIENT: ASHLAND CHEMICAL COMPANY		PROJ. NO. 86-01-010
BORING CONTRACTOR: T. M. GATES, INC.		DATE START: 9/27/88
TOP OF CASING ELEVATION: 24.25		DATE FINISH: 9/27/88
GROUND ELEVATION: 21.7' DATUM: MEAN SEA LEVEL		DRILLER: BILL GIBSON
DRILLING METHOD: 4.25" I.D. HOLLOW STEM ROTARY AUGER		TMG-REP. BAM/JNS
SAMPLING METHOD: SPLIT SPOON BY ASTM METHOD D-1586		
CORING METHOD: N/A		

DEPTH FT.	SAMPLE NO.	BLOWS ON SAMPLE SPOON PER 6"	SYMBOL	IDENTIFICATION & REMARKS
1				
2				
3				
4	S-1	4		GRAY CLAY FILL WITH TRACE SILT AND TRACE SAND, SOFT, MOIST
		4		
5		3		
6				
8				
9	S-2	8	C L	LIGHT TAN SILTY CLAY, SILT INTERBEDED (1" BED THICKNESS), STIFF, MOIST
		7		
10		8		
11				
12				
13				
14				
15				
16				
17				
18				
20				
21				



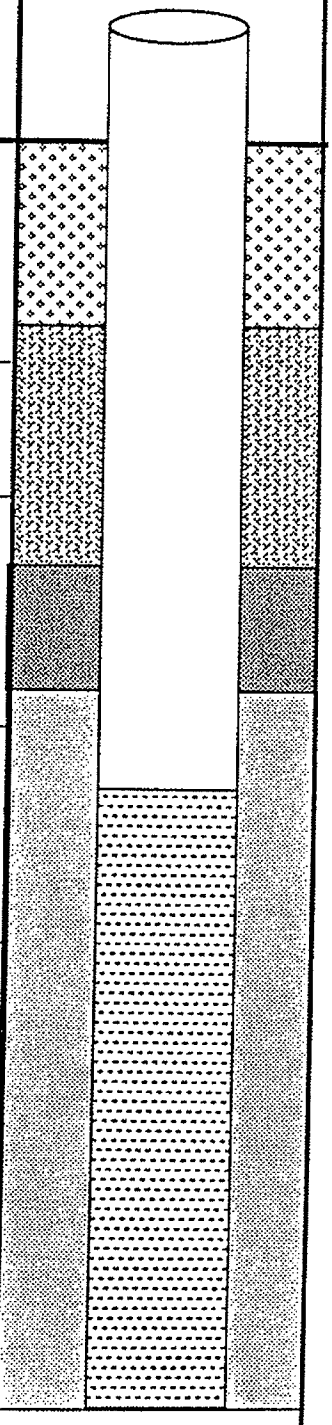
END OF BORING

WELL INSTALLATION

- 0.01 INCH SLOT, FLUSH JOINT, STAINLESS STEEL WELL SCREEN: 14.1' - 3.4'
- WASHED SILICA SAND: 14.1' - 2.7'
- BENTONITE PELLET SEAL: 2.7' - 0.5'
- CONCRETE PLUG: 0.5' - 0.0'
- HEIGHT OF STEEL PROTECTIVE CASING ABOVE GROUND SURFACE: 2.55'

T.M. GATES, INC	INVESTIGATIVE BORING & MONITORING WELL INSTALLATION LOG	WELL # MW-13 STATUS: ACTIVE
PROJECT: RENSSELAER, N.Y. I.C & S FACILITY		SHT. NO. 1 OF 2
CLIENT: ASHLAND CHEMICAL, INC.		PROJ. NO. 86-01-010
BORING CONTRACTOR: EMPIRE SOIL INVESTIGATIONS, INC.		DATE START: 9-20-93
TOP OF CASING ELEVATION: 37.46		DATE FINISH: 9-23-93
GROUND ELEVATION: 35.15 DATUM: MEAN SEA LEVEL		DRILLER: J. LEONHARDT
DRILLING METHOD: 4.25" I.D. HOLLOW STEM ROTARY AUGER		TMG-REP. JNS
SAMPLING METHOD: SPLIT SPOON BY ASTM METHOD D-1586		
CORING METHOD: N/A		

DEPTH FT.	SAMPLE NO.	BLOWS ON SAMPLE SPOON PER 6"	SYMBOL	IDENTIFICATION & REMARKS
1	S-1	6		Fill - Tan, brown, and black sandy silt fill, with cinders and brick pieces, moist, firm.
2		3		
3	S-2	6		
4		5		
5	S-3	4	CL	Light gray and tan silty clay, dry, firm.
6		6		
7	S-4	4	SP / CH	Light gray and tan very fine-grained silty sand, trace clay, wet. Interlaminated with light gray clay, moist, firm.
8		4		
9	S-5	5		
10		5		
11	S-6	35	SP	Olive brown silty fine sand, little coarse-grained sand and gravel, wet, dense.
12		33		
13	S-7	38		
14		32		
15	S-8	6	ML	Gray clayey silt till, trace to with sand, trace to little gravel, wet, very firm-dense.
16		20		
17	S-9	20		
18		26		
19	S-10	20		
20		18		
21	S-11	20		
		16		
		18		
		20		
		20		
		28		
		30		
		28		
		24		
		28		
		30		
		20		
		28		
		70		
		74		
		76		
		100=1"		END OF BORING

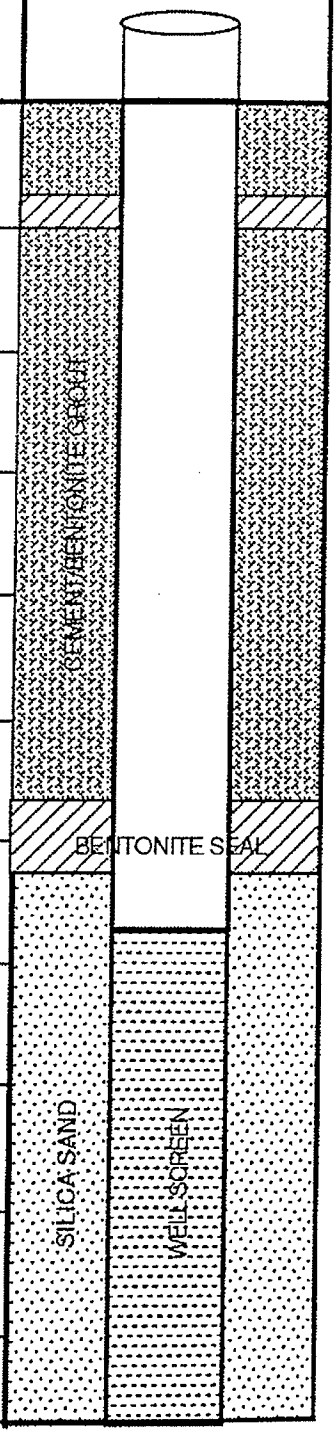


T.M. GATES, INC.	INVESTIGATIVE BORING & MONITORING WELL INSTALLATION LOG	MW-13 (WELL NO.)
PROJECT: RENSSELAER N.Y. I C & S FACILITY		SHT NO 2 OF 2
CLIENT: ASHLAND CHEMICAL, INC.		PROJ. NO. 86-01-010

	SAMPLE NO.	BLOWS ON SAMPLE SPOON PER 6"	SYMBOL	IDENTIFICATION & REMARKS
22				NOTE: Attempts to set well in original hole failed. On 9/23/93, driller offset 4 feet and drilled new hole to 20.5 feet. The well was set in the second hole and the first hole was filled with grout to the ground surface.
23				
24				
25				
26				WELL INSTALLATION
27				
28				- 0.01 INCH SLOT, FLUSH JOINT, STAINLESS STEEL WELL SCREEN: 20.5' - 10.5'
29				- WASHED SILICA SAND: 20.5' - 8.9'
30				- BENTONITE PELLET SEAL: 8.9' - 6.8'
				- BENTONITE/CEMENT GROUT: 6.8' - 3.0'
32				- CONCRETE PLUG: 3.0' - 0.0'
33				- HEIGHT OF STEEL PROTECTIVE CASING ABOVE GROUND SURFACE: 2.31
34				
35				
36				
37				
38				
39				
40				
41				
42				
43				
44				
45				

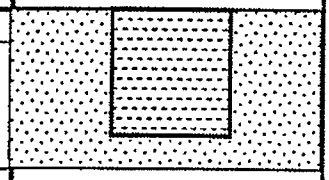
T.M. GATES, INC	INVESTIGATIVE BORING & MONITORING WELL INSTALLATION LOG	WELL # MW-13D STATUS: PLUGGED & ABANDONED
PROJECT: SOUTH CENTRAL RENSSELAER		SHT. NO. 1 OF 2
CLIENT: ASHLAND CHEMICAL INC.		PROJ. NO. 86-01-010
BORING CONTRACTOR: EMPIRE SOIL INVESTIGATIONS INC.		DATE START 11-27-90
TOP OF CASING ELEVATION:		DATE FINISH 11-28-90
GROUND ELEVATION: DATUM: MEAN SEA LEVEL		DRILLER DAVE BARTLETT
DRILLING METHOD: HOLLOW STEM AUGER		TMG-REP. MAM
SAMPLING METHOD: SPLIT SPOON BY ASTM METHOD D-1586		
CORING METHOD:		

DEPTH FT.	SAMPLE NO.	BLOWS ON SAMPLE SPOON PER 6"	SYMBOL	IDENTIFICATION & REMARKS
1	S-1	6, 4, 3, 8	SP	SAND AND CINDERS with gravel - Black; WET sampler tip; ODOR
2				
3	S-2	2, 9, 5, 8	SP	as above over 2" clay with red brick fragment; SATURATED; ODOR
4				
5	S-3	2, 1, 1, 1	SP	SAND - gray to black, coarse grained; with gravel and cinders and brick fragments; SATURATED: ODOR
6	S-4	11, 5, 9, 8	GC CL	GRAVEL - .25->1" with sand as above over 6" CLAY - green to gray with sand and some gravel
8	S-5	7, 17, 10, 5	GC	GRAVEL - 50% .25->1" and coarse grained sand with clay; abundant black shale fragments
10	S-6	5, 4, 11, 8	SC	SAND - very coarse grained with gravel as above; 4" clay lense - brown, with some gravel
12	S-7	12, 9, 5, 4		NO RECOVERY
14	S-8	7, 5, 5, 10	GC	GRAVEL - 60% gravel, 40% clay and sand
16	S-9	4, 2, 2, 4	ML	SILT - Medium gray, uniform; soft, rapid dilatancy
18	S-10	1, 2, 5, 9	ML	SILT as above over 6" SILT as above with 20% gravel (.25")
20	S-11	5, 6, 22	ML	SILT as above with increasing gravel up to 20%



T.M. GATES, INC.	INVESTIGATIVE BORING & MONITORING WELL INSTALLATION LOG	MW - 13D (WELL NO.)
PROJECT: SOUTH CENTRAL RENSSELAER		SHT. NO. 2 OF 2
CLIENT: ASHLAND CHEMICAL INC.		PROJ. NO. 86-01-010

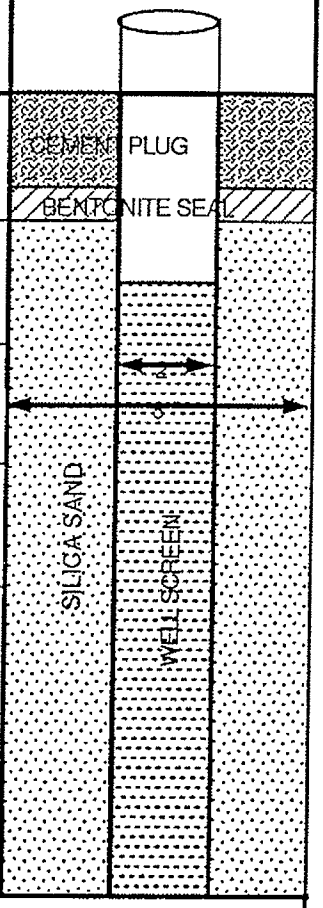
DEPTH FT.	SAMPLE NO.	BLOWS ON SAMPLE SPOON PER 6"	SYMBOL	IDENTIFICATION & REMARKS
22		16	MI	
23	S-12	8 14 13 19	SM	SAND - Gray, medium grained; well sorted but with large (>1") shale clasts, rounded; NO ODOR
24				
25	S-13	8 12 15 68	GS	GRAVEL - with sands as above
26				
27	S-14	92 61 100/.3	SM SH	SAND - Gray, fine grained, silty with 30-40% gravel (some shale with partings) over 6" SHALE - Black, with partings
28				



23.5-13.5' : 0.01 inch PVC well screen
23.5-12.5' : three bags #5 washed silica sand
12.5-11.3' : bentonite pellet seal
11.3 -2.0' : cement/bentonite grout
2.0-1.2 ' : bentonite pellet seal
1.2 - 0 ' : cement plug
Well developed by bailing

T.M. GATES, INC	INVESTIGATIVE BORING & MONITORING WELL INSTALLATION LOG	WELL # MW-13S STATUS: PLUGGED & ABANDONED
PROJECT: SOUTH CENTRAL RENSSELAER		SHT. NO. 1 OF 1
CLIENT: ASHLAND CHEMICAL INC.		PROJ. NO. 86-01-010
BORING CONTRACTOR: EMPIRE SOIL INVESTIGATIONS INC.		DATE START 11-27-90
TOP OF CASING ELEVATION:		DATE FINISH 11-27-90
GROUND ELEVATION: DATUM: MEAN SEA LEVEL		DRILLER DAVE BARTLETT
DRILLING METHOD: HOLLOW STEM AUGER		TMG-REP. MAM
SAMPLING METHOD: SPLIT SPOON BY ASTM METHOD D-1586		
CORING METHOD:		

DEPTH FT.	SAMPLE NO.	BLOWS ON SAMPLE SPOON PER 6"	SYMBOL	IDENTIFICATION & REMARKS
1				SEE MW-13D FOR SOIL DESCRIPTION
2				
3				
4				
5				
6				
8				
9				
10				
11				
12				
13				

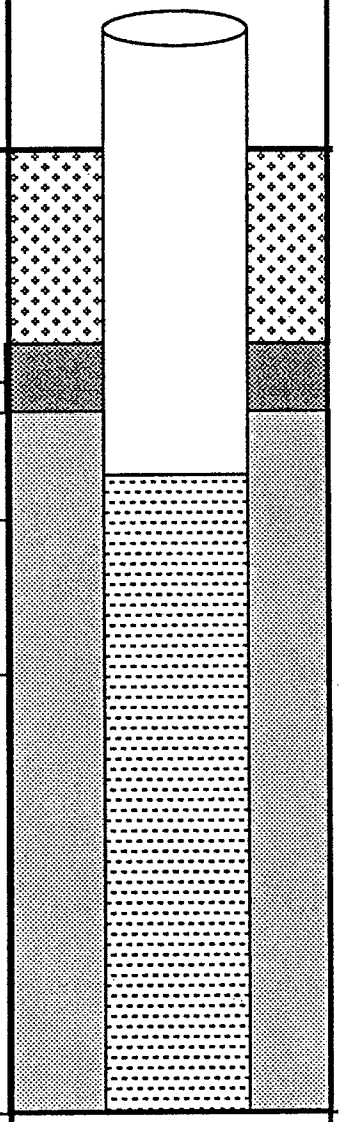


END OF BORING

13-10' : 0.01 inch PVC well screen
13- 2' : three bags #5 washed quartz sand
2 -1.5': bentonite pellet seal
1.5-0' : cement plug
Well developed by bailing 10 well volumes

T.M. GATES, INC	INVESTIGATIVE BORING & MONITORING WELL INSTALLATION LOG	WELL # MW-14 STATUS: ACTIVE
JECT: RENSSELAER, N.Y. I C & S FACILITY		SHT. NO. 1 OF 1
IT: ASHLAND CHEMICAL, INC.		PROJ. NO. 86-01-010
ORING CONTRACTOR: EMPIRE SOIL INVESTIGATIONS, INC.		DATE START: 9-23-93
P OF CASING ELEVATION: 34.20		DATE FINISH: 9-24-93
OUND ELEVATION: 31.76 DATUM: MEAN SEA LEVEL		DRILLER: J. LEONHARDT
RILLING METHOD: 4.25" I.D. HOLLOW STEM ROTARY AUGER		TMG-REP. JNS
MPLING METHOD: SPLIT SPOON BY ASTM METHOD D-1586		
RING METHOD: N/A		

FT.	SAMPLE NO.	BLOWS ON SAMPLE SPOON PER 6"	SYMBOL	IDENTIFICATION & REMARKS
1	S-1	5 5 4 4	CL	Brown and gray silty clay, trace to little fine- to coarse-grained sand, trace gravel, moist, soft.
2	S-2	11 9 7		
		6	CH	Gray clay, moist, soft-very soft.
4	S-3	8 6 7 6	CL	Gray-olive brown silty clay, trace to little fine- to coarse-grained sand, moist, soft.
6	S-4	4 4 3 6	CH / SM	Gray clay, with interlaminated lenses of gray silt, wet soft.
8	S-5	12 12 18 22	ML	Gray clayey silt till, trace to some sand, and trace gravel, wet, very firm-dense.
10	S-6	8 15 21 30		
12	S-7	60 100=4"		
13		72		
14	S-8	100=4"		
15				END OF BORING WELL INSTALLATION - 0.01 INCH SLOT, FLUSH JOINT, STAINLESS STEEL WELL SCREEN: 15.0' - 5.0' - WASHED SILICA SAND: 15.0' - 4.0' - BENTONITE PELLET SEAL: 4.0' - 3.0' - CONCRETE PLUG: 3.0' - 0.0' - HEIGHT OF STEEL PROTECTIVE CASING ABOVE GROUND SURFACE: 2.44'
16				
17				
18				
19				
20				
21				



T.M. GATES, INC

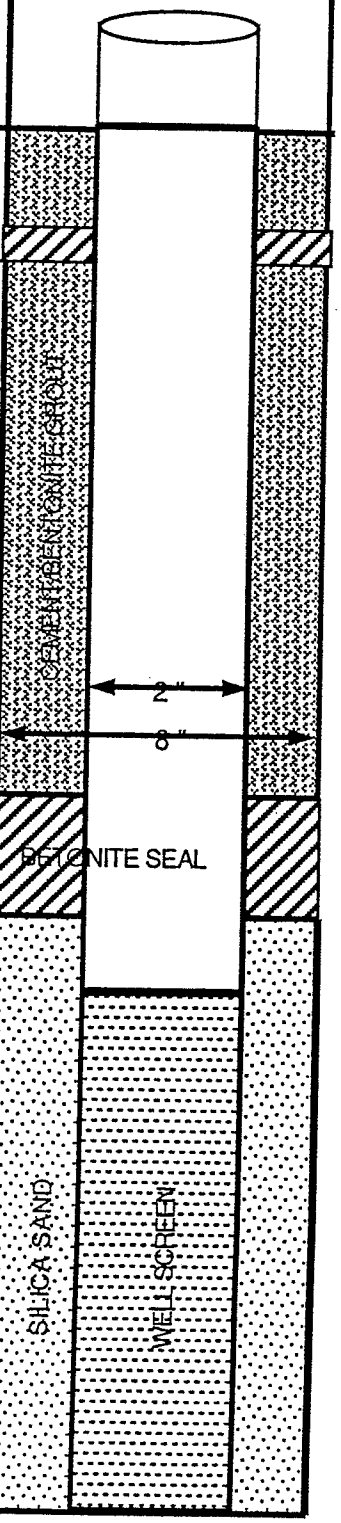
INVESTIGATIVE BORING & MONITORING WELL INSTALLATION LOG

WELL # MW-14D
STATUS: PLUGGED & ABANDONED

PROJECT: SOUTH CENTRAL RENSSELAER
CLIENT: ASHLAND CHEMICAL INC.
BORING CONTRACTOR: EMPIRE SOIL INVESTIGATIONS INC.
TOP OF CASING ELEVATION:
GROUND ELEVATION: DATUM: MEAN SEA LEVEL
DRILLING METHOD: HOLLOW STEM AUGER
SAMPLING METHOD: SPLIT SPOON BY ASTM METHOD D-1586
CORING METHOD:

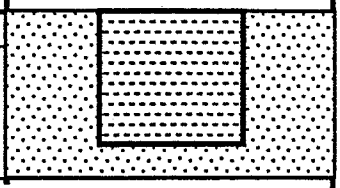
SHT. NO. 1 OF 2
PROJ. NO. 86-01-010
DATE START 11-26-90
DATE FINISH 11-27-90
DRILLER DAVE BARTLETT
TMG-REP. MAM

DEPTH FT.	SAMPLE NO.	BLOWS ON SAMPLE SPOON PER 6"	SYMBOL	IDENTIFICATION & REMARKS
1				SEE MW-14S FOR SHALLOW SOIL DESCRIPTION
2				
3				
4				
5				
6				
8				
9				
10				
11				
12				
13	S-1	2, 2, 2, 2	ML	SILT - gray, uniform; firm to soft; rapid dilatancy; SATURATED
14				
15	S-2	1, 1, 3, 4	ML	SILT _ as above
16				
17	S-3	2, 2, 4, 4	ML	SILT - as above
18				
	S-4	1, 2, 2, 3	ML	SILT - as above, with occasional medium grained sandy lenses from 20 - 22'
21	S-5	5, 6, 10	ML	1.5' SILT as above over 6" SAND - gray, medium grained; with 10% gravel (.25") black, rounded shale pebbles; SATURATED; SLIGHT ODOR



T.M. GATES, INC.	INVESTIGATIVE BORING & MONITORING WELL INSTALLATION LOG	MW-14D (WELL NO.)
PROJECT: SOUTH CENTRAL RENSSELAER		SHT. NO. 2 OF 2
CLIENT: ASHLAND CHEMICAL INC.		PROJ. NO. 86-01-010

DEPTH FT.	SAMPLE NO.	BLOWS ON SAMPLE SPOON PER 6"	SYMBOL	IDENTIFICATION & REMARKS
22		12	SM	
23	S-5	8 15 11 12	GM	GRAVEL - rounded shale and quartz (.25-1") with sand; SATURATED; SLIGHT ODOR
24				

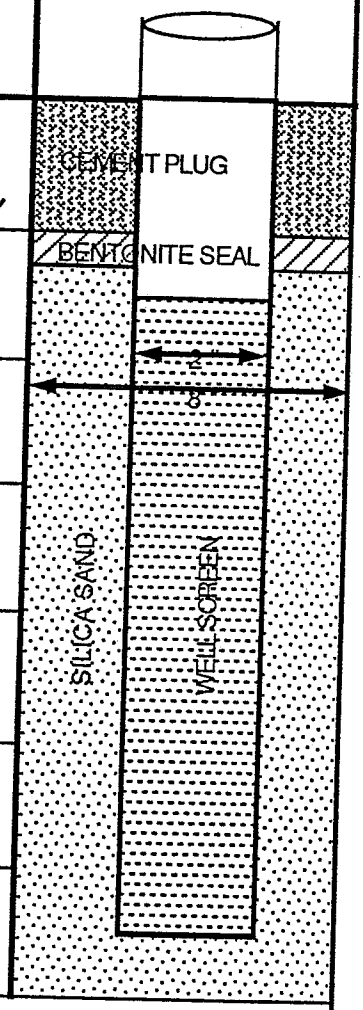


23.5'-13.5' : 0.01 inch PVC well screen
13.5'-12.3' : 2.5 bags #5 washed silica sand
12.3'-10.3' : bentonite pellet seal
10.3'-2.0' : cement/bentonite grout
2.0'-1.5' : bentonite pellet seal
1.5'- 0' : cement plug

Auger to 24', set at 23.5' through augers.
Well developed by bailing.

T.M. GATES, INC	INVESTIGATIVE BORING & MONITORING WELL INSTALLATION LOG	WELL # MW-14S STATUS: PLUGGED & ABANDONED
PROJECT: SOUTH CENTRAL RENSSELAER		SHT. NO. 1 OF 1
CLIENT: ASHLAND CHEMICAL INC.		PROJ. NO. 86-01-010
BORING CONTRACTOR: EMPIRE SOIL INVESTIGATIONS INC.		DATE START 11-26-90
TOP OF CASING ELEVATION:		DATE FINISH 11-26-90
GROUND ELEVATION: DATUM: MEAN SEA LEVEL		DRILLER DAVE BARTLETT
DRILLING METHOD: HOLLOW STEM AUGER		TMG-REP. MAM
SAMPLING METHOD: SPLIT SPOON BY ASTM METHOD D-1586		
CORING METHOD:		

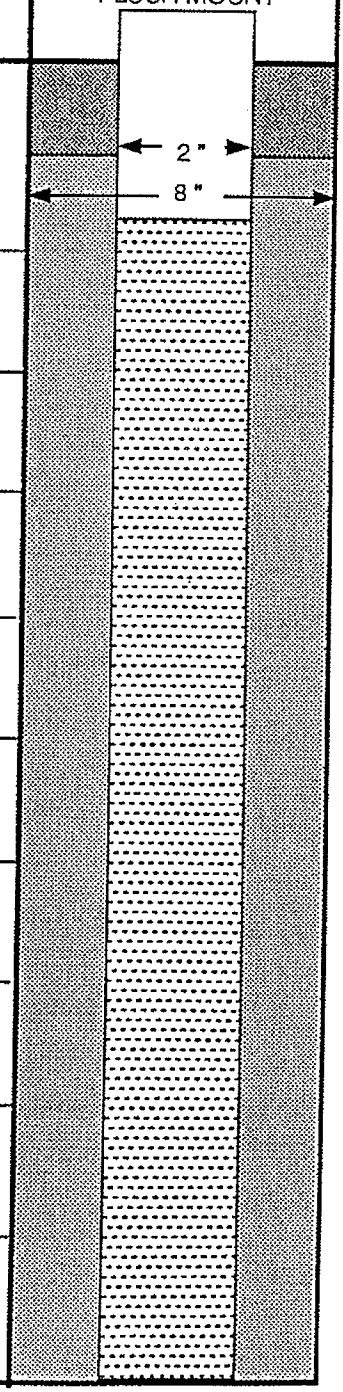
DEPTH FT.	SAMPLE NO.	BLOWS ON SAMPLE SPOON PER 6"	SYMBOL	IDENTIFICATION & REMARKS
1	S-1	4 4 5 3	SP	6" SAND and CINDERS - Black to dark brown; DRY; NO ODOR
2				
3	S-2	2 2 6 4	SC	SAND - Black, medium grained, well sorted; clayey; SATURATED; SOLVENT ODOR
4				
5	S-3	2 2 3 3	SC CL	SAND as above over CLAY - Gray, trace sand, one red brick fragment; stiff; MOIST; ODOR
6				
7	S-4	3 6 7 8	CL SC	CLAY as above over SAND - dark gray, coarse grained (cinders?); occaisional .25" gravel
8				
9	S-5	7 6 9 14	CL GC	CLAY - gray, with < 10% gravel over GRAVEL - gray, sandy, clayey; some >1"
10				
11	S-6	4 3 5 5	GC ML	GRAVEL as above over SILT- gray, firm; SATURATED
12				
13	S-7	1 1 6 6	ML	SILT - gray,uniform; soft to medium firm; rapid dilatancy; SATURATED
14				



13.0-10.0' : 0.01 inch PVC well screen
13.0- 2.5' : 2.5 bags #5 washed silica sand
2.5- 2.0' : bentonite pellet seal
2.0 - 0 ' : cement plug
Well developed by bailing ten well volumes.

T.M. GATES, INC	INVESTIGATIVE BORING & MONITORING WELL INSTALLATION LOG	WELL # MW-15 (OB-2) STATUS: ACTIVE
PROJECT: ASHLAND CHEMICAL, INC. - RENSSELAER, NEW YORK		SHT. NO. 1 OF 2
CLIENT: ASHLAND CHEMICAL, INC.		PROJ. NO. 91-01-034
BORING CONTRACTOR: T.M. GATES, INC.		DATE START 10/13/92
TOP OF CASING ELEVATION: 26.11		DATE FINISH 10/13/92
GROUND ELEVATION: 25.87 DATUM: MEAN SEA LEVEL		DRILLER BG
DRILLING METHOD: 4.25" I.D. HOLLOW STEM AUGER		TMG-REP. TKW
SAMPLING METHOD: SPLIT SPOON BY ASTM METHOD D-1586		
*COMMENT: PUMP TEST OBSERVATION WELL OB-2 WAS FITTED WITH A FLUSH MOUNT AND DESIGNATED MW-15		

DEPTH FT.	SAMPLE NO.	BLOWS ON SAMPLE SPOON PER 6"	SYMBOL	IDENTIFICATION & REMARKS
1				FILL, NOT SAMPLED
2				
3		3	ML	GREY-BLACK OILY SANDY CLAYEY SILT
4		5		
		2		
5		2		
		2	SW	4 " SAND OVER
6		6		
		4	ML	GREY-BLACK CLAYEY SILT, TRACE SAND AND GRAVEL
7		3		
		19	ML	GREY-BLACK SANDY CLAYEY SILT WITH 6" GREY SILTY CLAY LENS
8		8		
		6		
9		6		
		4	ML	GREY-BLACK SANDY CLAYEY SILT OVER GREY SILTY CLAY, TRACE SAND AND GRAVEL
10		3		
		4	CL	
11		5		
		6	CL	GREY SILTY CLAY, TRACE SAND AND GRAVEL
12		4		
		4		
13		4		
		1	ML	GREY CLAYEY SILT, LOOSE TO MEDIUM
14		1		
		1		
15		1		
		1	ML	GREY CLAYEY SILT, LOOSE TO MEDIUM
16		1		
		1		
17		1		
		1	ML	GREY CLAYEY SILT, LOOSE TO MEDIUM
18		1		
		2		
19		2		
		5	ML	GREY SANDY CLAYEY SILT, TRACE GRAVEL
20		6		
		5		
21		6		
		6		



T.M. GATES, INC.	INVESTIGATIVE BORING & MONITORING WELL INSTALLATION LOG	MW-15 (FORMERLY OB-2)
PROJECT: ASHLAND CHEMICAL, INC. - RENSSELAER, NEW YORK		SHT. NO. 2 OF 2
CLIENT: ASHLAND CHEMICAL, INC.		PROJ. NO. 91-01-034

DEPTH FT.	SAMPLE NO.	BLOWS ON SAMPLE SPOON PER 6"	SYMBOL	IDENTIFICATION & REMARKS
22		7		
		11	ML	GREY SANDY CLAYEY SILT, TRACE GRAVEL
23		14		
		9		
24		9	CL	GREY SANDY SILTY CLAY
		50		
25		-		
		50		
26		-		BEDROCK (SHALE AND LIMESTONE), NO SAMPLE
		-		
27				
28				
29				END OF BORING
30				
31				WELL INSTALLATION
32				
33				2" PVC .01 SLOT SCREEN: 27.5'-2.5'
34				2" PVC RISER: 2.5'-1' ABOVE
35				CLEAN SILICA SAND: 27.5'-1.5'
36				BENTONITE SEAL: 1.5'-SURFACE
37				
38				
39				
40				
41				
42				
43				
44				
45				

Boring Log: MW-16

Project: Ashland Distribution Co.

Project No.: 462690

Location: Rensselaer, NY

Geologist: David P. Bouchard

Completion Date: May 16, 2001

Surface Elevation (ft. MSL): Not determined

Total Depth (ft. bgs): 34

TOC Elevation (ft. MSL): Not determined

Borehole Diameter (in.) 2.0 Probe/8.25 HSA

ESC

Sample Data				SUBSURFACE PROFILE		
Depth	Sample Interval	% Recovery	PID (ppm)	Symbol	Description	Well Construction
0					Ground Surface	
1	1	75	40.2		*Sand with Gravel (SP)* Brown fine-grained sand, some gravel, little silt; loose; dry.	
2					*Sand (SP)* Dark brown to black fine-grained sand, little gravel, little silt, trace brick, glass; loose; dry.	
3	2	50	29.6		*Silt (ML)* Brown to dark brown silt, little fine to medium-grained sand, little gravel, trace brick, wood; loose to medium dense; dry.	
4						
5	3	0	NA			
6					*Silt with Gravel (ML)* Dark grey to black silt and gravel, little clay; loose; moist; oily appearance.	
7	4	100	120.2		*Sand with Gravel (SP)* Brown fine-grained sand, some gravel, little wood debris; loose; dry.	
8					*Silt (ML)* Reddish-brown silt, little to some gravel, little to some clay; medium dense to dense; dry.	
9	5	0	NA			
10						
11	6	75	67.4		*Silty Clay (CH)* Greyish-brown silty clay, trace gravel between 12.0 and 13.2 feet; soft, plastic; moist.	
12						
13	7	100	60.4		*Silt with Gravel (ML)* Brown silt and gravel, little clay; loose to medium dense; wet becoming moist between 13.8 and 14.25 feet.	
14						
15	8	75	64.2		*Silty Clay (CH)* Grey silty clay; soft, plastic, sticky; moist.	
16						
17	9	75	60.4			
18						
19	10	50	47.9		*Clay (CH)* Grey clay; medium stiff, sticky; moist.	
20						
21	11	50	65.9			
22					*Silt (ML)* Grey silt, little clay; medium dense; wet (slow dilatancy).	
23	12	75	56.4		*Silt with Gravel (ML)* Grey silt and gravel, little to some clay; loose (soft, sticky) becoming medium dense between 23.6 and 24.0; moist to wet.	
24						
25						

Subcontractor: Parratt Wolff, Inc.

Driller/Operator: Ian Grassy

Method: 2-inch Probe/4.25-inch HSA

Boring Log: MW-16

Project: Ashland Distribution Co.

Project No.: 462690

Location: Rensselaer, NY

Geologist: David P. Bouchard

Completion Date: May 16, 2001

Surface Elevation (ft. MSL): Not determined

Total Depth (ft. bgs): 34

TOC Elevation (ft. MSL): Not determined

Borehole Diameter (in.) 2.0 Probe/8.25 HSA

ESC

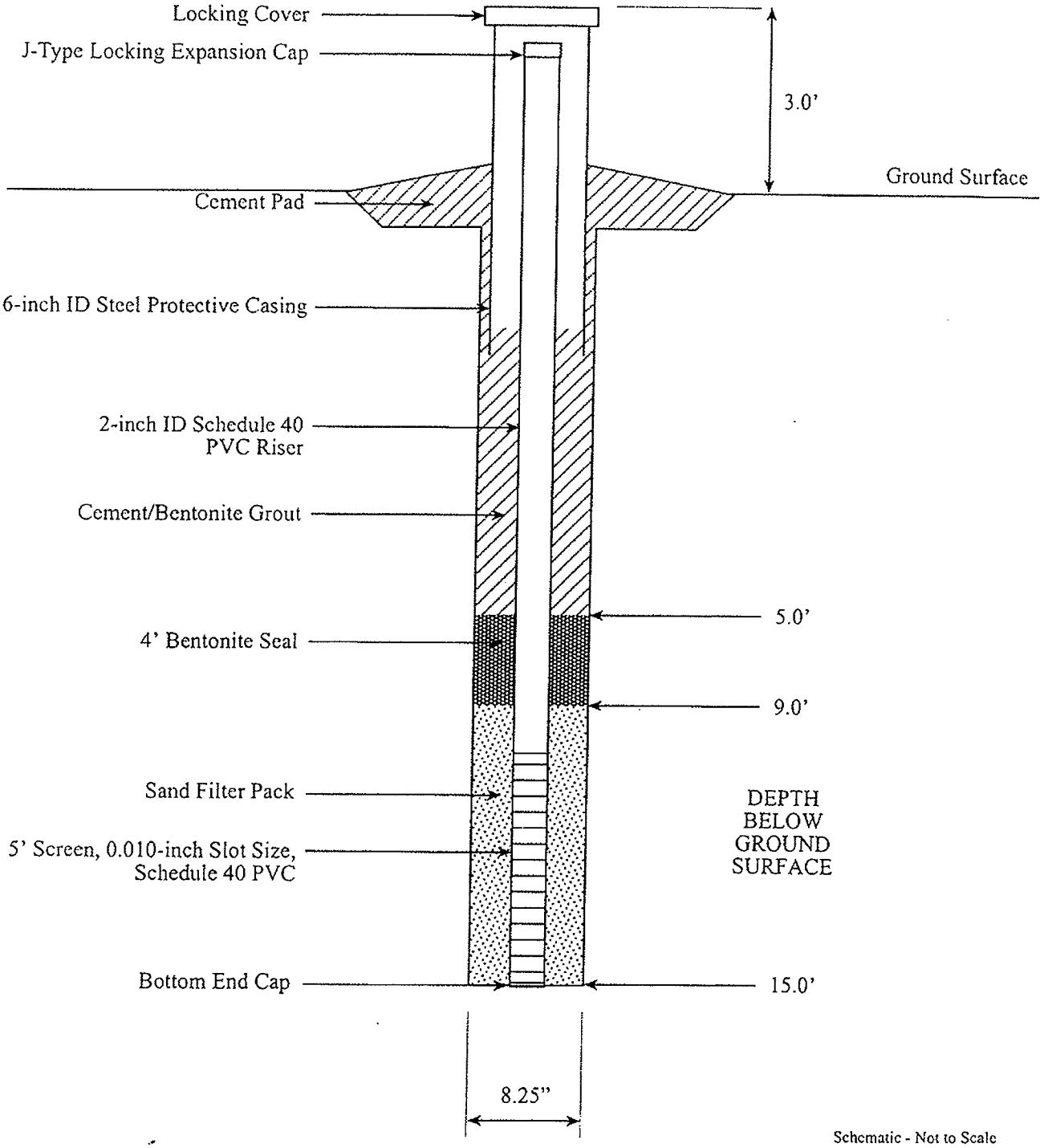
Sample Data				SUBSURFACE PROFILE		
Depth	Sample Interval	% Recovery	PID (ppm)	Symbol	Description	Well Construction
26	13	75	28.2		*Sand (SP)* Grey fine-grained sand; dense to very dense; moist to wet (slow dilatancy).	
27	14	75	54.6			
28					*Sandy Silt (ML)* Grey fine-grained sandy silt; medium dense; moist to wet (slow dilatancy).	
29	15	50	64.4		*Sand (SP)* Grey fine-grained sand interbedded with thin (less than 1-inch-thick) bands of grey fine-grained sandy silt and grey medium-grained sand; medium dense to dense; moist.	
30						
31	16	50	0.0			
32						
33	17	75	69.6		*Silt with Gravel (ML)* Grey silt and gravel, little fine to medium-grained sand; medium dense to dense becoming very dense between 32.5 and 34 feet; moist to wet (slow dilatancy).	
34					Boring Terminated	
35						
36						
37						
38						
39						
40						
41						
42						
43						
44						
45						
46						
47						
48						
49						
50						

Subcontractor: Parratt Wolff, Inc.

Driller/Operator: Ian Grassy

Method: 2-inch Probe/4.25-inch HSA

Site Name: Ashland Distribution Co.
Location: Rensselaer, New York
Date: May 16, 2001



Schematic - Not to Scale

ESC
ENVIRONMENTAL STRATEGIES CORPORATION
11911 Freedom Drive Suite 900
Reston, Virginia 22090
703-709-6500

As-Built Diagram for Monitoring Well MW-16
Ashland Distribution Company.
Rensselaer, New York

Boring Log: MW-17

Project: Ashland Distribution Co.

Project No.: 462690

Location: Rensselaer, NY

Geologist: David P. Bouchard

Completion Date: May 17, 2001

Surface Elevation (ft. MSL): Not determined

Total Depth (ft. bgs): 27.8

TOC Elevation (ft. MSL): Not determined

Borehole Diameter (in.) 2.0 Probe/8.25 HSA

ESC

Sample Data				SUBSURFACE PROFILE		
Depth	Sample Interval	% Recovery	PID (ppm)	Symbol	Description	Well Construction
0					Ground Surface	
1	1	50	3.8		*Silt with Gravel (ML)* Dark brown to black silt, trace to some gravel, trace brick, wood, glass; medium dense to dense; dry.	
2						
3	2	100	3.6		*Silty Sand (SP)* Greenish-grey fine-grained sand and silt; medium dense; dry.	
4						
5	3	25	0.0		*Silty Clay (CH)* Greyish-brown silty clay, trace gravel; very stiff to hard; dry.	
6						
7	4	50	0.0			
8						
9	5	75	0.0		*Silty Clay (CH)* Reddish-brown silty clay trace to little fine to medium-grained sand, trace to little gravel; stiff to hard, non-plastic becoming plastic between 9.8 and 12.0 feet; dry.	
10						
11	6	25	0.0			
12						
13	7	100	81.6		*Silty Clay (CH)* Greyish-brown silty clay; stiff, dry.	
14					*Silt with Gravel (ML)* Greyish-brown silt and gravel, little clay; medium dense; dry.	
15	8	0	NA		*Clay (CH)* Greyish-brown clay, little silt; soft; moist.	
16						
17	9	100	86.7		*Silt with Gravel (ML)* Brown silt and gravel, little clay; loose; wet.	
18					*Clay (CH)* Grey clay; soft, sticky; moist becoming wet between 18.5 and 18.9 feet.	
19	10	75	0.0			
20						
21	11	50	65.9		*Silt with Gravel (ML)* Grey silt and gravel, little clay; dense to very dense; moist.	
22						
23	12	100	0.2		*Silty Clay (CH)* Grey silty clay; soft, sticky; wet.	
24					*Silt with Gravel (ML)* Grey silt and gravel, little clay; loose; wet.	
25					*Sand (SP)* Grey fine-grained sand, little silt; very dense; wet (slow dilatancy)	

Subcontractor: Parratt Wolff, Inc.

Method: 2-inch Probe/4.25-inch HSA

Driller/Operator: Ian Grassy

Boring Log: MW-17

Project: Ashland Distribution Co.

Project No.: 462690

Location: Rensselaer, NY

Geologist: David P. Bouchard

Completion Date: May 17, 2001

Surface Elevation (ft. MSL): Not determined

Total Depth (ft. bgs): 27.8

TOC Elevation (ft. MSL): Not determined

Borehole Diameter (in.) 2.0 Probe/8.25 HSA

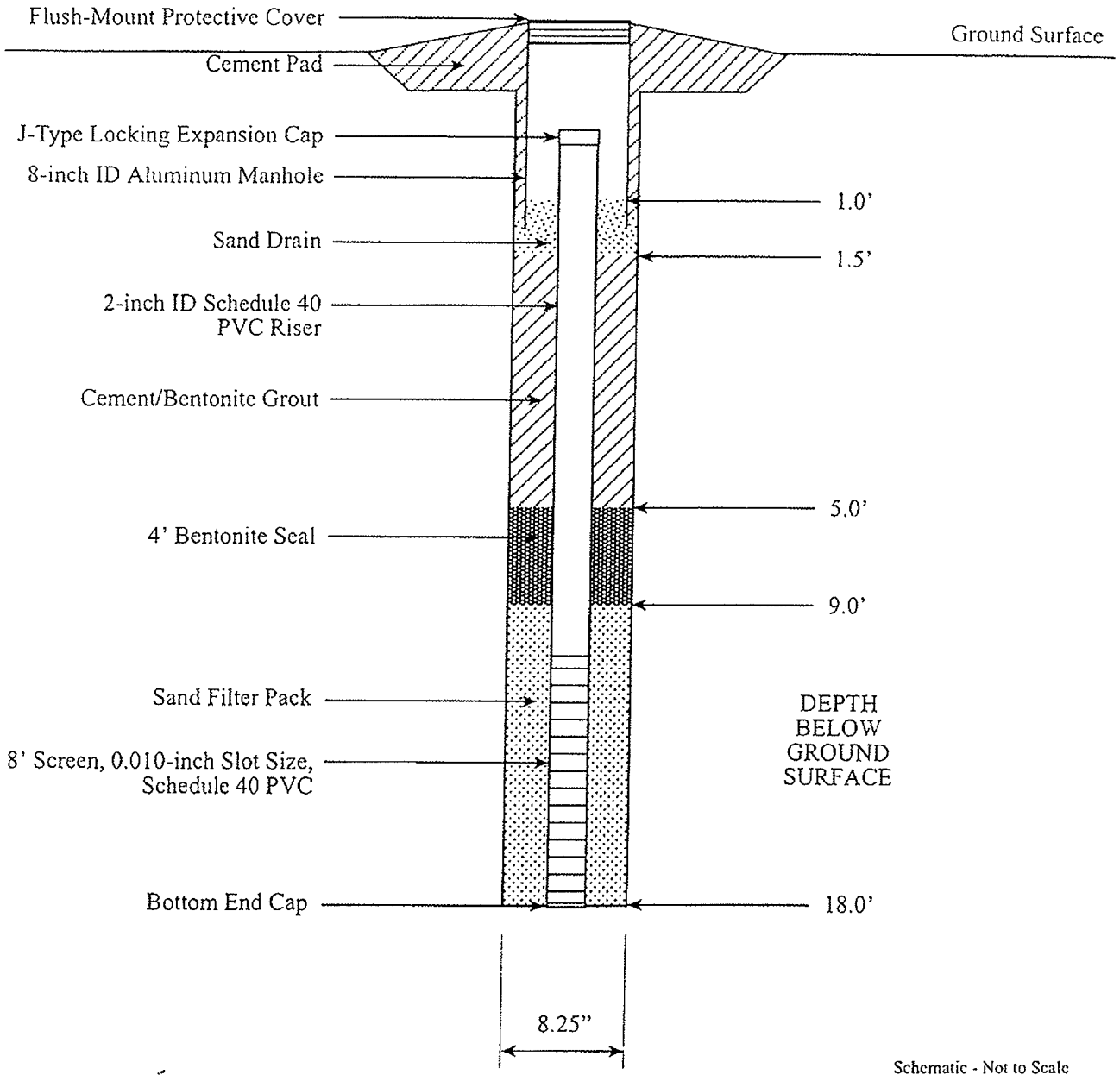
Sample Data				SUBSURFACE PROFILE		
Depth	Sample Interval	% Recovery	PID (ppm)	Symbol	Description	Well Construction
26	13	75	0.0			
27	14	100	0.0		*Sand with Gravel (SP)* Dark grey fine-grained sand and gravel, some silt; very dense; dry.	
28					Boring Terminated	
29						
30						
31						
32						
33						
34						
35						
36						
37						
38						
39						
40						
41						
42						
43						
44						
45						
46						
47						
48						
49						
50						

Subcontractor: Parratt Wolff, Inc.

Driller/Operator: Ian Grassy

Method: 2-inch Probe/4.25-inch HSA

Site Name: Ashland Distribution Co.
Location: Rensselaer, New York
Date: May 17, 2001



Schematic - Not to Scale

ESC
ENVIRONMENTAL STRATEGIES CORPORATION
11911 Freedom Drive Suite 900
Reston, Virginia 22090
703-709-6500

As-Built Diagram for Monitoring Well MW-17
Ashland Distribution Company.
Rensselaer, New York

Boring Log: MW-18

Project: Ashland Distribution Co.

Project No.: 462690

Location: Rensselaer, NY

Geologist: David P. Bouchard

Completion Date: May 16, 2001

Surface Elevation (ft. MSL): Not determined

Total Depth (ft. bgs): 27.7

TOC Elevation (ft. MSL): Not determined

Borehole Diameter (in.) 2.0 Probe/8.25 HSA

ESC

Sample Data				SUBSURFACE PROFILE		
Depth	Sample Interval	% Recovery	PID (ppm)	Symbol	Description	Well Construction
0					Ground Surface	
1	1	75	0.6		*Sand with Gravel (SP)* Dark brown to black medium-grained sand and gravel, little silt, trace brick, glass, cinders; medium dense to dense; dry.	
2						
3	2	75	0.2			
4					*Gravel (GP)* Coarse gravel (ballast); loose; dry.	
5	3	25	0.4		*Silt with Gravel (ML)* Greenish-grey to brown silt, some gravel; medium dense; dry.	
6						
7	4	50	0.4			
8					*Silty Clay (CH)* Greyish-brown silty clay, stiff to very stiff; dry.	
9	5	100	0.0		*Silt with Gravel (ML)* Greyish-black silt, some gravel, little medium-grained sand, little clay; loose; wet.	
10					*Silty Clay (CH)* Reddish-brown to grey silty clay; very stiff, plastic; dry.	
11	6	100	0.0			
12					*Silt (ML)* Greyish-brown silt, little clay, trace gravel; medium dense; dry becoming wet between 13.5 and 14.8 feet.	
13	7	25	0.1			
14						
15	8	100	0.0		*Silty Clay (CH)* Grey silty clay; soft, sticky; moist to wet.	
16					*Silt (ML)* Grey silt, little clay; dense; moist.	
17	9	75	0.0		*Silt with Gravel (ML)* Dark grey silt and gravel, trace coarse-grained sand; medium dense; moist.	
18					*Sand (SP)* Grey fine-grained sand; dense; moist.	
19	10	100	0.0		*Silt with Gravel (ML)* Grey silt and gravel, little clay; loose; wet.	
20					*Sand (SP)* Grey fine-grained sand; dense; wet (slow dilatancy).	
21	11	50	0.0			
22						
23	12	0	NA		*Sand with Gravel (SP)* Grey medium-grained sand and gravel, little silt; loose; wet.	
24						
25						

Subcontractor: Parratt Wolff, Inc.

Driller/Operator: Ian Grassy

Method: 2-inch Probe/4.25-inch HSA

Boring Log: MW-18

Project: Ashland Distribution Co.

Project No.: 462690

Location: Rensselaer, NY

Geologist: David P. Bouchard

Completion Date: May 16, 2001

Surface Elevation (ft. MSL): Not determined

Total Depth (ft. bgs): 27.7

TOC Elevation (ft. MSL): Not determined

Borehole Diameter (in.) 2.0 Probe/8.25 HSA

ESC

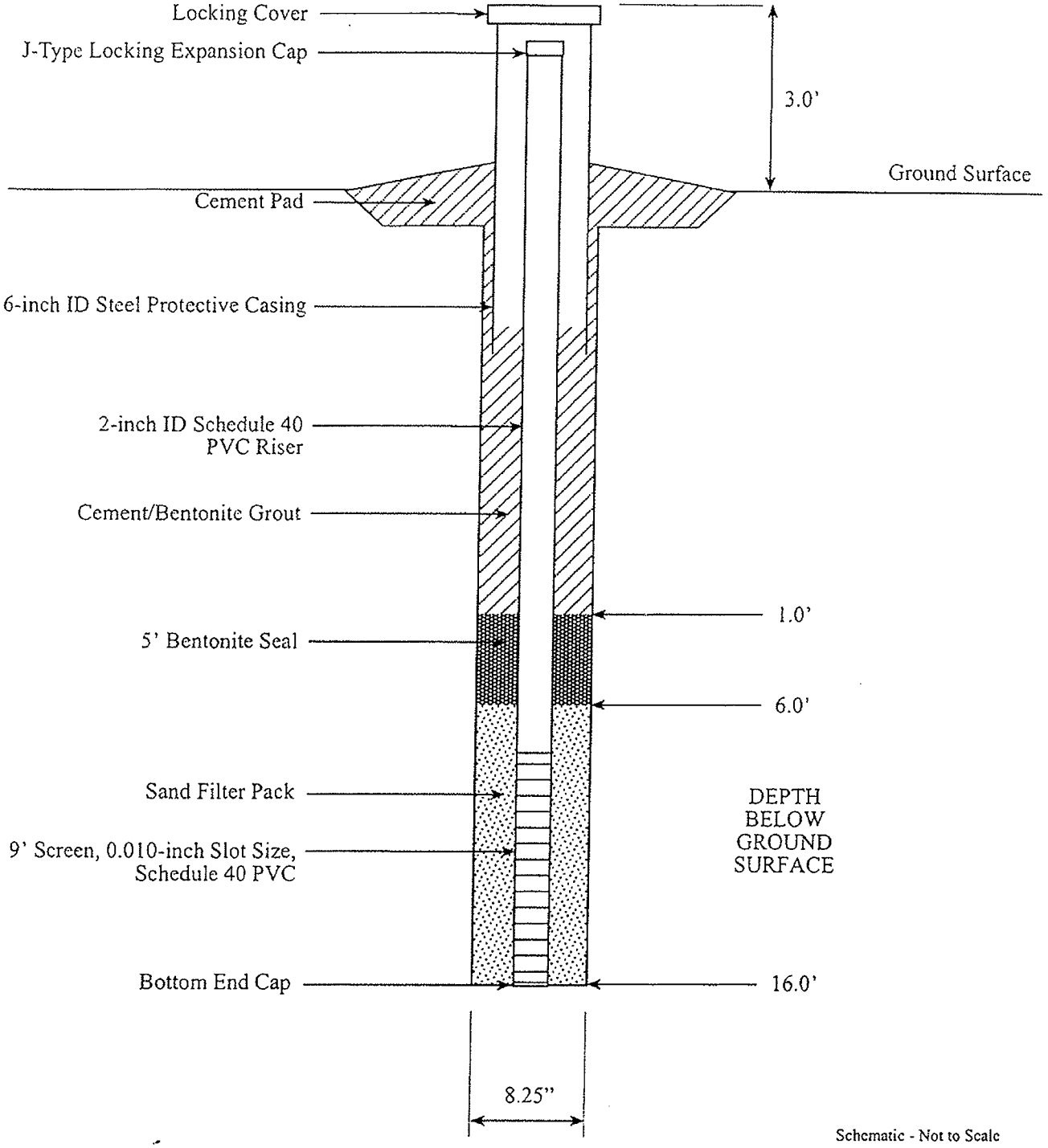
Sample Data				SUBSURFACE PROFILE		
Depth	Sample Interval	% Recovery	PID (ppm)	Symbol	Description	Well Construction
26	13	75	0.0			
27	14	100	0.0		*Sand (SP)* Dark grey fine-grained sand: dense; moist.	
28					*Sand (SP)* Grey medium-grained sand, trace gravel: dense to very dense; moist; faint odor.	
29					Boring Terminated	
30						
31						
32						
33						
34						
35						
36						
37						
38						
39						
40						
41						
42						
43						
44						
45						
46						
47						
48						
49						
50						

Subcontractor: Parratt Wolff, Inc.

Driller/Operator: Ian Grassy

Method: 2-inch Probe/4.25-inch HSA

Site Name: Ashland Distribution Co.
Location: Rensselaer, New York
Date: May 16, 2001



Schematic - Not to Scale

ENVIRONMENTAL STRATEGIES CORPORATION
11911 Freedom Drive Suite 900
Reston, Virginia 22090
703-709-6500

As-Built Diagram for Monitoring Well MW-18
Ashland Distribution Company.
Rensselaer, New York

Boring Log: MW-19

Project: Ashland Distribution Co.

Project No.: 462690

Location: Rensselaer, NY

Geologist: David P. Bouchard

Completion Date: May 14, 2001

Surface Elevation (ft. MSL): Not determined

Total Depth (ft. bgs): 18

TOC Elevation (ft. MSL): Not determined

Borehole Diameter (in.) 2.0 Probe/12.25 HSA

ESC

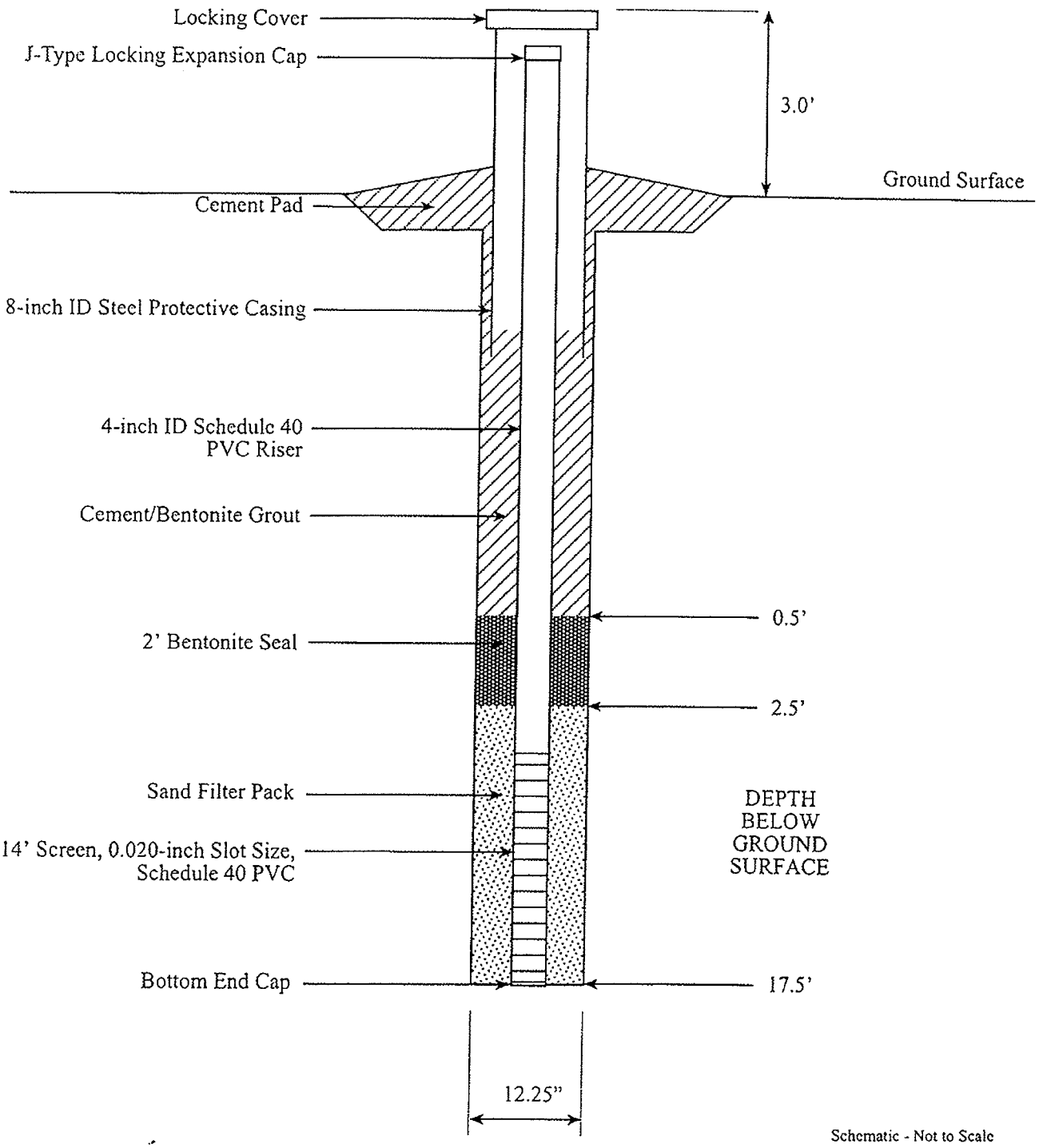
Sample Data				SUBSURFACE PROFILE		
Depth	Sample Interval	% Recovery	PID (ppm)	Symbol	Description	Well Construction
0					Ground Surface	
1	1	25	0.0		*Gravel (GP)* Coarse gravel; loose; dry.	
2						
3	2	75	66.2		*Sand with Gravel (SP)* Dark grey to black coarse-grained sand and gravel; loose; wet; strong odor.	
4					*Silty Clay (CH)* Grey to greyish-black silty clay; stiff to very stiff; moist; moderate odor.	
5	3	25	35.6		*Sand (SP)* Dark grey to black fine to medium-grained sand, trace silt; moist to wet; moderate odor.	
6					*Silty Clay (CH)* Grey to greyish-black silty clay; stiff to very stiff; moist; moderate odor.	
7					*Sand with Gravel (SP)* Dark grey to black coarse-grained sand and gravel, little silty clay (in discrete clumps); loose; wet; moderate to strong odor.	
8						
9						
10						
11						
12					*Not Logged* See EB-19.	
13						
14						
15						
16						
17						
18					Boring Terminated	
19						
20						
21						
22						
23						
24						
25						

Subcontractor: Parratt Wolff, Inc.

Driller/Operator: Ian Grassy

Method: 2-inch Probe/8.25-inch HSA

Site Name: Ashland Distribution Co.
Location: Rensselaer, New York
Date: May 15, 2001



Schematic - Not to Scale

ESC
ENVIRONMENTAL STRATEGIES CORPORATION
11911 Freedom Drive Suite 900
Reston, Virginia 22090
703-709-6500

As-Built Diagram for Monitoring Well MW-19
Ashland Distribution Company.
Rensselaer, New York

Boring Log: PZ-1

Project: Ashland Distribution Co.

Project No.: 462690

Location: Rensselaer, NY

Geologist: David P. Bouchard

Completion Date: May 15, 2001

Surface Elevation (ft. MSL): Not determined

Total Depth (ft. bgs): 18

TOC Elevation (ft. MSL): Not determined

Borehole Diameter (in.) 2.0 Probe/8.25 HSA

ESC

Sample Data				SUBSURFACE PROFILE		
Depth	Sample Interval	% Recovery	PID (ppm)	Symbol	Description	Well Construction
0					Ground Surface	
1	1	25	2.4		*Silt with Gravel (ML)* Greyish-brown silt, some gravel, trace to little fine to medium-grained sand; medium dense; dry.	
2						
3	2	25	97.4			
4						
5	3	25	44.5		*Sand with Gravel (SP)* Greyish-black medium to coarse-grained sand and gravel, trace to little silt; loose; wet; strong odor, sheen visible, brown oily substance coating some grains.	
6						
7	4	0	NA			
8						
9	5	50	40.5			
10					*Silt with Gravel (ML)* Greyish-black silt, little medium-grained sand, some coarse gravel; loose; wet; strong odor, sheen visible.	
11	6	50	47.0			
12					*Silt with Gravel (ML)* Greyish-brown silt, little medium-grained sand, some coarse gravel, trace fine to coarse-grained sand, trace to little clay nodules; medium dense; wet; moderate odor, sheen visible.	
13	7	100	18.6			
14					*Silt with Gravel (ML)* Reddish-brown silt, some gravel, little clay; dense to very dense; dry.	
15	8	100	30.4			
16					*Silty Clay (CH)* Greyish-black silty clay, trace gravel; stiff, plastic; moist.	
17	9	100	40.6		*Clay (CH)* Greyish-black clay, little silt; very stiff, plastic; moist.	
18					Boring Terminated	
19						
20						
21						
22						
23						
24						
25						

Subcontractor: Parratt Wolff, Inc.

Driller/Operator: Ian Grassy

Method: 2-inch Probe/4.25-inch HSA

Boring Log: PZ-2

Project: Ashland Distribution Co.

Project No.: 462690

Location: Rensselaer, NY

Geologist: David P. Bouchard

Completion Date: May 15, 2001

Surface Elevation (ft. MSL): Not determined

Total Depth (ft. bgs): 16

TOC Elevation (ft. MSL): Not determined

Borehole Diameter (in.) 2.0 Probe/8.25 HSA

ESC

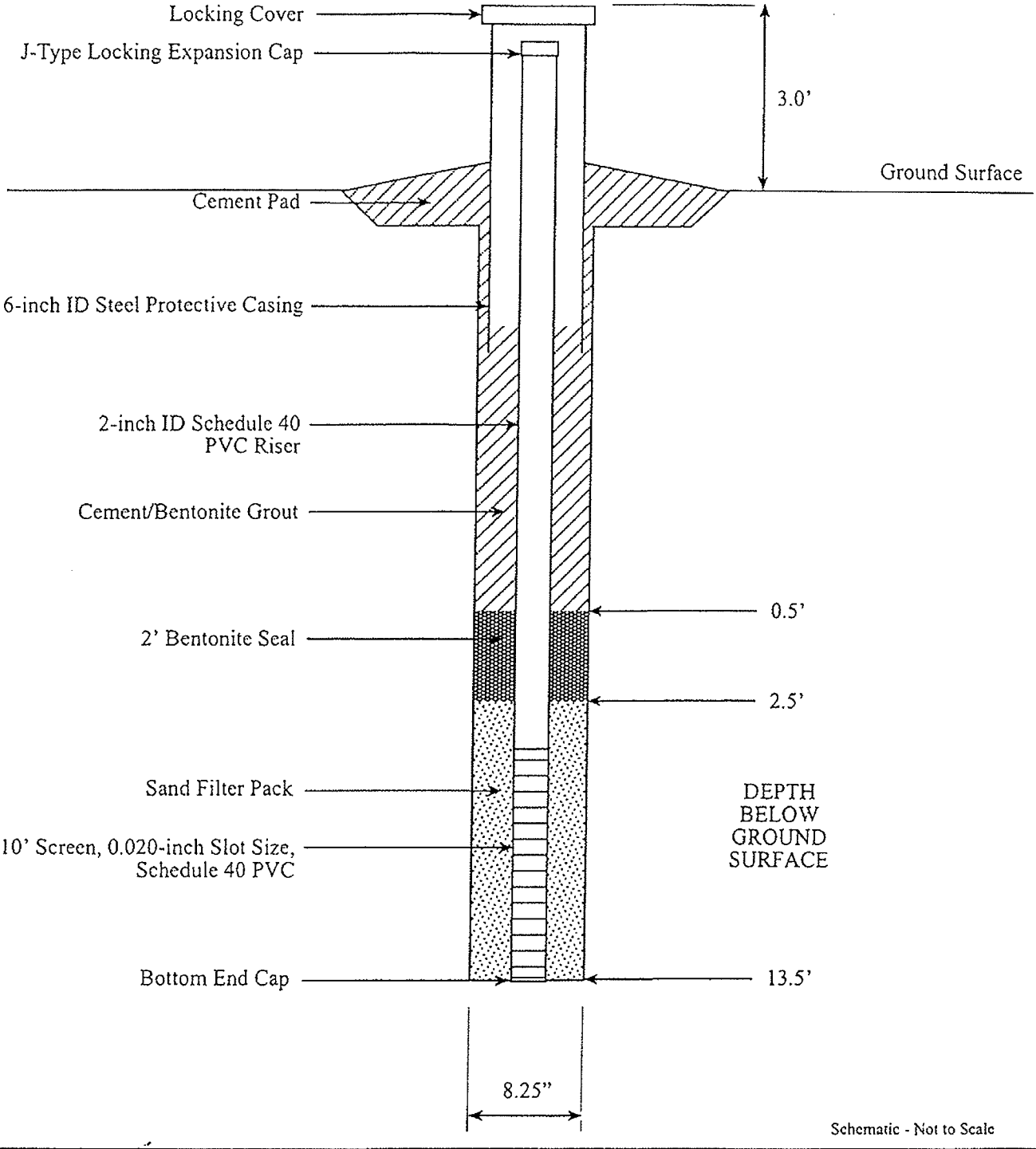
Sample Data				SUBSURFACE PROFILE		
Depth	Sample Interval	% Recovery	PID (ppm)	Symbol	Description	Well Construction
0					Ground Surface	
1	1	25	0.9		*Silt with Sand (ML)* Dark brown silt, little fine to medium-grained sand, trace gravel, trace wood, brick; medium dense; dry.	
2						
3	2	25	3.5			
4						
5	3	50	0.1		*Sand with Gravel (SP)* Dark grey to black coarse-grained sand and gravel, little silt; loose; wet; faint odor.	
6						
7	4	0	NA		*Silty Clay (CH)* Greyish-brown to black silty clay; medium stiff, plastic, sticky; moist.	
8						
9	5	50	1.8			
10					*Silt with Sand (ML)* Greyish-black silt, little fine to medium-grained sand, little gravel; medium dense; moist to wet.	
11	6	50	5.3			
12					*Silt (ML)* Reddish-brown silt, little to some clay, trace fine-grained sand, trace gravel; medium dense to dense; moist.	
13	7	50	3.4			
14					*Silty Clay (CH)* Reddish-brown to greyish-brown silty clay; medium stiff to stiff becoming very stiff at 15.8 feet, plastic; moist.	
15	8	75	2.8			
16					Boring Terminated	
17						
18						
19						
20						
21						
22						
23						
24						
25						

Subcontractor: Parratt Wolff, Inc.

Driller/Operator: Ian Grassy

Method: 2-inch Probe/4.25-inch HSA

Site Name: Ashland Distribution Co.
Location: Rensselaer, New York
Date: May 15, 2001



Schematic - Not to Scale

ESC
ENVIRONMENTAL STRATEGIES CORPORATION
11911 Freedom Drive Suite 900
Reston, Virginia 22090
703-709-6500

As-Built Diagram for Monitoring Well PZ-2
Ashland Distribution Company.
Rensselaer, New York

Boring Log: PZ-3

Project: Ashland Distribution Co.

Project No.: 462690

Location: Rensselaer, NY

Geologist: David P. Bouchard

Completion Date: May 15, 2001

Surface Elevation (ft. MSL): Not determined

Total Depth (ft. bgs): 22

TOC Elevation (ft. MSL): Not determined

Borehole Diameter (in.) 2.0 Probe/8.25 HSA

ESC

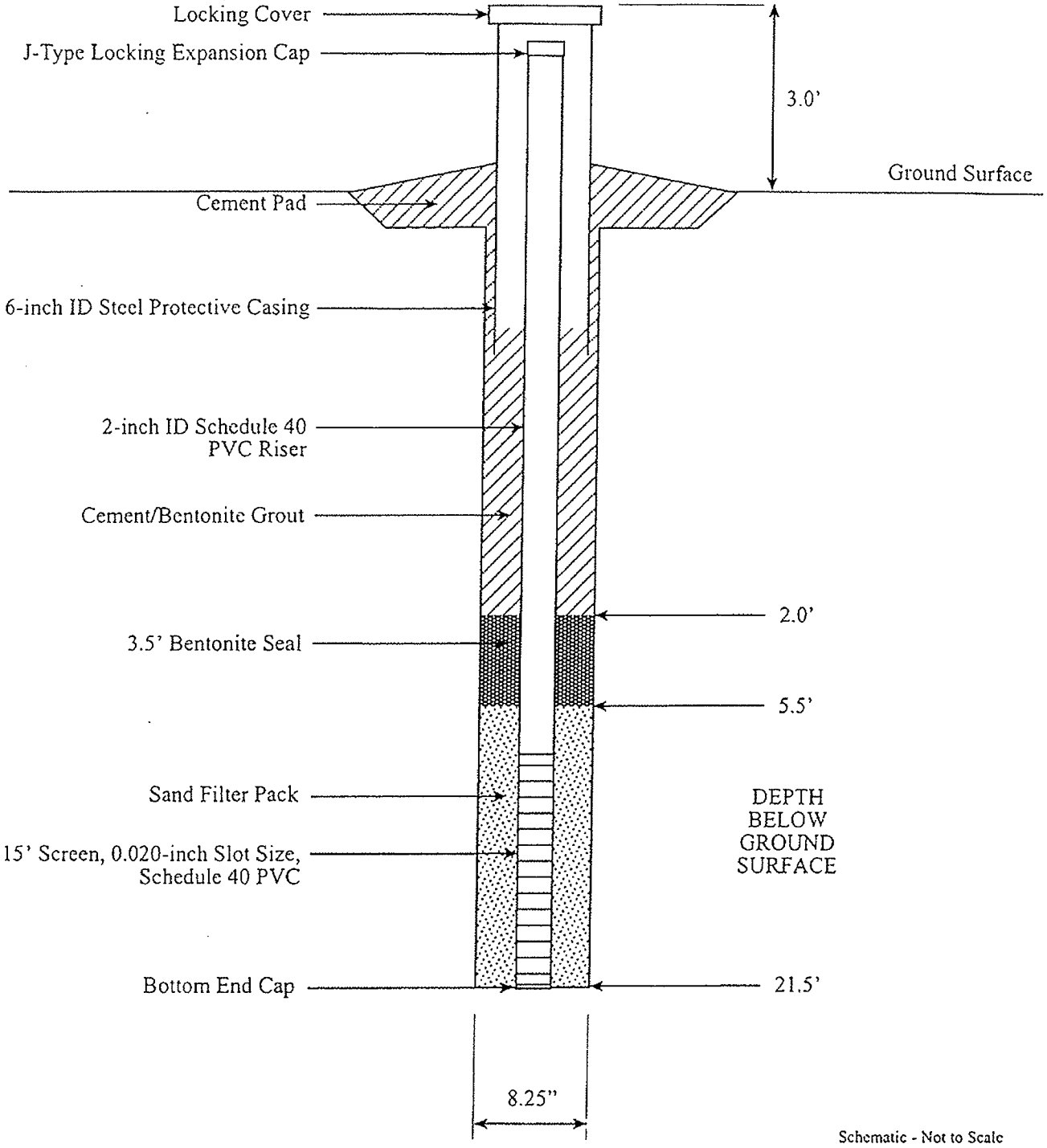
Sample Data				SUBSURFACE PROFILE		
Depth	Sample Interval	% Recovery	PID (ppm)	Symbol	Description	Well Construction
0					Ground Surface	
1	1	25	0.2		*Silt with Gravel (ML)* Brown to greyish-brown silt, some coarse gravel; dense; dry.	
2						
3	2	75	0.1			
4					*Sand with Gravel (SP)* Black fine to medium-grained sand and gravel, trace brick, glass, wood; medium dense to very dense; moist.	
5	3	0	NA			
6						
7	4	50	0.0		*Clay (CH)* Greenish-grey clay, trace to little silt; stiff, plastic; dry.	
8						
9	5	50	2.4		*Silt with gravel (ML)* Greenish-grey silt and coarse gravel, trace medium to coarse-grained sand; loose; wet.	
10						
11	6	100	5.8		*Silt (ML)* Greenish-grey silt, trace gravel; medium dense; moist.	
12					*Sand with Gravel (SP)* Brown fine to medium-grained sand, some gravel; loose; wet.	
13	7	0	NA		*Sand (SP)* Brown to reddish-brown fine-grained sand, little silt, trace coarse gravel; very dense; moist.	
14						
15	8	50	0.0			
16						
17	9	50	0.2		*Sand with Gravel (SP)* Brown fine to medium-grained sand and gravel; lobse; wet.	
18						
19	10	0	NA			
20						
21	11	100	7.2		*Silty Clay (CH)* Greyish-brown silty clay; stiff to very stiff, plastic; moist.	
22					Boring Terminated	
23						
24						
25						

Subcontractor: Parratt Wolff, Inc.

Driller/Operator: Ian Grassy

Method: 2-inch Probe/4.25-inch HSA

Site Name: Ashland Distribution Co.
Location: Rensselaer, New York
Date: May 15, 2001



Schematic - Not to Scale

ENVIRONMENTAL STRATEGIES CORPORATION
11911 Freedom Drive Suite 900
Reston, Virginia 22090
703-709-6500

As-Built Diagram for Monitoring Well PZ-3
Ashland Distribution Company.
Rensselaer, New York

ARCADIS

Appendix E

Summary of Historical VOC Data in Groundwater

Appendix E. Summary of Historical VOC Data in Groundwater, Revised Draft RFI Report, Ashland Inc., Rensselaer, New York

Location ID: / Date Collected:	NYSDEC TOGS 1.1.1 Water Guidance Values	RW-1 12/22/98	RW-2 09/05/96	RW-7 09/05/96	RW-7 12/22/98	GP-1 06/16/99	GP-2 06/16/99	GP-3 06/16/99	GP-4 06/16/99	GP-5 06/17/99	GP-6 06/17/99	GP-8 06/17/99	GP-9 06/16/99	GP-10 06/17/99	GP-11 06/16/99	GP-12 06/17/99
Volatile Organics																
1,1,1-Trichloroethane	5	50 U	100 U	**740**	50 U	120 U	5.0 U	50 U	**1,700**	5.0 U	200 U	50 U	50 U [50 U]	5.0 U	5.0 U	5.0 U
1,1,2,2-Tetrachloroethane	5	50 U	100 U	500 U	50 U	120 U	5.0 U	50 U	500 U	5.0 U	200 U	50 U	50 U [50 U]	5.0 U	5.0 U	5.0 U
1,1,2-Trichloroethane	1	50 U	100 U	500 U	50 U	120 U	5.0 U	50 U	500 U	5.0 U	200 U	50 U	50 U [50 U]	5.0 U	5.0 U	5.0 U
1,1-Dichloroethane	5	50 U	100 U	500 U	50 U	120 U	5.0 U	50 U	**1,600**	5.0 U	200 U	50 U	50 U [50 U]	5.0 U	5.0 U	5.0 U
1,1-Dichloroethene	5	50 U	100 U	500 U	50 U	120 U	5.0 U	50 U	500 U	5.0 U	200 U	50 U	50 U [50 U]	5.0 U	5.0 U	5.0 U
1,2-Dichloroethane	0.6	50 U	100 U	500 U	50 U	120 U	5.0 U	50 U	500 U	5.0 U	200 U	**1,700**	50 U [50 U]	5.0 U	**7.1**	5.0 U
1,2-Dichloroethene (total)	- -	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,2-Dichloropropane	1	50 U	100 U	500 U	50 U	120 U	5.0 U	50 U	500 U	5.0 U	200 U	50 U	50 U [50 U]	5.0 U	5.0 U	5.0 U
2-Butanone	- -	250 U	500 U	2,500 U	250 U	620 U	25 U	250 U	2,500 U	25 U	1,000 U	250 U	250 U [250 U]	25 U	25 U	25 U
2-Chloroethylvinylether	- -	500 U	1,000 U	5,000 U	500 U	1,200 U	50 U	500 U	5,000 U	50 U	2,000 U	500 U	500 U [500 U]	50 U	50 U	50 U
2-Hexanone	50	250 U	500 U	2,500 U	250 U	620 U	25 U	250 U	2,500 U	25 U	1,000 U	250 U	250 U [250 U]	25 U	25 U	25 U
4-Methyl-2-pentanone	- -	250 U	500 U	2,500 U	250 U	620 U	25 U	250 U	2,500 U	25 U	1,000 U	250 U	250 U [250 U]	25 U	25 U	25 U
Acetone	50	500 U	1,000 U	5,000 U	500 U	1,200 U	50 U	500 U	5,000 U	50 U	2,000 U	500 U	500 U [500 U]	50 U	50 U	50 U
Benzene	1	50 U	**560**	500 U	50 U	120 U	5.0 U	50 U	500 U	5.0 U	200 U	50 U	50 U [50 U]	5.0 U	5.0 U	5.0 U
Bromodichloromethane	50	50 U	100 U	500 U	50 U	120 U	5.0 U	50 U	500 U	5.0 U	200 U	50 U	50 U [50 U]	5.0 U	5.0 U	5.0 U
Bromoform	50	50 U	100 U	500 U	50 U	120 U	5.0 U	50 U	500 U	5.0 U	200 U	50 U	50 U [50 U]	5.0 U	5.0 U	5.0 U
Bromomethane	5	100 U	200 U	1,000 U	100 U	250 U	10 U	100 U	1,000 U	10 U	400 U	100 U	100 U [100 U]	10 U	10 U	10 U
Carbon Disulfide	- -	50 U	100 U	500 U	50 U	120 U	5.0 U	50 U	500 U	5.0 U	200 U	50 U	50 U [50 U]	5.0 U	5.0 U	5.0 U
Carbon Tetrachloride	5	50 U	100 U	500 U	50 U	120 U	5.0 U	50 U	500 U	5.0 U	200 U	**51**	50 U [50 U]	5.0 U	5.0 U	5.0 U
Chlorobenzene	5	50 U	100 U	500 U	50 U	120 U	5.0 U	50 U	500 U	5.0 U	200 U	50 U	50 U [50 U]	5.0 U	5.0 U	5.0 U
Chloroethane	5	100 U	200 U	1,000 U	100 U	250 U	10 U	100 U	1,000 U	10 U	400 U	100 U	100 U [100 U]	10 U	10 U	10 U
Chloroform	7	50 U	100 U	500 U	50 U	120 U	**11**	50 U	500 U	5.0 U	200 U	50 U	50 U [50 U]	5.0 U	5.0 U	5.0 U
Chloromethane	- -	100 U	200 U	1,000 U	100 U	250 U	10 U	100 U	1,000 U	10 U	400 U	100 U	100 U [100 U]	10 U	10 U	10 U
cis-1,2-Dichloroethene	5	**840**	**510**	**14,000**	**1,200**	**3,100**	5.0 U	**1,500**	**19,000**	5.0 U	**3,300**	**880**	**1,000 [990]**	5.0 U	**35**	5.0 U
cis-1,3-Dichloropropene	0.4	50 U	100 U	500 U	50 U	120 U	5.0 U	50 U	500 U	5.0 U	200 U	50 U	50 U [50 U]	5.0 U	5.0 U	5.0 U
Dibromochloromethane	50	50 U	100 U	500 U	50 U	120 U	5.0 U	50 U	500 U	5.0 U	200 U	50 U	50 U [50 U]	5.0 U	5.0 U	5.0 U
Ethylbenzene	5	50 U	**460**	500 U	50 U	120 U	5.0 U	50 U	**560**	5.0 U	200 U	50 U	50 U [50 U]	5.0 U	5.0 U	5.0 U
Methylene Chloride	5	50 U	100 U	500 U	50 U	120 U	5.0 U	50 U	500 U	5.0 U	200 U	50 U	50 U [50 U]	5.0 U	5.0 U	5.0 U
Naphthalene	10	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Styrene	5	50 U	100 U	500 U	50 U	120 U	5.0 U	50 U	500 U	5.0 U	200 U	50 U	50 U [50 U]	5.0 U	5.0 U	5.0 U
Tetrachloroethene	5	50 U	100 U	500 U	50 U	120 U	**87**	**1,200**	**40,000 *F**	5.0 U	200 U	50 U	50 U [50 U]	5.0 U	5.0 U	5.0 U
Toluene	5	50 U	**2,900**	500 U	50 U	120 U	5.0 U	50 U	**730**	5.0 U	200 U	50 U	50 U [50 U]	5.0 U	5.0 U	5.0 U
trans-1,2-Dichloroethene	5	50 U	100 U	500 U	50 U	120 U	5.0 U	50 U	500 U	5.0 U	200 U	50 U	**84 [100]**	5.0 U	5.0 U	5.0 U
trans-1,3-Dichloropropene	0.4	50 U	100 U	500 U	50 U	120 U	5.0 U	50 U	500 U	5.0 U	200 U	50 U	50 U [50 U]	5.0 U	5.0 U	5.0 U
Trichloroethene	5	50 U	100 U	**1,600**	50 U	120 U	**12**	**560**	**5,400**	5.0 U	**410**	50 U	**1,200 [980]**	5.0 U	5.0 U	5.0 U
Vinyl Acetate	- -	100 U	200 U	1,000 U	100 U	250 U	10 U	100 U	1,000 U	10 U	400 U	100 U	100 U [100 U]	10 U	10 U	10 U
Vinyl Chloride	2	**180**	200 U	**2,100**	**570**	**430**	10 U	**520**	1,000 U	10 U	400 U	**480**	**490 [440]**	10 U	**42**	10 U
Xylenes (total)	5	50 U	**3,800**	500 U	50 U	250 U	10 U	100 U	**2,100**	10 U	400 U	100 U	100 U [100 U]	10 U	10 U	10 U
Total VOCs	- -	**1,000**	**8,200**	**18,000**	**1,800**	**3,500**	**110**	**3,800**	**71,000**	ND	**3,700**	**3,100**	**2,800 [2,500]**	ND	**84**	ND

See Notes on Page 31.

Appendix E. Summary of Historical VOC Data in Groundwater, Revised Draft RFI Report, Ashland Inc., Rensselaer, New York

Location ID: / Date Collected:	NYSDEC TOGS 1.1.1 Water Guidance Values	GP-13 03/13/00	GP-14 03/13/00	GP-15 03/13/00	GP-16 03/13/00	GP-17 03/13/00	GP-18 03/13/00	GP-19A 03/13/00	GP-19B 03/13/00	GP-19C 03/16/00	GP-20 03/16/00	GP-21 03/16/00	GP-22 03/13/00	GP-23 03/13/00	GP-24 03/13/00	GP-25 03/13/00
Volatile Organics																
1,1,1-Trichloroethane	5	ND	ND	ND	ND	ND	ND	**550 [590]**	ND	NA	NA	NA	ND	ND	ND	ND
1,1,2,2-Tetrachloroethane	5	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,1,2-Trichloroethane	1	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,1-Dichloroethane	5	ND	ND	ND	ND	**21**	ND	**550 [560]**	ND	**12**	ND	ND	ND	ND	ND	ND
1,1-Dichloroethene	5	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,2-Dichloroethane	0.6	ND	ND	ND	ND	ND	ND	ND [ND]	ND	NA	NA	NA	ND	ND	ND	ND
1,2-Dichloroethene (total)	- -	24	ND	ND	18	ND	3,300	750 [770]	9,800	130	8.0	9.0	ND	ND	ND	ND
1,2-Dichloropropane	1	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
2-Butanone	- -	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
2-Chloroethylvinylether	- -	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
2-Hexanone	50	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
4-Methyl-2-pentanone	- -	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Acetone	50	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Benzene	1	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Bromodichloromethane	50	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Bromoform	50	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Bromomethane	5	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Carbon Disulfide	- -	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Carbon Tetrachloride	5	ND	ND	ND	ND	ND	ND	ND [ND]	ND	NA	NA	NA	ND	ND	ND	ND
Chlorobenzene	5	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Chloroethane	5	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Chloroform	7	ND	ND	ND	ND	ND	ND	ND [ND]	ND	NA	NA	NA	ND	ND	ND	ND
Chloromethane	- -	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
cis-1,2-Dichloroethene	5	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
cis-1,3-Dichloropropene	0.4	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Dibromochloromethane	50	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Ethylbenzene	5	ND	ND	ND	ND	ND	ND	ND [ND]	ND	NA	NA	NA	ND	ND	ND	ND
Methylene Chloride	5	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Naphthalene	10	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Styrene	5	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Tetrachloroethene	5	ND	ND	ND	ND	ND	ND	ND [ND]	ND	**44**	ND	ND	ND	ND	ND	ND
Toluene	5	ND	ND	ND	ND	ND	ND	ND [ND]	ND	NA	NA	NA	**20**	ND	ND	ND
trans-1,2-Dichloroethene	5	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
trans-1,3-Dichloropropene	0.4	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Trichloroethene	5	ND	ND	ND	ND	ND	ND	ND [ND]	ND	NA	NA	NA	ND	ND	ND	ND
Vinyl Acetate	- -	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Vinyl Chloride	2	ND	ND	ND	ND	ND	**380**	**1,800 [2,100]**	**7,000**	**300**	**33**	ND	ND	ND	ND	ND
Xylenes (total)	5	ND	ND	ND	ND	ND	ND	ND [ND]	ND	NA	NA	NA	ND	ND	ND	ND
Total VOCs	- -	**24**	ND	ND	**18**	**21**	**3,700**	**3,700 [4,000]**	**17,000**	**490**	**41**	**9.0**	**20**	ND	ND	ND

See Notes on Page 31.

Appendix E. Summary of Historical VOC Data in Groundwater, Revised Draft RFI Report, Ashland Inc., Rensselaer, New York

Location ID: / Date Collected:	NYSDEC TOGS 1.1.1 Water Guidance Values	GP-26A 08/16/00	GP-26B 08/16/00	GP-27A 08/16/00	GP-27B 08/16/00	GP-28A 08/16/00	GP-28B 08/16/00	GP-29 08/16/00	GP-30A 08/16/00	GP-30B 08/16/00	GP-31 08/16/00	GP-33 08/16/00	HP-1 04/09/07	HP-2 04/09/07	HP-3 04/09/07	IMP-1 02/28/06
Volatile Organics																
1,1,1-Trichloroethane	5	ND	NA	ND	NA	ND	NA	ND	ND	NA	ND [ND]	ND	1.0 U	1.0 U	1.0 U	1.0 U
1,1,2,2-Tetrachloroethane	5	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	1.0 U	1.0 U	1.0 U	1.0 U
1,1,2-Trichloroethane	1	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	1.0 U	1.0 U	1.0 U	1.0 U
1,1-Dichloroethane	5	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND [ND]	ND	1.0 U	1.0 U	1.0 U	1.0 U
1,1-Dichloroethene	5	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	1.0 U	1.0 U	1.0 U	1.0 U
1,2-Dichloroethane	0.6	ND	NA	ND	NA	ND	NA	ND	ND	NA	ND [ND]	ND	1.0 U	1.0 U	1.0 U	**110**
1,2-Dichloroethene (total)	- -	13,000	11	170	ND	ND	ND	ND	ND	ND	1,500 [1,400]	ND	NA	NA	NA	NA
1,2-Dichloropropane	1	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	1.0 U	1.0 U	1.0 U	1.0 U
2-Butanone	- -	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	10 U	10 U	10 U	10 U
2-Chloroethylvinylether	- -	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
2-Hexanone	50	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	10 U	10 U	10 U	10 U
4-Methyl-2-pentanone	- -	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	10 U	10 U	10 U	10 U
Acetone	50	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	25 U	25 U	25 U	25 U
Benzene	1	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	1.0 U	1.0 U	1.0 U	1.0 U
Bromodichloromethane	50	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	1.0 U	1.0 U	1.0 U	1.0 U
Bromoform	50	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	1.0 U	1.0 U	1.0 U	1.0 U
Bromomethane	5	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	1.0 U	1.0 U	1.0 U	1.0 U
Carbon Disulfide	- -	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	2.0 U	2.0 U	2.0 U	2.0 U
Carbon Tetrachloride	5	ND	NA	ND	NA	ND	NA	ND	ND	NA	ND [ND]	ND	1.0 U	1.0 U	1.0 U	1.0 U
Chlorobenzene	5	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	1.0 U	1.0 U	1.0 U	1.0 U
Chloroethane	5	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	1.0 U	1.0 U	1.0 U	1.0 U
Chloroform	7	ND	NA	ND	NA	ND	NA	ND	ND	NA	ND [ND]	ND	1.0 U	1.0 U	1.0 U	1.0 U
Chloromethane	- -	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	1.0 U	1.0 U	1.0 U	1.0 U
cis-1,2-Dichloroethene	5	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	1.0 U	1.0 U	1.0 U	**330**
cis-1,3-Dichloropropene	0.4	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	1.0 U	1.0 U	1.0 U	1.0 U
Dibromochloromethane	50	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	1.0 U	1.0 U	1.0 U	1.0 U
Ethylbenzene	5	ND	NA	ND	NA	ND	NA	ND	ND	NA	ND [ND]	ND	1.0 U	1.0 U	1.0 U	1.0 U
Methylene Chloride	5	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	5.0 U	5.0 U	5.0 U	5.0 U
Naphthalene	10	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Styrene	5	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	1.0 U	1.0 U	1.0 U	1.0 U
Tetrachloroethene	5	ND	ND	ND	ND	ND	ND	ND	ND	ND	**4,700 [9,600]**	ND	1.0 U	1.0 U	1.0 U	1.0 U
Toluene	5	ND	NA	**10**	NA	**19**	NA	ND	ND	NA	ND [ND]	ND	1.0 U	1.0 U	**1.1**	1.0 U
trans-1,2-Dichloroethene	5	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	1.0 U	1.0 U	1.0 U	**4.5**
trans-1,3-Dichloropropene	0.4	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	1.0 U	1.0 U	1.0 U	1.0 U
Trichloroethene	5	**4,500**	NA	ND	NA	ND	NA	ND	ND	NA	**800 [760]**	ND	1.0 U	1.0 U	1.0 U	1.0 U
Vinyl Acetate	- -	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Vinyl Chloride	2	**1,900**	ND	ND	ND	ND	ND	ND	**210**	ND	ND [ND]	ND	1.0 U	1.0 U	1.0 U	**88**
Xylenes (total)	5	ND	NA	ND	NA	ND	NA	ND	ND	NA	ND [ND]	ND	2.0 U	2.0 U	2.0 U	2.0 U
Total VOCs	- -	**19,000**	**11**	**180**	ND	**19**	ND	ND	**210**	ND	**7,000 [12,000]**	ND	ND	ND	**1.1**	**530**

See Notes on Page 31.

Appendix E. Summary of Historical VOC Data in Groundwater, Revised Draft RFI Report, Ashland Inc., Rensselaer, New York

Location ID: / Date Collected:	NYSDEC TOGS 1.1.1 Water Guidance Values	IMP-1 05/03/06	IMP-1 10/05/06	IMP-2 02/28/06	IMP-2 05/03/06	IMP-2 10/05/06	IMP-3 02/28/06	IMP-3 05/03/06	IMP-3 10/05/06	IMP-3 04/10/08	IMP-3 09/16/08	IP-1 02/28/06	IP-1 05/03/06	IP-1 10/05/06	MW-1 05/30/97	MW-1 11/21/97	MW-1 05/29/98
Volatile Organics																	
1,1,1-Trichloroethane	5	5.0 U	1.0 U	1.0 U	2.0 U	1.0 U	1.0 U	2.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	**1,300**	**1,400**	**600 D**
1,1,2,2-Tetrachloroethane	5	5.0 U	1.0 U	1.0 U	2.0 U	1.0 U	1.0 U	2.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	250 U	500 U	5.0 U
1,1,2-Trichloroethane	1	5.0 U	NA	1.0 U	2.0 U	NA	1.0 U	2.0 U	NA	1.0 U	1.0 U	1.0 U	1.0 U	NA	250 U	500 U	5.0 U
1,1-Dichloroethane	5	5.0 U	1.0 U	1.0 U	2.0 U	1.0 U	1.0 U	2.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	250 U	500 U	**5.4**
1,1-Dichloroethene	5	5.0 U	1.0 U	1.0 U	2.0 U	1.0 U	1.0 U	2.0 U	**5.5**	1.0 U	1.0 U	1.0 U	1.0 U	**1.1**	**330**	**460 J**	**170**
1,2-Dichloroethane	0.6	**100**	**76**	**82**	**51**	**49**	**45**	**60**	**15**	1.0 U	**5.6**	1.0 U	1.0 U	**1.2**	250 U	500 U	**5.1**
1,2-Dichloroethene (total)	- -	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,2-Dichloropropane	1	5.0 U	NA	1.0 U	2.0 U	NA	1.0 U	2.0 U	NA	1.0 U	1.0 U	1.0 U	1.0 U	NA	250 U	500 U	5.0 U
2-Butanone	- -	50 U*	10 U	10 U	20 U*	10 U	10 U	20 U*	10 U	10 U	10 U	10 U	10 U*	10 U	1,200 U	2,500 U	25 U
2-Chloroethylvinylether	- -	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	2,500 U	5,000 U	50 U
2-Hexanone	50	50 U*	NA	10 U	20 U*	NA	10 U	20 U*	NA	10 U	10 U	10 U	10 U*	NA	1,200 U	2,500 U	25 U
4-Methyl-2-pentanone	- -	50 U	10 U	10 U	20 U	10 U	10 U	20 U	10 U	10 U	10 U	10 U	10 U	10 U	1,200 U	2,500 U	25 U
Acetone	50	130 U	25 U	25 U	50 U	25 U	25 U	50 U	25 U	25 U	25 U	25 U	25 U	25 U	2,500 U	5,000 U	50 U
Benzene	1	5.0 U	1.0 U	1.0 U	2.0 U	1.0 U	1.0 U	2.0 U	1.0 U	1.0 U	1.0 U	**1.6**	1.0 U	1.0 U	250 U	500 U	5.0 U
Bromodichloromethane	50	5.0 U	NA	1.0 U	2.0 U	NA	1.0 U	2.0 U	NA	1.0 U	1.0 U	1.0 U	1.0 U	NA	250 U	500 U	5.0 U
Bromoform	50	5.0 U	NA	1.0 U	2.0 U	NA	1.0 U	2.0 U	NA	1.0 U	1.0 U	1.0 U	1.0 U	NA	250 U	500 U	5.0 U
Bromomethane	5	5.0 U	NA	1.0 U	2.0 U	NA	1.0 U	2.0 U	NA	1.0 UJ	1.0 U	1.0 U	1.0 U	NA	500 U	1,000 U	10 U
Carbon Disulfide	- -	10 U	NA	2.0 U	4.0 U	NA	2.0 U	4.0 U	NA	2.0 U	2.0 U	2.0 U	2.0 U	NA	250 U	500 U	5.0 U
Carbon Tetrachloride	5	5.0 U	1.0 U	1.0 U	2.0 U	1.0 U	1.0 U	2.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	250 U	500 U	5.0 U
Chlorobenzene	5	5.0 U	NA	1.0 U	2.0 U	NA	1.0 U	2.0 U	NA	1.0 U	1.0 U	1.0 U	1.0 U	NA	250 U	500 U	5.0 U
Chloroethane	5	5.0 U	1.0 U	1.0 U	2.0 U	1.0 U	1.0 U	2.0 U	1.0 U	1.0 U	1.0 UJ	1.0 U	1.0 U	1.0 U	500 U	1,000 U	10 U
Chloroform	7	5.0 U	NA	1.0 U	2.0 U	NA	1.0 U	2.0 U	NA	1.0 U	1.0 U	1.0 U	1.0 U	NA	250 U	500 U	**9.1**
Chloromethane	- -	5.0 U	NA	1.0 U	2.0 U	NA	1.0 U	2.0 U	NA	1.0 UJ	1.0 UJ	1.0 U	1.0 U	NA	500 U	1,000 U	10 U
cis-1,2-Dichloroethene	5	**570**	**680 D**	**330 D**	**520 D**	**700 D**	**190**	**390**	**400 D**	**30**	**73**	**230 D**	**170**	**560 D**	**6,400**	**7,000**	**5,300 D**
cis-1,3-Dichloropropene	0.4	5.0 U	NA	1.0 U	2.0 U	NA	1.0 U	2.0 U	NA	1.0 U	1.0 U	1.0 U	1.0 U	NA	250 U	500 U	5.0 U
Dibromochloromethane	50	5.0 U	NA	1.0 U	2.0 U	NA	1.0 U	2.0 U	NA	1.0 U	1.0 U	1.0 U	1.0 U	NA	250 U	500 U	5.0 U
Ethylbenzene	5	5.0 U	1.0 U	1.0 U	2.0 U	1.0 U	1.0 U	2.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	250 U	500 U	5.0 U
Methylene Chloride	5	25 U	5.0 U	5.0 U	10 U	5.0 U	5.0 U	10 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	250 U	500 U	5.0 U
Naphthalene	10	NA	1.0 U	NA	NA	1.0 U	NA	NA	1.0 U	NA	NA	NA	NA	1.0 U	NA	NA	NA
Styrene	5	5.0 U	NA	1.0 U	2.0 U	NA	1.0 U	2.0 U	NA	1.0 U	1.0 U	1.0 U	1.0 U	NA	250 U	500 U	5.0 U
Tetrachloroethene	5	5.0 U	1.0 U	1.0 U	2.0 U	1.0 U	1.0 U	2.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	**2,700**	**2,500**	**1,800 D**
Toluene	5	5.0 U	1.0 U	1.0 U	2.0 U	1.0 U	**2.3**	2.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	250 U	500 U	5.0 U
trans-1,2-Dichloroethene	5	**10**	**6.7**	**5.6**	**11**	**9.7**	**3.1**	**8.1**	**4.2**	1.0 U	**1.1**	**5.1**	**3.5**	**12**	250 U	500 U	**36**
trans-1,3-Dichloropropene	0.4	5.0 U	NA	1.0 U	2.0 U	NA	1.0 U	2.0 U	NA	1.0 U	1.0 U	1.0 U	1.0 U	NA	250 U	500 U	5.0 U
Trichloroethene	5	5.0 U	1.0 U	1.0 U	2.0 U	1.0 U	1.0 U	2.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	**22,000**	**18,000**	**10,000 D**
Vinyl Acetate	- -	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	500 U	1,000 U	10 U
Vinyl Chloride	2	**97**	**120**	**22**	**28**	**39**	**43**	**72**	**34**	1.0 U	**6.9**	**94**	**43**	**160**	500 U	1,000 U	**30**
Xylenes (total)	5	10 U	2.0 U*	2.0 U	4.0 U	2.0 U*	2.0 U	4.0 U	2.0 U*	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U*	250 U	500 U	5.0 U
Total VOCs	- -	**780**	**880**	**440**	**610**	**800**	**280**	**530**	**460**	**30**	**87 J**	**330**	**220**	**730**	**33,000**	**29,000 J**	**18,000**

See Notes on Page 31.

Appendix E. Summary of Historical VOC Data in Groundwater, Revised Draft RFI Report, Ashland Inc., Rensselaer, New York

Location ID: / Date Collected:	NYSDEC TOGS 1.1.1 Water Guidance Values	MW-1 11/20/98	MW-1 05/27/99	MW-1 11/16/99	MW-1 05/25/00	MW-1 11/30/00	MW-1 06/06/01	MW-1 11/08/01	MW-1 05/21/02	MW-1 11/13/02	MW-1 04/23/03	MW-1 07/16/03	MW-1 10/27/03	MW-1 04/05/04	MW-1 04/06/04	MW-1 10/13/04	MW-1 04/14/05
Volatile Organics																	
1,1,1-Trichloroethane	5	**590**	**390**	**400**	**160**	50 U	**72**	**450**	**330**	**130**	**52**	**66**	**110**	1.0 U	25 U	**150**	**230**
1,1,2,2-Tetrachloroethane	5	500 U	50 U	250 U	100 U	50 U	50 U	100 U	25 U	25 U	5.0 U	**19**	5.0 U	1.0 U	25 U	25 U	10 U
1,1,2-Trichloroethane	1	500 U	50 U	250 U	100 U	50 U	50 U	100 U	25 U	25 U	5.0 U	10 U	5.0 U	1.0 U	25 U	25 U	10 U
1,1-Dichloroethane	5	500 U	50 U	250 U	100 U	50 U	50 U	100 U	25 U	25 U	5.0 U	10 U	5.0 U	1.0 U	25 U	25 U	**10**
1,1-Dichloroethene	5	500 U	**170**	250 U	100 U	50 U	**130**	**240**	**150**	**66**	**15**	**48**	**34**	1.0 U	25 U	**64**	**160**
1,2-Dichloroethane	0.6	500 U	50 U	250 U	100 U	50 U	50 U	100 U	25 U	25 U	5.0 U	10 U	5.0 U	1.0 U	25 U	25 U	10 U
1,2-Dichloroethene (total)	- -	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,2-Dichloropropane	1	500 U	50 U	250 U	100 U	50 U	50 U	100 U	25 U	25 U	5.0 U	10 U	5.0 U	1.0 U	25 U	25 U	10 U
2-Butanone	- -	2,500 U	500 U	1,200 U	500 U	250 U	250 U	500 U	250 U	250 U	50 U	100 U	50 U	10 U	250 U	250 U	100 U
2-Chloroethylvinylether	- -	5,000 U	500 U	2,500 U	1,000 U	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
2-Hexanone	50	2,500 U	500 U	1,200 U	500 U	250 U	250 U	500 U	250 U	250 U	50 U	100 U	50 U	10 U	250 U	250 U	100 U
4-Methyl-2-pentanone	- -	2,500 U	500 U	1,200 U	500 U	250 U	250 U	500 U	250 U	250 U	50 U	100 U	50 U	10 U	250 U	250 U	100 U
Acetone	50	5,000 U	1,200 U	2,500 U	1,000 U	500 U	500 U	1,000 U	620 U	620 U	120 U	250 U	120 U	25 U	620 U	620 U	250 U
Benzene	1	500 U	50 U	250 U	100 U	50 U	50 U	100 U	25 U	25 U	5.0 U	10 U	5.0 U	1.0 U	25 U	25 U	10 U
Bromodichloromethane	50	500 U	50 U	250 U	100 U	50 U	50 U	100 U	25 U	25 U	5.0 U	10 U	5.0 U	1.0 U	25 U	25 U	10 U
Bromoform	50	500 U	50 U	250 U	100 U	50 U	50 U	100 U	25 U	25 U	5.0 U	**10**	5.0 U	1.0 U	25 U	25 U	10 U
Bromomethane	5	1,000 U	50 U	500 U	200 U	100 U	100 U	200 U	25 U	25 U	5.0 U	10 U	5.0 U	1.0 U	25 U	25 U	10 U
Carbon Disulfide	- -	500 U	50 U	250 U	100 U	50 U	50 U	100 U	25 U	25 U	5.0 U	10 U	5.0 U	1.0 U	25 U	25 U	10 U
Carbon Tetrachloride	5	500 U	50 U	250 U	100 U	50 U	50 U	100 U	25 U	25 U	5.0 U	10 U	**20**	1.0 U	25 U	25 U	10 U
Chlorobenzene	5	500 U	50 U	250 U	100 U	50 U	50 U	100 U	25 U	25 U	5.0 U	10 U	5.0 U	1.0 U	25 U	25 U	10 U
Chloroethane	5	1,000 U	50 U	500 U	200 U	100 U	100 U	200 U	25 U	25 U	5.0 U	10 U	5.0 U	1.0 U	25 U	25 U	10 U
Chloroform	7	500 U	50 U	250 U	100 U	50 U	50 U	100 U	25 U	25 U	5.0 U	10 U	5.0 U	**1.6**	25 U	25 U	10 U
Chloromethane	- -	1,000 U	50 U	500 U	200 U	100 U	100 U*F	200 U*F	25 U	25 U	5.0 U	10 U	5.0 U	1.0 U	25 U	25 U	10 U
cis-1,2-Dichloroethene	5	**2,400**	**3,100**	**2,500**	**1,400**	**580**	**2,200**	**2,400**	**4,000**	**1,200**	**700**	**1,100**	**1,600 D**	1.0 U	**480**	**1,200**	**5,400 D**
cis-1,3-Dichloropropene	0.4	500 U	50 U	250 U	100 U	50 U	50 U	100 U	25 U	25 U	5.0 U	10 U	5.0 U	1.0 U	25 U	25 U	10 U
Dibromochloromethane	50	500 U	50 U	250 U	100 U	50 U	50 U	100 U	25 U	25 U	5.0 U	10 U	5.0 U	1.0 U	25 U	25 U	10 U
Ethylbenzene	5	500 U	50 U	250 U	100 U	50 U	50 U	100 U	25 U	25 U	5.0 U	10 U	5.0 U	1.0 U	25 U	25 U	10 U
Methylene Chloride	5	500 U	250 U	250 U	100 U	50 U	50 U	100 U	120 U	120 U	25 U	50 U	25 U	5.0 U	120 U	120 U	10 U
Naphthalene	10	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Styrene	5	500 U	50 U	250 U	100 U	50 U	50 U	100 U	25 U	25 U	5.0 U	**23**	5.0 U	1.0 U	25 U	25 U	10 U
Tetrachloroethene	5	**1,000**	**810**	**630**	**380**	**100**	**470**	**740**	**950**	**250**	**100**	**130**	**260**	**6.6**	**32**	**260**	**650**
Toluene	5	500 U	50 U	250 U	100 U	50 U	50 U	100 U	25 U	25 U	5.0 U	10 U	5.0 U	1.0 U	25 U	25 U	10 U
trans-1,2-Dichloroethene	5	500 U	50 U	250 U	100 U	50 U	50 U	100 U	**100**	25 U	**28**	**13**	**87**	1.0 U	25 U	25 U	**42**
trans-1,3-Dichloropropene	0.4	500 U	50 U	250 U	100 U	50 U	50 U	100 U	25 U	25 U	5.0 U	10 U	5.0 U	1.0 U	25 U	25 U	10 U
Trichloroethene	5	**7,900**	**5,600**	**5,900**	**2,800**	**1,200**	**3,800**	**3,800 D**	**4,500**	**2,000**	**740**	**1,300**	**2,100 D**	**9.4**	**600**	**2,300**	**2,800 D**
Vinyl Acetate	- -	1,000 U	100 U	500 U	200 U	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Vinyl Chloride	2	1,000 U	50 U	500 U	200 U	100 U	100 U	200 U	25 U	25 U	5.0 U	**14**	5.0 U	1.0 U	25 U	25 U	**69**
Xylenes (total)	5	500 U	100 U	500 U	200 U	100 U	100 U	200 U	50 U	50 U	10 U	20 U	10 U	2.0 U	50 U	50 U	20 U
Total VOCs	- -	**12,000**	**10,000**	**9,400**	**4,700**	**1,900**	**6,700**	**7,600**	**10,000**	**3,600**	**1,600**	**2,700**	**4,200**	**18**	**1,100**	**4,000**	**9,400**

See Notes on Page 31.

Appendix E. Summary of Historical VOC Data in Groundwater, Revised Draft RFI Report, Ashland Inc., Rensselaer, New York

Location ID: / Date Collected:	NYSDEC TOGS 1.1.1 Water Guidance Values	MW-1 05/10/06	MW-1 10/05/06	MW-1 04/12/07	MW-1 09/14/07	MW-1 04/09/08	MW-1 09/15/08	MW-2 04/05/04	MW-3 05/29/97	MW-3 11/20/97	MW-3 05/28/98	MW-3 11/19/98	MW-3 05/26/99	MW-3 11/16/99	MW-3 05/24/00	MW-3 11/29/00
Volatile Organics																
1,1,1-Trichloroethane	5	**210**	**1.7**	**20**	**8.0**	4.0 U [4.0 U]	5.0 U	**3.5**	5.0 U	5.0 U	5.0 U	5.0 U	1.0 U	5.0 U	**7.4**	5.0 U
1,1,2,2-Tetrachloroethane	5	25 U	1.0 U	5.0 U	2.0 U	4.0 U [4.0 U]	5.0 U	1.0 U	5.0 U	5.0 U	5.0 U	5.0 U	1.0 U	5.0 U	5.0 U	5.0 U
1,1,2-Trichloroethane	1	25 U	NA	5.0 U	2.0 U	4.0 U [4.0 U]	5.0 U	1.0 U	5.0 U	5.0 U	5.0 U	5.0 U	1.0 U	5.0 U	5.0 U	5.0 U
1,1-Dichloroethane	5	25 U	1.0 U	5.0 U	**2.1**	4.0 U [4.0 U]	5.0 U	**13**	5.0 U	5.0 U	5.0 U	5.0 U	1.0 U	5.0 U	**31**	5.0 U
1,1-Dichloroethene	5	**170**	**2.1**	**43**	**7.6**	4.0 U [4.0 U]	5.0 U	**1.4**	5.0 U	5.0 U	5.0 U	5.0 U	1.0 U	5.0 U	5.0 U	5.0 U
1,2-Dichloroethane	0.6	25 U	1.0 U	5.0 U	2.0 U	4.0 U [4.0 U]	5.0 U	1.0 U	5.0 U	5.0 U	5.0 U	5.0 U	1.0 U	5.0 U	5.0 U	5.0 U
1,2-Dichloroethene (total)	- -	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,2-Dichloropropane	1	25 U	NA	5.0 U	2.0 U	4.0 U [4.0 U]	5.0 U	1.0 U	5.0 U	5.0 U	5.0 U	5.0 U	1.0 U	5.0 U	5.0 U	5.0 U
2-Butanone	- -	250 U	10 U	50 U	20 U	40 U [40 U]	50 U	10 U	25 U	25 U	25 U	25 U	10 U	25 U	25 U	25 U
2-Chloroethylvinylether	- -	NA	NA	NA	NA	NA	NA	NA	50 U	50 U	50 U	50 U	10 U	50 U	50 U	NA
2-Hexanone	50	250 U	NA	50 U	20 U	40 U [40 U]	50 U	10 U	25 U	25 U	25 U	25 U	10 U	25 U	25 U	25 U
4-Methyl-2-pentanone	- -	250 U	10 U	50 U	20 U	40 U [40 U]	50 U	10 U	25 U	25 U	25 U	25 U	10 U	25 U	25 U	25 U
Acetone	50	630 U	25 U	130 U	50 U	100 U [100 U]	120 U	25 U	50 U	50 U	50 U	50 U	25 U	50 U	50 U	50 U
Benzene	1	25 U	1.0 U	5.0 U	2.0 U	4.0 U [4.0 U]	5.0 U	1.0 U	5.0 U	5.0 U	5.0 U	5.0 U	1.0 U	5.0 U	5.0 U	5.0 U
Bromodichloromethane	50	25 U	NA	5.0 U	2.0 U	4.0 U [4.0 U]	5.0 U	1.0 U	5.0 U	5.0 U	5.0 U	5.0 U	1.0 U	5.0 U	5.0 U	5.0 U
Bromoform	50	25 U	NA	5.0 U	2.0 U	4.0 U [4.0 U]	5.0 U	1.0 U	5.0 U	5.0 U	5.0 U	5.0 U	1.0 U	5.0 U	5.0 U	5.0 U
Bromomethane	5	25 U	NA	5.0 U	2.0 UJ	4.0 UJ [4.0 U]	5.0 U	1.0 U	10 U	10 U	10 U	10 U	1.0 U	10 U	10 U	10 U
Carbon Disulfide	- -	50 U	NA	10 U	4.0 U	8.0 U [8.0 U]	10 UJ	1.0 U	5.0 U	**1.2 J**	5.0 U	5.0 U	**28**	5.0 U	5.0 U	5.0 U
Carbon Tetrachloride	5	25 U	1.0 U	5.0 U	2.0 U	4.0 U [4.0 U]	5.0 U	1.0 U	5.0 U	5.0 U	5.0 U	5.0 U	1.0 U	5.0 U	5.0 U	5.0 U
Chlorobenzene	5	25 U	NA	5.0 U	2.0 U	4.0 U [4.0 U]	5.0 U	1.0 U	5.0 U	5.0 U	5.0 U	5.0 U	1.0 U	5.0 U	5.0 U	5.0 U
Chloroethane	5	25 U	1.0 U	5.0 U	2.0 U	4.0 U [4.0 U]	5.0 UJ	1.0 U	10 U	10 U	10 U	10 U	1.0 U	10 U	10 U	10 U
Chloroform	7	25 U	NA	5.0 U	2.0 U	4.0 U [4.0 U]	5.0 U	1.0 U	5.0 U	5.0 U	5.0 U	5.0 U	1.0 U	5.0 U	5.0 U	5.0 U
Chloromethane	- -	25 U	NA	5.0 U	2.0 U	4.0 UJ [4.0 UJ]	5.0 U	1.0 U	10 U	10 U	10 U	10 U	1.0 U	10 U	10 U	10 U
cis-1,2-Dichloroethene	5	**4,700**	**91**	**1,400 D**	**420 D**	**150 [150]**	**340 J**	**39**	5.0 U	5.0 U	5.0 U	5.0 U	1.0 U	5.0 U	**59**	5.0 U
cis-1,3-Dichloropropene	0.4	25 U	NA	5.0 U	2.0 U	4.0 U [4.0 U]	5.0 U	1.0 U	5.0 U	5.0 U	5.0 U	5.0 U	1.0 U	5.0 U	5.0 U	5.0 U
Dibromochloromethane	50	25 U	NA	5.0 U	2.0 U	4.0 U [4.0 U]	5.0 U	1.0 U	5.0 U	5.0 U	5.0 U	5.0 U	1.0 U	5.0 U	5.0 U	5.0 U
Ethylbenzene	5	25 U	1.0 U	5.0 U	2.0 U	4.0 U [4.0 U]	5.0 U	1.0 U	5.0 U	5.0 U	5.0 U	5.0 U	1.0 U	5.0 U	5.0 U	5.0 U
Methylene Chloride	5	130 U	5.0 U	25 U	10 U	20 U [20 U]	25 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U
Naphthalene	10	NA	1.0 U	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Styrene	5	25 U	NA	5.0 U	2.0 U	4.0 U [4.0 U]	5.0 U	1.0 U	5.0 U	5.0 U	5.0 U	5.0 U	1.0 U	5.0 U	5.0 U	5.0 U
Tetrachloroethene	5	**470**	**5.9**	**48**	**42**	**10 [10]**	**23**	**11**	5.0 U	5.0 U	5.0 U	5.0 U	1.0 U	5.0 U	5.0 U	5.0 U
Toluene	5	25 U	1.0 U	5.0 U	2.0 U	4.0 U [4.0 U]	5.0 U	1.0 U	5.0 U	5.0 U	5.0 U	5.0 U	1.0 U	5.0 U	5.0 U	5.0 U
trans-1,2-Dichloroethene	5	**29**	1.0 U	5.0 U	2.0 U	4.0 U [4.0 U]	5.0 U	1.0 U	5.0 U	5.0 U	5.0 U	5.0 U	1.0 U	5.0 U	5.0 U	5.0 U
trans-1,3-Dichloropropene	0.4	25 U	NA	5.0 U	2.0 U	4.0 U [4.0 U]	5.0 U	1.0 U	5.0 U	5.0 U	5.0 U	5.0 U	1.0 U	5.0 U	5.0 U	5.0 U
Trichloroethene	5	**2,200**	**110**	**610**	**1,100 D**	**310 J [310]**	**750 J**	**28**	5.0 U	5.0 U	5.0 U	5.0 U	1.0 U	5.0 U	**12**	5.0 U
Vinyl Acetate	- -	NA	NA	NA	NA	NA	NA	NA	10 U	10 U	10 U	10 U	2.0 U	10 U	10 U	NA
Vinyl Chloride	2	**59**	1.0 U	**6.3**	2.0 U	4.0 U [4.0 U]	5.0 U	**11**	10 U	10 U	10 U	10 U	1.0 U	10 U	10 U	10 U
Xylenes (total)	5	50 U	2.0 U	10 U	4.0 U	8.0 U [8.0 U]	10 U	2.0 U	5.0 U	5.0 U	5.0 U	5.0 U	2.0 U	10 U	10 U	10 U
Total VOCs	- -	**7,800**	**210**	**2,100**	**1,600**	**470 J [470]**	**1,100 J**	**110**	ND	**1.2 J**	ND	ND	**28**	ND	**110**	ND

See Notes on Page 31.

Appendix E. Summary of Historical VOC Data in Groundwater, Revised Draft RFI Report, Ashland Inc., Rensselaer, New York

Location ID: / Date Collected:	NYSDEC TOGS 1.1.1 Water Guidance Values	MW-3 06/06/01	MW-3 11/07/01	MW-3 05/21/02	MW-3 11/12/02	MW-3 04/23/03	MW-3 07/15/03	MW-3 10/27/03	MW-3 04/05/04	MW-3 04/08/04	MW-3 10/13/04	MW-3 04/13/05	MW-3 05/09/06	MW-3 10/04/06	MW-3 04/11/07	MW-3 09/13/07
Volatile Organics																
1,1,1-Trichloroethane	5	5.0 U	5.0 U	1.0 U	1.0 U	1.0 U [1.0 U]	1.0 U	1.0 U	**3.3**	1.0 U [1.0 U]	1.0 U	1.0 U [1.0 U]	1.0 U	1.0 U	1.0 U	1.0 U
1,1,2,2-Tetrachloroethane	5	5.0 U	5.0 U	1.0 U	1.0 U	1.0 U [1.0 U]	1.0 U	1.0 U	1.0 U	1.0 U [1.0 U]	1.0 U	1.0 U [1.0 U]	1.0 U	1.0 U	1.0 U	1.0 U
1,1,2-Trichloroethane	1	5.0 U	5.0 U	1.0 U	1.0 U	1.0 U [1.0 U]	1.0 U	1.0 U	1.0 U	1.0 U [1.0 U]	1.0 U	1.0 U [1.0 U]	1.0 U	NA	1.0 U	1.0 U
1,1-Dichloroethane	5	**24**	5.0 U	1.0 U	1.0 U	**3.2 [2.0]**	1.0 U	1.0 U	**1.7**	1.0 U [1.0 U]	1.0 U	1.0 U [1.0 U]	1.0 U	1.0 U	1.0 U	1.0 U
1,1-Dichloroethene	5	5.0 U	5.0 U	1.0 U	1.0 U	1.0 U [1.0 U]	1.0 U	1.0 U	1.0 U	1.0 U [1.0 U]	1.0 U	1.0 U [1.0 U]	1.0 U	1.0 U	1.0 U	1.0 U
1,2-Dichloroethane	0.6	5.0 U	5.0 U	1.0 U	1.0 U	1.0 U [1.0 U]	1.0 U	1.0 U	1.0 U	1.0 U [1.0 U]	1.0 U	1.0 U [1.0 U]	1.0 U	1.0 U	1.0 U	1.0 U
1,2-Dichloroethene (total)	- -	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,2-Dichloropropane	1	5.0 U	5.0 U	1.0 U	1.0 U	1.0 U [1.0 U]	1.0 U	1.0 U	1.0 U	1.0 U [1.0 U]	1.0 U	1.0 U [1.0 U]	1.0 U	NA	1.0 U	1.0 U
2-Butanone	- -	25 U	25 U	10 U	10 U	10 U [10 U]	10 U	10 U	10 U	10 U [10 U]	10 U	10 U [10 U]	10 U	10 U	10 U	10 U
2-Chloroethylvinylether	- -	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
2-Hexanone	50	25 U	25 U	10 U	10 U	10 U [10 U]	10 U	10 U	10 U	10 U [10 U]	10 U	10 U [10 U]	10 U	NA	10 U	10 U
4-Methyl-2-pentanone	- -	25 U	25 U	10 U	10 U	10 U [10 U]	10 U	10 U	10 U	10 U [10 U]	10 U	10 U [10 U]	10 U	10 U	10 U	10 U
Acetone	50	50 U	50 U	25 U	25 U	25 U [25 U]	25 U	25 U	25 U	25 U [25 U]	25 U	25 U [25 U]	25 U	25 U	25 U	25 U
Benzene	1	5.0 U	5.0 U	1.0 U	1.0 U	1.0 U [1.0 U]	1.0 U	1.0 U	1.0 U	**2.9 [1.0 U]**	1.0 U	1.0 U [1.0 U]	1.0 U	1.0 U	1.0 U	1.0 U
Bromodichloromethane	50	5.0 U	5.0 U	1.0 U	1.0 U	1.0 U [1.0 U]	1.0 U	1.0 U	1.0 U	1.0 U [1.0 U]	1.0 U	1.0 U [1.0 U]	1.0 U	NA	1.0 U	1.0 U
Bromoform	50	5.0 U	5.0 U	1.0 U	1.0 U	1.0 U [1.0 U]	1.0 U	1.0 U	1.0 U	1.0 U [1.0 U]	1.0 U	1.0 U [1.0 U]	1.0 U	NA	1.0 U	1.0 U
Bromomethane	5	10 U	10 U	1.0 U	1.0 U	1.0 U [1.0 U]	1.0 U	1.0 U	1.0 U	1.0 U [1.0 U]	1.0 U	1.0 U [1.0 U]	1.0 U	NA	1.0 U	1.0 UJ
Carbon Disulfide	- -	5.0 U	5.0 U	1.0 U	1.0 U	1.0 U [1.0 U]	1.0 U	1.0 U	1.0 U	1.0 U [1.0 U]	1.0 U	1.0 U [1.0 U]	2.0 U	NA	2.0 U	2.0 U
Carbon Tetrachloride	5	5.0 U	5.0 U	1.0 U	1.0 U	1.0 U [1.0 U]	1.0 U	1.0 U	1.0 U	1.0 U [1.0 U]	1.0 U	1.0 U [1.0 U]	1.0 U	1.0 U	1.0 U	1.0 U
Chlorobenzene	5	5.0 U	5.0 U	1.0 U	1.0 U	1.0 U [1.0 U]	1.0 U	1.0 U	1.0 U	1.0 U [1.0 U]	1.0 U	1.0 U [1.0 U]	1.0 U	NA	1.0 U	1.0 U
Chloroethane	5	10 U	10 U	1.0 U	1.0 U	1.0 U [1.0 U]	1.0 U	1.0 U	1.0 U	1.0 U [1.0 U]	1.0 U	1.0 U [1.0 U]	1.0 U	1.0 U	1.0 U	1.0 U
Chloroform	7	5.0 U	5.0 U	1.0 U	1.0 U	1.0 U [1.0 U]	1.0 U	1.0 U	1.0 U	1.0 U [1.0 U]	1.0 U	1.0 U [1.0 U]	1.0 U	NA	1.0 U	1.0 U
Chloromethane	- -	10 U	10 U	1.0 U	1.0 U	1.0 U [1.0 U]	1.0 U	1.0 U	1.0 U	1.0 U [1.0 U]	1.0 U	1.0 U [1.0 U]	1.0 U*	NA	1.0 U	1.0 U
cis-1,2-Dichloroethene	5	**28**	5.0 U	**2.2**	**3.1**	**1.6 [1.8]**	**2.4**	**1.1**	**16**	1.0 U [1.0 U]	1.0 U	1.0 U [1.0 U]	1.0 U	1.0 U	1.0 U	1.0 U
cis-1,3-Dichloropropene	0.4	5.0 U	5.0 U	1.0 U	1.0 U	1.0 U [1.0 U]	1.0 U	1.0 U	1.0 U	1.0 U [1.0 U]	1.0 U	1.0 U [1.0 U]	1.0 U	NA	1.0 U	1.0 U
Dibromochloromethane	50	5.0 U	5.0 U	1.0 U	1.0 U	1.0 U [1.0 U]	1.0 U	1.0 U	1.0 U	1.0 U [1.0 U]	1.0 U	1.0 U [1.0 U]	1.0 U	NA	1.0 U	1.0 U
Ethylbenzene	5	5.0 U	5.0 U	1.0 U	1.0 U	1.0 U [1.0 U]	1.0 U	1.0 U	1.0 U	**1.3 [1.0 U]**	1.0 U	1.0 U [1.0 U]	1.0 U	1.0 U	1.0 U	1.0 U
Methylene Chloride	5	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U [5.0 U]	5.0 U	5.0 U	5.0 U	5.0 U [5.0 U]	5.0 U	1.0 U [1.0 U]	5.0 U	5.0 U	5.0 U	5.0 U
Naphthalene	10	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	1.0 U	NA	NA
Styrene	5	5.0 U	5.0 U	1.0 U	1.0 U	1.0 U [1.0 U]	**2.1**	1.0 U	1.0 U	1.0 U [1.0 U]	1.0 U	1.0 U [1.0 U]	1.0 U	NA	1.0 U	1.0 U
Tetrachloroethene	5	5.0 U	5.0 U	1.0 U	1.0 U	1.0 U [1.0 U]	1.0 U	1.0 U	**100**	1.0 U [1.0 U]	1.0 U	1.0 U [1.0 U]	1.0 U	1.0 U	1.0 U	1.0 U
Toluene	5	5.0 U	5.0 U	1.0 U	1.0 U	1.0 U [1.0 U]	1.0 U	1.0 U	1.0 U	1.0 U [1.0 U]	1.0 U	1.0 U [1.0 U]	1.0 U	1.0 U	1.0 U	1.0 U
trans-1,2-Dichloroethene	5	5.0 U	5.0 U	1.0 U	1.0 U	1.0 U [1.0 U]	**1.3**	1.0 U	1.0 U	1.0 U [1.0 U]	1.0 U	1.0 U [1.0 U]	1.0 U	1.0 U	1.0 U	1.0 U
trans-1,3-Dichloropropene	0.4	5.0 U	5.0 U	1.0 U	1.0 U	1.0 U [1.0 U]	1.0 U	1.0 U	1.0 U	1.0 U [1.0 U]	1.0 U	1.0 U [1.0 U]	1.0 U	NA	1.0 U	1.0 U
Trichloroethene	5	5.0 U	5.0 U	1.0 U	1.0 U	1.0 U [1.0 U]	1.0 U	1.0 U	**85**	1.0 U [1.0 U]	1.0 U	1.0 U [1.0 U]	1.0 U	1.0 U	1.0 U	1.0 U
Vinyl Acetate	- -	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Vinyl Chloride	2	10 U	**16**	**9.8**	**6.9**	**2.2 [2.1]**	**2.9**	**1.8**	**2.4**	1.0 U [1.0 U]	**1.2**	1.0 U [1.0 U]	1.0 U*	1.0 U	1.0 U	1.0 U
Xylenes (total)	5	10 U	10 U	2.0 U	2.0 U	2.0 U [2.0 U]	2.0 U	2.0 U	2.0 U	**3.3 [2.0 U]**	2.0 U	2.0 U [2.0 U]	2.0 U	2.0 U	2.0 U	2.0 U
Total VOCs	- -	**52**	**16**	**12**	**10**	**7.0 [5.9]**	**8.7**	**2.9**	**210**	**7.5 [ND]**	**1.2**	ND [ND]	ND	ND	ND	ND

See Notes on Page 31.

Appendix E. Summary of Historical VOC Data in Groundwater, Revised Draft RFI Report, Ashland Inc., Rensselaer, New York

Location ID: / Date Collected:	NYSDEC TOGS 1.1.1 Water Guidance Values	MW-3 04/09/08	MW-3 09/15/08	MW-4 05/30/97	MW-4 11/21/97	MW-4 05/28/98	MW-4 11/19/98	MW-4 05/27/99	MW-4 11/16/99	MW-4 05/25/00	MW-4 11/29/00	MW-4 06/06/01	MW-4 11/07/01	MW-4 05/21/02	MW-4 11/12/02	MW-4 04/23/03	MW-4 10/27/03
Volatile Organics																	
1,1,1-Trichloroethane	5	1.0 U	1.0 U	5.0 U	5.0 U	5.0 U	5.0 U	1.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	1.0 U	1.0 U	1.0 U	1.0 U
1,1,2,2-Tetrachloroethane	5	1.0 U	1.0 U	5.0 U	5.0 U	5.0 U	5.0 U	1.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	1.0 U	1.0 U	1.0 U	1.0 U
1,1,2-Trichloroethane	1	1.0 U	1.0 U	5.0 U	5.0 U	5.0 U	5.0 U	1.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	1.0 U	1.0 U	1.0 U	1.0 U
1,1-Dichloroethane	5	1.0 U	1.0 U	**2.2 J**	**3.2 J**	5.0 U	5.0 U	**2.4**	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	**1.5**	1.0 U	1.0 U	1.0 U
1,1-Dichloroethene	5	1.0 U	1.0 U	5.0 U	5.0 U	5.0 U	5.0 U	1.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	1.0 U	1.0 U	1.0 U	1.0 U
1,2-Dichloroethane	0.6	1.0 U	1.0 U	5.0 U	5.0 U	5.0 U	5.0 U	1.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	1.0 U	1.0 U	1.0 U	1.0 U
1,2-Dichloroethene (total)	- -	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,2-Dichloropropane	1	1.0 U	1.0 U	5.0 U	5.0 U	5.0 U	5.0 U	1.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	1.0 U	1.0 U	1.0 U	1.0 U
2-Butanone	- -	10 U	10 U	25 U	25 U	25 U	25 U	10 U	25 U	25 U	25 U	25 U	25 U	10 U	10 U	10 U	10 U
2-Chloroethylvinylether	- -	NA	NA	50 U	50 U	50 U	50 U	10 U	50 U	50 U	NA	NA	NA	NA	NA	NA	NA
2-Hexanone	50	10 U	10 U	25 U	25 U	25 U	25 U	10 U	25 U	25 U	25 U	25 U	25 U	10 U	10 U	10 U	10 U
4-Methyl-2-pentanone	- -	10 U	10 U	25 U	25 U	25 U	25 U	10 U	25 U	25 U	25 U	25 U	25 U	10 U	10 U	10 U	10 U
Acetone	50	25 U	25 U	50 U	50 U	50 U	50 U	25 U	50 U	50 U	50 U	50 U	50 U	25 U	25 U	25 U	25 U
Benzene	1	1.0 U	1.0 U	**1.7 J**	**1.0 J**	5.0 U	5.0 U	1.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Bromodichloromethane	50	1.0 U	1.0 U	5.0 U	5.0 U	5.0 U	5.0 U	1.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Bromoform	50	1.0 U	1.0 U	5.0 U	5.0 U	5.0 U	5.0 U	1.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Bromomethane	5	1.0 UJ	1.0 U	10 U	10 U	10 U	10 U	1.0 U	10 U	10 U	10 U	10 U	10 U	1.0 U	1.0 U	1.0 U	1.0 U
Carbon Disulfide	- -	2.0 U	2.0 U	**3.2 J**	**2.0 J**	5.0 U	**5.4**	**40**	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Carbon Tetrachloride	5	1.0 U	1.0 U	5.0 U	5.0 U	5.0 U	5.0 U	1.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Chlorobenzene	5	1.0 U	1.0 U	5.0 U	5.0 U	5.0 U	5.0 U	1.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Chloroethane	5	1.0 U	1.0 U	**5.7 J**	10 U	10 U	10 U	1.0 U	10 U	10 U	10 U	10 U	10 U	1.0 U	1.0 U	1.0 U	1.0 U
Chloroform	7	1.0 U	1.0 U	5.0 U	5.0 U	5.0 U	5.0 U	1.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Chloromethane	- -	1.0 UJ	1.0 UJ	10 U	10 U	10 U	10 U	1.0 U	10 U	10 U	10 U	10 U	10 U	1.0 U	1.0 U	1.0 U	1.0 U
cis-1,2-Dichloroethene	5	1.0 U	1.0 U	5.0 U	5.0 U	5.0 U	5.0 U	1.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	1.0 U	1.0 U	1.0 U	1.0 U
cis-1,3-Dichloropropene	0.4	1.0 U	1.0 U	5.0 U	5.0 U	5.0 U	5.0 U	1.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Dibromochloromethane	50	1.0 U	1.0 U	5.0 U	5.0 U	5.0 U	5.0 U	1.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Ethylbenzene	5	1.0 U	1.0 U	5.0 U	5.0 U	5.0 U	5.0 U	1.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Methylene Chloride	5	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U
Naphthalene	10	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Styrene	5	1.0 U	1.0 U	5.0 U	5.0 U	5.0 U	5.0 U	1.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Tetrachloroethene	5	1.0 U	1.0 U	5.0 U	5.0 U	5.0 U	5.0 U	1.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Toluene	5	1.0 U	1.0 U	5.0 U	5.0 U	5.0 U	5.0 U	1.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	1.0 U	1.0 U	1.0 U	1.0 U
trans-1,2-Dichloroethene	5	1.0 U	1.0 U	5.0 U	5.0 U	5.0 U	5.0 U	1.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	1.0 U	1.0 U	1.0 U	1.0 U
trans-1,3-Dichloropropene	0.4	1.0 U	1.0 U	5.0 U	5.0 U	5.0 U	5.0 U	1.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Trichloroethene	5	1.0 U	1.0 U	**0.96 J**	5.0 U	5.0 U	5.0 U	1.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Vinyl Acetate	- -	NA	NA	10 U	10 U	10 U	10 U	2.0 U	10 U	10 U	NA	NA	NA	NA	NA	NA	NA
Vinyl Chloride	2	1.0 U	1.0 U	10 U	10 U	10 U	10 U	1.0 U	10 U	10 U	10 U	10 U	10 U	1.0 U	1.0 U	1.0 U	1.0 U
Xylenes (total)	5	2.0 U	2.0 U	5.0 U	5.0 U	5.0 U	5.0 U	2.0 U	10 U	10 U	10 U	10 U	10 U	2.0 U	2.0 U	2.0 U	2.0 U
Total VOCs	- -	ND	NDJ	**14 J**	**6.2 J**	ND	**5.4**	**42**	ND	ND	ND	ND	ND	**1.5**	ND	ND	ND

See Notes on Page 31.

Appendix E. Summary of Historical VOC Data in Groundwater, Revised Draft RFI Report, Ashland Inc., Rensselaer, New York

Location ID: / Date Collected:	NYSDEC TOGS 1.1.1 Water Guidance Values	MW-4 04/05/04	MW-4 04/06/04	MW-4 10/13/04	MW-4 04/13/05	MW-4 05/09/06	MW-4 10/04/06	MW-4 04/11/07	MW-4 09/14/07	MW-4 04/09/08	MW-4 09/15/08	MW-5 11/07/01	MW-5 04/05/04	MW-5S 05/29/97	MW-5S 11/21/97	MW-5S 05/29/98
Volatile Organics																
1,1,1-Trichloroethane	5	1.0 U	**2.5**	1.0 U	1.0 U	1.0 U [1.0 U]	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	5.0 U	**23**	5.0 U	5.0 U	5.0 U
1,1,2,2-Tetrachloroethane	5	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U [1.0 U]	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	5.0 U	1.0 U	5.0 U	5.0 U	5.0 U
1,1,2-Trichloroethane	1	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U [1.0 U]	NA	1.0 U	1.0 U	1.0 U	1.0 U	5.0 U	1.0 U	5.0 U	5.0 U	5.0 U
1,1-Dichloroethane	5	1.0 U	**3.0**	1.0 U	1.0 U	1.0 U [1.0 U]	**1.3**	1.0 U	**2.2**	1.0 U	1.0 U	5.0 U	**1.5**	5.0 U	5.0 U	5.0 U
1,1-Dichloroethene	5	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U [1.0 U]	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	5.0 U	**4.2**	5.0 U	5.0 U	5.0 U
1,2-Dichloroethane	0.6	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U [1.0 U]	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	5.0 U	1.0 U	5.0 U	5.0 U	5.0 U
1,2-Dichloroethene (total)	- -	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,2-Dichloropropane	1	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U [1.0 U]	NA	1.0 U	1.0 U	1.0 U	1.0 U	5.0 U	1.0 U	5.0 U	5.0 U	5.0 U
2-Butanone	- -	10 U	10 U	10 U	10 U	10 U [10 U]	10 U	10 U	10 U	10 U	10 U	25 U	10 U	25 U	25 U	25 U
2-Chloroethylvinylether	- -	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	50 U	50 U	50 U
2-Hexanone	50	10 U	10 U	10 U	10 U	10 U [10 U]	NA	10 U	10 U	10 U	10 U	25 U	10 U	25 U	25 U	25 U
4-Methyl-2-pentanone	- -	10 U	10 U	10 U	10 U	10 U [10 U]	10 U	10 U	10 U	10 U	10 U	25 U	10 U	25 U	25 U	25 U
Acetone	50	25 U	25 U	25 U	25 U	25 U [25 U]	25 U	25 U	25 U	25 U	25 U	50 U	25 U	50 U	50 U	50 U
Benzene	1	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U [1.0 U]	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	5.0 U	1.0 U	5.0 U	5.0 U	5.0 U
Bromodichloromethane	50	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U [1.0 U]	NA	1.0 U	1.0 U	1.0 U	1.0 U	5.0 U	1.0 U	5.0 U	5.0 U	5.0 U
Bromoform	50	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U [1.0 U]	NA	1.0 U	1.0 U	1.0 U	1.0 U	5.0 U	1.0 U	5.0 U	5.0 U	5.0 U
Bromomethane	5	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U [1.0 U]	NA	1.0 U	1.0 UJ	1.0 U	1.0 U	10 U	1.0 U	10 U	10 U	10 U
Carbon Disulfide	- -	1.0 U	1.0 U	1.0 U	1.0 U	2.0 U [2.0 U]	NA	2.0 U	**2.9**	2.0 U	2.0 U	5.0 U	1.0 U	5.0 U	5.0 U	5.0 U
Carbon Tetrachloride	5	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U [1.0 U]	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	5.0 U	1.0 U	5.0 U	5.0 U	5.0 U
Chlorobenzene	5	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U [1.0 U]	NA	1.0 U	1.0 U	1.0 U	1.0 U	5.0 U	1.0 U	5.0 U	5.0 U	5.0 U
Chloroethane	5	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U [1.0 U]	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	10 U	1.0 U	10 U	10 U	10 U
Chloroform	7	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U [1.0 U]	NA	1.0 U	1.0 U	1.0 U	1.0 U	5.0 U	**3.2**	5.0 U	5.0 U	5.0 U
Chloromethane	- -	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U* [1.0 U*]	NA	1.0 U	1.0 U	1.0 U	1.0 UJ	10 U	1.0 U	10 U	10 U	10 U
cis-1,2-Dichloroethene	5	1.0 U	**26**	1.0 U	1.0 U	1.0 U [1.0 U]	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	5.0 U	**1.7**	5.0 U	5.0 U	5.0 U
cis-1,3-Dichloropropene	0.4	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U [1.0 U]	NA	1.0 U	1.0 U	1.0 U	1.0 U	5.0 U	1.0 U	5.0 U	5.0 U	5.0 U
Dibromochloromethane	50	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U [1.0 U]	NA	1.0 U	1.0 U	1.0 U	1.0 U	5.0 U	1.0 U	5.0 U	5.0 U	5.0 U
Ethylbenzene	5	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U [1.0 U]	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	5.0 U	1.0 U	5.0 U	5.0 U	5.0 U
Methylene Chloride	5	5.0 U	5.0 U	5.0 U	1.0 U	5.0 U [5.0 U]	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U
Naphthalene	10	NA	NA	NA	NA	NA	1.0 U	NA	NA	NA	NA	NA	NA	NA	NA	NA
Styrene	5	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U [1.0 U]	NA	1.0 U	1.0 U	1.0 U	1.0 U	5.0 U	1.0 U	5.0 U	5.0 U	5.0 U
Tetrachloroethene	5	1.0 U	**3.8**	1.0 U	1.0 U	1.0 U [1.0 U]	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	5.0 U	**8.2**	5.0 U	5.0 U	**11**
Toluene	5	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U [1.0 U]	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	5.0 U	1.0 U	5.0 U	5.0 U	5.0 U
trans-1,2-Dichloroethene	5	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U [1.0 U]	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	5.0 U	1.0 U	5.0 U	5.0 U	5.0 U
trans-1,3-Dichloropropene	0.4	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U [1.0 U]	NA	1.0 U	1.0 U	1.0 U	1.0 U	5.0 U	1.0 U	5.0 U	5.0 U	5.0 U
Trichloroethene	5	1.0 U	**16**	1.0 U	1.0 U	1.0 U [1.0 U]	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	5.0 U	**12**	5.0 U	5.0 U	5.0 U
Vinyl Acetate	- -	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	10 U	10 U	10 U
Vinyl Chloride	2	1.0 U	**2.2**	1.0 U	1.0 U	1.0 U* [1.0 U*]	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	10 U	1.0 U	10 U	10 U	10 U
Xylenes (total)	5	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U [2.0 U]	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	10 U	2.0 U	5.0 U	5.0 U	5.0 U
Total VOCs	- -	ND	**54**	ND	ND	ND [ND]	**1.3**	ND	**5.1**	ND	NDJ	ND	**54**	ND	ND	**11**

See Notes on Page 31.

Appendix E. Summary of Historical VOC Data in Groundwater, Revised Draft RFI Report, Ashland Inc., Rensselaer, New York

Location ID: / Date Collected:	NYSDEC TOGS 1.1.1 Water Guidance Values	MW-5S 11/19/98	MW-5S 05/26/99	MW-5S 11/16/99	MW-9 05/30/97	MW-9 11/21/97	MW-9 05/29/98	MW-9 11/19/98	MW-9 05/26/99	MW-9 11/16/99	MW-9 05/24/00	MW-9 11/30/00	MW-9 06/06/01	MW-9 05/21/02	MW-9 11/12/02	MW-9 04/23/03	MW-9 10/27/03
Volatile Organics																	
1,1,1-Trichloroethane	5	5.0 U	**1.8**	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	1.0 U	5.0 U	5.0 U	5.0 U	5.0 U	1.0 U	1.0 U	1.0 U	1.0 U
1,1,2,2-Tetrachloroethane	5	5.0 U	1.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	1.0 U	5.0 U	5.0 U	5.0 U	5.0 U	1.0 U	1.0 U	1.0 U	1.0 U
1,1,2-Trichloroethane	1	5.0 U	1.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	1.0 U	5.0 U	5.0 U	5.0 U	5.0 U	1.0 U	1.0 U	1.0 U	1.0 U
1,1-Dichloroethane	5	5.0 U	**4.9**	5.0 U	**3.7 J**	**9.3**	5.0 U	**6.0**	**2.4**	5.0 U	5.0 U	5.0 U	5.0 U	**2.0**	**5.8**	**1.2**	**3.6**
1,1-Dichloroethene	5	5.0 U	1.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	1.0 U	5.0 U	5.0 U	5.0 U	5.0 U	1.0 U	1.0 U	1.0 U	1.0 U
1,2-Dichloroethane	0.6	5.0 U	1.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	1.0 U	5.0 U	5.0 U	5.0 U	5.0 U	1.0 U	1.0 U	1.0 U	1.0 U
1,2-Dichloroethene (total)	- -	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,2-Dichloropropane	1	5.0 U	1.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	1.0 U	5.0 U	5.0 U	5.0 U	5.0 U	1.0 U	1.0 U	1.0 U	1.0 U
2-Butanone	- -	25 U	10 U	25 U	25 U	25 U	25 U	25 U	10 U	25 U	25 U	25 U	25 U	**12**	10 U	10 U	10 U
2-Chloroethylvinylether	- -	50 U	10 U	50 U	50 U	50 U	50 U	50 U	10 U	50 U	50 U	NA	NA	NA	NA	NA	NA
2-Hexanone	50	25 U	10 U	25 U	25 U	25 U	25 U	25 U	10 U	25 U	25 U	25 U	25 U	10 U	10 U	10 U	10 U
4-Methyl-2-pentanone	- -	25 U	10 U	25 U	25 U	25 U	25 U	25 U	10 U	25 U	25 U	25 U	25 U	10 U	10 U	10 U	10 U
Acetone	50	50 U	25 U	50 U	50 U	50 U	50 U	50 U	25 U	50 U	50 U	50 U	50 U	25 U	25 U	25 U	25 U
Benzene	1	5.0 U	1.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	1.0 U	5.0 U	5.0 U	5.0 U	5.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Bromodichloromethane	50	5.0 U	1.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	1.0 U	5.0 U	5.0 U	5.0 U	5.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Bromoform	50	5.0 U	1.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	1.0 U	5.0 U	5.0 U	5.0 U	5.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Bromomethane	5	10 U	1.0 U	10 U	10 U	10 U	10 U	10 U	1.0 U	10 U	10 U	10 U	10 U	1.0 U	1.0 U	1.0 U	1.0 U
Carbon Disulfide	- -	5.0 U	1.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	1.0 U	5.0 U	5.0 U	5.0 U	5.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Carbon Tetrachloride	5	5.0 U	1.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	1.0 U	5.0 U	5.0 U	5.0 U	5.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Chlorobenzene	5	5.0 U	1.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	1.0 U	5.0 U	5.0 U	5.0 U	5.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Chloroethane	5	10 U	1.0 U	10 U	10 U	10 U	10 U	10 U	1.0 U	10 U	10 U	10 U	10 U	1.0 U	1.0 U	1.0 U	1.0 U
Chloroform	7	5.0 U	1.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	1.0 U	5.0 U	5.0 U	5.0 U	5.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Chloromethane	- -	10 U	1.0 U	10 U	10 U	10 U	10 U	10 U	1.0 U	10 U	10 U	10 U	10 U	1.0 U	1.0 U	1.0 U	1.0 U
cis-1,2-Dichloroethene	5	5.0 U	**2.9**	5.0 U	**0.72 J**	**1.6 J**	5.0 U	5.0 U	1.0 U	5.0 U	5.0 U	5.0 U	5.0 U	1.0 U	**1.4**	1.0 U	1.0 U
cis-1,3-Dichloropropene	0.4	5.0 U	1.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	1.0 U	5.0 U	5.0 U	5.0 U	5.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Dibromochloromethane	50	5.0 U	1.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	1.0 U	5.0 U	5.0 U	5.0 U	5.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Ethylbenzene	5	5.0 U	1.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	1.0 U	5.0 U	5.0 U	5.0 U	5.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Methylene Chloride	5	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U
Naphthalene	10	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Styrene	5	5.0 U	1.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	1.0 U	5.0 U	5.0 U	5.0 U	5.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Tetrachloroethene	5	5.0 U	**1.2**	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	1.0 U	5.0 U	5.0 U	5.0 U	5.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Toluene	5	5.0 U	1.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	1.0 U	5.0 U	5.0 U	5.0 U	5.0 U	1.0 U	1.0 U	1.0 U	1.0 U
trans-1,2-Dichloroethene	5	5.0 U	1.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	1.0 U	5.0 U	5.0 U	5.0 U	5.0 U	1.0 U	1.0 U	1.0 U	1.0 U
trans-1,3-Dichloropropene	0.4	5.0 U	1.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	1.0 U	5.0 U	5.0 U	5.0 U	5.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Trichloroethene	5	5.0 U	**2.2**	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	1.0 U	5.0 U	5.0 U	5.0 U	5.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Vinyl Acetate	- -	10 U	2.0 U	10 U	10 U	10 U	10 U	10 U	2.0 U	10 U	10 U	NA	NA	NA	NA	NA	NA
Vinyl Chloride	2	10 U	1.0 U	10 U	10 U	10 U	10 U	10 U	1.0 U	10 U	10 U	10 U	10 U	1.0 U	1.0 U	1.0 U	1.0 U
Xylenes (total)	5	5.0 U	2.0 U	10 U	5.0 U	5.0 U	5.0 U	5.0 U	2.0 U	10 U	10 U	10 U	10 U	2.0 U	2.0 U	2.0 U	2.0 U
Total VOCs	- -	ND	**13**	ND	**4.4 J**	**11 J**	ND	**6.0**	**2.4**	ND	ND	ND	ND	**14**	**7.2**	**1.2**	**3.6**

See Notes on Page 31.

Appendix E. Summary of Historical VOC Data in Groundwater, Revised Draft RFI Report, Ashland Inc., Rensselaer, New York

Location ID: / Date Collected:	NYSDEC TOGS 1.1.1 Water Guidance Values	MW-9 04/06/04	MW-9 10/13/04	MW-9 04/13/05	MW-9 05/09/06	MW-9 10/04/06	MW-9 04/11/07	MW-9 09/18/07	MW-9 04/09/08	MW-9 09/15/08	MW-10 05/29/97	MW-10 11/21/97	MW-10 05/29/98	MW-10 11/20/98	MW-10 05/27/99	MW-10 11/16/99	MW-10 05/24/00
Volatile Organics																	
1,1,1-Trichloroethane	5	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	5.0 U	5.0 U	5.0 U	5.0 U	1.0 U	5.0 U	5.0 U
1,1,2,2-Tetrachloroethane	5	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	5.0 U	5.0 U	5.0 U	5.0 U	1.0 U	5.0 U	5.0 U
1,1,2-Trichloroethane	1	1.0 U	1.0 U	1.0 U	1.0 U	NA	1.0 U	1.0 U	1.0 U	1.0 U	5.0 U	5.0 U	5.0 U	5.0 U	1.0 U	5.0 U	5.0 U
1,1-Dichloroethane	5	1.0 U	**2.2**	**1.5**	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	5.0 U	5.0 U	5.0 U	5.0 U	1.0 U	5.0 U	5.0 U
1,1-Dichloroethene	5	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	5.0 U	5.0 U	5.0 U	5.0 U	1.0 U	5.0 U	5.0 U
1,2-Dichloroethane	0.6	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	5.0 U	5.0 U	5.0 U	5.0 U	1.0 U	5.0 U	5.0 U
1,2-Dichloroethene (total)	- -	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,2-Dichloropropane	1	1.0 U	1.0 U	1.0 U	1.0 U	NA	1.0 U	1.0 U	1.0 U	1.0 U	5.0 U	5.0 U	5.0 U	5.0 U	1.0 U	5.0 U	5.0 U
2-Butanone	- -	10 U	10 U	10 U	10 U	10 U	10 U	10 UJ	10 U	10 U	25 U	25 U	25 U	25 U	10 U	25 U	25 U
2-Chloroethylvinylether	- -	NA	NA	NA	NA	NA	NA	NA	NA	NA	50 U	50 U	50 U	50 U	10 U	50 U	50 U
2-Hexanone	50	10 U	10 U	10 U	10 U	NA	10 U	10 U	10 U	10 U	25 U	25 U	25 U	25 U	10 U	25 U	25 U
4-Methyl-2-pentanone	- -	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	25 U	25 U	25 U	25 U	10 U	25 U	25 U
Acetone	50	25 U	25 U	25 U	25 U	25 U	25 U	25 UJ	25 U	25 U	50 U	50 U	50 U	50 U	25 U	50 U	50 U
Benzene	1	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	5.0 U	5.0 U	5.0 U	5.0 U	1.0 U	5.0 U	5.0 U
Bromodichloromethane	50	1.0 U	1.0 U	1.0 U	1.0 U	NA	1.0 U	1.0 U	1.0 U	1.0 U	5.0 U	5.0 U	5.0 U	5.0 U	1.0 U	5.0 U	5.0 U
Bromoform	50	1.0 U	1.0 U	1.0 U	1.0 U	NA	1.0 U	1.0 U	1.0 U	1.0 U	5.0 U	5.0 U	5.0 U	5.0 U	1.0 U	5.0 U	5.0 U
Bromomethane	5	1.0 U	1.0 U	1.0 U	1.0 U	NA	1.0 U	1.0 U	1.0 UJ	1.0 U	10 U	10 U	10 U	10 U	1.0 U	10 U	10 U
Carbon Disulfide	- -	1.0 U	1.0 U	1.0 U	2.0 U	NA	2.0 U	2.0 U	2.0 U	2.0 U	5.0 U	5.0 U	5.0 U	5.0 U	1.0 U	5.0 U	5.0 U
Carbon Tetrachloride	5	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	5.0 U	5.0 U	5.0 U	5.0 U	1.0 U	5.0 U	5.0 U
Chlorobenzene	5	1.0 U	1.0 U	1.0 U	1.0 U	NA	1.0 U	1.0 U	1.0 U	1.0 U	5.0 U	5.0 U	5.0 U	5.0 U	1.0 U	5.0 U	5.0 U
Chloroethane	5	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 UJ	1.0 U	1.0 U	10 U	10 U	10 U	10 U	1.0 U	10 U	10 U
Chloroform	7	1.0 U	1.0 U	1.0 U	1.0 U	NA	1.0 U	1.0 U	1.0 U	1.0 U	5.0 U	5.0 U	5.0 U	5.0 U	1.0 U	5.0 U	5.0 U
Chloromethane	- -	1.0 U	1.0 U	1.0 U	1.0 U*	NA	1.0 U	1.0 U	1.0 UJ	1.0 UJ	10 U	10 U	10 U	10 U	1.0 U	10 U	10 U
cis-1,2-Dichloroethene	5	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	**5.2**	**4.3 J**	**24**	5.0 U	**1.8**	5.0 U	5.0 U
cis-1,3-Dichloropropene	0.4	1.0 U	1.0 U	1.0 U	1.0 U	NA	1.0 U	1.0 U	1.0 U	1.0 U	5.0 U	5.0 U	5.0 U	5.0 U	1.0 U	5.0 U	5.0 U
Dibromochloromethane	50	1.0 U	1.0 U	1.0 U	1.0 U	NA	1.0 U	1.0 U	1.0 U	1.0 U	5.0 U	5.0 U	5.0 U	5.0 U	1.0 U	5.0 U	5.0 U
Ethylbenzene	5	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	5.0 U	5.0 U	5.0 U	5.0 U	1.0 U	5.0 U	5.0 U
Methylene Chloride	5	5.0 U	5.0 U	1.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U
Naphthalene	10	NA	NA	NA	NA	1.0 U	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Styrene	5	1.0 U	1.0 U	1.0 U	1.0 U	NA	1.0 U	1.0 U	1.0 U	1.0 U	5.0 U	5.0 U	5.0 U	5.0 U	1.0 U	5.0 U	5.0 U
Tetrachloroethene	5	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	5.0 U	5.0 U	5.0 U	5.0 U	1.0 U	5.0 U	5.0 U
Toluene	5	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	5.0 U	5.0 U	5.0 U	5.0 U	1.0 U	5.0 U	5.0 U
trans-1,2-Dichloroethene	5	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	5.0 U	5.0 U	5.0 U	5.0 U	1.0 U	5.0 U	5.0 U
trans-1,3-Dichloropropene	0.4	1.0 U	1.0 U	1.0 U	1.0 U	NA	1.0 U	1.0 U	1.0 U	1.0 U	5.0 U	5.0 U	5.0 U	5.0 U	1.0 U	5.0 U	5.0 U
Trichloroethene	5	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	5.0 U	5.0 U	5.0 U	5.0 U	1.0 U	5.0 U	5.0 U
Vinyl Acetate	- -	NA	NA	NA	NA	NA	NA	NA	NA	NA	10 U	10 U	10 U	10 U	2.0 U	10 U	10 U
Vinyl Chloride	2	1.0 U	1.0 U	1.0 U	1.0 U*	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	10 U	10 U	10 U	10 U	1.0 U	10 U	10 U
Xylenes (total)	5	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	5.0 U	5.0 U	5.0 U	5.0 U	2.0 U	10 U	10 U
Total VOCs	- -	ND	**2.2**	**1.5**	ND	ND	ND	ND	ND	NDJ	**5.2**	**4.3 J**	**24**	ND	**1.8**	ND	ND

See Notes on Page 31.

Appendix E. Summary of Historical VOC Data in Groundwater, Revised Draft RFI Report, Ashland Inc., Rensselaer, New York

Location ID: / Date Collected:	NYSDEC TOGS 1.1.1 Water Guidance Values	MW-10 11/30/00	MW-10 06/07/01	MW-10 11/08/01	MW-10 05/21/02	MW-10 11/12/02	MW-10 04/21/03	MW-10 07/16/03	MW-10 10/27/03	MW-10 04/06/04	MW-10 10/13/04	MW-10 04/13/05	MW-10 05/09/06	MW-10 10/04/06	MW-10 04/11/07	MW-10 09/12/07
Volatile Organics																
1,1,1-Trichloroethane	5	5.0 U	5.0 U	5.0 U	1.0 U	1.0 U	1.0 U	1.0 U [1.0 U]	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U [1.0 U]	1.0 U	1.0 U
1,1,2,2-Tetrachloroethane	5	5.0 U	5.0 U	5.0 U	1.0 U	1.0 U	1.0 U	1.0 U [1.0 U]	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U [1.0 U]	1.0 U	1.0 U
1,1,2-Trichloroethane	1	5.0 U	5.0 U	5.0 U	1.0 U	1.0 U	1.0 U	1.0 U [1.0 U]	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	NA	1.0 U	1.0 U
1,1-Dichloroethane	5	5.0 U	5.0 U	5.0 U	1.0 U	1.0 U	1.0 U	1.0 U [1.0 U]	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U [1.0 U]	1.0 U	1.0 U
1,1-Dichloroethene	5	5.0 U	5.0 U	5.0 U	1.0 U	1.0 U	1.0 U	1.0 U [1.0 U]	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U [1.0 U]	1.0 U	1.0 U
1,2-Dichloroethane	0.6	5.0 U	5.0 U	5.0 U	1.0 U	1.0 U	1.0 U	1.0 U [1.0 U]	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U [1.0 U]	1.0 U	1.0 U
1,2-Dichloroethene (total)	- -	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,2-Dichloropropane	1	5.0 U	5.0 U	5.0 U	1.0 U	1.0 U	1.0 U	1.0 U [1.0 U]	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	NA	1.0 U	1.0 U
2-Butanone	- -	25 U	25 U	25 U	10 U	10 U	10 U	10 U [10 U]	10 U	10 U	10 U	10 U	10 U	10 U [10 U]	10 U	10 U
2-Chloroethylvinylether	- -	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
2-Hexanone	50	25 U	25 U	25 U	10 U	10 U	10 U	10 U [10 U]	10 U	10 U	10 U	10 U	10 U	NA	10 U	10 UJ
4-Methyl-2-pentanone	- -	25 U	25 U	25 U	10 U	10 U	10 U	10 U [10 U]	10 U	10 U	10 U	10 U	10 U	10 U [10 U]	10 U	10 U
Acetone	50	50 U	50 U	50 U	25 U	25 U	25 U	25 U [25 U]	25 U	25 U	25 U	25 U	25 U	25 U [25 U]	25 U	25 U
Benzene	1	5.0 U	5.0 U	5.0 U	1.0 U	1.0 U	1.0 U	1.0 U [1.0 U]	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U [1.0 U]	1.0 U	1.0 U
Bromodichloromethane	50	5.0 U	5.0 U	5.0 U	1.0 U	1.0 U	1.0 U	1.0 U [1.0 U]	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	NA	1.0 U	1.0 U
Bromoform	50	5.0 U	5.0 U	5.0 U	1.0 U	1.0 U	1.0 U	1.0 U [1.0 U]	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	NA	1.0 U	1.0 UJ
Bromomethane	5	10 U	10 U	10 U	1.0 U	1.0 U	1.0 U	1.0 U [1.0 U]	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	NA	1.0 U	1.0 U
Carbon Disulfide	- -	5.0 U	5.0 U	5.0 U	1.0 U	1.0 U	1.0 U	1.0 U [1.0 U]	1.0 U	1.0 U	1.0 U	1.0 U	2.0 U	NA	2.0 U	2.0 U
Carbon Tetrachloride	5	5.0 U	5.0 U	5.0 U	1.0 U	1.0 U	1.0 U	1.0 U [1.0 U]	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U [1.0 U]	1.0 U	1.0 U
Chlorobenzene	5	5.0 U	5.0 U	5.0 U	1.0 U	1.0 U	1.0 U	1.0 U [1.0 U]	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	NA	1.0 U	1.0 U
Chloroethane	5	10 U	10 U	10 U	1.0 U	1.0 U	1.0 U	1.0 U [1.0 U]	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U [1.0 U]	1.0 U	1.0 U
Chloroform	7	5.0 U	5.0 U	5.0 U	1.0 U	1.0 U	1.0 U	1.0 U [1.0 U]	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	NA	1.0 U	1.0 U
Chloromethane	- -	10 U	10 U	10 U	1.0 U	1.0 U	1.0 U	1.0 U [1.0 U]	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U*	NA	1.0 U	1.0 UJ
cis-1,2-Dichloroethene	5	5.0 U	5.0 U	5.0 U	1.0 U	1.0 U	1.0 U	1.0 U [1.0 U]	1.0 U	**7.4**	**1.5**	1.0 U	1.0 U	1.0 U [1.0 U]	1.0 U	1.0 U
cis-1,3-Dichloropropene	0.4	5.0 U	5.0 U	5.0 U	1.0 U	1.0 U	1.0 U	1.0 U [1.0 U]	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	NA	1.0 U	1.0 U
Dibromochloromethane	50	5.0 U	5.0 U	5.0 U	1.0 U	1.0 U	1.0 U	1.0 U [1.0 U]	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	NA	1.0 U	1.0 UJ
Ethylbenzene	5	5.0 U	5.0 U	5.0 U	1.0 U	1.0 U	1.0 U	1.0 U [1.0 U]	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U [1.0 U]	1.0 U	1.0 U
Methylene Chloride	5	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U [5.0 U]	5.0 U	5.0 U	5.0 U	1.0 U	5.0 U	5.0 U [5.0 U]	5.0 U	5.0 U
Naphthalene	10	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	1.0 U [1.0 U]	NA	NA
Styrene	5	5.0 U	5.0 U	5.0 U	1.0 U	1.0 U	1.0 U	**3.0 [2.0]**	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	NA	1.0 U	1.0 U
Tetrachloroethene	5	5.0 U	5.0 U	5.0 U	1.0 U	1.0 U	1.0 U	1.0 U [1.0 U]	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U [1.0 U]	1.0 U	1.0 U
Toluene	5	5.0 U	5.0 U	5.0 U	1.0 U	1.0 U	1.0 U	1.0 U [1.0 U]	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U [1.0 U]	1.0 U	1.0 U
trans-1,2-Dichloroethene	5	5.0 U	5.0 U	5.0 U	1.0 U	1.0 U	1.0 U	1.0 U [1.0 U]	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U [1.0 U]	1.0 U	1.0 U
trans-1,3-Dichloropropene	0.4	5.0 U	5.0 U	5.0 U	1.0 U	1.0 U	1.0 U	1.0 U [1.0 U]	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	NA	1.0 U	1.0 U
Trichloroethene	5	5.0 U	5.0 U	5.0 U	1.0 U	1.0 U	1.0 U	1.0 U [1.0 U]	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U [1.0 U]	1.0 U	1.0 U
Vinyl Acetate	- -	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Vinyl Chloride	2	10 U	10 U	10 U	1.0 U	1.0 U	1.0 U	1.0 U [1.0 U]	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U*	1.0 U [1.0 U]	1.0 U	1.0 U
Xylenes (total)	5	10 U	10 U	10 U	2.0 U	2.0 U	2.0 U	2.0 U [2.0 U]	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U [2.0 U]	2.0 U	2.0 U
Total VOCs	- -	ND	ND	ND	ND	ND	ND	**3.0 [2.0]**	ND	**7.4**	**1.5**	ND	ND	ND [ND]	ND	ND

See Notes on Page 31.

Appendix E. Summary of Historical VOC Data in Groundwater, Revised Draft RFI Report, Ashland Inc., Rensselaer, New York

Location ID: / Date Collected:	NYSDEC TOGS 1.1.1 Water Guidance Values	MW-10 04/10/08	MW-10 09/16/08	MW-11 05/29/97	MW-11 11/21/97	MW-11 05/29/98	MW-11 11/20/98	MW-11 05/27/99	MW-11 11/16/99	MW-11 05/24/00	MW-11 11/30/00	MW-11 06/06/01	MW-11 11/08/01	MW-11 05/21/02	MW-11 11/12/02	MW-11 04/21/03
Volatile Organics																
1,1,1-Trichloroethane	5	1.0 U	1.0 U	5.0 U	5.0 U	5.0 U	5.0 U	1.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	1.0 U	1.0 U	1.0 U
1,1,2,2-Tetrachloroethane	5	1.0 U	1.0 U	5.0 U	5.0 U	5.0 U	5.0 U	1.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	1.0 U	1.0 U	1.0 U
1,1,2-Trichloroethane	1	1.0 U	1.0 U	5.0 U	5.0 U	5.0 U	5.0 U	1.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	1.0 U	1.0 U	1.0 U
1,1-Dichloroethane	5	1.0 U	1.0 U	5.0 U	5.0 U	5.0 U	5.0 U	1.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	1.0 U	1.0 U	1.0 U
1,1-Dichloroethene	5	1.0 U	1.0 U	5.0 U	5.0 U	5.0 U	5.0 U	1.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	1.0 U	1.0 U	1.0 U
1,2-Dichloroethane	0.6	1.0 U	1.0 U	5.0 U	5.0 U	5.0 U	5.0 U	1.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	1.0 U	1.0 U	1.0 U
1,2-Dichloroethene (total)	- -	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,2-Dichloropropane	1	1.0 U	1.0 U	5.0 U	5.0 U	5.0 U	5.0 U	1.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	1.0 U	1.0 U	1.0 U
2-Butanone	- -	10 U	10 U	25 U	25 U	25 U	25 U	10 U	25 U	25 U	25 U	25 U	25 U	10 U	10 U	10 U
2-Chloroethylvinylether	- -	NA	NA	50 U	50 U	50 U	50 U	10 U	50 U	50 U	NA	NA	NA	NA	NA	NA
2-Hexanone	50	10 U	10 U	25 U	25 U	25 U	25 U	10 U	25 U	25 U	25 U	25 U	25 U	10 U	10 U	10 U
4-Methyl-2-pentanone	- -	10 U	10 U	25 U	25 U	25 U	25 U	10 U	25 U	25 U	25 U	25 U	25 U	10 U	10 U	10 U
Acetone	50	25 U	25 U	50 U	50 U	50 U	50 U	25 U	50 U	50 U	50 U	50 U	50 U	25 U	25 U	25 U
Benzene	1	1.0 U	1.0 U	5.0 U	5.0 U	5.0 U	5.0 U	1.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	1.0 U	1.0 U	1.0 U
Bromodichloromethane	50	1.0 U	1.0 U	5.0 U	5.0 U	5.0 U	5.0 U	1.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	1.0 U	1.0 U	1.0 U
Bromoform	50	1.0 U	1.0 U	5.0 U	5.0 U	5.0 U	5.0 U	1.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	1.0 U	1.0 U	1.0 U
Bromomethane	5	1.0 UJ	1.0 U	10 U	10 U	10 U	10 U	1.0 U	10 U	10 U	10 U	10 U	10 U	1.0 U	1.0 U	1.0 U
Carbon Disulfide	- -	2.0 U	2.0 U	**1.7 J**	5.0 U	5.0 U	5.0 U	1.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	1.0 U	1.0 U	1.0 U
Carbon Tetrachloride	5	1.0 U	1.0 U	5.0 U	5.0 U	5.0 U	5.0 U	1.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	1.0 U	1.0 U	1.0 U
Chlorobenzene	5	1.0 U	1.0 U	5.0 U	5.0 U	5.0 U	5.0 U	1.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	1.0 U	1.0 U	1.0 U
Chloroethane	5	1.0 U	1.0 UJ	10 U	10 U	10 U	10 U	1.0 U	10 U	10 U	10 U	10 U	10 U	1.0 U	1.0 U	1.0 U
Chloroform	7	1.0 U	1.0 U	5.0 U	5.0 U	5.0 U	5.0 U	1.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	1.0 U	1.0 U	1.0 U
Chloromethane	- -	1.0 UJ	1.0 UJ	10 U	10 U	10 U	10 U	1.0 U	10 U	10 U	10 U	10 U	10 U	1.0 U	1.0 U	1.0 U
cis-1,2-Dichloroethene	5	1.0 U	1.0 U	5.0 U	5.0 U	5.0 U	5.0 U	1.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	1.0 U	1.0 U	1.0 U
cis-1,3-Dichloropropene	0.4	1.0 U	1.0 U	5.0 U	5.0 U	5.0 U	5.0 U	1.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	1.0 U	1.0 U	1.0 U
Dibromochloromethane	50	1.0 U	1.0 U	5.0 U	5.0 U	5.0 U	5.0 U	1.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	1.0 U	1.0 U	1.0 U
Ethylbenzene	5	1.0 U	1.0 U	5.0 U	5.0 U	5.0 U	5.0 U	1.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	1.0 U	1.0 U	1.0 U
Methylene Chloride	5	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U
Naphthalene	10	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Styrene	5	1.0 U	1.0 U	5.0 U	5.0 U	5.0 U	5.0 U	1.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	1.0 U	1.0 U	1.0 U
Tetrachloroethene	5	1.0 U	1.0 U	5.0 U	5.0 U	5.0 U	5.0 U	1.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	1.0 U	1.0 U	1.0 U
Toluene	5	1.0 U	1.0 U	5.0 U	5.0 U	5.0 U	5.0 U	1.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	1.0 U	1.0 U	1.0 U
trans-1,2-Dichloroethene	5	1.0 U	1.0 U	5.0 U	5.0 U	5.0 U	5.0 U	1.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	1.0 U	1.0 U	1.0 U
trans-1,3-Dichloropropene	0.4	1.0 U	1.0 U	5.0 U	5.0 U	5.0 U	5.0 U	1.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	1.0 U	1.0 U	1.0 U
Trichloroethene	5	1.0 U	1.0 U	5.0 U	5.0 U	5.0 U	5.0 U	1.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	1.0 U	1.0 U	1.0 U
Vinyl Acetate	- -	NA	NA	10 U	10 U	10 U	10 U	2.0 U	10 U	10 U	NA	NA	NA	NA	NA	NA
Vinyl Chloride	2	1.0 U	1.0 U	10 U	10 U	10 U	10 U	1.0 U	10 U	10 U	10 U	10 U	10 U	1.0 U	1.0 U	1.0 U
Xylenes (total)	5	2.0 U	2.0 U	5.0 U	5.0 U	5.0 U	5.0 U	2.0 U	10 U	10 U	10 U	10 U	10 U	2.0 U	2.0 U	2.0 U
Total VOCs	- -	ND	NDJ	**1.7 J**	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND

See Notes on Page 31.

Appendix E. Summary of Historical VOC Data in Groundwater, Revised Draft RFI Report, Ashland Inc., Rensselaer, New York

Location ID: / Date Collected:	NYSDEC TOGS 1.1.1 Water Guidance Values	MW-11 10/28/03	MW-11 04/09/04	MW-11 10/13/04	MW-11 04/14/05	MW-11 05/08/06	MW-11 10/04/06	MW-11 04/11/07	MW-11 09/24/07	MW-11 04/10/08	MW-11 09/16/08	MW-12A 05/29/97	MW-12A 11/21/97	MW-12A 05/29/98	MW-12A 11/20/98	MW-12A 05/27/99
Volatile Organics																
1,1,1-Trichloroethane	5	1.0 U [1.0 U]	1.0 U	1.0 U [1.0 U]	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	5.0 U	5.0 U	5.0 U	5.0 U	1.0 U
1,1,2,2-Tetrachloroethane	5	1.0 U [1.0 U]	1.0 U	1.0 U [1.0 U]	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	5.0 U	5.0 U	5.0 U	5.0 U	1.0 U
1,1,2-Trichloroethane	1	1.0 U [1.0 U]	1.0 U	1.0 U [1.0 U]	1.0 U	1.0 U	NA	1.0 U	1.0 U	1.0 U	1.0 U	5.0 U	5.0 U	5.0 U	5.0 U	1.0 U
1,1-Dichloroethane	5	1.0 U [1.0 U]	1.0 U	1.0 U [1.0 U]	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	5.0 U	5.0 U	5.0 U	5.0 U	1.0 U
1,1-Dichloroethene	5	1.0 U [1.0 U]	1.0 U	1.0 U [1.0 U]	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	5.0 U	5.0 U	5.0 U	5.0 U	1.0 U
1,2-Dichloroethane	0.6	1.0 U [1.0 U]	1.0 U	1.0 U [1.0 U]	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	5.0 U	5.0 U	5.0 U	5.0 U	1.0 U
1,2-Dichloroethene (total)	- -	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,2-Dichloropropane	1	1.0 U [1.0 U]	1.0 U	1.0 U [1.0 U]	1.0 U	1.0 U	NA	1.0 U	1.0 U	1.0 U	1.0 U	5.0 U	5.0 U	5.0 U	5.0 U	1.0 U
2-Butanone	- -	10 U [10 U]	10 U	10 U [10 U]	10 U	10 U	10 U	10 U	10 U	10 U	10 U	25 U	25 U	25 U	25 U	10 U
2-Chloroethylvinylether	- -	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	50 U	50 U	50 U	50 U	10 U
2-Hexanone	50	10 U [10 U]	10 U	10 U [10 U]	10 U	10 U	NA	10 U	10 U	10 U	10 U	25 U	25 U	25 U	25 U	10 U
4-Methyl-2-pentanone	- -	10 U [10 U]	10 U	10 U [10 U]	10 U	10 U	10 U	10 U	10 U	10 U	10 U	25 U	25 U	25 U	25 U	10 U
Acetone	50	25 U [25 U]	25 U	25 U [25 U]	25 U	25 U	25 U	25 U	25 U	25 U	25 U	50 U	50 U	50 U	50 U	25 U
Benzene	1	1.0 U [1.0 U]	1.0 U	1.0 U [1.0 U]	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	5.0 U	5.0 U	5.0 U	5.0 U	1.0 U
Bromodichloromethane	50	1.0 U [1.0 U]	1.0 U	1.0 U [1.0 U]	1.0 U	1.0 U	NA	1.0 U	1.0 U	1.0 U	1.0 U	5.0 U	5.0 U	5.0 U	5.0 U	1.0 U
Bromoform	50	1.0 U [1.0 U]	1.0 U	1.0 U [1.0 U]	1.0 U	1.0 U	NA	1.0 U	1.0 U	1.0 U	1.0 U	5.0 U	5.0 U	5.0 U	5.0 U	1.0 U
Bromomethane	5	1.0 U [1.0 U]	1.0 U	1.0 U [1.0 U]	1.0 U	1.0 U	NA	1.0 U	1.0 UJ	1.0 UJ	1.0 U	10 U	10 U	10 U	10 U	1.0 U
Carbon Disulfide	- -	1.0 U [1.0 U]	1.0 U	1.0 U [1.0 U]	1.0 U	2.0 U	NA	2.0 U	2.0 U	2.0 U	2.0 U	5.0 U	5.0 U	5.0 U	5.0 U	**4.7**
Carbon Tetrachloride	5	1.0 U [1.0 U]	1.0 U	1.0 U [1.0 U]	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	5.0 U	5.0 U	5.0 U	5.0 U	1.0 U
Chlorobenzene	5	1.0 U [1.0 U]	1.0 U	1.0 U [1.0 U]	1.0 U	1.0 U	NA	1.0 U	1.0 U	1.0 U	1.0 U	5.0 U	5.0 U	5.0 U	5.0 U	1.0 U
Chloroethane	5	1.0 U [1.0 U]	1.0 U	1.0 U [1.0 U]	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	10 U	10 U	10 U	10 U	1.0 U
Chloroform	7	1.0 U [1.0 U]	1.0 U	1.0 U [1.0 U]	1.0 U	1.0 U	NA	1.0 U	1.0 U	1.0 U	1.0 U	5.0 U	5.0 U	5.0 U	5.0 U	1.0 U
Chloromethane	- -	1.0 U [1.0 U]	1.0 U	1.0 U [1.0 U]	1.0 U	1.0 U	NA	1.0 U	1.0 U	1.0 UJ	1.0 U	10 U	10 U	10 U	10 U	1.0 U
cis-1,2-Dichloroethene	5	1.0 U [1.0 U]	1.0 U	1.0 U [1.0 U]	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	5.0 U	5.0 U	5.0 U	5.0 U	1.0 U
cis-1,3-Dichloropropene	0.4	1.0 U [1.0 U]	1.0 U	1.0 U [1.0 U]	1.0 U	1.0 U	NA	1.0 U	1.0 U	1.0 U	1.0 U	5.0 U	5.0 U	5.0 U	5.0 U	1.0 U
Dibromochloromethane	50	1.0 U [1.0 U]	1.0 U	1.0 U [1.0 U]	1.0 U	1.0 U	NA	1.0 U	1.0 U	1.0 U	1.0 U	5.0 U	5.0 U	5.0 U	5.0 U	1.0 U
Ethylbenzene	5	1.0 U [1.0 U]	1.0 U	1.0 U [1.0 U]	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	5.0 U	5.0 U	5.0 U	5.0 U	1.0 U
Methylene Chloride	5	5.0 U [5.0 U]	5.0 U	5.0 U [5.0 U]	1.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U
Naphthalene	10	NA	NA	NA	NA	NA	1.0 U	NA	NA	NA	NA	NA	NA	NA	NA	NA
Styrene	5	1.0 U [1.0 U]	1.0 U	1.0 U [1.0 U]	1.0 U	1.0 U	NA	1.0 U	1.0 U	1.0 U	1.0 U	5.0 U	5.0 U	5.0 U	5.0 U	1.0 U
Tetrachloroethene	5	1.0 U [1.0 U]	1.0 U	1.0 U [1.0 U]	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	5.0 U	5.0 U	5.0 U	5.0 U	1.0 U
Toluene	5	1.0 U [1.0 U]	1.0 U	1.0 U [1.0 U]	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	5.0 U	5.0 U	5.0 U	5.0 U	1.0 U
trans-1,2-Dichloroethene	5	1.0 U [1.0 U]	1.0 U	1.0 U [1.0 U]	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	5.0 U	5.0 U	5.0 U	5.0 U	1.0 U
trans-1,3-Dichloropropene	0.4	1.0 U [1.0 U]	1.0 U	1.0 U [1.0 U]	1.0 U	1.0 U	NA	1.0 U	1.0 U	1.0 U	1.0 U	5.0 U	5.0 U	5.0 U	5.0 U	1.0 U
Trichloroethene	5	1.0 U [1.0 U]	1.0 U	1.0 U [1.0 U]	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	5.0 U	5.0 U	5.0 U	5.0 U	1.0 U
Vinyl Acetate	- -	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	10 U	10 U	10 U	10 U	2.0 U
Vinyl Chloride	2	1.0 U [1.0 U]	1.0 U	1.0 U [1.0 U]	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	10 U	10 U	10 U	10 U	1.0 U
Xylenes (total)	5	2.0 U [2.0 U]	2.0 U	2.0 U [2.0 U]	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	5.0 U	5.0 U	5.0 U	5.0 U	2.0 U
Total VOCs	- -	ND [ND]	ND	ND [ND]	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	**4.7**

See Notes on Page 31.

Appendix E. Summary of Historical VOC Data in Groundwater, Revised Draft RFI Report, Ashland Inc., Rensselaer, New York

Location ID: / Date Collected:	NYSDEC TOGS 1.1.1 Water Guidance Values	MW-12A 11/16/99	MW-12A 05/24/00	MW-12A 11/30/00	MW-12A 06/07/01	MW-12A 11/08/01	MW-12A 05/21/02	MW-12B 05/29/97	MW-12B 11/21/97	MW-12B 05/29/98	MW-12B 11/20/98	MW-12B 05/27/99	MW-12B 11/16/99	MW-12B 05/24/00	MW-12B 11/30/00	MW-12B 06/07/01	MW-12B 11/08/01
Volatile Organics																	
1,1,1-Trichloroethane	5	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	1.0 U	5.0 U	5.0 U	5.0 U	5.0 U	1.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U
1,1,2,2-Tetrachloroethane	5	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	1.0 U	5.0 U	5.0 U	5.0 U	5.0 U	1.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U
1,1,2-Trichloroethane	1	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	1.0 U	5.0 U	5.0 U	5.0 U	5.0 U	1.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U
1,1-Dichloroethane	5	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	1.0 U	5.0 U	5.0 U	5.0 U	5.0 U	1.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U
1,1-Dichloroethene	5	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	1.0 U	5.0 U	5.0 U	5.0 U	5.0 U	1.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U
1,2-Dichloroethane	0.6	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	1.0 U	5.0 U	5.0 U	5.0 U	5.0 U	1.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U
1,2-Dichloroethene (total)	- -	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,2-Dichloropropane	1	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	1.0 U	5.0 U	5.0 U	5.0 U	5.0 U	1.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U
2-Butanone	- -	25 U	25 U	25 U	25 U	25 U	10 U	25 U	25 U	25 U	25 U	10 U	25 U	25 U	25 U	25 U	25 U
2-Chloroethylvinylether	- -	50 U	50 U	NA	NA	NA	NA	50 U	50 U	50 U	50 U	10 U	50 U	50 U	NA	NA	NA
2-Hexanone	50	25 U	25 U	25 U	25 U	25 U	10 U	25 U	25 U	25 U	25 U	10 U	25 U	25 U	25 U	25 U	25 U
4-Methyl-2-pentanone	- -	25 U	25 U	25 U	25 U	25 U	10 U	25 U	25 U	25 U	25 U	10 U	25 U	25 U	25 U	25 U	25 U
Acetone	50	50 U	50 U	50 U	50 U	50 U	25 U	50 U	50 U	50 U	50 U	25 U	50 U	50 U	50 U	50 U	50 U
Benzene	1	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	1.0 U	5.0 U	5.0 U	5.0 U	5.0 U	1.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U
Bromodichloromethane	50	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	1.0 U	5.0 U	5.0 U	5.0 U	5.0 U	1.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U
Bromoform	50	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	1.0 U	5.0 U	5.0 U	5.0 U	5.0 U	1.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U
Bromomethane	5	10 U	10 U	10 U	10 U	10 U	1.0 U	10 U	10 U	10 U	10 U	1.0 U	10 U	10 U	10 U	10 U	10 U
Carbon Disulfide	- -	**9.9**	5.0 U	5.0 U	5.0 U	5.0 U	1.0 U	5.0 U	5.0 U	5.0 U	5.0 U	**5.8**	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U
Carbon Tetrachloride	5	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	1.0 U	5.0 U	5.0 U	5.0 U	5.0 U	1.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U
Chlorobenzene	5	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	1.0 U	5.0 U	5.0 U	5.0 U	5.0 U	1.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U
Chloroethane	5	10 U	10 U	10 U	10 U	10 U	1.0 U	10 U	10 U	10 U	10 U	1.0 U	10 U	10 U	10 U	10 U	10 U
Chloroform	7	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	1.0 U	5.0 U	5.0 U	5.0 U	5.0 U	1.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U
Chloromethane	- -	10 U	10 U	10 U	10 U	10 U	1.0 U	10 U	10 U	10 U	10 U	1.0 U	10 U	10 U	10 U	10 U	10 U
cis-1,2-Dichloroethene	5	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	1.0 U	5.0 U	5.0 U	5.0 U	5.0 U	1.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U
cis-1,3-Dichloropropene	0.4	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	1.0 U	5.0 U	5.0 U	5.0 U	5.0 U	1.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U
Dibromochloromethane	50	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	1.0 U	5.0 U	5.0 U	5.0 U	5.0 U	1.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U
Ethylbenzene	5	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	1.0 U	5.0 U	5.0 U	5.0 U	5.0 U	1.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U
Methylene Chloride	5	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U
Naphthalene	10	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Styrene	5	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	1.0 U	5.0 U	5.0 U	5.0 U	5.0 U	1.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U
Tetrachloroethene	5	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	1.0 U	5.0 U	5.0 U	5.0 U	5.0 U	1.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U
Toluene	5	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	1.0 U	5.0 U	5.0 U	5.0 U	5.0 U	1.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U
trans-1,2-Dichloroethene	5	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	1.0 U	5.0 U	5.0 U	5.0 U	5.0 U	1.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U
trans-1,3-Dichloropropene	0.4	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	1.0 U	5.0 U	5.0 U	5.0 U	5.0 U	1.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U
Trichloroethene	5	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	1.0 U	5.0 U	5.0 U	5.0 U	5.0 U	1.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U
Vinyl Acetate	- -	10 U	10 U	NA	NA	NA	NA	10 U	10 U	10 U	10 U	2.0 U	10 U	10 U	NA	NA	NA
Vinyl Chloride	2	10 U	10 U	10 U	10 U	10 U	1.0 U	10 U	10 U	10 U	10 U	1.0 U	10 U	10 U	10 U	10 U	10 U
Xylenes (total)	5	10 U	10 U	10 U	10 U	10 U	2.0 U	5.0 U	5.0 U	5.0 U	5.0 U	2.0 U	10 U	10 U	10 U	10 U	10 U
Total VOCs	- -	**9.9**	ND	ND	ND	ND	ND	ND	ND	ND	ND	**5.8**	ND	ND	ND	ND	ND

See Notes on Page 31.

Appendix E. Summary of Historical VOC Data in Groundwater, Revised Draft RFI Report, Ashland Inc., Rensselaer, New York

Location ID: / Date Collected:	NYSDEC TOGS 1.1.1 Water Guidance Values	MW-12B 05/21/02	MW-12D 11/12/02	MW-12D 04/21/03	MW-12D 10/28/03	MW-12D 04/08/04	MW-12D 10/13/04	MW-12D 04/14/05	MW-12D 05/08/06	MW-12D 10/03/06	MW-12D 04/10/07	MW-12D 09/21/07	MW-12D 04/10/08	MW-12D 09/16/08	MW-12S 11/12/02	MW-12S 04/21/03	MW-12S 10/28/03
Volatile Organics																	
1,1,1-Trichloroethane	5	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
1,1,2,2-Tetrachloroethane	5	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
1,1,2-Trichloroethane	1	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	NA	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
1,1-Dichloroethane	5	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
1,1-Dichloroethene	5	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
1,2-Dichloroethane	0.6	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
1,2-Dichloroethene (total)	- -	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,2-Dichloropropane	1	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	NA	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
2-Butanone	- -	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
2-Chloroethylvinylether	- -	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
2-Hexanone	50	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	NA	10 U	10 U	10 U	10 U	10 U	10 U	10 U
4-Methyl-2-pentanone	- -	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Acetone	50	25 U	25 U	25 U	25 U	25 U	25 U	25 U	25 U	25 U	25 U	25 U	25 U	25 U	25 U	25 U	25 U
Benzene	1	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Bromodichloromethane	50	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	NA	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Bromoform	50	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	NA	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Bromomethane	5	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	NA	1.0 U	1.0 UJ	1.0 UJ	1.0 U	1.0 U	1.0 U	1.0 U
Carbon Disulfide	- -	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	2.0 U	NA	2.0 U	2.0 U	2.0 U	2.0 U	1.0 U	1.0 U	1.0 U
Carbon Tetrachloride	5	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Chlorobenzene	5	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	NA	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Chloroethane	5	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 UJ	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Chloroform	7	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	NA	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Chloromethane	- -	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	NA	1.0 U	1.0 UJ	1.0 UJ	1.0 U	1.0 U	1.0 U	1.0 U
cis-1,2-Dichloroethene	5	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
cis-1,3-Dichloropropene	0.4	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	NA	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Dibromochloromethane	50	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	NA	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Ethylbenzene	5	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Methylene Chloride	5	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	1.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U
Naphthalene	10	NA	NA	NA	NA	NA	NA	NA	NA	1.0 U	NA	NA	NA	NA	NA	NA	NA
Styrene	5	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	NA	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Tetrachloroethene	5	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Toluene	5	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
trans-1,2-Dichloroethene	5	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
trans-1,3-Dichloropropene	0.4	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	NA	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Trichloroethene	5	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Vinyl Acetate	- -	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Vinyl Chloride	2	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Xylenes (total)	5	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U
Total VOCs	- -	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND

See Notes on Page 31.

Appendix E. Summary of Historical VOC Data in Groundwater, Revised Draft RFI Report, Ashland Inc., Rensselaer, New York

Location ID: / Date Collected:	NYSDEC TOGS 1.1.1 Water Guidance Values	MW-12S 04/09/04	MW-12S 10/13/04	MW-12S 04/14/05	MW-12S 05/08/06	MW-12S 10/04/06	MW-12S 04/10/07	MW-12S 09/21/07	MW-12S 04/10/08	MW-12S 09/16/08	MW-13 05/29/97	MW-13 11/21/97	MW-13 05/28/98	MW-13 11/19/98	MW-13 05/26/99	MW-13 11/16/99	MW-13 05/24/00
Volatile Organics																	
1,1,1-Trichloroethane	5	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	5.0 U	5.0 U	5.0 U	5.0 U	1.0 U	5.0 U	5.0 U
1,1,2,2-Tetrachloroethane	5	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	5.0 U	5.0 U	5.0 U	5.0 U	1.0 U	5.0 U	5.0 U
1,1,2-Trichloroethane	1	1.0 U	1.0 U	1.0 U	1.0 U	NA	1.0 U	1.0 U	1.0 U	1.0 U	5.0 U	5.0 U	5.0 U	5.0 U	1.0 U	5.0 U	5.0 U
1,1-Dichloroethane	5	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	5.0 U	5.0 U	5.0 U	5.0 U	1.0 U	5.0 U	5.0 U
1,1-Dichloroethene	5	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	5.0 U	5.0 U	5.0 U	5.0 U	1.0 U	5.0 U	5.0 U
1,2-Dichloroethane	0.6	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	5.0 U	5.0 U	5.0 U	5.0 U	1.0 U	5.0 U	5.0 U
1,2-Dichloroethene (total)	- -	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,2-Dichloropropane	1	1.0 U	1.0 U	1.0 U	1.0 U	NA	1.0 U	1.0 U	1.0 U	1.0 U	5.0 U	5.0 U	5.0 U	5.0 U	1.0 U	5.0 U	5.0 U
2-Butanone	- -	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	25 U	25 U	25 U	25 U	10 U	25 U	25 U
2-Chloroethylvinylether	- -	NA	NA	NA	NA	NA	NA	NA	NA	NA	50 U	50 U	50 U	50 U	10 U	50 U	50 U
2-Hexanone	50	10 U	10 U	10 U	10 U	NA	10 U	10 U	10 U	10 U	25 U	25 U	25 U	25 U	10 U	25 U	25 U
4-Methyl-2-pentanone	- -	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	25 U	25 U	25 U	25 U	10 U	25 U	25 U
Acetone	50	25 U	25 U	25 U	25 U	25 U	25 U	25 U	25 U	25 U	50 U	50 U	50 U	50 U	25 U	50 U	50 U
Benzene	1	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	5.0 U	5.0 U	5.0 U	5.0 U	1.0 U	5.0 U	5.0 U
Bromodichloromethane	50	1.0 U	1.0 U	1.0 U	1.0 U	NA	1.0 U	1.0 U	1.0 U	1.0 U	5.0 U	5.0 U	5.0 U	5.0 U	1.0 U	5.0 U	5.0 U
Bromoform	50	1.0 U	1.0 U	1.0 U	1.0 U	NA	1.0 U	1.0 U	1.0 U	1.0 U	5.0 U	5.0 U	5.0 U	5.0 U	1.0 U	5.0 U	5.0 U
Bromomethane	5	1.0 U	1.0 U	1.0 U	1.0 U	NA	1.0 U	1.0 UJ	1.0 UJ	1.0 U	10 U	10 U	10 U	10 U	1.0 U	10 U	10 U
Carbon Disulfide	- -	1.0 U	1.0 U	1.0 U	2.0 U	NA	2.0 U	2.0 U	2.0 U	2.0 U	5.0 U	5.0 U	5.0 U	5.0 U	1.0 U	5.0 U	5.0 U
Carbon Tetrachloride	5	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	5.0 U	5.0 U	5.0 U	5.0 U	1.0 U	5.0 U	5.0 U
Chlorobenzene	5	1.0 U	1.0 U	1.0 U	1.0 U	NA	1.0 U	1.0 U	1.0 U	1.0 U	5.0 U	5.0 U	5.0 U	5.0 U	1.0 U	5.0 U	5.0 U
Chloroethane	5	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 UJ	1.0 U	1.0 U	10 U	10 U	10 U	10 U	1.0 U	10 U	10 U
Chloroform	7	1.0 U	1.0 U	1.0 U	1.0 U	NA	1.0 U	1.0 U	1.0 U	1.0 U	5.0 U	5.0 U	5.0 U	5.0 U	1.0 U	5.0 U	5.0 U
Chloromethane	- -	1.0 U	1.0 U	1.0 U	1.0 U	NA	1.0 U	1.0 UJ	1.0 UJ	1.0 U	10 U	10 U	10 U	10 U	1.0 U	10 U	10 U
cis-1,2-Dichloroethene	5	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	5.0 U	5.0 U	5.0 U	5.0 U	1.0 U	5.0 U	5.0 U
cis-1,3-Dichloropropene	0.4	1.0 U	1.0 U	1.0 U	1.0 U	NA	1.0 U	1.0 U	1.0 U	1.0 U	5.0 U	5.0 U	5.0 U	5.0 U	1.0 U	5.0 U	5.0 U
Dibromochloromethane	50	1.0 U	1.0 U	1.0 U	1.0 U	NA	1.0 U	1.0 U	1.0 U	1.0 U	5.0 U	5.0 U	5.0 U	5.0 U	1.0 U	5.0 U	5.0 U
Ethylbenzene	5	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	5.0 U	5.0 U	5.0 U	5.0 U	1.0 U	5.0 U	5.0 U
Methylene Chloride	5	5.0 U	5.0 U	1.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U
Naphthalene	10	NA	NA	NA	NA	1.0 U	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Styrene	5	1.0 U	1.0 U	1.0 U	1.0 U	NA	1.0 U	1.0 U	1.0 U	1.0 U	5.0 U	5.0 U	5.0 U	5.0 U	1.0 U	5.0 U	5.0 U
Tetrachloroethene	5	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	5.0 U	5.0 U	5.0 U	5.0 U	1.0 U	5.0 U	5.0 U
Toluene	5	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	5.0 U	5.0 U	5.0 U	5.0 U	1.0 U	5.0 U	5.0 U
trans-1,2-Dichloroethene	5	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	5.0 U	5.0 U	5.0 U	5.0 U	1.0 U	5.0 U	5.0 U
trans-1,3-Dichloropropene	0.4	1.0 U	1.0 U	1.0 U	1.0 U	NA	1.0 U	1.0 U	1.0 U	1.0 U	5.0 U	5.0 U	5.0 U	5.0 U	1.0 U	5.0 U	5.0 U
Trichloroethene	5	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	5.0 U	5.0 U	5.0 U	5.0 U	1.0 U	5.0 U	5.0 U
Vinyl Acetate	- -	NA	NA	NA	NA	NA	NA	NA	NA	NA	10 U	10 U	10 U	10 U	2.0 U	10 U	10 U
Vinyl Chloride	2	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	10 U	10 U	10 U	10 U	1.0 U	10 U	10 U
Xylenes (total)	5	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	5.0 U	5.0 U	5.0 U	5.0 U	2.0 U	10 U	10 U
Total VOCs	- -	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND

See Notes on Page 31.

Appendix E. Summary of Historical VOC Data in Groundwater, Revised Draft RFI Report, Ashland Inc., Rensselaer, New York

Location ID: / Date Collected:	NYSDEC TOGS 1.1.1 Water Guidance Values	MW-13 11/29/00	MW-13 06/05/01	MW-13 11/08/01	MW-13 05/21/02	MW-13 11/12/02	MW-13 04/23/03	MW-13 07/16/03	MW-13 10/28/03	MW-13 04/08/04	MW-13 10/13/04	MW-13 04/14/05	MW-13 05/08/06	MW-13 10/03/06	MW-13 04/10/07	MW-13 09/17/07	MW-13 04/09/08
Volatile Organics																	
1,1,1-Trichloroethane	5	5.0 U	5.0 U	5.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
1,1,2,2-Tetrachloroethane	5	5.0 U	5.0 U	5.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
1,1,2-Trichloroethane	1	5.0 U	5.0 U	5.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	NA	1.0 U	1.0 U	1.0 U
1,1-Dichloroethane	5	5.0 U	5.0 U	5.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
1,1-Dichloroethene	5	5.0 U	5.0 U	5.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
1,2-Dichloroethane	0.6	5.0 U	5.0 U	5.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
1,2-Dichloroethene (total)	- -	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,2-Dichloropropane	1	5.0 U	5.0 U	5.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	NA	1.0 U	1.0 U	1.0 U
2-Butanone	- -	25 U	25 U	25 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
2-Chloroethylvinylether	- -	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
2-Hexanone	50	25 U	25 U	25 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	NA	10 U	10 U	10 U
4-Methyl-2-pentanone	- -	25 U	25 U	25 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Acetone	50	50 U	50 U	50 U	25 U	25 U	25 U	25 U	25 U	25 U	25 U	25 U	25 U	25 U	25 U	25 U	25 U
Benzene	1	5.0 U	5.0 U	5.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Bromodichloromethane	50	5.0 U	5.0 U	5.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	NA	1.0 U	1.0 U	1.0 U
Bromoform	50	5.0 U	5.0 U	5.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	NA	1.0 U	1.0 U	1.0 U
Bromomethane	5	10 U	10 U	10 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	NA	1.0 U	1.0 UJ	1.0 UJ
Carbon Disulfide	- -	5.0 U	5.0 U	5.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	2.0 U	NA	2.0 U	2.0 U	2.0 U
Carbon Tetrachloride	5	5.0 U	5.0 U	5.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Chlorobenzene	5	5.0 U	5.0 U	5.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	NA	1.0 U	1.0 U	1.0 U
Chloroethane	5	10 U	10 U	10 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Chloroform	7	5.0 U	5.0 U	5.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	NA	1.0 U	1.0 U	1.0 U
Chloromethane	- -	10 U	10 U	10 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	NA	1.0 U	1.0 U	1.0 UJ
cis-1,2-Dichloroethene	5	5.0 U	5.0 U	5.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
cis-1,3-Dichloropropene	0.4	5.0 U	5.0 U	5.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	NA	1.0 U	1.0 U	1.0 U
Dibromochloromethane	50	5.0 U	5.0 U	5.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	NA	1.0 U	1.0 U	1.0 U
Ethylbenzene	5	5.0 U	5.0 U	5.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Methylene Chloride	5	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	1.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U
Naphthalene	10	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	1.0 U	NA	NA	NA
Styrene	5	5.0 U	5.0 U	5.0 U	1.0 U	1.0 U	1.0 U	**2.0**	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	NA	1.0 U	1.0 U	1.0 U
Tetrachloroethene	5	5.0 U	5.0 U	5.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Toluene	5	5.0 U	5.0 U	5.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
trans-1,2-Dichloroethene	5	5.0 U	5.0 U	5.0 U	1.0 U	1.0 U	1.0 U	**1.1**	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
trans-1,3-Dichloropropene	0.4	5.0 U	5.0 U	5.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	NA	1.0 U	1.0 U	1.0 U
Trichloroethene	5	5.0 U	5.0 U	5.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Vinyl Acetate	- -	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Vinyl Chloride	2	10 U	10 U	10 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Xylenes (total)	5	10 U	10 U	10 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U
Total VOCs	- -	ND	ND	ND	ND	ND	ND	**3.1**	ND	ND	ND	ND	ND	ND	ND	ND	ND

See Notes on Page 31.

Appendix E. Summary of Historical VOC Data in Groundwater, Revised Draft RFI Report, Ashland Inc., Rensselaer, New York

Location ID: / Date Collected:	NYSDEC TOGS 1.1.1 Water Guidance Values	MW-13 09/15/08	MW-14 05/29/97	MW-14 11/20/97	MW-14 05/28/98	MW-14 11/19/98	MW-14 05/26/99	MW-14 11/15/99	MW-14 05/24/00	MW-14 11/29/00	MW-14 06/05/01	MW-14 11/08/01	MW-14 05/21/02	MW-14 11/12/02	MW-14 12/20/02	MW-14 04/23/03	MW-14 07/15/03
Volatile Organics																	
1,1,1-Trichloroethane	5	1.0 U	5.0 U	5.0 U	5.0 U	5.0 U	1.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
1,1,2,2-Tetrachloroethane	5	1.0 U	5.0 U	5.0 U	5.0 U	5.0 U	1.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
1,1,2-Trichloroethane	1	1.0 U	5.0 U	5.0 U	5.0 U	5.0 U	1.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
1,1-Dichloroethane	5	1.0 U	5.0 U	5.0 U	5.0 U	5.0 U	1.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
1,1-Dichloroethene	5	1.0 U	5.0 U	5.0 U	5.0 U	5.0 U	1.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
1,2-Dichloroethane	0.6	1.0 U	5.0 U	5.0 U	5.0 U	5.0 U	1.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
1,2-Dichloroethene (total)	- -	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,2-Dichloropropane	1	1.0 U	5.0 U	5.0 U	5.0 U	5.0 U	1.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
2-Butanone	- -	10 U	25 U	25 U	25 U	25 U	10 U	25 U	25 U	25 U	25 U	25 U	10 U	10 U	10 U	10 U	10 U
2-Chloroethylvinylether	- -	NA	50 U	50 U	50 U	50 U	10 U	50 U	50 U	NA	NA	NA	NA	NA	NA	NA	NA
2-Hexanone	50	10 U	25 U	25 U	25 U	25 U	10 U	25 U	25 U	25 U	25 U	25 U	10 U	10 U	10 U	10 U	10 U
4-Methyl-2-pentanone	- -	10 U	25 U	25 U	25 U	25 U	10 U	25 U	25 U	25 U	25 U	25 U	10 U	10 U	10 U	10 U	10 U
Acetone	50	25 U	50 U	50 U	50 U	50 U	25 U	50 U	50 U	50 U	50 U	50 U	25 U	25 U	25 U	25 U	25 U
Benzene	1	1.0 U	5.0 U	5.0 U	5.0 U	5.0 U	1.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Bromodichloromethane	50	1.0 U	5.0 U	5.0 U	5.0 U	5.0 U	1.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Bromoform	50	1.0 U	5.0 U	5.0 U	5.0 U	5.0 U	1.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Bromomethane	5	1.0 U	10 U	10 U	10 U	10 U	1.0 U	10 U	10 U	10 U	10 U	10 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Carbon Disulfide	- -	2.0 U	5.0 U	5.0 U	5.0 U	5.0 U	1.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Carbon Tetrachloride	5	1.0 U	5.0 U	5.0 U	5.0 U	5.0 U	1.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Chlorobenzene	5	1.0 U	5.0 U	5.0 U	5.0 U	5.0 U	1.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Chloroethane	5	1.0 U	10 U	10 U	10 U	10 U	1.0 U	10 U	10 U	10 U	10 U	10 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Chloroform	7	1.0 U	5.0 U	5.0 U	5.0 U	5.0 U	1.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Chloromethane	- -	1.0 UJ	10 U	10 U	10 U	10 U	1.0 U	10 U	10 U	10 U	10 U	10 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
cis-1,2-Dichloroethene	5	1.0 U	5.0 U	5.0 U	5.0 U	5.0 U	1.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
cis-1,3-Dichloropropene	0.4	1.0 U	5.0 U	5.0 U	5.0 U	5.0 U	1.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Dibromochloromethane	50	1.0 U	5.0 U	5.0 U	5.0 U	5.0 U	1.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Ethylbenzene	5	1.0 U	5.0 U	5.0 U	5.0 U	5.0 U	1.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Methylene Chloride	5	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U
Naphthalene	10	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Styrene	5	1.0 U	5.0 U	5.0 U	5.0 U	5.0 U	1.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	1.0 U	1.0 U	1.0 U	1.0 U	**2.0**
Tetrachloroethene	5	1.0 U	5.0 U	5.0 U	5.0 U	5.0 U	1.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	1.0 U	1.0 U	1.0 U	1.0 U	**1.3**
Toluene	5	1.0 U	5.0 U	5.0 U	5.0 U	5.0 U	1.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
trans-1,2-Dichloroethene	5	1.0 U	5.0 U	5.0 U	5.0 U	5.0 U	1.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
trans-1,3-Dichloropropene	0.4	1.0 U	5.0 U	5.0 U	5.0 U	5.0 U	1.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Trichloroethene	5	1.0 U	5.0 U	5.0 U	5.0 U	5.0 U	1.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Vinyl Acetate	- -	NA	10 U	10 U	10 U	10 U	2.0 U	10 U	10 U	NA	NA	NA	NA	NA	NA	NA	NA
Vinyl Chloride	2	1.0 U	10 U	10 U	10 U	10 U	1.0 U	10 U	10 U	10 U	10 U	10 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Xylenes (total)	5	2.0 U	5.0 U	5.0 U	5.0 U	5.0 U	2.0 U	10 U	10 U	10 U	10 U	10 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U
Total VOCs	- -	NDJ	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	**3.3**

See Notes on Page 31.

Appendix E. Summary of Historical VOC Data in Groundwater, Revised Draft RFI Report, Ashland Inc., Rensselaer, New York

Location ID: / Date Collected:	NYSDEC TOGS 1.1.1 Water Guidance Values	MW-14 10/27/03	MW-14 04/08/04	MW-14 10/13/04	MW-14 04/13/05	MW-14 05/08/06	MW-14 10/03/06	MW-14 04/10/07	MW-14 09/17/07	MW-14 04/09/08	MW-14 09/15/08	MW-15 05/30/97	MW-15 11/21/97	MW-15 05/29/98	MW-15 11/20/98	MW-15 05/27/99	MW-15 11/16/99
Volatile Organics																	
1,1,1-Trichloroethane	5	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	5.0 U	5.0 U	5.0 U	5.0 U	1.0 U	5.0 U
1,1,2,2-Tetrachloroethane	5	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	5.0 U	5.0 U	5.0 U	5.0 U	**1.5**	5.0 U
1,1,2-Trichloroethane	1	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	NA	1.0 U	1.0 U	1.0 U	1.0 U	5.0 U	5.0 U	5.0 U	5.0 U	1.0 U	5.0 U
1,1-Dichloroethane	5	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	**3.5 J**	**3.9 J**	5.0 U	5.0 U	**3.4**	5.0 U
1,1-Dichloroethene	5	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	5.0 U	5.0 U	5.0 U	5.0 U	1.0 U	5.0 U
1,2-Dichloroethane	0.6	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	5.0 U	5.0 U	5.0 U	5.0 U	1.0 U	5.0 U
1,2-Dichloroethene (total)	- -	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,2-Dichloropropane	1	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	NA	1.0 U	1.0 U	1.0 U	1.0 U	5.0 U	5.0 U	5.0 U	5.0 U	1.0 U	5.0 U
2-Butanone	- -	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	25 U	25 U	25 U	25 U	10 U	25 U
2-Chloroethylvinylether	- -	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	50 U	50 U	50 U	50 U	10 U	50 U
2-Hexanone	50	10 U	10 U	10 U	10 U	10 U	NA	10 U	10 U	10 U	10 U	25 U	25 U	25 U	25 U	10 U	25 U
4-Methyl-2-pentanone	- -	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	25 U	25 U	25 U	25 U	10 U	25 U
Acetone	50	25 U	25 U	25 U	25 U	25 U	25 U	25 U	25 U	25 U	25 U	50 U	50 U	50 U	50 U	25 U	50 U
Benzene	1	1.0 U	**1.1**	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	**29**	**1.0 J**	**29**	**26**	**8.0**	**19**
Bromodichloromethane	50	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	NA	1.0 U	1.0 U	1.0 U	1.0 U	5.0 U	5.0 U	5.0 U	5.0 U	1.0 U	5.0 U
Bromoform	50	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	NA	1.0 U	1.0 U	1.0 U	1.0 U	5.0 U	5.0 U	5.0 U	5.0 U	1.0 U	5.0 U
Bromomethane	5	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	NA	1.0 U	1.0 UJ	1.0 U	1.0 U	10 U	10 U	10 U	10 U	1.0 U	10 U
Carbon Disulfide	- -	1.0 U	1.0 U	1.0 U	1.0 U	2.0 U	NA	2.0 U	2.0 U	2.0 U	2.0 U	5.0 U	5.0 U	5.0 U	5.0 U	1.0 U	5.0 U
Carbon Tetrachloride	5	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	5.0 U	5.0 U	5.0 U	5.0 U	1.0 U	5.0 U
Chlorobenzene	5	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	NA	1.0 U	1.0 U	1.0 U	1.0 U	5.0 U	5.0 U	5.0 U	5.0 U	1.0 U	5.0 U
Chloroethane	5	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	10 U	10 U	10 U	10 U	1.0 U	10 U
Chloroform	7	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	NA	1.0 U	1.0 U	1.0 U	1.0 U	5.0 U	**3.7 J**	5.0 U	5.0 U	**5.9**	5.0 U
Chloromethane	- -	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	NA	1.0 U	1.0 U	1.0 U	1.0 UJ	10 U	10 U	10 U	10 U	1.0 U	10 U
cis-1,2-Dichloroethene	5	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	**1.1**	**130**	**200**	**510 D**	**7.3**	**130**	**44**
cis-1,3-Dichloropropene	0.4	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	NA	1.0 U	1.0 U	1.0 U	1.0 U	5.0 U	5.0 U	5.0 U	5.0 U	1.0 U	5.0 U
Dibromochloromethane	50	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	NA	1.0 U	1.0 U	1.0 U	1.0 U	5.0 U	5.0 U	5.0 U	5.0 U	1.0 U	5.0 U
Ethylbenzene	5	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	5.0 U	5.0 U	**5.2**	5.0 U	1.0 U	5.0 U
Methylene Chloride	5	5.0 U	5.0 U	5.0 U	1.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U
Naphthalene	10	NA	NA	NA	NA	NA	1.0 U	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Styrene	5	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	NA	1.0 U	1.0 U	1.0 U	1.0 U	5.0 U	5.0 U	5.0 U	5.0 U	1.0 U	5.0 U
Tetrachloroethene	5	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	**12**	**66**	**60**	5.0 U	**36**	**5.7**
Toluene	5	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	5.0 U	5.0 U	5.0 U	5.0 U	1.0 U	5.0 U
trans-1,2-Dichloroethene	5	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	5.0 U	5.0 U	5.0 U	5.0 U	**1.1**	5.0 U
trans-1,3-Dichloropropene	0.4	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	NA	1.0 U	1.0 U	1.0 U	1.0 U	5.0 U	5.0 U	5.0 U	5.0 U	1.0 U	5.0 U
Trichloroethene	5	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	**32**	**96**	**28**	**7.5**	**65**	**8.7**
Vinyl Acetate	- -	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	10 U	10 U	10 U	10 U	2.0 U	10 U
Vinyl Chloride	2	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	**48**	**3.9 J**	**170**	**15**	**5.6**	**24**
Xylenes (total)	5	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	5.0 U	5.0 U	5.0 U	5.0 U	2.0 U	10 U
Total VOCs	- -	ND	**1.1**	ND	ND	ND	ND	ND	ND	ND	**1.1 J**	**250 J**	**370 J**	**800**	**56**	**260**	**100**

See Notes on Page 31.

Appendix E. Summary of Historical VOC Data in Groundwater, Revised Draft RFI Report, Ashland Inc., Rensselaer, New York

Location ID: / Date Collected:	NYSDEC TOGS 1.1.1 Water Guidance Values	MW-15 05/25/00	MW-15 11/30/00	MW-15 06/05/01	MW-15 11/08/01	MW-15 05/21/02	MW-15 11/13/02	MW-15 04/23/03	MW-15 07/16/03	MW-15 10/27/03	MW-15 04/08/04	MW-15 10/12/04	MW-15 04/13/05	MW-15 08/11/05	MW-15 05/09/06	MW-15 10/05/06
Volatile Organics																
1,1,1-Trichloroethane	5	5.0 U	5.0 U	5.0 U	5.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U [1.0 U]	1.0 U	1.0 U
1,1,2,2-Tetrachloroethane	5	5.0 U	5.0 U	5.0 U	5.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U [1.0 U]	1.0 U	1.0 U
1,1,2-Trichloroethane	1	5.0 U	5.0 U	5.0 U	5.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U [1.0 U]	1.0 U	NA
1,1-Dichloroethane	5	5.0 U	5.0 U	5.0 U	5.0 U	**1.1**	**2.0**	1.0 U	**3.0**	**1.4**	**1.1**	**1.4**	1.0 U	**1.0 U [1.1]**	**1.5**	1.0 U
1,1-Dichloroethene	5	5.0 U	5.0 U	5.0 U	5.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U [1.0 U]	1.0 U	1.0 U
1,2-Dichloroethane	0.6	5.0 U	5.0 U	5.0 U	5.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U [1.0 U]	1.0 U	**1.5**
1,2-Dichloroethene (total)	- -	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,2-Dichloropropane	1	5.0 U	5.0 U	5.0 U	5.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U [1.0 U]	1.0 U	NA
2-Butanone	- -	25 U	25 U	25 U	25 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U [10 U]	10 U	10 U
2-Chloroethylvinylether	- -	50 U	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
2-Hexanone	50	25 U	25 U	25 U	25 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U [10 U]	10 U	NA
4-Methyl-2-pentanone	- -	25 U	25 U	25 U	25 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U [10 U]	10 U	10 U
Acetone	50	50 U	50 U	50 U	50 U	25 U	25 U	25 U	25 U	25 U	25 U	25 U	25 U	25 U [25 U]	25 U	25 U
Benzene	1	5.0 U	**10**	5.0 U	**40**	**3.4**	**9.1**	**6.6**	**12**	**8.3**	**1.7**	**19**	**4.8**	**11 [12]**	**43**	**58**
Bromodichloromethane	50	5.0 U	5.0 U	5.0 U	5.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U* [1.0 U*]	1.0 U	NA
Bromoform	50	5.0 U	5.0 U	5.0 U	5.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U [1.0 U]	1.0 U	NA
Bromomethane	5	10 U	10 U	10 U	10 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U [1.0 U]	1.0 U	NA
Carbon Disulfide	- -	5.0 U	5.0 U	5.0 U	5.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U [1.0 U]	2.0 U	NA
Carbon Tetrachloride	5	5.0 U	5.0 U	5.0 U	5.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U [1.0 U]	1.0 U	1.0 U
Chlorobenzene	5	5.0 U	5.0 U	5.0 U	5.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U [1.0 U]	1.0 U	NA
Chloroethane	5	10 U	10 U	10 U	10 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U [1.0 U]	1.0 U	1.0 U
Chloroform	7	5.0 U	5.0 U	5.0 U	5.0 U	1.0 U	1.0 U	1.0 U	**2.1**	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U [1.0 U]	1.0 U	NA
Chloromethane	- -	10 U	10 U	10 U	10 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	**1.4 [1.5]**	1.0 U*	NA
cis-1,2-Dichloroethene	5	**87**	**40**	**88**	**38**	**31**	**34**	**35**	**59**	**16**	**28**	**46**	**23**	**2.2 [2.6]**	**3.7**	**12**
cis-1,3-Dichloropropene	0.4	5.0 U	5.0 U	5.0 U	5.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U [1.0 U]	1.0 U	NA
Dibromochloromethane	50	5.0 U	5.0 U	5.0 U	5.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U [1.0 U]	1.0 U	NA
Ethylbenzene	5	5.0 U	5.0 U	5.0 U	5.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U [1.0 U]	**4.4**	**2.4**
Methylene Chloride	5	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	1.0 U	5.0 U [5.0 U]	5.0 U	5.0 U
Naphthalene	10	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	1.0 U
Styrene	5	5.0 U	5.0 U	5.0 U	5.0 U	1.0 U	1.0 U	1.0 U	**2.2**	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U [1.0 U]	1.0 U	NA
Tetrachloroethene	5	**62**	**19**	**63**	**6.0**	**24**	**24**	**12**	**43**	**12**	**26**	**4.3**	**15**	1.0 U [1.0 U]	1.0 U	**1.1**
Toluene	5	5.0 U	5.0 U	5.0 U	5.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U [1.0 U]	**2.6**	1.0 U
trans-1,2-Dichloroethene	5	5.0 U	5.0 U	5.0 U	5.0 U	1.0 U	1.0 U	1.0 U	**1.5**	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U [1.0 U]	1.0 U	**1.3**
trans-1,3-Dichloropropene	0.4	5.0 U	5.0 U	5.0 U	5.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U [1.0 U]	1.0 U	NA
Trichloroethene	5	**78**	**26**	**80**	**7.3**	**32**	**36**	**16**	**55**	**13**	**41**	**9.2**	**18**	**1.6 [1.6]**	**2.9**	**1.6**
Vinyl Acetate	- -	10 U	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Vinyl Chloride	2	10 U	10 U	10 U	**16**	**2.0**	**13**	**13**	**6.2**	**5.2**	1.0 U	**47**	**12**	**5.4 [6.0]**	**2.9 ***	**12**
Xylenes (total)	5	10 U	10 U	10 U	10 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U [2.0 U]	**65**	**16**
Total VOCs	- -	**230**	**95**	**230**	**110**	**94**	**120**	**83**	**180**	**56**	**98**	**130**	**73**	**22 [25]**	**130**	**110**

See Notes on Page 31.

Appendix E. Summary of Historical VOC Data in Groundwater, Revised Draft RFI Report, Ashland Inc., Rensselaer, New York

Location ID: / Date Collected:	NYSDEC TOGS 1.1.1 Water Guidance Values	MW-15 04/12/07	MW-15 09/18/07	MW-15 04/09/08	MW-15 09/16/08	MW-16 06/07/01	MW-16 07/06/01	MW-16 11/08/01	MW-16 05/21/02	MW-16 11/12/02	MW-16 12/20/02	MW-16 04/21/03	MW-16 07/15/03	MW-16 10/28/03	MW-16 04/09/04	MW-16 10/13/04	MW-16 04/14/05
Volatile Organics																	
1,1,1-Trichloroethane	5	1.0 U	1.0 U	1.0 U	1.0 U	5.0 U	5.0 U	5.0 U	1.0 U	2.0 U	1.0 U	1.0 U	5.0 U	1.0 U	1.0 U	10 U	1.0 U
1,1,2,2-Tetrachloroethane	5	1.0 U	1.0 U	1.0 U	1.0 U	5.0 U	5.0 U	5.0 U	1.0 U	2.0 U	1.0 U	1.0 U	5.0 U	1.0 U	1.0 U	10 U	1.0 U
1,1,2-Trichloroethane	1	1.0 U	1.0 U	1.0 U	1.0 U	5.0 U	5.0 U	5.0 U	1.0 U	2.0 U	1.0 U	1.0 U	5.0 U	1.0 U	1.0 U	10 U	1.0 U
1,1-Dichloroethane	5	**1.0**	**2.3**	1.0 U	**2.1**	5.0 U	5.0 U	5.0 U	1.0 U	2.0 U	1.0 U	1.0 U	5.0 U	1.0 U	1.0 U	10 U	1.0 U
1,1-Dichloroethene	5	1.0 U	1.0 U	1.0 U	1.0 U	5.0 U	5.0 U	5.0 U	1.0 U	2.0 U	1.0 U	1.0 U	5.0 U	**1.1**	**1.3**	10 U	1.0 U
1,2-Dichloroethane	0.6	1.0 U	1.0 U	1.0 U	1.0 U	5.0 U	5.0 U	5.0 U	**1.3**	**4.5**	1.0 U	1.0 U	**6.1**	**2.1**	**3.4**	10 U	1.0 U
1,2-Dichloroethene (total)	- -	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,2-Dichloropropane	1	1.0 U	1.0 U	1.0 U	1.0 U	5.0 U	5.0 U	5.0 U	1.0 U	2.0 U	1.0 U	1.0 U	5.0 U	1.0 U	1.0 U	10 U	1.0 U
2-Butanone	- -	10 U	10 UJ	10 U	10 U	25 U	25 U	25 U	10 U	20 U	10 U	10 U	50 U	10 U	10 U	100 U	10 U
2-Chloroethylvinylether	- -	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
2-Hexanone	50	10 U	10 U	10 U	10 U	25 U	25 U	25 U	10 U	20 U	10 U	10 U	50 U	10 U	10 U	100 U	10 U
4-Methyl-2-pentanone	- -	10 U	10 U	10 U	10 U	25 U	25 U	25 U	10 U	20 U	10 U	10 U	50 U	10 U	10 U	100 U	10 U
Acetone	50	25 U	25 UJ	25 U	25 U	50 U	50 U	50 U	25 U	50 U	25 U	25 U	120 U	25 U	25 U	250 U	25 U
Benzene	1	**28**	**29**	**21**	**34**	5.0 U	5.0 U	5.0 U	1.0 U	2.0 U	1.0 U	1.0 U	5.0 U	1.0 U	1.0 U	10 U	1.0 U
Bromodichloromethane	50	1.0 U	1.0 U	1.0 U	1.0 U	5.0 U	5.0 U	5.0 U	1.0 U	2.0 U	1.0 U	1.0 U	5.0 U	1.0 U	1.0 U	10 U	1.0 U
Bromoform	50	1.0 U	1.0 U	1.0 U	1.0 U	5.0 U	5.0 U	5.0 U	1.0 U	2.0 U	1.0 U	1.0 U	5.0 U	1.0 U	1.0 U	10 U	1.0 U
Bromomethane	5	1.0 U	1.0 U	1.0 U	1.0 U	10 U	10 U	10 U	1.0 U	2.0 U	1.0 U	1.0 U	5.0 U	1.0 U	1.0 U	10 U	1.0 U
Carbon Disulfide	- -	2.0 U	2.0 U	2.0 U	2.0 U	5.0 U	5.0 U	5.0 U	1.0 U	2.0 U	1.0 U	1.0 U	5.0 U	1.0 U	1.0 U	10 U	1.0 U
Carbon Tetrachloride	5	1.0 U	1.0 U	1.0 U	1.0 U	5.0 U	5.0 U	5.0 U	1.0 U	2.0 U	1.0 U	1.0 U	5.0 U	1.0 U	1.0 U	10 U	1.0 U
Chlorobenzene	5	1.0 U	1.0 U	1.0 U	1.0 U	5.0 U	5.0 U	5.0 U	1.0 U	2.0 U	1.0 U	1.0 U	5.0 U	1.0 U	1.0 U	10 U	1.0 U
Chloroethane	5	1.0 U	1.0 U	1.0 U	1.0 UJ	10 U	10 U	10 U	1.0 U	2.0 U	1.0 U	1.0 U	5.0 U	1.0 U	1.0 U	10 U	1.0 U
Chloroform	7	1.0 U	1.0 U	1.0 U	1.0 U	5.0 U	5.0 U	5.0 U	1.0 U	2.0 U	1.0 U	1.0 U	5.0 U	1.0 U	1.0 U	10 U	1.0 U
Chloromethane	- -	1.0 U	1.0 U	1.0 U	1.0 UJ	10 U	10 U	10 U	1.0 U	2.0 U	1.0 U	1.0 U	5.0 U	1.0 U	1.0 U	10 U	1.0 U
cis-1,2-Dichloroethene	5	**1.5**	**13**	**2.7**	**4.6**	**22**	5.0 U	**83**	**63**	**200**	**150**	**50**	**450**	**210 D**	**220 D**	**340**	**120**
cis-1,3-Dichloropropene	0.4	1.0 U	1.0 U	1.0 U	1.0 U	5.0 U	5.0 U	5.0 U	1.0 U	2.0 U	1.0 U	1.0 U	5.0 U	1.0 U	1.0 U	10 U	1.0 U
Dibromochloromethane	50	1.0 U	1.0 U	1.0 U	1.0 U	5.0 U	5.0 U	5.0 U	1.0 U	2.0 U	1.0 U	1.0 U	5.0 U	1.0 U	1.0 U	10 U	1.0 U
Ethylbenzene	5	1.0 U	1.0 U	1.0 U	1.0 U	5.0 U	5.0 U	5.0 U	1.0 U	2.0 U	1.0 U	1.0 U	5.0 U	1.0 U	1.0 U	10 U	1.0 U
Methylene Chloride	5	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	10 U	5.0 U	5.0 U	25 U	5.0 U	5.0 U	50 U	1.0 U
Naphthalene	10	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Styrene	5	1.0 U	1.0 U	1.0 U	1.0 U	5.0 U	5.0 U	5.0 U	1.0 U	2.0 U	1.0 U	1.0 U	**10**	1.0 U	1.0 U	10 U	1.0 U
Tetrachloroethene	5	1.0 U	1.0 U	1.0 U	1.0 U	5.0 U	5.0 U	5.0 U	1.0 U	2.0 U	1.0 U	1.0 U	5.0 U	1.0 U	1.0 U	10 U	1.0 U
Toluene	5	1.0 U	1.0 U	1.0 U	1.0 U	5.0 U	5.0 U	5.0 U	1.0 U	2.0 U	1.0 U	1.0 U	5.0 U	1.0 U	1.0 U	10 U	1.0 U
trans-1,2-Dichloroethene	5	1.0 U	1.0 U	1.0 U	1.0 U	5.0 U	5.0 U	5.0 U	1.0 U	2.0 U	1.0 U	1.0 U	**9.1**	**1.0**	**4.4**	10 U	1.0 U
trans-1,3-Dichloropropene	0.4	1.0 U	1.0 U	1.0 U	1.0 U	5.0 U	5.0 U	5.0 U	1.0 U	2.0 U	1.0 U	1.0 U	5.0 U	1.0 U	1.0 U	10 U	1.0 U
Trichloroethene	5	**2.9**	**6.5**	**1.6**	1.0 U	5.0 U	5.0 U	**8.9**	**6.9**	**15**	**12**	**5.1**	**32**	**13**	**8.2**	**14**	**8.4**
Vinyl Acetate	- -	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Vinyl Chloride	2	**2.0**	**12**	**3.4**	**13**	10 U	10 U	**10**	**4.2**	**23**	**1.8**	1.0 U	**20**	**8.9**	**3.1**	**31**	1.0 U
Xylenes (total)	5	2.0 U	2.0 U	2.0 U	2.0 U	10 U	10 U	10 U	2.0 U	4.0 U	2.0 U	2.0 U	10 U	2.0 U	2.0 U	20 U	2.0 U
Total VOCs	- -	**35**	**63**	**29**	**54 J**	**22**	ND	**100**	**75**	**240**	**160**	**55**	**530**	**240**	**240**	**390**	**130**

See Notes on Page 31.

Appendix E. Summary of Historical VOC Data in Groundwater, Revised Draft RFI Report, Ashland Inc., Rensselaer, New York

Location ID: / Date Collected:	NYSDEC TOGS 1.1.1 Water Guidance Values	MW-16 08/11/05	MW-16 05/09/06	MW-16 10/05/06	MW-16 04/12/07	MW-16 09/24/07	MW-16 04/10/08	MW-16 09/16/08	MW-17 06/07/01	MW-17 07/06/01	MW-17 11/08/01	MW-17 05/21/02	MW-17 11/12/02	MW-17 04/21/03	MW-17 07/15/03	MW-17 10/28/03	MW-17 04/06/04
Volatile Organics																	
1,1,1-Trichloroethane	5	10 U	1.0 U	1.0 U	2.0 U	5.0 U	1.0 U	5.0 U	5.0 U	5.0 U	5.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
1,1,2,2-Tetrachloroethane	5	10 U	1.0 U	1.0 U	2.0 U	5.0 UJ	1.0 U	5.0 U	5.0 U	5.0 U	5.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
1,1,2-Trichloroethane	1	10 U	1.0 U	NA	2.0 U	5.0 U	1.0 U	5.0 U	5.0 U	5.0 U	5.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
1,1-Dichloroethane	5	10 U	1.0 U	**1.1**	2.0 U	5.0 U	1.0 U	5.0 U	5.0 U	5.0 U	5.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
1,1-Dichloroethene	5	10 U	**1.4**	**4.5**	2.0 U	5.0 U	1.0 U	5.0 U	5.0 U	5.0 U	5.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
1,2-Dichloroethane	0.6	**13**	**2.4**	**7.5**	2.0 U	**6.0**	1.0 U	**6.8**	5.0 U	5.0 U	5.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
1,2-Dichloroethene (total)	- -	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,2-Dichloropropane	1	10 U	1.0 U	NA	2.0 U	5.0 U	1.0 U	5.0 U	5.0 U	5.0 U	5.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
2-Butanone	- -	100 U	10 U	10 U	20 U	50 U	10 U	50 U	25 U	25 U	25 U	10 U	10 U	10 U	10 U	10 U	10 U
2-Chloroethylvinylether	- -	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
2-Hexanone	50	100 U	10 U	NA	20 U	50 UJ	10 U	50 U	25 U	25 U	25 U	10 U	10 U	10 U	10 U	10 U	10 U
4-Methyl-2-pentanone	- -	100 U	10 U	10 U	20 U	50 U	10 U	50 U	25 U	25 U	25 U	10 U	10 U	10 U	10 U	10 U	10 U
Acetone	50	250 U	25 U	25 U	50 U	130 UJ	25 U	120 U	50 U	50 U	50 U	25 U	25 U	25 U	25 U	25 U	25 U
Benzene	1	10 U	1.0 U	1.0 U	2.0 U	5.0 U	1.0 U	5.0 U	5.0 U	5.0 U	5.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Bromodichloromethane	50	10 U*	1.0 U	NA	2.0 U	5.0 U	1.0 U	5.0 U	5.0 U	5.0 U	5.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Bromoform	50	10 U	1.0 U	NA	2.0 U	5.0 U	1.0 U	5.0 U	5.0 U	5.0 U	5.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Bromomethane	5	10 U	1.0 U	NA	2.0 U	5.0 U	1.0 UJ	5.0 U	10 U	10 U	10 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Carbon Disulfide	- -	10 U	2.0 U	NA	4.0 U	10 U	2.0 U	10 UJ	5.0 U	5.0 U	5.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Carbon Tetrachloride	5	10 U	1.0 U	1.0 U	2.0 U	5.0 U	1.0 U	5.0 U	5.0 U	5.0 U	5.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Chlorobenzene	5	10 U	1.0 U	NA	2.0 U	5.0 U	1.0 U	5.0 U	5.0 U	5.0 U	5.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Chloroethane	5	10 U	1.0 U	1.0 U	2.0 U	5.0 U	1.0 U	5.0 UJ	10 U	10 U	10 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Chloroform	7	10 U	1.0 U	NA	2.0 U	5.0 U	1.0 U	5.0 U	5.0 U	5.0 U	5.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Chloromethane	- -	10 U	1.0 U*	NA	2.0 U	5.0 U	1.0 UJ	5.0 U	10 U	10 U	10 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
cis-1,2-Dichloroethene	5	**840**	**180 D**	**600 D**	**300**	**410**	**150**	**490**	5.0 U	**8.0**	5.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
cis-1,3-Dichloropropene	0.4	10 U	1.0 U	NA	2.0 U	5.0 U	1.0 U	5.0 U	5.0 U	5.0 U	5.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Dibromochloromethane	50	10 U	1.0 U	NA	2.0 U	5.0 U	1.0 U	5.0 U	5.0 U	5.0 U	5.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Ethylbenzene	5	10 U	1.0 U	1.0 U	2.0 U	5.0 U	1.0 U	5.0 U	5.0 U	5.0 U	5.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Methylene Chloride	5	50 U	5.0 U	5.0 U	10 U	25 U	5.0 U	25 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U
Naphthalene	10	NA	NA	1.0 U	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Styrene	5	10 U	1.0 U	NA	2.0 U	5.0 U	1.0 U	5.0 U	5.0 U	5.0 U	5.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Tetrachloroethene	5	10 U	1.0 U	1.0 U	2.0 U	5.0 U	1.0 U	5.0 U	5.0 U	5.0 U	5.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Toluene	5	10 U	1.0 U	1.0 U	2.0 U	5.0 U	1.0 U	5.0 U	5.0 U	5.0 U	5.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
trans-1,2-Dichloroethene	5	10 U	**3.8**	**4.9**	**2.1**	**6.8**	**1.4**	5.0 U	5.0 U	5.0 U	5.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
trans-1,3-Dichloropropene	0.4	10 U	1.0 U	NA	2.0 U	5.0 U	1.0 U	5.0 U	5.0 U	5.0 U	5.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Trichloroethene	5	**26**	**17**	**33**	**21**	5.0 U	**15**	**42**	5.0 U	5.0 U	5.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Vinyl Acetate	- -	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Vinyl Chloride	2	**28**	**4.8 ***	**26**	**4.2**	**63**	1.0 U	5.0 U	10 U	10 U	10 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Xylenes (total)	5	20 U	2.0 U	2.0 U*	4.0 U	10 U	2.0 U	10 U	10 U	10 U	10 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U
Total VOCs	- -	**910**	**210**	**680**	**330**	**490**	**170**	**540 J**	ND	**8.0**	ND	ND	ND	ND	ND	ND	ND

See Notes on Page 31.

Appendix E. Summary of Historical VOC Data in Groundwater, Revised Draft RFI Report, Ashland Inc., Rensselaer, New York

Location ID: / Date Collected:	NYSDEC TOGS 1.1.1 Water Guidance Values	MW-17 10/13/04	MW-17 04/14/05	MW-17 02/28/06	MW-17 05/03/06	MW-17 10/03/06	MW-17 04/10/07	MW-17 09/21/07	MW-17 04/10/08	MW-17 09/16/08	MW-18 06/06/01	MW-18 07/06/01	MW-18 11/08/01	MW-18 05/21/02	MW-18 11/12/02	MW-18 04/21/03	MW-18 10/28/03
Volatile Organics																	
1,1,1-Trichloroethane	5	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	5.0 U	5.0 U	20 U	5.0 U	10 U	10 U	10 U
1,1,2,2-Tetrachloroethane	5	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	5.0 U	5.0 U	20 U	5.0 U	10 U	10 U	10 U
1,1,2-Trichloroethane	1	1.0 U	1.0 U	1.0 U	1.0 U	NA	1.0 U	1.0 U	1.0 U	1.0 U	5.0 U	5.0 U	20 U	5.0 U	10 U	10 U	10 U
1,1-Dichloroethane	5	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	5.0 U	5.0 U	20 U	5.0 U	10 U	10 U	10 U
1,1-Dichloroethene	5	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	5.0 U	5.0 U	20 U	5.0 U	**13**	10 U	10 U
1,2-Dichloroethane	0.6	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	**180**	**130**	**100**	**110**	**55**	**41**	10 U
1,2-Dichloroethene (total)	- -	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,2-Dichloropropane	1	1.0 U	1.0 U	1.0 U	1.0 U	NA	1.0 U	1.0 U	1.0 U	1.0 U	5.0 U	5.0 U	20 U	5.0 U	10 U	10 U	10 U
2-Butanone	- -	10 U	10 U	10 U	10 U*	10 U	10 U	10 U	10 U	10 U	25 U	25 U	100 U	50 U	100 U	100 U	100 U
2-Chloroethylvinylether	- -	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
2-Hexanone	50	10 U	10 U	10 U	10 U*	NA	10 U	10 U	10 U	10 U	25 U	25 U	100 U	50 U	100 U	100 U	100 U
4-Methyl-2-pentanone	- -	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	25 U	25 U	100 U	50 U	100 U	100 U	100 U
Acetone	50	25 U	25 U	25 U	25 U	25 U	25 U	25 U	25 U	25 U	50 U	50 U	200 U	120 U	250 U	250 U	250 U
Benzene	1	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	5.0 U	5.0 U	20 U	5.0 U	10 U	10 U	10 U
Bromodichloromethane	50	1.0 U	1.0 U	1.0 U	1.0 U	NA	1.0 U	1.0 U	1.0 U	1.0 U	5.0 U	5.0 U	20 U	5.0 U	10 U	10 U	10 U
Bromoform	50	1.0 U	1.0 U	1.0 U	1.0 U	NA	1.0 U	1.0 U	1.0 U	1.0 U	5.0 U	5.0 U	20 U	5.0 U	10 U	10 U	10 U
Bromomethane	5	1.0 U	1.0 U	1.0 U	1.0 U	NA	1.0 U	1.0 UJ	1.0 UJ	1.0 U	10 U	10 U	40 U	5.0 U	10 U	10 U	10 U
Carbon Disulfide	- -	1.0 U	1.0 U	2.0 U	2.0 U	NA	2.0 U	2.0 U	2.0 U	2.0 U	5.0 U	5.0 U	20 U	5.0 U	10 U	10 U	10 U
Carbon Tetrachloride	5	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	5.0 U	5.0 U	20 U	5.0 U	10 U	10 U	10 U
Chlorobenzene	5	1.0 U	1.0 U	1.0 U	1.0 U	NA	1.0 U	1.0 U	1.0 U	1.0 U	5.0 U	5.0 U	20 U	5.0 U	**14**	10 U	10 U
Chloroethane	5	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 UJ	1.0 U	1.0 U	10 U	10 U	40 U	5.0 U	10 U	10 U	10 U
Chloroform	7	1.0 U	1.0 U	1.0 U	1.0 U	NA	1.0 U	1.0 U	1.0 U	1.0 U	5.0 U	5.0 U	20 U	5.0 U	10 U	10 U	10 U
Chloromethane	- -	1.0 U	1.0 U	1.0 U	1.0 U	NA	1.0 U	1.0 UJ	1.0 UJ	1.0 U	10 U*F	10 U*F	40 U	5.0 U	10 U	10 U	10 U
cis-1,2-Dichloroethene	5	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	**430 E**	**370**	**600**	**790**	**1,000**	**860**	**800**
cis-1,3-Dichloropropene	0.4	1.0 U	1.0 U	1.0 U	1.0 U	NA	1.0 U	1.0 U	1.0 U	1.0 U	5.0 U	5.0 U	20 U	5.0 U	10 U	10 U	10 U
Dibromochloromethane	50	1.0 U	1.0 U	1.0 U	1.0 U	NA	1.0 U	1.0 U	1.0 U	1.0 U	5.0 U	5.0 U	20 U	5.0 U	10 U	10 U	10 U
Ethylbenzene	5	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	5.0 U	5.0 U	20 U	5.0 U	**10**	10 U	10 U
Methylene Chloride	5	5.0 U	1.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	20 U	25 U	50 U	50 U	50 U
Naphthalene	10	NA	NA	NA	NA	1.0 U	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Styrene	5	1.0 U	1.0 U	1.0 U	1.0 U	NA	1.0 U	1.0 U	1.0 U	1.0 U	5.0 U	5.0 U	20 U	5.0 U	**10**	10 U	10 U
Tetrachloroethene	5	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	5.0 U	5.0 U	20 U	5.0 U	**17**	10 U	10 U
Toluene	5	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	5.0 U	5.0 U	20 U	5.0 U	**12**	10 U	10 U
trans-1,2-Dichloroethene	5	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	**23**	**5.1**	20 U	**11**	**27**	10 U	**13**
trans-1,3-Dichloropropene	0.4	1.0 U	1.0 U	1.0 U	1.0 U	NA	1.0 U	1.0 U	1.0 U	1.0 U	5.0 U	5.0 U	20 U	5.0 U	10 U	10 U	10 U
Trichloroethene	5	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	5.0 U	5.0 U	20 U	5.0 U	**19**	10 U	10 U
Vinyl Acetate	- -	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Vinyl Chloride	2	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	**210**	**150**	**190**	**250**	**240**	**180**	**140**
Xylenes (total)	5	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	10 U	10 U	40 U	10 U	**23**	20 U	20 U
Total VOCs	- -	ND	ND	ND	ND	ND	ND	ND	ND	ND	**840**	**660**	**890**	**1,200**	**1,400**	**1,100**	**950**

See Notes on Page 31.

Appendix E. Summary of Historical VOC Data in Groundwater, Revised Draft RFI Report, Ashland Inc., Rensselaer, New York

Location ID: / Date Collected:	NYSDEC TOGS 1.1.1 Water Guidance Values	MW-18 04/09/04	MW-18 10/13/04	MW-18 04/14/05	MW-18 02/28/06	MW-18 05/03/06	MW-18 10/04/06	MW-18 04/12/07	MW-18 09/24/07	MW-18 04/10/08	MW-18 09/16/08	MW-18S 07/15/03	MW-19 06/07/01	MW-19 07/06/01	MW-19 11/08/01	MW-19 05/21/02
Volatile Organics																
1,1,1-Trichloroethane	5	10 U	10 U	10 U	1.0 U	2.0 U [2.0 U]	1.0 U	1.0 U	5.0 U	5.0 U	5.0 U	10 U	50 U	**34**	50 U	**31 [30]**
1,1,2,2-Tetrachloroethane	5	10 U	10 U	10 U	1.0 U	2.0 U [2.0 U]	1.0 U	1.0 U	5.0 U	5.0 U	5.0 U	10 U	50 U	5.0 U	50 U	10 U [10 U]
1,1,2-Trichloroethane	1	10 U	10 U	10 U	1.0 U	2.0 U [2.0 U]	NA	1.0 U	5.0 U	5.0 U	5.0 U	10 U	50 U	5.0 U	50 U	10 U [10 U]
1,1-Dichloroethane	5	10 U	10 U	10 U	1.0 U	2.0 U [2.0 U]	1.0 U	1.0 U	5.0 U	5.0 U	5.0 U	10 U	**100**	**100**	**100**	**69 [75]**
1,1-Dichloroethene	5	10 U	10 U	10 U	1.0 U	2.0 U [2.0 U]	**1.1**	1.0 U	5.0 U	5.0 U	5.0 U	10 U	50 U	5.0 U	50 U	10 U [10 U]
1,2-Dichloroethane	0.6	**27**	**36**	**49**	**18**	**32 [33]**	**15**	**13**	5.0 U	5.0 U	5.0 U	**58**	50 U	5.0 U	50 U	10 U [10 U]
1,2-Dichloroethene (total)	- -	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,2-Dichloropropane	1	10 U	10 U	10 U	1.0 U	2.0 U [2.0 U]	NA	1.0 U	5.0 U	5.0 U	5.0 U	10 U	50 U	5.0 U	50 U	10 U [10 U]
2-Butanone	- -	100 U	100 U	100 U	10 U	20 U* [20 U*]	10 U	10 U	50 UJ	50 U	50 U	100 U	250 U	25 U	250 U	100 U [100 U]
2-Chloroethylvinylether	- -	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
2-Hexanone	50	100 U	100 U	100 U	10 U	20 U* [20 U*]	NA	10 U	50 U	50 U	50 U	100 U	250 U	25 U	250 U	100 U [100 U]
4-Methyl-2-pentanone	- -	100 U	100 U	100 U	10 U	20 U [20 U]	10 U	10 U	50 U	50 U	50 U	100 U	250 U	25 U	250 U	100 U [100 U]
Acetone	50	250 U	250 U	250 U	25 U	50 U [50 U]	25 U	25 U	130 UJ	120 U	120 U	250 U	500 U	50 U	500 U	250 U [250 U]
Benzene	1	10 U	10 U	10 U	**1.4**	2.0 U [2.0 U]	**1.3**	**1.1**	5.0 U	5.0 U	5.0 U	10 U	50 U	**15**	50 U	**12 [13]**
Bromodichloromethane	50	10 U	10 U	10 U	1.0 U	2.0 U [2.0 U]	NA	1.0 U	5.0 U	5.0 U	5.0 U	10 U	50 U	5.0 U	50 U	10 U [10 U]
Bromoform	50	10 U	10 U	10 U	1.0 U	2.0 U [2.0 U]	NA	1.0 U	5.0 U	5.0 U	5.0 U	10 U	50 U	5.0 U	50 U	10 U [10 U]
Bromomethane	5	10 U	10 U	10 U	1.0 U	2.0 U [2.0 U]	NA	1.0 U	5.0 UJ	5.0 UJ	5.0 U	10 U	100 U	10 U	100 U	10 U [10 U]
Carbon Disulfide	- -	10 U	10 U	10 U	2.0 U	4.0 U [4.0 U]	NA	2.0 U	10 U	10 U	10 U	10 U	50 U	5.0 U	50 U	10 U [10 U]
Carbon Tetrachloride	5	10 U	10 U	10 U	1.0 U	2.0 U [2.0 U]	1.0 U	1.0 U	5.0 U	5.0 U	5.0 U	10 U	50 U	5.0 U	50 U	10 U [10 U]
Chlorobenzene	5	10 U	10 U	10 U	1.0 U	2.0 U [2.0 U]	NA	1.0 U	5.0 U	5.0 U	5.0 U	10 U	50 U	5.0 U	50 U	10 U [10 U]
Chloroethane	5	10 U	10 U	10 U	1.0 U	2.0 U [2.0 U]	1.0 U	1.0 U	5.0 U	5.0 U	5.0 U	10 U	100 U	**16**	100 U	**15 [14]**
Chloroform	7	10 U	10 U	10 U	1.0 U	2.0 U [2.0 U]	NA	1.0 U	5.0 U	5.0 U	5.0 U	10 U	50 U	**16**	50 U	**34 [41]**
Chloromethane	- -	10 U	10 U	10 U	1.0 U	2.0 U [2.0 U]	NA	1.0 U	5.0 U	5.0 UJ	5.0 UJ	10 U	100 U	10 U*F	100 U	10 U [10 U]
cis-1,2-Dichloroethene	5	**650**	**830**	**570**	**470 D**	**420 D [360]**	**740 D**	**460 D**	**460**	**420**	**380**	**1,000**	**870**	**820**	**1,400**	**1,100 [1,200]**
cis-1,3-Dichloropropene	0.4	10 U	10 U	10 U	1.0 U	2.0 U [2.0 U]	NA	1.0 U	5.0 U	5.0 U	5.0 U	10 U	50 U	5.0 U	50 U	10 U [10 U]
Dibromochloromethane	50	10 U	10 U	10 U	1.0 U	2.0 U [2.0 U]	NA	1.0 U	5.0 U	5.0 U	5.0 U	10 U	50 U	5.0 U	50 U	10 U [10 U]
Ethylbenzene	5	10 U	10 U	10 U	1.0 U	2.0 U [2.0 U]	1.0 U	1.0 U	5.0 U	5.0 U	5.0 U	10 U	50 U	5.0 U	50 U	10 U [10 U]
Methylene Chloride	5	50 U	50 U	10 U	5.0 U	10 U [10 U]	5.0 U	5.0 U	25 U	25 U	25 U	50 U	50 U	5.0 U	50 U	50 U [50 U]
Naphthalene	10	NA	NA	NA	NA	NA	1.0 U	NA	NA	NA	NA	NA	NA	NA	NA	NA
Styrene	5	10 U	10 U	10 U	1.0 U	2.0 U [2.0 U]	NA	1.0 U	5.0 U	5.0 U	5.0 U	**19**	50 U	5.0 U	50 U	10 U [10 U]
Tetrachloroethene	5	10 U	10 U	10 U	1.0 U	2.0 U [2.0 U]	1.0 U	1.0 U	5.0 U	5.0 U	5.0 U	10 U	**82**	**57**	**66**	**120 [100]**
Toluene	5	10 U	10 U	10 U	1.0 U	2.0 U [2.0 U]	1.0 U	1.0 U	5.0 U	5.0 U	5.0 U	10 U	50 U	5.0 U	50 U	10 U [10 U]
trans-1,2-Dichloroethene	5	**31**	**15**	10 U	**12**	**7.9 [7.4]**	**12**	**8.6**	**7.5**	**8.3**	**6.7**	**23**	50 U	**7.3**	50 U	10 U [10 U]
trans-1,3-Dichloropropene	0.4	10 U	10 U	10 U	1.0 U	2.0 U [2.0 U]	NA	1.0 U	5.0 U	5.0 U	5.0 U	10 U	50 U	5.0 U	50 U	10 U [10 U]
Trichloroethene	5	10 U	10 U	10 U	1.0 U	2.0 U [2.0 U]	1.0 U	1.0 U	5.0 U	5.0 U	5.0 U	10 U	**360**	**330**	**340**	**740 [830]**
Vinyl Acetate	- -	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Vinyl Chloride	2	**130**	**230**	**100**	**100**	**45 [40]**	**110**	**110**	**76**	**56**	**59**	**220**	**520**	**490**	**540**	**460 [430]**
Xylenes (total)	5	20 U	20 U	20 U	2.0 U	4.0 U [4.0 U]	2.0 U	2.0 U	10 U	10 U	10 U	20 U	100 U	10 U	100 U	20 U [20 U]
Total VOCs	- -	**840**	**1,100**	**720**	**600**	**500 [440]**	**880**	**590**	**540**	**480**	**450 J**	**1,300**	**1,900**	**1,900**	**2,400**	**2,600 [2,700]**

See Notes on Page 31.

Appendix E. Summary of Historical VOC Data in Groundwater, Revised Draft RFI Report, Ashland Inc., Rensselaer, New York

Location ID: / Date Collected:	NYSDEC TOGS 1.1.1 Water Guidance Values	MW-19 11/13/02	MW-19 04/21/03	MW-19 07/16/03	MW-19 10/27/03	MW-19 04/08/04	MW-19 10/12/04	MW-19 04/13/05	MW-19 08/11/05	MW-19 05/10/06	MW-19 10/05/06	MW-19 04/12/07	MW-19 09/18/07	MW-19 04/09/08	MW-19 09/15/08	MW-20 05/30/97
Volatile Organics																
1,1,1-Trichloroethane	5	**29 [29]**	**33**	**16**	**16**	**58**	25 U	**34**	20 U	**57**	1.0 U	**1.3 [1.0 U]**	**1.3**	5.0 U	1.0 U	**2,000**
1,1,2,2-Tetrachloroethane	5	10 U [10 U]	10 U	10 U	10 U	1.0 U	25 U	20 U	20 U	1.0 U	1.0 U	1.0 U [1.0 U]	1.0 U	5.0 U	1.0 U	500 U
1,1,2-Trichloroethane	1	10 U [10 U]	10 U	10 U	10 U	1.0 U	25 U	20 U	20 U	1.0 U	NA	1.0 U [1.0 U]	1.0 U	5.0 U	1.0 U	500 U
1,1-Dichloroethane	5	**91 [95]**	**52**	**49**	**40**	**150**	**130**	**100**	**150**	**150**	**160**	**86 [1.3]**	**42**	**36**	**40**	500 U
1,1-Dichloroethene	5	10 U [10 U]	10 U	10 U	10 U	**6.4**	25 U	20 U	20 U	1.0 U	1.0 U	1.0 U [1.0 U]	1.0 U	**5.7**	1.0 U	**540**
1,2-Dichloroethane	0.6	10 U [10 U]	10 U	10 U	10 U	1.0 U	25 U	20 U	20 U	1.0 U	1.0 U	1.0 U [1.0 U]	1.0 U	5.0 U	1.0 U	500 U
1,2-Dichloroethene (total)	- -	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,2-Dichloropropane	1	10 U [10 U]	10 U	10 U	10 U	**1.4**	25 U	20 U	20 U	**1.2**	NA	1.0 U [1.0 U]	1.0 U	5.0 U	1.0 U	500 U
2-Butanone	- -	100 U [100 U]	100 U	100 U	100 U	10 U	250 U	200 U	200 U	10 U	10 U	10 U [10 U]	10 UJ	50 U	10 U	2,500 U
2-Chloroethylvinylether	- -	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	5,000 U
2-Hexanone	50	100 U [100 U]	100 U	100 U	100 U	10 U	250 U	200 U	200 U	10 U	NA	10 U [10 U]	10 U	50 U	10 U	2,500 U
4-Methyl-2-pentanone	- -	100 U [100 U]	100 U	100 U	100 U	10 U	250 U	200 U	200 U	10 U	10 U	10 U [10 U]	10 U	50 U	10 U	2,500 U
Acetone	50	250 U [250 U]	250 U	250 U	250 U	25 U	620 U	500 U	500 U	25 U	25 U	25 U [25 U]	25 UJ	120 U	25 U	5,000 U
Benzene	1	**16 [15]**	10 U	**12**	10 U	**16**	25 U	20 U	20 U	**12**	**16**	**13 [4.1]**	**17**	**13**	**18**	500 U
Bromodichloromethane	50	10 U [10 U]	10 U	10 U	10 U	1.0 U	25 U	20 U	20 U*	1.0 U	NA	1.0 U [1.0 U]	1.0 U	5.0 U	1.0 U	500 U
Bromoform	50	10 U [10 U]	10 U	10 U	10 U	1.0 U	25 U	20 U	20 U	1.0 U	NA	1.0 U [1.0 U]	1.0 U	5.0 U	1.0 U	500 U
Bromomethane	5	10 U [10 U]	10 U	10 U	10 U	1.0 U	25 U	20 U	20 U	1.0 U	NA	1.0 U [1.0 U]	1.0 U	5.0 U	1.0 U	1,000 U
Carbon Disulfide	- -	10 U [10 U]	10 U	10 U	10 U	1.0 U	25 U	20 U	20 U	2.0 U	NA	2.0 U [2.0 U]	2.0 U	10 U	2.0 UJ	500 U
Carbon Tetrachloride	5	10 U [10 U]	10 U	10 U	10 U	1.0 U	25 U	20 U	20 U	1.0 U	1.0 U	1.0 U [1.0 U]	1.0 U	5.0 U	1.0 U	500 U
Chlorobenzene	5	10 U [10 U]	10 U	10 U	10 U	**3.0**	25 U	20 U	20 U	**1.0**	NA	**1.2 [1.0 U]**	1.0 U	5.0 U	1.0 U	500 U
Chloroethane	5	10 U [10 U]	10 U	10 U	10 U	**49**	**28**	20 U	20 U	**110 D**	**490 D**	**280 D [1.0 U]**	**190 D**	5.0 U	**59 J**	1,000 U
Chloroform	7	**23 [20]**	**90**	**20**	**100**	**1.9**	25 U	**31**	20 U	1.0 U	NA	1.0 U [1.0 U]	1.0 U	**8.4**	**1.7**	500 U
Chloromethane	- -	10 U [10 U]	10 U	10 U	10 U	1.0 U	25 U	20 U	20 U	1.0 U	NA	1.0 U [1.0 U]	1.0 U	5.0 U	1.0 U	1,000 U
cis-1,2-Dichloroethene	5	**1,200 [1,100]**	**1,100**	**740**	**1,600**	**2,200 D**	**1,600**	**1,200**	**1,600**	**4.9**	**3.5**	**100 [1.2]**	**100**	**490**	**15**	**7,900**
cis-1,3-Dichloropropene	0.4	10 U [10 U]	10 U	10 U	10 U	1.0 U	25 U	20 U	20 U	1.0 U	NA	1.0 U [1.0 U]	1.0 U	5.0 U	1.0 U	500 U
Dibromochloromethane	50	10 U [10 U]	10 U	10 U	10 U	1.0 U	25 U	20 U	20 U	1.0 U	NA	1.0 U [1.0 U]	1.0 U	5.0 U	1.0 U	500 U
Ethylbenzene	5	10 U [10 U]	10 U	10 U	10 U	**3.4**	25 U	20 U	20 U	**4.9**	**6.3**	**4.4 [1.0 U]**	**4.1**	5.0 U	1.0 U	500 U
Methylene Chloride	5	50 U [50 U]	50 U	50 U	50 U	5.0 U	120 U	20 U	100 U	5.0 U	5.0 U	5.0 U [5.0 U]	5.0 U	25 U	5.0 U	500 U
Naphthalene	10	NA	NA	NA	NA	NA	NA	NA	NA	NA	1.0 U	NA	NA	NA	NA	NA
Styrene	5	10 U [10 U]	10 U	**20**	10 U	1.0 U	25 U	20 U	20 U	1.0 U	NA	1.0 U [1.0 U]	1.0 U	5.0 U	1.0 U	500 U
Tetrachloroethene	5	**41 [38]**	**150**	**21**	**200**	**5.6**	25 U	**82**	20 U	1.0 U	1.0 U	1.0 U [1.0 U]	1.0 U	**19**	1.0 U	**4,200**
Toluene	5	10 U [10 U]	10 U	10 U	10 U	**8.9**	25 U	20 U	20 U	**7.7**	**9.9**	**5.9 [2.8]**	**4.3**	**5.9**	**5.4**	500 U
trans-1,2-Dichloroethene	5	**12 [10 U]**	**12**	**15**	10 U	**28**	25 U	20 U	**21**	**7.7**	**10**	**8.6 [1.0 U]**	**6.0**	5.0 U	**3.5**	500 U
trans-1,3-Dichloropropene	0.4	10 U [10 U]	10 U	10 U	10 U	1.0 U	25 U	20 U	20 U	1.0 U	NA	1.0 U [1.0 U]	1.0 U	5.0 U	1.0 U	500 U
Trichloroethene	5	**170 [140]**	**520**	**96**	**340**	**17**	**62**	**260**	20 U	1.0 U	1.0 U	**1.1 [3.7]**	1.0 U	**70**	1.0 U	**29,000**
Vinyl Acetate	- -	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	1,000 U
Vinyl Chloride	2	**860 [870]**	**320**	**270**	**230**	**2,100 D**	**2,100**	**1,100**	**1,700**	**3.8**	**8.6**	**310 D [1.1]**	**310 D**	**230**	**30**	1,000 U
Xylenes (total)	5	20 U [20 U]	20 U	20 U	20 U	**9.0**	50 U	40 U	40 U	**11**	**15**	**8.9 [2.0 U]**	**9.3**	10 U	**2.4**	500 U
Total VOCs	- -	**2,400 [2,300]**	**2,300**	**1,300**	**2,500**	**4,700**	**3,900**	**2,800**	**3,500**	**370**	**720**	**820 [14]**	**680**	**880**	**180 J**	**44,000**

See Notes on Page 31.

Appendix E. Summary of Historical VOC Data in Groundwater, Revised Draft RFI Report, Ashland Inc., Rensselaer, New York

Location ID: / Date Collected:	NYSDEC TOGS 1.1.1 Water Guidance Values	MW-20 11/21/97	MW-20 05/29/98	MW-20 11/20/98	MW-20 05/27/99	MW-20 11/16/99	MW-20 05/25/00	MW-20 11/30/00	MW-20 06/06/01	MW-20 11/08/01	MW-A1 04/09/08	MW-A1 09/15/08	MW-B1 04/09/08	MW-B1 09/15/08	PZ-1 08/11/05	PZ-1 05/10/06
Volatile Organics																
1,1,1-Trichloroethane	5	**1,300**	500 U	**430**	**320**	**500**	120 U	50 U	**58**	**420**	1.0 U	2.0 U	5.0 U	10 U [1.0 U]	20 U	10 U
1,1,2,2-Tetrachloroethane	5	500 U	5.0 U	250 U	25 U	120 U	120 U	50 U	50 U	100 U	1.0 U	2.0 U	5.0 U	10 U [1.0 U]	20 U	10 U
1,1,2-Trichloroethane	1	500 U	5.0 U	250 U	25 U	120 U	120 U	50 U	50 U	100 U	1.0 U	2.0 U	5.0 U	10 U [1.0 U]	20 U	10 U
1,1-Dichloroethane	5	500 U	**5.2**	250 U	25 U	120 U	120 U	50 U	50 U	100 U	**27**	**28**	5.0 U	10 UJ [1.0 U]	**110**	**28**
1,1-Dichloroethene	5	**480 J**	**150**	250 U	**140**	**170**	120 U	50 U	**130**	**210**	1.0 U	2.0 U	5.0 U	**10 U [4.7 J]**	20 U	10 U
1,2-Dichloroethane	0.6	500 U	5.0 U	250 U	25 U	120 U	120 U	50 U	50 U	100 U	1.0 U	2.0 U	**70**	**81 [76]**	20 U	10 U
1,2-Dichloroethene (total)	- -	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,2-Dichloropropane	1	500 U	5.0 U	250 U	25 U	120 U	120 U	50 U	50 U	100 U	1.0 U	2.0 U	5.0 U	10 U [1.0 U]	20 U	10 U
2-Butanone	- -	2,500 U	25 U	1,200 U	250 U	620 U	620 U	250 U	250 U	500 U	10 U	20 U	50 U	100 U [10 U]	200 U	100 U
2-Chloroethylvinylether	- -	5,000 U	50 U	2,500 U	50 U	1,200 U	1,200 U	NA	NA	NA	NA	NA	NA	NA	NA	NA
2-Hexanone	50	2,500 U	25 U	1,200 U	250 U	620 U	620 U	250 U	250 U	500 U	10 U	20 U	50 U	100 U [10 U]	200 U	100 U
4-Methyl-2-pentanone	- -	2,500 U	25 U	1,200 U	250 U	620 U	620 U	250 U	250 U	500 U	10 U	20 U	50 U	100 U [10 U]	200 U	100 U
Acetone	50	5,000 U	50 U	2,500 U	620 U	1,200 U	1,200 U	500 U	500 U	1,000 U	25 U	50 U	120 U	250 U [25 U]	500 U	250 U
Benzene	1	500 U	5.0 U	250 U	25 U	120 U	120 U	50 U	50 U	100 U	**9.2**	**8.9**	5.0 U	10 U [1.0 U]	20 U	10 U
Bromodichloromethane	50	500 U	5.0 U	250 U	25 U	120 U	120 U	50 U	50 U	100 U	1.0 U	2.0 U	5.0 U	10 U [1.0 U]	20 U*	10 U
Bromoform	50	500 U	5.0 U	250 U	25 U	120 U	120 U	50 U	50 U	100 U	1.0 U	2.0 U	5.0 U	10 U [1.0 U]	20 U	10 U
Bromomethane	5	1,000 U	10 U	500 U	25 U	250 U	250 U	100 U	100 U	200 U	1.0 U	2.0 U	**26**	10 U [1.0 U]	20 U	10 U
Carbon Disulfide	- -	500 U	5.0 U	250 U	25 U	120 U	120 U	50 U	50 U	100 U	2.0 U*	4.0 U	10 U	20 U [2.0 U]	20 U	20 U
Carbon Tetrachloride	5	500 U	5.0 U	250 U	25 U	120 U	120 U	50 U	50 U	100 U	1.0 U	2.0 U	5.0 U	10 U [1.0 U]	20 U	10 U
Chlorobenzene	5	500 U	5.0 U	250 U	25 U	120 U	120 U	50 U	50 U	100 U	**1.8**	2.0 U	5.0 U	10 U [1.0 U]	20 U	10 U
Chloroethane	5	1,000 U	10 U	500 U	25 U	250 U	250 U	100 U	100 U	200 U	**20**	**12 J**	5.0 U	10 U [1.0 U]	20 U	10 U
Chloroform	7	500 U	**9.1**	250 U	25 U	120 U	120 U	50 U	50 U	100 U	1.0 U	2.0 U	5.0 U	10 U [1.0 U]	**90**	**39**
Chloromethane	- -	1,000 U	10 U	500 U	25 U	250 U	250 U	100 U	100 U*F	200 U*F	1.0 U	2.0 UJ	5.0 U	10 U [1.0 U]	20 U	10 U
cis-1,2-Dichloroethene	5	**6,700**	**4,600 D**	**1,800**	**2,900**	**3,000**	**1,000**	**600**	**2,100**	**2,200**	**230 D**	**360**	**1,000 D**	**1,300 [1,300 D]**	**6,800 D**	**1,900**
cis-1,3-Dichloropropene	0.4	500 U	5.0 U	250 U	25 U	120 U	120 U	50 U	50 U	100 U	1.0 U	2.0 U	5.0 U	10 U [1.0 U]	20 U	10 U
Dibromochloromethane	50	500 U	5.0 U	250 U	25 U	120 U	120 U	50 U	50 U	100 U	1.0 U	2.0 U	5.0 U	10 U [1.0 U]	20 U	10 U
Ethylbenzene	5	500 U	5.0 U	250 U	25 U	120 U	120 U	50 U	50 U	100 U	1.0 U	2.0 U	5.0 U	10 U [1.0 U]	20 U	10 U
Methylene Chloride	5	500 U	5.0 U	250 U	120 U	120 U	120 U	50 U	50 U	100 U	5.0 U	10 U	25 U	50 U [5.0 U]	100 U	50 U
Naphthalene	10	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Styrene	5	500 U	5.0 U	250 U	25 U	120 U	120 U	50 U	50 U	100 U	1.0 U	2.0 U	5.0 U	10 U [1.0 U]	20 U	10 U
Tetrachloroethene	5	**1,900**	**1,400 D**	**720**	**680**	**920**	**290**	**100**	**400**	**690**	**2.6**	2.0 U	5.0 U	10 U [1.0 U]	**180**	10 U
Toluene	5	500 U	5.0 U	250 U	25 U	120 U	120 U	50 U	50 U	100 U	1.0 U	2.0 U	5.0 U	10 U [1.0 U]	**50**	**32**
trans-1,2-Dichloroethene	5	500 U	**25**	250 U	**42**	120 U	120 U	50 U	50 U	100 U	**3.3**	**2.8**	**28**	**34 [34]**	**49**	**29**
trans-1,3-Dichloropropene	0.4	500 U	5.0 U	250 U	25 U	120 U	120 U	50 U	50 U	100 U	1.0 U	2.0 U	5.0 U	10 U [1.0 U]	20 U	10 U
Trichloroethene	5	**16,000**	**8,500 D**	**5,900**	**4,800**	**6,600**	**2,100**	**1,300**	**3,600**	**4,600 D**	**5.0**	**4.0**	5.0 U	10 U [1.0 U]	**75**	10 U
Vinyl Acetate	- -	1,000 U	10 U	500 U	50 U	250 U	250 U	NA	NA	NA	NA	NA	NA	NA	NA	NA
Vinyl Chloride	2	1,000 U	**27**	500 U	25 U	250 U	250 U	100 U	100 U	200 U	**240 D**	**360**	**310**	**270 [300 D]**	**3,200**	**790**
Xylenes (total)	5	500 U	5.0 U	250 U	50 U	250 U	250 U	100 U	100 U	200 U	2.0 U	4.0 U	10 U	20 U [2.0 U]	40 U	**22**
Total VOCs	- -	**26,000 J**	**15,000**	**8,900**	**8,900**	**11,000**	**3,400**	**2,000**	**6,300**	**8,100**	**540**	**780 J**	**1,400**	**1,700 J [1,500 J]**	**11,000**	**2,800**

See Notes on Page 31.

Appendix E. Summary of Historical VOC Data in Groundwater, Revised Draft RFI Report, Ashland Inc., Rensselaer, New York

Location ID: / Date Collected:	NYSDEC TOGS 1.1.1 Water Guidance Values	PZ-1 10/05/06	PZ-1 09/18/07	PZ-2 08/11/05	PZ-2 05/10/06	PZ-2 10/05/06	PZ-3 08/11/05	PZ-3 05/10/06	PZ-3 09/21/07	PZ-4 10/05/06	PZ-5 09/14/07	PZ-6 02/28/06	PZ-6 05/03/06	PZ-6 10/04/06	PZ-6 09/14/07	PZ-7 09/14/07
Volatile Organics																
1,1,1-Trichloroethane	5	**50**	50 U	1.0 U	1.0 U	1.0 U [1.0 U]	20 U	1.0 U	10 U	**8.1**	**17**	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
1,1,2,2-Tetrachloroethane	5	10 U	50 U	1.0 U	1.0 U	1.0 U [1.0 U]	20 U	1.0 U	10 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
1,1,2-Trichloroethane	1	NA	50 U	1.0 U	1.0 U	NA	20 U	1.0 U	10 U	NA	1.0 U	1.0 U	1.0 U	NA	1.0 U	1.0 U
1,1-Dichloroethane	5	**260**	**120**	**17**	**14**	**1.4 [1.5]**	**27**	**35**	**33**	**18**	**160**	**5.7**	**6.5**	**7.2**	**9.6**	1.0 U
1,1-Dichloroethene	5	**26**	50 U	**1.2**	1.0 U	1.0 U [1.0 U]	20 U	1.0 U	10 U	1.0 U	**1.4**	**1.0**	1.0 U	1.0 U	1.0 U	1.0 U
1,2-Dichloroethane	0.6	10 U	50 U	**3.4**	**4.0**	**2.9 [2.7]**	20 U	1.0 U	10 U	**3.3**	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
1,2-Dichloroethene (total)	- -	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,2-Dichloropropane	1	NA	50 U	1.0 U	1.0 U	NA	20 U	1.0 U	10 U	NA	1.0 U	1.0 U	1.0 U	NA	1.0 U	1.0 U
2-Butanone	- -	100 U	500 UJ	10 U	10 U	10 U [10 U]	200 U	10 U	100 U	10 U	10 U	10 U	10 U*	10 U	10 U	10 U
2-Chloroethylvinylether	- -	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
2-Hexanone	50	NA	500 U	10 U	10 U	NA	200 U	10 U	100 U	NA	10 U	10 U	10 U*	NA	10 U	10 U
4-Methyl-2-pentanone	- -	100 U	500 U	10 U	10 U	10 U [10 U]	200 U	10 U	100 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Acetone	50	250 U	1,300 UJ	25 U	25 U	25 U [25 U]	500 U	25 U	250 U	25 U	25 U	25 U	25 U	25 U	25 U	25 U
Benzene	1	**43**	50 U	**15**	**2.2**	**9.0 [7.9]**	20 U	**7.3**	10 U	**6.2**	**3.4**	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Bromodichloromethane	50	NA	50 U	1.0 U*	1.0 U	NA	20 U*	1.0 U	10 U	NA	1.0 U	1.0 U	1.0 U	NA	1.0 U	1.0 U
Bromoform	50	NA	50 U	1.0 U	1.0 U	NA	20 U	1.0 U	10 U	NA	1.0 U	1.0 U	1.0 U	NA	1.0 U	1.0 U
Bromomethane	5	NA	50 U	1.0 U	1.0 U	NA	20 U	1.0 U	10 UJ	NA	1.0 UJ	1.0 U	1.0 U	NA	1.0 UJ	1.0 UJ
Carbon Disulfide	- -	NA	100 U	1.0 U	2.0 U	NA	20 U	2.0 U	20 U	NA	2.0 U	2.0 U	2.0 U	NA	2.0 U	2.0 U
Carbon Tetrachloride	5	10 U	50 U	1.0 U	1.0 U	1.0 U [1.0 U]	20 U	1.0 U	10 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Chlorobenzene	5	NA	50 U	1.0 U	1.0 U	NA	20 U	**12**	**12**	NA	1.0 U	1.0 U	1.0 U	NA	1.0 U	1.0 U
Chloroethane	5	10 U	50 U	**37**	**12**	**32 [39]**	**41**	**58**	**100 J**	1.0 U	**74**	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Chloroform	7	NA	**76**	1.0 U	1.0 U	NA	20 U	1.0 U	10 U	NA	1.0 U	1.0 U	1.0 U	NA	1.0 U	1.0 U
Chloromethane	- -	NA	50 U	1.0 U	1.0 U	NA	20 U	1.0 U	10 UJ	NA	1.0 U	1.0 U	1.0 U	NA	1.0 U	1.0 U
cis-1,2-Dichloroethene	5	**23,000 D**	**5,900**	**150 D**	**3.3**	1.0 U [1.0 U]	**2,900**	**46**	**1,100**	1.0 U	**66**	**130**	**100**	**110**	**130**	**22**
cis-1,3-Dichloropropene	0.4	NA	50 U	1.0 U	1.0 U	NA	20 U	1.0 U	10 U	NA	1.0 U	1.0 U	1.0 U	NA	1.0 U	1.0 U
Dibromochloromethane	50	NA	50 U	1.0 U	1.0 U	NA	20 U	1.0 U	10 U	NA	1.0 U	1.0 U	1.0 U	NA	1.0 U	1.0 U
Ethylbenzene	5	**120**	**51**	1.0 U	**1.6**	**4.0 [3.9]**	20 U	1.0 U	10 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Methylene Chloride	5	50 U	250 U	5.0 U	5.0 U	5.0 U [5.0 U]	100 U	5.0 U	50 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U
Naphthalene	10	10 U	NA	NA	NA	1.0 U [1.0 U]	NA	NA	NA	1.0 U	NA	NA	NA	1.0 U	NA	NA
Styrene	5	NA	50 U	1.0 U	1.0 U	NA	20 U	1.0 U	10 U	NA	1.0 U	1.0 U	1.0 U	NA	1.0 U	1.0 U
Tetrachloroethene	5	**11**	50 U	**60**	1.0 U	1.0 U [1.0 U]	**340**	1.0 U	10 U	**2.5**	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	**4.5**
Toluene	5	**650**	**260**	**1.0**	**3.9**	**11 [12]**	20 U	**1.6**	10 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
trans-1,2-Dichloroethene	5	**210**	**84**	**2.7**	**6.8**	**1.7 [1.8]**	**27**	**10**	**12**	1.0 U	**1.4**	**1.1**	**1.4**	1.0 U	1.0 U	1.0 U
trans-1,3-Dichloropropene	0.4	NA	50 U	1.0 U	1.0 U	NA	20 U	1.0 U	10 U	NA	1.0 U	1.0 U	1.0 U	NA	1.0 U	1.0 U
Trichloroethene	5	10 U	50 U	**20**	1.0 U	1.0 U [1.0 U]	**200**	1.0 U	10 U	**7.7**	**5.1**	**34**	**7.2**	**8.0**	**8.4**	**3.8**
Vinyl Acetate	- -	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Vinyl Chloride	2	**14,000 D**	**2,900**	**250 D**	**4.3**	1.0 U [1.0 U]	**1,500**	**79**	**570**	**62**	**7.1**	**54**	**20**	**26**	**30**	**10**
Xylenes (total)	5	**530 ***	**230**	**4.7**	**7.0**	**18 [17]**	40 U	2.0 U	20 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U
Total VOCs	- -	**39,000**	**9,600**	**560**	**59**	**80 [86]**	**5,000**	**250**	**1,800 J**	**110**	**340**	**230**	**140**	**150**	**180**	**40**

See Notes on Page 31.

Appendix E. Summary of Historical VOC Data in Groundwater, Revised Draft RFI Report, Ashland Inc., Rensselaer, New York

Location ID: / Date Collected:	NYSDEC TOGS 1.1.1 Water Guidance Values	SUMP 05/29/97	SUMP 11/20/97	SUMP 05/28/98	SUMP 11/19/98	SUMP 02/02/99	SUMP 05/26/99	SUMP 11/15/99	SUMP 05/24/00	SUMP 05/21/02	SUMP 11/13/02	SUMP 04/21/03	SUMP 07/15/03	SUMP 10/27/03	SUMP 04/06/04	SUMP 10/12/04	SUMP 04/13/05
Volatile Organics																	
1,1,1-Trichloroethane	5	**40**	**31**	**26**	5.0 U	10 U	**15**	5.0 U	5.0 U	**7.1**	**5.7**	**2.7**	**12**	**9.6**	**2.2**	4.0 U	**4.5**
1,1,2,2-Tetrachloroethane	5	5.0 U	10 U	5.0 U	5.0 U	10 U	1.0 U	5.0 U	5.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	4.0 U	1.0 U
1,1,2-Trichloroethane	1	5.0 U	10 U	5.0 U	5.0 U	10 U	1.0 U	5.0 U	5.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	4.0 U	1.0 U
1,1-Dichloroethane	5	**35**	**38**	**30**	5.0 U	**10**	**22**	5.0 U	5.0 U	**10**	**8.0**	**3.8**	**16**	**15**	**1.0**	4.0 U	**6.4**
1,1-Dichloroethene	5	5.0 U	**1.5 J**	5.0 U	5.0 U	10 U	1.0 U	5.0 U	5.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	4.0 U	1.0 U
1,2-Dichloroethane	0.6	**16**	**8.9 J**	5.0 U	5.0 U	10 U	**5.6**	5.0 U	5.0 U	**2.8**	**1.8**	**3.0**	**2.8**	**2.3**	1.0 U	4.0 U	**2.8**
1,2-Dichloroethene (total)	- -	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,2-Dichloropropane	1	5.0 U	10 U	5.0 U	5.0 U	10 U	1.0 U	5.0 U	5.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	4.0 U	1.0 U
2-Butanone	- -	25 U	50 U	25 U	25 U	50 U	10 U	25 U	25 U	10 U	10 U	10 U	10 U	10 U	10 U	40 U	10 U
2-Chloroethylvinylether	- -	50 U	100 U	50 U	50 U	100 U	10 U	50 U	50 U	NA	NA	NA	NA	NA	NA	NA	NA
2-Hexanone	50	25 U	50 U	25 U	25 U	50 U	10 U	25 U	25 U	10 U	10 U	10 U	10 U	10 U	10 U	40 U	10 U
4-Methyl-2-pentanone	- -	25 U	50 U	25 U	25 U	50 U	10 U	25 U	25 U	10 U	10 U	10 U	10 U	10 U	10 U	40 U	10 U
Acetone	50	50 U	100 U	50 U	50 U	100 U	25 U	50 U	50 U	25 U	25 U	25 U	25 U	25 U	25 U	100 U	25 U
Benzene	1	5.0 U	10 U	5.0 U	5.0 U	10 U	1.0 U	5.0 U	5.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	4.0 U	1.0 U
Bromodichloromethane	50	5.0 U	10 U	5.0 U	5.0 U	10 U	1.0 U	5.0 U	5.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	4.0 U	1.0 U
Bromoform	50	5.0 U	10 U	5.0 U	5.0 U	10 U	1.0 U	5.0 U	5.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	4.0 U	1.0 U
Bromomethane	5	10 U	20 U	10 U	10 U	20 U	1.0 U	10 U	10 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	4.0 U	1.0 U
Carbon Disulfide	- -	5.0 U	10 U	5.0 U	5.0 U	10 U	1.0 U	5.0 U	5.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	4.0 U	1.0 U
Carbon Tetrachloride	5	5.0 U	10 U	5.0 U	5.0 U	10 U	1.0 U	5.0 U	5.0 U	**1.1**	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	4.0 U	1.0 U
Chlorobenzene	5	5.0 U	10 U	5.0 U	5.0 U	10 U	1.0 U	5.0 U	5.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	4.0 U	1.0 U
Chloroethane	5	10 U	**4.1 J**	10 U	10 U	20 U	1.0 U	10 U	10 U	1.0 U	1.0 U	**1.6**	1.0 U	**3.4**	1.0 U	4.0 U	1.0 U
Chloroform	7	**1.5 J**	10 U	5.0 U	5.0 U	10 U	1.0 U	5.0 U	5.0 U	1.0 U	1.0 U	1.0 U	1.0 U	**1.8**	1.0 U	4.0 U	1.0 U
Chloromethane	- -	10 U	20 U	10 U	10 U	20 U	1.0 U	10 U	10 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	4.0 U	1.0 U
cis-1,2-Dichloroethene	5	**210**	**570**	**540 D**	**31**	**140**	**300 D**	**29**	**28**	**42**	**30**	**72**	**160**	**210 D**	**25**	**100**	**200**
cis-1,3-Dichloropropene	0.4	5.0 U	10 U	5.0 U	5.0 U	10 U	1.0 U	5.0 U	5.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	4.0 U	1.0 U
Dibromochloromethane	50	5.0 U	10 U	5.0 U	5.0 U	10 U	1.0 U	5.0 U	5.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	4.0 U	1.0 U
Ethylbenzene	5	5.0 U	10 U	5.0 U	5.0 U	10 U	1.0 U	5.0 U	5.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	4.0 U	1.0 U
Methylene Chloride	5	5.0 U	10 U	5.0 U	5.0 U	10 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	20 U	1.0 U
Naphthalene	10	NA	NA	NA	NA	10 U	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Styrene	5	5.0 U	10 U	5.0 U	5.0 U	10 U	1.0 U	5.0 U	5.0 U	1.0 U	1.0 U	1.0 U	**2.2**	1.0 U	1.0 U	4.0 U	1.0 U
Tetrachloroethene	5	**4.1 J**	**6.1 J**	**7.0**	5.0 U	10 U	**2.8**	5.0 U	5.0 U	**1.6**	**1.5**	1.0 U	**3.4**	**3.7**	1.0 U	4.0 U	1.0 U
Toluene	5	**5.0**	10 U	**81**	5.0 U	10 U	1.0 U	5.0 U	5.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	4.0 U	1.0 U
trans-1,2-Dichloroethene	5	5.0 U	**2.2 J**	5.0 U	5.0 U	10 U	**1.4**	5.0 U	5.0 U	1.0 U	1.0 U	1.0 U	**4.0**	**1.0**	1.0 U	4.0 U	**1.2**
trans-1,3-Dichloropropene	0.4	5.0 U	10 U	5.0 U	5.0 U	10 U	1.0 U	5.0 U	5.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	4.0 U	1.0 U
Trichloroethene	5	**13**	**23**	**25**	**5.4**	**13**	**11**	5.0 U	5.0 U	**6.8**	**6.1**	**1.7**	**10**	**12**	**1.6**	4.0 U	**3.5**
Vinyl Acetate	- -	10 U	20 U	10 U	10 U	20 U	2.0 U	10 U	10 U	NA	NA	NA	NA	NA	NA	NA	NA
Vinyl Chloride	2	**8.5 J**	**82**	**130**	10 U	20 U	**9.3**	**15**	10 U	**6.3**	1.0 U	**2.7**	**2.5**	**3.4**	**1.2**	4.0 U	**1.0**
Xylenes (total)	5	5.0 U	**4.9 J**	**9.0**	5.0 U	10 U	2.0 U	10 U	10 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	8.0 U	2.0 U
Total VOCs	- -	**330 J**	**770 J**	**850**	**36**	**160**	**370**	**44**	**28**	**78**	**53**	**88**	**210**	**260**	**31**	**100**	**220**

See Notes on Page 31.

Appendix E. Summary of Historical VOC Data in Groundwater, Revised Draft RFI Report, Ashland Inc., Rensselaer, New York

Location ID: / Date Collected:	NYSDEC TOGS 1.1.1 Water Guidance Values	SUMP 05/09/06	SUMP 07/10/06	SUMP 10/04/06	SUMP 04/11/07	SUMP 09/13/07	SUMP 04/10/08	SUMP 09/15/08
Volatile Organics								
1,1,1-Trichloroethane	5	**4.7**	1.0 U	1.0 U	**6.5**	**8.8 D [7.0]**	**4.2**	5.0 U
1,1,2,2-Tetrachloroethane	5	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U [1.0 U]	1.0 U	5.0 U
1,1,2-Trichloroethane	1	1.0 U	1.0 U	NA	1.0 U	1.0 U [1.0 U]	1.0 U	5.0 U
1,1-Dichloroethane	5	**53**	1.0 U	**9.1**	**7.8**	**14 [14]**	**10**	**9.1**
1,1-Dichloroethene	5	1.0 U	1.0 U	1.0 U	**1.5**	1.0 U [1.0 U]	**1.1**	5.0 U
1,2-Dichloroethane	0.6	**3.9**	1.0 U	**1.3**	**1.2**	1.0 U [1.0 U]	1.0 U	5.0 U
1,2-Dichloroethene (total)	- -	NA	NA	NA	NA	NA	NA	NA
1,2-Dichloropropane	1	1.0 U	1.0 U	NA	1.0 U	1.0 U [1.0 U]	1.0 U	5.0 U
2-Butanone	- -	10 U	10 U	10 U	10 U	10 U [10 U]	10 U	50 U
2-Chloroethylvinylether	- -	NA	NA	NA	NA	NA	NA	NA
2-Hexanone	50	10 U	10 U	NA	10 U	10 U [10 U]	10 U	50 U
4-Methyl-2-pentanone	- -	10 U	10 U	10 U	10 U	10 U [10 U]	10 U	50 U
Acetone	50	25 U	25 U	25 U	25 U	25 U [25 U]	25 U	120 U
Benzene	1	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U [1.0 U]	1.0 U	5.0 U
Bromodichloromethane	50	1.0 U	1.0 U	NA	1.0 U	1.0 U [1.0 U]	1.0 U	5.0 U
Bromoform	50	1.0 U	1.0 U	NA	1.0 U	1.0 U [1.0 U]	1.0 U	5.0 U
Bromomethane	5	1.0 U	1.0 U	NA	1.0 U	1.0 UJ [1.0 UJ]	1.0 UJ	5.0 U
Carbon Disulfide	- -	2.0 U	2.0 U	NA	2.0 U	2.0 U [2.0 U]	2.0 U	10 U
Carbon Tetrachloride	5	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U [1.0 U]	1.0 U	5.0 U
Chlorobenzene	5	1.0 U	1.0 U	NA	1.0 U	1.0 U [1.0 U]	1.0 U	5.0 U
Chloroethane	5	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U [1.0 U]	1.0 U	5.0 UJ
Chloroform	7	1.0 U	1.0 U	NA	1.0 U	1.0 U [1.0 U]	1.0 U	5.0 U
Chloromethane	- -	1.0 U*	1.0 U	NA	1.0 U	1.0 U [1.0 U]	1.0 UJ	5.0 UJ
cis-1,2-Dichloroethene	5	**180 D**	**58**	**170**	**170**	**320 D [300 D]**	**310 DJ**	**240**
cis-1,3-Dichloropropene	0.4	1.0 U	1.0 U	NA	1.0 U	1.0 U [1.0 U]	1.0 U	5.0 U
Dibromochloromethane	50	1.0 U	1.0 U	NA	1.0 U	1.0 U [1.0 U]	1.0 U	5.0 U
Ethylbenzene	5	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U [1.0 U]	1.0 U	5.0 U
Methylene Chloride	5	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U [5.0 U]	5.0 U	25 U
Naphthalene	10	NA	NA	1.0 U	NA	NA	NA	NA
Styrene	5	1.0 U	1.0 U	NA	1.0 U	1.0 U [1.0 U]	1.0 U	5.0 U
Tetrachloroethene	5	**1.2**	1.0 U	**2.0**	1.0 U	**2.9 D [2.8 D]**	**2.0**	5.0 U
Toluene	5	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U [1.0 U]	1.0 U	5.0 U
trans-1,2-Dichloroethene	5	**2.3**	**1.0**	**1.2**	1.0 U	**1.2 [1.1]**	**1.5**	5.0 U
trans-1,3-Dichloropropene	0.4	1.0 U	1.0 U	NA	1.0 U	1.0 U [1.0 U]	1.0 U	5.0 U
Trichloroethene	5	**4.0**	**2.8**	**8.6**	**3.5**	**13 D [9.4]**	**7.0**	5.0 U
Vinyl Acetate	- -	NA	NA	NA	NA	NA	NA	NA
Vinyl Chloride	2	**1.6 ***	**36**	**3.9**	**7.6**	**41 [38]**	**56**	**64**
Xylenes (total)	5	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U [2.0 U]	2.0 U	10 U
Total VOCs	- -	**250**	**98**	**200**	**200**	**400 [370]**	**390 J**	**310 J**

See Notes on Page 31.

Appendix E. Summary of Historical VOC Data in Groundwater, Revised Draft RFI Report, Ashland Inc., Rensselaer, New York

Notes:

NYSDEC TOGS 1.1.1 Water Guidance Values = New York State Department of Environmental Conservation Technical and Operational Guidance Series (TOGS), June 1998, and its addenda (January 1999 Errata Sheet, April 2000 Addendum, and June 2004 Addendum).

Shaded cells denote results in exceedance of criteria.

Bold results denote detections.

All results are in micrograms per liter (ug/l), equivalent to parts per billion (ppb).

Duplicate sample results are in brackets.

NA = Not Analyzed.

RW-1, RW-2, and RW-7 sample IDs were submitted to the lab as CW-1, CW-2, and CW-7. Boring logs for these locations reflect total depth and geology that indicate they are the same locations, therefore sample IDs were altered to reflect locations that have been reported on site maps historically.

Lab Qualifiers	Definition
*	
*F35	Due to analyte abundance, target compound concentrations are reported from multiple runs to achieve requested detection limits.
D	Compound quantitated using a secondary dilution.
DJ	Compound quantitated using a secondary dilution. Estimated; result is below the project quantitation limit but greater than or equal to the MDL.
E/390	
J	Indicates an estimated value.
ND	None detected.
NDJ	
U	The compound was analyzed for but not detected. The associated value is the compound quantitation limit.
U *	The compound was analyzed for but not detected. The associated value is the compound quantitation limit.
U*F35	The compound was analyzed for but not detected. The associated value is the compound quantitation limit. Due to analyte abundance, target compound concentrations are reported from multiple runs to achieve requested detection limits.
UJ	The compound was analyzed for but not detected. The associated value is the compound quantitation limit. Indicates an estimated value.

BASF CORPORATION

COLUMBIA TURNPIKE (OVERPASS)

GB ENTERPRISES, LLC

CARPINELLO OIL

PRATT WALTER & SONS

ALBANY MACK SALES

VOLVO SERVICE CENTER

GP-22 [20] (12-16)
GP-25 [ND] (2-6)
GP-23 [ND] (12-16)
GP-24 [ND] (2-6)
GP-14 [ND] (6-16)
GP-28A [19] (4-8)
GP-16 [ND] (2-6)
GP-13 [24] (9-14)
GP-27A [180] (6-16)
GP-16 [18] (4-8)
GP-29 [ND] (14-18)
GP-5 [ND] (4-14)
GP-6 [3,710] (4-14)
GP-8 [3,111] (4-14)
MW-11
MW-12A
MW-12B
MW-10
GP-33 [19,400] (13-17)
GP-26A
GP-17 [21] (4-8)
GP-4 [71,090] (4-8)
GP-19A and B [3,650] (2-6) [16,800] (11-15)
GP-18 [3,630] (2-6)
RW-7
RW-6
RW-5
RW-4
RW-3
RW-2
RW-1
MW-15
GP-11 [84] (8-12)
GP-30A [210] (13-17)
MW-3
MW-4
MW-6S (ABANDONED)
GP-9 [2,774] (8-12)
SHED
DRIVE THRU BUILDING
SUMP
FORMER SOIL STOCKPILE AREA
STREAM
WAREHOUSE
WAREHOUSE
WAREHOUSE
MW-9
MW-1
GP-12 [ND] (4-8)
GP-10 [ND] (20-24)
SWMU 3
SOUTH STREET
MIKEN AVE
[3,780] (4-8)
GP-3
GP-31 [7,000] (7-17)
CONC PAD
OFFICE AND WAREHOUSE
ASPHALT
ADC 1
[3,530] (4-7)
GP-1
GP-2 [110] (4-7)
WAREHOUSE (METAL BUILDING)
GRAVEL
MW-13
ASPHALT PARKING AREA
MW-14
CONC RETAINING WALL
AMTRACK PROPERTY
CSX TRANSPORTATION, INC., PROPERTY
RAILROAD TRACKS

LEGEND

MW-10	MONITORING WELL
GP-10	*IN-SITU* GROUNDWATER SAMPLE LOCATION (JUNE 1999)
GP-13	*IN-SITU* GROUNDWATER SAMPLE LOCATION (MARCH 2000)
GP-26	*IN-SITU* GROUNDWATER SAMPLE LOCATION (AUGUST 2000)
GP-33	*IN-SITU* GROUNDWATER SAMPLE LOCATION (MAY 2001)
⑧	STORAGE TANKS
RW-1	RECOVERY WELL
[110]	TOTAL VOCs IN GROUNDWATER IN µg/l
(4-7)	SAMPLE DEPTH IN FEET BGS
[ND]	VOCs NOT DETECTED IN GROUNDWATER

LEGEND

AOC 1	FORMER SOLVENT TRANSFER AND DRUM STORAGE AREA
SWMU 3	FORMER DRUM STORAGE AREA

SCALE, FEET
0 100 200

NOTES:

1. Base mapping prepared by ABD Engineers & Surveyors from a July 1996 field survey.
2. Survey shown is subject to any subsurface easements, restrictions or conditions that exist, if any.
3. Underground utilities are shown from field location if possible. Others are shown from record data. Their exact location may be different from that as shown and others may exist.
4. This survey has been prepared in accordance with the code of practice for land surveys adopted by the New York State Association of Professional Land Surveyors as last revised January, 1993
5. Elevations based on USGS datum.
6. This survey was prepared without the benefit of an up to date abstract of title or title report and is subject to any statement of fact that such abstract of title or title report may reveal.

Drawn By: RAZ — 061002
Checked:
Approved:
DWG Number: 462690-B51

ASHLAND INC. FACILITY
RENSSELAER, NEW YORK
PREPARED FOR
ASHLAND INC.
DUBLIN, OHIO

Figure 3

TOTAL VOC CONCENTRATIONS IN UPPER SHALLOW GROUNDWATER ZONE

ESC ENGINEERING of NEW YORK, P.C.
9 Albany Street
Cazenovia, New York 13035
315-655-3900

D:\DWG\400\462690 Rensl\462690B51.dwg, 06/26/2002 01:32:51 PM, raz

BASF CORPORATION

ALBANY MACK SALES

PRATT WALTER & SONS

CARPINELLO OIL

GB ENTERPRISES, LLC

VOLVO SERVICE CENTER

COLUMBIA TURNPIKE (OVERPASS)

CSX TRANSPORTATION, INC., PROPERTY

RAILROAD TRACKS

STREAM

SHED

DRIVE THRU BUILDING

SUMP

FORMER SOIL STOCKPILE AREA

WAREHOUSE

WAREHOUSE

WAREHOUSE

OFFICE AND WAREHOUSE

WAREHOUSE (METAL BUILDING)

ASPHALT

GRAVEL

ASPHALT PARKING AREA

CONC RETAINING WALL

AMTRACK PROPERTY

SOUTH STREET

AIKEN AVE.

AOC 1

SWMU 3

MW-1 MW-4 MW-5S (ABANDONED) MW-9 MW-10 MW-11 MW-12A MW-12B MW-13 MW-14 MW-15 MW-16 MW-17 MW-18 MW-19

GP-19C [486] GP-20 [41] GP-21 [9] GP-26B [11] GP-27B [ND] GP-28B [ND] GP-30B [ND]

PZ-1 PZ-2 PZ-3

RW-1 RW-2 RW-3 RW-4 RW-5 RW-6 RW-7

LEGEND

MW-10	MONITORING WELL
GP-13	*IN-SITU* GROUNDWATER SAMPLE LOCATION (MARCH 2000)
GP-26	*IN-SITU* GROUNDWATER SAMPLE LOCATION (AUGUST 2000)
PZ-2	PIEZOMETER LOCATION
(8)	STORAGE TANKS
RW-1	RECOVERY WELL
[11]	TOTAL VOCs IN GROUNDWATER IN µg/l
[ND]	VOCs NOT DETECTED IN GROUNDWATER

LEGEND

AOC 1	FORMER SOLVENT TRANSFER AND DRUM STORAGE AREA
SWMU 3	FORMER DRUM STORAGE AREA

SCALE, FEET

0 100 200

NOTES:

1. Base mapping prepared by ABD Engineers & Surveyors from a July 1996 field survey.
2. Survey shown is subject to any subsurface easements, restrictions or conditions that exist, if any.
3. Underground utilities are shown from field location if possible. Others are shown from record data. Their exact location may be different from that as shown and others may exist.
4. This survey has been prepared in accordance with the code of practice for land surveys adopted by the New York State Association of Professional Land Surveyors as last revised January, 1993
5. Elevations based on USGS datum.
6. This survey was prepared without the benefit of an up to date abstract of title or title report and is subject to any statement of fact that such abstract of title or title report may reveal.

Drawn By: raz — 061002
Checked:
Approved:
DWG Number: 462690-B52

ASHLAND INC. FACILITY
RENSSELAER, NEW YORK
PREPARED FOR
ASHLAND INC.
DUBLIN, OHIO

Figure 4

TOTAL VOC CONCENTRATIONS IN
LOWER SHALLOW GROUNDWATER ZONE

ESC ENGINEERING of NEW YORK, P.C.
9 Albany Street
Cazenovia, New York 13035
315-655-3900

D:\DWG\400\462690 Rensslt462690B52.dwg, 06/26/2002 01:31:59 PM, raz