UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 4
ATLANTA FEDERAL CENTER
61 FORSYTH STREET
ATLANTA, GEORGIA 30303-8960

SEP 2 3 2008

SUBJECT: Evaluation of Ashland Distribution Company's status under the RCRA Corrective Action Environmental Indicator Event Codes (CA725 and CA750)
EPA I.D. Number: MSD 000 829 150

FROM: Patricia A. Anderson
Corrective Action Specialist
Corrective Action Section
PAA 9/18/08

THRU: D. Karen Knight, CHMM, Chief
Corrective Action Section
D. Karen Knight 9/18/08

TO: Jeffrey T. Pallas, Chief
Restoration and Underground Storage Tank Branch
Jeff Pallas 9/23/08

I. PURPOSE OF MEMO

This memo is written to formalize an evaluation of Ashland Distribution Company's (Ashland) status in relation to the following corrective action event codes defined in the RCRA Info:

1) Current Human Exposures Under Control (CA725),

2) Migration of Contaminated Groundwater under Control (CA750).

Concurrence by the RUST Branch Chief is required prior to entering these event codes into RCRA Info. Your concurrence with the interpretations provided in the following paragraphs and the subsequent recommendations is satisfied by dating and signing above.

QUICK REFERENCE FOR STATUS OF ENVIRONMENTAL INDICATORS					
Name and EPA I.D. Number	Location	Current CA725 Decision	Current CA750 Decision	If Current Decision is Negative, Projected Date for Positive EI	
				CA725	CA750
Ashland Distribution Company MSD 000-829-150	455 Industrial Dr. Jackson, MS	YES 9/18/08	YES 9/18/08	----------	----------

II. HISTORY OF ENVIRONMENTAL INDICATOR EVALUATIONS AT THE FACILITY AND REFERENCE DOCUMENTS

This evaluation is the first environmental indicator (EI) evaluation for Ashland Distribution Company, Inc. for CA 725 and CA 750. Reference documents used for this evaluation are as follows:

September 22, 1998	Final RCRA Facility Assessment
January 1999	RCRA Part B Permit Application
February 2, 2001	HSWA Portion of the RCRA Permit
January 15, 2002	Final Confirmatory Sampling Program
April 7, 2003	RCRA Facility Investigation, Phase I Report
January 9, 2004	RCRA Facility Investigation, Phase II Report
January 10, 2006	State of Mississippi and Federally Enforceable Air Pollution Control Permit
November 15, 2006	RCRA Facility Investigation, Phase V Report
February 8, 2007	Fourth Quarter 2006 Monitoring Report
April 19, 2007	March 2007 Sampling Event Groundwater Monitoring Report
July 24, 2007	RCRAInfo
January 2008	Human Health Risk Assessment
March 17, 2008	First Quarter monitoring Report
July 23, 2008	Second Quarter 2008 Monitoring Report
July 23, 2008	Letter from Ashland to EPA: SUBJ: Response to Comments, Approval – Ecological and Human Health Risk Assessment Reports and 4th Quarter 2007 and 1st Quarter 2008 Groundwater Monitoring Reports, Initiation of Corrective Measures Study

III. SUMMARY

Facility Description

Ashland Distribution Company, Inc., (Ashland) is within the Hawkins Field Industrial District of northwest Jackson, Hinds County, Mississippi (Figure 1). This 6.28 acre facility is partially within the 100-year floodplain of Town Creek, which was diverted eastward to its present location prior to Ashland buying the property. The facility property is surrounded by commercial buildings and warehouses, Industrial Drive, the Gulf, Mobile, and Ohio Railroad right-of-way, and the Hawkins Field Airport (Airport). The Hawkins Industrial Park (Industrial Park) and Ashland's surface water drainage is to local, earthen and concrete lined drainage ditches (Figure 2). The surface water in these ditches flows easterly through the Industrial Drive culverts, into Town Creek, which flows southeasterly, discharging into the Pearl River about eight miles from

the facility (Figure 1). The Pearl River is Jackson, Mississippi's principal water source. The nearest residential areas are 750 -950 ft west/southwest from the facility (Figure 1).

Since 1969, Ashland has stored and distributed bulk product chemicals to industrial customers within a 30-mile radius. These customers include textile, coatings, inks and printing, adhesives, and metal working companies. No chemical manufacturing occurs at this facility.

Ashland receives truck shipments of chemicals in liquid and dry form, and until May 2006, received railcar shipments of chemicals. These industrial chemicals and solvents are stored in bulk form in tanks or their original containers, or blended and repackaged into new products, which are also stored in tanks. These products are distributed to local industrial users via tank trucks and vans in drums, containers or other appropriate packaging.

Ashland also stores and transports plant and customer generated containerized hazardous wastes in their warehouse. The plant wastes include solvents, acids, and caustics, generated from flushing product lines and pumps, drippage and inadvertent spills of product from solvent and acid drumming operations, and waste from general cleaning operations.

The customer drummed wastes, include spent and off-specification organic solvents, inorganic corrosives, waste sludge, and wastes containing copper, arsenic, cyanides, nickel, or chromium, water-based leaded ink residues, and miscellaneous non-hazardous wastes, and contaminated stormwater. These wastes are picked up at generator facilities and transported to the Ashland facility in Department of Transportation (DOT) approved containers. These containers are not opened by the facility, and no evidence of a release was identified during the site inspection, found in the file material, or reported by facility representatives.

Final accumulation of on-site and customer generated waste occurs at the Hazardous Waste Container Storage Area in the warehouse (Figure 2). The facility is permitted to store 144 drums or 7,900 gallons of DOT contained hazardous waste. These wastes are stored until a truckload (80 drums or equivalent) is accumulated and shipped off-site to permitted treatment, storage and disposal facilities. Since Hurricane Katrina, August 29, 2005, Ashland's operations have significantly decreased (September 26, 2006, EPA Site Visit observations).

Regulatory History

The original State RCRA Permit, issued on July 24, 1984, expired on July 24, 1994. The Hazardous and Solid Waste Amendment (HSWA) permit was issued on February 1, 2001, along with renewal of the State permit. In addition to requiring the investigation of soil and groundwater contamination, the HSWA permit also requires that Ashland comply with 40 CFR Subpart CC-Air Emission Standards for Containers.

In addition to these Subpart CC regulations, the 5 year State of Mississippi and Federally Enforceable Air Pollution Control Permit, dated January 10, 2006, authorizes Ashland to construct and operate air emission equipment, and emit air contamination from various site emission points. Ashland is to limit total facility volatile organic chemical (VOC) emissions to no more than 49 tons/year (TPY) and hazardous air pollutant (HAP) emissions to no more than 9.9 TPY of any single HAP and no more than 24.9 TPY of total combined HAPs.

The RCRA Facility Assessment (RFA) and Confirmatory Sampling (CS) Reports, conducted under the HSWA permit, indicated that releases of hazardous constituents from two (2) Solid Waste Management Units (SWMUs) and four (4) Areas of Concern (AOCs) have impacted soil and groundwater, thus requiring a RCRA Facility Investigation (RFI) (Figure 3). From 2003 to 2008, Ashland completed five (5) phases of the RFI and submitted semi-annual groundwater monitoring reports from August 2006 to July 2008 to determine if there were any plausible human exposures.

Hydrogeology

Ashland's groundwater is actually surface water that accumulates beneath the facility in the fill material and weathered portion of the Yazoo Clay Formation (Figure 4), creating contaminated perched groundwater at 2.5-16 feet below ground surface (ft-bgs). This perched groundwater, which is unable to sustain domestic well production, is underlain by the Jackson Group. The Jackson Group consists of the Yazoo Clay and Moodys Branch formations. The unweathered native portion of the Yazoo Clay Formation has no significant groundwater. Therefore, the nearest regional groundwater occurs within the Cockfield Formation into which the nearby domestic wells are completed 200 to 1,400 ft-bgs.

Surface and Subsurface Soils

The RFI, Phase V Report shows that hazardous constituents have impacted soil at concentrations > screening values. The greatest soil contamination occurs on-site, adjacent to operational areas. This contamination extends laterally with low levels of VOC and semi-volatile organic chemical (SVOC) contaminated soil occurring off-site, west of the railroad tracks.

The hazardous constituents have impacted soils at concentrations > the Region 9 Preliminary Remediation Goals (PRGs) in an industrial setting. For surface soils (0-1 ft-bgs), the hazardous constituents include PCE, TCE, cis-1,2- DCE, toluene, xylene, bis (2-ethylhexylphthalate) (Figure 5), and arsenic (Table 5).

For subsurface soils (1>10 ft-bgs), the hazardous constituents include PCE, TCE, cis-1,2-DCE, vinyl chloride, toluene, xylene, methylene chloride, carbon tetrachloride (Figures 6 and 7), and arsenic (Table 5). On-site contaminated subsurface soil extends vertically to 36 ft-bgs. However, arsenic concentrations from 1.6 to 16 mg/kg are < screening levels for a non-carcinogen for an adult in a residential setting (160 mg/kg).

Ashland has controlled all plausible human exposures to impacted surface and subsurface soil by implementing both engineered and institutional controls (soil cover, fences, signs, Air and RCRA Permits), including the HSWA Portion of the RCRA Permit, and Site Management Plan (SMP).

Surface Water and Storm water Swale

The RFI, Phase V Report shows that hazardous constituents have impacted surface water at concentrations > screening values. The stormwater swale along the northern property line drains the Industrial Park (Figure 2), including the Ashland Facility. The Revised Human Health Risk Assessment Report, dated January 2008 shows that arsenic from 2.5-12 mg/kg is the only hazardous constituent detected in the swale's sediment at concentrations > the Region 9 PRGs for industrial land use (1.5 mg/kg, Table 5). However, arsenic concentrations are < the screening levels for a non-carcinogen for an adult in a residential setting (160 mg/kg). No VOCs or SVOCs were detected at concentrations > the Region 9 PRGs.

The stormwater swale receives surface water runoff and groundwater from the Ashland Facility. The Revised Human Health Risk Assessment Report, dated January 2008, compared the hazardous constituents concentrations, detected in the swale's surface water, to US EPA National Water Quality Criteria for human health + organisms and the state of Mississippi Water Quality Criteria for Intrastate, Interstate, and Coastal Waters. Although vinyl chloride was detected from ND-3.5 µg/l in the stormwater swale's surface water at concentrations > US EPA National Water Quality Criteria for human health + organisms, no contaminants were detected at concentrations > the State of Mississippi Water Quality Criteria for Intrastate, Interstate, and Coastal Waters. The possibility of this contaminated groundwater impacting a trespasser is unlikely as there are no nearby residences or pedestrian access paths in this area, and no trespassers have been observed in the stormwater swale. Therefore, the stormwater swale is not considered attractive to potential trespassers.

Groundwater

The RFI, Phase V Report shows that hazardous constituents have impacted groundwater at concentrations > screening values. The greatest groundwater contamination occurs on-site, adjacent to operational areas.

Groundwater data shows two recharge areas: 1) at the center of the site from which perched water flows outward in a radial pattern (Figure 8) and 2) near the southern property boundary from which perched water flows in a northern direction. These flow directions from two recharge areas create a groundwater swale across the southern portion of the facility.

Groundwater wells, installed to determine the lateral and vertical extent of contamination, detected VOC, SVOC, and metal contaminated groundwater beneath most

of Ashland and vertically to 12-16 ft-bgs (Figures 9 and 10). The Second Quarter 2008 Monitoring Report, dated July 23, 2008, concludes that hazardous constituents from the operational areas have impacted groundwater at concentrations > Regional Screening Levels (RSLs) or the Mississippi Department of Environmental Quality's Target Remediation Goals (MDEQ TRGs).

The hazardous constituents impacting groundwater with concentrations > the screening levels include PCE, TCE, cis-1,2- DCE, trans-1,2-DCE, 1,1-DCE, vinyl chloride (Figure 9), benzene, naphthalene, 1,4-dioxane and arsenic (Figure 10). The greatest concentrations of VOC and SVOC contaminated groundwater remain on-site. No VOC, SVOC, or arsenic contaminated groundwater was detected in monitoring wells installed off-site north and west of the Ashland Facility. However, arsenic from 43-99 μg/l was detected at concentrations > the screening level standards (50 μg/l) east of Ashland on the Airport property. Based on SESD's July 2008 investigation, and on and off-site chemical and hydrogeologic data, this contamination, near Industrial Drive, is limited in its extent and does not appear to be from Ashland's operations.

The extent of contamination along the eastern facility boundary detected the following hazardous constituents at concentrations > MDEQ TRGs: 1) arsenic off-site on the Airport property and 2) TCE in Ashland's eastern most on-site well. Based on this information, EPA's Science and Ecosystem Support Division (SESD) investigated the drainage ditches, swale, and Town Creek on the Airport property east of the facility. Surface soil, sediment, and surface water samples collected from these areas showed no evidence that VOC and SVOC contaminated surface water or groundwater contamination extends to these areas. Also, the concentrations of arsenic appears to be from off-site sources other than the Ashland facility.

Once the extent of the on-site contamination was determined, Interim Measures, involving High Vacuum Multi-phase Extraction utilizing a 750-SCFM thermal oxidizer-(HVME-TO) was implemented in November 2003. These Interim Measures removed and treated contaminated groundwater and vapor in AOCs A and B, and SWMU 4A (Figure 3).

Semi-annual groundwater monitoring reports submitted from August 2006 to July 2008 show the contamination from Ashland's operations is within industrial screening criteria. Although the plume of organic contamination from the former WW II Maintenance Building has spread to the eastern boundary of the Ashland facility, there is no evidence that it is impacting the Airport swale, or Town Creek. EPA will require continued groundwater monitoring to verify plume stabilization until a final remedy decision is made. Also, there are no drinking water wells on- or off-site within the plume of contamination. Therefore, the extent of groundwater contamination is determined and under control.

Air Emissions

Exposures from air are regulated under the HSWA Portion of the RCRA Permit and the State of Mississippi and Federally Enforceable Air Pollution Control Permit.

IV. CONCLUSION FOR CA725

It is recommended that the CA 725 status for Ashland Distribution Company be a "YES" for human exposure under control.

Ashland has adequately characterizing all media for plausible human exposures. Ashland has implemented engineered and institutional controls for contaminated surface water, soils, and groundwater; thereby, controlling plausible human health exposures. Human exposures from air are controlled by the HSWA Portion of the RCRA Permit and the State of Mississippi and Federally Enforceable Air Pollution Control Permit. EPA has determination that Current Human Exposure at Ashland is under control. Ashland has therefore met the requirements for meeting the Government Performance Results Act (GPRA) Environmental Indicator (EI) goals for CA725.

V. CONCLUSION FOR CA750

It is recommended that the CA 750 status for the Ashland Distribution Company be a "YES" for groundwater migration controlled.

EPA has also determined that the groundwater plume of contamination from Ashland's operations remains primarily on site. The low concentration of arsenic detected on the Airport property is greater than any contamination on-site; therefore, it appears to be due to off-site sources. Based on this and the most recent groundwater monitoring report data, it is EPA's determination that the groundwater migration of hazardous constituents are currently under control. Ashland has therefore met the requirements for the GPRA EI goals for CA750.

Attachments and Figures:	1. CA725:	Current Human Exposures Under Control
	2. CA750:	Migration of Contaminated Groundwater under Control

ATTACHMENT 1
DOCUMENTATION OF ENVIRONMENTAL INDICATOR DETERMINATION
RCRA Corrective Action
Environmental Indicator (EI) RCRIS Code (CA725)
Current Human Exposures Under Control

Facility Name: Ashland Distribution Company
Facility Address: 455 Industrial Drive, Jackson, Mississippi
Facility EPA ID #: MSD 000 829 150

1. Has all available relevant/significant information on known and reasonably suspected releases to soil, groundwater, surface water/sediments, and air, subject to RCRA Corrective Action (e.g., from Solid Waste Management Units (SWMU), Regulated Units (RU), and Areas of Concern (AOC)), been considered in this EI determination?

   _X_ If yes - check here and continue with #2 below,

   ____ If no - re-evaluate existing data, or

   ____ If data are not available skip to #6 and enter "IN" (more information needed) status code.

BACKGROUND

Definition of Environmental Indicators (for the RCRA Corrective Action)

Environmental Indicators (EI) are measures being used by the RCRA Corrective Action program to go beyond programmatic activity measures (e.g., reports received and approved, etc.) to track changes in the quality of the environment. The two EI developed to date indicate the quality of the environment in relation to current human exposures to contamination and the migration of contaminated groundwater. An EI for non-human (ecological) receptors is intended to be developed in the future.

Definition of "Current Human Exposures Under Control" EI

A positive "Current Human Exposures Under Control" EI determination ("YE" status code) indicates that there are no "unacceptable" human exposures to "contamination" (i.e., contaminants in concentrations in excess of appropriate risk-based levels) that can be reasonably expected under current land- and groundwater-use conditions (for all "contamination" subject to RCRA corrective action at or from the identified facility (i.e., site-wide)).

Relationship of EI to Final Remedies

While Final remedies remain the long-term objective of the RCRA Corrective Action program the EI are near-term objectives which are currently being used as Program measures for the Government Performance and Results Act of 1993, GPRA). The "Current Human Exposures Under Control" EI are for reasonably expected human exposures under current land- and groundwater-use conditions ONLY, and do not consider potential future land- or groundwater-use conditions or ecological receptors. The RCRA Corrective Action program's overall mission to protect human health and the environment requires that Final remedies address these issues (i.e., potential future human exposure scenarios, future land and groundwater uses, and ecological receptors).

Duration / Applicability of EI Determinations

EI determinations status codes should remain in RCRIS national database ONLY as long as they remain true (i.e., RCRIS status codes must be changed when the regulatory authorities become aware of contrary information).

Rational and References: The RCRA Facility Assessment (RFA), after identifying all of the SWMUs and AOCs on Ashland's site, recommended that Ashland conduct confirmatory sampling or integrity testing at 6 SWMUs and 5 AOCs (Figure 3). After reviewing the RFA and Confirmatory Sampling Reports, EPA determined that sources of contamination existed at the following 2 SWMUs and 4 AOCs:

SWMU-2 – Former Lime Pit,
SWMU 4A – Former Acid Drum Pad,
AOC A – Abandoned Underground Storage Tank and Tote Tank Storage Area
AOC B – Former Truck Loading/Unloading Area,
AOC C – Railroad Loading/Unloading Area, and
AOC E – Solvent Tank Farm.

During Ashland's 2007 investigation of the extent of soil and groundwater contamination originating from the above SWMUs and AOCs, elevated concentrations of VOC contaminated groundwater was detected near the location of a former WWII Maintenance building. The groundwater from monitoring well (MW), MW-13, had 44 µg/l PCE, 110 µg/l TCE, 78,000 µg/l cis-1,2-DCE, 730 µg/l trans-1,2-DCE, 2,400 µg/l 1,1-DCE µg/l, 1,900 µg/l vinyl chloride, 360 µg/l benzene, 46 µg/l xylene and 21 µg/l 1,4-dioxane (Figures 9 and10). Based on this data, Ashland investigated the extent of this groundwater contamination.

References: September 22, 1998 Final RCRA Facility Assessment
January 15, 2002 Final Confirmatory Sampling Program

2. Are groundwater, soil, surface water, sediments, or air **media** known or reasonably suspected to be **"contaminated"** above appropriately protective risk-based "levels" (applicable promulgated standards, as well as other appropriate standards, guidelines, guidance, or criteria) from releases subject to RCRA Corrective Action (from SWMUs, RUs or AOCs)?

Media	Yes	No	?	Rationale/Key Contaminants
Groundwater	x			On-site VOCs, SVOCs, and arsenic[1] Off-site arsenic
Air (indoors)		x		No contaminants; no vapor intrusion
Surface Soil (e.g., <1 ft)	x			On-site VOCs, SVOC, and arsenic
Surface Water	x			On-site VOCs [3]
Sediment	x			On-site stormwater swale arsenic [2]
Subsurface Soil (e.g., >1 ft)	x			On-site VOCs and arsenic [2]
Air (outdoors)		x		On-site contaminants do not exceed the Ms State and Federal Air permit limits

[1] Groundwater Contaminants detected at concentrations > MDEQ TRGs
[2] Soil Contaminants detected at concentrations > Region 9, PRGs in an Industrial setting
[3] U. S. EPA Water Quality Criteria for human health + organisms

____ If no (for all media) - skip to #6, and enter "YE," status code after providing or citing appropriate "levels," and referencing sufficient supporting documentation demonstrating that these "levels" are not exceeded.

__x__ If yes (for any media) - continue after identifying key contaminants in each "contaminated" medium, citing appropriate "levels" (or provide an explanation for the determination that the medium could pose an unacceptable risk), and referencing supporting documentation.

____ If unknown (for any media) - skip to #6 and enter "IN" status code.

Rationale: Groundwater: Groundwater data from the 2nd Quarter 2008 Monitoring Report concludes that the greatest contamination occurs adjacent to the operational areas (SWMUs and AOCs) of the site. The volatile organic chemicals (VOCs), contaminating groundwater at concentrations > the screening levels are as follows: PCE, TCE, cis-1,2-DCE, trans-1,2- DCE, 1,1-DCE, vinyl chloride, benzene, chloroform, and bromodichloromethane (Figures 9 and 10). The semi-volatile organic chemicals (SVOCs), contaminating groundwater at concentrations > the screening levels are, 1,4-dioxane and naphthalene (Figure 10).

Groundwater contaminated with arsenic extends throughout the Ashland Facility and off-site east of the facility onto the Airport property (Figure 10). While the on-site maximum arsenic concentration (24 μg/l) does not exceed screening levels (50 μg/l), the screening levels are exceeded off-site on the Airport property (43-99 μg/l). However, these arsenic levels are limited in their extent and appear to not be from Ashland's operations.

Ashland's contaminants, screening levels, and locations (historical maximum contamination) are as follows:

Chemicals	Maximum Concentration (μg/l)	Screening Levels MDEQ TRGs/RSLs (μg/l)	Contamination Source Location
PCE	170	5	MW-5 (AOCs B/E)
TCE	1,500	5	MW-8
cis-1,2-DCE	720	70	MW-5 (AOCs B/E)
1,1-DCE	53	340	MW-5 (AOCs B/E)
Vinyl Chloride	59	2	MW-5 (AOCs B/E)
Benzene	59	5	MW-21
Chloroform (off-site)	8.6	0.19	MW-17[1]
Bromodichloromethane (Off-site)	2.6	1.1	MW-17[1]
1,4 Dioxane	890	6.1	MW-7 (AOC C)
Naphthalene	250	6.2	MW-21
Arsenic (on-site)	24	50	MW-7 (AOC C)
Arsenic (off-site)	99	50	MW-17

[1] Chloroform and dibromochloromethane are a byproduct from the reaction of chlorinated water with organics and are not associated with activities conducted at the facility.

Operations at the former WWII Maintenance Building contaminated groundwater at MW-13 (Figures 9 and 10). The following chemicals were detected at concentrations > screening levels: 44 μg/l PCE, 110 μg/l TCE, 78,000 μg/l cis-1,2-DCE, 730 μg/l, trans-1,2-DCE (100 μg/l, MSDEQ TRGs), 2,400 μg/l, 1,1-DCE μg/l, 1,900 μg/l vinyl chloride, and 360 μg/l benzene.

Air Indoors: The quantitative evaluation of the potential for vapor intrusion was not determined at this site as the nearest impacted soil and perched water are in the outdoor operational areas, approximately 80 ft. from the office building. Therefore, the potential for chemical migration via vapor intrusion is not significant.

Also, the Hazardous Waste Container Storage Area is managed in accordance with Subpart CC of the HSWA Portion of the RCRA Permit to minimize any release of chemical vapors into the warehouse and adjoining facility offices.

Sediment and Surface Water: Data from the 2006 Groundwater Monitoring Report, dated February 8, 2007, shows the stormwater swale receives groundwater and surface water runoff from the site and adjacent upstream properties (Figure 2). From 2005 to 2007, sediment and surface water samples were collected from this swale at upstream, on-site, and downstream locations, and analyzed for volatile organic chemicals (VOCs), semi-volatile organic chemicals (SVOCs), and metals.

- **Sediment:** All VOCs and SVOCs in the stormwater swale (Figure 2) were detected at concentrations less than (<) residential land use screening levels, while the maximum arsenic concentration was 12 mg/kg (screening level 1.6 mg/kg, (Table 5)). However, this arsenic concentration is < screening levels for a non-carcinogen for an adult in a residential setting (160 mg/kg).

- **Surface Water:** Chloroform, dibromochloromethane, and vinyl chloride were detected in the stormwater swale (Figure 2) at concentrations > the U. S. EPA National Water Quality Criteria for Human Health + organisms. Chloroform was detected upstream from the site, adjacent to the site and downstream from the site, while dibromochloromethane was detected adjacent to the site. Chloroform and dibromochloromethane are by-products from the reaction of chlorinated water with organics and are not associated with Ashland's activities.

  Vinyl chloride was detected at concentrations from ND-3.5 µg/l (MCLs 2 µg/l) in the stormwater swale at sampling locations adjacent to and downstream from the site. Initially, vinyl chloride was of further concern, as the concentrations were occasionally greater than residential screening values. However, this facility is in an industrial setting with a nearby Airport and no nearby residences or pedestrian access paths. Therefore, exposures to trespassers are not likely.

Surface soil: Soil data from the RFI, Phase V Report shows that the VOCs contaminating surface soil (0-1 foot below ground surface (ft-bgs) at concentrations > the Region 9 PRGs in an industrial setting are as follows: PCE, TCE, toluene, and xylene (Figure 5). Bis (2-ethylhexyl) phthalate is the only SVOC and arsenic is the only metal contaminating surface soil at concentrations greater than the > Region 9 PRGs in an industrial setting.

Ashland's contaminants, screening levels, and source locations are as follows:

Chemicals	Maximum Concentration (mg/kg)	Screening Levels Region 9 PRGs (mg/kg)	Contamination Source Location
PCE	370	1.3	AOCs A/B, SWMU 4A
TCE	14		AOCs A/B, SWMU 4A
Toluene	710	520	AOC C
Xylene	1,300	420	AOC C
bis (2-ethylhexyl) phthalate	320	120	AOC A, SWMU 4A
Arsenic (on-site)	16	1.6	West Drainage Ditch

Subsurface soil: The VOCs contaminating subsurface soil (1-10 ft-bgs) at concentrations > Region 9 PRGs in an industrial setting are PCE, TCE, toluene, and xylene (Figures 6, and 7). Arsenic is the only metal contaminating the subsurface soil at concentrations > Region 9 PRGs in an industrial setting (Table 5).

Ashland's contaminants, screening levels, and source locations are as follows:

Chemicals	Maximum Concentration (mg/kg)	Screening Levels Region 9 PRGs (mg/kg)	Contamination Source Location
PCE	20 (2,200)[1]	1.3	SWMU 4A/AOC A/B
TCE	2.8	0.11	SWMU 4A/AOC A/B
Cis-1,2-DCE	44	15	AOC A/B
Toluene	1,400	520	SWMU 4A/AOC A/B
Xylene	740	420	AOC C
Arsenic (on-site)	4.4	1.6	MW-19 (background)

[1] (2,200 mg/kg, values in MW-13 WWII Maintenance Building)

Air Outdoors: Outdoor air sampling data for quantitative evaluation of the potential for air contamination was not collected at this site, as there is a significant reduction in operations at this facility. Also, outdoor air releases are managed under the State of Mississippi and Federally Enforceable Air Pollution Control Permit, dated January 10, 2006. Semi-annual reports show there have been no permit violations.

Reference(s):

February 2, 2001	HSWA Portion of the RCRA Permit
January 10, 2006	State of Mississippi and Federally Enforceable Air Pollution Control Permit
November 15, 2006	RCRA Facility Investigation, Phase V Report
February 8, 2007	Fourth Quarter 2006 Monitoring Report
January 2008	Human Health Risk Assessment
July 23, 2008	Second Quarter 2008 Monitoring Report

3. Are there **complete pathways** between "contamination" and human receptors such that exposures can be reasonably expected under the current (land- and groundwater-use) conditions?

Summary Exposure Pathway Evaluation Table Potential **Human Receptors** (Under Current Conditions)							
"Contami-nated" Media	**Residents**	**Workers**	**Day-Care**	**Construction**	**Trespassers**	**Recreation**	**Food**
Groundwater	No	No	No	**Yes**	No	No	No
Air (indoors)	No	N/L	No	N	No	No	No
Soil (surface, e.g., <1 ft)	No	No	No	**Yes**	No	No	No
Surface Water	No	No	No	No	N/L	No	No
Sediment	No	No	No	No	N/L	No	No
Soil (subsurface, e.g., >1 ft)	No	No	No	**Yes**	No	No	No
Air (outdoors)	No	No	No	No	No	No	No

Instructions for Summary Exposure Pathway Evaluation Table:

1. For Media which are not "contaminated" as identified in #2, please strike-out specific Media, including Human Receptors' spaces, or enter "N/C" for not contaminated.

2. Enter "yes" or "no" for potential "completeness" under each "Contaminated" Media -- Human Receptor combination (Pathway).

Note: In order to focus the evaluation to the most probable combinations, some potential "Contaminated" Media - Human Receptor combinations (Pathways) are not assigned spaces in the above table (i.e, **N/L - not likely**). While these combinations may not be probable in most situations, they may be possible in some settings and **should be added as necessary**.

_____ If no (pathways are not complete for any contaminated media-receptor combination) - skip to #6, and enter "YE" status code, after explaining and/or referencing condition(s) in-place, whether natural or man-made, preventing a complete exposure pathway from each contaminated medium (e.g., use optional Pathway Evaluation Work Sheet to analyze major pathways).

___X___ If yes (pathways are complete for any "Contaminated" Media - Human Receptor combination) - continue after providing supporting explanation.

_____ If unknown (for any "Contaminated" Media - Human Receptor combination) - skip to #6 and enter "IN" status code

Rationale: The potential receptors and pathways were evaluated as part of the Revised Human Health Risk Assessment Report, dated January 2008. These included an adult industrial indoor and outdoor worker, groundskeeper, and adult construction/excavation worker, and a trespasser.

Groundwater: Site groundwater consists of isolated pockets of seasonally accumulated water that occurs in thick sequences of sandy backfill material and reworked native soil. Accumulated groundwater is encountered at depths ranging between 2.5 and 16 ft-bgs.

The approximately 1-3 ft thick backfill material is underlain by reworked native soil of the Yazoo Clay Formation (Figure 4). This Formation includes a silty clay and clayey silt layer between 4 and 12 ft-bgs that becomes more plastic clay near 20 ft-bgs.

Groundwater is not encountered in the deeper native plastic clay portion of the Yazoo Clay Formation. The first regional groundwater occurs at about 130 ft-bgs in the Cockfield Formation. The nearest industrial or residential drinking water wells, located beyond a 1-mile radius from the site, extract water from this or deeper formations. Therefore, site and nearby groundwater is not used for potable water.

The groundwater contamination from Ashland's operations has stabilized on-site. Although the plume of contamination from the former WW II Maintenance Building has spread to the eastern boundary of the Ashland facility, there is no evidence that it is impacting the Airport swale, or Town Creek. Therefore, this plume has stabilized on the Airport property between the Ashland facility and the Airport swale and Town Creek. Because there are no drinking water wells within or near this area, there is no future possibility of impacts to drinking water.

Therefore, no exposure pathway for residents or on-site workers exists. The facility is enclosed by a chain linked fence with proper signage, and locking gate with access limited to employees. Therefore, trespassers can not enter the property. There are no day-care or recreation facilities, and no agriculture or residential gardening in the area.

Air Indoors: The greatest concentrations of contaminated soil remain on-site with lower concentrations extending off-site west of the facility into the Industrial Park. Most of the impacted soil and perched water are in the outdoor operational areas, approximately 80 feet or more from the existing office building. Therefore, the potential for chemical migration via vapor intrusion is not significant.

The Hazardous Waste Container Storage Area is managed in accordance with the HSWA portion of the RCRA Permit Subpart CC, which requires that all DOT containers remain closed while stored in this area. No permit violations have been reported. Therefore, workers are not exposed to indoor air vapor from the containers.

This contamination does not extend near neighboring industrial/commercial buildings. Therefore, it does not result in an unacceptable indoor air inhalation risk to other facilities.

Surface Soil (<1 ft deep): Potential exposure pathways for contaminated surface soil include; direct dermal contact, incidental ingestion of soils, inhalation of particulates in dust generated from wind erosion or mechanical disturbance of surface soils and inhalation of volatiles in outdoor air.

Under current site use, the potential for exposure to surface soil contaminants is low for industrial workers, because the impacted site soil is covered by concrete paving, gravel, or established vegetation. The facility is surrounded by a chain linked fence with proper signage and an automatic locking gate that prevents potential exposure to trespassers.

The receptor with the greatest potential for exposure to contaminated surface soil remains for the future site construction/excavation worker and groundskeeper, as potential exposure could be associated with surface soil disturbance activities. During any future subsurface excavation (i.e. removal of tree stump, building construction), Ashland will implement their Site Management Plan (SMP) to prevent exposures.

Surface Water and Sediment: The stormwater swale, outside the facility fence, receives surface water runoff, groundwater, and eroded soil from the site and adjacent upstream properties (Figure 2). The swale frequently contains murky shallow water in either a ponded or slow flowing state.

No trespassers have been observed in the stormwater swale. The nearest residences are 750-950 ft west/southwest of this area, and there are no pedestrian access paths in this area. Therefore, the stormwater swale is not considered attractive to potential trespassers.

Subsurface soils (>1 feet deep): Potential exposure to contaminated subsurface soils may occur via direct contact (dermal and incidental ingestion) and inhalation of volatiles in outdoor air during excavation activities. Under current site use, construction and outdoor industrial workers, and groundskeepers do not engage in subsurface excavation. During any future subsurface excavation (i.e. removal of tree stump, building construction), Ashland will implement their Site Management Plan (SMP) to prevent exposures.

Air Outdoors: Although the migration of volatile contaminants from subsurface soil to ambient outdoor air is possible, the industrial indoor/outdoor workers' exposure potential is negligible, as this potential exposure is managed and monitored through the January 10, 2006, State of Mississippi and Federally Enforceable Air Pollution Control Permit.

References:

September 22, 1998	Final RCRA Facility Assessment
February 2, 2001	HSWA Portion of the RCRA Permit
April 7, 2003	RCRA Facility Investigation, Phase 1 Report
January 9, 2004	RCRA Facility Investigation, Phase II Report
January 10, 2006	State of Mississippi and Federally Enforceable Air Pollution Control Permit

4. Can the exposures from any of the complete pathways identified in #3 be reasonably expected to be "significant" (i.e., potentially "unacceptable" because exposures can be reasonably expected to be: 1) greater in magnitude (intensity, frequency and/or duration) than assumed in the derivation of the acceptable "levels" (used to identify the "contamination"); or 2) the combination of exposure magnitude (perhaps even though low) and contaminant concentrations (which may be substantially above the acceptable "levels") could result in greater than acceptable risks)?

____ If no (exposures can not be reasonably expected to be significant (i.e., potentially "unacceptable") for any complete exposure pathway) - skip to #6 and enter "YE" status code after explaining and/or referencing documentation justifying why the exposures (from each of the complete pathways) to "contamination" (identified in #3) are not expected to be "significant."

__X__ If yes (exposures could be reasonably expected to be "significant" (i.e., potentially "unacceptable") for any complete exposure pathway) - continue after providing a description (of each potentially "unacceptable" exposure pathway) and explaining and/or referencing documentation justifying why the exposures (from each of the remaining complete pathways) to "contamination" (identified in #3) are not expected to be "significant."

____ If unknown (for any complete pathway) - skip to #6 and enter "IN" status code

Rationale: The Revised Human Health Risk Assessment Report, January 2008 concludes that exposures to construction workers, groundskeepers and trespassers are significant. Nevertheless, any exposures to construction workers and groundskeepers are eliminated through engineering and institutional controls (i. e. SMP). Also, Ashland is within an Industrial Park with no nearby residences; therefore, any exposure to trespassers is unlikely.

Reference(s): January 2008 Human Health Risk Assessment

5. Can the "significant" **exposures** (identified in #4) be shown to be within **acceptable** limits?

__X__ If yes (all "significant" exposures have been shown to be within acceptable limits) - continue and enter "YE" after summarizing <u>and</u> referencing documentation justifying why all "significant" exposures to "contamination" are within acceptable limits (e.g., a site-specific Human Health Risk Assessment).

_____ If no (there are current exposures that can be reasonably expected to be "unacceptable")- continue and enter "NO" status code after providing a description of each potentially "unacceptable" exposure.

_____ If unknown (for any potentially "unacceptable" exposure) - continue and enter "IN" status code

Rationale: All potential exposures to hazardous constituents in the surface have been controlled through engineered controls and pollution control permits as referenced in the Revised Human Health Risk Assessment Report, dated January 2008. Surface soils with hazardous constituents that exceed the industrial PRGs are covered by concrete, gravel, or grass. Also, outdoor workers' potential exposure to contaminated air vapor is managed and monitored through the January 10, 2006, State of Mississippi and Federally Enforceable Air Pollution Control Permit. Semi-annual reports, submitted to Mississippi show no permit violations have occurred since 2006. Therefore, outdoor site workers are not likely to have direct contact with contaminated soil, or inhale particles or vapors.

All potential exposures to hazardous constituents in the indoor air have been controlled through engineering controls and Subpart CC of the HSWA Portion of the RCRA permit. Subpart CC requires that the DOT containers in the Hazardous Waste Storage Area remain closed during storage; therefore, preventing any release of vapors into indoor air. No violations of this permit condition have been reported. Because the nearest contaminated surface and subsurface soil, and groundwater are approximately 80 ft from the warehouse, which has a solid concrete floor, the potential for soil vapor intrusion into this building is unlikely.

All potential exposures to hazardous constituents in the surface and subsurface soils, and groundwater have been controlled through engineered controls and Ashland's SMP as referenced in the Revised Human Health Risk Assessment Report, dated January 2008. Because there are potential risks associated with impacted surface, subsurface soils and/or perched groundwater, which may occur during excavation, construction activities, or tree removal, Ashland prepared a SMP that provides guidance for any on-site management of subsurface activities. This SMP will mitigate potential human exposures and health risks to construction workers and groundskeepers.

Reference(s):		
	February 2, 2001	HSWA Portion of the RCRA Permit
	January 10, 2006	State of Mississippi and Federally Enforceable Air Pollution Control Permit
	January 2008	Human Health Risk Assessment

6. Check the appropriate RCRIS status codes for the Current Human Exposures Under Control EI event code (CA725), and obtain Supervisor (or appropriate Manager)

signature and date on the EI determination below (and attach appropriate supporting documentation as well as a map of the facility):

__X__ YE - Yes, "Current Human Exposures Under Control" has been verified. Based on a review of the information contained in this EI Determination, "Current Human Exposures" are expected to be "Under Control" at the Ashland Distribution Company facility. EPA ID # MSD 000 829 150, located at 455 Industrial Drive, Jackson, Mississippi under current and reasonably expected conditions. This determination will be re-evaluated when the Agency/State becomes aware of significant changes at the facility.

____ NO - "Current Human Exposures" are NOT "Under Control."

____ IN - More information is needed to make a determination.

Completed by Patricia A. Anderson Date: September 18, 2008
Patricia A. Anderson
Corrective Action Specialist

Supervisor D. Karen Knight Date: September 18, 2008
D. Karen Knight, CHMM
Chief, Corrective Action Section
EPA, Region 4

Locations where References may be found:

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ATTACHMENT 2

DOCUMENTATION OF ENVIRONMENTAL INDICATOR DETERMINATION
RCRA Corrective Action
Environmental Indicator (EI) RCRIS Event Code (CA750)
Migration of Contaminated Groundwater Under Control

Facility Name: Ashland Distribution Company
Facility Address: 455 Industrial Drive, Jackson, Mississippi
Facility EPA ID #: MSD 000 829 150

1. Has **all** available relevant/significant information on known and reasonably suspected releases to the groundwater media, subject to RCRA Corrective Action (e.g., from Solid Waste Management Units (SWMU), Regulated Units (RU), and Areas of Concern (AOC)), been **considered** in this EI determination?

   __X__ If yes - check here and continue with #2 below,

   _____ If no - re-evaluate existing data, or

   _____ If data are not available, skip to #8 and enter "IN" (more information needed) status code.

BACKGROUND

Definition of Environmental Indicators (for the RCRA Corrective Action)

Environmental Indicators (EI) are measures being used by the RCRA Corrective Action program to go beyond programmatic activity measures (e.g., reports received and approved, etc.) to track changes in the quality of the environment. The two EI developed to-date indicate the quality of the environment in relation to current human exposures to contamination and the migration of contaminated groundwater. An EI for non-human (ecological) receptors is intended to be developed in the future.

Definition of "Migration of Contaminated Groundwater Under Control" EI

A positive "Migration of Contaminated Groundwater Under Control" EI determination ("YE" status code) indicates that the migration of "contaminated" groundwater has stabilized, and that monitoring will be conducted to confirm that contaminated groundwater remains within the original "area of contaminated groundwater" (for all groundwater "contamination" subject to RCRA corrective action at or from the identified facility (i.e., site-wide)).

Relationship of EI to Final Remedies

While Final remedies remain the long-term objective of the RCRA Corrective Action program the EI are near-term objectives which are currently being used as Program measures for the Government Performance and Results Act of 1993, GPRA). The

"Migration of Contaminated Groundwater Under Control" EI pertains ONLY to the physical migration (i.e., further spread) of contaminated groundwater and contaminants within groundwater (e.g., non-aqueous phase liquids or NAPLs). Achieving this EI does not substitute for achieving other stabilization or final remedy requirements and expectations associated with sources of contamination and the need to restore, wherever practicable, contaminated groundwater to be suitable for its designated current and future uses.

Duration / Applicability of EI Determinations

EI Determinations status codes should remain in RCRIS national database ONLY as long as they remain true (i.e., RCRIS status codes must be changed when the regulatory authorities become aware of contrary information).

Rational: The RCRA Facility Assessment (RFA), after identifying all of the SWMUs and AOCs on Ashland's site, recommended that Ashland conduct confirmatory sampling or integrity testing at 6 SWMUs and 5 AOCs (Figure 3). After reviewing the RFA and Confirmatory Sampling Reports, EPA determined that sources of contamination existed at the following 2 SWMUs and 4 AOCs:

SWMU-2 – Former Lime Pit,
SWMU 4A – Former Acid Drum Pad,
AOC A – Abandoned Underground Storage Tank and Tote Tank Storage Area
AOC B – Former Truck Loading/Unloading Area,
AOC C – Railroad Loading/Unloading Area, and
AOC E – Solvent Tank Farm.

During Ashland's 2007 investigation of the extent of soil and groundwater contamination originating from the above SWMUs and AOCs, elevated concentrations of VOC contaminated groundwater was detected near the location of a former WWII Maintenance building. The groundwater from monitoring well (MW), MW-13, had 44 µg/l PCE, 110 µg/l TCE, 78,000 µg/l cis-1,2-DCE, 730 µg/l trans-1,2-DCE, 2,400 µg/l 1,1-DCE µg/l, 1,900 µg/l vinyl chloride, 360 µg/l benzene, 46 µg/l xylene and 21 µg/l 1,4-dioxane (Figures 9 and10). Based on this data, Ashland investigated the extent of this groundwater contamination.

References:

September 22, 1998	Final RCRA Facility Assessment
January 15, 2002	Final Confirmatory Sampling Program

2. Is **groundwater** known or reasonably suspected to be **"contaminated"** above appropriately protective "levels" (i.e., applicable promulgated standards, as well as other appropriate standards, guidelines, guidance, or criteria) from releases subject to RCRA Corrective Action, anywhere at, or from, the facility?

___x___ If yes - continue after identifying key contaminants, citing appropriate "levels," and referencing supporting documentation.

_____ If no - skip to #8 and enter "YE" status code, after citing appropriate "levels," and referencing supporting documentation to demonstrate that groundwater is not "contaminated."

_____ If unknown - skip to #8 and enter "IN" status code.

Rationale: The 2nd Quarter 2008 Groundwater Monitoring Report, dated January 2008, concluded that two contaminant plumes with significant groundwater contamination exist at Ashland, which are attributed to: 1) Ashland's operations and 2) a former WW II Maintenance Building's operations. Contamination from Ashland's operations was detected in MW-4 through 8, MW-14, MW-15, and MW-21. The WW II Maintenance Building's contamination was detected in MW-13 and MW-20 (Figures 9 & 10).

Concerning Ashland's historical contamination: The on-site wells with the maximum concentrations of VOCs and SVOCs are adjacent to and downgradient from the source areas.
Ashland's contaminants, screening levels, and locations (historical maximum contamination) are as follows (Figure 3):

Chemicals	Maximum Concentration (µg/l)	Screening Levels MDEQ TRGs/RSLs (µg/l)	Contamination Source Location
PCE	170	5	MW-5 (AOCs B/E)
TCE	1,500	5	MW-8
cis-1,2-DCE	720	70	MW-5 (AOCs B/E)
1,1-DCE	53	340	MW-5 (AOCs B/E)
Vinyl Chloride	59	2	MW-5 (AOCs B/E)
Benzene	59	5	MW-21
Chloroform (off-site)	8.6	0.19	MW-17[1]
Bromodichloromethane (Off-site)	2.6	1.1	MW-17[1]
1,4 Dioxane	890	6.1	MW-7 (AOC C)
Naphthalene	250	6.2	MW-21
Arsenic (on-site)	24	50	MW-7 (AOC C)
Arsenic (off-site)	99	50	MW-17

[1] Chloroform and dibromochloromethane are a byproduct from the reaction of chlorinated water with organics and are not associated with activities conducted at the facility.

Operations at the former WWII Maintenance Building contaminated groundwater at MW-13 (Figures 9 and 10). The WW II Maintenance Building's contaminants and maximum concentrations, which are > screening levels (see above chart) are as follows: 44 µg/l PCE, 110 µg/l TCE, 78,000 µg/l cis-1,2-DCE, 730 µg/l, trans-1,2-DCE (100 µg/l, MSDEQ TRGs), 2,400 µg/l, 1,1-DCE µg/l, 1,900 µg/l vinyl chloride, 360 µg/l, and benzene. During the February 6, 2008 sampling event, a maximum concentration of 21 µg/l 1,4-dioxane was detected in MW-13.

Since October 30, 2007, the groundwater concentrations of PCE have diminished in these wells. The concentrations of TCE and the other daughter products have stabilized or diminished in all wells, except MW-7, where vinyl chloride concentrations are increasing. During the latest June 2008 sampling event, the maximum groundwater contaminant values and corresponding wells are as follows: 76 µg/l PCE at MW-5, 550 µg/l TCE at MW-8, 670 µg/l cis-1,2-DCE at MW-5, 8.4 µg/l trans-1,2-DCE at MW-6, 29 µg/l 1,1-DCE at MW-5, and 36 µg/l vinyl chloride at MW-5 (Figure 9).

Since October 30, 2007, groundwater contaminated with benzene and xylene has been detected in on- site and off-site wells. Benzene concentrations have stabilized or diminished, except in MW-17 and MW-21, where the concentrations have slightly increased. Xylene concentrations have diminished or are nondetect in all wells. During the latest June 2008 sampling event, the maximum groundwater contaminant values and corresponding wells are as follows: 28 µg/l benzene at MW-21, and 480 µg/l xylene at MW-7 (Figure 10).

Since October 30, 2007, groundwater contaminated with 1,4-Dioxane and naphthalene has been detected in on-site wells. Naphthalene and 1,4-Dioxane concentrations have stabilized. During the latest June 2008 sampling event, the maximum concentration of 1,4-dioxane in groundwater was 370 µg/l at MW-7. Naphthalene was ND in all wells (Figure 10).

Since October 30, 2007, arsenic concentrations in on-site wells range from ND-24 µg/l. Off-site at MW-17 arsenic was detected at concentrations ranging from 43-99 µg/l (Figure 10).

Concerning the WW II Maintenance Building's contamination: VOC contamination was detected in MW-13, during the October 30, 2007 sampling event, at concentrations > MDEQ TRGs or RSLs, have recently diminished in this well. During the latest June 2008 sampling event, maximum groundwater contamination detected in MW-13 was as follows: 61,000 µg/l cis-1,2-DCE and 950 µg/l 1,1-DCE. PCE, TCE, trans-1,2-DCE, vinyl chloride, benzene, xylene, naphthalene, 1,4-dioxane were ND (Figures 9 and 10).

Reference(s): January 2008 Human Health Risk Assessment
July 23, 2008 Second Quarter 2008 Monitoring Report

3. Has the **migration** of contaminated groundwater **stabilized** such that contaminated groundwater is expected to remain within "existing area of contaminated groundwater"[7] as defined by the monitoring locations designated at the time of this determination?

__X__ If yes - continue, after presenting or referencing the physical evidence (e.g., groundwater sampling/measurement/migration barrier data) and rationale why contaminated groundwater is expected to remain within the (horizontal or vertical) dimensions of the "existing area of groundwater contamination"[7]).

____ If no (contaminated groundwater is observed or expected to migrate beyond the designated locations defining the "existing area of groundwater contamination") skip to #8 and enter "NO" status code, after providing an explanation.

____ If unknown - skip to #8 and enter "IN" status code.

Rationale: Facility monitoring wells, downgradient from the sources of contamination, were installed as the groundwater investigations progressed. Therefore, the 2nd Quarter 2008 Monitoring Report includes the monitoring results vary from 2-7 sampling events/ well.

Groundwater data shows two recharge areas: 1) at the center of the site from which perched water flows outward in a radial pattern, and 2) near the southern property boundary from which perched water flows in a northern direction (Figure 8). These flow directions from two recharge areas create a groundwater swale across the southern portion of the facility.

Ashland's contamination: The groundwater contamination spreads radially from the facility's operational area. Towards the north, west, and south, the extent of contamination is determined as data from MW-9 through MW-12, and MW-18 and MW-19, downgradient from the sources of contamination, detected no contamination. EPA will require Ashland to continue monitoring these wells until a final remedy decision is made.

Contamination has also spread radially and downgradient from near the operational areas towards Ashland's eastern property boundary. However, the determination of the extent of contamination along Ashland's eastern boundary is more difficult, as contaminated groundwater was detected in some wells but not others. The following eastern-most wells, MW-1, MW-17, and MW-21, were contaminated, while no contamination was detected in MW-2 and MW-3. The concentration of benzene in MW-1 is stabilized or diminished showing the benzene plume at this well has also stabilized. EPA will require continued monitoring of this well to verify the effectiveness of future corrective measures at this facility.

Ashland's remaining eastern boundary wells, MW-21 and MW-17 were drilled into the path of the former Town Creek Channel (Figure 9). This Channel is a preferential flow path for any on-site contamination. During the last 3 sampling events, benzene, detected from 12-28 µg/l in MW-21 has spread to MW-17 with detections from 1.1-1.0 µg/l (screening level 5 µg/l). In addition to benzene, groundwater in MW-21 has detected from ND-2.3 µg/l cis-1,2-DCE (screening level 70 µg/l), 4.7-6.8 µg/l xylene (screening levels 200 µg/l), ND-13 µg/l naphthalene (screening level 6.2 µg/l), and ND-14 µg/l 1,4-dioxane (screening level 6.1 µg/l). The concentrations of cis-1,2-DCE and xylene in MW-21 are < screening levels (Figures 9 and 10), and are not impacting MW-17. Although naphthalene and 1,4-dioxane are > the screening levels, they also are not impacting MW-17. Therefore, the VOC and SVOC contamination at MW-17 and MW-21 appears to have stabilized. Nevertheless, EPA will require that Ashland continue monitoring these wells to verify plume stabilization.

During the last 3 groundwater sampling events, arsenic concentrations ranging from ND-24 µg/l were detected from on-site monitoring wells, while arsenic concentrations ranging from 43 to 99 µg/l were detected from monitoring well MW-17 on the Airport property. Based on this information EPA's SESD conducted a field investigation in July 2008 on the Airport property. Surface soil and sediment samples from the Airport swale and Town Creek on the Airport property detected arsenic at concentrations similar to those on the Ashland facility. Therefore, the arsenic in MW-17 near Industrial Drive is limited in its extent, and possibly originates from other sources.

VOC and SVOC contamination at the former WW II Maintenance Building: During the October 2007 sampling event the maximum groundwater contamination, detected in MW-13 was as follows: 44 µg/l PCE, 110 µg/l TCE, 78,000 µg/l cis-1,2-DCE, 730 µg/l, trans-1,2-DCE (100 µg/l, MSDEQ TRGs), 2,400 µg/l, 1,1-DCE µg/l, 1,900 µg/l vinyl chloride, and 360 µg/l benzene. Since October 2007 the last two sampling events have shown significant reductions in the concentrations of contamination, with 61,000 µg/l cis-1,2-DCE and 950 µg/l 1,1-DCE. PCE, TCE, trans-1,2-DCE, vinyl chloride, benzene, xylene, naphthalene, 1,4-dioxane were ND (Figures 9 and 10).

While there has been a significant reduction in the concentration of contaminants at MW-13, the contamination has spread from MW-13 to MW-20 (Figure 9). During the last three sampling events, 3.6-5.6 µg/l TCE and 15-25 µg/l cis-1,2-DCE were detected in groundwater from MW-20. Therefore, the contamination originating at MW-13 may extends beyond Ashland's eastern property line at concentrations > the screening limits for TCE (5 µg/l).

Based on SESD's July 2008 field investigation on the Airport property, surface soil, sediment, and surface water samples from the Airport swale and Town Creek showed no evidence of VOC or SVOC contamination. Therefore, the WW II Maintenance Building contamination, extends beyond Ashland's eastern property line, but is stabilized on the Airport property and is not impacting surface water. Nevertheless, EPA will require that Ashland continue monitoring MW-20 to verify plume stabilization.

Also, the contamination in MW-20 may not represent the greatest concentrations of downgradient contamination. The topography indicates that prior to any development the groundwater swale extended across the southern end of Ashland in a northeasterly direction, thus creating a preferential groundwater and contaminant flow path north of MW-20. Therefore, additional monitoring wells may be required on the Ashland or Airport property to verify the effectiveness of future corrective measures at this facility.

Reference(s):		
	September 22, 1998	Final RCRA Facility Assessment
	January 2008	Human Health Risk Assessment
	March 17, 2008	First Quarter monitoring Report
	July 23, 2008	Second Quarter 2008 Monitoring Report

4. Does "contaminated" groundwater **discharge** into **surface water** bodies?

__X__ If yes - continue after identifying potentially affected surface water bodies.

_____ If no - skip to #7 (and enter a "YE" status code in #8, if #7 = yes) after providing an explanation and/or referencing documentation supporting that groundwater "contamination" does not enter surface water bodies.

_____ If unknown - skip to #8 and enter "IN" status code.

Rationale): Surface water runoff and groundwater from Ashland and upgradient facilities in the Industrial Park impact the stormwater swale along the northern property boundary of the Ashland Facility. Vinyl chloride remains a contaminant of concern, as it was detected occasionally at concentrations greater than residential screening values (ND-3.5 µg/l) (MCLs 2 µg/l). However, this facility is in an industrial setting with a nearby Airport and no nearby residences or pedestrian access paths.

Based on SESD's July 2008 field investigation on the Airport property, surface soil, sediment, and surface water samples collected from the Airport swale and Town Creek showed no evidence of VOC or SVOC contamination. Therefore, the WW II Maintenance Building contamination, while stabilized on the Airport property,is not discharging into the Airport swale or Town Creek.

Reference(s):		
	January 2008	Human Health Risk Assessment

5. Is the **discharge** of "contaminated" groundwater into surface water likely to be **"insignificant"** (i.e., the maximum concentration[11] of each contaminant discharging into surface water is less than 10 times their appropriate groundwater "level," and there are no other conditions (e.g., the nature and number of discharging contaminants, or environmental setting) which significantly increase the potential for unacceptable impacts to surface water, sediments, or eco-systems at these concentrations)?

____ If yes - skip to #7 (and enter "YE" status code in #8 if #7 = yes), after documenting: 1) the maximum known or reasonably suspected concentration[8] of key contaminants discharged above their groundwater "level," the value of the appropriate "level(s)," and if there is evidence that the concentrations are increasing; and 2) providing a statement of professional judgement/explanation (or reference documentation) supporting that the discharge of groundwater contaminants into the surface water is not anticipated to have unacceptable impacts to the receiving surface water, sediments, or eco-system.

__X__ If no - (the discharge of "contaminated" groundwater into surface water is potentially significant) - continue after documenting: 1) the maximum known or reasonably suspected concentration[8] of each contaminant discharged above its groundwater "level," the value of the appropriate "level(s)," and if there is evidence that the concentrations are increasing; and 2) for any contaminants discharging into surface water in concentrations greater than 100 times their appropriate groundwater "levels," providing the estimated total amount (mass in kg/yr) of each of these contaminants that are being discharged (loaded) into the surface water body (at the time of the determination), and identifying if there is evidence that the amount of discharging contaminants is increasing.

____ If unknown - enter "IN" status code in #8.

Rationale: Vinyl chloride is a chemical of concern in the stormwater swale. Nevertheless, there are no nearby residential areas or pedestrian access paths near the Ashland Facility and the stormwater swale. Also, Industrial Drive is used by heavy trucks, and no trespassers have been observed in the stormwater swale. Therefore, the stormwater swale is not considered attractive to potential trespassers.

Reference(s): January 2008 Human Health Risk Assessment

6. Can the **discharge** of "contaminated" groundwater into surface water be shown to be "**currently acceptable**" (i.e., not cause impacts to surface water, sediments or eco-systems that should not be allowed to continue until a final remedy decision can be made and implemented?

__X__ If yes - continue after either: 1) identifying the Final Remedy decision incorporating these conditions, or other site-specific criteria (developed for the protection of the site's surface water, sediments, and eco-systems), and referencing supporting documentation demonstrating that these criteria are not exceeded by the discharging groundwater; OR
2) providing or referencing an interim-assessment, appropriate to the potential for impact, that shows the discharge of groundwater contaminants into the surface water is (in the opinion of a trained specialists, including ecologist) adequately protective of receiving surface water, sediments, and eco-systems, until such time when a full assessment and final remedy decision can be made. Factors which should be considered in the interim-assessment (where appropriate to help identify the impact associated with discharging groundwater) include: surface water body size, flow, use/classification/habitats and contaminant loading limits, other sources of surface water/sediment contamination, surface water and sediment sample results and comparisons to available and appropriate surface water and sediment "levels," as well as any other factors, such as effects on ecological receptors (e.g., via bio-assays/benthic surveys or site-specific ecological Risk Assessments), that the overseeing regulatory agency would deem appropriate for making the EI determination.

____ If no - (the discharge of "contaminated" groundwater can not be shown to be "**currently acceptable**") - skip to #8 and enter "NO" status code, after documenting the currently unacceptable impacts to the surface water body, sediments, and/or eco-systems.

____ If unknown - skip to 8 and enter "IN" status code.

Rationale): Vinyl chloride is a chemical of concern in the stormwater swale. Nevertheless, there are no nearby residential areas or pedestrian access paths near the Ashland Facility and the stormwater swale. Also, Industrial Drive is used by heavy trucks, and no trespassers have been observed in the stormwater swale. Therefore, the stormwater swale is not considered attractive to potential trespassers.

Reference(s): January 2008 Human Health Risk Assessment

7. Will groundwater **monitoring** / measurement data (and surface water/sediment/ecological data, as necessary) be collected in the future to verify that contaminated groundwater has remained within the horizontal (or vertical, as necessary) dimensions of the "existing area of contaminated groundwater?"

__X__ If yes - continue after providing or citing documentation for planned activities or future sampling/measurement events. Specifically identify the well/measurement locations which will be tested in the future to verify the expectation (identified in #3) that groundwater contamination will not be migrating horizontally (or vertically, as necessary) beyond the "existing area of groundwater contamination."

_____ If no - enter "NO" status code in #8.

_____ If unknown - enter "IN" status code in #8.

Rationale): In their July 23, 2008 letter to EPA, Ashland agreed to EPA's request to continue monitoring groundwater for metals, VOCs, and SVOCs until 4th Quarter 2008. EPA will evaluate this groundwater data to determine any changes in the monitoring program. Ashland has submitted a Corrective Measures Study Work Plan. Once the corrective measures are selected, Ashland will continue to monitor groundwater to determine their effectiveness.

Completed by Patricia A. Anderson Date: September 18, 2008
Patricia A. Anderson
Corrective Action Specialist

Supervisor D. Karen Knight Date: September 18, 2008
D. Karen Knight, CHMM
Chief, Corrective Action Section
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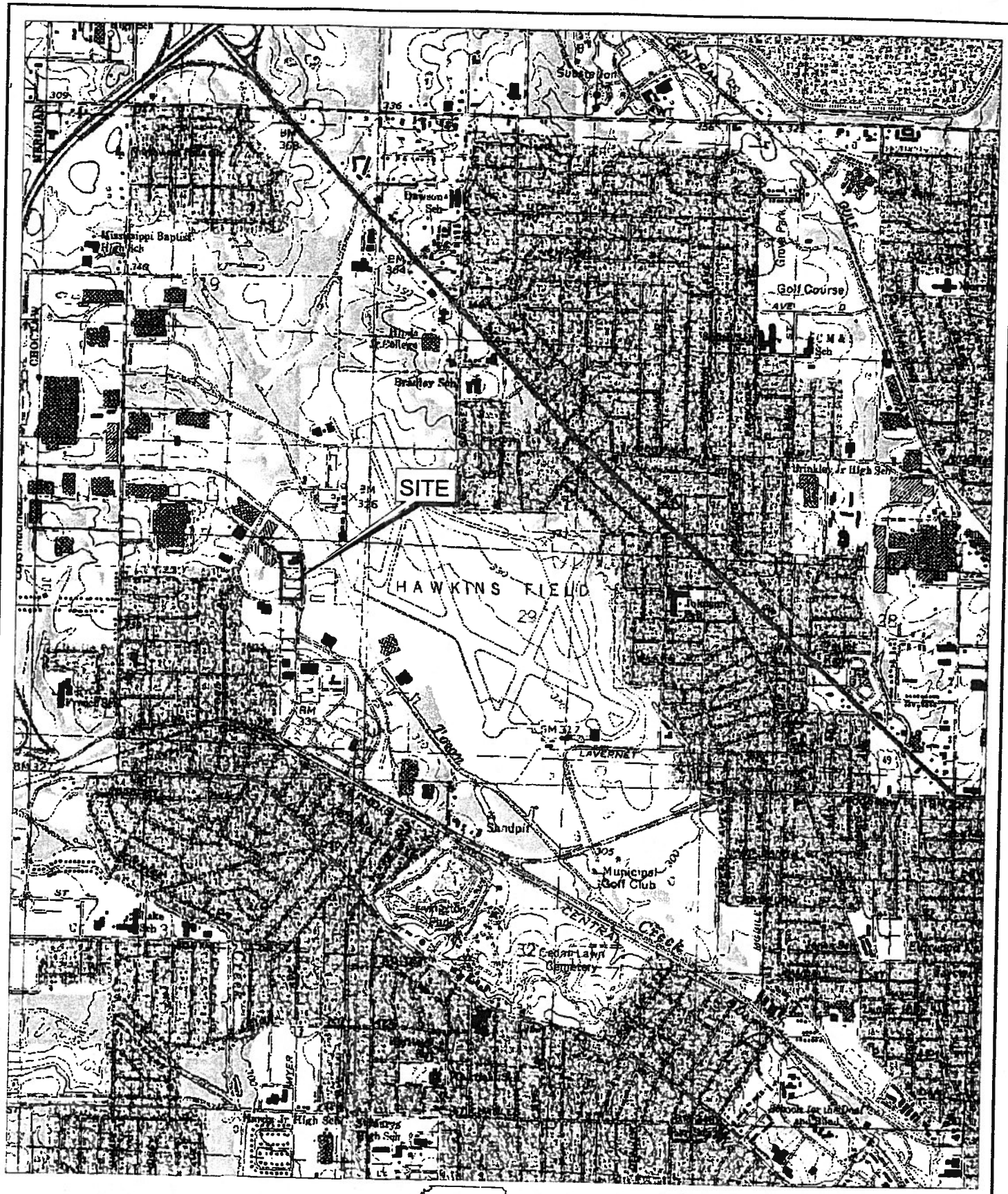
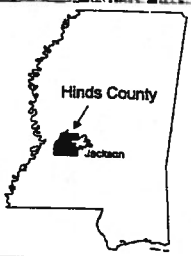


Site Boundary

N



Source: USGS 7.5' Topographic Quadrangle
Jackson, Mississippi Quadrangle

SITE VICINITY MAP

Ashland Distribution Company
Jackson, Mississippi

Prepared for: Ashland, Inc.	Scale in Feet 800 0 800 (approximate)
Project Manager: TW	
Image Created By: CRA	
Date: May 10, 2002	URS
Project Number: 82-00900054.00	Fig. 1

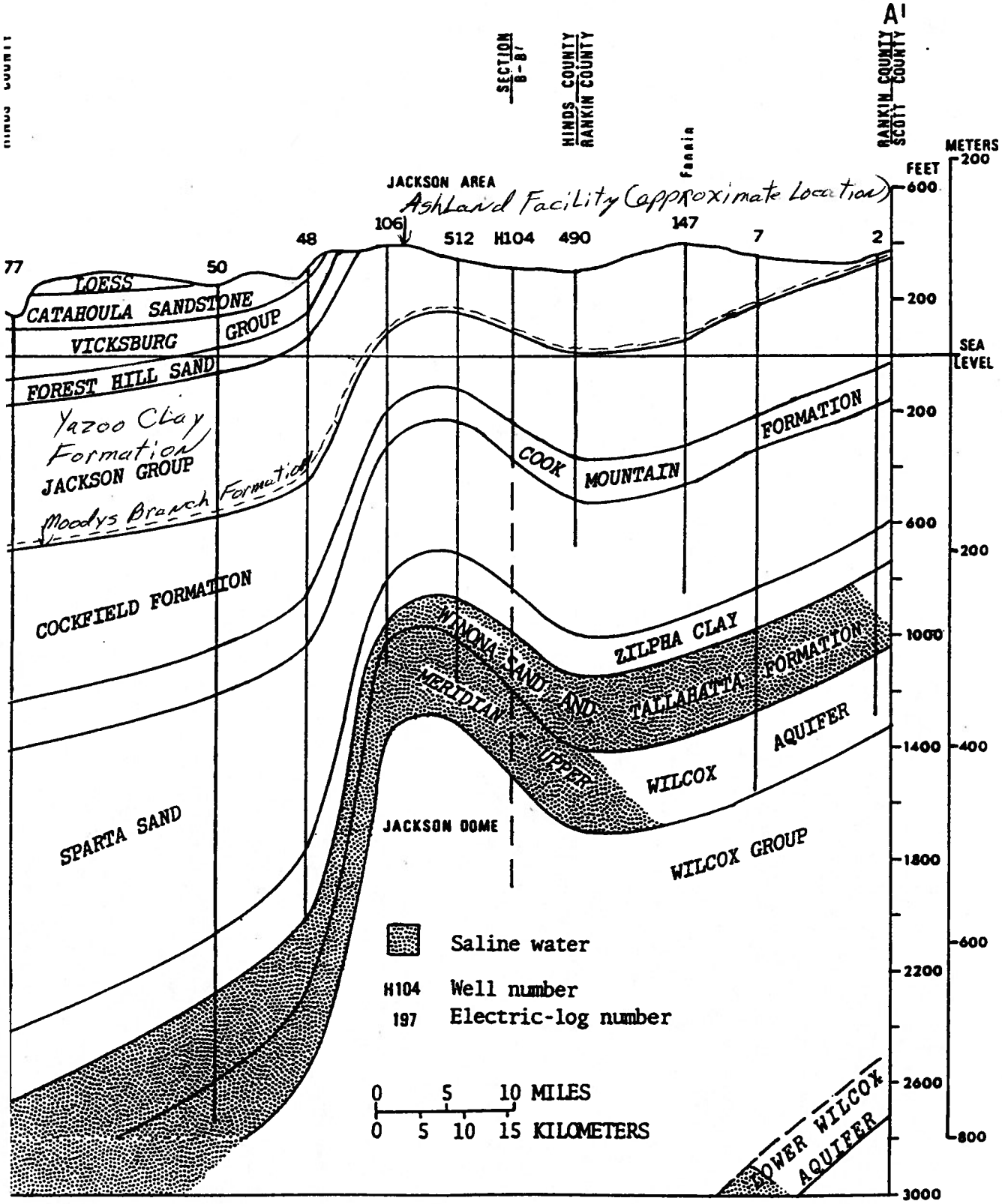


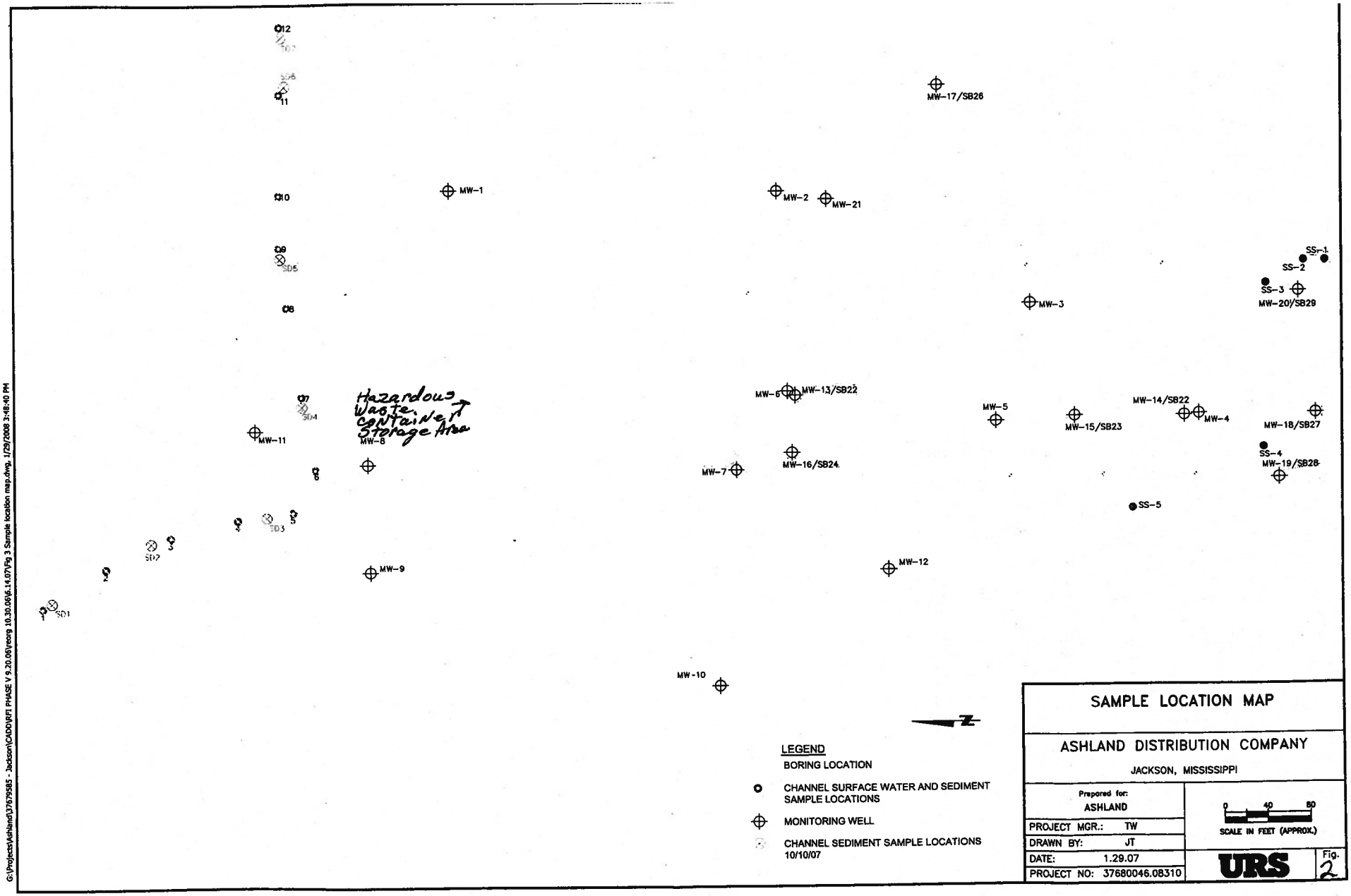
FIGURE 4 GEOHYDROLOGIC CROSS-SECTION OF HINDS COUNTY

TABLE 5
SOIL SAMPLE METALS ANALYTICAL RESULTS
Ashland Distribution Company Facility - Jackson, MS

Sample ID	Sample Date	Sample Depth (feet)	Arsenic (mg/kg)	Barium (mg/kg)	Cadmium (mg/kg)	Chromium (mg/kg)	Lead (mg/kg)	Mercury (mg/kg)	Selenium (mg/kg)	Silver (mg/kg)
Soil Screening Levels[1]:										
Residential Land Use			0.39	540	3.7	210	400	2.3	3.9	39
Industrial Land Use			1.6	6700	45	450	800	31	510	510
2 x Background Concentration[2]			18	780	n/a	106	35	0.2	1.1	n/a
ON-SITE SOIL SAMPLES										
ASH-SB27-0-1	10/09/07	0-1	**6**	100	< 0.52	20	27	< 0.021	< 2.6	< 1
ASH-SB28-0.5-1.5	10/09/07	0.5-1	**5**	76	< 0.51	13	9.6	< 0.021	< 2.5	< 1
ASH-SB29-0-1	10/09/07	0-1	**4.8**	130	< 0.57	17	12	< 0.022	< 2.9	< 1.1
ASH-SS1-0-1	10/09/07	0-1	**6.3**	90	< 0.47	19	53	0.027	< 2.4	< 0.94
ASH-SS2-0-1	10/09/07	0-1	**2.8**	52	< 0.51	18	25	< 0.021	< 2.5	< 1
ASH-SS3-0-1	10/09/07	0-1	1.6	25	< 0.45	9	29	< 0.02	< 2.3	< 0.91
ASH-SS4-0-1	10/09/07	0-1	**6.9**	130	< 0.58	34	20	< 0.024	< 2.9	< 1.2
ASH-SS5-0-1	10/09/07	0-1	**16**	550	< 0.56	34	51	0.047	< 2.8	< 1.1
ASH-SB29-3-4	10/09/07	3-4	**3.8**	130	< 0.52	13	8.8	< 0.022	< 2.6	< 1
ASH-SB28-6-8	10/09/07	6-8	**4.4**	130	< 0.57	31	9.5	< 0.024	< 2.9	< 1.1
ASH-SB27-12-14	10/09/07	12-14	**3.2**	140	< 0.62	42	15	0.028	< 3.1	< 1.2
OFF-SITE STORM WATER SWALE SAMPLES										
ASH-SD1-101007	10/10/07	0-1	**4.3**	99	< 0.7	29	34	0.06	< 3.5	< 1.4
ASH-SD2-101007	10/10/07	0-1	**3.3**	96	< 0.74	13	15	0.053	< 3.7	< 1.5
ASH-SD3-101007	10/10/07	0-1	**2.5**	76	< 0.56	12	10	0.028	< 2.8	< 1.1
ASH-SD4-101007	10/10/07	0-1	**5.7**	81	< 0.8	16	24	0.037	< 4	< 1.6
ASH-SD5-101007	10/10/07	0-1	**4.1**	95	< 0.9	14	17	0.043	< 4.5	< 1.8
ASH-SD6-101007	10/10/07	0-1	**8.4**	76	< 0.63	21	13	< 0.026	< 3.1	< 1.3
ASH-SD7-101007	10/10/07	0-1	**12**	40	< 0.58	21	12	< 0.024	< 2.9	< 1.2

Notes:
1) Soil SL (screening levels) for Industrial Land Use:
for carcinogens = USEPA Region IX Preliminary Remediation Goals for Industrial Soils (PRGs, Oct. 2004)
for non-carcinogen = minimum value of 0.1 x PRG (combined soil PRG) or saturation value
2) Background concentration = arithmentic mean of background concentrations in Mississippi soils from *Guidance for Developing Ecological Soil Screening Levels, Attachment 1-4, Appendix A.* http://www.epa.gov/ecotox/ecossl/SOPs.htm). OSWER Directive 92857-5

Bold indicates concentration detected above Industrial and Residential Screening Levels
Bold box indicates concentration detected above Residential Screening Level
"<" indicates not detected at reporting limit shown
mg/kg = milligrams per kilogram
n/a = not available



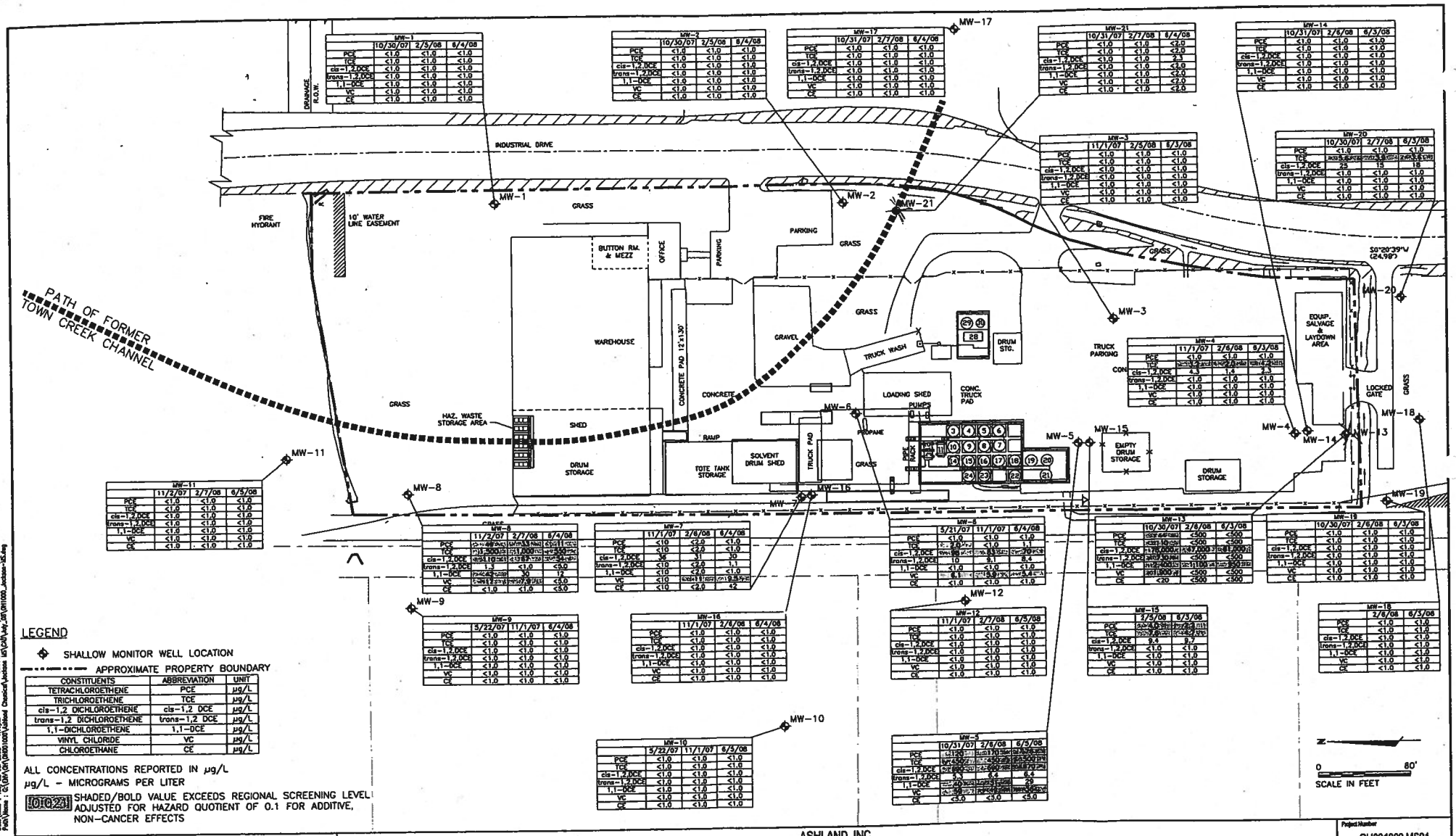
SAMPLE LOCATION MAP

ASHLAND DISTRIBUTION COMPANY

JACKSON, MISSISSIPPI

Prepared for: ASHLAND	0 40 80 SCALE IN FEET (APPROX.)
PROJECT MGR.: TW	
DRAWN BY: JT	
DATE: 1.29.07	URS
PROJECT NO: 37680046.08310	Fig. 2

G:\Projects\Ashland\37679585 - Jackson\CADD\RFI PHASE V 9.20.06\yeorg 10.30.06\6.14.07\Fig 3 Sample location map.dwg, 1/29/2008 3:48:40 PM



MW-1	10/30/07	2/5/08	6/4/08
PCE	<1.0	<1.0	<1.0
TCE	<1.0	<1.0	<1.0
cis-1,2,DCE	<1.0	<1.0	<1.0
trans-1,2,DCE	<1.0	<1.0	<1.0
1,1-DCE	<1.0	<1.0	<1.0
VC	<1.0	<1.0	<1.0
CE	<1.0	<1.0	<1.0

MW-2	10/30/07	2/5/08	6/4/08
PCE	<1.0	<1.0	<1.0
TCE	<1.0	<1.0	<1.0
cis-1,2,DCE	<1.0	<1.0	<1.0
trans-1,2,DCE	<1.0	<1.0	<1.0
1,1-DCE	<1.0	<1.0	<1.0
VC	<1.0	<1.0	<1.0
CE	<1.0	<1.0	<1.0

MW-17	10/31/07	2/7/08	6/4/08
PCE	<1.0	<1.0	<1.0
TCE	<1.0	<1.0	<1.0
cis-1,2,DCE	<1.0	<1.0	<1.0
trans-1,2,DCE	<1.0	<1.0	<1.0
1,1-DCE	<1.0	<1.0	<1.0
VC	<1.0	<1.0	<1.0
CE	<1.0	<1.0	<1.0

MW-21	10/31/07	2/7/08	6/4/08
PCE	<1.0	<1.0	<2.0
TCE	<1.0	<1.0	<2.0
cis-1,2,DCE	<1.0	<1.0	2.3
trans-1,2,DCE	<1.0	<1.0	<2.0
1,1-DCE	<1.0	<1.0	<2.0
VC	<1.0	<1.0	<2.0
CE	<1.0	<1.0	<2.0

MW-14	10/31/07	2/6/08	6/3/08
PCE	<1.0	<1.0	<1.0
TCE	<1.0	<1.0	<1.0
cis-1,2,DCE	<1.0	<1.0	<1.0
trans-1,2,DCE	<1.0	<1.0	<1.0
1,1-DCE	<1.0	<1.0	<1.0
VC	<1.0	<1.0	<1.0
CE	<1.0	<1.0	<1.0

MW-3	11/1/07	2/5/08	6/3/08
PCE	<1.0	<1.0	<1.0
TCE	<1.0	<1.0	<1.0
cis-1,2,DCE	<1.0	<1.0	<1.0
trans-1,2,DCE	<1.0	<1.0	<1.0
1,1-DCE	<1.0	<1.0	<1.0
VC	<1.0	<1.0	<1.0
CE	<1.0	<1.0	<1.0

MW-20	10/30/07	2/7/08	6/3/08
PCE	<1.0	<1.0	<1.0
TCE	[illegible]	[illegible]	[illegible]
cis-1,2,DCE	25	15	18
trans-1,2,DCE	<1.0	<1.0	<1.0
1,1-DCE	<1.0	<1.0	<1.0
VC	<1.0	<1.0	<1.0
CE	<1.0	<1.0	<1.0

MW-4	11/1/07	2/6/08	6/3/08
PCE	<1.0	<1.0	<1.0
TCE	[illegible]	[illegible]	[illegible]
cis-1,2,DCE	4.3	1.4	3.1
trans-1,2,DCE	<1.0	<1.0	<1.0
1,1-DCE	<1.0	<1.0	<1.0
VC	<1.0	<1.0	<1.0
CE	<1.0	<1.0	<1.0

MW-11	11/3/07	2/7/08	6/5/08
PCE	<1.0	<1.0	<1.0
TCE	<1.0	<1.0	<1.0
cis-1,2,DCE	<1.0	<1.0	<1.0
trans-1,2,DCE	<1.0	<1.0	<1.0
1,1-DCE	<1.0	<1.0	<1.0
VC	<1.0	<1.0	<1.0
CE	<1.0	<1.0	<1.0

MW-8	11/3/07	2/7/08	6/4/08
PCE	[illegible]	[illegible]	[illegible]
TCE	[illegible]	[illegible]	[illegible]
cis-1,2,DCE	[illegible]	[illegible]	[illegible]
trans-1,2,DCE	1.3	<1.0	<5.0
1,1-DCE	[illegible]	30	12
VC	[illegible]	[illegible]	<5.0
CE	<1.0	<1.0	<5.0

MW-7	11/1/07	2/6/08	6/4/08
PCE	<10	<2.0	<1.0
TCE	<10	<2.0	<1.0
cis-1,2,DCE	36	31	30
trans-1,2,DCE	<10	<2.0	1.1
1,1-DCE	<10	<2.0	<1.0
VC	<10	[illegible]	[illegible]
CE	<10	<2.0	42

MW-6	5/21/07	11/1/07	6/4/08
PCE	<1.0	<1.0	<1.0
TCE	[illegible]	<1.0	1.1
cis-1,2,DCE	[illegible]	[illegible]	[illegible]
trans-1,2,DCE	10	8.1	8.4
1,1-DCE	<1.0	<1.0	<1.0
VC	[illegible]	[illegible]	[illegible]
CE	<1.0	<1.0	<1.0

MW-13	10/30/07	2/6/08	6/3/08
PCE	[illegible]	<500	<500
TCE	[illegible]	<500	<500
cis-1,2,DCE	[illegible]	[illegible]	[illegible]
trans-1,2,DCE	[illegible]	<500	<500
1,1-DCE	[illegible]	[illegible]	[illegible]
VC	[illegible]	<500	<500
CE	<20	<500	<500

MW-19	10/30/07	2/6/08	6/3/08
PCE	<1.0	<1.0	<1.0
TCE	<1.0	<1.0	<1.0
cis-1,2,DCE	<1.0	<1.0	<1.0
trans-1,2,DCE	<1.0	<1.0	<1.0
1,1-DCE	<1.0	<1.0	<1.0
VC	<1.0	<1.0	<1.0
CE	<1.0	<1.0	<1.0

MW-9	5/22/07	11/1/07	6/4/08
PCE	<1.0	<1.0	<1.0
TCE	<1.0	<1.0	<1.0
cis-1,2,DCE	<1.0	<1.0	<1.0
trans-1,2,DCE	<1.0	<1.0	<1.0
1,1-DCE	<1.0	<1.0	<1.0
VC	<1.0	<1.0	<1.0
CE	<1.0	<1.0	<1.0

MW-16	11/1/07	2/6/08	6/4/08
PCE	<1.0	<1.0	<1.0
TCE	<1.0	<1.0	<1.0
cis-1,2,DCE	<1.0	<1.0	<1.0
trans-1,2,DCE	<1.0	<1.0	<1.0
1,1-DCE	<1.0	<1.0	<1.0
VC	<1.0	<1.0	<1.0
CE	<1.0	<1.0	<1.0

MW-12	11/1/07	2/7/08	6/5/08
PCE	<1.0	<1.0	<1.0
TCE	<1.0	<1.0	<1.0
cis-1,2,DCE	<1.0	<1.0	<1.0
trans-1,2,DCE	<1.0	<1.0	<1.0
1,1-DCE	<1.0	<1.0	<1.0
VC	<1.0	<1.0	<1.0
CE	<1.0	<1.0	<1.0

MW-15	2/5/08	6/3/08
PCE	[illegible]	[illegible]
TCE	[illegible]	[illegible]
cis-1,2,DCE	9.4	9.7
trans-1,2,DCE	<1.0	<1.0
1,1-DCE	<1.0	<1.0
VC	<1.0	<1.0
CE	<1.0	<1.0

MW-18	2/6/08	6/3/08
PCE	<1.0	<1.0
TCE	<1.0	<1.0
cis-1,2,DCE	<1.0	<1.0
trans-1,2,DCE	<1.0	<1.0
1,1-DCE	<1.0	<1.0
VC	<1.0	<1.0
CE	<1.0	<1.0

MW-10	5/22/07	11/1/07	6/3/08
PCE	<1.0	<1.0	<1.0
TCE	<1.0	<1.0	<1.0
cis-1,2,DCE	<1.0	<1.0	<1.0
trans-1,2,DCE	<1.0	<1.0	<1.0
1,1-DCE	<1.0	<1.0	<1.0
VC	<1.0	<1.0	<1.0
CE	<1.0	<1.0	<1.0

MW-5	10/31/07	2/6/08	6/5/08
PCE	[illegible]	[illegible]	[illegible]
TCE	[illegible]	[illegible]	[illegible]
cis-1,2,DCE	[illegible]	[illegible]	[illegible]
trans-1,2,DCE	5.3	6.6	6.4
1,1-DCE	[illegible]	[illegible]	29
VC	[illegible]	[illegible]	[illegible]
CE	<5.0	<5.0	<5.0

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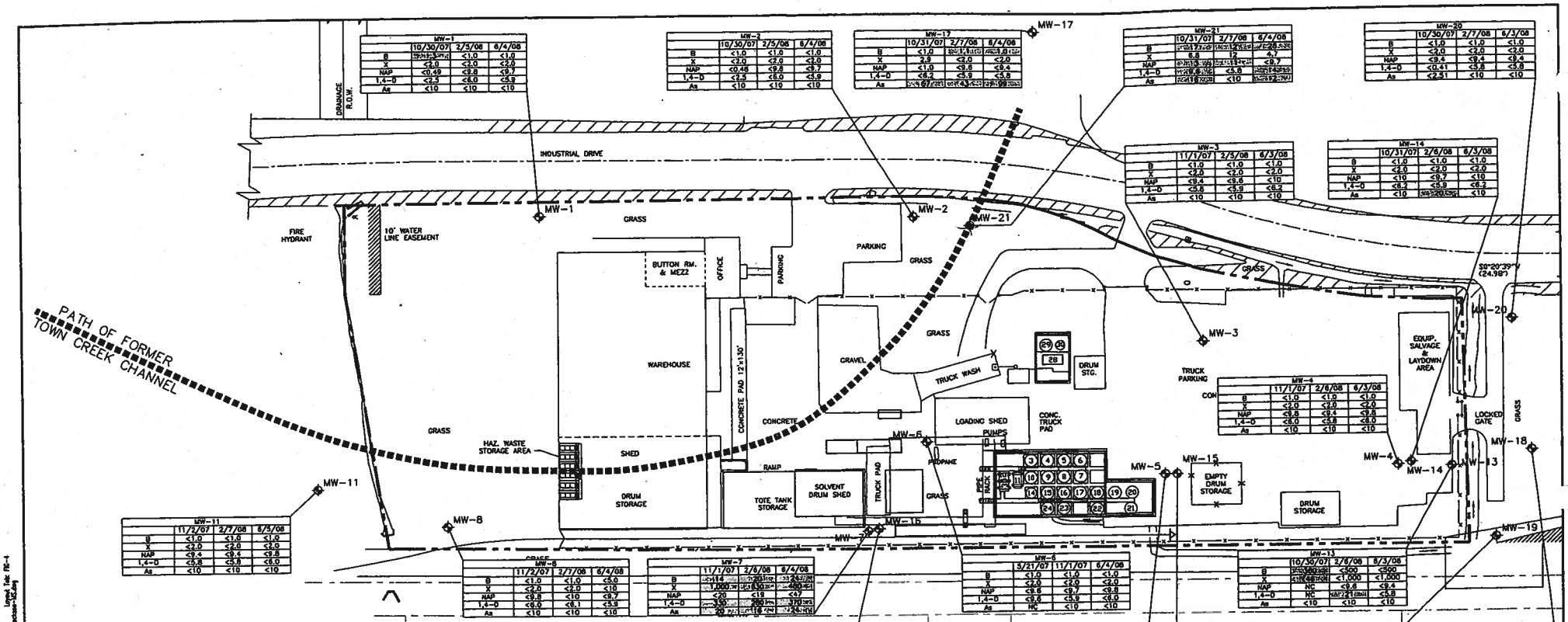
Project Director: G. PAGE
Task Manager: B. BURKE
Technical Review: B. BURKE

ASHLAND, INC.
QUARTERLY MONITORING REPORT

WATER ANALYTICAL RESULTS
SELECT CHLORINATED VOCs
JACKSON, MISSISSIPPI

Project Number: OH001000.MS01
Drawing Date: 22 JULY 2008
Figure: 9



MW-1	10/30/07	2/5/08	6/4/08
B	[illegible]	<1.0	<1.0
X	<2.0	<2.0	<2.0
NAP	<0.49	<9.8	<9.7
1,4-D	<2.5	<8.0	<5.9
As	<10	<10	<10

MW-2	10/30/07	2/5/08	6/4/08
B	<1.0	<1.0	<1.0
X	<2.0	<2.0	<2.0
NAP	<0.45	<9.8	<9.7
1,4-D	<2.5	<8.0	<5.9
As	<10	<10	<10

MW-17	10/31/07	2/7/08	6/4/08
B	<1.0	[illegible]	[illegible]
X	2.9	<2.0	<2.0
NAP	<1.0	<9.8	<9.4
1,4-D	<8.2	<5.9	<5.9
As	[illegible]	[illegible]	[illegible]

MW-21	10/31/07	2/7/08	6/4/08
B	[illegible]	[illegible]	[illegible]
X	5.8	12	4.7
NAP	[illegible]	[illegible]	<9.7
1,4-D	[illegible]	<5.8	[illegible]
As	[illegible]	<10	[illegible]

MW-20	10/30/07	2/7/08	6/3/08
B	<1.0	<1.0	<1.0
X	<2.0	<2.0	<2.0
NAP	<9.4	<9.4	<9.4
1,4-D	<0.41	<5.8	<5.8
As	<2.51	<10	<10

MW-3	11/1/07	2/5/08	6/3/08
B	<1.0	<1.0	<1.0
X	<2.0	<2.0	<2.0
NAP	<9.4	<9.6	<10
1,4-D	<5.8	<5.9	<8.2
As	<10	<10	<10

MW-14	10/31/07	2/6/08	6/3/08
B	<1.0	<1.0	<1.0
X	<2.0	<2.0	<2.0
NAP	<10	<9.7	<10
1,4-D	<8.2	<5.9	<8.2
As	<10	[illegible]	<10

MW-4	11/1/07	2/6/08	6/3/08
B	<1.0	<1.0	<1.0
X	<2.0	<2.0	<2.0
NAP	<9.8	<9.4	<9.8
1,4-D	<8.0	<5.8	<8.0
As	<10	<10	<10

MW-11	11/2/07	2/7/08	6/5/08
B	<1.0	<1.0	<1.0
X	<2.0	<2.0	<2.0
NAP	<9.4	<9.4	<9.8
1,4-D	<5.8	<5.8	<8.0
As	<10	<10	<10

MW-8	11/2/07	2/7/08	6/4/08
B	<1.0	<1.0	<5.0
X	<2.0	<2.0	<10
NAP	<9.8	<10	<9.7
1,4-D	<8.0	<8.1	<5.9
As	<10	<10	<10

MW-7	11/1/07	2/6/08	6/4/08
B	[illegible]	[illegible]	[illegible]
X	1,000	[illegible]	[illegible]
NAP	<20	<19	<47
1,4-D	330	280	170
As	20	[illegible]	[illegible]

MW-6	5/21/07	11/1/07	6/4/08
B	<1.0	<1.0	<1.0
X	<2.0	<2.0	<2.0
NAP	<9.6	<9.7	<9.8
1,4-D	<5.6	<5.8	<8.0
As	NC	<10	<10

MW-13	10/30/07	2/6/08	6/3/08
B	[illegible]	<500	<500
X	[illegible]	<1,000	<1,000
NAP	NC	<9.8	<9.4
1,4-D	NC	[illegible]	<5.8
As	<10	<10	<10

MW-9	5/22/07	11/1/07	6/4/08
B	<1.0	<1.0	<1.0
X	<2.0	<2.0	<2.0
NAP	<9.4	<9.8	<9.4
1,4-D	<5.4	<8.0	<5.8
As	<10	<10	<10

MW-16	11/1/07	2/6/08	6/4/08
B	<1.0	<1.0	<1.0
X	<2.0	<2.0	<2.0
NAP	<10	<19	<9.7
1,4-D	120	270	49
As	<10	<10	<10

MW-12	11/1/07	2/7/08	6/5/08
B	<1.0	<1.0	<1.0
X	<2.0	<2.0	<2.0
NAP	<9.4	<9.4	<9.4
1,4-D	<5.8	<5.8	<5.8
As	<10	<10	<10

MW-19	10/30/07	2/6/08	6/3/08
B	<1.0	<1.0	<1.0
X	<2.0	<2.0	<2.0
NAP	NA	<9.8	<10
1,4-D	NA	<5.9	<8.2
As	<10	<10	<10

MW-18	2/6/08	6/3/08
B	<1.0	<1.0
X	<2.0	<2.0
NAP	<9.6	<9.7
1,4-D	<5.9	<5.9
As	<10	<10

MW-10	5/22/07	11/1/07	6/5/08
B	<1.0	<1.0	<1.0
X	<2.0	<2.0	<2.0
NAP	<9.4	<9.8	<9.8
1,4-D	<5.4	<8.0	<8.0
As	NC	<10	<10

MW-5	10/31/07	2/6/08	6/5/08
B	<5.0	<5.0	<5.0
X	<10	<10	<10
NAP	<9.8	<9.4	<9.4
1,4-D	[illegible]	[illegible]	[illegible]
As	<10	<10	<10

MW-15	2/5/08	6/3/08
B	<1.0	<1.0
X	<2.0	<2.0
NAP	<9.8	<9.4
1,4-D	<8.0	<5.8
As	<10	<10

LEGEND

SHALLOW MONITOR WELL LOCATION

APPROXIMATE PROPERTY BOUNDARY

CONSTITUENTS	ABBREVIATION	UNIT
BENZENE	B	µg/L
XYLENES	X	µg/L
NAPHTHALENE	NAP	µg/L
1,4-DIOXANE	1,4-D	µg/L
ARSENIC	As	µg/L

ALL CONCENTRATIONS REPORTED IN µg/L

µg/L – MICROGRAMS PER LITER

NC – NOT COLLECTED

0.0028 SHADED/BOLD VALUE EXCEEDS REGIONAL SCREENING LEVEL ADJUSTED FOR HAZARD QUOTIENT OF 0.1 FOR ADDITIVE, NON-CANCER EFFECTS

0 80'

SCALE IN FEET

Date/Time : Tue, 22 Jul 2008 - 11:11am
File/Name : C:\Jobs\OH001000\Ashland Chemical\Jackson MS\OH001000_Jackson.dwg
Current Plotted : G. Page
Layout Tab: FR-4

Version : R17.1s (LMS Tech)
Name : sadmin

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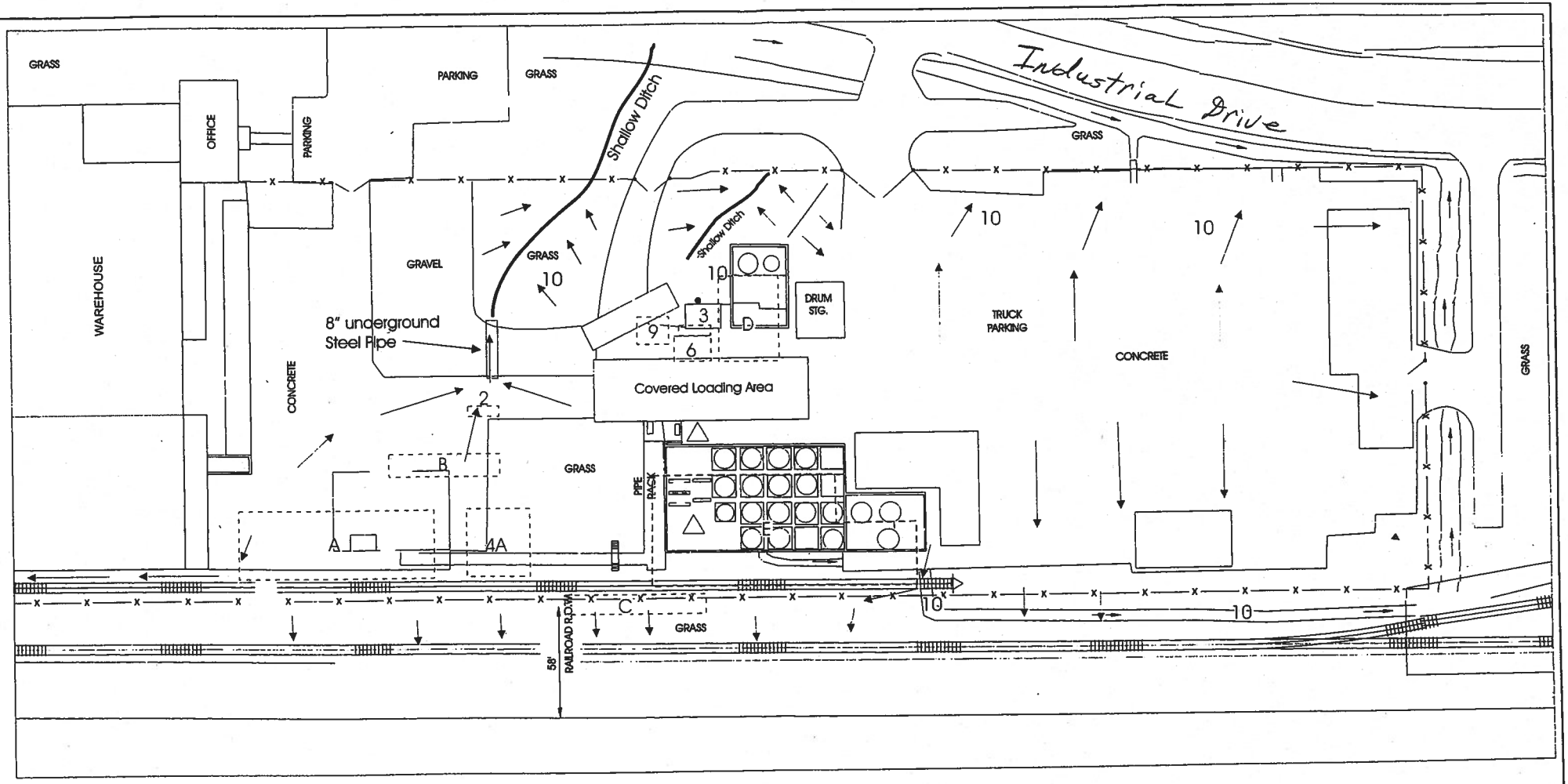
ASHLAND, INC.
QUARTERLY MONITORING REPORT

WATER ANALYTICAL RESULTS
SELECTED NON-CHLORINATED CONSTITUENTS
JACKSON, MISSISSIPPI

Project Number: OH001000.MS01
Drawing Date: 22 JULY 2008
Figure: 10



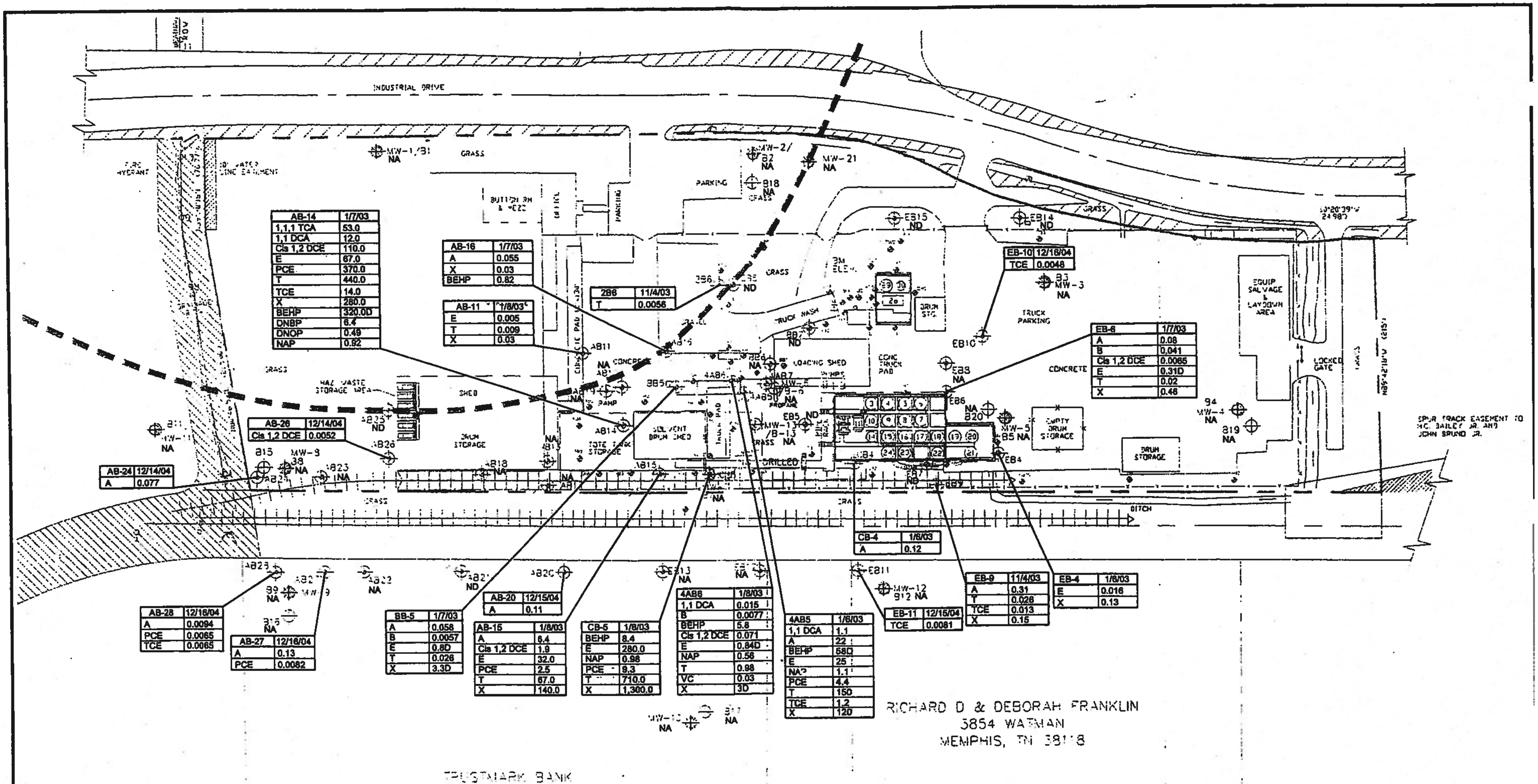
SWMU No.	SWMU Name
2.	Lime Pit
3.	Neutralization Pit
4A.	Former Acid Drumming Pad
6.	Former Container Rinsing Area
9.	Acid Drippage Pad
10.	Stormwater Runoff System

AOC No.	AOC Name
A.	Abandoned Storage Tank Area
B.	Former Truck Loading/Unloading Area
C.	Railcar Loading/Unloading Area
D.	Acid Tank Farm
E.	Solvent Tank Farm Area

→ Surface Water Drainage Direction

N

Ashland Distribution Company Jackson Mississippi	URS Corporation *1553 East County Line Road* *Jackson, Mississippi*			**STORMWATER RUNOFF SYSTEM MAP**
	SCALE: 1" = 50'	DRAWN BY: WHJ	DATE: 01/07/02	FILE NO. 820090005-
		CHKD. BY: JKM	DATE: 01/07/02	FIG. NO. 3



LEGEND

COMPOUND ABBREVIATION — SAMPLE DATE — CONCENTRATION

Compound	Abbreviation	1/7/03
1,1-DICHLOROETHANE	1,1 DCA	0.032
Bis-(2-ETHYLHEXYL)PHTHALATE	BEHP	0.2
Cis 1,2-DICHLOROETHENE	Cis 1,2 DCE	44D
ETHYLBENZENE	E	0.57D
DI-N-PHTHALATE	DNBP	0.37
TETRACHLOROETHENE	PCE	2.1D
TOLUENE	T	1.5
DI-N-OCTYLPHTHALATE	DNOP	0.03
TRICHLOROETHENE	TCE	0.47D
VINYL CHLORIDE	VC	0.14
XYLENE	X	0.78
NAPTHALENE	NAP	0.78
ACETONE	A	0.78
BENZENE	B	0.78

⊕ BORING LOCATIONS

⊕ MONITORING WELL LOCATIONS

ND NO COMPOUNDS WERE DETECTED ABOVE LABORATORY REPORTING LIMITS AT THIS DEPTH

NA NO SAMPLE WAS COLLECTED AT THIS DEPTH

ONLY THOSE COMPOUNDS DETECTED ABOVE LABORATORY REPORTING LIMITS ARE SHOWN ON THIS FIGURE

RESULTS ARE IN mg/Kg

IF MORE THAN ONE SAMPLE WAS COLLECTED >10 FEET THE RESULTS OF THE DEEPEST DEPTH SAMPLED ARE SHOWN ON FIGURE

SCALE IN FEET (APPROX.) 0 40 80

SUMMARY OF SOIL ANALYTICAL RESULTS(mg/Kg) 0–1 FOOT DEPTH INTERVAL 2003–2006

ASHLAND DISTRIBUTION COMPANY

Jackson, Mississippi

Prepared for: ASHLAND

PROJECT MGR.: TW

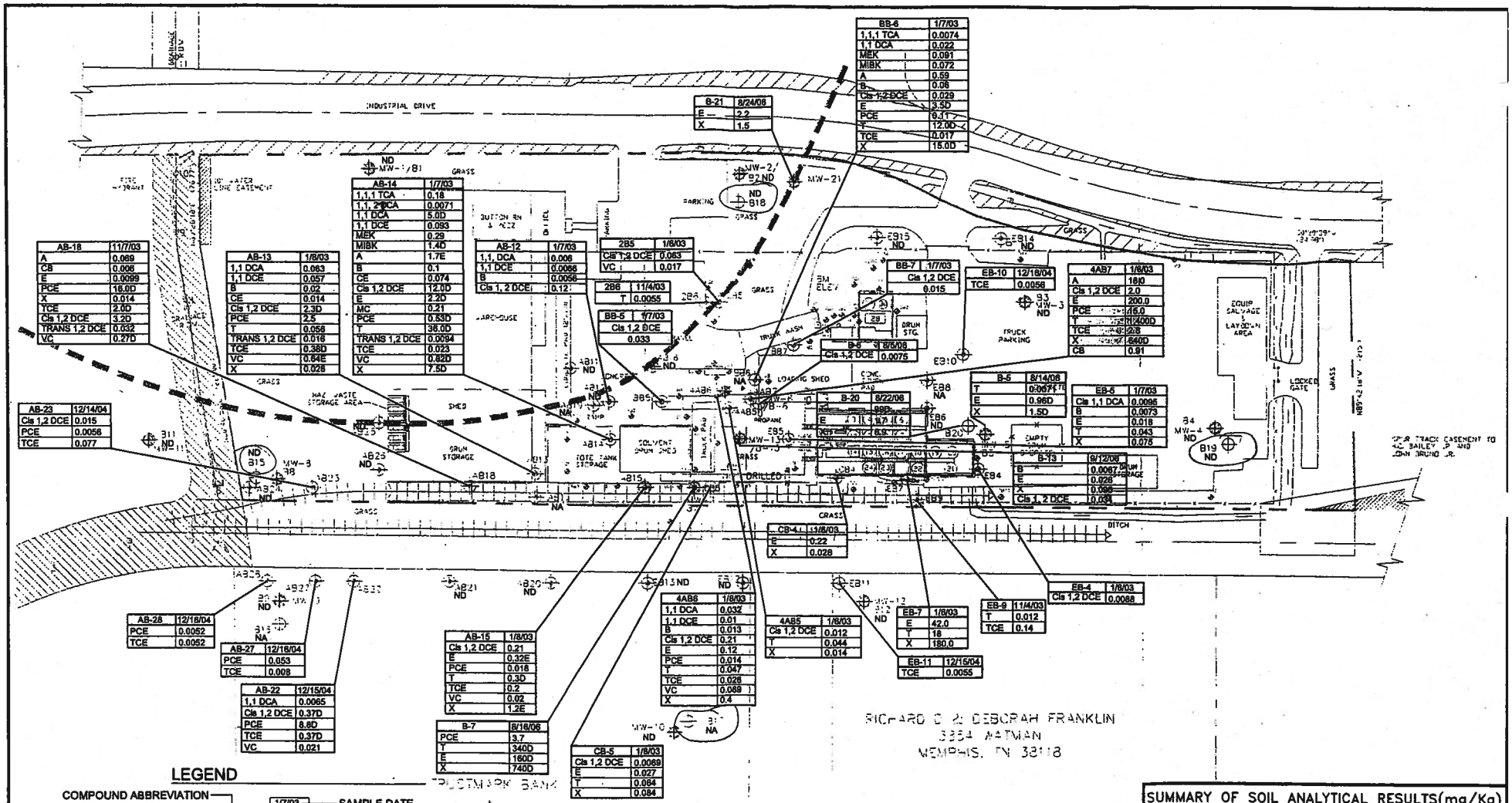
DRAWN BY: JT

DATE: 10.24.06

PROJECT NO: 37679782.07301

URS

Fig. 5



AB-18	11/7/03
A	0.069
CB	0.006
E	0.0099
PCE	16.0D
X	0.014
TCE	2.0D
Cis 1,2 DCE	3.2D
TRANS 1,2 DCE	0.032
VC	0.27D

AB-13	1/8/03
1,1 DCA	0.063
1,1 DCE	0.057
B	0.02
CE	0.014
Cis 1,2 DCE	2.3D
PCE	2.5
T	0.056
TRANS 1,2 DCE	0.016
TCE	0.38D
VC	0.64E
X	0.028

AB-14	1/7/03
1,1,1 TCA	0.18
1,1,2 TCA	0.0071
1,1 DCA	5.0D
1,1 DCE	0.093
MEK	0.29
MIBK	1.4D
A	1.7E
B	0.1
CE	0.074
Cis 1,2 DCE	12.0D
E	2.2D
MC	0.21
PCE	0.53D
T	36.0D
TRANS 1,2 DCE	0.0094
TCE	0.023
VC	0.82D
X	7.5D

AB-12	1/7/03
1,1, DCA	0.006
1,1 DCE	0.0056
B	0.0056
Cis 1, 2 DCE	0.12

2B5	1/8/03
Cis 1,2 DCE	0.063
VC	0.017

2B6	11/4/03
T	0.0055

BB-5	1/7/03
Cis 1,2 DCE	0.033

BB-6	1/7/03
1,1,1 TCA	0.0074
1,1 DCA	0.022
MEK	0.091
MIBK	0.072
A	0.59
B	0.06
Cis 1,2 DCE	0.029
E	3.5D
PCE	0.11
T	12.0D
TCE	0.017
X	15.0D

B-21	8/24/06
E	2.2
X	1.5

BB-7	1/7/03
Cis 1,2 DCE	0.015

EB-10	12/16/04
TCE	0.0056

4AB7	1/8/03
A	18/0
Cis 1,2 DCE	2.0
E	200.0
PCE	16.0
T	11/400D
TCE	2.8
X	640D
CB	0.91

B-6	8/8/06
Cis 1,2 DCE	0.0075

B-5	8/14/06
T	0.0071
E	0.96D
X	1.5D

EB-5	1/7/03
Cis 1,1 DCA	0.0096
B	0.0073
E	0.018
T	0.043
X	0.075

B-20	8/22/06
99D	
E	[illegible]
[illegible]	[illegible]

B-13	9/12/06
B	0.0067
E	0.026
X	0.066
Cis 1, 2 DCE	0.034

AB-23	12/14/04
Cis 1,2 DCE	0.015
PCE	0.0056
TCE	0.077

CB-4	1/8/03
E	0.22
X	0.028

AB-28	12/16/04
PCE	0.0052
TCE	0.0052

AB-27	12/16/04
PCE	0.053
TCE	0.008

AB-22	12/15/04
1,1 DCA	0.0065
Cis 1,2 DCE	0.37D
PCE	8.8D
TCE	0.37D
VC	0.021

AB-15	1/8/03
Cis 1,2 DCE	0.21
E	0.32E
PCE	0.018
T	0.3D
TCE	0.2
VC	0.02
X	1.2E

B-7	8/16/06
PCE	3.7
T	340D
E	160D
X	740D

CB-5	1/8/03
Cis 1,2 DCE	0.0069
E	0.027
T	0.064
X	0.084

4AB6	1/8/03
1,1 DCA	0.032
1,1 DCE	0.01
B	0.013
Cis 1,2 DCE	0.21
E	0.12
PCE	0.014
T	0.047
TCE	0.026
VC	0.069
X	0.4

4AB5	1/8/03
Cis 1,2 DCE	0.012
T	0.044
X	0.014

EB-7	1/8/03
E	42.0
T	18
X	180.0

EB-11	12/15/04
TCE	0.0055

EB-9	11/4/03
T	0.012
TCE	0.14

EB-4	1/8/03
Cis 1,2 DCE	0.0088

LEGEND

COMPOUND ABBREVIATION — 1/7/03 — SAMPLE DATE — CONCENTRATION

1,1-DICHLOROETHANE	1,1 DCA	0.032
CHLOROBENZENE	CB	0.2
Cis 1,2-DICHLOROETHENE	Cis 1,2 DCE	44D
ETHYLBENZENE	E	0.57D
TRANS 1,2-DICHLOROETHENE	TRANS 1,2 DCE	0.37
TETRACHLOROETHENE	PCE	2.1D
TOLUENE	T	1.5
1,1 DICHLOROETHENE	1,1 DCE	0.03
TRICHLOROETHENE	TCE	0.47D
VINYL CHLORIDE	VC	0.14
XYLENE	X	0.78
BENZENE	B	0.78
ACETONE	A	0.78
CHLOROETHENE	CE	0.78
1,1,1 TRICHLOROETHANE	1,1,1 TCA	0.78
1,1,2 TRICHLOROETHANE	1,1,2 TCA	0.78
2 BUTANONE	MEK	0.78
4-METHYL 2-PENTANONE	MIBK	0.78
METHYL CHLORIDE	MC	0.78

BORING LOCATIONS

MONITORING WELL LOCATIONS

ND NO COMPOUNDS WERE DETECTED ABOVE LABORATORY REPORTING LIMITS AT THIS DEPTH

NA NO SAMPLE WAS COLLECTED AT THIS DEPTH

ONLY THOSE COMPOUNDS DETECTED ABOVE LABORATORY REPORTING LIMITS ARE SHOWN ON THIS FIGURE.
RESULTS ARE IN mg/Kg
IF MORE THAN ONE SAMPLE WAS COLLECTED >10 FEET THE RESULTS OF THE DEEPEST DEPTH SAMPLED ARE SHOWN ON FIGURE

D = VALUE FROM DILUTED SAMPLE
E = ESTIMATED VALUE

SUMMARY OF SOIL ANALYTICAL RESULTS(mg/Kg)
1–10 FOOT DEPTH INTERVAL
2003–2006

ASHLAND DISTRIBUTION COMPANY

Jackson, Mississippi

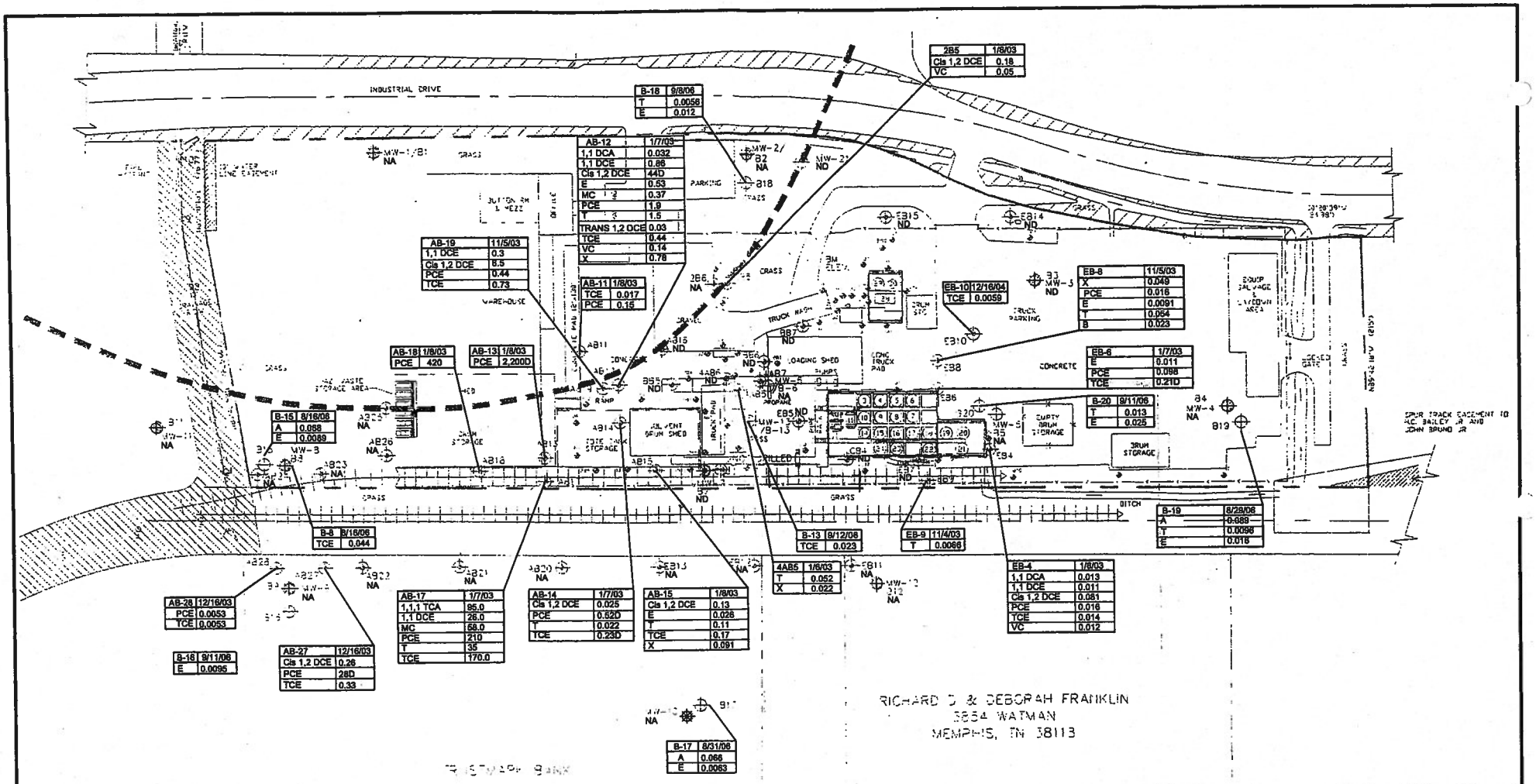
Prepared for: ASHLAND

PROJECT MGR.: TW
DRAWN BY: JT
DATE: 10.24.06
PROJECT NO: 37679782.07301

0 40 80
SCALE IN FEET (APPROX.)

URS

Fig. 6



LEGEND

COMPOUND ABBREVIATION

		1/7/03
1,1-DICHLOROETHANE	1,1 DCA	0.032
1,1-DICHLOROETHENE	1,1 DCE	0.2
Cis 1,2-DICHLOROETHENE	Cis 1,2 DCE	44D
ETHYLBENZENE	E	0.57D
METHYLENE CHLORIDE	MC	0.37
TETRACHLOROETHENE	PCE	2.1D
TOLUENE	T	1.5
TRANS 1,2-DICHLOROETHENE	TRANS 1,2 DCE	0.03
TRICHLOROETHENE	TCE	0.47D
VINYL CHLORIDE	VC	0.14
XYLENE	X	0.78
1,1,1-TRICHLOROETHANE	1,1,1-TCA	0.038
ACETONE	A	0.78

SAMPLE DATE

CONCENTRATION

BORING LOCATIONS

MONITORING WELL LOCATIONS

ND NO COMPOUNDS WERE DETECTED ABOVE LABORATORY REPORTING LIMITS AT THIS DEPTH

NA NO SAMPLE WAS COLLECTED AT THIS DEPTH

ONLY THOSE COMPOUNDS DETECTED ABOVE LABORATORY REPORTING LIMITS ARE SHOWN ON THIS FIGURE.

RESULTS ARE IN mg/Kg

IF MORE THAN ONE SAMPLE WAS COLLECTED >10 FEET THE RESULTS OF THE DEEPEST DEPTH SAMPLED ARE SHOWN ON FIGURE

SUMMARY OF SOIL ANALYTICAL RESULTS(mg/Kg) >10 FOOT DEPTH INTERVAL 2003–2006

ASHLAND DISTRIBUTION COMPANY

Jackson, Mississippi

Prepared for: ASHLAND

PROJECT MGR.: TW

DRAWN BY: JT

DATE: 10.24.06

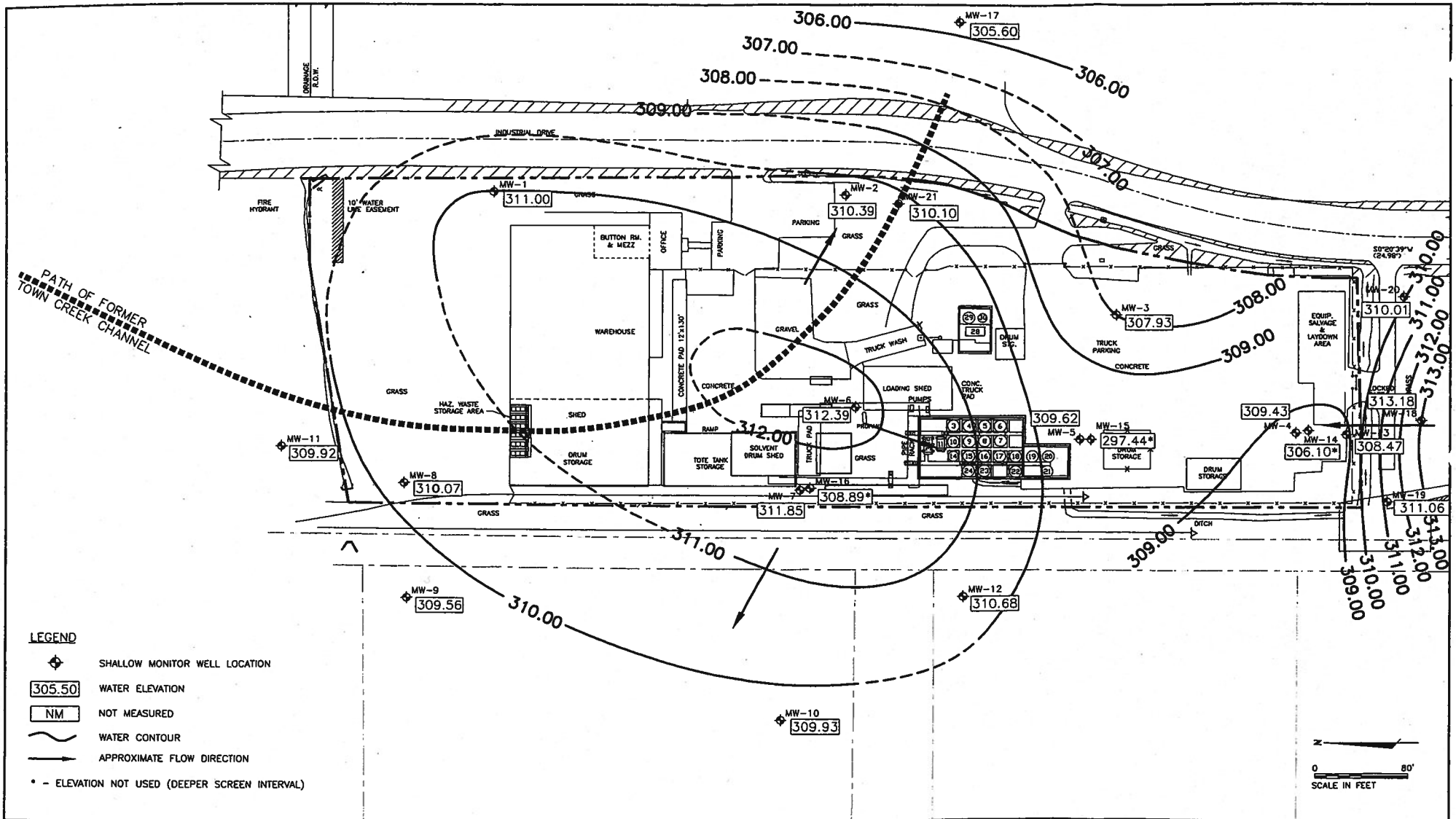
PROJECT NO: 37679782.07301

0 40 80

SCALE IN FEET (APPROX.)

URS

Fig. 7



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Task Manager	B. BURKE
Technical Review	B. BURKE

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ASHLAND, INC.
QUARTERLY MONITORING REPORT

WATER GRADIENT MAP - JUNE 3, 2008

JACKSON, MISSISSIPPI

Project Number: OH001000.MS01
Drawing Date: 22 JULY 2008
Figure: 8