DOCUMENTATION OF ENVIRONMENTAL INDICATOR DETERMINATION

Interim Final 2/5/99
Revised 9/20/02

RCRA Corrective Action
Environmental Indicator (EI) RCRA Info Code (CA750)
Migration of Contaminated Groundwater Under Control

Facility Name: Univar USA, Inc. (formerly Vopak USA, Inc., and Van Waters & Rogers, Inc.)
Facility Address: Intersection of Cash & Silver Streets, Burlington, Iowa
Facility EPA ID #: IAT200010916

DETERMINATION RESULT: YE

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.

The Univar USA, Inc., (Univar) facility was established as early as 1937 by the Chicago Rock Island and Pacific Railroad. Full-service industrial chemical distribution began at the facility in 1957, when McKesson Chemical Company (McKesson) began leasing the property (they later purchased it). Chemical handling activities at McKesson included warehousing, bulk receipt of chemicals via railcar and tanker truck, corrosive liquids repackaging, solvent repackaging, chlorine repackaging, and bleach production. In early 1986, McKesson discontinued packaging operations, bleach production, and railcar and tanker truck shipments. Later in 1986, Van Waters & Rogers, Inc., (VW&R) purchased the facility, limited hazardous waste activities to storage, and removed nine product solvent tanks. In 1990, VW&R removed the remainder of the tanks from the facility and demolished those structures not related to storage of hazardous waste. Structures remaining included the concrete warehouse foundation, the concrete solvent repackaging building (used to store facility records), and the hazardous waste container storage unit. In 1995, the hazardous waste container storage unit was decontaminated and removed under an EPA-approved closure plan. Operations ceased at the facility in 1995 (Geomatrix Consultants, Inc. [Geomatrix] 1999). The property has since been owned by Vopak USA, Inc., and Univar (Geomatrix 2003). Figures 1 and 2 (Appendix 1) show the facility location and layout.

Solid waste management units (SWMU), identified by reference to historical land use and investigations at Univar, are depicted in Figure 3 (Appendix 1). These are described as follows.

SWMU 1: "Interim Hazardous Waste Container Storage Unit." The "Interim Hazardous Waste Container Storage Unit" was a 5-foot by 32-foot by 10-inch steel secondary containment unit used as a storage container for drums of halogenated and non-halogenated solvent wastes from off-site source generators. Materials stored in the storage container included spent solvents (tetrachloroethene [PCE]; toluene; 1,1,1-trichloroethane [TCA]; methylene chloride; xylene; stoddard solvent and ink; methanol; chloroform; acetone; methyl ethyl ketone; mineral spirits; trichloroethene [TCE]), waste oil, freon, waste paint-related materials, and 1,1,1-TCA still

bottoms. Materials were collected in the storage container until truckload-sized quantities (about 3,500 gallons over 30 to 60 days) accumulated. Then the materials were manifested and transported to a permitted treatment and disposal facility (Metcalf & Eddy 1991). A drain in the southwest corner of the containment unit was used to disharge liquids such as rainwater that accumulated there. According to the Current Conditions Report for VW&R, if the liquids that accumulated in the containment unit had an odor or appearance other than rainwater, or if a drum within the containment unit was leaking, all liquids were collected and managed as hazardous waste (Geomatrix 1999).

Although no releases from the hazardous waste storage area have been reported or known to have occurred, red-stained soil was observed surrounding the container during a 1984 Resource Conservation and Recovery Act (RCRA) compliance evaluation inspection (CEI) conducted by the Iowa Department of Natural Resources. The containment unit had been storing anhydrous synosol with a layer of red ink pigment on top for a period just under nine months. McKesson was required to remove the contaminated soil (Geomatrix 1999). During a 1991 RCRA Facility Assessment (RFA), however, stained soil was observed again near the temporary storage container (Metcalf & Eddy 1991). The unit was decommissioned in August 1992, and closure activities were conducted in 1995. Analyses of closure samples collected from the decontaminated unit—including final rinse water samples, field/equipment blank samples, wash/rinse source water samples, and drummed waste liquid samples—revealed that all contaminant concentrations were below cleanup objectives designated in the approved closure plan and modifications (BASCOR Environmental, Inc. 1995). No other reported releases or observed staining are documented for this area.

SWMU 2: Elementary Neutralization Unit. The elementary neutralization unit was a 10- by 10- by 7-foot underground structure constructed of rubber-lined concrete with a wooden top. It was used to accumulate liquid effluent from rinsing reusable containers of mineral acid or alkaline product. The effluent rinse water was piped directly from the chemical repackaging building to the neutralization unit. When the accumulated liquid was neutralized, the liquid was pumped through the top of the neutralization unit to a sanitary sewer (Metcalf & Eddy 1991).

The elementary neutralization unit was installed in 1981 and removed in 1990. According to the Current Conditions Report for VW&R, no known releases or spills have been reported in association with the elementary neutralization unit. From 1957 until the elementary neutralization unit was installed in 1981, rinse water was neutralized in a limestone pit. No information is available about the exact dimensions or location of the limestone pit (Geomatrix 1999).

Areas of concern (AOC) identified based on historical land use and investigations at Univar are depicted in Figure 3 (Appendix 1). These are described as follows.

AOC A: Chlorine Repackaging Building. The former chlorine repackaging building housed the bleach production, chlorine repackaging, and corrosive liquid packaging operations. Bleach was produced in two 1,000-gallon tanks on a concrete platform in the building. Chlorine was received off the railroad spur west of the building and repackaged in 100, 150, and 2,000-pound cylinders. Empty cylinders used for repackaging chlorine were cleaned with caustic soda and steam before being filled. Corrosives were repackaged at the northwest corner of the building. Drains from the railroad platform, the steam-cleaning booth, and the corrosives repackaging area led to the elementary neutralization unit described above. Prior to repackaging, empty cylinders were painted in a paint booth located on the west side of the building. The paint booth had sheet metal walls, a concrete floor, and an exhaust fan that directed the air from the booth outside. Before construction of the paint booth, cylinders had been painted using a spray gun or a roller. Chemicals used in the chlorine repackaging building included chlorine, caustic soda, and paint (containing xylene, xylol, naptha, and aliphatic hydrocarbons) in unknown quantities (Metcalf & Eddy 1991; Geomatrix 1999).

About 5,000 gallons of sodium hypochlorite (liquid bleach) reportedly were released into the City of Burlington sanitary sewer in the late 1970s. Bleach production tanks were removed in 1986, and the chlorine repackaging building was removed in 1990. The concrete platform, concrete building floor, and foundation remain (Geomatrix 1999).

AOC B: Mineral Acid Tank Farm. The mineral acid tank farm consisted of three horizontal tanks—a 10,000-gallon hydrochloric acid tank, a 6,000-gallon sulfuric acid tank, and a 2,600-gallon nitric acid tank—on a 30- by 30-foot concrete pad and surrounded by concrete walls. The tanks were visible on aerial photographs dating as far back as 1962, and they were removed in 1986 (Geomatrix 1999). No reported releases or observed staining are documented for this area.

AOC C: Covered Storage Area. The covered storage area consisted of drums of solvents, mineral acids, and caustics stored on the north side of the chlorine repackaging building. The covered storage area was used for about 30 years. The roof and supports have been removed from the covered storage area; however, the concrete foundation remains (Geomatrix 1999). No reported releases or observed staining are documented for this area.

AOC D: Solvent Repackaging Building. The solvent repackaging building was used to package virgin solvent into 55-gallon drums. Aboveground piping transported the solvent from the solvent tank farm adjacent to the building to a fill station inside the building. Empty drums traveled along a conveyer system to the fill station and then outside the building. There, full drums were removed from the conveyor system and placed in the covered storage area until delivery. Materials handled in the solvent repackaging plant included the solvents methylene chloride, Shell Sol 140, di-isobutyl ketone, isopropyl alcohol, methyl ethyl ketone, butyl cellosolve, methanol, cellosolve solvent, diacetone alcohol, Neu-Tri (TCE), xylene, methyl isobutyl ketone, toluene, and 1,1,1-TCA (Geomatrix 1999).

Solvent repackaging operations were active from 1976 to 1986. Later, the building was used to house documents. During the 1991 RFA, inspectors observed staining where the piping system entered the east wall of the building (Metcalf & Eddy 1991). No reported releases are documented for this area.

AOC E: Solvent Tank Farm. The solvent tank farm consisted of 15 vertical aboveground storage tanks mounted on concrete pads. An unlined dike wall surrounded the solvent tank farm. An aboveground piping system led from the tanks to the adjacent solvent repackaging building. Tanker trucks parked on a concrete pad south of the tank farm during delivery of solvents. Chemicals handled at the solvent tank farm were the same as those handled in the solvent repackaging building (Geomatrix 1999).

The solvent tank farm was installed in 1976. An overfill of a 1,1,1-TCA tank reportedly occurred later that decade, releasing an estimated 1,000 gallons of 1,1,1-TCA to the ground. Nine tanks were removed from the tank farm in 1986, and the remaining six tanks, appurtenances, and dike walls were removed in 1990. No soil was removed during these removal activities; however, some soil may have been reworked (Geomatrix 1999). Elevated concentrations of chlorinated volatile organic compounds (VOC) have been detected in soil and groundwater in the area of the former solvent tank farm (Geomatrix 2000).

Two rail lines bound the Univar facility to the west. West of the railroad tracks is the Case facility. Residential property is located about 1,000 feet west of Univar. To the north of Univar are Bi State Gas, Inc., and a Case storage lot. To the east are a sanitary sewer lift station and another Case storage yard and field. South of the Univar facility is a Case parking lot, and beyond that a fertilizer wholesaler, paint and resin manufacturers, two petroleum wholesalers, a livestock equipment manufacturer, and two wicker product manufacturers (Geomatrix 1999).

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 ground water 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 RCRA Info national database ONLY as long as they remain true (i.e., RCRA Info status codes must be changed when the regulatory authorities become aware of contrary information).

2. Is **groundwater** known or reasonably suspected to be **"contaminated"**[1] above appropriately protective "levels" (i.e., applicable promulgated standards, as well as other appropriate standards, guidelines, guidance, or criteria [e.g., Maximum Contaminant Levels (MCLs), the maximum permissible level of a contaminant in water delivered to any user of a public water system under the Safe Drinking Water Act]) 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 and Reference(s):

The Univar facility is underlain by about 6 to 10 feet of low permeability clay fill. Beneath this fill lies the A zone, an alluvial aquifer of stratified fine to coarse sand and sand with gravel. The A-zone aquifer has a saturated thickness of 20 to 30 feet, with an average water table elevation of about 12 feet below ground surface (bgs). Beneath the A-zone aquifer is a 15- to 25-foot aquitard, the B zone. The B zone separates the A-zone aquifer from a lower alluvial aquifer known as the C zone. The C-zone aquifer and the Mississippi River, located about 0.3 mile east of the Univar facility, provide drinking water for the area (Geomatrix 2000). Predominant groundwater flow is east-southeast, toward the Mississippi River, at a rate of about 250 feet per year. However, groundwater flow within the A zone sometimes reverses for short periods of time in response to high flow conditions in the Mississippi River, which is only 1,400 feet east of the Univar facility (see Attachment 1). Downward migration of groundwater through the low permeability B zone is relatively slow at a rate of less than 3 feet per year (Geomatrix 2000).

In support of a 1999 current conditions report on the Univar facility, Geomatrix researched groundwater use in the facility area using databases maintained by the Iowa Department of Natural Resources (IDNR) Geological Survey Bureau (GSB). The database search addressed the City of Burlington's water supply intake from the Mississippi River and identified production, monitoring , municipal, and residential wells within a 1-mile radius of the facility and west of the Mississippi. Two municipal public water supply wells screened in the C-zone aquifer are located about 4,500 feet north-northwest of the Univar facility. An A-zone well owned the Burlington Municipal Water Department and located 4,500 feet north-northwest of the Univar facility was plugged in 1992. A C-zone irrigation well at the Burlington Golf Club was identified about 5,000 feet west-northwest of the facility. A permitted private well of unknown depth owned by John Klein (Permit No. 2971) and a C-zone well owned by Murry Iron Works were identified about 2,000 feet south of the facility. Additionally, three monitoring wells were identified at the Univar facility, and 16 monitoring wells were identified at the Case facility, adjacent west of the Univar facility (Geomatrix 1999). No municipal or private wells were identified east-southeast (downgradient) of the Univar facility. In November 2000, the City of Burlington City Council passed a Well Ordinance prohibiting construction of wells within the city limits for use as a potable water source, with exemptions for existing private wells and special exemptions by the Burlington municipal waterworks (see Attachment 2) (City of Burlington 2000).

[1] "Contamination" and "contaminated" describes media containing contaminants (in any form, NAPL and/or dissolved, vapors, or solids, that are subject to RCRA) in concentrations in excess of appropriate "levels" (appropriate for the protection of the groundwater resource and its beneficial uses).

The C-zone aquifer does not appear to be impacted by contamination; however, the A-zone aquifer has been contaminated by historical releases in the Univar facility area. Historical reports indicate that groundwater at the Univar facility may have been impacted by the reported release of about 1,000 gallons of 1,1,1-TCA from the solvent tank farm and about 5,000 gallons of sodium hypochlorite from chlorine repackaging operations (Geomatrix 1999; Metcalf & Eddy 1991). A groundwater contamination plume containing chlorinated VOCs, ethylbenzene, and xylenes is located beneath the former solvent tank area near the center of the facility (Geomatrix 2000).

Groundwater also may have been impacted by petroleum hydrocarbon releases located west and upgradient of the Univar facility (Geomatrix 1999; Metcalf & Eddy 1991). Another contamination plume containing petroleum hydrocarbons—including benzene, toluene, ethylbenzene, and xylenes—is located beneath the railroad tracks and the former Case facility USTs on the western boundary of the Univar property. The plume extends along the western property boundary and then east-southeastward across the southern half of the facility (Geomatrix 2000).

In 1991 and 1992, three groundwater monitoring wells (GMMW1, GMMW2, GMMW3) were installed at the Univar facility to determine the eastern limit of hydrocarbon-affected groundwater emanating from the Case property (see Figure 2, Appendix 1). Groundwater samples collected at these locations revealed detections of the following compounds, which were compared to EPA maximum contaminant levels (MCL), or EPA Region 9 preliminary remediation goals (PRG) for tap water if no MCLs were available:

Table 1 - Comparison of 1991 Groundwater Samples to Federal Standards

Constituent of Concern	Range of Detected Concentrations (µg/L)	EPA MCL (µg/L)
Benzene	<1 - 72	5
Chloroform	12 - 210	6.2[a]
1,1-Dichloroethane	68 - 380	810[a]
1,1-Dichloroethene	150 - 1,200	7
Ethylbenzene	<1 - 170	700
Methylene chloride	<10 - 16	4.3[a]
1,1,1-Trichloroethane	670 - 5,100	200
Trichloroethene	<3.5 - 170	5
Toluene	<1 - 210	1,000
Xylenes	<3 - 1,000	10,000

Notes:

[a] No EPA MCL is available for this compound; this value is the EPA Region 9 PRG.
EPA U.S. Environmental Protection Agency
MCL EPA Maximum Contaminant Level
µg/L Micrograms per liter
PRG EPA Region 9 Preliminary Remediation Goal

Detected concentrations of benzene; chloroform; 1,1-dichloroethene (DCE); methylene chloride; 1,1,1-TCA; and TCE exceeded their respective EPA MCLs, or EPA Region 9 PRG for tap water if no MCLs were available (Geomatrix 1999).

In November 1999, and in April and May 2000, additional groundwater samples were collected from monitoring wells and direct-push borings in the upper (A zone) aquifer, and from monitoring wells in the lower (C zone) aquifers beneath the Univar facility. Several constituents of potential concern (COPC) were detected in A-zone monitoring wells at concentrations exceeding MCLs, or EPA Region 9 PRGs for tap water if no MCLs were available. From the lower aquifer (C zone), the COPCs *cis*-1,2-DCE (0.4 µg/L) and 1,1-DCA (0.6 µg/L) were detected in one sample at concentrations significantly below their risk-based standards of 70 µg/L and 810 µg/L (Geomatrix 2000). Based on the groundwater analytical data, Univar installed C-zone monitoring well MW4C in 1999 and five A-zone monitoring wells (MW4A, MW5A, MW6A, MW7A, MW8A) in July and August 2000.

Table 2 - Comparison of 1999-2000 Groundwater Samples to Federal Standards

Constituent of Concern	Maximum Concentration (µg/L)	EPA MCL (µg/L)
Benzene	1,800	5
Carbon tetrachloride	500	5
Chloroform	16	6.2[a]
1,1-Dichloroethane	1,700	810[a]
1,2-Dichloroethane	80	5
1,1-Dichloroethene	350	7
cis-1,2-Dichloroethene	2,400	70
Ethylbenzene	11,000	700
Tetrachloroethene	13,000	5
1,1,1-Trichloroethane	4,500	200
Trichloroethene	390	5
Vinyl chloride	56	2
Xylenes	42,000	10,000

Notes:
[a] No EPA MCL is available for this compound; this value is the EPA Region 9 PRG.
EPA U.S. Environmental Protection Agency
MCL EPA Maximum Contaminant Level
µg/L Micrograms per liter
PRG EPA Region 9 Preliminary Remediation Goal

Also during the 1999 to 2000 sampling event, direct-push soil samples were collected from the surface (0 to 2 feet bgs) and from the base of the unsaturated zone (about 10 feet bgs) at 26 locations across the Univar facility. Table 3 summarizes the positive COPC detections in these soil samples.

Table 3 - Comparison of 1999-2000 Soil Samples to Federal Standards

	Benzene	Chloroform	cis-1,2-Dichloroethene	Tetrachloroethene	1,1,1-Trichloroethane	Trichloroehtene	Benzo(a)anthracene	Benzo(a)pyrene	Benzo(b)fluoranthene	Benzo(k)fluoranthene	Chrysene	Dibenz(a,h)anthracene	Hexachlorobenzene	Indeno(1,2,3-cd)pyrene	alpha-BHC	beta-BHC	Dieldrin
SB02_2	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	***10***	***13***	***12***	**10**	**14**	***2.3***	<0.3	7.6	<0.01	<0.01	<0.01
SB02_10	<0.1	<0.1	<0.1	***0.44***	<0.1	<0.1	**0.2J**	**0.2J**	**0.2J**	<0.3	<0.3	<0.3	<0.3	<0.3	<0.01	<0.01	<0.01
SBM02_10	<0.005	<0.005	<0.005	***0.21J***	<0.005	<0.005	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
SB04_7	<0.1	*0.12*	<0.1	<0.1	<0.1	<0.1	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.01	<0.01	<0.01
SBM04_7	<0.005	0.04	<0.005	**0.014**	<0.005	<0.005	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
SB05_2	<0.1	<0.1	<0.1	***4.5***	<0.1	***0.13***	**1**	**0.9**	**0.9**	<0.3	<0.3	**0.2J**	**0.2J**	**0.6**	<0.01	<0.01	<0.01
SBM05_2	<0.005	<0.005	<0.005	***0.205J***	<0.005	0.008	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
SBM05_14	<0.005	<0.005	<0.005	**0.009J**	<0.005	<0.005	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
SB06_2	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	**0.3J**	**0.3J**	**0.3J**	<0.3	<0.3	<0.3	<0.3	<0.3	<0.01	<0.01	**0.003J**
SB07_2	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.01	<0.01	**0.001J**
SB08_2M	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.3	**0.08J**	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.01	<0.01	<0.01
SBM10_2	<0.005	<0.005	<0.005	**0.007**	<0.005	<0.005	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
SB11_10	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.01	**0.001J**	<0.01
SB12_11	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	**0.004J**	<0.01	<0.01
SB13_2	<0.1	<0.1	<0.1	<0.1	**0.6**	***0.17***	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.01	<0.01	<0.01
SB13_10	<0.1	<0.1	<0.1	<0.1	**0.42**	<0.1	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.01	<0.01	**0.001J**
SB15_2	<0.1	<0.1	<0.1	<0.1	**0.11**	<0.1	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.01	<0.01	<0.01
SB16_2	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.3	**0.07J**	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.01	<0.01	<0.01
SB17_2	<0.1	<0.1	***0.11***	<0.1	**0.16**	***0.35***	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.01	<0.01	**0.002J**
SBM17_2	<0.005	<0.005	<0.005	<0.005	<0.005	**0.023**	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
SB18_2	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	**0.1J**	**0.1J**	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.01	<0.01	<0.01
SB19_2	<0.1	<0.1	***0.11***	<0.1	**0.24**	***0.18***	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.01	<0.01	<0.01
SBM19_2	<0.005	<0.005	**0.032**	<0.005	<0.005	**0.012**	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
SB21_2D	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	**0.2J**	**0.2J**	**0.2J**	<0.3	<0.3	<0.3	<0.3	<0.3	<0.01	<0.01	**0.0008J**
SB21_9	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	**0.09J**	**0.1J**	**0.08J**	<0.3	<0.3	<0.3	<0.3	<0.3	<0.01	**0.001J**	**0.001J**
SBM27_7	<0.005	<0.005	<0.005	**0.024**	<0.005	<0.005	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Residential PRG	0.6	3.6	43	1.5	1200	0.053	0.62	0.062	0.62	6.2	62	0.062	0.3	0.62	0.09	0.32	0.03
Industrial PRG	1.3	12	150	3.4	1200	0.11	2.1	0.21	2.1	21	210	0.21	1.1	2.1	0.36	1.3	0.11
SSL (DAF 20)	0.03	0.6	0.4	0.06	2	0.06	2	8	5	49	160	2	2	14	0.0005	0.003	0.004

Notes:

Units are in milligrams per kilogram		DAF	Dilution attenuation factor
Bold	Detection	J	Estimated quantity
Italics	Sample concentration exceeded SSL (DAF 20)	NA	Not analyzed
Light shading	Sample concentration exceeded residential PRG	PRG	Preliminary remediation goal
Dark shading	Sample concentration exceeded industrial PRG	SSL	Soil screening level

Of the polyaromatic hydrocarbons (PAH) detected, concentrations of benzo(a)pyrene, benzo(b)fluoranthene, benzo(a)anthracene, and dibenz(a,h)anthracene in one surface soil sample from AOC A exceeded EPA soil screening levels (SSL) for migration to groundwater at a dilution attenuation factor (DAF) of 20. Other semi-volatile organic compounds (SVOC) were detected in soil, but not at concentrations exceeding EPA SSLs for migration to groundwater at DAF 20. Of the volatile organic compounds (VOC) detected, PCE concentrations in one surface and one subsurface soil sample, TCE concentrations in four surface soil samples, and benzene and chloroform concentrations in single subsurface samples exceeded EPA SSLs for migration to groundwater at DAF 20. Limited pesticides were detected in the surface soil samples; however, no pesticide concentration exceeded EPA SSLs for migration to groundwater at DAF 20 (Geomatrix 2000). Contaminants present in soil at concentrations exceeding SSLs could potentially be sources of current or future groundwater contamination.

Two additional monitoring wells (MW10A and MW11A) were installed downgradient of the Univar facility in 2002. Quarterly groundwater monitoring of the upper (A zone) and lower (C zone) aquifers is ongoing at the Univar facility wells, with the most recent round of samples collected in September 2004. Quarterly groundwater samples are collected from monitoring wells MW4A, MW5A, MW6A, MW7A, MW8A, MW9A, MW10A, and MW11A screened in the A zone, and from monitoring well MW4C screened in the C zone. Although COPC concentrations have decreased, 10 COPCs continue to be detected in A-zone monitoring wells at concentrations exceeding MCLs, or EPA Region 9 PRGs for tap water if no MCLs are available: benzene; 1,1-dichloroethane; 1,1-DCE; *cis*-1,2-DCE; ethylbenzene; 1,1,1-TCA; PCE; TCE; vinyl chloride; and total xylenes. No COPCs have been detected in the C-zone monitoring well (Geomatrix 2004a, 2004c).

Overall, VOC contamination impacts A-zone groundwater in two areas. The first area is a plume that extends along the western property boundary and then extends east-southeastward across the southern half of the facility. The second area consists of two relatively distinct plumes in the former solvent tank area near the center of the facility (Geomatrix 2003). Plume contour maps of chlorinated ethene concentrations, petroleum hydrocarbon concentrations, and simulated PCE and 1,1,1-TCA concentrations in groundwater produced in support of the Univar RFI indicated that groundwater contamination on or from the Univar facility would not extend to the private and municipal wells identified 4,500 to 5,000 feet north-northwest or 2,000 feet south of the facility (Geomatrix 2000).

Table 4 - Summary of COPCs Detected in Quarterly Groundwater Monitoring[a] at Concentrations Exceeding Federal Standards

	EPA Maximum Contaminant Level (µg/L)	Maximum Concentration Detected (µg/L)	Location of Maximum Detection	Date of Maximum Detection	Maximum Concentration Detected 09/04 (µg/L)	Location of Maximum 09/04 Detection
Benzene	5	1,800	GMMW1A	11/13/99	19	MW5A
Carbon Tetrachloride	5	500	MW4A	07/26/00	ND	ND
Chloroform	6.2 [b]	17	MW4A	05/27/03	ND	ND
1,1-Dichloroethane	7	1,700	MW4A	08/23/00	960	MW4A
1,2-Dichloroethane	5	80	MW6A	07/26/00	0.85	MW8A
1,1-Dichloroethene	7	350	MW4A	08/23/00	30	MW4A

Table 4 - Summary of COPCs Detected in Quarterly Groundwater Monitoring[a] at Concentrations Exceeding Federal Standards

	EPA Maximum Contaminant Level (µg/L)	Maximum Concentration Detected (µg/L)	Location of Maximum Detection	Date of Maximum Detection	Maximum Concentration Detected 09/04 (µg/L)	Location of Maximum 09/04 Detection
cis-1,2-Dichloroethene	70	2,400	MW4A	08/23/00	560	MW4A
Ethylbenzene	700	11,000	MW4A	12/27/00	6,600	MW4A
Tetrachloroethene	5	13,000	MW6A	07/26/00	2,200	MW6A
1,1,1-Trichloroethane	200	4,500	MW4A	08/23/00	310	MW4A
Trichloroethene	5	440	MW5A	12/26/00	35	MW8A
Vinyl Chloride	2	210	MW4A	04/25/02	43	MW5A
Xylene (total)	10,000	48,400	MW4A	10/10/01	27,000	MW4A

Notes:
[a] Quarterly groundwater monitoring in wells MW4A, MW5A, MW6A, MW7A, MW8A, MW9A, MW10A, and MW11A
[b] No EPA MCL is available for this compound; this value is the EPA Region 9 PRG.
EPA U.S. Environmental Protection Agency
MCL EPA Maximum Contaminant Level
µg/L Micrograms per liter
ND Not detected
PRG EPA Region 9 Preliminary Remediation Goal

In May 2004, 14 direct-push borings were completed downgradient of the Univar facility (see Figure 4, Appendix 1). At each location, soil samples were collected continuously from ground surface to the base of the A zone. Soil samples were screened using a calibrated photoionization detector; however, no VOCs were detected. Also at each location, a groundwater sample was collected from within the upper 10 feet of the saturated A zone and another was collected from the bottom 10 feet of the saturated A zone. A total of 28 groundwater samples was collected and analyzed for VOCs. Benzene; PCE; TCE; *cis*-1,2-DCE; 1,1-DCE; and vinyl chloride were detected at concentrations exceeding EPA MCLs (see Table 5) (Geomatrix 2004b). The direct-push groundwater results indicated that two distinct groundwater plumes of dissolved VOCs are located east of the Univar site. The plumes appear to be distributed along the groundwater flow path traveling east-southeast toward the Mississippi River (Geomatrix 2004b).

Table 5 - Comparison of 2004 Direct-Push Groundwater Detections to Federal Standards

	Benzene	1,1-Dichloroethene	-1,2-Dichloroethene	Tetrachloroethene	1,1,1-Trichloroethane	Trichloroethene	Vinyl Chloride
GP2004_2_32	<2	<2	<2	**20**	26	<2	<2
GP2004_4_32	<2	<2	<2	<2	<2	**5**	<2
GP2004_5_42	<2	**13**	**480 J**	**29**	18	**59**	<2
GP2004_6_42	<2	4	**260 J**	<2	<2	<2	<2
GP2004_7_41	**15**	**12**	**390 J**	<2	<2	<2	**28**
GP2004_8_46	**8**	**16**	**540 J**	<2	<2	<2	**47**
GP2004_10_47	<2	<2	50	<2	<2	<2	**11**
GP2004_11_37	<2	<2	<2	<2	<2	<2	**40**
GP2004_11_47	<2	<2	<2	<2	<2	<2	**47**
GP2004_12_45	<2	**14**	**170 J**	<2	<2	<2	**24**
GP2004_13_42	**16**	**9**	**240 J**	<2	<2	<2	**95**
GP2004_13_52	**54**	**32**	**460 J**	<2	<2	<2	**300 J**
GP2004_14_36	<2	<2	4	<2	<2	<2	**10**
EPA MCL	5	7	70	5	200	5	2

Notes:
Units are in micrograms per liter
Bold Sample concentration exceeded EPA MCL
EPA U.S. Environmental Protection Agency
J Estimated quantity
MCL EPA Maximum Contaminant Level

Based on the results of the direct-push investigation, four new monitoring wells (MW12A, MW13A, MW14A, and MW15A) were installed downgradient of the Univar site—two wells at the toe of each apparent plume (see Figure 5, Appendix 1). Table 6 shows the results of the first round of groundwater samples collected from those wells in September 2004. The presence of elevated vinyl chloride concentrations in each of these wells is likely the result of natural degradation of chlorinated solvents.

Table 6 - September 2004 Analytical Results
for Groundwater Samples Collected from New Monitoring Wells

	Benzene	Chloroform	1,1-Dichloroethane	1,1-Dichloroethene	-1,2-Dichloroethene	-1,2-Dichloroethene	Tetrachloroethene	1,1,1-Trichloroethane	Trichloroethene	Vinyl Chloride
MW12A	<0.5	<0.5	5.8	0.82	23	<0.5	<0.5	<0.5	<0.5	1.3
MW13A	0.60	0.96	**25**	**9.8**	**120**	1.3	**44**	29	**160**	**2.5**
MW14A	<0.5	<0.5	2.8	<0.5	20	<0.5	<0.5	<0.5	<0.5	**2.8**
MW15A	<0.5	1.8	3.7	<0.5	3.4	<0.5	<0.5	<0.5	<0.5	**9.9**
EPA MCL	5	6.2[a]	7	7	70	100	5	200	5	2

Notes:
Units are in micrograms per liter
[a] No EPA MCL is available for this compound; this value is the EPA Region 9 PRG.
Bold Sample concentration exceeded EPA MCL
EPA U.S. Environmental Protection Agency
MCL EPA Maximum Contaminant Level
PRG EPA Region 9 Preliminary Remediation Goal

3. Has the **migration** of contaminated groundwater **stabilized** (such that contaminated groundwater is expected to remain within "existing area of contaminated groundwater"[2] 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"[2]).

_____ If no (contaminated groundwater is observed or expected to migrate beyond the designated locations defining the "existing area of groundwater contamination"[2]) - skip to #8 and enter "NO" status code, after providing an explanation.

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

Rationale and Reference(s):

Vertical migration of contaminated groundwater from the A-zone aquifer to the C-zone aquifer appears to be contained by the B-zone aquitard. Downward migration of groundwater through the low permeability B zone is relatively slow (less than 3 feet per year). Additionally, chemical analyses of C-zone groundwater samples indicate that COPCs have not significantly impacted the lower aquifer (Geomatrix 2000). No COPCs were detected in the C-zone monitoring well during the May and September 2004 sampling events (Geomatrix 2004a, 2004c).

The horizontal extent of the plume has been delineated and appears to be stabilized based on the information provided.

During the May and September 2004 groundwater sampling events, samples from every A-zone monitoring well (MW4A, MW5A, MW6A, MW7A, MW8A, MW9A, MW10A, and MW11A) contained at least one COPC at a concentration exceeding EPA MCLs, or EPA Region 9 PRGs if MCLs were not available (Geomatrix 2004a, 2004c). However, statistical analysis (Mann-Kendall) of PCE; TCE; 1,1,1-TCA; 1,1-DCE; *cis*-1,2-DCE; and vinyl chloride in groundwater from the eight monitoring wells indicates that concentrations of most compounds have a downward trend or no trend after seven or more sampling events (Geomatrix 2004a). The exceptions are increasing concentrations of 1,1-DCA in MW6A and MW9A, and increasing concentrations of TCE in MW9A (Geomatrix 2004a). Both MW6A and MW9A lie within the groundwater contamination plume(s).

The RCRA facility investigation of the Univar facility determined that biologically facilitated reductive dechlorination in the A-zone aquifer is naturally attenuating the dissolved chlorinated VOC plume. In a downgradient direction, PCE and TCE are reduced to *cis*-1,2-DCE, vinyl chloride, and ethene, while 1,1,1-TCA is reduced to 1,1- and 1,2-DCA, chloroethane, and ethane. Groundwater samples from newly installed downgradient

[2] "existing area of contaminated groundwater" is an area (with horizontal and vertical dimensions) that has been verifiably demonstrated to contain all relevant groundwater contamination for this determination, and is defined by designated (monitoring) locations proximate to the outer perimeter of "contamination" that can and will be sampled/tested in the future to physically verify that all "contaminated" groundwater remains within this area, and that the further migration of "contaminated" groundwater is not occurring. Reasonable allowances in the proximity of the monitoring locations are permissible to incorporate formal remedy decisions (i.e., including public participation) allowing a limited area for natural attenuation.

monitoring wells MW14A and MW15A contained concentrations of vinyl chloride, a degradation product, that exceeded the EPA MCL; concentrations of all other VOCs were nondetect or below the EPA MCL. Geochemical conditions at the facility are conducive to reductive dechlorination, as represented by chloride, sulfate, alkalinity, ferrous iron, oxygen reduction potential, and dissolved oxygen. Natural carbon and anthropogenic carbon from the petroleum hydrocarbon contamination enhance and drive the biodegradation of chlorinated VOCs. Petroleum hydrocarbon concentrations also decrease with distance from the source, suggesting consumption or degradation (Geomatrix 2000).

Horizontal migration of contaminated groundwater in the A-zone aquifer also is affected by predominant groundwater flow toward the Mississippi River, in an east-southeast direction at a rate of about 250 feet per year (Geomatrix 2000). Groundwater flow within the A zone sometimes shifts or reverses in response to high flow conditions in the Mississippi River, located 1,400 feet east of the Univar facility (Geomatrix 2000). Attachment 1 contains the A-zone water level maps for several quarterly groundwater monitoring events. Because these shifts in flow direction are not regular or extended events, contaminated groundwater eventually travels toward the river and the area of contaminated groundwater is not significantly expanded. Groundwater contamination at the downgradient edge of the plume(s) is contained by the Mississippi River, which serves as a hydraulic boundary.

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 and Reference(s):

Monitoring wells MW14A and MW15A are located at the downgradient edge of the plume(s) between the Univar facility and the Mississippi River (see Figure 5, Appendix 1). These wells are located directly west of the Mississippi River levee and approximately 450 feet west of the Mississippi River. Groundwater samples collected in September 2004 indicate that concentrations of vinyl chloride in monitoring wells MW14A and MW15A exceed EPA MCLs (see Table 6). Given the concentrations of vinyl chloride detected in these wells and their proximity to the Mississippi River, contaminated groundwater likely is discharging to the Mississippi River.

5. Is the **discharge** of "contaminated" groundwater into surface water likely to be **"insignificant"** (i.e., the maximum concentration[3] 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)?

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__X__ 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[3] 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) provide 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.

_____ If no - (the discharge of "contaminated" groundwater into surface water is potentially significant) - continue after documenting: 1) the maximum known or reasonably suspected concentration[3] 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[3] greater than 100 times their appropriate groundwater "levels," 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 identify if there is evidence that the amount of discharging contaminants is increasing.

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

Rationale and Reference(s):

Discharge of contaminated groundwater into the Mississippi River is likely to be "insignificant" because COPC concentrations in groundwater samples collected from downgradient monitoring wells MW14A and MW15A are less than 10 times the EPA MCL. COPC concentrations in groundwater samples collected from MW14A and MW15A also are below conservative EPA Region 5 Ecological Screening Levels (ESL) (see Table 7). In monitoring well MW13A, located directly upgradient of MW15A, COPC concentrations also are below EPA Region 5 ESLs and 10 times EPA MCLs, except for TCE. Because the TCE concentration falls below detection limits by the time it reaches downgradient wells MW14A and MW15A, contaminated groundwater between the Univar site and the Mississippi River is not expected to significantly impact the ecological community in Mississippi River surface water or sediment.

[3] As measured in groundwater prior to entry to the groundwater-surface water/sediment interaction (e.g., hyporheic) zone.

Table 7 - Significance of September 2004 Groundwater Analytical Results in Downgradient Monitoring Wells MW14A and MW15A

	Vinyl Chloride	Trichloroethene	Benzene	-1,2-Dichloroethene	Tetrachloroethene	1,1-Dichloroethene	1,1,1-Trichloroethane	1,1-Dichloroethane	Chloroform
MW14A	**2.8**	<0.5	<0.5	20	<0.5	<0.5	<0.5	2.8	<0.5
MW15A	**9.9**	<0.5	<0.5	3.4	<0.5	<0.5	<0.5	3.7	1.8
EPA ESL	930	47	114	970	45	65	76	47	140
10 x EPA MCL	20	50	50	700	50	70	2,000	70	62[a]

Notes:
Units are in micrograms per liter
Bold Sample concentration exceeded EPA MCL
[a] No EPA MCL is available for this compound; this value is the EPA Region 9 PRG.
EPA U.S. Environmental Protection Agency
MCL EPA Maximum Contaminant Level
PRG EPA Region 9 Preliminary Remediation Goal
ESL EPA Region 5 Ecological Screening Level

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[4])?

_____ 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[5], 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 and Reference(s):

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[4] Note, because areas of inflowing groundwater can be critical habitats (e.g., nurseries or thermal refugia) for many species, appropriate specialist (e.g., ecologist) should be included in management decisions that could eliminate these areas by significantly altering or reversing groundwater flow pathways near surface water bodies.

[5]The understanding of the impacts of contaminated groundwater discharges into surface water bodies is a rapidly developing field and reviewers are encouraged to look to the latest guidance for the appropriate methods and scale of demonstration to be reasonably certain that discharges are not causing currently unacceptable impacts to the surface waters, sediments or eco-systems.

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 and Reference(s):

Univar is expected to continue quarterly groundwater monitoring in accordance with Administrative Order on Consent, Docket No. VII-97-H-0004.

8. Check the appropriate RCRA Info status codes for the Migration of Contaminated Groundwater Under Control EI (event code CA750), and obtain Supervisor (or appropriate Manager) signature and date on the EI determination below (attach appropriate supporting documentation as well as a map of the facility).

__X__ YE - Yes, "Migration of Contaminated Groundwater Under Control" has been verified. Based on a review of the information contained in this EI determination, it has been determined that the "Migration of Contaminated Groundwater" is "Under Control" at the Univar USA, Inc., facility , EPA ID # IAT200010916, located at Burlington, Iowa. Specifically, this determination indicates that the migration of "contaminated" groundwater is under control, and that monitoring will be conducted to confirm that contaminated groundwater remains within the "existing area of contaminated groundwater" This determination will be re-evaluated when the Agency becomes aware of significant changes at the facility.

_____ NO - Unacceptable migration of contaminated groundwater is observed or expected.

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

Completed by /Signed by Patricia Murrow/ Date ___09/30/04__
(signature)
Pat Murrow
Project Manager, RCRA Corrective Action & Permits Branch
EPA Region 7

Supervisor /Signed by Jody Hudson/ Date ___10/05/04__
(signature)
Jody Hudson
Associate Director of RCRA
EPA Region 7

Locations where References may be found:

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REFERENCES

BASCOR Environmental, Inc. 1995. Closure Report, Burlington Bottoms Facility, Burlington, Iowa. Prepared for Van Waters & Rogers, Inc. May.

City of Burlington. 2000. Well Ordinance Number 3151, Passed by the City of Burlington, Iowa, City Council. November 13.

Geomatrix Consultants, Inc. (Geomatrix). 1999. Description of Current Conditions Report, Van Water & Rogers, Inc., Burlington Facility, Burlington, Iowa. Prepared for Van Waters & Rogers, Inc. February.

Geomatrix. 2000. Draft Resource Conservation and Recovery Act (RCRA) Facility Investigation Report, Van Waters & Rogers, Inc., Burlington Bottoms Facility, Burlington, Iowa. Prepared for Van Waters & Rogers, Inc. December.

Geomatrix. 2003. Administrative Order on Consent, Univar USA, Inc., Cash & Silver Street, Burlington, IA, First Quarter 2003 Progress Report. Prepared for Univar USA, Inc. April 2.

Geomatrix. 2004a. Monitoring Event Report, 2nd Quarter 2004, Univar USA, Inc. July 8.

Geomatrix. 2004b. Technical Memorandum: Off-Site Groundwater Sampling Results. June 3.

Geomatrix. 2004c. Monitoring Event Report, 3rd Quarter 2004, Univar USA, Inc. September.

Metcalf & Eddy, Inc. 1991. RCRA Facility Assessment Report for Van Waters & Rogers, Inc., Cash & Silver Streets, Burlington, Iowa, RCRA ID No. IAT200010916. Prepared for EPA Region 7. December 18.