

US EPA ARCHIVE DOCUMENT

**STATEMENT OF BASIS/FINAL DECISION AND
RESPONSE TO COMMENTS SUMMARY**

**REGION VII
ID # 3594**

**Monsanto Agricultural Company
Muscatine, Iowa
(Signed July 21, 1995)**

Facility/Unit Type: Manufacturer of agricultural materials
Contaminants: Chlorobenzene and Diallylate
Media: Groundwater
Remedy: Extract contaminated groundwater by using an on-site recovery well system, and treat extracted water with activated carbon

FACILITY DESCRIPTION

In 1980, Monsanto notified EPA of its hazardous waste activities and submitted Part A of its hazardous waste permit application. In 1987, EPA completed a study that determined that soil and groundwater contamination were present at the facility and that further investigation and study were required. In 1988, Monsanto submitted Part B of its permit application, and in 1989 Monsanto and EPA signed a consent agreement, pursuant to RCRA Section §3008(h), which required Monsanto to investigate the soil and groundwater contamination at the facility. Monsanto conducted a RCRA Facility Investigation (RFI) in 1990 and a Corrective Measures Study (CMS) in 1991.

The facility began operations in 1961 for storage of ammonia fertilizer. Production of ammonia began in 1962. Production of the herbicide randox began in 1964 and continued until 1967. The manufacture of propachlor, alachlor, butachlor, and acetochlor began in 1965, 1967, 1970, and 1992, respectively, and continues at the facility today. The facility began manufacturing acrylonitrile-butadiene-styrene (ABS) plastic in 1976.

The Monsanto facility comprises approximately 474 acres along the Mississippi River in Muscatine County, Iowa. The Mississippi River is directly to the east of the facility, and Spring Lake is located several hundred feet to the south. The manufacturing facility consists of approximately 160 acres, which is enclosed by chain-link fencing. Surrounding land use is primarily agricultural (rural), with some industry to the north of the facility. The population of the area is approximately 23,280.

There is an alluvial aquifer with a saturated thickness of about 130 feet across most of the site. Hydraulic conductivity values are highly variable both horizontally and vertically within the alluvial aquifer. Groundwater flow conditions beneath the Monsanto plant are primarily determined by the continuous by Monsanto production wells. The city of Muscatine obtains its drinking water from the alluvial aquifer. The city operates 3 well fields located north of the facility. These 3 wells produce approximately 8.1 billion gallons of drinking water per year. The alluvial aquifer is also used extensively for irrigation purposes. Approximately 3.8 billion gallons per year are utilized for this purpose.

Two plumes of groundwater contamination have been identified: a chlorobenzene plume centered beneath the area of the Lasso "Tech Plant," and a diallate plume centered beneath the areas of the "Liquid Formulation" warehouse. Some residual chlorobenzene and diallate contamination has also been found in the soil at these locations. No off-site contamination has been identified. Pursuant to the consent agreement, Monsanto has implemented interim measures that include monitoring plume migration, and extracting and treating contaminated groundwater.

EXPOSURE PATHWAYS

Groundwater is the primary medium that has been contaminated at the facility. Groundwater contamination is the result of releases from material handling areas, such as loading/unloading areas, where materials spilled onto the ground. Because the

CONTAMINATION DETECTED AND CLEANUP GOALS

Media	Estimated Volume	Contaminant	Maximum Concentration (ppm)	Action Level	Cleanup Goal	Point of Compliance
Groundwater	Not Given	Chlorobenzene Diallate	21,116 5,500	Not Given	100 98	Not Given

soil at the facility is porous and highly transmissive, rain has carried such spilled materials from the soil into the groundwater. Improvements to the loading areas have reduced or eliminated releases to the soil. Groundwater monitoring has indicated that the contaminant plumes have not migrated beyond the facility boundary.

SELECTED REMEDY

The selected remedy for remediation of the site will address elevated concentrations of chlorobenzene and diallate in the groundwater. The remedy requires that the facility:

- Pump a minimum of 5.5 million gallons of groundwater per day from beneath the facility. Approximately ten production wells will be used to maintain the contaminant plumes beneath the facility. Some of this pumped groundwater will be used for non-contact cooling water and discharged to the Mississippi River without treatment under a National Pollutant Discharge Elimination System (NPDES) permit. The other pumped groundwater will be used as process water and will be biologically treated before it is discharged to the Mississippi River;
- Extract contaminated groundwater from the plumes using four extraction wells. (This system is separate from, and withdraws

groundwater in addition to, the water withdrawn by the pumping system);

- Treat the extracted groundwater in an on-site, liquid phase, activated carbon adsorption system;
- Pump the treated water to the facility water distribution system for use as cooling water, after which it will be discharged to the Mississippi River under the facility's NPDES permit; and
- Perform groundwater monitoring.

The total cost of the selected remedy is estimated to be nearly \$2.3 million.

INNOVATIVE TECHNOLOGIES CONSIDERED

None.

PUBLIC PARTICIPATION

A public comment period was held from March 16, to May 15, 1996. No comments were received.

NEXT STEPS

EPA will continue to monitor the progress and effectiveness of the remedy by reviewing monitoring reports and conducting periodic on-site inspections of the remedial system.

KEYWORDS:

groundwater; VOCs, chlorobenzene, diallate; extraction, carbon adsorption, monitoring, on-site treatment, on-site discharge

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