STATEMENT OF BASIS/FINAL DECISION AND RESPONSE TO COMMENTS SUMMARY

REGION VII
ID # MO0673

MEMC Electronic Materials Inc. Facility

St. Peters, Missouri
(Signed April 19, 1995)

Facility/Unit Type:	**Silicon wafer manufacturing, administrative and research facility**
Contaminants:	**1,1-dichloroethylene (1,1-DCE), 1,2-dichloroethylene (1,2-DCE), trichloroethylene (TCE), and vinyl chloride**
Media:	**Groundwater**
Remedy:	**Extraction of contaminated groundwater, treatment with on-site air stripping system and cooling system**

FACILITY DESCRIPTION

In 1981 and 1983, Monsanto installed groundwater monitoring wells at its St. Peters, Missouri, facility to determine whether plant activities were affecting the quality of the groundwater. Monitoring data revealed that groundwater underlying the facility in the uppermost aquifer had been contaminated with volatile organic compounds (VOCs). A groundwater extraction and treatment system consisting of extraction wells and an air stripper was installed in 1985 as an interim measure. This system is still operational and is monitored and assessed periodically to check the performance of the pumping wells and air stripper unit.

The Plant is situated in the Mississippi River Basin just north of the Mississippi River Basin/Missouri Basin groundwater divide. The bedrock that underlies the Plant is primarily Burlington-Keokuk limestone of Mississippian age. The Burlington-Keokuk limestone is continuous in this area and crops to the south and north of the site. The total thickness of the limestone unit varies from 0 to 240 feet, depending upon removal by erosion, where present. Depth to groundwater at the Plant varies from 0 to 26 feet.

MEMC acquired the facility from Monsanto on April 1, 1989, and it became MEMC's corporate headquarters in April 1990. From 1989 to 1994, MEMC conducted a RCRA Facility Investigation (RFI) and a Corrective Measures Study (CMS) pursuant to an EPA administrative consent order. The RFI indicated that concentrations of 1,1-DCE, TCE, and vinyl chloride were present in the groundwater underlying the facility at concentrations above action levels. The CMS recommended that a corrective measure be implemented to address contaminated groundwater at the facility.

The facility is located in St. Peters, Missouri, in central St. Charles County. It is a silicon wafer manufacturing, administrative, and research facility that provides silicon substrate to the electronics industry worldwide. The facility currently employs over 1,900 people. The facility is located in an industrial land use area; however, the surrounding land use is primarily agricultural.

This Facility received the Governor of Missouri's Environmental Award in 1994 for not generating any hazardous waste as a result of completely changing it's operation from solvent based to water based. The environmental problems currently being addressed resulted from the use of the solvents at the facility and releases of the solvents to groundwater. The facility had a number of potential release locations among which were regulated surface impoundments and an empty drum wash area.

Land surrounding the Plant is primarily used for industrial and agricultural purposes. There are currently 14 permanent residences within a one mile radius of the Plant, seven 7 of which have groundwater wells which are monitored annually by MEMC.

EXPOSURE PATHWAYS

The contaminants of concern could potentially migrate through the groundwater toward private wells located hydraulically downgradient of the facility. Groundwater discharges into area surface drainages in the Mississippi River floodplain northeast of the facility. Thus, contamination of the groundwater and private wells could affect wildlife and people using those resources. The potential exposure pathways for contaminated groundwater are ingestion and dermal contact.

SELECTED REMEDY

The following corrective measures was selected by EPA to remediate the contaminated groundwater:

- Extract contaminated groundwater using a recovery well system;
- Treat extracted groundwater using an on-site air stripping system;
- Discharge the effluent from the air stripper to Belleau Creek via an existing National Pollutant Discharge Elimination System (NPDES) permitted outfall, or to the local publicly owned treatment works (POTW); and
- Continue to monitor the groundwater and air stripper influent and effluent contaminant concentrations for the presence of VOCs.

The corrective measure goals set forth above may be achieved by continued operation of the exsisting interim measures. The total cost of the selected remedy is approximately $3.5 million.

INNOVATIVE TECHNOLOGIES CONSIDERED

Alternatives considered were air stripping, air stripping with resin absorption, air stripping with thermal oxidation, carbon adsorption, and chemical/UV oxidation.

PUBLIC PARTICIPATION

The public comment period began on December 2, 1994, and closed on January 17, 1995. Notice of the selected remedy ran four times in the local papers. Because no comments were received, a public hearing was not scheduled.

CONTAMINATION DETECTED AND CLEANUP GOALS

Media	Estimated Volume	Contaminant	Maximum Concentration (ppm)	Action Level	Cleanup Goal	Point of Compliance
Groundwater	Unknown	1,1-DCE 1,2-DCE TCE Vinyl Chloride	1530 2280 1820 450	7 70 5 2	7 70 5	Each Groundwater Extraction Wells (1-5)

NEXT STEPS

The selected corrective measure - groundwater extraction followed by air stripping - will be monitored and assessed periodically to check performance against established cleanup levels. A Corrective Measures Implementation Order will be issued to the Respondent and the Missouri Department of Natural Resources will become the over viewer of work at this Facility in conjuction with overview of the regulated surface impoundment.

KEYWORDS:

groundwater; ingestion; VOCs; air stripping, extraction, monitoring, on-site treatment, on-site discharge

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