FIVE-YEAR REVIEW REPORT

Auto Ion Chemicals Site
Kalamazoo, Michigan

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Auto Ion Chemicals Site
Kalamazoo, Michigan
First Five-Year Review Report

I. Introduction

The purpose of a five-year review is to determine whether a remedy at a site is protective of human health and the environment. The methods, findings, and conclusions of reviews are documented in Five-Year Review reports. In addition, Five-Year Review reports identify issues found during the review, if any, and identify recommendations to address them.

United States Environmental Protection Agency (EPA or "the Agency") is preparing this Five-Year Review report pursuant to Section 121 of the Comprehensive Environmental Response Compensation and Liability Act of 1980 (CERCLA), as amended by the Superfand Amendments and Reauthorization Act of 1986 (SARA), and Section 300.430(f)(4)(ii) of the National Oil and Hazardous Substance Contingency Plan (NCP). CERCLA §121 states:

> *If the President selects a remedial action that results in any hazardous substances, pollutants, or contaminants remaining at the site, the President shall review such remedial action no less often than each five years after the initiation of such remedial action being implemented. In addition, if upon such review it is the judgement of the President that action is appropriate at such site in accordance with section 104, the President shall take or require such action. The President shall report to the Congress a list of facilities for which such review is required, the results of all such reviews, and any actions taken as a result of such reviews.*

The Agency interpreted this requirement further in the NCP. 40 CFR §300.430(f)(4)(ii) states:

> *If a remedial action is selected that results in hazardous substances, pollutants, or contaminants remaining at the site above levels that allow for unlimited use and unrestricted exposure, the lead agency shall review such action no less often than every five years after the initiation of the selected remedial action.*

EPA, Region 5, conducted the five-year review of the remedy implemented at the Auto Ion Chemicals (Auto Ion) site in Kalamazoo, Michigan. This report documents the results of this review conducted by the Remedial Project Manager (RPM) for the site and the RPM's immediate supervisor. The Michigan Department of Environmental Quality (MDEQ) also provided an expedited review and comments on the report. MDEQ's efforts are appreciated and their comments were fully incorporated in the report. The review was initiated in June 2001 and completed in September 2001.

This is the first five-year review for the Auto Ion site. The triggering action for this statutory review is the initiation of the remedial action for Operable Unit 1 (OU1) on April 19, 1993. The five-year review is required due to the fact that hazardous substances, pollutants, or contaminants remain at the site above levels that allow for unlimited use and unrestricted exposure.

EPA has established a three-tiered approach for conducting five-year reviews, the most basic of which provides a minimum protectiveness evaluation (Level I review). EPA determines the level of review based on site-specific considerations, including the nature of the response action, the status of on-site response activities and proximity to populated areas and sensitive environmental areas. A Type I review was conducted at the Auto Ion site, and consisted of a review of all documents associated with the remedial actions including progress reports and a site visit.

II. Site Chronology

Table 1 - Chronology of Site Events

Event	Date
Initial discovery of problem or contamination	4/28/72
Pre-NPL responses	N/A
NPL listing	9/8/83
Action Memorandum for removal action	6/84
Removal actions	1985
Administrative Order on Consent	6/18/86
Completion date of Remedial Investigation/Feasibility Study	OU1: 7/19/89 OU2: 3/4/94
ROD signature – Operable Unit 1	9/27/89
ROD signature – Operable Unit 2	9/23/94
Explanation of Significant Differences	3/23/93
First Consent Decree for OU1	5/15/90
Second Consent Decree for OU1	11/12/91
Remedial design start for OU1	7/90
Remedial design complete for OU1	3/16/93
Actual remedial action start for OU1	4/19/93
Construction dates for OU1	4/19/93 to 11/5/93
Construction completion date for OU1	8/3/94
Consent Decree for OU2	3/12/97
Remedial design start for OU2	3/94
Remedial design complete for OU2	8/4/94
Actual remedial action start for OU2	8/15/94
Construction dates for OU2	N/A
Construction completion date for OU2	N/A
Final Close-out Report	N/A
Deletion from NPL	Site has not been deleted.
Previous five-year reviews	None

III. Background

The Auto Ion site is located at 74 Mills Street in the northeast section of Kalamazoo, Michigan. The site is in a commercial/industrial area and occupies about 1.5 acres of land. The Kalamazoo River flows adjacent to the site's southern border in a northwesterly direction. O'Neil Street borders the site to the north and Mills Street borders the site to the east. The majority of the Auto Ion site lies within the 100-year floodplain of the river. Kalamazoo is a city of approximately 230,000 residents and is located in Kalamazoo County.

From 1914 until 1956, the City of Kalamazoo operated a coal-burning power plant at the site. In 1964, the Auto Ion Chemical Company purchased the property and operated a waste treatment facility for electroplating wastes. The facility was abandoned in 1973 after the State of Michigan refused to renew its license to operate.

Currently, the site is vacant and fenced. No buildings or other structures remain on the site. Except for the portion of the site along the bank of the Kalamazoo River, the site is relatively flat. The area of the site along the river is steep and is densely vegetated and wooded.

Current land use for the surrounding area is mainly commercial and residential. The Kalamazoo River is used for fishing; however, due to the numerous industrial facilities and hazardous waste sites along its banks, a number of restrictions are in place on consumption of fish from the river. The nearest residences to the Auto Ion site are approximately 500 feet to the north.

Drinking water for residents of the City of Kalamazoo is supplied by a municipal system that draws groundwater from an aquifer outside of the influence of the Auto Ion site.

A Conrail railyard is located across the street to the east of the site, and a painting facility is located adjacent to the western and northern borders of the site. Both of these facilities are included on the State of Michigan's 307 list, which is a list of sites with environmental contamination. The stretch of the Kalamazoo River flowing adjacent to the Auto Ion site is part of the Superfund site called the Kalamazoo River/Allied Paper site.

The primary contaminants at the site are polynuclear aromatic hydrocarbons (PAHs), chlorinated organic solvents, and heavy metals. It is probable that at least some of the PAH contamination was the result of the coal-burning power plant that operated at the site in the first half of the century.

The Auto Ion Chemical Company, which operated a waste treatment facility for electroplating wastes from 1964 to 1973 at the site, is the source of the heavy metal and chlorinated solvent contamination. Waste treatment operations at the Auto Ion Company included cyanide destruction and precipitation of heavy metals. Sludges generated from the treatment operations were disposed of in an on-site lagoon. The lagoon was located on the west side of the site. During its years of operation, poor waste handling practices at the facility resulted in multiple spills to the surface soil at the site as well as illegal discharges to the Kalamazoo River and to city sewers.

PAHs, heavy metals, and chlorinated solvents were detected in on-site soils. Heavy metal and chlorinated solvent contamination are present in groundwater beneath the site. Although some elevated levels of a variety of contaminants were detected in sediments collected from the Kalamazoo River, the contamination could not be conclusively attributed to the Auto Ion site.

Due to the waste handling practices and spills at the Auto Ion Chemical Company, in 1973 the

State of Michigan refused to renew the facility's waste handling license. In 1983, the site was officially placed on the NPL and designated a Superfund site.

In 1985, EPA entered into an agreement with the potentially responsible parties (PRPs) to conduct a removal action at the abandoned facility. The removal action consisted of containerizing and off-site disposal of hazardous materials (i.e., plating wastes) left at the site. In 1986, on-site structures were razed by the City of Kalamazoo.

The initial remedial investigation/feasibility study (RI/FS) for the Auto Ion site was placed in the administrative record on August 7, 1989. The RI included the collection of soil, sediment, groundwater and surface water samples from the site and the adjacent Kalamazoo River. The first operable unit (OU1) for the site focused on cleaning up the soil at the site that was contaminated. Soils in the vadose zone which were contaminated with organics or inorganics at levels above site-specific cleanup standards were excavated. The site-specific cleanup standards were established at a carcinogenic risk level of 10^{-6}, or the average background level, whichever was greater. Excavation and off-site disposal of the former Auto Ion basement floor and demolition debris inside the former basement were also part of OU1. A total of 23,243 tons of soil and debris – including 11,850 tons of non-hazardous soil and debris and 12,393 tons of hazardous (RCRA F006) soil and debris – were removed from the site. OU1 also consisted of backfilling the excavated areas, posting "no trespassing" signs, and grading and seeding of the site. The final remedial action (RA) report for OU1 was approved in August 1994.

OU2 focused on addressing the groundwater contamination at the site. Based on the FS report for OU2, which was approved on March 4, 1994, EPA selected monitored natural attenuation and institutional controls as the remedy for OU2. As part of the OU2 remedy, alternate concentration limits (ACLs) for groundwater were to be established. The method for establishing ACLs was developed during the remedial design of OU2 and consisted of the establishment of ACLs for the contaminants of concern listed in the ROD based on the initial eight rounds of groundwater sampling events, and establishment of the ACLs for additional compounds, as necessary, after an additional three years of groundwater sampling were conducted. ACLs were to be based on a statistically appropriate levels of contaminants observed in groundwater. The OU2 remedy also required the development of a Remedial Action Plan to be implemented to mitigate impact to the Kalamazoo River if there are exceedences of the ACLs.

Remedial action is necessary at the site due to risk posed by the presence of hazardous substances at the site. Hazardous substances that have been released at the site in each media include:

<u>Soil</u>
Arsenic
Barium
Cadmium
Chromium
Copper
Cyanide
Lead
Mercury
Nickel
Silver
Benzo(b)fluoranthene
Benzo(a)pyrene
Bis(2-ethylhexyl)phthalate

Chrysene

Groundwater
Arsenic
Barium
Cadmium
Chromium
Lead
Bis(2-ethylhexyl)phthalate
1,2-dichloroethane
Trichloroethane
Trichloroethene
Vinyl chloride

Exposures to soil and groundwater are associated with human health risks, due to exceedence of EPA's risk management criteria for either the average or reasonable maximum exposure scenarios. Risks from exposure to groundwater are attributed to the presence of various organic and inorganic hazardous substances that exist at concentrations exceeding State and Federal drinking water standards and surface water quality standards.

IV. Remedial Actions

A Record of Decision (ROD) for the first operable unit (OU1) was signed on September 27, 1989. In this initial ROD, it was determined that the clean-up work at the Auto Ion site would be divided into two operable units. OU1 would involve a source control remedial action to address contaminated soil at the site, and OU2 would address the remedial action required for groundwater contamination.

The ROD for OU1 addressed the principal threat at the site by removing the contaminated soil. The major components of the remedy for OU1 were listed as:

- Excavation and off-site treatment, via stabilization, of approximately 7200 cubic yards of contaminated soil;
- Disposal of the treated soils in an appropriate off-site facility; and
- Replacement of the excavated soil with clean fill.

An Explanation of Significant Differences (ESD) was signed on March 23, 1993, to document a treatability variance for the RCRA F006 waste that was on site.

The ROD for OU2 was signed on September 23, 1994. The purpose of the OU2 remedy was to establish ACLs for groundwater and institute a groundwater monitoring program that would ensure that groundwater did not pose a risk to human health or the environment. The major components of the OU2 remedy were listed as:

- Institutional controls to limit ground water use;
- Establishment of ACLs for ground water;
- Monitoring of ground water to ensure ACLs are not exceeded; and

- Development of a Remedial Action Plan (RAP) for ground water.

The remedy selected was based on potential to provide future protection of public health, welfare, and the environment. Site records provided reasonable evidence that quantities of contaminants existed in the Auto Ion site.

The selected alternative was considered to be protective of human health and the environment. The fencing, institutional controls, and removal of contaminated soils provides protection from direct contact with contaminated materials. Removal of contaminated soils also reduces infiltration from precipitation and significantly reduces the migration of contaminants into the groundwater and surface water.

Monitoring the groundwater will identify any failures of the remedy. Should increasing levels of contaminants be detected, additional corrective measures could be taken to abate any threat.

Removal of contaminated site soils was determined to comply with state regulations. The selected remedial alternative was also determined to comply with specific public health and environmental requirements. These ARARs are referred to as “chemical specific” requirements. Public health and environmental ARARs expressed as chemical-specific limits or requirements would be addressed by routine monitoring of groundwater.

The selected remedy complies with relevant portions of the State ARARs. The range of alternative actions that met ARAR requirements was limited. The selected alternative was cost effective since it was the least expensive alternative that satisfied the regulations. Cost effectiveness of the selected alternative was established relative to other alternatives which would have higher costs and essentially met the same ARARs without significantly increasing the benefit to human health and the environment. The selected alternative was determined to be the most cost effective alternative which will meet all ARARs over time.

In general, the remedial actions were constructed and documented in accordance with the approved plans and specifications. Several deviations from the approved plans and specifications were made during the course of construction in response to site conditions. How each remedy met remedial action goals is discussed below.

Fencing, Deed and Access Restrictions

The objective of the institutional control element of the response action was to place sufficient deed and access restrictions to ensure that: 1) the integrity of the soil cover is not compromised; 2) no construction, particularly of drinking water wells, occurs onsite which may increase the likelihood of exposure to remaining contaminants; and 3) there is no interference with operation and maintenance of the monitoring systems. To achieve these objectives a security fence was installed around the perimeter of the site to meet access control requirements in the ROD. The fence is standard chain link construction topped with barbed wire. The fence is being maintained in good repair and is checked periodically in accordance with the approved maintenance schedule.

Groundwater Monitoring Program

The objective of the groundwater program is to monitor the quality of the groundwater at the site. The system consists of 10 groundwater monitoring wells and 5 piezometers. Installation of the groundwater monitoring well is complete and documented, including boring logs and well construction details. The first round of baseline samples was collected in 1997. Monitoring is

on going.

The Remedial Action systems were inspected and found to comply with the intent of the Remedial Design. The Settling Defendants have contracted with Conestoga-Rovers and Associates, Inc. (CRA) to perform site operation and maintenance (O&M) activities. The work is being conducted in accordance with O&M requirements. The O&M requirements incorporate all EPA and State quality assurance and quality control procedures and protocols.

The long term remedial actions requirements at the site for O&M include, but are not limited to the following activities:

1. Routine maintenance of any groundwater monitoring systems, fencing and warning signs; and
2. Periodic sampling and testing of groundwater monitoring wells.

CRA, the Settling Defendants' contractor, has not reported any experience with significant O&M difficulties to date. O&M costs are running approximately as estimated.

V. Progress Since the Last Five-Year Review

This was the first five-year review for the site.

VI. Five-Year Review Process

Relevant correspondence, reports and other documents were reviewed during the five-year review. Data collected after construction of the remedy was reviewed and evaluated. A representative from EPA took part in a site inspection in August 2001. During the site inspection, groundwater monitoring wells and general site conditions were inspected and observed. The inspection evaluated the groundwater monitoring system and fencing. The weather during the inspection was mild with a light rain. Overall, the general quality of the wells appear to range from fair to good, and they appear to be in working order. The evaluation of the effectiveness of the groundwater (OU2) remedy is somewhat premature since the ACLs have not yet been developed. Further evaluation will be necessary after the ACLs are established.

VII. Technical Assessment

Question A: Is the remedy functioning as intended by the decision documents?

As noted above, monitoring systems are operating as intended. The contaminant levels in the groundwater at the site for some compounds appear to be consistent with expectations while the concentrations for the other compounds appear to be increasing. Institutional controls are in place, and no current or planned changes in use at the site suggest that they are not effective. Although these factors appear to indicate that the remedial actions continue to be effective, groundwater monitoring results indicate that several areas of the site continue to be impacted. The contaminant levels exceed Federal and State ARARs. The ACLs should be established and the Settling Defendants should continue to monitor the groundwater at the site for effectiveness of the OU2 remedy. If the ACLs are exceeded, appropriate actions should be taken pursuant to the RAP.

Question B: Are the exposure assumptions, toxicity data, cleanup levels, and remedial

action objectives (RAOs) used at the time of the remedy selection still valid?

With the exception of arsenic, neither Federal MCLs nor State groundwater standards have changed significantly since the time of the ROD. Federal and State standards for surface water quality and protection of aquatic life have not changed since the time of the ROD.

Toxicity and other factors for contaminants of concern have not changed significantly.

Changes in risk assessment methodologies since the time of the ROD do not call into question the protectiveness of the remedy.

Potential Federal ARARs of the ROD consist of the Clean Water Act, the Clean Air Act, National Ambient Air Quality Standard, and OSHA and DOT standards.

Potential State ARARs include the groundwater standards and other appropriate sections of Part 201 and Part 31 of the Natural Resources and Environmental Protection Act (NREPA), 1994 PA 451, as amended.

Based upon a review of site information, it appears that all Federal and State environmental ARAR requirements for on-site activities identified in the ROD are being complied with.

Question C: Has any other information come to light that could call into question the protectiveness of the remedy?

Monitoring data indicated that the concentrations of some contaminants may be increasing. Once ACLs are established, the Agency will be better able to evaluate the effectiveness of the remedy.

VIII. Issues

Some of the groundwater monitoring wells were in fair condition. Several areas of the fence were in need of maintenance. The wells and fencing should be inspected more frequently and repaired in a more timely manner. Since there have been more than eight rounds of sampling, ACLs should be established soon. Current ground water data should be compared to the ACLs when they are established.

IX. Recommendations and Follow-Up Actions

It is recommended that operation and maintenance activities continue in accordance with the approved schedules.

The following recommendations are made to address the deficiencies noted above:

A. The groundwater monitoring wells should be inspected for integrity and repaired as necessary;

B. The fence and warning signs should be inspected for integrity and repaired as necessary; and

C. ACLs should be established and groundwater data should be compared to the ACLs. If exceedences of the ACLs are detected, additional actions may be necessary to protect the

Kalamazoo River.

X. Protectiveness Statement

The remedy is expected to be protective of human health and the environment upon attainment of groundwater cleanup goals, through monitored natural attenuation, which is expected to require 50 to 60 years to achieve. The remedy is expected to be protective of unacceptable impacts to the Kalamazoo River by requiring additional actions if the groundwater discharging from the site to the river does not meet ACLs. In the interim, exposure pathways that could result in unacceptable risks are being controlled and institutional controls are preventing exposure to, or the ingestion of, contaminated groundwater. All threats at the site have been addressed through excavation of contaminated soil, the implementation of institutional controls, the installation of fencing and warning signs, and groundwater monitoring.

Long-term protectiveness of the remedial actions will be verified by obtaining additional groundwater samples to fully evaluate potential migration of the contaminant plume downgradient from the site and towards the river. Current data indicate that only trichloroethene, thallium, vinyl chloride, and arsenic exceed Federal drinking water standards. Additional sampling and analysis will be completed within the next six months. Current monitoring data indicate that the remedy is functioning as required to achieve groundwater cleanup limits in time.

The remedies at the Auto Ion site remain protective of human health and the environment. Although there are exceedences in groundwater, most contaminants remain confined to the site and do not appear to be impacting private drinking water sources. Institutional controls at the site remain in place and are effective.

XI. Next Review

The next five-year review for the Auto Ion site is required by September 2006, five years from the date of this review. Due to ongoing discussions regarding proposed ACLs, an addendum to this review or an additional review may be prepared prior to September 2006.