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FIVE -YEAR REVIEW REPORT
AUGUST 2000
RASMUSSEN DUMP SITE
LIVINGSTON CO., MICHIGAN

I. INTRODUCTION

The United States Environmental Protection Agency (U.S. EPA), Region 5, conducted this statutory five-year review under Section 121(c) of the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) and NCP part 300.430(f)(4)(ii) of the code of Federal Regulations (CFR). The purpose of this statutory five-year review is to evaluate whether the Rasmussen remedial action remains protective of human health and the environment and is functioning as designed, at this site where hazardous waste remains on-site at levels that do not allow for unlimited use and unrestricted exposure. The Type 1 review conducted for this site is applicable to a site at which construction is complete and there are no factors which suggest a higher level of review is necessary. The five-year report shall become part of the administrative record file for the Rasmussen Dump Superfund Site, which is available for viewing at the Brighton District Library, off Grand River on Library Drive, Brighton, Michigan, and at the Hamburg City Library, 7225 Stone Street, Hamburg, Michigan, during normal business hours. A copy of the administrative record file is also available for viewing at the U.S. EPA Region 5 office, in Chicago, Illinois.

Site History

The Rasmussen Dump Site is located on Spicer Road in Green Oak Township, Livingston County Michigan, 40 miles NW of Detroit, and about 1.5 miles NE of Hamburg, Michigan. The Site is privately owned, and is bounded by property owned by a family member to the east and by the Spiegelberg property to the west and south. Two residences are occupied by the property owner's family. An auto body shop and an auto salvage yard are located on the northern portion of the property. Current land usage of these adjacent properties include a residence on the northern portion of the east property, a gravel/sand mining operation to the west, a limited peat mining operation to the south, and livestock grazing to the south. The unlicensed Rasmussen dump accepted domestic and industrial wastes during the 1960's and early 1970's. The dump formed a ridge-like crest across the southern portion of the 33 acre site and property. Drummed and other industrial wastes were also disposed of at other locations on-site. The dump was never properly capped and "closed" prior to termination of operations. Sand and gravel mining, which began after closure in 1972, undermined the landfill and resulted in the redistribution of fill and drummed wastes.

Within the last year there has been private residential construction activities across Spicer Road, downgradient of the plume. A larger sub-development is rumored to be in the planning stage near the Site.

Response Actions

Low levels of ground water contamination were detected in a 1981 study conducted by the Michigan Department of Natural Resources (MDNR), currently the Michigan Department of Environmental Quality (MDEQ). U.S. EPA's Field Investigation Team conducted a site inspection in 1982, and the site was scored and placed on the Federal National Priorities List (NPL) in 1983.

In October and November 1984, the U.S. EPA Emergency Response Team removed 3,000 drums and 250 cubic yards of contaminated soils from the top and south face of the landfill. In December 1984, a state lead Federally funded Remedial Investigation (RI) was initiated. Late in 1985, MDEQ constructed an eight-foot high chain link fence around the landfill to restrict entry.

Remedial Investigation/Feasibility Study(RI/FS)

The report of findings for the RI was issued in September 1988.

Based on the findings of the RI, U.S. EPA delineated discrete areas of buried drums and contaminated soils. On August 24, 1989, U.S. EPA issued an Administrative Consent Order, for the removal of drums, wastes, and associated visibly contaminated soils from three of the soils areas. Eleven Potentially Responsible Parties (PRPs) signed the Order, which became effective August 24, 1989. Roughly 650 drums were unearthed and sent to Resource, Conservation, and Recovery Act (RCRA) facilities for disposal. The removal was complete in February 1990.

The FS Report, prepared by MDEQ, reviewed by U.S. EPA, and released for public comment on August 31, 1990, is also based on the findings of the RI and Risk Assessment Reports. Subsequent to the completion of the FS, further soil boring investigations and analyses were conducted from December of 1989 through January of 1990 under the terms of a Section 106 Administrative Order by Consent. The results of these investigations are detailed in a Technical Memorandum. The results of this study resulted in the removal of the remaining drummed wastes from the Northeast-Buried Drum (NEBD) Area, the Industrial Waste (IW) Area, and the Surface Drum (SD) Area. On March 28, 1991 U.S. EPA issued a Record of Decision (ROD) for the cleanup of Rasmussen's Dump. The remedy selected in the ROD is a combined ground water treatment remedy/soil flushing and landfill cap. Subsequently, U.S. EPA reached an agreement with 10 PRPs to privately undertake the cleanup at Rasmussen Dump Site. The Consent Decree directs the 10 parties to perform the following tasks:

a. Install a landfill cap meeting the requirements of Michigan Act 64 (now Part 111 of Michigan Act 451);

b. Procure and implement institutional controls/deed restrictions;

c. Implement a RD Data Collection Program to confirm the hydrogeologic characterization

of site ground water, and conduct field tests and treatability studies for the purpose of Remedial Design. The results of the RD Data Collection Program will supplement the existing data and used in the design of the treatment system and extraction/reinfiltration basin network;

d. Construct a ground water extraction system to capture and extract ground water for treatment, from the affected ground water zones;

e. Construct a ground water treatment plant to treat the extracted ground water prior to reintroduction;

f. Construct a reinfiltration basin(s) to discharge the treated ground water;

g. Construct new fencing, or modification of existing, to secure the constructed treatment plant and landfill cover;

h. Implement all operation, maintenance and monitoring activities for the completed Remedial Action activities including; operation and maintenance of the ground water treatment plant; monitoring the progress of ground water remediation; maintenance and ground water monitoring of the capped landfill; and

i. Implementation of a residential well monitoring program.

The Rasmussen Consent Decree was lodged with the United States District Court for the Eastern District of Michigan on February 14, 1992, and published in the Federal Register on Monday, March 2, 1992. The Consent Decree provided for 100% cost recovery.

Significant Differences for the ROD

Prior to the ROD signing and pursuant to Section 117(c) of CERCLA, 42 U.S.C. §9617(c), U.S. EPA issued an explanation of significant differences ("ESD") from the ROD remedy that was incorporated into the final remedial action. U.S. EPA changed the ground water Cleanup Standard as shown on Table 1.

Table 1

Chemical	ROD Cleanup Standards	ESD Cleanup Standards
Toluene	40.0 ppb	800.0 ppb
Xylenes	20.0 ppb	300.0 ppb
Ethylbenzene	30.0 ppb	70.0 ppb
Chlorobenzene	50.0 ppb	100.0 ppb
2-Methylphenol	300.0 ppb	400.0 ppb
1,1-Dichloroethene	2.0 ppb	7.0 ppb *
2-Chlorophenol	5.0 ppb	40.0 ppb *

* Deleted from ROD Cleanup Standards

There were several reasons for the ESD, ranging from typographical errors in the Proposed Plan, inadvertent omission of a contaminated area, faulty calculations, issuance of new RfD data and new Taste and Odor values. Further information on the ESD is available in the ROD.

Remedial Action

Remedial Action landfill cap construction activities began in March 1995. Construction activities included: site clearing and regrading, construction of reinforced walls on the North and South faces of the landfill, construction of a ballast zone at the base of the South Face, installation of a gas collection system, placement and compaction of the clay cap, placement of a drainage layer, and placement of the vegetative layer. The vegetative layer was seeded in the fall of 1995, and growth has been established. Remedial Action construction activity for the ground water treatment system began in May, 1995. Construction activity included: installation of extraction wells and associated underground piping systems, erection of a building and installation of process equipment for treating the contaminated ground water, reinfiltration basin construction, access road upgrade, and fencing to enclose the landfill and treatment systems.

A pre-final inspection of the construction activities was conducted by the MDEQ and U.S. EPA remedial project managers and the U.S. EPA ARCS oversight contractor on September 15, 1995. During the pre-final inspection, it was determined that the extraction, reinjection and treatment systems were constructed as designed, and the landfill cap was constructed in compliance with Michigan Act 641(now Part 115 of Michigan Act 451).

An approved Quality Assurance Project Plan (QAPP) for pre-construction and confirmation

sampling and analysis was utilized during the remedial design and remedial action to ensured that all analytical results reported were accurate to the degree necessary for compliance with the ROD. The laboratories used to conduct the pre-construction and confirmation analyses were determined to be acceptable for use by the U.S. EPA Region 5 Environmental Sciences Division based on previous laboratory audits.

A Construction Quality Assurance Plan (CQAP) was prepared in conjunction with the remedial design to address the activities necessary to ensure compliance with the requirements of the remedy. The protocols contained in the CQAP were employed during construction to ensure that the treatment system would perform in accordance with the ROD and RD plans and specifications. Details of the procedures used to ensure the quality of the construction work are contained in the approved CQAP.

The remedial design and remedial action construction management activities at the site were conducted by the PRP's construction quality assurance engineer under the oversight of MDEQ and U.S. EPA's Project managers, and U.S. EPA's ARCS oversight contractor, on a rotating schedule. The components of the remedial action were constructed by contractors and sub-subcontractors to the PRPs. All design plans and field activities were reviewed and approved by U.S. EPA, in consultation with MDEQ, to ensure consistency with the ROD, the RD and RA work plans, and Federal and State requirements.

II. DISCUSSION

Remedial Objectives:

The response action selected in the ROD is a treatment and a containment type remedy which addresses the principal threat posed by the contaminated ground water, and four waste areas at the Site. The containment part of the remedy addressed soils in the Northeast Buried Drum area (NEBD) and Top of Municipal Landfill (TML) areas. The principal threats from direct exposure to contaminated soils is controlled by the construction of an impervious clay cap over the TML and NEBD areas. A Pump and Treat process was designed and installed as the Final Remedy for the treatment of the contaminated plume and contaminants flushed from the Possible Drum Storage and Disposal Area (PDSLD) and Industrial Waste (IW) Area. Deed restrictions on the use of ground water are in effect until the aquifer has been restored to drinking water quality. Monitoring on a scheduled basis of the treatment plant effluent, ground water plume, leachate from the landfill, and PDSLD and IW soils, to follow the effectiveness of the ROD remedy in achieving progress toward cleanup standards.

Remedy Performance:

The Rasmussen Dump Site ground water investigation included analysis for Organics, Inorganic (primarily metals), Pesticides, Polychlorinated Biphenyls (PCBs), and ground water quality

indicators. The results are provided within the RI Report. Seventeen Volatile Organic Compounds (VOCs), one Semivolatile Organic Compound (SVOC) , and 2 metals from this investigation are shown on Table 1.

Early in the O&M program the effluent from the treatment plant on occasion had exceeded clean-up standards, but returned to compliance levels after cleaning the air stripper. This problem was eliminated when the stripper was placed on a preventative maintenance cleaning program.

In early 1997 it was apparent that the conditions in the ROD calling for "extraction of ground water to capture and halt the flow of the plume" and "halting the migration of contamination" was not being met, based on the hydraulic contour maps generated monthly for the site. Analysis of EW-104 (high levels of benzene and vinyl chloride) and the ground water flow to the north through the EW-104 area, suggested that ground water venting to the north-northeast could be contaminating the ground water beyond the northern edge of the plume toward Spicer Road. The U.S. EPA requested that the nature of the contamination, if any, be established for the ground water escaping the pump and treat system to the north-northeast of the plume, and corrective action be taken to eliminate flow through the plume to the northeast. The PRPs made several attempts in 1998 to "close" the hydraulic contour map by adjusting the extraction well pumping rates at EW-102, EW-103 and EW-104. The adjustments did not achieve the desired effect.

The PRPs then conducted additional ground water investigations between the north edge of the plume and Spicer Road. The results from these studies were reported periodically, which showed a small separate pocket of benzene and vinyl chloride contamination (occasionally above clean-up levels) near Spicer Road. In mid summer 1999, the PRPs submitted a plan to install an in-situ ozone/oxygen oxidation system, initially to treat this newly discovered contaminated pocket, but later revised it to treat all remaining residual contamination at the site. This will include treatment of the plume at EW-107, which is currently being defined, and appears to extend to the Spiegelberg property to the east-northeast. Implementation of this plan, if successful, would restore the ground water to ROD clean-up standards. The PRP request has been approved, a Work Plan submitted, and design and construction efforts initiated. The operation of this system will start in the Summer of 2000. The Work Plan modifies the existing monitoring system by including two additional monitoring wells, and reclassifying existing wells, consistent with the in-situ oxidation requirements. If the in-situ treatment does not reduce the aquifer contamination to ROD requirements within a three year period, contingency plans, identified in the Work Plan, (including pump and treat operations), will be pursued. A ROD amendment for the in-situ ozone oxidation system is being prepared.

An additional requirement of the ROD was to demonstrate that prior to discontinuing the soil flushing, soil tests, or other methods, were required to demonstrate that the soils do not contribute contamination to the plume. The PRPs submitted a report, and data from the most recent monitoring event, to demonstrate that this has occurred. The Agencies are evaluating these reports.

The treatment/soil flushing systems have been shut down to allow the ground water to return to

stable pre-treatment conditions, primarily for design purposes. The ozone oxidation system is being installed to the north, and will be completed for the EW-107 plume, once the EW-107 plume characterization has been completed.

ARARs

The ARARs identified in the ROD for this site remain protective of human health and the environment. Any air emissions from the ozone/oxygen treatment will be subject to air quality regulations (Part 55 of Act 451).

The remedy performed complies with the performance standards selected in the ROD. These standards remain protective of human health and the environment. The Construction Completion Report verifies that the construction was accomplished using sound engineering practice and following the guidelines of Agency requirements and Michigan Administrative Codes.

U.S. EPA believes that the landfill cap is fully adequate to protect against inhalation, ingestion and direct contact with the landfill materials, prevent landfill materials from eroding and migrating off-site, and prevent significant amounts of water from infiltrating into the landfill.

The ground water Pump and Treat System has reduced ground water contamination to asymptotic levels, and in-situ ozone/oxygen treatment should help reduce the remaining contaminants to ROD clean-up levels. There is no evidence of contamination leaching from the PDSLD or IW areas associated with the infiltration system. There are deed restrictions and site controls that prevent unauthorized use of the landfill or site ground water.

III. SUMMARY OF SITE VISIT

A site visit was conducted on May 10, 2000, by Ken Glatz, the U. S. EPA Remedial Project Manager (RPM). During the site visit, the RPM walked the landfill and associated areas and inspected the surface and walls of the landfill, the vegetative covering, the fence, the monitoring wells, the extraction wells, the gas vents, the drainage ditches, retention ponds and reinfiltration basin. The landfill cap was in excellent condition, and there were no signs of erosion on the steep side walls. There was no standing water in the infiltration basin, and the area was vegetated. Inspection of the treatment system indicated all equipment to be in good repair and in "standby" readiness.

IV. RECOMMENDATIONS

Proceed with the in-situ ozone/oxygen oxidation design and installation. Respond to the PRPs soil flushing status request. Continue operation and monitoring of the landfill cap. Continue ground water monitoring when the ozone/oxygen treatment system is in operation.

V. STATEMENT OF PROTECTIVENESS

The remedy selected for this site remains protective of human health and the environment. It is anticipated that the ozone/oxygen oxidation operation will shorten remediation completion compared to Pump and Treat operations.

VI. NEXT FIVE-YEAR REVIEW

The next five-year review will be conducted by March, 2005, which is ten years from the initiation of remedial action construction activities at the site (1995).

William E. Muno, Director
Superfund Division

8/28/00
Date