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UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 10
1200 Sixth Avenue
Seattle, Washington 98101

**MARTIN MARIETTA REDUCTION FACILITY
SUPERFUND SITE
THE DALLES, OREGON**

FIVE YEAR REVIEW REPORT

DECEMBER 28, 1994

AR 1.8



#4038

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I. INTRODUCTION

A. PURPOSE

Region 10 of the U.S. Environmental Protection Agency (EPA) conducted a Five-Year Review and prepared this report consistent with the requirements of Section 121(c) of the Comprehensive Environmental Response, Compensation and Liability Act (CERCLA) as amended and Section 300.430(f)(4)(ii) of the National Oil and Hazardous Substances Contingency Plan (NCP). The Martin Marietta Reduction Facility (MMRF) Superfund site is required to have five-year Statutory Reviews to ensure that the remedial action remains protective of public health and the environment and is functioning as designed. This review is a type Ia review which is applicable to a site at which the response action is ongoing.

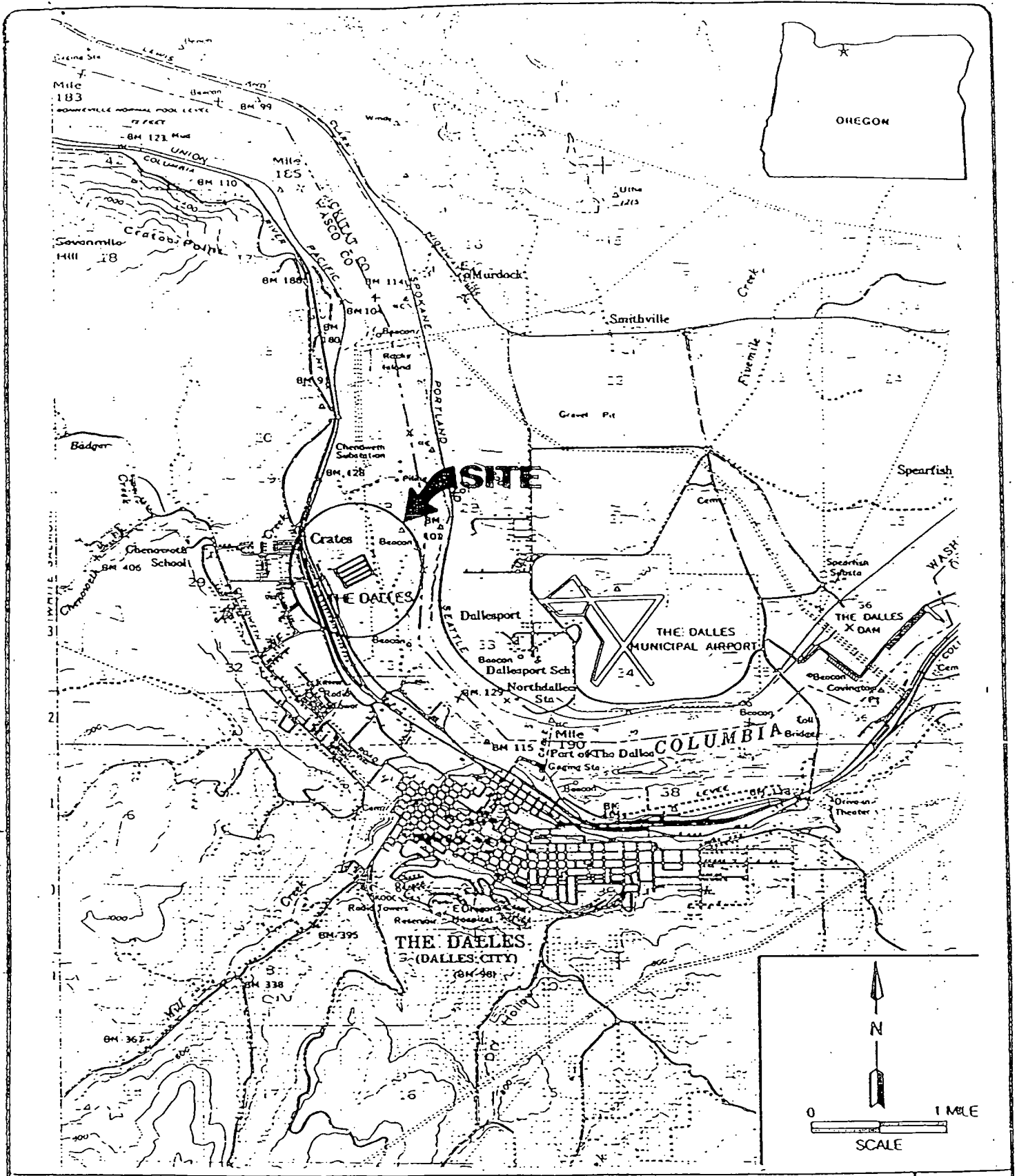
B. SITE CHARACTERISTICS AND HISTORY

The MMRF Superfund site (Site) is located in The Dalles, Wasco County, Oregon, just west of the Columbia River and east of the Union Pacific Railroad tracks, as shown in **Figure 1**. Operations were begun at the Site by Harvey Aluminum, Inc. in 1958. Harvey Aluminum, Inc. became a wholly owned subsidiary of Martin Marietta Corporation (MMC) in 1970. The MMRF continued operations until 1984, when the plant was shut down. In September of 1986, MMC leased a portion of the MMRF to Northwest Aluminum Company (NWA), which resumed primary aluminum operations in late 1986. In October 1991, MMC sold the portion of the MMRF not affected by EPA's deed restrictions to NWA. The NWA plant still produces aluminum by electrolytic reduction of alumina.

During facility operation, waste constituents were stored, treated and disposed of at the MMRF. Hazardous substances generated by the MMRF included fluoride, sodium, sulfate, cyanide, and polynuclear aromatic hydrocarbons (PAHs). The waste included spent potliner (cathode waste) from the alumina reduction cells. The cathode wastes contain cyanide compounds which form during the reduction process. Fluoride compounds were also present in the waste generated from the alumina reduction process.

A landfill located in the northern portion of the MMRF was used to dispose of primarily construction debris from the plant (**Figure 2**). Other materials disposed of in this landfill included asbestos insulation, coke, pitch, and cathode waste. In 1980 MMC installed a surface water drainage ditch and a leachate collection ditch and sump to try and control runoff and leachate from this landfill. After the signing of the ROD, this landfill was known as the "CERCLA Landfill" or "Landfill".

In the Spring of 1983, the presence of cyanide compounds was detected in the ground water. The MMRF was proposed for



SOURCE: USGS SURVEY MAP



SITE LOCATION MAP

REMEDIAL ACTION CONSTRUCTION REPORT
MARTIN MARIETTA REDUCTION FACILITY
THE DALLES, OREGON

FIGURE

1

DRAWN

SCALE

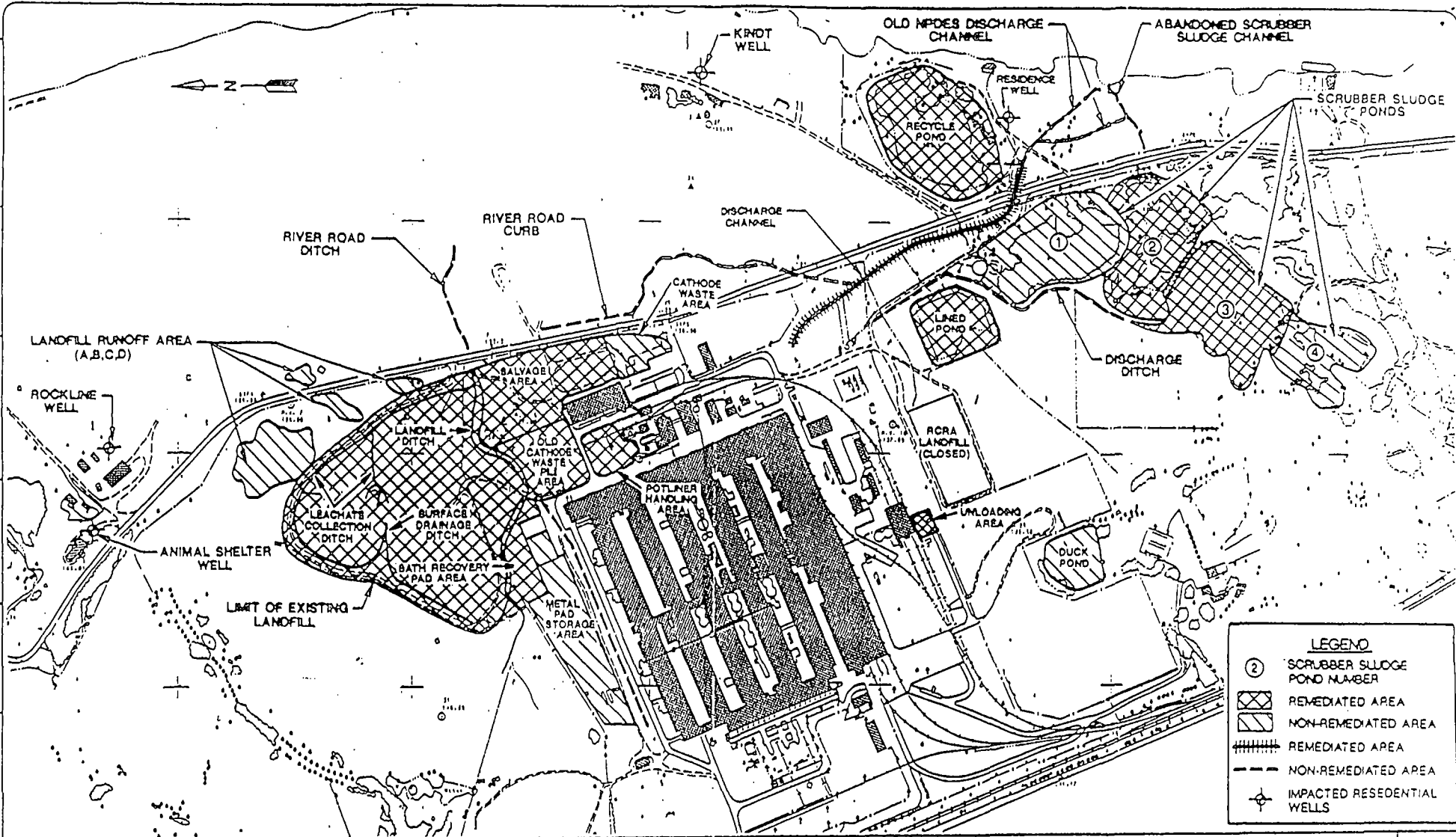
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DATE:



LEGEND	
②	SCRUBBER SLUDGE POND NUMBER
	REMEDIAED AREA
	NON-REMEDIAED AREA
	REMEDIAED AREA
	NON-REMEDIAED AREA
	IMPACTED RESEDENTIAL WELLS

40 FEET
APPROX SCALE



SITE PLAN

MARTIN MARIETTA REDUCTION FACILITY
THE DALLES, OREGON

FIGURE

2

inclusion on the NPL in October 1984. In 1987 the Site was formally listed on the NPL.

In September 1985, MMC and EPA entered into a Consent Order to conduct a remedial investigation/feasibility study (RI/FS) for the Site. Twenty-three areas were initially designated as potential contaminant source areas at the MMRF. The RI/FS concluded that thirteen source areas, and a portion of the shallow ground-water bearing zone, had contaminant concentrations that exceeded federal or state applicable relevant and appropriate requirements (ARARs) or acceptable lifetime non-cancer or cancer risk levels.

II. REMEDIAL OBJECTIVES

On September 29, 1988, EPA signed a Record of Decision (ROD) that addressed the potential sources of contamination as identified in the RI/FS. Remedial action objectives for the MMRF included both source control and ground-water management for the protection of human health and the environment. Specific objectives for source control at the Site included:

- ⊙ Minimization of the migration of contaminants from the source areas to the ground-water system, surface water, or soils;
- Protection of human health and the environment from potential adverse effects caused by direct contact with contaminants; and
- Protection of human health and the environment from potential adverse effects due to exposure to airborne contaminants.

A. PROGRESS OF REMEDIAL ACTION

The ROD addressed source control of the on-Site contamination through excavation and consolidation of contaminated soils into two former scrubber sludge pond areas and into the existing Landfill.

The selected remedy in the ROD included the following components:

- ⊙ Consolidate the residual cathode waste material and underlying fill material from the former Cathode Waste Management Areas into the existing Landfill;
- ⊙ Consolidate the cathode waste material from the Unloading Area into the existing Landfill;

- Cap the existing Landfill in place with a multi-media cap meeting Resource Conservation and Recovery Act (RCRA) performance criteria;
- Place a soil cover over the Scrubber Sludge Ponds 2 and 3;
- Plug and abandon nearby production wells and connect users to the City of The Dalles water supply system;
- Collect and treat leachate generated from the Landfill, and perched water from east of River Road and from the former Cathode Waste Management Areas;
- Recover and treat contaminated groundwater from the Unloading Area;
- Prepare ground-water quality monitoring and contingency plans to perform additional recovery of ground water in the event that further contamination is detected above ARARs or health-based standards; and
- Implement institutional controls including deed restrictions and fencing, to assure that the remedial action will protect human health and the environment during and after implementation.

The remedial action commenced on August 29, 1989. Pre-construction activities included excavation and consolidation of waste materials, and backfilling and regrading the former waste areas for drainage and erosion control. The soil cover for Scrubber Sludge Pond (SSP) 2 and SSP 3 was completed during the initial phase of remediation. This work included the placement and compaction of a minimum of 2 feet of clean silt and revegetation of the area.

Three former operating units were remediated. These units included: (1) the Lined Pond; (2) the Discharge Channel; and (3) the Recycle Pond. The Lined Pond was remediated between September 1989 and late October 1989. Remediation of the Lined Pond included removal and consolidation of the sludge and flexible membrane liner (FML) into the existing Landfill.

Remediation of The Discharge Channel and Recycle Pond included; dewatering and excavation of the sludge within the Recycle Pond and lower portion of the Discharge Channel, consolidation of the sludge into SSP 3, and placement of a 6-inch layer of crushed rock over the exposed portions of the Discharge Channel and Recycle Pond. Approximately 28,000 cubic yards of sludge were excavated and consolidated. Work was performed for the Recycle Pond from late August 1991 to mid November 1991, and

the Discharge Channel from late August 1991 through September 1991.

Remediation of the Cathode Waste Management Areas (CWMA) involved the excavation and consolidation of materials into the Landfill, backfilling with local soils, grading for drainage and placement of a rock cover for erosion control. These activities were conducted from the fall of 1989 through the spring of 1991. Construction of the Landfill cap was performed following the completion of waste excavation and consolidation activities. The Landfill cap is a multi-layered RCRA performance cap. Construction of the Landfill cap occurred from early June of 1990 to early March of 1991.

A Cyanide Destruction System (CDS) was selected by MMC for treatment of leachate generated from the Landfill. The CDS started operating in May, 1990. Perched water from the Potliner Handling Area was collected and treated in the CDS in May 1990 and from late July 1990 through September 1990.

The Landfill Leachate Collection System (LCS) was constructed to collect and transfer any generated leachate from the landfill to the CDS for treatment. The LCS was constructed during the period from June to December 1990. Leachate collection commenced on December 7, 1990 and continues to date (December 1994).

The ROD anticipated that leachate from the Landfill would gradually decrease to negligible levels within 5 years after construction of the Landfill due to the dry climate at the Site. The initial leachate volume decreased after cap completion from approximately 1,750 gallons per day down to 570 gallons per day by late fall 1991. However, with the onset of wet weather, leachate levels began to rise again, to as much as 3,100 gallons per day. The source of the increased leachate flow was believed to be perched ground water infiltrating through fractured basalt bedrock from south of the Landfill into the LCS. The presence of ponded water on the Landfill surface in the southwestern portion of the Landfill appeared to offer a continual source for recharge.

Based on the conclusion that the perched and ponded waters were the driving force behind the infiltration to the LCS, several activities were undertaken by MMC from the fall of 1992 through 1993, in response to the increased leachate flow. In October 1992 a dewatering trench was constructed to prevent perched water from flowing into the LCS while an underground pipe was installed to lower and divert ponded surface water around the Landfill. In addition, the surface-water drainage system was modified to increase drainage.

The purpose of the Unloading Area remediation was to remove the potlining material known to have been placed in the area down to the level of competent basalt bedrock, to perform verification sampling for fluoride from the exposed excavation faces, and to backfill the area to the existing grade. Approximately 2,000 cubic yards of potlining material and affected soil were removed from the area. The Unloading Area was backfilled using crushed rock only because of its proximity to an existing railroad track. The area was remediated during October, 1989.

Ground-water monitoring was divided into two specific programs: interim and long term. The interim ground water monitoring plan was executed while remedial activities were performed and included 11 monitoring locations. The long term ground water monitoring plan (LTGWMP) expanded the interim plan to include 41 monitoring locations. The LTGWMP will be the basis for evaluating ground water quality during the post-remediation period. Ground water monitoring analytes for the S/A and B aquifers include total and free cyanide, fluoride, sulfates, pH, specific conductance, and temperature. Yearly ground-water monitoring reports are submitted by MMC to EPA. As of the July 1994 monitoring report, all ground-water monitoring wells have concentrations of contaminants which are below the clean-up levels established in the ROD.

Placement of potable waterlines to the users of the Rockline, Klindt and Animal Shelter wells was required as an element of the selected remedial action. The work was completed during July and August 1990.

The selected remedial action required abandonment of four potable water wells. The Residence Well was abandoned in September, 1990, and the Animal Shelter Well in November, 1990. Difficulties in obtaining property access agreements caused delays in abandoning the Klindt well and the Rockline well. The Klindt well was abandoned in October 1992, and the Rockline well was finally abandoned in April 1994.

Access Controls at the Site were installed at the completion of remedial activities to eliminate direct contact and to control access by unauthorized personnel to the capped Landfill, its adjacent areas, and the covered SSPs. Direct access was restricted by the installation of a six foot high chain-link fence with three strands of barbed wire at the top and security gates during the July - October 1991 period. In addition, informational placards were posted in the early fall of 1991. MMC retains ownership of the fenced and controlled SSP area and the Landfill area.

Deed restrictions were implemented when the MMRF property was sold to NWA in September, 1991. The new deed restricts the installation of wells or use of ground water in and from the "S"

aquifer on all property sold. MMC retained ownership and control of 48.75 acres of the former MMRF consisting of all areas where remediated wastes were encapsulated, the closed RCRA Landfill, and the perched water treatment facility as well as an interconnecting roadway system to all retained property. The CERCLA Landfill, RCRA Landfill, and the Scrubber Sludge Ponds will remain with MMC. In addition, MMC retains ownership of all monitoring wells installed on Site in those portions of the property sold to NWA.

Based upon the latest ground-water monitoring data submitted to EPA in July 1994, the ground-water quality for the parameters of concern for the MMRF are below the clean-up levels for all monitoring locations.

III. RECOMMENDATIONS

The modifications to the Landfill surface water drainage system described in Section II above, still had minimal impact on the quantity of leachate generated by the Landfill. However, monitoring data has shown that cyanide and fluoride concentrations in the leachate have decreased since construction of the Landfill, and ground-water quality in the vicinity of the Landfill has not been impacted. Although leachate and ground-water quality have not been negatively impacted, it is now expected that the volume of leachate will not decline to negligible levels by April 1996, as per the ROD. Therefore, EPA has recommended that the current leachate treatment system be upgraded to accommodate the excess leachate volume caused by the infiltration of water into the Landfill. MMC has agreed to upgrade the CDS from a 2 gallon per minute (gpm) system to a 10 gpm system. The effluent from the CDS is currently being sampled and monitored weekly for cyanide. This monitoring will continue as long as the CDS is operating. In addition, quarterly ground-water monitoring will continue through September 1995 after which time MMC will submit to EPA a detailed review of the ground-water monitoring program, along with recommendations for continue long-term monitoring.

During the review of the remedial action, EPA identified a sump in the vicinity of the Potliner Handling Area which serves as a potential source of infiltration of contaminated surface water to ground water. EPA has recommended, and MMC has agreed to pump the water that has accumulated in the sump, remove the sump, and pave the area so that this potential source of infiltration can be eliminated.

IV. STATEMENT ON PROTECTIVENESS

I certify that the remedy selected for this site remains protective of human health and the environment.

V. NEXT FIVE-YEAR REVIEW

The next five-year review will be conducted by September, 1999.

Randall F. Smith

Randall F. Smith, Director
Hazardous Waste Division

12/28/94

Date

V. NEXT FIVE-YEAR REVIEW

The next five-year review will be conducted by September, 1999.

Randall F. Smith, Director
Hazardous Waste Division

Date

CONCURRENCE					
INITIAL	<i>RO</i>	<i>RF</i>	<i>GH</i>		
NAME	ORLEAN	KRUEGER	GEARHEARD		
DATE	12/28/94	12/28/94	12/28/94		