



Second Five-Year Review Report

for

Matthews Electroplating Superfund Site

Roanoke County, VA

June 2004

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Date:

6/21/04

AR000016

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List of Acronyms

ARARs	Applicable or relevant and appropriate requirements
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
COC	Contaminant of Concern
CIC	Community Involvement Coordinator
EPA	Environmental Protection Agency
MCL	Maximum Contaminant Level
NCP	National Oil and Hazardous Substances Pollution Contingency Plan
NPL	National Priorities List
O&M	Operations and Maintenance
PRP	Potentially Responsible Party
RA	Remedial Action
RAO	Remedial Action Objective
RD	Remedial Design
RI/FS	Remedial Investigation/Feasibility Study
ROD	Record of Decision
RP	Responsible Party
RPM	Remedial Project Manager
SATA	Site Assessment Technical Assistance

Executive Summary

Environmental problems at the Matthews Electroplating Superfund Site ("Site") in Roanoke County, Virginia were addressed through a suite of remedial and removal actions. EPA issued a Record of Decision ("ROD") for the Site on April 15, 1983 which called for the provision of an alternate drinking water supply to area residents. An extension to the City of Salem's water distribution system now provides area residents with potable water. A removal action was conducted in 1988 to remove high concentrations of chromium found in an above-ground tank onsite and high concentrations of mercury found in an overturned drum. The Site was deleted from the National Priorities List ("NPL") on January 19, 1989. Following three years of bi-annual ground water monitoring, EPA approved the Technical Close-Out Report for the Site in February 1994. The first five-year review was completed on April 19, 1999 which triggered this five-year review. This second five-year review found no issues that would call into question the protectiveness of the remedy selected for the Site.

By this Five-Year Review, EPA has determined that hazardous substances, pollutants or contaminants no longer remain at the site above levels that allow for unlimited use and unrestricted exposure. Therefore, no further Five-Year Reviews are contemplated for the Matthews Electroplating Superfund Site.

Five-Year Review Summary Form

SITE IDENTIFICATION		
Site name: Matthews Electroplating		
EPA ID: VAD980712970		
Region: 3	State: VA	City/County: Roanoke County
SITE STATUS		
NPL status: <input type="checkbox"/> Final <input checked="" type="checkbox"/> Deleted <input type="checkbox"/> Other (specify) _____		
Remediation Status (choose all that apply): <input type="checkbox"/> Under Construction <input type="checkbox"/> Operating <input checked="" type="checkbox"/> Complete		
Multiple OUs?* <input type="checkbox"/> YES <input checked="" type="checkbox"/> NO	Construction completion date: January 21, 1986	
Has site been put into reuse? <input type="checkbox"/> YES <input checked="" type="checkbox"/> NO <input type="checkbox"/> NA		
REVIEW STATUS		
Lead agency: <input checked="" type="checkbox"/> EPA <input type="checkbox"/> State <input type="checkbox"/> Tribe <input type="checkbox"/> Other Federal Agency _____		
Author name: Frederick N. Mac Millan		
Author title: Remedial Project Manager	Author Affiliation: U.S. EPA - Region 3	
Review period: December 22, 2003 - June 15, 2004		
Date(s) of site inspection: March 18, 2004		
Type of review:		
<input type="checkbox"/> Post-SARA <input checked="" type="checkbox"/> Pre-SARA <input type="checkbox"/> NPL-Removal only <input type="checkbox"/> Non-NPL Remedial Action Site <input type="checkbox"/> NPL State/Tribe-lead <input type="checkbox"/> Regional Discretion		
Review number: <input type="checkbox"/> 1 (first) <input checked="" type="checkbox"/> 2 (second) <input type="checkbox"/> 3 (third) <input type="checkbox"/> Other(specify) _____		
Triggering action:		
<input type="checkbox"/> Actual RA Onsite Construction at Site OU <input type="checkbox"/> Actual RA Start at OU# _____ <input type="checkbox"/> Construction Completion <input checked="" type="checkbox"/> Previous Five-Year Review Report <input type="checkbox"/> Other (specify) <u>Informed public review would be conducted</u>		
Triggering action date: April 19, 1999		
Due date (five years after triggering action date): April 19, 2004		

* ("OU" refers to operable unit.)

Five-Year Review Summary Form, cont'd.

Issues:

- One area homeowner was found to be using ground water. Debris (small glass tubes possibly containing mercury) and two old electrical transformers atop a derelict power pole were found on the Site.

Recommendations and Follow-up Actions:

- The homeowner's well will be sampled by the Virginia Department of Health. Roanoke County will assist the homeowner with connecting to the City of Salem municipal water supply. The Virginia Department of Environmental Quality is pursuing the issues of debris possibly containing mercury and the old electrical transformers with the Site property owner.

Protectiveness Statement:

- Because the remedial actions are protective, the site is protective of human health and the environment. There are no human or environmental receptors exposed to site contaminants above health-based levels. The Remedial Action Objective (RAO) at the Site is to prevent exposure to ground water contaminated with chromium via the residential exposure pathway by area residents drinking the water. EPA's installation of a municipal water supply line to provide an alternate supply of potable water to affected residents met the RAO. Site-related contaminants in ground water have since attenuated to safe levels and soils do not present an unacceptable risk to human health under a residential scenario. The remedy is expected to remain protective of human health and the environment.

Other Comments:

- Based on this Five-Year Review, EPA has determined that hazardous substances, pollutants or contaminants no longer remain at the site above levels that allow for unlimited use and unrestricted exposure. Therefore, no further Five-Year Reviews are contemplated for the Matthews Electroplating Site.

**U.S. Environmental Protection Agency, Region III
Second Five -Year Review Report
Matthews Electroplating
Superfund Site
Roanoke County, Virginia**

I. Introduction

The purpose of five-year reviews is to determine whether the 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 recommendations to address them.

The Environmental Protection Agency (EPA) is preparing this Five-Year Review report pursuant to the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) §121 and the National Oil and Hazardous Substances Pollution 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 to assure that human health and the environment are being protected by the 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] or [106], 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 3 has conducted a five-year review of the remedial actions implemented at the Matthews Electroplating Superfund Site in Roanoke County, Virginia. This review was conducted for the entire site by the Remedial Project Manager (RPM) from December 2003 through June 2004. This report documents the results of the review.

This is the second five-year review for the Matthews Electroplating Site. The triggering action for this policy review is the prior five-year review for the Site completed on April 19, 1999.

The five-year review is required due to the fact that hazardous substances, pollutants, or contaminants may remain at the site above levels that allow for unlimited use and unrestricted exposure.

II. Site Chronology

Table 1 lists the chronology of events for the Matthews Electroplating Site.

Table 1: Chronology of Site Events

Site began operating as a repair and electroplating shop for automobile bumpers. Wastewater containing electroplating fluids dumped into sinkhole onsite.	1972-1975
Residential wells found contaminated with chromium, nickel and cyanide.	November 1975
Virginia State Water Control Board issues "cease and desist" order. Operations cease.	January 1976
Site owner (J.T. Matthews) declares bankruptcy	June 1976
Subsequent owner (Albert Salem) removes waste material, constructs diversion ditches and places clay cap over portions of the Site under order by the State.	1977
Virginia State Water Control Board refers the Site to EPA	1981
EPA conducts first public meeting at the Site	April 12, 1982
EPA begins Remedial Investigation	April 13, 1982
Remedial Investigation completed, Feasibility Study begins	October 29, 1982
EPA conducts second public meeting	December 16, 1982
Site proposed to the NPL	December 30, 1982
Feasibility Study completed	January 18, 1983
Record of Decision signed	April 15, 1983
Matthews Electroplating Site listed on the NPL	September 8, 1983
Remedial Design begins (extension of municipal water line)	September 20, 1983
Remedial Design Completed	July 30, 1984

Event	Date
Remedial Action begins	January 7, 1985
Remedial Action completed	January 30, 1986
EPA begins investigation of tanks and drums left onsite	March 3, 1988
EPA begins emergency removal action at the Site	March 11, 1988
EPA Site Close-Out Report signed	March 29, 1988
EPA completes removal action	August 16, 1988
Matthews Electroplating deleted from the NPL	January 19, 1989
Virginia Department of Waste Management begins 3-year ground water monitoring effort under post-deletion Site O&M plan	April 10, 1989
Technical Close-Out report on 3-Year O&M plan issued	December 17, 1992
First EPA Five-Year Review completed	April 19, 1999
Addendum to the first Five-Year review completed	August 10, 2000

III. Background

Physical Characteristics

The Matthews Electroplating Superfund Site is located in Roanoke County, Virginia, approximately three and a half miles southwest of Salem. It is situated on Virginia Secondary Route 796, Pleasant Run Drive, near the intersection of Virginia State Route 460 and Interstate 81. The 1.7 acre property was the site of an automobile bumper repair and plating facility in the early 1970s and is surrounded by residential properties. The nearest residence is about 500 feet away (See Attachment 1).

Land and Resource Use

The Site consists of a plot of land in a small valley off of Rt. 796 with an abandoned commercial building, debris, an electrical power supply pole and transformer. A portion of land near the building where a sinkhole was located is capped. The sinkhole leads to an aquifer that supplied drinking water to the nearby residents. The property is not in active use at this time and is significantly overgrown. The site is situated near a secondary road in a residential/semi-rural area. There are about 150 residences within 4,000 feet of the Site. In 1995, the Site was re-zoned from industrial to residential.

From 1972 to 1976, the Site was used as an auto bumper repair and electroplating facility. Bumpers were straightened and prepared for plating in the Bumper Preparation Building, and then plated with chromium and nickel in the Electroplating Building. Only one building remains today. The site was owned by a Mr. J.T. Matthews when it was operated as a repair and plating facility. When the operation closed and declared bankruptcy in 1976, ownership of the property passed to an area bank. The property was sold to a Mr. Albert Salem in 1977 for use as a small pig farm. Since that time, the property was sold to several different parties and is currently owned by a Mr. Charles Waldron.

History of Contamination

In 1975, the Commonwealth of Virginia, State Water Control Board ("SWCB") began receiving complaints from residents about their well water. This prompted the SWCB to identify Matthews Electroplating as a potential source of contamination and monitor approximately thirty wells within the Site area for total chromium, hexavalent chromium, nickel, and cyanide. Three residential wells and the original on-site well exhibited total chromium concentrations over Virginia's drinking water quality standard at that time of 50 micrograms per liter (50 µg/l, or 50 parts per billion (ppb)); nickel and cyanide were not at levels of concern.

The site owner, Mr. J.T. Matthews had been discharging wastewater directly onto the ground outside of the Electroplating Building and letting it drain into a sinkhole. In January 1976, the SWCB ordered Mr. Matthews to cease and desist from further discharge of wastewater from the plating operation. In June 1976, the facility went out of business.

Initial Response Activities

In 1977 Mr. Albert Salem purchased the property for a small-scale pig farming operation. As part of the purchase agreement, the SWCB required the new owner to implement corrective measures to prevent further leaching of chromium into ground water from the sinkhole and its immediate area. Mr. Salem removed trash and other waste material, installed surface water drainage ditches along the foundation line of the Electroplating Building and the uphill boundary of a wet weather water course, constructed surface water diversion ditches, constructed a culvert to carry surface water runoff that flowed underneath the Bumper Preparation Building (now gone) to the western property boundary, and placed a clay cap over the southwestern portion of the Site where the sinkhole and the wet weather water course were located, effectively obstructing further access to the sinkhole and surrounding contaminated soil.

EPA conducted a remedial investigation and feasibility study ("RI/FS") from April 13, 1982 to January 18, 1983 to determine and define the character and extent of contamination resulting from the Site, and to determine the most appropriate action to protect human health and the environment. On April 15, 1983 EPA issued a Record of Decision ("ROD") for the Site. Matthews Electroplating was listed on the NPL on September 8, 1983.

Basis for Taking Action

The Virginia SWCB referred the Site to EPA as a potential Superfund candidate in 1981. EPA conducted a Remedial Investigation and Feasibility Study ("RI/FS") from 1982 to 1983. During the RI/FS, EPA discovered that the contaminated ground water plume had extended about one half mile southwest of the Site due to the fractured bedrock in the area. Ground water samples showed that the contaminants of concern are total chromium and hexavalent chromium (Cr⁺⁶), the most toxic form of this metal, which comprised virtually all of the chromium detected in ground water. Levels of hexavalent chromium in residential wells was as high as 192 µg/l (or ppb). Cyanide was not detected and only low levels of nickel (less 50 ppb) were found in the ground water. Historical data showed that the concentration of contaminants in ground water had decreased markedly between 1976 and 1982, but the potential for continued leaching of contaminated soils remained. Soil sampling results indicated that wastewater may have flowed from the western side or the rear of the Electroplating Building and into the sinkhole. It also indicated that nickel was present in surface soil. Soil samples showed that aside from the high concentration of nickel (1000 to 4000 mg/kg) and total chromium (70 to 572 mg/kg) from surface soil in the north and west end of the Electroplating Building, the remainder of the soil profiles contained very small amounts of nickel and chromium. Surface soil concentrations of hexavalent chromium ranged from 0.4 to 10.8 mg/kg (See Attachment 2).

IV. Remedial Action

Remedy Selection

The ROD was signed on April 15, 1983. The ROD specified the extension of a municipal water line from the City of Salem, VA to provide an alternative supply of potable water to area residents near the Matthews Electroplating Site to prevent exposure to ground water contaminated by chromium. Residents would then be connected to this municipal water line and cease to use their drinking water wells. This would involve:

- Extension/construction of the municipal water supply line
- Connection of residences to the new water supply line

Remedy Implementation

The remedial action objective was achieved by extending the municipal water supply from the Salem, VA water treatment plant to neighborhoods in the vicinity of the Site. The scope of the work included:

- Installation of approximately 18,300 linear feet of 16, 12, 10, and 6 inch ductile iron water line with 10 fire hydrants
- Installation of a 500,000 gallon above-ground water storage tank
- Construction of a concrete masonry unit with brick veneer pump house

- Installation of two 350 gallon per minute centrifugal booster pumps, associated telemetry and electrical systems, and
- Providing water service connections to 31 buildings.

The contract for the construction of the water line was awarded on January 7, 1985; construction work for the water line extension was completed on January 21, 1986. All design and construction work was managed under the auspices of the U.S. Army Corps of Engineers.

Following the completion of the waterline extension, EPA conducted post remediation sampling for both soil (July 1987) and ground water (February 1987). Only total chromium, hexavalent chromium, and lead were tested for in the soil. The results indicated that the levels of both chromium and lead were typical of background levels. The concentrations of hexavalent chromium found in soil ranged from 0.13 to 3.6 mg/kg which are well within the range considered to be safe. Only one ground water sample result approached the 50 µg/l chromium EPA Maximum Contaminant Level ("MCL") for chromium in drinking water. High levels of lead were found in several wells but it was determined that it is a natural condition in the area and that it is not site-related.

Removal Action

No on-site remedial action was called for in the ROD. However, EPA did conduct a removal action. On March 3, 1988, EPA sampled an above-ground storage tank and one overturned 55 gallon drum at the Site. High concentrations of chromium were found in the above-ground tank and high concentration of mercury in the overturned drum. EPA began an emergency removal action at the Site on March 11, 1988. On March 26, 1988, materials in the above-ground tanks were transferred into 55 gallon drums and the drums were placed into overpacks. A total of 32 drums were transported to approved waste management facilities. After removal, soil samples taken from areas around the tanks and drum confirmed that no additional action was warranted.

Following the removal, the Commonwealth of Virginia and EPA agreed that no further cleanup measures were appropriate, and the Closeout Report for the Site was signed on March 29, 1988. The Commonwealth of Virginia further agreed to conduct post deletion monitoring of existing residential wells bi-annually for three years, and the Matthews Electroplating Site was deleted from the NPL on January 19, 1989.

Beginning in 1989, the Commonwealth of Virginia implemented a three-year post deletion ground water monitoring plan. The Commonwealth collected samples from residential wells twice a year and analyzed them for hexavalent chromium, total chromium, and lead. By the end of 1992, the total chromium concentrations were below 50 µg/l. High levels of lead were determined to be natural in the area, and cyanide and nickel were never identified at elevated levels and therefore were not determined to be contaminants of concern during the RI/FS.

Contaminants in soils were not found to present a threat to human health at that time. The documented decline of contaminant concentrations in ground water to within safe drinking water

levels demonstrated that migration of soil-bound contaminants to ground water was no longer a concern at the Site. Reported levels of chromium in soil were below risk-based concentration (RBC) screening levels. Nickel was found above the RBC screening level at a single location, but was not considered a risk to residents. EPA had also found a drum onsite labeled "oxalate." On April 26, 1999 VDEQ reported that the on-site drum had been evaluated and determined to be nonhazardous. No further action was taken.

The Matthews Electroplating Site had been zoned for industrial use for many years. Based on the first Five-Year Review, it was determined that the remedy selected for the Site remained protective of human health and the environment for industrial use. During that review, EPA learned that the Site had been re-zoned from industrial to residential use in 1995, though the Site was not in residential use at that time. EPA then reevaluated the Site under a residential use scenario.

In August 1999, EPA collected and analyzed additional onsite soils data and concluded that the site should pose no unacceptable risk to human health even under a residential exposure scenario. EPA also evaluated the clay cap and surveyed the cap limits during this time. On January 31, 1989 the Agency for Toxic Substances and Disease Registry (ATSDR) had recommended to EPA that contaminated onsite soils be reevaluated if land use at the Site changed. EPA's 1999 Five-Year Review indicated that we would conduct limited soil sampling and supply that information to ATSDR. In August 1999 EPA conducted that limited soil sampling study and also delineated and characterized the clay cap placed over the original sinkhole where plating wastes had been disposed at the Site. Because there was no unacceptable risk at the site, EPA did not request ATSDR to review the data. These activities were recorded in an Addendum to the Five-Year Review completed on August 10, 2000.

System Operation/Operation and Maintenance

The City of Salem Water and Sewer Department operates and maintains the municipal water treatment plant that supplies potable water to residents near the Site. The Roanoke County Utility Department is responsible for operating and maintaining the water line extension from the treatment plant to the residents served by the municipal water distribution system.

V. Progress Since Last Five-Year Review

The Site Review Team, with representatives of EPA and VDEQ met the owner at the Site. The Site itself has generally sat idle since the last five year review. Only one deteriorating building is left onsite and the property is extensively overgrown. The property is still zoned residential, but no development activity was evident. Little had changed at the Site since the last five-year review. Based on the findings of the last five-year review, and assuming those findings were representative of onsite conditions in surface and subsurface soil, the site was determined to pose no unacceptable risk to human health under a residential exposure scenario.

VI. Five-Year Review Process

Administrative Components

The Matthews Electroplating Five-Year Review team was led by Frederick Mac Millan of EPA Region 3, Remedial Project Manager (RPM) for the Matthews Electroplating Superfund Site and included Larry Johnson, Community Involvement Coordinator, EPA Region 3 and Elizabeth Lohman, Environmental Program Planner, Virginia Department of Environmental Quality (VDEQ).

Community Involvement/Interviews

EPA, with the involvement and assistance of VDEQ contacted several area residents in early March 2004 in advance of the Site visit to set up interviews. The community had been very involved when EPA had originally intervened, and several of the original residents present during the 1982-1985 site investigation and cleanup still live in the area. A notice to publicize the Five-Year review was prepared and placed in the Roanoke Times. Unfortunately, due to a clerical error the ad did not run until May 7, 2004. Following signature on this Five-Year Review document, a notice will be sent to a local newspaper announcing that the Five-Year Review report for the Matthews Electroplating Superfund Site is complete, and that the results of the review and the report are available to the public in the information repository located at the Salem Public Library, 28 East Main Street, Salem, VA 24153.

On March 18 and 19, 2004 EPA Community Involvement Coordinator, Larry Johnson, EPA Remedial Project Manager, Frederick N. Mac Millan, and VDEQ Senior Environmental Planner, Elizabeth Lohman conducted interviews with several citizens with residences near the boundaries of the site. The following questions were asked of each interviewee:

1. Do you have any past or present knowledge of the site? If you are aware of the site, what is your overall impression of the site?
2. What effects do you think the site operations may have had on the surrounding community?
3. Are you aware of any community concerns regarding the site or its operation and administration?
4. Are you aware of any events, incidents, or activities at the site such as vandalism, trespassing or emergency responses from local authorities?
5. Do you feel well informed about the sites activities and progress?
6. Do you have any comments, suggestions or recommendations regarding the sites management or operation?

The citizens interviewed had good recollection and a generally favorable impression of EPA and the 1982-1986 response at the former electroplating facility. They had observed the operation of

the business, had seen the contaminants being dumped into the sinkhole onsite, remembered the issues surrounding contaminated area drinking water wells (some their own) and were gratified that EPA had stepped in and successfully resolved the problem. The remedy of routing new city water lines to all the affected residents was greeted favorably. The citizens all indicated that they considered themselves to be well informed of both the cleanup operations and the hazards previously presented by the site. They had all attended meetings sponsored by EPA while the site was still active.

During the interview process, EPA and VDEQ learned of one property in the affected area where the original owner at the time of the cleanup chose not to connect to the new municipal water line when it was installed by EPA (1985-1986). The current residents claimed that they were making extensive use of bottled water, though still using their well. They had desired to hook-up to the municipal water line when they purchased the house from the previous owner, but claimed they could not afford to.

At the homeowner's request, EPA and VDEQ followed up on this matter with representatives of the Commonwealth of Virginia Department of Health (VDH) and Roanoke County Department of Community Development at a meeting on March 19, 2004. VDH agreed to sample the homeowner's well and representatives of the County pledged to work with the homeowner to provide connection to the municipal water supply line, already in place as a result of EPA's 1985 cleanup, by means of grant funds or a payment plan for the homeowner.

The only unusual event of note was the recent dumping of tires on the vacant portion of the property which were removed at no cost by Roanoke County during a community cleanup promotion. No incidences of vandalism, trespassing or police/fire responses were noted.

The citizens interviewed stated that they were very satisfied with the remedy in place at the former electroplating site. The residents felt that the greatest effect that the clean-up had on their community was that they had safe, clean drinking water thanks to the remedy in place. The only concern of the residents was that they did not want to have another business concern on the site. Since the site is zoned residential, they feel that only a residence should be built there.

Document Review

The second Five-Year Review consisted of a review of relevant documents identified in Attachment 3 including the Site Investigation Reports, the Feasibility Study Report, the ROD, the Federal On-Scene Coordinator's Report on the removal performed at the Site in 1988, the Site Close-Out Report, the Technical Closeout Report for post-deletion monitoring, the first Five-Year Review (1999), a SATA Trip Report documenting activities performed following the first Five-Year Review, and the Addendum to the first Five-Year Review (See Attachment 3).

Data Review

Ground Water

Post-deletion groundwater sampling was conducted bi-annually from 1989 to 1992 by the Commonwealth of Virginia Department of Environmental Quality as part of the operation and maintenance (O&M) phase at the site, which began on the date of delisting. The Commonwealth collected samples from six residential wells in the vicinity of the site twice a year and analyzed them for hexavalent chromium, total chromium, and lead. Though total lead at one residential well was found above the EPA action level of 15µg/l, the total and hexavalent chromium concentrations had dropped below 50 µg/l in all residential wells by February 1992. Since the remedy eliminated the use of ground water as a source of potable water, much of the mobilization of contaminants to ground water by continued use of the former drinking water wells was curtailed and the threat to human health posed by exposure to contaminated ground water had also been eliminated.

Soils

In November 1999 EPA conducted a risk assessment of contaminated soils in the vicinity of the Site following the first Five-Year Review completed in April. This action was taken in response to the Site being re-zoned for residential use four years earlier. Several hazardous metals were detected in soil at the site. Most noteworthy of these were site contaminants chromium and nickel, plus arsenic, cadmium, iron, and manganese. A table listing the reported ranges of these chemicals at the site, the 95th percent Upper Confidence Limit (UCL) of the arithmetic mean concentration for each chemical, and the residential Risk-Based Concentrations (RBCs) for soil ingestion from the 1999 risk assessment is shown below:

CHEMICAL	CONCENTRATION RANGE (mg/kg)	95th PERCENT UCL CONCENTRATION (mg/kg)	RESIDENTIAL RBC for INGESTION* (mg/kg)
arsenic	4.1 - 15.1	9.2	0.43
cadmium	nd - 97.5	9.6	78
chromium	15.1 - 621	621**	120,000 /230
iron	3370 - 53,100	53,100**	23,000
manganese	37 - 1980	1980**	1600
nickel	nd - 3920	527	1600

nd = not detected

*The residential RBC for arsenic is based on an excess cancer risk of 1E-06. For the remaining chemicals, each RBC is based on a Hazard Quotient of 1 for non-cancer endpoints. Note that for chromium, RBCs for both total and hexavalent chromium are provided.

**Because the 95th percent UCL concentration exceeds the maximum reported level, the maximum is presented for comparison to the residential RBC.

Though the maximum level of chromium found in soils at the site exceeded the RBC for *hexavalent* chromium (621 mg/kg v. the RBC of 230 mg/kg), it was deemed very unlikely that chromium in soil was present predominantly in the hexavalent form. When on-site levels of chromium were compared to the RBC for *total* chromium, they fell well below the residential RBC.

The 95th percent UCL values for cadmium and nickel did not exceed their respective residential RBCs and therefore were eliminated from further consideration. The 95th percent UCL concentration for arsenic in soil at the site exceeded its RBC, but was determined to be naturally-occurring and not site related. A similar determination was reached for the high levels of iron and manganese at the site, and they were also eliminated as contaminants of concern.

Based on these findings, it was determined that the site soils did not pose an unacceptable risk to human health under a residential exposure scenario.

Site Inspection

The site inspection took place on March 18, 2004 and was conducted by RPM Fred Mac Millan and the project team. The peripheral extent of the clay cap was difficult to discern, but the cap appeared intact. Several piles of asphalt road debris had been brought onsite by the Site's current owner, Mr. Charles Waldron, who met EPA and VDEQ at the Site. Some trash and a few empty rusted drums/tanks were present on the property, including some small glass tubes that appeared to contain mercury. None of these tubes appeared to be leaking. This issue was brought to the attention of the owner by VDEQ for resolution. A derelict power supply pole topped by two transformers was also found onsite. By letter dated March 25, 2004, VDEQ directed Mr. Waldron to determine whether the transformers still had poly-chlorinated biphenyl (PCB)-containing oils and to take appropriate action under the Toxic Substances Control Act (TSCA). VDEQ has also contacted EPA Region 3 for assistance with this matter.

Mr. and Mrs. Waldron were interviewed by EPA and VDEQ during the site inspection. Mr. Waldron explained his intent to use the asphalt material, obtained from Commonwealth road construction sites, to cover portions of the property in conjunction with prospective plans to develop the site for business purposes. After determining that it would be very difficult to obtain needed zoning changes for the property, he indicated that he had decided not to pursue that option. Mr. Waldron is currently considering the possibility of constructing a new home on the property as his primary residence.

On March 19, 2004 the RPM met with representatives of the Roanoke County Department of Community Development and discussed possible development of the Site property. Representatives of the County told the RPM that any site owner would have to apply for extensive permits to develop the Site, even for constructing a primary residence. Both Roanoke County and VDEQ agreed to alert EPA to any permit application or actual activity at the former Matthews Electroplating Site.

VII. Technical Assessment

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

Yes. A review of documents, and the results of the site inspection indicates that the remedy is functioning as intended by the ROD. The alternate potable water supply from the Salem, VA water treatment plant, provided to area residents via the municipal water line put in place by EPA has effectively cut the exposure pathway between residents and contaminated ground water. O&M of the water line by the City of Salem, VA Water and Sewer Department continues to be effective. The clay cap obstructs access to the sinkhole onsite where electroplating wastes were once disposed. Site-related contaminants in ground water have attenuated to safe levels and soils do not present an unacceptable risk to human health under a residential scenario. The site inspection did not identify any issues which would compromise the integrity of the clay cap or the protectiveness of the remedy.

Question B: Are the exposure assumptions, toxicity data, cleanup levels, and RAOs used at the time of the remedy still valid?

There have been no changes in the physical conditions of the site that would affect the protectiveness of the remedy. In 1999 the Site was reevaluated by EPA in response to a zoning change from industrial to residential use in 1995. EPA determined that the remedy remained protective under a residential exposure scenario.

Remedial Action Objectives (RAOs)

The Remedial Action Objective (RAO) was to prevent exposure to ground water contaminated with chromium via drinking the water.

Changes in Standards and To Be Considereds (RBCs)

The second Five-Year Review consisted of a review of the relevant documents identified in Attachment 3. No specific ARARs were specified in the ROD for the provision of alternate water supply to the affected residences. However EPA did rely on the federal drinking water standards and EPA's Soil RBCs for a residential use exposure scenario to make conclusions regarding the protectiveness of the Site as discussed in the Data Review subsection.

Changes in Exposure Pathways, Toxicity, and Other Contaminant Characteristics

There are no changes to note.

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

No. The remedy itself remains protective as it severed the exposure route between residents and contaminated drinking water.

While conducting this Five-Year Review, EPA did discover that an area homeowner was being exposed to ground water by continuing to use their well. The original owner of this property at the time of the cleanup chose not to connect to the new municipal water line when it was installed by EPA. The current owner reportedly purchased the property in 1988. Post-deletion ground water monitoring by the Commonwealth of Virginia Department of Waste Management showed chromium levels had dropped below the MCL by 1992. Any exposure to chromium via the use of contaminated ground water after 1992 would likely have been at levels below the MCL.

At EPA's/VDEQ's request the Commonwealth of Virginia Department of Health (VDH) and Roanoke County Department of Community Development are following up with the homeowner to sample the homeowner's well and to provide a connection to the municipal water supply line. EPA will follow up on this issue with VDEQ, VDH and the County.

Technical Assessment Summary

According to the data reviewed, the site inspection, and the interviews the remedy is functioning as intended by the ROD. There have been no changes in the physical conditions at the site that would call into question the protectiveness of the remedy. Ground water monitoring conducted by the Commonwealth of Virginia indicates that any exposure to chromium via the use of contaminated ground water after 1992 would likely have been at levels below the MCL. In 1999 EPA determined that exposure to onsite soils did not pose an unacceptable risk to human health under a residential exposure scenario.

VIII. Issues

Issue	Currently Affects Protectiveness (Y/N)	Affects Future Protectiveness (Y/N)
Old electrical transformers possibly containing PCBs, discarded glass tubes possibly containing mercury	N	N
One homeowner not connected to municipal water line	N	N

IX. Recommendations and Follow-Up Actions

Issue	Recommendations/ Follow-up Actions	Party Responsible	Oversight Agency	Milestone Date	Affects Protectiveness? (Y/N)	
					Current	Future
Evaluate and dispose of glass tubes/transformers	Follow-up action by VDEQ for disposition	VDEQ	EPA	July 2004	N	N
Connection of residence to municipal water line	Sample well, arrange connection to municipal water line	VDEQ, VDH, Roanoke County	EPA	July 2004	N	N

X. Protectiveness Statement

Because the remedial actions are protective, the site is protective of human health and the environment. There are no human or environmental receptors exposed to site contaminants above health-based levels. The Remedial Action Objective (RAO) at the Site is to prevent exposure to ground water contaminated with chromium by way of drinking the water. EPA's installation of a municipal water supply line to provide an alternate supply of potable water to affected residents met the RAO. Site-related contaminants in ground water have since attenuated to safe levels and soils do not present an unacceptable risk to human health under a residential scenario. Therefore, the remedy is expected to remain protective of human health and the environment.

XI. Next Review

Based on the foregoing Five-Year Review, EPA has determined that hazardous substances, pollutants or contaminants no longer remain at the site above levels that allow for unlimited use and unrestricted exposure. Therefore, no further Five-Year Reviews are contemplated for the Matthews Electroplating Superfund Site.

Attachments

Attachments 1, 2, and 3 follow this page.

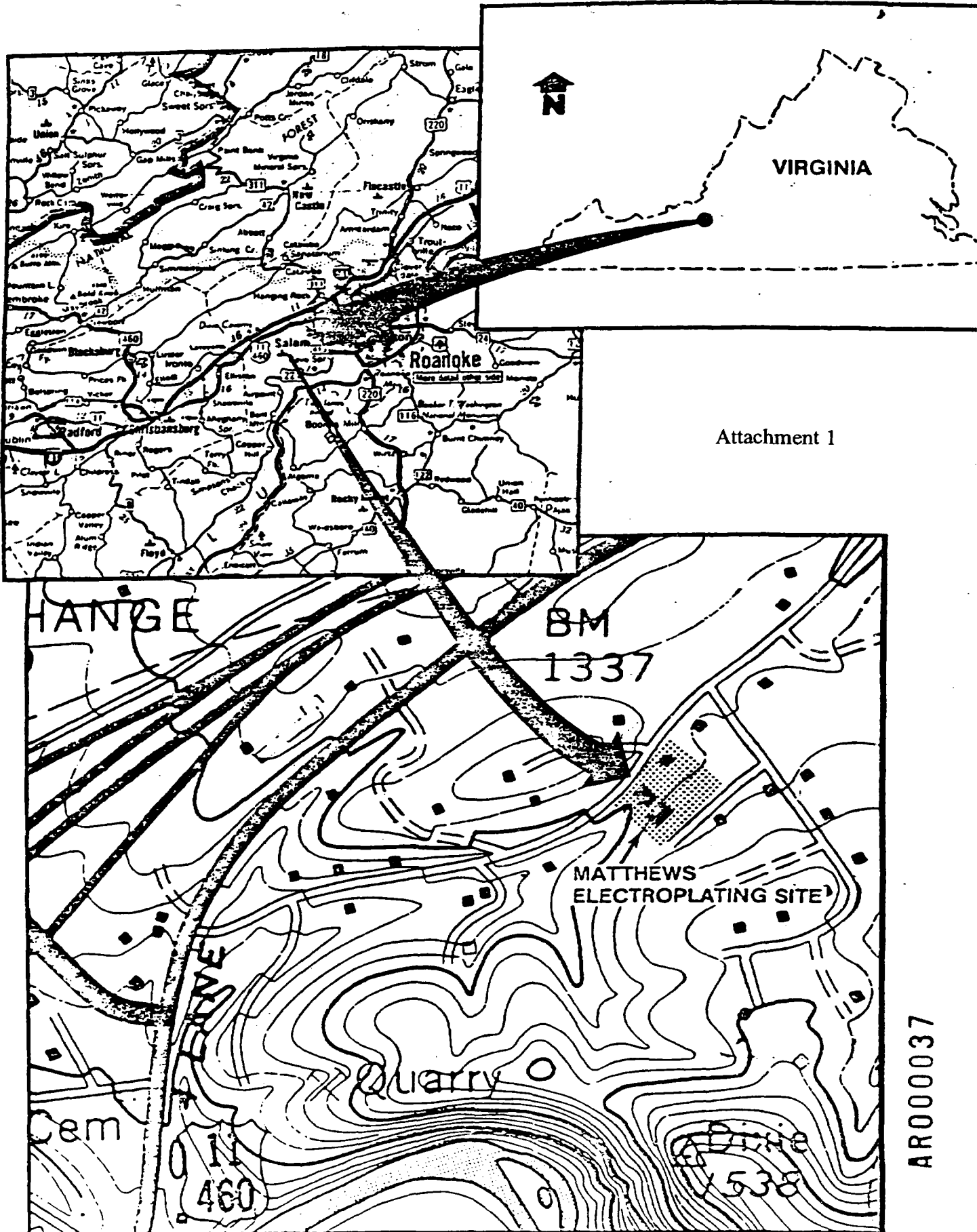
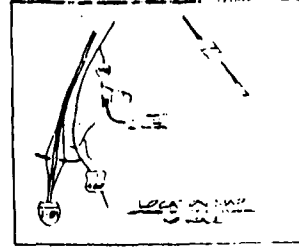
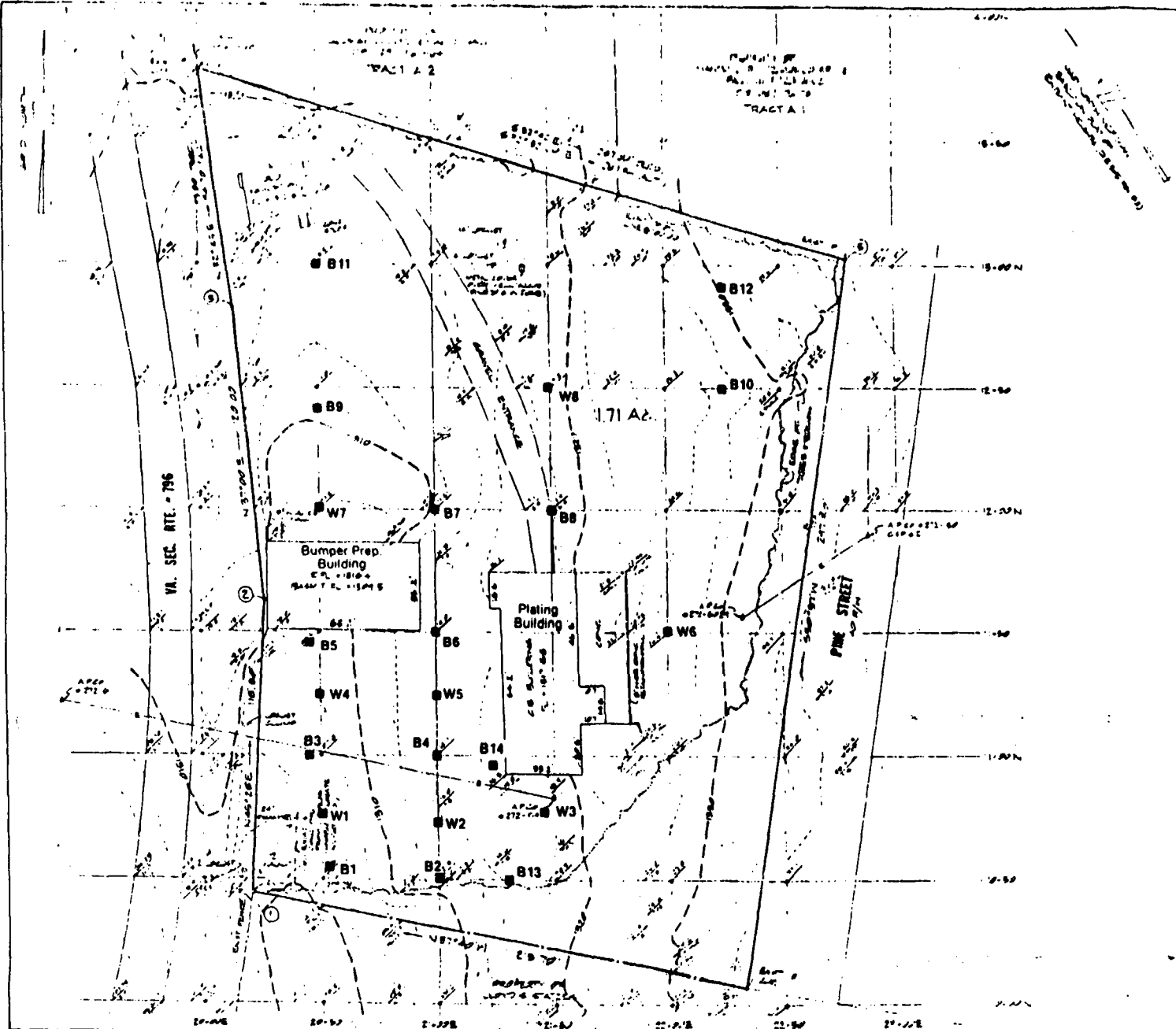


FIGURE 1-1 GENERAL LOCATION MAP OF THE SITE MATTHEUS ELECTROPLATING. SALEM, VIRGINIA

AR000037



LEGEND:
 O - OFFICE WELL
 T.B. - TOP OF BANK
 E.P. - EDGE OF PAVEMENT
 A.P.C. - APPALACHIAN POWER CO.
 C.P. - CHESAPEAKE & POTOMAC TELEPHONE CO.
 ■ - SOIL BORING LOCATION

Attachment 2

AR000038

MATTHEWS ELECTROPLATING SITE
 BEING
 TRACT B: VIEWPOINT HEIGHTS - D.B. 505 PG. 831
 BRADDOCK COUNTY, VIRGINIA

Scale 1" = 40' DATE: 28 APRIL 1967

WESTERN ENGINEERING & SURVEYING
 1000 EAST 10TH AVENUE
 DENVER, COLORADO 80202

FIGURE 2-1 TOPOGRAPHIC SURVEY AND SOIL BORING LOCATION MAP

ATTACHMENT 3

List of Documents Reviewed

- Field Investigation Report, Matthews Electroplating Site, Salem, Virginia, Remedial Investigation and Feasibility Study, Roy F. Weston, Inc., West Chester, Pennsylvania, 31 August 1982
- Field Investigation Report, Matthews Electroplating Site, Salem, Virginia, Roy F. Weston, Inc., West Chester, Pennsylvania, 29 October 1982
- Feasibility Study Report, Matthews Electroplating Site, Salem, Virginia, Roy F. Weston, Inc., West Chester, Pennsylvania, 18 January 1983
- Record of Decision, Remedial Alternatives Selection, Matthews Electroplating Site, Roanoke County, Virginia, April 15, 1983
- Federal On-Scene Coordinator's Report for Matthews Electroplating NPL Site, Roanoke County, Virginia, CERCLA Removal Action, March 10, 1988 through August 16, 1988
- Closeout Report, Matthews Electroplating Site, Roanoke County, Virginia, March 29, 1988
- Matthews Electroplating Superfund Site, Salem, VA, Draft Technical Closeout Report, Commonwealth of Virginia, Department of Waste Management, December 17, 1992
- U.S. Environmental Protection Agency, Region III, Hazardous Site Cleanup Division, Five-Year Review (Level I), Matthews Electroplating Superfund Site, Roanoke County, Virginia, April 19, 1999
- Site Assessment Technical Assistance (SATA), Trip Report, Matthews Electroplating Superfund Site, Salem, Roanoke County, VA, Roy F. Weston, Inc., Federal Programs Division, 29 October 1999
- U.S. Environmental Protection Agency, Region III, Hazardous Site Cleanup Division, Five-Year Review (Level I) Addendum, Matthews Electroplating Superfund Site, Roanoke County, Virginia, August 10, 2000

Second Five-Year Review Report

for

Matthews Electroplating Superfund Site

Roanoke County, VA

June 2004

Prepared By:

U.S. Environmental Protection Agency
Region 3
Philadelphia, PA

Approved By:

Date:

Abraham Ferdas, Director
Hazardous Site Cleanup Division
EPA Region III

CONCURRENCES

SYMBOL							
SURNAME							
DATE							

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