

FIVE-YEAR REVIEW REPORT

**MONROE AUTO PIT SUPERFUND SITE
(FINCH ROAD LANDFILL)**

**PARAGOULD, ARKANSAS
GREENE COUNTY**



**REGION 6
AUGUST 2004**

FIRST FIVE-YEAR REVIEW

FOR

**MONROE AUTO PIT SUPERFUND SITE
(FINCH ROAD LANDFILL)**

**PARAGOULD, ARKANSAS
GREENE COUNTY**

AUGUST 2004

**PREPARED BY:
U.S. EPA REGION 6
DALLAS, TEXAS**

FIVE-YEAR REVIEW

Monroe Auto Pit Superfund Site (Finch Road Landfill) Paragould, Greene County, Arkansas

Summary of Five-Year Review Findings

The results of the five-year review at the Monroe Auto Pit (Finch Road Landfill) site located in Paragould, Greene County, Arkansas indicate that the response action is protective of human health and the environment. The implemented response action is functioning as designed and the site has been properly maintained.

Actions Needed

No deficiencies were noted during the site inspection as discussed in this report. There are no deficiencies that could impact the protectiveness of the remedy.

Determinations

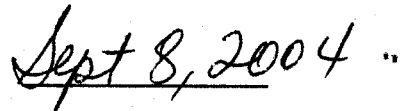
The response action implemented for the Monroe Auto Pit site continues to be protective of human health and the environment.

Approved By:

Date:


Samuel Coleman, P.E.

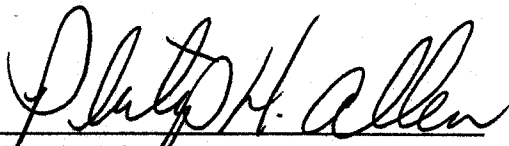
Director, Superfund Division
U.S. Environmental Protection Agency
Region 6

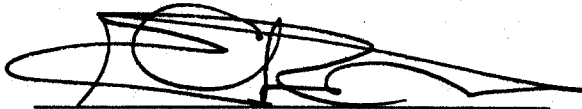

Sept 8, 2004

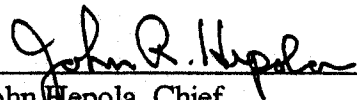
CONCURRENCES

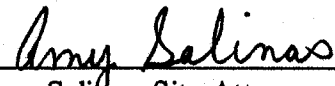
FIVE-YEAR REVIEW

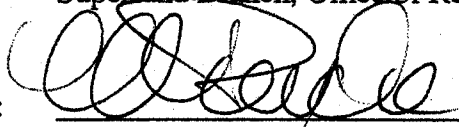
Monroe Auto Pit Superfund Site (Finch Road landfill)
Paragould, Greene County, Arkansas

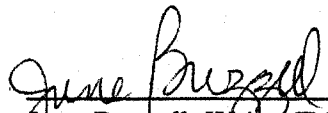
By:  Date: 8/11/04
Philip H. Allen, P.E.
Remedial Project Manager

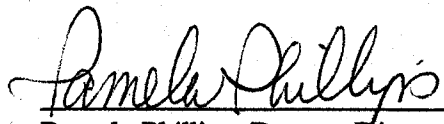
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Superfund Division

**First Five-Year Review Report
Monroe Auto Pit Superfund Site
(Finch Road Landfill)**

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LIST OF ACRONYMS

ADEQ	Arkansas Department of Environmental Quality
ADPC&E	Arkansas Department of Pollution Control and Ecology
AOC	Administrative Order on Consent
ARARs	applicable or relevant and appropriate requirements
ATSDR	Agency for Toxic Substances and Disease Registry
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act of 1980
CFR	Code of Federal Regulations
cm/sec	centimeters per second
COPC	Chemicals of Potential Concern
CWA	Clean Water Act
EPA	U. S. Environmental Protection Agency
ERA	Ecological Risk Assessment
FS	Feasibility Study
HHRA	human health risk assessment
HI	Hazard Index
HRS	Hazard Ranking System
MCL	Maximum Contaminant Levels
mg/kg	milligrams per kilogram
mg/L	milligrams per liter
MSL	Mean Sea Level
NCP	National Oil and Hazardous Substances Pollution Contingency Plan
NPL	National Priorities List
O&M	operation and maintenance
OSWER	The Office of Solid Waste and Emergency Response
OU	Operable Unit
PRGs	Preliminary Remediation Goals
PRPs	potentially responsible parties
QASP	quality assurance sampling program
RAO	remedial action objectives
RCRA	Resource Conservation and Recovery Act
RI	Remedial Investigation
RI/FS	Remedial Investigation/Feasibility Study
ROD	Record of Decision
SARA	Superfund Amendments and Reauthorization Act
TAL	Target Analyte List
TCLP	Toxicity Characteristic Leaching Procedure
µg/L	micrograms per liter
USC	United States Code
VOC	volatile organic compound
yd ³	Cubic yards

EXECUTIVE SUMMARY

The first Five-Year Review of the Monroe Auto Pit Superfund Site (Site) in Paragould, Green County, Arkansas, was completed in August 2004 for the ground water. The results of the five-year review indicate that the response action is protective of human health and the environment. The implemented response action is functioning as designed and the site has been properly maintained. No deficiencies were noted that impact the protectiveness of the remedy.

The Monroe Auto Pit Superfund Site (the site), also known as the Finch Road Landfill, is located in northeastern Arkansas in an unincorporated portion of Greene County, approximately three miles southwest of Paragould. The site lies immediately west of Arkansas Highway 358, approximately three miles west of its intersection with U.S. Highway 49. The site lies in the Northwest Quarter of the Northeast Quarter of Section 17, Township 16 North, Range 5 East, in the Paragould West 7.5-minute quadrangle. The southwestern corner of the site is at latitude 36°01'0" and longitude 90°34'30". The site occupies 7 acres of a former sand and gravel borrow pit. The area is basically rural and lightly populated with private residences located immediately south, north, and northeast of the site (Figure 1).

The site is owned by Tenneco Automotive, Inc., successor to Monroe Auto Equipment Company, One International Drive, Monroe, Michigan. The property is identified as parcel no. 4071-1 in the Greene County Tax Assessor's office. The legal description provided in the property deed is "all that part of the south half of the Northwest Quarter of the Northeast Quarter of Section 17, Township 16 North, Range 5 East lying West of the highway No. 358" (Warranty Deed 1973).

Monroe Auto Equipment Company (now Tenneco Automotive, Inc.) purchased the described property for disposal of alum and lime electroplating sludge that originated from settling ponds used for the treatment of wastewater from Monroe Auto Equipment's Paragould manufacturing plant. The waste material was placed on the site from 1973 to 1978, resulting in over 10,000 cubic yards (CY) of sludge at the site in the sand and gravel pit.

In July 1987, the EPA conducted a Site Assessment inspection to assess the potential for public exposure to contaminants being released from the site. Subsequently, on August 30, 1990, the site was formally added to the National Priorities List (NPL) of Superfund Sites. Principal pollutants identified by the EPA included solvents and degreasing agents such as 1,1-Dichloroethane (1,1-DCA), 1,2-Dichloroethene (1,2-DCE), Xylenes, and metals. As an interim action, Tenneco initiated sampling of private residential wells located within ½ mile of the site beginning in July 1987.

An initial Remedial Action (RA), including removal of the sludge and impacted soil, was executed in accordance with the original Record of Decision (ROD) dated September 26, 1996, the Amended Record of Decision dated November 9, 2000 (signed by the State of Arkansas on

September 15, 2000), and the *Request for Approval of Proposed Removal Action Remedy* letter dated September 24, 1999. The remedy for the site is comprised of two components, the initial RA and post-remedial monitoring. The initial RA was completed in the fall of 1999 and Tenneco continues to conduct monitoring of the ground water in areas surrounding the site.

Tenneco initiated periodic ground water monitoring of select wells in 1988 and semi-annual monitoring of 18 wells, as outlined in the Groundwater Monitoring Plan (SECOR, November 2000) (GMP) beginning in March 2001. Groundwater monitoring, as presented in the GMP, has included five events including semi-annual monitoring of 18 wells for SVOCs, metals and VOCs over the past 2.5 years. Overall, concentrations of SVOCs and metals were low in the initial sampling completed in 1988 and, for the most part, remained near or below the remedial action goals for these respective compounds throughout; any locations exhibiting concentrations above the remedial action goals have naturally attenuated to levels below the remedial action goals for the site. However, select wells have exhibited higher concentrations of VOCs. Throughout the groundwater monitoring activities at the site, well ESA-2A has exhibited the highest concentrations of VOCs, including 1,2 Dichloroethylene (DCE) at 750 ug/L in March 1988. After completion of the Soil Remedy in December 1999, which resulted in removal of the source of contaminants, ground water monitoring at the site indicates that concentrations of contaminants in the groundwater have naturally attenuated to levels nearing the remedial action goals for VOCs at the site. Currently, 1,2 DCE concentrations in well ESW-2A have naturally attenuated, based on the most recent sampling completed in July 2003, to 66 ug/L (Remedial Action Goal – 70 ug/L). Based on the most recent groundwater sampling results presented in the First Half of 2003 Semi-Annual Sampling Report [Parsons, December 2003], only two wells (ESW-2A and EWS-14-3) exhibited detectable concentrations of COCs (1,2 Dichloroethene) during the first half 2003 groundwater sampling event. Both of these detections were below the Remedial Action Goal for 1,2 DCE presented in the ROD. The results of groundwater monitoring since removing the contaminated soil and sludge demonstrate the effectiveness of the soil remedy, and it is anticipated that site will achieve the ROD remediation goals on or before the end of the next five-year review period.

In the Preliminary Close Out Report, dated September 17, 2001, for the Monroe Auto site, it is stated that: “Hazardous substances remain in the ground water at the Site above health-based levels after completion of the remedial action. Pursuant to CERCLA section 121(c) and as provided in OSWER Directive 9355.7-02, Structure and Components of Five-Year Reviews, dated May 23, 1991, and OSWER Directive 9355.7-02A, Supplemental Five-Year Review Guidance, dated July 26, 1994, the EPA and the ADEQ will conduct statutory five-year reviews of the ground water at the site and determine if the remedy is protective of human health and the environment. Because the source of contamination above health-based levels has been removed from the site, 5-year reviews of the soil are not required.” However, upon further review, and since this ground water remedy is considered a long-term monitored natural attenuation remedy, and levels of contaminants have decreased significantly, it is anticipated that attenuation and degradation will eliminate the contamination in the groundwater since the source of contamination has been completely removed. Therefore, this five-year review can be considered a “policy” review. Based on review of ground water monitoring data, the levels of contaminants

are continually dissipating; therefore the natural attenuation remedy envisioned for the groundwater is being achieved. Since the source of contamination (consisting of contaminated soil and sludge) has been removed, five year reviews of the source materials are not required.

The response action implemented at the Monroe Auto Pit Site continues to be protective of human health and the environment. Because the remedial action of natural attenuation for the ground water, upon completion, will not leave hazardous substances, pollutants or contaminants on-site above levels that allow unlimited use and unrestricted exposure (but requires five or more years to complete), EPA will continue to conduct policy five-year reviews of the site for the ground water only.

Five-Year Review Summary Form

SITE IDENTIFICATION		
Site name (from WasteLAN): Monroe Auto Equipment Company (Paragould Pit)		
EPA ID (from WasteLAN): ARD980864110		
Region: 6	State: Arkansas	City/County: Paragould, Greene County
SITE STATUS		
NPL status: <input checked="" type="checkbox"/> Final <input 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: September 2001	
Has site been put into reuse? <input type="checkbox"/> YES <input checked="" type="checkbox"/> NO		
REVIEW STATUS		
Lead agency: <input checked="" type="checkbox"/> EPA <input checked="" type="checkbox"/> State <input type="checkbox"/> Tribe <input type="checkbox"/> Other Federal Agency _____		
Author name: Philip H. Allen		
Author title: Remedial Project Manager	Author affiliation: EPA Region 6	
Review period: 03/18/04 to 8/23/04		
Date(s) of site inspection: 03/18/2004		
Type of review: <div style="display: flex; justify-content: space-around; font-size: small;"> <input type="checkbox"/> Post-SARA <input type="checkbox"/> Pre-SARA <input type="checkbox"/> NPL-Removal only </div> <div style="display: flex; justify-content: space-around; font-size: small;"> <input type="checkbox"/> Non-NPL Remedial Action Site <input type="checkbox"/> NPL State/Tribe-lead </div> <input checked="" type="checkbox"/> Regional Discretion(Policy Review)		
Review number: <input checked="" type="checkbox"/> 1 (first) <input type="checkbox"/> 2 (second) <input type="checkbox"/> 3 (third) <input type="checkbox"/> Other (specify) _____		
Triggering action: <input type="checkbox"/> Actual RA Onsite Construction at OU # _____ <input type="checkbox"/> Actual RA Start for Groundwater <input type="checkbox"/> Construction Completion <input type="checkbox"/> Previous Five-Year Review Report <input checked="" type="checkbox"/> Other (specify) <u>Preliminary Close Out Report (PCOR)</u>		
Triggering action date: 9/17/01		
Due date (five years after triggering action date): 9/17/06		

* ["OU" refers to operable unit.]

Five-Year Review Summary Form

Deficiencies: There were no deficiencies noted during the site inspection that could affect the protectiveness of the implemented response action.

Recommendations and Follow-up Actions:

V. Continue site O&M, and groundwater monitoring.

Protectiveness Statement:

The results of the first five-year review for the Monroe Auto Pit site indicate that the implemented response action conducted for the site remains protective of human health and the environment. No deficiencies were noted during the site inspection that would affect the protectiveness of the remedy. Evaluation of the ground water data for the past five years indicates that site groundwater currently exceeds standards presented in the Record of Decision (ROD) in a select few groundwater monitoring wells on site. Further review of groundwater data indicates that natural attenuation is reducing site related contaminants effectively. The implemented response action continues to be protective of human health and the environment.

**MONROE AUTO PIT SUPERFUND SITE
(FINCH ROAD LANDFILL)
FIRST FIVE YEAR REVIEW REPORT**

I. INTRODUCTION

The United States Environmental Protection Agency (EPA) Region 6 and the Arkansas Department of Environmental Quality (ADEQ) conducted this first five-year review for the response action implemented at the Monroe Auto Pit Superfund Site (Monroe Auto site). Also participating in the five-year inspection were representatives of the Potentially Responsible Party (Tenneco Automotive - Tenneco). The purpose of the first five-year review for the Monroe Auto Site is to determine whether the remedy at the Monroe Auto Site is protective of human health and the environment.

Although hazardous substances remain in the ground water at the site above clean up levels, the remedial action of natural attenuation for the groundwater, upon completion, will not leave hazardous substances, pollutants or contaminants on-site above levels that allow unlimited use and unrestricted exposure, but requires five or more years to complete. Therefore, this is a policy review as opposed to a statutory review.

Because the source of contamination above health-based levels has been removed from the site, five-year reviews of the soil (and other source material) are not required, therefore this five-year review is being conducted for ground water only. This report documents the results of the first five-year review conducted for the Monroe Auto Site. This five-year review report is intended to identify issues found during the review, if any, and recommendations to address them.

The EPA Region 6 is preparing this first five-year review for the Monroe Auto site pursuant to the Comprehensive Environmental Response, Compensation and Liability Act (CERCLA) Section 121, 42 U.S.C. § 9621 the National Contingency Plan (NCP), and OSWER No. 9355.7-03B-P (June 2001), *Comprehensive Five-Year Review Guidance*. CERCLA Section 121states:

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 judgment 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 National Contingency Plan (NCP); 40 CFR Section 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 than every five years after the initiation of the selected remedial action.

The U.S. EPA Region 6 has conducted the first five-year review of the response action implemented by Tenneco at the Monroe Auto Site located in Paragould, Greene County, Arkansas. This five-year review was conducted from March 2004 through August 2004. This report documents the results of the five-year review. Tenneco, the Potentially Responsible Party (PRP) provided ground water monitoring data and other information used in preparing this report.

This first five-year review for the Monroe Auto Site was triggered by the date that construction was completed at the Site, which is the PCOR date of September 17, 2001. This five-year review was conducted earlier to ensure the protection of human health and the environment. This review focuses on ground water since all source material has been removed from the site during remedial action of the soils and sludge. Therefore, the source of contamination above health-based levels has been removed from the site. Consequently, five-year reviews of the soils are not required. As provided in the current guidance on Five Year Reviews [OSWER Directive 9355.7-03B-P, *Comprehensive Five-Year Review Guidance* (June 2001)], the EPA conducts this five-year review as a matter of EPA policy, until cleanup levels are achieved that allow unlimited use and unrestricted exposure.

II. SITE CHRONOLOGY

EVENT	DATE
Proposed NPL Listing for Monroe Auto Site	1989
Final NPL Listing	August 30, 1990
Monroe Auto Equipment entered into an Consent Administrative Order to perform RI/FS	June 28, 1991
ADPC&E assumed lead role for the site	May 1995
Proposed Plan released to public	July 17, 1995
Public comment period	July 17 to August 17, 1995 with an extension granted until October 16, 1995
ROD signature	September 26, 1996
Amended ROD signature	September 15, 2000 by ADEQ and November 9, 2000 by EPA

EVENT	DATE
Commencement of RA activities (source material)	September 1999
Commencement of groundwater RA activities	October 11, 1999
Final site construction inspection	September 14, 2001
Preliminary Close Out Report	September 17, 2001

III. BACKGROUND

In 1973, Monroe Auto Equipment Company (now Tenneco Automotive, Inc.) purchased a seven-acre tract of land in Greene County, Arkansas. The site included an inactive sand and gravel borrow pit. From 1973 to 1978, Monroe Auto Equipment deposited nearly 15,000 cubic yards (CY) of alum and lime electroplating sludge/slurry at the site in the abandoned sand and gravel pit. The sludge originated from settling ponds that were used for the treatment of wastewater from Monroe Auto Equipment's Paragould manufacturing plant. The sludge contained approximately 85% liquid.

Under ADPC&E (currently ADEQ) review, Monroe conducted a series of investigations at the site between 1979 and 1990. These included the installation of ground water monitoring wells, and sampling and analysis of ground water, soil and surface water. In July 1987, the EPA conducted a Site Assessment inspection to assess the potential for public exposure to contaminants potentially being released from the site. The results of groundwater monitoring at the site in 1988 and 1989 indicated the presence of 100 parts per billion (ppb) of 1,1-Dichloroethane and 145 ppb of 1,2-Dichloroethylene.

The site was proposed for listing on the National Priority List (NPL) as the Monroe Auto Equipment Co. (Paragould Pit) on October 26, 1989 (54 Fed. Reg. 43778). The Site was listed final on the NPL as the "Monroe Auto Equipment Co. (Paragould Pit)" on August 30, 1990 (Fed. Reg. 35502). The primary contaminants identified by the EPA were solvents and degreasing agents including 1,1-Dichloroethane (1,1-DCA), 1,2-Dichloroethene (1,2-DCE), Xylenes, and metals.

A Potentially Responsible Party (PRP) search conducted in 1990 under CERCLA Section 104 (e) 42 U.S.C. 9604(e), indicated that Monroe Auto Equipment was the only PRP for this site. On March 14, 1991, the EPA issued notice of an impending Remedial Investigation and Feasibility Study (RI/FS) to the PRP. Monroe Auto Equipment, now Tenneco, responded to the notice with a good faith offer to perform the RI/FS.

On June 28, 1991, Monroe Auto Equipment Company entered into a Consent Administrative Order with the EPA to conduct a RI/FS under CERCLA. The RI was completed in August 1993, and the FS was completed in April 1995. On September 26, 1996, the Record

of Decision (ROD) was issued and signed for the Site. The ROD selected a remedy for the soil, sludge, and ground water at the site that included capping the sludge disposal area, installing a ground water interception system (french drain), and addressing the ground water contamination through natural attenuation, degradation and monitoring. In February 1998, the ADPC&E (currently Arkansas Department of Environmental Quality) signed an Administrative Order on Consent directing Tenneco to conduct the Remedial Design/Remedial Action (RD/RA) under ADPC&E oversight. In 1999, Tenneco submitted a petition to modify the ROD to change the method of contaminated soil remediation from containment of the contaminated soil and sludge, to excavation and treatment as required by the Resource Conservation and Recovery Act for removal, and disposal of contaminated soil and sludge in a off-site permitted, secure Subtitle D disposal facility. The amended ROD was signed by the ADEQ on September 15, 2000, and by the EPA on November 9, 2000. The amendment to the ROD did not alter the Remedial Action Goals established by the 1996 ROD, or the Applicable or Relevant and Appropriate Requirements listed in the 1996 ROD. The revised soil remedy did not alter the previous requirement of monitored natural attenuation and degradation of the ground water. The new remedy was consistent with the statements and expressed wishes regarding remediation activities from nearby residents. By treatment and removal of the waste from the site, the site is available for future development.

The amended soil or source remedy included: excavation of sludge and stained soils; verifying removal of impacted materials from the sludge disposal area; transporting and disposing of stained soil in a Subtitle D landfill; solidify and stabilizing sludge material; stockpiling stabilized sludge; apply for de-listing of stabilized sludge and transporting and disposing of stabilized sludge in accordance with the results of the de-listing petition.

The remedial action, which was initiated in September 1999, consisted of the excavation of approximately 9,000 cubic yards of contaminated soil and segregation of approximately 3,000 cubic yards of sludge; stabilizing the sludge with 10 percent lime addition, and temporarily stockpiling the stabilized sludge in an on-site lined containment cell for subsequent testing. The off-site disposal of the stained soil (that did not require treatment), and the stabilization of the contaminated sludge was completed in Fall 1999. The temporary storage of the treated sludge allowed time for the preparation of a petition for de-listing of the stabilized material and disposal of the stabilized material in a Subtitle D landfill. A De-listing Petition (Petition) was prepared by the PRP in August 2000, and the Petition was approved by the ADEQ and EPA Region 6 in November 2000. Upon approval of the Petition, the remaining stabilized sludge was transported and disposed of at a Subtitle D disposal facility.

A Preliminary Close-out Report (PCOR) documenting that the EPA Region 6 and the ADEQ have approved the completion of construction activities associated with the Monroe Auto Equipment Company Superfund Site (Site) in accordance with OSWER Directive 9320.2-09A-P, Close Out Procedures for National Properties List Sites [USEPA, September 17, 2001] was signed on September 17, 2001. The EPA completed the final site construction inspection on September 14, 2001. The EPA and the ADEQ have determined that the potentially responsible party (PRP), Tenneco Automotive, formerly Monroe Auto, has implemented the remedy in

accordance with the Amendment to the ROD, the 1996 ROD, and the ADEQ and the EPA approved remedial design (RD) plans and specifications. Therefore, all field construction activities are complete.

IV. SITE CHARACTERISTICS

Geology

Pliocene sand and gravel (Crowley's Ridge deposits) from braided and meandering stream environments overlie Eocene clay, silt, sand and lignite deposits. In the site area, the Crowley's Ridge deposits unconformably overlie the Eocene Wilcox Group. The Jackson and Claiborne Groups have been eroded away on the northern sections of the Ridge.

At the site, the Crowley's Ridge deposits characteristically contain cobbles up to two inches in diameter, mixed with sand, clayey sand, and silty sand. The deposits are up to 70 feet in thickness east of the site, where the deposits have not been excavated. These deposits are 10 to 15 feet thick on the site where sand and gravel excavation occurred during quarry operations. In some gravel pits surrounding the site, these sands and gravels were excavated to the top of the Wilcox Group.

At the site, individual thicknesses of sand and clay layers in the Wilcox Group vary from less than one inch to several feet. However, a consistent, very stiff clay layer in the Wilcox Group correlates between boreholes across the site. The clay layer has an estimated thickness of 40 to almost 70 feet. Several lignite deposits were also encountered in this clay, which is typical of the Wilcox in this area. Fine to medium-grained sands underlie the thick clay at all monitoring well locations.

Hydrogeology

Two primary ground water zones have been identified at the site: The upper zone of the Wilcox aquifer and the lower zone of the Wilcox aquifer. Perched ground water has also been identified in some locations near the sludge disposal area. The following subsections discuss the occurrence and hydraulic characteristics of these three zones.

Perched Ground Water Zones

Perched ground water intermittently occurs across the site. Thin layers of stiff clay, up to several inches in thickness, were observed at depths between five feet and 50 feet. After periods of precipitation, the soil above these clay layers has been found to be saturated, creating localized zones of perched ground water. During these high water periods (water levels can change by as much as 10 feet), water discharges from the springs. Five monitoring wells are installed in the perched ground water zone at the site. Water level measurements were taken monthly for one year to document the seasonal fluctuations. These measurements indicate that perched ground water is seasonal and intermittent. The presence and amount of perched ground water are dependent upon precipitation.

Subsurface field investigations have shown that one localized perched ground water zone may be continuous beneath the area of sludge/soil contamination. The elevation of the perched ground water surface has been recorded at approximately 416 to 427 feet above MSL (13 to 26 feet below land surface [bls]) when present in the monitoring wells. The perched ground water gradient slopes in the general direction of the ravines south-southwest of the sludge disposal area.

It is believed that perched ground water may discharge through springs in two ravines. Perched ground water is also likely to percolate into the underlying Wilcox aquifer through discontinuities in the underlying low-permeability zone.

A deeper perched zone has been identified on the northern portion of the site. The ground water surface elevation in this zone was measured at approximately 381 feet above MSL (approximately 70 feet bls) in February 1992. This perched zone is likely formed from a clay lens that was encountered at a depth of approximately 80 feet bls. Multiple perched water zones are typical of alluvial formations such as the Wilcox Group and in areas where local infiltration is the major form of recharge for the aquifer.

Upper Wilcox Aquifer

Two ground water zones were encountered in the Wilcox aquifer through the total depth of subsurface investigation. The upper zone behaves as an unconfined aquifer composed of interbedded sand and clay. Five monitoring well clusters and six single wells monitor the upper Wilcox aquifer. These wells are designated as ESW # -1 (lower part of the upper aquifer) and ESW # -3 or A (upper part of the upper aquifer). Exceptions to these labels are ESW 1A- intermediate perched zone, ESW 8 and 9- lower part of the upper aquifer, and ESW 6- the lower Wilcox aquifer. Approximately 10 to 70 feet of Crowley's Ridge deposits overlie the Wilcox aquifer upper zone in the site area. A clay layer greater than 40 feet in thickness forms the base of the Wilcox aquifer upper zone. At the southern boundary of the site, the surface of the clay layer was encountered at approximately 266 feet above MSL (174 feet bls).

The flow pattern in the upper zone of the Wilcox aquifer is determined to radiate from the western portion of the site toward the northeast and southeast quadrants. Water levels fluctuate by a few inches up to one foot seasonally. The hydraulic gradient in the SE direction (Mar '93) is 0.005 ft/foot and in the NE direction, 0.006 ft/foot. The saturated thickness of the upper Wilcox aquifer is approximately 50 feet. A downward gradient may exist in the upper zone of the Wilcox aquifer. This vertical gradient is due in part to the low hydraulic conductivity of the clay and recharge from the overlying Crowley's Ridge deposits to the upper zone of the Wilcox aquifer. The hydraulic conductivity in the vicinity of ESW-13-1 is approximately 420 gallons per day per square foot (gpd/ft²) or 2.0×10^{-2} centimeters per second (cm/s). The aquifer is composed of silty sand, with lenses of sandy, silty clay.

Lower Wilcox Aquifer

A confined ground water aquifer, the Wilcox aquifer lower zone, has been identified below the Wilcox aquifer upper zone. The lower zone of the Wilcox aquifer is separated from the upper zone by a clay confining layer more than 40 feet thick. Hydraulic conductivity tests performed on samples of this clay yielded vertical hydraulic conductivity values on the order of 10^{-9} cm/sec.

Five monitoring wells monitor the lower Wilcox aquifer. These wells are designated by ESW # -2, except for well ESW- 6. The lower Wilcox aquifer is composed of fine to medium-grained sand and fine gravel, which coarsens with depth. At the southern site boundary, this zone is approximately 36 feet thick, extending from 226 feet above MSL to 190 feet above MSL.

The ground water flow in the lower Wilcox aquifer is primarily to the east and southeast from the site, and the gradient appears to be relatively smooth across the monitored area. Based on aquifer pump tests (May '92) the hydraulic gradient near ESW 13-2 averages 0.002 ft/foot. The hydraulic gradient was calculated at 56 ft/day (2.0×10^{-2} cm/sec).

V. REMEDIAL ACTIONS

The following section includes discussions of the initial plans, history of implementation of the remedy and current status of the remedy. Although this five-year review is being conducted for ground water only, a brief description of the soil portion of the remedy is included to provide an accurate understanding of how the source materials were completely removed from the site. This also supports EPA's determination that this five-year review is a policy review since all site related contamination in the ground water could naturally attenuate and/or degrade below cleanup levels.

Soil Remedial Implementation History

The Remedial Action was executed in accordance with the Record of Decision (ROD) dated September 26, 1996 and the *Request for Approval of Proposed Removal Action Remedy* letter dated September 24, 1999. The remedy for the Site is comprised of two components, the initial RA and post-remedial monitoring. The RA consisted of excavation of the contaminated material, segregation of the stained soil from the contaminated sludge, treatment of the sludge, off-site disposal of the stained soil, and stockpiling of the treated sludge in a temporary on-site lined impoundment and ultimately disposed off-site. This RA was completed in the fall of 1999.

The final remedy was detailed in the following documents: *Remedial Design Submittal Quality Assurance Project Plan* (August 1999), *Remedial Action Workplan* (October 1999), *Remedial Design Submittal Sampling and Analysis Plan* (October 1999), and *Remedial Design Submittal Health and Safety Plan* (November 1999). The final remedy represents the culmination of activities that resulted from the preliminary site investigation completed in 1988, the RI/FS, the ROD and Amended ROD.

Overview of the Soil Remedial Action

The remedy is comprised of the following major components as stipulated in the *Workplan*:

- Excavate, segregate and stage sludge, stained soils, and overburden (clean soil) and unstained soils;
- Stockpile overburden and unstained soils for use as backfill;
- Solidify sludge material with 5 to 10 percent lime addition;
- Analyze stained soil and solidified sludge;
- Transport and dispose of stained soil that exhibits concentrations of constituents of concern (COC) below toxicity characteristic leaching procedure (TCLP) levels and EPA Region VI Medium Specific Health Based Screening Levels in a Subtitle D landfill;
- Stockpile stabilized sludge in an on-site lined containment cell;
- Apply for de-listing of stabilized sludge;
- Verify removal of impacted materials from the sludge pit through analytical testing of the bottom and sides of the excavation area;
- Restore the site by backfilling, grading and seeding;
- Transport and dispose of stabilized sludge in accordance with the results of the de-listing petition; and
- Conduct groundwater monitoring to ensure the effectiveness of the RA.

Summary of RA Goals

Contaminant of Concern	Target Goal	Basis
Soil/Sludge		
Trichloroethylene	0.1-10 mg/Kg	Carcinogenic Risk
Vinyl chloride	20-2,000 mg/Kg	Carcinogenic Risk
Antimony	6 mg/Kg	Noncarcinogenic Effects
Arsenic	0.02-2 mg/Kg	Carcinogenic Risk
Beryllium	0.07-7 mg/Kg	Carcinogenic Risk
Chromium VI	3-300 mg/Kg	Carcinogenic Risk
Lead	500 mg/Kg	EPA Guidance
Ground water		
cis-1,2-Dichloroethylene	70 µg/L	MCL
trans-1,2-Dichloroethylene	100 µg/L	MCL
bis(2-Ethylhexyl)phthalate	6 µg/L	MCL
Beryllium	4 µg/L	MCL
Chromium	50 µg/L	MCL
Lead	15 µg/L	SDWA Action Level
Manganese	200 µg/L	MCL

Summary of Soil RA Implementation

The soil remedial action, which was initiated in September 1999, consisted of the excavation and segregation of 14,633 cubic yards of soil. Based on field calculations, a total of 3,348 cubic yards of overburden (clean fill material), 8,553 cubic yards of stained soil and 2,732 yards of sludge (prior to stabilization and consolidation) were removed during the excavation activities.

The overburden was removed, stockpiled, sampled and confirmed to meet the RA Goals for Soil and used as backfill. In accordance with the *Remedial Design Submittal Sampling and Analysis Plan (SAP)* (SECOR, October 1999), one grab sample was collected for every 2,000 cubic yards of overburden, unstained soil or clean backfill. A total of 8,160 cubic yards of additional soil was imported for use as backfill, yielding a total of 11,508 yards of backfill used to replace the stained soil and sludge removed from the site. The site was recontoured to provide better drainage, enabling use of a smaller amount of soil required for backfill (11,508 cubic yards backfilled as compared to 14,633 cubic yards removed). A total of seven samples were collected from the overburden and imported backfill and confirmed the backfill material met the soil remedial clean-up requirements for the Site.

The 8,553 cubic yards of stained soil was stockpiled, sampled to confirm disposal in accordance with ADEQ requirements (*Confirmation of Stained Soil Disposal Requirements, ADEQ October 27, 1999*), and disposed in two Subtitle D Landfills upon confirmation of soil constituents levels. In accordance with the SAP, at a minimum, one grab sample was collected for every 500 cubic yards of stained soil. A total of 26 samples were collected from the stained soil to confirm this material met the disposal requirements for the permitted landfill. The weigh tickets from the Subtitle D Landfills confirm the disposal of the 8,553 cubic yards or 14,599 tons (1.7 tons / cubic yard) of stained soil as part of the Soil RA. A total of 11,621 tons of stained soil was transported and disposed at the Butler County Landfill in Poplar Bluff, Missouri and 2,978 tons of stained soil were transported and disposed at the Waste Management – Two Pines Landfill in North Little Rock, Arkansas.

The 2,732 cubic yards of sludge removed was stabilized with approximately 241 tons of quicklime and stockpiled in an on-site lined containment cell. In accordance with the SAP, at a minimum, one grab sample was collected for every 500 cubic yards of stabilized sludge. A total of seven samples were collected from the stabilized sludge to provide the basis for preparation of a petition for de-listing of this material. The 2,723 cubic yards of sludge removed was based on field measurements prior to stabilization. Surveying of this material after stabilization and consolidation over several months after placement in the containment cell yielded a volume of 1,798 cubic yards. A De-listing Petition (Petition) was prepared by the PRP in August 2000. The Petition was approved by EPA and subsequently by the ADEQ in an August 27, 2001 letter entitled *Exclusion of F006 Waste at the Tenneco/Monroe Facility from the Definition of Hazardous Waste*. Upon approval of the Petition, the 1,798 cubic yards or 3,243 tons (1.8 tons / cubic yard) of stabilized sludge was transported and disposed of at the Waste Management - Two Pines Landfill in North Little Rock, Arkansas.

The bottom and sidewalls of the sludge pit excavation were extended until the visually impacted material had been removed. Prior to the collection of verification samples, an additional 1-foot of material was removed and disposed as stained soil. In accordance with the SAP, a verification soil sample was collected for every 500 square feet of sidewall or floor. A total of 81 verification samples were collected which confirmed that the excavation activities met the RA Goals for Soil for the site.

In accordance with oral field instructions by the EPA Remedial Project Manager (RPM), and later included in the amendment to the ROD, the PRP excavated all of the stained soil and sludge to levels at or below the RA Goals for Soil at the site. The stained soil that had concentrations of the COC's below the TCLP levels and the EPA Region 6's Medium Specific Health Based Screening Levels was excavated and disposed in a Subtitle D Landfill. The final shipment of the stained soil was on December 16, 1999. The contractor also stabilized all of the contaminated soil and sludge above the TCLP levels of the EPA Regions 6's Medium Specific Health Based Screening Levels. The final shipment of the stabilized material was on September 13, 2001. The Ground Monitoring Plan, the Sampling and Analysis Plan, and the Quality Assurance Project Plan, and the Operations and Maintenance Plan were developed in accordance with Section V of the Consent Administrative Order LIS 98-014 and the Statement of Work that had been issued for the post-soil remediation ground water remedy. Construction-related activities are complete; the final inspection was completed on September 14, 2001.

Summary of Remediation Progress Since Initiation of Remediation

EPA Region 6 and ADEQ agree that the soil remedy is complete and that the source of the groundwater contaminants has been removed. More than 11,500 cubic yards of stained soil and sludge have been removed from the site and disposed in a Subtitle D Landfill. The Groundwater Remedy portion of the September 26, 1996 ROD and the 2000 ROD Amendment included conducting long-term groundwater monitoring of wells at the site and local private wells located in the vicinity of the Site. As part of the Groundwater Remedy, a *Groundwater Monitoring Plan* (GMP) (SECOR, November 2000) was prepared for the Site. The GMP was developed in accordance with Section V of the CAO LIS 98-014 and the SOW issued for the post-soil remediation Groundwater Remedy. The GMP specified procedures to be followed for long-term ground water monitoring and other ground water activities to be conducted at the Site to ensure compliance with the requirements of the CAO and ROD and ROD Amendment. Tenneco initiated GMP activities in September 2001 and has continued to conduct Semi-Annual monitoring of the groundwater wells at the site as outlined in the GMP. The results of the semi-annual sampling events are presented in respective Semi-Annual Sampling Reports (Parsons, January 2002, February 2002, September 2002, March 2003, December 2003). Based on the most recent groundwater sampling results from the site groundwater monitoring wells, presented in the First Half 2003 Semi-Annual Sampling Report [Parsons, December 2003], only two wells (ESW-2A and ESW-14-3) exhibit detectable concentrations of VOCs (1,2 Dichloroethene) during the first half of 2003 groundwater sampling event; both detections were below the remedial goal for 1,2 DCE presented in the ROD. Additionally, all other COCs from site ground water monitoring wells, with the exception of one detection of lead in well ESW12-1 [believed not to be related to

site contaminants] and one detection of bis(2-Ethylhexyl)phthalate in well ESW 10-1 [believed to result from degrading PVC well casing, or possibly a laboratory contaminant], exhibited either non-detectable results, or detections below the RA Goal for ground water.

Requirements for long-term ground water monitoring in the ROD were based on implementation of a containment soil remedy thus leaving contamination on-site and therefore requiring long-term monitoring of ground water to ensure the soil remedy contained the contamination on-site and contaminant levels in ground water continued to decline in concentration. As presented previously in this section, the soil remedy included in the ROD was modified in the ROD Amendment to include removal of stained soil and sludge from the site to below the Site RA Goals for Soil and disposal at an off-site Subtitle D Landfill. The results of ground water monitoring since removal of the stained soil and sludge demonstrate the effectiveness of the remedy, which consists of natural attenuation/degradation; therefore, it is anticipated that the remedial goals for the ground water as stated in the ROD will be achieved on or before the end of the next five-year review period.

Based on analysis of semi-annual ground water sampling results since March 2001, a request to reduce the number of groundwater monitoring wells and COCs included in the Site GMP was included in the First Semi-Annual 2003 Sampling Report (Parsons, December 2003). The requested revised GMP focused only on VOCs at six select groundwater monitoring well locations. The ADEQ approved the revised GMP. Overall, the current GMP for the site includes monitoring groundwater elevations at all site groundwater monitoring wells, and collecting groundwater samples from monitoring wells ESW-2A, ESW-3A, ESW-11-1, ESW-11-3, ESW-12-1, ESW-12-3, ESW-14-1 and ESW-14-3 for VOCs.

Also, a request to remove the requirements for sampling of the private wells was submitted to EPA and ADEQ on March 31, 2002. The request to discontinue sampling of the private wells was conditionally approved (based on submission of additional data) by the ADEQ in 2003. As part of the discussions between ADEQ and Tenneco following the March 31, 2003 request, a Private Well Report (ARCADIS, January 2004) was prepared to summarize the results of over 10 years of sampling the 29 private groundwater wells located within ½ mile of the Site. The Private Well Report provided a summary of available information for each of the 29 wells and presented a comparative analysis of the analytical results from over 10 years of sampling the private wells to the maximum contaminant levels (MCLs). Based on the findings presented in the report, no VOCs were detected in any of the private wells above the MCLs over the past 10 years. Select inorganics, primarily lead, were detected at varying concentrations, periodically exceeding the respective MCL in select samples collected prior to 1996. These detections of lead however were within background concentration levels for the surrounding area and not estimated to have resulted from contamination at the site. Based on the data review presented in the Private Well Report, none of the private wells located within ½ mile of the site are concluded to have been impacted by contamination from the site.

VI. FIVE- YEAR REVIEW PROCESS

This first five-year review for the Monroe Auto site has been conducted in accordance with the current EPA guidance titled, *Comprehensive Five-Year Review Guidance*, dated June 2001. A site inspection was conducted on March 18, 2004, as part of the five-year review and applicable reports and documents covering the review period were evaluated. A newspaper notice was published in the Paragould Daily Press on July 17, 2004, to notify the community that EPA had started the five-year review for the Monroe Auto Site. Once the Five-Year Review Report has been signed by EPA, a copy will be placed in the three site repositories which include: the Northeast Arkansas Regional Library, located at 120 North 12th Street, in Paragould, Arkansas 72450; the U.S. Environmental Protection Agency, Seventh Floor Reception Area, 1445 Ross Avenue, Ste. 12D13, Dallas, Texas 75202-2733; and the Arkansas Department of Environmental Quality, 8001 National Drive, Little Rock, Arkansas 72209.

The findings of the Five-Year Review inspection and review process are described in the following sections.

Site Inspection

A site inspection was conducted by EPA and ADEQ. Tenneco also participated in the site inspection. The inspection was conducted on March 18, 2004, and consisted of evaluating the site conditions as well as the condition of the monitoring well system. During the inspection, no action items were identified. All monitoring wells were in good condition, and all protective casings were functioning properly. All locks on the casings were also in good condition.

The only deficiency that was observed was some minor erosion in a drainage pathway; however, the PRP had already addressed the problem by placing a “geonet” in the area. This had resolved the problem since vegetative cover was being re-established.

Standards Review

The five-year review included evaluation of the Applicable or Relevant and Appropriate Requirements (ARARs) identified for the Monroe Auto site. There are no current changes to the ARARs identified in the ROD and Amended ROD for the site.

Data Review

Data and document review for this Five-Year Review Report included the Record of Decision, Amended Record of Decision, Remedial Investigation, Feasibility Study, Remedial Action Report, Groundwater Monitoring Plan, and the Response Action Reports submitted since completion of the response action for the site.

VII. TECHNICAL ASSESSMENT

Five Year Review guidance requires EPA to evaluate each site using the following questions:

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

The response action performed at Monroe Auto site is functioning as intended. The source of contamination has been completely removed; and based on sampling and laboratory analytical data, the natural attenuation and degradation remedy for the groundwater appears to be effectively reducing the concentrations of contaminants in the groundwater. Deed restrictions specified by the State and approved by EPA have been filed by the site owner and remain on file in the Greene County property records. The site is fenced and access properly restricted. The site owner is performing consistent maintenance on the site overall. The site owner is also continuing the ground water monitoring for the site as directed by the ADEQ and EPA.

Question B: Are the assumptions used at the time of remedy selection still valid?

Specific assumptions and requirements for the ground water outlined in the ROD and amended ROD are still valid. The predominant land use for the site is zoned industrial/commercial; however, land use in the area of the site is mixed industrial and residential. No new human health or ecological exposure pathways have been identified, nor have any new contaminants or sources of contaminants.

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

No other information has come to light that could call into question the protectiveness of the prior response action.

VIII. ISSUES

Issues affecting the performance of the completed remedial action at the site were not identified during the site inspections.

Annual ground water monitoring results presented in the 2003 Response Action Report for the Compliance Wells are in Figures 3 - 6.

IX. PROTECTIVENESS STATEMENT

The remedy conducted through a response action by the PRP for the Monroe Auto Site remains protective of human health and the environment. Soil and sludge exceeding cleanup levels for the contaminants of concern identified in the amended ROD have been removed from the site and disposed in a permitted appropriate landfill. All material used for backfill in the old abandoned sand and gravel pit were sampled and deemed “clean”. Ground water monitoring conducted during the past five years does not indicate that contaminants in the ground water are migrating further off-site. Semi-annual ground water monitoring will continue until the end of 2005, at which time the EPA and ADEQ will evaluate the groundwater monitoring program, and possibly modify the frequency of monitoring. At a minimum, the site ground water will be monitored on an annual basis until the next five-year review (scheduled for 2009), to verify that contaminants in the ground water continue to naturally attenuate and degrade. The EPA and ADEQ will continue to conduct policy five-year reviews until it is concluded that no future groundwater monitoring is necessary.

X. NEXT REVIEW

The Second Five-Year Review for Monroe Auto Pit Superfund Site will be performed within five years of the signature date of this Five-Year Review report.

Site Inspection Checklist

I. SITE INFORMATION

Site name: Monroe Auto Equipment Company Superfund Site

Date of inspection: March 18, 2004

Location and Region: Paragould, Greene County, Arkansas, Region 6 **EPA ID:** ARD980864110

Agency, office, or company leading the five-year review: EPA Region 6

Weather/temperature: Clear/Warm

Remedy Includes: (Check all that apply)

Landfill cover/containment

Monitored natural attenuation

Access controls

Groundwater containment

Institutional controls

Vertical barrier walls

Groundwater pump and treatment

Surface water collection and treatment

Other _____

Attachments:

Inspection team roster attached

Site map attached

II. INTERVIEWS (Check all that apply) N/A

It was decided not to conduct interviews for this site. This was based on the remedy that was implemented for the site, regular site visits by the ground water monitoring staff and follow-up discussions, the generally low level of maintenance required for the site and it's industrial use and location. Technical personnel from the ADEQ and the site owner/PRP and its contractor accompanied the EPA Region 6 RPM on the five year review inspection.

1. **O&M site manager:** Clifton H. Ritter, Manager Facilities and Environmental

Name

Title

Interviewed at site **at office** by phone Phone no. (870) 236-5308

Problems, suggestions; Report attached _____

2. **O&M staff** _____

Name Title Date

Interviewed at site at office by phone Phone no. _____

Problems, suggestions; Report attached _____

3. **Local regulatory authorities and response agencies** (i.e., State and Tribal offices, emergency response office, police department, office of public health or environmental health, zoning office, recorder of deeds, or other city and county offices, etc.) Fill in all that apply.

Agency _____

Contact _____

Name Title Date Phone no.

Problems; suggestions; Report attached _____

4. **Other interviews** (optional) Report attached.

FIVE -YEAR REVIEW SITE INSPECTION TEAM

March 18, 2004

Five-Year Review Site Inspection Team Roster:

NAME	ORGANIZATION	PHONE #
Philip H. Allen, P.E.	U.S. EPA Region 6	214/665-8516
Masoud Arjmandi	ADEQ	501/682-0852
Dave Ann Pennington	ADEQ	501/683-0068
Lisa Detlefsen, P.E.	Tenneco Automotive	870/236-5343
Clifton H. Ritter	Tenneco Automotive	870/236-5308
Scott D. Andrews, P.E., CHMM	ARCADIS G&M, Inc.	720/344-3804

ATTACHMENT

DOCUMENTS REVIEWED

- Remedial Investigation Report for the Monroe Auto Equipment Site. October 1, 1993.
- Feasibility Study of Remedial Alternatives for the Monroe Auto Pit Superfund Site. April 1994.
- U.S. Environmental Protection Agency (EPA), 1996. Record of Decision for the Monroe Auto Equipment Site. September 26, 1996.
- Consent Administrative Order (In the Matter of Tenneco Automotive Incorporated for the Monroe Auto Equipment Site; LIS 98-014). February 5, 1998.
- Interim Groundwater Sampling Results. March 1, 1999.
- Construction Report - Monroe Auto Pit Superfund Site. May 4, 2000 (Revised August 21, 2000)
- Amended Record of Decision (Amended ROD) for the Monroe Auto Equipment Site. Signed by the State of Arkansas on September 15, 2000, and signed by the U.S. Environmental Protection Agency on November 9, 2000.
- Remedial Action Report
- U.S. Environmental Protection Agency (EPA), 2001. Preliminary Close Out Report for the Monroe Auto Equipment Company Site. September 17, 2001.
- First Semi-Annual Sampling Event - March 2001. January 1, 2002.
- Second Semi-Annual Sampling Event - September 2001. February 1, 2002.
- First Semi-Annual Sampling Event - Spring 2002. September 1, 2002.
- Second Semi-Annual Sampling Event - Fall 2002. March 1, 2003.
- U.S. Environmental Protection Agency (EPA), 2001. Comprehensive Five-Year Review Guidance, OSWER No. 9355.7-03B-P. June 2001.