

GENERAL SITE INFORMATION, CHARACTERISTICS, AND STATUS

Project Name	<u>TRIANA/TENNESSEE RIVER</u>	ProjectID: 04-05
Last Updated:	09/18/02	
City:	Triana	
County:	Madison	
State:	AL	
Country:	USA	
Bodies of Water:	Two tributaries to the Tennessee River	
US EPA Region:	IV	
Status (Active, Complete, or Monitoring Only):	Complete	
Date On NPL:	1983	
ROD/ESD Date:	Decision Documents in lieu of a ROD (equivalent to RODs)	
Operable Unit:	N / A	
Areas of Concern (length or acres):	11-mile stretch of two tributaries of the Tennessee River.	
Other Characteristics of Water Body:	An eleven mile stretch of two tributaries of the Tennessee River, the Huntsville Spring branch (HSB) and Indian Creek (IC), flow through the Redstone Arsenal and the Wheeler Wildlife Refuge that are located southwest of the city of Huntsville, Alabama. The Huntsville Spring Branch starts within the city limits of Huntsville and flows south-southwest to its confluence with Indian Creek. Indian Creek then carries the flow of both streams until it joins the Tennessee river near the town of Triana, Alabama.	
Contaminants of Concern:	DDT	
Source of Contamination:	Discharge via a drainage ditch from a DDT manufacturing plant operated by Olin Corporation, under a lease from the U.S. Army, within Redstone Arsenal	
Contaminated Area Physical Characteristics:	5.4 Miles of the Huntsville Spring Branch and 5.6 miles of Indian Creek containing an estimated 409 tons of DDT.	
Type of Regulatory Action:	Superfund. Final.	
Overall Status Summary:	<p>To resolve a DDT contamination problem, a Consent Decree was entered in 1983 between the State of Alabama, EPA, and Olin Corporation. Remediation consisting of permanent stream diversion, then isolation of the most contaminated 2.5 miles by direct burial was completed in 1987. Remediation included diversion/rechanneling of 2.5 miles of tributary (two sections); burial and revegetation of the isolated stretches of tributary containing an estimated 93% of the DDT; 150,000 cy of soil removed to form channels; and 400,000 cy of clean soil and rocks imported and used for burial.</p> <p>Ten year post-construction monitoring of fish and groundwater started January 1, 1988. A five-year review performed in 1992 concluded that "remedial actions . . . appear to be doing well." In accordance with the Consent Decree, Olin had ten years following remediation to achieve the performance standard of 5 ppm DDT in the fillets of three species of fish in order to satisfy the Consent Decree and declare the remediation successful. A second five-year review was completed in 1998 and confirmed that "the remedial action is accomplishing its goal of preventing contact between the ecosystem and DDT," but, although fish DDT levels continued to decline, channel catfish and smallmouth buffalo did not meet the 5 ppm DDT performance standard. Largemouth bass reached the standard; channel catfish and smallmouth buffalo did not (although 80 to 90% DDT concentration reductions were observed). An Order was signed in April 1999 that extended the attainment periods for these two species of fish by five and ten</p>	

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more years, respectively.

Remedial Action Planned: ☒

Risk Assessment: ☐

Remedial Action Implemented: ☒

Status of Dredging ☐

PRPs: ☒

Contacts: ☒

References: ☒

Modeling: ☐

Fishing Advisory: ☒

Key Conditions: capping, extended (>1 mile) river, habitat/streambank restoration, post monitoring

REMEDIAL ACTION PLANNED

Project Name	<u>TRIANA/TENNESSEE RIVER</u>	ProjectID: 04-05
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Target Sediment Cleanup Standards (TSCS):	None. Target is for DDT levels in edible portions of three target species of fish to reduce below the FDA limit of 5 ppm within ten years after burial remedy.	
How TSCS Established:	N/A	
Target Bank and Floodplain Cleanup Levels (if applicable):	None	
Other Target:	Following completion of remedial action in Reach A, the sediments in Reaches B and C, with relatively lower levels of DDT, should, through natural recovery (natural deposition) be covered by clean, upstream sediments.	
Environmental Sample Data References:	Not available	
	<ul style="list-style-type: none">• Sediment:• Water:• Fish:	
Estimated Target Volume:	Not available	
Planned Disposal Method:	N/A	
Estimated Calendar Time to Implement Remedy:	Not available	
Estimated Time to Implement Remedy:	Not available	
Estimated Cost to Implement Remedy:	Not available	
Stated Remedial Action Objectives (and Source):	<p>Decision Document Number 4, Report on DDT in Reaches B (Huntsville Spring Branch, miles 2.4 to 0.0) and C (all 5.6 miles of Indian Creek), dated April 16, 1987, was written to accept Olin's report on Reaches B and C and agreed with the conclusion that no remedial actions in Reach B and C appeared necessary to meet the Consent Decree's performance standard. The RP's decision to accept the Report will not preclude further remedial actions should compliance monitoring indicate the remedies implemented in Reach A (HSB, Miles 5.4 to 2.4) are not sufficient to achieve the performance standard as set forth in the Consent Decree. Sediments in reaches B and C contained relatively small amounts of DDT compared to the quantity of DDT in Reach A which was already undergoing remedial action work. Furthermore, the sedimentation history of these two reaches shows that they are areas of deposition, not scouring. Following completion of remedial action in Reach A, the sediments in Reaches B and C should, through natural deposition, be covered by clean, upstream sediments and therefore be isolated from the aquatic environment. Thus, direct exposure of fish to DDT-containing sediments in these two reaches should diminish over time.</p> <p>(Source: Reference A-133). Interim fish level and surface water goals established for DDT, as well as fish level goals of 5 ppm or less DDT in three species of fish within 10 years after completion of remediation and demonstrated for 3 consecutive years thereafter; no sediment levels.</p> <p>As stated in one of the Decision Documents: The remedial objective was to:"... develop and</p>	

REMEDIAL ACTION PLANNED

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implement a remedial plan that will meet a performance standard of 5 ppm of DDT in fillets of channel catfish, largemouth bass, and smallmouth buffalo in each of three reaches of the Huntsville Spring Branch-Indian Creek System (tributaries of the Tennessee River)."

"Once the performance standard is attained in all three performance standard fish species and in all three Reaches and maintained for three consecutive years, Olin is to operate and maintain the water sampling and fish collection activities for an additional seven years. At the conclusion of this seven year period, if Olin is in compliance with the provisions of the CD and the performance standard, Olin shall be deemed to have completely fulfilled all of its obligation, and the Consent Decree shall terminate."

Measures of Success to be Used:

The CD specifies the time for compliance with the performance standard and the requirements for termination of the CD. Specifically, Olin shall attain the performance standard of 5 ppm DDT in fillets of specified fish species in Reaches A, B, and C, within 10 years after completion of the construction and implementation of the remedy. Olin shall be deemed to "attain the performance standard" when the average DDT concentration in fillets of each of the three performance-standard species (or substitute species) is 5 ppm in Reaches A, B, and C for one year.

After attaining the performance standard, Olin shall demonstrate "continued attainment of the performance standard," which will occur when the average DDT concentration in fillets of each of the three fish species is 5 ppm or less for three consecutive years (including the year of attainment) in Reaches A, B, and C. After "achievement of continued attainment, "Olin shall operate or maintain the remedies for a period of seven additional years.

Planned Monitoring and Restoration:

Biennial fish and surface water sampling by the PRP; GW monitoring in 12 wells near or in the filled channel in years 1 and 10; ongoing inspection and maintenance of the filled stretch.

Agency Position on Sediment Removal (and Source):

Pre-SARA Decision Documents, 1985: EPA-led review panel comprising industry, federal, state, and town officials concluded that dredging could destroy aquatic and wetland habitats and potentially expose downstream populations to the contamination. Another alternative -- building low-level dams to halt the movement of contaminated sediments -- was also considered and rejected as well, since it would not attain required standards. The review panel decided that the best alternative was permanent stream diversion to isolate a 2.5 mile stretch, and burial of DDT-contaminated sediments in the 2.5 mile stretch which contained 93% of the DDT mass.

REMEDIAL ACTION IMPLEMENTED

Project Name:	<u>TRIANA/TENNESSEE RIVER</u>	ProjectID: 04-05
Last Updated:	09/18/02	
Physical Target:	11-mile stretch of two tributaries of the Tennessee River containing 409 tons of DDT, most in a 1.9 mile stretch.	
Goals:	FDA level of 5 ppm or less DDT in 3 species of fish within 10 years, and demonstrated for 3 consecutive years after.	
Primary Contractor:	Not available	
Other Contractors:	Woodward - Clyde Consultants	
Generic Remediation Method:	Permanent rechannelization and stream diversion, followed by direct burial; natural recovery.	
Equipment:	Conventional earth moving equipment.	
Material Handling:	<p>The remedial action included bypassing and burying in place the most heavily contaminated channel area (Huntsville Spring Branch Miles 5.4 to 4.0), rerouting Huntsville Spring Branch, cutting a new channel to the large embayment area, filling the old channel, after isolation, with layers of soils, stone, and geotextile fabric, and construction of blocking dams plus several rainfall runoff diversion ditches. The remedial action isolated 308 out of 318 tons of DDT estimated to be present in that stretch. The remedial action consisted of: a new wastewater diversion ditch; a northern diversion ditch; access roads and stream crossings; north and south staging areas for construction activities; excavation of the 1,640 foot salient cut and the 3,250 foot Oxbow cut; three diversion structures and a diversion levee; the blocking off, dewatering and filling of the HSB channel from HSBM 5.5 to HSBM 4.0, including the west portion of the loop and the small embayment at HSBM 4.2 to isolate the DDT; covering the dewatered channel with geotextile fabric and nine inches of crushed rock; the addition of soil and topsoil; and revegetation measures.</p> <p>The remedial action also included bypassing and burying in place 71 of the 75.6 tons of DDT estimated to occur in the Huntsville Spring Branch stretch from Miles 4.0 to 2.4. The remedial action consisted of constructing four diversion structures; excavating a new channel between HSB mileposts 3.4 and 2.4; filling three areas; constructing a diversion ditch around the fill areas; and excavating portions of the sediments from the channel. The construction area was entirely within the safety fan of one of the missile test ranges at Redstone Arsenal and within the normal fluctuation zone of Wheeler Reservoir. Therefore, construction was closely coordinated with operations of both the test range and the reservoir. Because of activities at the test range, much of the construction work was performed at night under lights. Completion of remedial action in both stretches effectively isolated in place approximately 93 percent of the DDT in the two tributaries. Remediation resulted in 150,000 cy of soil removed for new channels and 400,000 cy of clean soil and rocks used for burial. 28,000 truckloads. Remediation was accepted as completed on January 1, 1988, which became the date for beginning the long-term monitoring program.</p>	
Volume Removed:	No contaminated sediment removal. Rechannelization, then direct burial of 2.5 miles of tributaries with 400,000 cy of clean soil and rocks; natural recovery only in eight miles of other tributaries.	
Calendar Time:	April 1986 through July 1987.	
Time To Implement:	16 months	
Total Cost:	\$30 million	
Dredging Cost:	N/A	
Disposal of Sediment:	N/A (rechannelization of two tributaries and direct burial of isolated 2.5 mile stretch.)	

REMEDIAL ACTION IMPLEMENTED

Project Name:	<u>TRIANA/TENNESSEE RIVER</u>	ProjectID: 04-05
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Volume of Water:	N/A	
Method of Water Treatment:	N/A	
Water Discharge Limit:	N/A	
Air Monitoring During Remediation:	N/A	
Water Monitoring During Remediation:	Unknown	
Outcome:	Completed in 1987. Permanent stream diversion, then isolation of 2.5 miles of tributary by direct burial. Three years after (1990), "...the overall ranges of DDT in fish had dropped by as much as 86% while DDT in surface water decreased by 93%." Average DDT levels in fish at year 10 (1997) in three reaches are 5 - 6.9 ppm for channel catfish vs. baseline average (1985) of 66-95 ppm; 0.5-1.1 ppm at year 9 (1996) for largemouth bass vs. baseline average (1985) of 7.1-37 ppm; and 9.4-21 ppm at year 10 for smallmouth buffalo vs. baseline average (1985) of 110-180 ppm. Target level in the fillets of each fish species is 5 ppm DDT. Accordingly, largemouth bass had reached the standard; channel catfish and smallmouth buffalo did not (although 80 to 90% DDT concentration reductions were observed). An Order was signed in April 1999 that extended the attainment periods for these two species by five and ten more years, respectively.	
Restoration and Post-Monitoring:	Biennial fish and surface water sampling by the PRP; groundwater monitoring in 12 wells near or in the filled channel in years 1 and 10; ongoing inspecting and maintaining of the filled stretch. Five-year reviews performed in 1992 (Reference A-132) and 1998 (Reference A-770). No deficiencies in remedy noted or changes recommended.	
Site-Specific Difficulties:	Details not available	
Monitoring Data References:	<ul style="list-style-type: none">• Sediment None• Water: Not obtained• Fish: A-132; A-133; A-770; B-223	

POTENTIALLY RESPONSIBLE PARTIES

Project Name **TRIANA/TENNESSEE RIVER**

ProjectID: 04-05

PRP Name: PRP INFORMATION NOT RELEASED

PRPID:

Street Address:

City:

State:

KEY CONTACTS

Project Name **TRIANA/TENNESSEE RIVER**

ProjectID: 04-05

Last Name: KEY CONTACT INFORMATION NOT RELEASED

Contact ID:

First Name:

Title:

Company:

Address:

City:

State:

Postal Code:

Work Phone # :

Other Phone #:

Fax # :

Email Address:

REFERENCES

Project Name TRIANA/TENNESSEE RIVER

ProjectID: 04-05

Reference Type: A

ReferenceID: 132

Title: *Five Year Review: Triana / Tennessee River Site, Triana, Madison County, Alabama*

Location: AEM

Category: Site Update

Prepared by/Author: Roy F. Weston, Inc.

Preparer/Author Address: Norcross, GA 30071

Prepared For: US EPA Region IV

Date Published: June 1993

Key Words and Phrases:

Reference Type: A

ReferenceID: 133

Title: *Superfund Site Interim Close Out Report: Triana / Tennessee River Site Triana, Alabama*

Location: AEM

Category: Site Update

Prepared by/Author: US EPA Region IV

Preparer/Author Address:

Prepared For: General Public

Date Published: December 18, 1991

Key Words and Phrases:

REFERENCES

Project Name TRIANA/TENNESSEE RIVER

ProjectID: 04-05

Reference Type: A

ReferenceID: 362

Title: *Request for Public Comment on an Extension of Time for Reaching the Performance Standard of 5 Parts Per Million DDT in Channel Catfish and Smallmouth Buffalo at the Triana/Tennessee River Site*

Location: AEM

Category: Miscellaneous

Prepared by/Author: US EPA Region IV

Preparer/Author Address: Waste Management Division
Atlanta, GA

Prepared For: General Public

Date Published: September 9, 1998

Key Words and Phrases:

Reference Type: A

ReferenceID: 770

Title: *Final Report: Five-Year Review: Triana/Tennessee River Site: Triana, Madison County, Alabama (Revision 1)*

Location: AEM

Category: Monitoring Plan/Report

Prepared by/Author: Roy F. Weston, Inc.

Preparer/Author Address: Suite 200
5405 Metric Place
Norcross, GA 30092

Prepared For: US EPA Region IV

Date Published: May 1999

Key Words and Phrases:

REFERENCES

Project Name TRIANA/TENNESSEE RIVER

ProjectID: 04-05

Reference Type: A

ReferenceID: 1061

Title: *Huntsville Spring Branch - Indiana Creek Long-Term Monitoring Program Annual Report No. 1*

Location: AEM

Category: Monitoring Plan/Report

Prepared by/Author:

Preparer/Author Address:

Prepared For:

Date Published: April 15, 1989

Key Words and Phrases:

Reference Type: A

ReferenceID: 1062

Title: *Huntsville Spring Branch - Indiana Creek Long-Term Monitoring Program Annual Report No. 10*

Location: AEM

Category: Monitoring Plan/Report

Prepared by/Author: Olin Corporation, Environmental Remediation Group

Preparer/Author Address: Charleston, TN

Prepared For:

Date Published: May 15, 1998

Key Words and Phrases:

Reference Type: B

ReferenceID: 100

Title: *Superfund at Work: Success in Brief: EPA and Olin Clean Up Triana Site : "A Major Victory for the Environment" (EPA 520-F-93-001)*

Location: AEM

Category: Site Update

Prepared by/Author: US EPA HQ

Preparer/Author Address: Office of Solid Waste and Emergency Response (5502G)
Washington, DC

Prepared For: General Public

Date Published: 1993 Spring

Key Words and Phrases:

REFERENCES

Project Name TRIANA/TENNESSEE RIVER

ProjectID: 04-05

Reference Type: B

ReferenceID: 223

Title: *Average DDT Concentrations in Fish by Year*

Location: AEM

Category: Site Update

Prepared by/Author: Alan Yarbrough

Preparer/Author

Address: US EPA Region IV
Atlanta, GA

Prepared For:

Date Published: May 14, 1998

**Key Words and
Phrases:**

Reference Type: L

ReferenceID: 119

Title: *Sediment Remediation Projects in the U.S. Using Capping or
Burial*

Location: AEM

Category: Capping/Placement

Prepared by/Author: AEM, Inc.

**Preparer/Author
Address:**

Prepared For: Distribution

Date Published: September 25, 2001

**Key Words and
Phrases:**

Reference Type: L

ReferenceID: 127

Title: *Contaminated Sediment Projects in the U.S. Using Monitored
Natural Recovery*

Location: AEM

Category: Capping/Placement

Prepared by/Author: AEM, Inc.

**Preparer/Author
Address:**

Prepared For: Distribution

Date Published: September 25, 2001

**Key Words and
Phrases:**

REFERENCES

Project Name TRIANA/TENNESSEE RIVER

ProjectID: 04-05

Reference Type: L

ReferenceID: 177

Title: *EPA's Evolving Position on Remedial Dredging*

Location: AEM

Category: ROD/Proposed Plan/Action Memo/Decision Document

Prepared by/Author: AEM, Inc.

Preparer/Author Address: Malvern, PA 19355

Prepared For: Internal Distribution

Date Published: Undated

Key Words and Phrases:

Reference Type: R

ReferenceID: 16

Title: *Letter to PRP re: Case Histories: Contaminated Sediment Sites*

Location: AEM

Category: Site Update

Prepared by/Author: AEM, Inc.

Preparer/Author Address: Malvern, PA 19355

Prepared For: Olin Corporation, submitted to

Date Published: August 17, 1998

Key Words and Phrases:

FISH ADVISORIES

Project Name **TRIANA/TENNESSEE RIVER**

ProjectID: 04-05

Advisory: Huntsville Spring Branch and Indian Creek ***AdvisoryID:*** 510
Extent: From Redstone Arsenal to the Tennessee River (Madison County)
Pollutant: DDT
Species: bass-white
Population: NCGP
Population Definition: No Consumption-General Population: Advise against consumption by the general population.

Advisory Type: River ***Advisory Number:*** 1240
Status (Active or Rescinded): Active ***Date Rescinded:***
Contact Name: Dr. Neil Sass ***Contact Number:*** 334-206-5941

Advisory: Huntsville Spring Branch and Indian Creek ***AdvisoryID:*** 514
Extent: From Redstone Arsenal to the Tennessee River (Madison County)
Pollutant: DDT
Species: catfish-channel
Population: NCGP
Population Definition: No Consumption-General Population: Advise against consumption by the general population.

Advisory Type: River ***Advisory Number:*** 1240
Status (Active or Rescinded): Active ***Date Rescinded:***
Contact Name: Dr. Neil Sass ***Contact Number:*** 334-206-5941

Advisory: Huntsville Spring Branch and Indian Creek ***AdvisoryID:*** 511
Extent: From Redstone Arsenal to the Tennessee River (Madison County)
Pollutant: DDT
Species: buffalo-bigmouth
Population: NCGP
Population Definition: No Consumption-General Population: Advise against consumption by the general population.

Advisory Type: River ***Advisory Number:*** 1240
Status (Active or Rescinded): Rescinded ***Date Rescinded:***
Contact Name: Dr. Neil Sass ***Contact Number:*** 334-206-5941

FISH ADVISORIES

Project Name **TRIANA/TENNESSEE RIVER**

ProjectID: 04-05

Advisory: Huntsville Spring Branch and Indian Creek ***AdvisoryID:*** 512
Extent: From Redstone Arsenal to the Tennessee River (Madison County)
Pollutant: DDT
Species: buffalo-smallmouth
Population: NCGP
Population Definition: No Consumption-General Population: Advise against consumption by the general population.

Advisory Type: River ***Advisory Number:*** 1240
Status (Active or Rescinded): Rescinded ***Date Rescinded:***
Contact Name: Dr. Neil Sass ***Contact Number:*** 334-206-5941

Advisory: Huntsville Spring Branch and Indiana Creek ***AdvisoryID:*** 1007
Extent: From Redstone Arsenal to the Tennessee River (Madison County)
Pollutant: DDT
Species: bullhead-brown
Population: NCGP
Population Definition: No Consumption-General Population: Advise against consumption by the general population.

Advisory Type: River ***Advisory Number:*** 1240
Status (Active or Rescinded): Rescinded ***Date Rescinded:***
Contact Name: Dr. Neil Sass ***Contact Number:*** 334-206-5941

Advisory: Tennessee River ***AdvisoryID:*** 128
Extent: From confluence of Indian Creek and Tennessee River to Interstate 65 bridge
Pollutant: DDT
Species: catfish-channel
Population: NCGP
Population Definition: No Consumption-General Population: Advise against consumption by the general population.

Advisory Type: River ***Advisory Number:*** 9292
Status (Active or Rescinded): Rescinded ***Date Rescinded:*** 04/26/96
Contact Name: Dr. Neil Sass ***Contact Number:*** 334-206-5941

FISH ADVISORIES

Project Name **TRIANA/TENNESSEE RIVER**

ProjectID: 04-05

Advisory: Tennessee River ***AdvisoryID:*** 129
Extent: One mile on either side of the confluence of Indian Creek and the Tennessee River
Pollutant: DDT
Species: bass-largemouth
Population: NCGP
Population Definition: No Consumption-General Population: Advise against consumption by the general population.

Advisory Type: River ***Advisory Number:*** 9292
Status (Active or Rescinded): Rescinded ***Date Rescinded:*** 04/26/96
Contact Name: Dr. Neil Sass ***Contact Number:*** 334-206-5941

Advisory: Tennessee River ***AdvisoryID:*** 130
Extent: One mile on either side of the confluence of Indian Creek and the Tennessee River
Pollutant: DDT
Species: buffalo-smallmouth
Population: NCGP
Population Definition: No Consumption-General Population: Advise against consumption by the general population.

Advisory Type: River ***Advisory Number:*** 9292
Status (Active or Rescinded): Rescinded ***Date Rescinded:*** 04/26/96
Contact Name: Dr. Neil Sass ***Contact Number:*** 334-206-5941

Advisory: Tennessee River ***AdvisoryID:*** 131
Extent: One mile on either side of the confluence of Indian Creek and the Tennessee River
Pollutant: DDT
Species: catfish-channel
Population: NCGP
Population Definition: No Consumption-General Population: Advise against consumption by the general population.

Advisory Type: River ***Advisory Number:*** 9293
Status (Active or Rescinded): Rescinded ***Date Rescinded:*** 04/26/96
Contact Name: Dr. Neil Sass ***Contact Number:*** 334-206-5941
