FIFTH FIVE-YEAR REVIEW REPORT FOR WHITE CHEMICAL CORPORATION SUPERFUND SITE ESSEX COUNTY, NEW JERSEY



Prepared by

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Date

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LIST OF ABBREVIATIONS & ACRONYMS

AOC	Administrative Order on Consent
ARAR	Applicable or Relevant and Appropriate Requirement
ASTs	Above-ground Storage Tanks
ATSDR	Agency for Toxic Substances and Disease Registry
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CFR	Code of Federal Regulations
EPA	United States Environmental Protection Agency
FFS	Focused Feasibility Study
FYR	Five-Year Review
GWQS	Groundwater Quality Standards
ICs	Institutional Controls
MCLs	Maximum Contaminant Limits
NCP	National Oil and Hazardous Substances Pollution Contingency Plan
NJDEP	New Jersey Department of Environmental Protection
NPL	National Priorities List
OU	Operable Unit
O&M	Operation and Maintenance
PRP	Potentially Responsible Party
RA	Remedial Action
RAO	Remedial Action Objectives
RCRA	Resource Conservation and Recovery Act
RI/FS	Remedial Investigation/Feasibility Study
ROD	Record of Decision
RPM	Remedial Project Manager
TBC	To Be Considereds
TCE	Trichloroethene
UAO	Unilateral Administrative Order
VI	Vapor Intrusion
WCC	White Chemical Corporation

I. INTRODUCTION

The purpose of a Five-Year Review (FYR) is to evaluate the implementation and performance of a remedy in order to determine if the remedy is and will continue to be protective of human health and the environment. The methods, findings, and conclusions of reviews are documented in FYR reports such as this one. In addition, FYR reports identify issues found during the review, if any, and document recommendations to address them.

The U.S. Environmental Protection Agency (EPA) is preparing this five-year review pursuant to the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) Section 121, consistent with the National Contingency Plan (NCP) (40 CFR Section 300.430(f)(4)(ii)), and considering EPA policy.

This is the fifth FYR for the White Chemical Corporation (WCC) Superfund Site (Site), located in the City of Newark, Essex County, New Jersey. The triggering action for this statutory review is the completion date of the previous FYR on March 22, 2012. The FYR has been prepared due to the fact that hazardous substances, pollutants, or contaminants remain at the site above levels that allow for unlimited use and unrestricted exposure (UU/UE).

The Site consists of three operable units (OUs), and one, OU2, will be addressed in this FYR. OU2 addressed contaminated soils in the surface and subsurface, as well as the demolition and off-site disposal of nine on-site buildings, and the removal and off-site disposal of above-ground storage tanks. OU1, which addressed the stabilization of the Site through treatment, neutralization, recycling, and off-site disposal of contaminated materials, is not being reviewed in this FYR, as all construction activities for this OU have been completed, and there are no operation and maintenance activities associated with OU1. OU3 is not included in this FYR as the remedy has yet to be implemented. The OU3 ROD, signed September 26, 2012, addresses groundwater contaminated from past operations at the former WCC facility through in-situ bioremediation, and will be the final remedial action (RA) for the Site.

The White Chemical Corporation Superfund Site FYR was led by Brittany Hotzler, the EPA Remedial Project Manager. Participants included Rachel Griffiths, EPA Hydrogeologist, Abbey States, EPA Human Health Risk Assessor, and Natalie Loney, EPA Community Involvement Coordinator. The review began on 7/19/2016.

Site Background

The White Chemical Corporation Superfund Site is approximately 4.4 acres in size, and is located at 660 Frelinghuysen Avenue, in the City of Newark, Essex County, New Jersey (Figure 1). Historically, the property was used for industrial purposes dating back to the 1930's and has had numerous owners/operators.

In 1983, White Chemical Corporation (WCC) leased the property and operated at the Site until 1990, manufacturing a variety of acid chlorides, brominated organics, mineral acids, and fire retardant compounds. Improper drum storage, including open, leaking, and fuming drums, as well as mishandling of chemicals, led to their release and the subsequent contamination of soil and groundwater.

Currently, the land is vacant, undeveloped, and comprised of a properly graded lot containing clean fill and stone to prevent erosion and aid in surface water run-off. Frelinghuysen Avenue is a major

thoroughfare with significant residential, commercial, and industrial structures within a half-mile radius of the WCC property, including Newark Liberty International Airport, Conrail and Amtrak rail lines, and U. S. highway Routes 1 and 9. The Site is currently zoned commercial/industrial, and the City of Newark currently has no plans to change the zoning of this land. There are no current uses of groundwater resources at the Site, and none are anticipated in the future. There is potential for immediate redevelopment of the Site upon completion of the cleanup.

Site Geology

The Site is located in the Piedmont (Lowlands) Physiographic Province. The Lowlands are bounded by the Coastal Plain to the south and east, the New England Uplands to the north, and the Piedmont Uplands to the west. The geology of the region is characterized by unconsolidated sediments deposited on sedimentary bedrock of Triassic Age. The sedimentary bedrock consists of an arkosic shale which is reported to lie approximately 85 feet below ground surface. The unconsolidated sediments are typically composed of three strata: alluvium, tidal marsh deposits, and glacial drift. The glacial drift is the deepest limit, which rests unconformably on the bedrock.

Two geologic features are primarily used when discussing the Site's geology: overburden and bedrock. The overburden consists of deposits of clayey silt and fine to coarse-grained sand, which generally thicken (considerably) to the east. Fill material is encountered across the Site, ranging in thickness from two to ten feet. The fill consists mostly of silt with trace sand and gravel. Beneath the fill, clayey silt deposits ranging in thickness from approximately two to ten feet are encountered. The deposits are interpreted to be the alluvial deposits discussed above. Beneath the alluvium, fine to coarse sand with varying amounts of silt and gravel are encountered with an occasional silt lens, ranging in thickness from approximately four to 40 feet. These deposits are interpreted to represent the Pleistocene glacial deposits.

Beneath the overburden is weathered bedrock, which ranges in thickness from a few feet thick to approximately 20 feet thick. The weathered bedrock is composed of highly fractured Brunswick Formation, a red to reddish brown shale, with occasional gray beds. Bedrock is encountered at approximately 30 to 60 feet below ground surface (bgs) at the Site, with bedrock elevations decreasing to the northwest and southeast.

Site Hydrogeology

The hydrogeology at the Site is divided into three water bearing zones: shallow overburden, deep overburden, and bedrock. Water levels in each aquifer zone are generally within 1-2 feet of each other. The water table occurs at approximately 8 to 13 feet bgs. Fluctuations in water level elevations may indicate local recharge, sinks, or other features that result in shifting flow directions. However, overall gradients for all three systems are generally to the east, toward Newark Airport (formerly a wetland groundwater discharge area) and Newark Bay.

Groundwater flow in the fractured bedrock aquifer is characterized as a complex leaky multi-layer flow system. Groundwater flows in the fractures along the strike or dip or high angle fractures connecting different low angle bedding planes. The locations of the high angle fractures are unpredictable, making it extremely challenging to understand the groundwater flow paths in this system.

FIVE-YEAR REVIEW SUMMARY FORM

			SITE ID	ENTIFICATION
Site Name:	White C	hemical C	Corporatio	on Site
EPA ID:	NJD980	755623		
Region: 2		State: NJ Cit		City/County: Newark/Essex
			SI	FE STATUS
NPL Status:	Final			
Multiple OU Yes	s?		Has the No	e site achieved construction completion?
			REV	IEW STATUS
Lead agency [If "Other Fe	: EPA ederal Age	ency", ent	er Agenc	y name]:
Author name	e (Federa	l or State	Project 1	Manager): Brittany Hotzler
Author affili	ation: EP	A		
Review perio	od: 7/19/2	016 - 2/1/2	2017	
Date of site in	nspection	: 8/15/201	16	
Type of revie	ew: Statut	ory		
Review num	ber: 5			
Triggering a	ction date	e: 3/22/20	12	
Due date (fiv	e years af	ter trigger	ring actio	on date): 3/22/2017

II. RESPONSE ACTION SUMMARY

Basis for Taking Action

After several site inspections and Notices of Violations, early removal actions were taken by the New Jersey Department of Environmental Protection (NJDEP) between May and August of 1990, and included the removal of approximately 1,000 drums from the Site. In August 1990, NJDEP reached its project cost ceiling of \$825,000 and was forced to suspend operations. NJDEP subsequently requested that EPA undertake a removal action at the Site. In September 1990, EPA performed a Preliminary Assessment of the WCC facility and found numerous Resource Conservation and Recovery Act (RCRA) violations. Approximately 10,900 55-gallon drums of hazardous substances were precariously stacked or improperly stored throughout the Site. The drums and containers were in various stages of deterioration, with many fuming and leaking their contents onto the soil. That same month, EPA issued a Unilateral Administrative Order (UAO) barring WCC from continuing on-site operations and ordering evacuation of all personnel. The U.S. District Court of the District of New Jersey issued an order

enforcing EPA's UAO in October of 1990. In November of 1990, the Agency for Toxic Substances and Disease Registry (ATSDR) issued a health consultation, which concluded that the Site posed an imminent and substantial health and safety threat to nearby residents and workers. In early 1991, EPA prepared a Focused Feasibility Study (FFS) to identify and evaluate the remedial alternatives of an early remedial response. Conditions at the site, as identified during the FFS, suggested that the then present unstable situation could lead to a catastrophic release of hazardous material that would likely affect the surrounding community. Exposures to on-site hazardous materials and the threat of a catastrophic release posed by the uncontrolled storage of materials on-site posed an imminent and substantial threat to public health.

The Site was listed on the National Priorities List in September 1991, with the OU1 Record of Decision (ROD) issued that same month.

Sampling conducted during the OU2 RI/FS identified several shallow subsurface "hot spots" of contamination that were largely comprised of volatile organic compounds (VOCs). The contaminants of concern identified in soils at the Site include 1,2-dichloroethane, cis-1,2-dichloroethene, ethylbenzene, 1,1,2,2-tetrachloroethane, 1,1,2-trichloroethane, tetrachloroethene, trichloroethene, and xylenes.

Significant human health risks at the Site were due primarily to the inhalation of vapors in contaminated groundwater from VOCs, including 1,2-dichloroethane and trichloroethene. Potential risks to small mammals were identified during the ecological risk evaluation, but were deemed to be insignificant as the Site offers limited habitat to wildlife since it is within a highly urbanized location and contains very little vegetation or open space.

Response Actions

EPA has addressed the Site in three separate operable units. The following remedial action objectives (RAOs) were established for OU1 of the White Chemical Corporation site:

- Prevent ingestion/inhalation/direct contact with hazardous substances at concentrations posing a potentially imminent and substantial endangerment.
- Prevent release of hazardous substances that would result in or through a catastrophic event (e.g. explosion, fire, generation of contaminant vapor plume) or migration of hazardous substances that would result in contamination of groundwater, surface water, soil, or releases into the atmosphere.

The OU1 Record of Decision (ROD), issued September 21, 1991, called for:

- The continuation of Site stabilization as well as the utilization of disposal measures for removing surface contamination (i.e. drums, tanks, other containers) from the Site.
- Disposal methods involving the mobilization of treatment units to the Site to treat or neutralize some of the materials prior to off-site disposal.
- The reuse of untreated material found to be sufficiently free of impurities as product, as well as some of the treated material.
- Off-site transportation of material that is sufficiently stabilized, bulked, and/or treated to a RCRA-approved treatment facility, a hazardous waste disposal facility, or an appropriate facility for recycling or processing.

The OU2 ROD was issued on September 29, 2005. The following RAOs were established for OU2 of the White Chemical Corporation site:

- Reduce or eliminate the direct contact threat associated with contaminated soil to levels protective of a commercial/industrial use.
- Reduce or eliminate exposure through inhalation of vapors that may migrate from contaminated soils.
- Minimize or eliminate contaminant migration to the groundwater.
- Maximize consistency with the future development of the Site.

The Major components of the OU2 Selected Remedy include:

- Demolition and off-site disposal of nine on-site buildings.
- Removal and off-site disposal of above-ground storage tanks (ASTs).
- Excavation of an estimated 21,158 cubic yards of contaminated soil.
- Off-site transportation and disposal of contaminated soil, with treatment as necessary.
- Backfilling and grading of all excavated areas with clean soil and seeding of the areas.
- Placement of a deed notice to restrict land use to non-residential (commercial/light industrial) uses.
- Appropriate environmental monitoring to ensure the effectiveness of the remedy.

The OU3 ROD was issued on September 26, 2012. The following RAOs were established for OU3 of the White Chemical Corporation site:

- Protect human health by preventing exposure via drinking and showering to contaminated groundwater concentrations above remediation goals (RGs).
- Restore the groundwater in both the shallow and deep overburden aquifers to drinking water standards by reducing Site contaminant concentrations to RGs to the extent practicable
- Decrease contaminant mass in the bedrock aquifer to the extent practicable.

The Major components of the OU3 Selected remedy include:

- In-situ bioremediation of the groundwater in the shallow and deep overburden aquifers by reducing Site contaminant concentrations to Federal Maximum Contaminant Levels (MCLs) and New Jersey Groundwater Quality Standards (GWQS) to the extent practical.
- Treatment of the bedrock aquifer in an effort to decrease contaminant mass to the extent practical.
- The establishment of a Classification Exemption Area (CEA), which is an institutional control, to minimize the potential for exposure to contaminated groundwater.
- Implementation of a long-term sampling and analysis program to monitor the contamination at the Site to assess groundwater migration, and to establish whether contaminants are meeting the appropriate NJ GWQS or MCLs, whichever is lower.

EPA evaluated alternatives for restoration of the shallow and deep overburden aquifers below the railline corridor and the bedrock aquifer to Applicable or Relevant and Appropriate Requirements (ARARs) and concluded that no practical alternatives could be implemented. Consequently, EPA is invoking an ARAR waiver for portions of the groundwater at the Site due to Technical Impracticability. This remedy addresses the groundwater contamination known to be attributable to past activities at the former White Chemical Corporation facility. Principal threat wastes in the form of contents of tanks, drums, laboratory containers, and cylinders as well as contaminated soils, which acted as a source of contamination to the groundwater aquifer, were addressed during the OU1 and OU2 response actions. As was stated in the Introduction, this remedy has not been implemented and as such, will not be evaluated in this FYR.

Contaminant of Concern	Remediation Goals (µg/kg)
1,2-Dichloroethane	1,000
cis-1,2-Dichloroethene	1,000
Ethylbenzene	100,000
1,1,2,2-Tetrachlorethane	1,000
1,1,2-Trichloroethane	1,000
Tetrachloroethene (PCE)	1,000
Trichloroethene (TCE)	1,000
m,p-Xylenes	67,000 μg/kg
o-Xylenes	67,000 μg/kg

Table 1: White Chemical Corporation Contaminants of Concern Soil Remediation Goals

Status of Implementation

OU1

By March 1993, a potentially responsible party (PRP) group operating under an Administrative Order on Consent (AOC) removed drums, content of tanks, laboratory containers, liquid contained in process tanks, and gas cylinders. The OU1 activities included the removal of approximately 7,900 drums containing hazardous substances; removal of 12,500 laboratory containers; removal of the contents of 191 tanks and vessels, removal of 14 gas cylinders, and removal of 4,497 empty drums. In addition, the following was decontaminated: 2,600 linear feet of metal piping, 590 linear feet of glass piping, and 750 linear feet of polyvinyl chloride piping, all of which were associated with various process formulation tanks. In 1996, the City of Newark acquired the Site through foreclosure after the property owner failed to pay property taxes.

This OU has been completed and effectively decontaminated and removed wastes off site. No operation, maintenance, or monitoring is required as part of this ROD and this OU will not be discussed further in this FYR.

OU2

The OU remediation activities were divided into two phases.

Phase 1, which included the building demolition and removal of the ASTs, was implemented by EPA from March 2006 through August 2007. Early testing within the buildings indicated the presence of asbestos-containing material and lead. A total of approximately 60 cubic yards of asbestos-containing

material was encapsulated and properly disposed off-site. In total, nine on-site buildings were demolished, which included all above-ground structures, slabs and subsurface structures.

In addition to the demolition and disposal activities, EPA also conducted several additional soil investigations at the Site (2007) to provide additional soil delineation data for the OU2 Remedial Design (OU2 RD).

The excavation plan was divided into eight excavation areas. OU2 Phase 2 initial site preparation activities began in August 2008, pre-excavation and waste characterization sampling occurred in November 2008, mobilization activities occurred in December 2008, and physical excavation and transportation and disposal activities commenced in January 2009. All excavation, transportation, and disposal activities were completed by March 2009, except for the excavation of two locations along the eastern fence line of the Site. These two locations showed contamination in place above the cleanup criteria, but were found to be inaccessible due to their location next to the power line for the railroad. Exposure to these soils and redevelopment of this area of the Site is unlikely. A total of 23,338 tons of soil were removed and later transported and disposed of off-site. Site restoration, which included the placement and grading of clean soils (in excavations areas) and 3-inch stone over the entire Site, began in March and was completed in April 2009. A final inspection was conducted on April 16, 2009.

IC Summary Table

Media, engineered controls, and areas that do not support UU/UE based on current conditions	ICs Neede d	ICs Called for in the Decision Documen ts	Impacted Parcel(s)	IC Objective	Title of IC Instrument Implemented and Date (or planned)
Land Use	Yes	Yes	Block 3872, Lot 109 on Tax Map of Essex County	Placement of a deed notice by the property owner to restrict land use to non-residential (commercial/industria l) use	Deed Notice, February 20, 2014

 Table 3: Summary of Implemented ICs

Climate Change

Potential site impacts from climate change have been assessed, and the performance of the remedy is currently not at risk due to the expected effects of climate changes in the region and near the Site.

Operations & Maintenance

Operations and maintenance activities at the Site are limited to Site inspections and IC verification.

III. PROGRESS SINCE THE LAST REVIEW

This section includes the protectiveness determinations and statements from the **last** five-year review as well as the recommendations from the **last** five-year review and the current status of those

recommendations.

OU #	Protectiveness Determination	Protectiveness Statement
1	Protective	The implemented remedy for OU1 protects human
		health and the environment by controlling exposure
		pathways that could result in unacceptable risk.
2	Short-term Protective	The implemented remedy for OU2 protects human
		health and the environment in the short-term by
		controlling the exposure pathways that could result
		in unacceptable risk. In order for the OU2 remedy
		to be protective in the long-term, final institutional
		controls (deed notice) need to be implemented.

Table 4: Protectiveness Determinations/Statements from the 2012 FYR

Table 5: Status of Recommendations from the 2012 FYR

OU #	Issue	Recommendations	Current Status	Current Implementation Status Description	Completion Date (if applicable)
2	Institutional	Implement the	Completed	A Deed Notice was placed on	2/20/2014
	Controls Not	Institutional		the property by the City of	
	Implemented	Controls (Deed		Newark as an institutional	
		Notice)		control	

IV. FIVE-YEAR REVIEW PROCESS

Community Notification, Involvement & Site Interviews

On November 14, 2016, EPA Region 2 posted a notice on its website indicating that it would be reviewing site cleanups and remedies at 38 Superfund sites in New York and New Jersey, including the White Chemical Corporation site. The announcement can be found at the following web address:

http://www.epa.gov/sites/production/files/2016-11/documents/five_year_reviews_fy2017_final.pdf.

In addition to this notification, a public notice was provided to the City of Newark for posting on the City's website on 2/3/2017, stating that there was a five-year review and inviting the public to submit any comments to the U.S. EPA. The notice also included contact information, including addresses and telephone numbers for questions related to the repositories. The results of the review and the report will be made available at the Site information repositories, located at EPA Region 2, 290 Broadway, 18th Floor, New York, New York, 10007, and at the Newark Public Library, 5 Washington Street, Newark, NJ, 07102.

In the past, EPA has had periodic phone calls and correspondence with the City of Newark to discuss the status of the Site and the different activities associated with the individual OUs. Most recently, EPA has discussed the progress of the OU3 remedial design activities, and the potential redevelopment plans for

the property. To date, there is a letter of intent from a developer who is interested in redeveloping the Site after the remedial action for OU3 has been completed.

Data Review

No data collection was required over the past five years to support evaluation of the OU2 remedy.

Site Inspection

The inspection of the Site was conducted on 8/15/2016. In attendance were Brittany Hotzler (EPA RPM), Ray Klimcsak (EPA RPM), and Rachel Griffiths (EPA Hydrogeologist). The purpose of the inspection was to assess the protectiveness of the remedy. During the site inspection, no issues impacting current and/or future protectiveness were observed.

V. TECHNICAL ASSESSMENT

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

A deed notice was implemented at the site in February 2014. Currently, the Site is surrounded by a fence, therefore no unacceptable exposures are occurring, and the implemented portion of the remedy is functioning as intended.

QUESTION B: Are the exposure assumptions, toxicity data, cleanup levels, and remedial action objectives (RAOs) used at the time of the remedy selection still valid?

There have been no other physical changes to the Site that would adversely affect the protectiveness of the implemented portions of the remedy. Commercial/industrial land use assumptions, exposure assumptions and pathways evaluated in the RI/FS and considered in the decision documents remain valid.

The RAOs for OU2 include: reduce or eliminate the direct contact threat associated with contaminated soil to levels protective of a commercial/industrial use, reduce or eliminate exposure through inhalation of vapors that may migrate from contaminated soils, minimize or eliminate contaminant migration to the groundwater and maximize consistency with the future development of the Site. The RAOs for OU2 remain valid. Currently, the City of Newark is in discussions with potential redevelopers.

There have been no changes in the Applicable or Relevant and Appropriate Requirements (ARARs) and no new standards affecting the protectiveness of the remedy. In 2011, EPA's IRIS program released an updated toxicological profile for Trichloroethene (TCE), however, the cleanup level for TCE at the Site (1.0 mg/kg) remains below the updated screening level for industrial soil and NJDEP's non-residential direct contact soil remediation standard. This change does not impact protectiveness.

The excavation and off-site removal of the contaminated soils effectively removed the likelihood for the exposure of inhalation of contaminated vapors due to shallow contaminated soils. There are currently no on-site structures which warrant any vapor intrusion (VI) investigations, however, there are two buildings located above the highest concentration areas of the groundwater plume. In November 2015, a sub-slab VI investigation was conducted at the property located at the northern boundary of the site, and

several exceedances of EPA's sub-slab commercial vapor intrusion screening levels were detected. A follow-up investigation of the property in March 2016 did not detect any significant exceedances of indoor air screening levels. The property will be resampled during the next five-year review period to confirm that no unacceptable exposures in indoor air are occurring. The second property located on the western boundary of the site is not currently enclosed, therefore exposure to vapors in indoor air is not expected to be a concern.

Although other specific parameters may have changed since the time the risk assessment was completed, the process that was used remains valid and is not expected to affect the remedy. The exposure assumptions, toxicity data, cleanup levels and RAOs identified for OU2 remain valid.

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

There is no information that calls into question the protectiveness of the remedy.

VI. ISSUES/RECOMMENDATIONS

Issues/Recommendations
OU(s) without Issues/Recommendations Identified in the Five-Year Review:
OU2

VII. PROTECTIVNESS STATEMENT

	Protectiveness Statement(s)	
<i>Operable Unit:</i> OU2	Protectiveness Determination: Protective	Planned Addendum Completion Date: N/A
Protectiveness Staten The implemented ren the exposure pathway	<i>ment:</i> nedy for OU2 protects human health and t ys that could result in unacceptable risk.	he environment by controlling

VIII. NEXT REVIEW

The next five-year review report for the White Chemical Corporation Superfund Site is required five years from the completion date of this review.

APPENDIX A – REFERENCE LIST

Reference List	Date
White Chemical OU1 Record of Decision	September 1991
White Chemical OU2 Record of Decision	September 2005
White Chemical Fourth Five Year Review	June 2012
White Chemical OU3 Record of Decision	September 2012

APPENDIX B – CHRONOLOGY OF SITE EVENTS

Chronology of Events	Date
White Chemical Corporation (WCC) manufactures chemical products at the Site	1983-1990
New Jersey Department of Environmental Protection (NJDEP) issues several Notices of Violations	June – September 1989
NJDEP issues an Administrative Order and penalty	March 15, 1990
NJDEP issues violation notices under the New Jersey Spill Prevention, Compensation and Control (SPCC) Act	April 1990
NJDEP directs WCC to secure and stabilize the facility	May 8, 1990
NJDEP removal action	May – August 1990
NJDEP requests that the EPA conduct a removal action at the Site	August 1990
EPA issues a Unilateral Administrative Order (UAO)	September 1990
Agency for Toxic Substances and Disease Registry (ATSDR) finds Site poses an imminent and substantial health and safety threat	November 1990
EPA completes Focused Feasibility Study (FFS)	June 1991
Site added to the National Priorities List	September 25, 1991
Remedial Action Record of Decision (ROD) is signed	September 26, 1991
EPA initiates Remedial Action	September 27, 1991
EPA issues a UAO to ten companies and one individual	March 31, 1992
EPA and PRP group initiates response action at the Site	October 29, 1992
EPA and PRP group completes response action	March 1993
First Five-Year Review	September 30, 1997
Start of Remedial Investigation at the Site	October 1998
OU2 Remedial Investigation is field work is completed	July 1999
EPA Superfund Redevelopment Pilot Grant award to City	October 1, 2000
OU2 Remedial Investigation is completed	April 2003

EPA issues the OU2 Record of Decision	September 29, 2005
EPA begins Phase 1 of the OU2 remedy (building demolition)	February 2006
EPA completes building demolition	July 2006
EPA initiates Remedial Design for Phase 2 of the OU2 remedy (soil remediation)	June 2006
EPA approves the Final Remedial Design for OU2	March 2008
Membrane Interface Probe (MIP) Investigation and Soil and Groundwater Sampling activities, performed by Weston and overseen by EPA Removal	March 2008
EPA awards the Remedial Action (RA) contract (through an IA with the USACE) to Conti Environmental	July 2008
Site preparation activities for RA activities begin for OU2	September 2008
Pre-excavation and Waste Characterization activities are performed	November 2008
Excavation and Transport and Disposal (T&D) activities begin for OU2	January 2009
Excavation and T&D activities are completed	March 2009
Excavation and T&D activities are completed Site Restoration activities are completed	March 2009 April 2009
Excavation and T&D activities are completed Site Restoration activities are completed Final Inspection for OU2	March 2009 April 2009 April 2009
Excavation and T&D activities are completed Site Restoration activities are completed Final Inspection for OU2 Technical Assistance contract is awarded to CDM, through an IA with the USACE for OU3 RI/FS activities	March 2009 April 2009 April 2009 December 2009
Excavation and T&D activities are completed Site Restoration activities are completed Final Inspection for OU2 Technical Assistance contract is awarded to CDM, through an IA with the USACE for OU3 RI/FS activities OU3 Remedial Investigation is completed	March 2009 April 2009 April 2009 December 2009 May 2012
Excavation and T&D activities are completed Site Restoration activities are completed Final Inspection for OU2 Technical Assistance contract is awarded to CDM, through an IA with the USACE for OU3 RI/FS activities OU3 Remedial Investigation is completed OU3 Feasibility Study is completed	March 2009 April 2009 April 2009 December 2009 May 2012 July 2012
Excavation and T&D activities are completed Site Restoration activities are completed Final Inspection for OU2 Technical Assistance contract is awarded to CDM, through an IA with the USACE for OU3 RI/FS activities OU3 Remedial Investigation is completed OU3 Feasibility Study is completed EPA issues the OU3 Record of Decision	March 2009 April 2009 April 2009 December 2009 May 2012 July 2012 September 26, 2012
Excavation and T&D activities are completed Site Restoration activities are completed Final Inspection for OU2 Technical Assistance contract is awarded to CDM, through an IA with the USACE for OU3 RI/FS activities OU3 Remedial Investigation is completed OU3 Feasibility Study is completed EPA issues the OU3 Record of Decision Draft Pilot Study is submitted	March 2009 April 2009 April 2009 December 2009 May 2012 July 2012 September 26, 2012 February 2016
Excavation and T&D activities are completed Site Restoration activities are completed Final Inspection for OU2 Technical Assistance contract is awarded to CDM, through an IA with the USACE for OU3 RI/FS activities OU3 Remedial Investigation is completed OU3 Feasibility Study is completed EPA issues the OU3 Record of Decision Draft Pilot Study is submitted Draft Intermediate Design Analysis Report is submitted	March 2009 April 2009 April 2009 December 2009 May 2012 July 2012 July 2012 September 26, 2012 February 2016 February 2016

APPENDIX C – FIGURES

Figure 1



Figure 2

