2020 Community Involvement Plan

Former Defense Depot Memphis, Tennessee
U.S. EPA I.D. Number TN4210020570

Revision 1
December 2020

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Department of the Army

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Acronyms and Abbreviations

AR	Administrative Record
AS/SVE	Air Sparging with Soil Vapor Extraction
ATSDR	Agency for Toxic Substance and Disease Registry
BCT	BRAC Cleanup Team
BEC	BRAC Environmental Coordinator
BRAC	Base Realignment and Closure
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CIL	Community Involvement Line
CIP	Community Involvement Plan
COC	Contaminants of Concern
CRP	Community Relations Plan
CVOC	Chlorinated Volatile Organic Compound
CWM	Chemical Warfare Materiel
CY	Cubic Yard
DA	Department of the Army
DDMT	Defense Depot Memphis, Tennessee
DLA	Defense Logistics Agency
DoD	U.S. Department of Defense
DRC	Depot Redevelopment Corporation
EBT	Enhanced Bioremediation Treatment
EDGE	Economic Development Growth Engine of Memphis and Shelby County
EISR	Early Implementation of Selected Remedy
ESD	Explanation of Significant Differences
ET&D	Excavation, Transportation and Disposal
FCOR	Final Closeout Report
FFA	Federal Facilities Agreement
FFS	Focused Feasibility Study
FOST	Finding of Suitability to Transfer
FSVE	Fluvial Soil Vapor Extraction
HRS	Hazard Ranking System
IR	Information Repository
IRA	Interim Remedial Action
IRACR	Interim Remedial Action Completion Report
ISTD	In Situ Thermal Desorption
LTM	Long-term Monitoring
LUC	Land Use Control
MI	Main Installation
MLGW	Memphis, Light, Gas & Water
MNA	Monitored Natural Attenuation
NCP	National Contingency Plan
NPL	National Priorities List
O&M	Operation and Maintenance

PCP	Pentachlorophenol
POC	Point of Contact
PRB	Permeable Reactive Barrier
RA	Remedial Action
RAB	Restoration Advisory Board
RACR	Remedial Action Completion Report
RAO	Remedial Action Objective
RCRA	Resource Conservation and Recovery Act
RD	Remedial Design
RI	Remedial Investigation
ROD	Record of Decision
RPM	Remedial Project Manager
SCHD	Shelby County Health Department
SMP	Site Management Plan
SRI	Supplemental Remedial Investigation
SVE	Soil Vapor Extraction
TAG	Technical Assistance Grant
TDEC	Tennessee Department of Environment and Conservation
TRC	Technical Review Committee
U.S.	United States
USEPA	United States Environmental Protection Agency
VOC	Volatile Organic Compound
ZVI	Zero-Valent Iron

1 Overview of the Community Involvement Plan

This Community Involvement Plan (CIP) was created to fulfill the community involvement requirements of the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA), the National Contingency Plan (NCP) and Department of Defense (DoD) policy at the former Defense Depot Memphis, Tennessee (DDMT). DoD will conduct the community involvement activities outlined in this plan in order that residents are informed and provided opportunities to be involved. HDR prepared this CIP for the Office of the Assistant Chief of Staff for Installation Management, Base Realignment and Closure (BRAC) Division under Contract W91278-16-D-0061, Task Order 0002 with the U.S. Army Corps of Engineers, Mobile District.

The BRAC Environmental Coordinator (BEC) represents the Department of Army (DA) BRAC Division and is responsible for managing DDMT's environmental cleanup and implementing the CIP. The BEC serves with representatives of the United States Environmental Protection Agency (USEPA) and Tennessee Department of Environment and Conservation (TDEC) on the Site Management Team; formerly known as the BRAC Cleanup Team (BCT). See Section 2.3.3 for DA BEC contact information.

After being added to the National Priorities List (NPL) also known as Superfund in 1992, DDMT implemented a proactive, community-based outreach program as part of an overall commitment to protect human health and the environment and to return the property to productive community use. In 1994, a Technical Review Committee (TRC) consisting of representatives from DDMT, USEPA, TDEC and municipal government was established. The TRC was converted to a Restoration Advisory Board (RAB) in 1997 and representatives from local community groups were added to facilitate communications with the community regarding environmental issues. Additional information is provided in Sections 2.2.4 and 3.2.

The 1997 Interim Community Relations Plan (CRP) focused on identifying community concerns, implementing community outreach to build trust and credibility, and facilitating communication with the community regarding environmental issues. The 1999 CRP focused on sustaining public trust and credibility while using outreach to reduce community concern during several high-visibility activities, including the chemical warfare materiel (CWM) removal program and the remedial investigations (RIs) for the Main Installation (MI) and Dunn Field.

The 2004 CIP, prepared after the Records of Decision (RODs) for both the MI and Dunn Field were signed, changed the focus from community involvement in the decision process to keeping the community informed during implementation of the selected remedies. The 2010 CIP was prepared after the Dunn Field ROD Amendment was signed in 2009 to fulfill public involvement requirements during operation and maintenance (O&M) and long-term monitoring (LTM) of the original and amended remedies.

The purpose of this 2020 CIP is to describe the steps that will be taken to fulfill public involvement requirements during continuing O&M and LTM of the selected remedies, and

during the Supplemental Remedial Investigation (SRI), Focused Feasibility Study (FFS) and review of the selected remedy on the MI. Community involvement will continue until the remedial action objectives (RAOs) in the decision documents are achieved and DDMT is deleted from the NPL. The CIP was submitted to USEPA and TDEC for review on 5 June 2018. Responses to comments are provided in Appendix A.

The specific objectives of the CIP are to:

- Provide effective management of the community involvement program;
- Respond to public concerns and fulfill information needs;
- Fulfill public involvement requirements; and
- Fulfill information availability requirements.

The CIP will be implemented to ensure compliance with applicable federal, state, and DoD community involvement requirements and guidelines.

This CIP describes site history, location and surrounding land use, and environmental restoration (Section 2.0), provides background information on the surrounding community (Section 3.0), presents the community involvement program (Section 4.0), and provides point of contact for civic officials, regulatory agency personnel and local media organizations (Appendices B and C). The CIP draws upon several information sources, including previous CIP versions, community contacts on the Community Involvement Line (CIL), public comments received on Five-Year Reviews, and DDMT site files.

2 Site Information

2.1 Site Description/Location

DDMT encompasses 642 acres in the south-central section of Memphis, 4 miles southeast of the Central Business District and 1 mile north of Memphis International Airport (Figure 1). The facility is located in a mixed residential, commercial, and industrial land use area.

DDMT consists of two areas, the MI and Dunn Field (Figure 2). The MI covers 578 acres bordered by Airways Boulevard to the east, Perry Road to the west, Ball Road to the south, and Dunn Avenue to the north.

The MI contained most of the buildings and material storage yards for DDMT. At the time of closure in 1997, there were approximately 118 buildings, 26 miles of railroad tracks, and 28 miles of paved streets at DDMT. Approximately 126 acres were used for covered storage space, and approximately 138 acres were used for open storage space. The MI was redeveloped by the Depot Redevelopment Corporation (DRC) as Memphis Depot Business Park and later renamed Memphis Depot Industrial Park. The majority of the MI was subsequently sold to Mayfield Properties LP and Barnhart Crane; Mayfield Properties LP later sold its property to Memphis Depot TIC LLC and DP 107 LLC. Colliers International is the property manager for the Memphis Depot Industrial Park. The DRC, now operated under the Economic Development Growth Engine (EDGE) of Memphis and Shelby County, retains a portion of the MI (Table 1 and Figures 3 and 4).

Dunn Field is located across Dunn Avenue from the northwest quadrant of the MI. Dunn Field covers 64 acres of mostly undeveloped land that was historically used for storage of bauxite and fluorspar and for waste disposal. Approximately 41 acres of the eastern area of Dunn Field have been transferred, with about 39 acres sold to the Dunn Field Business Park LLC and about 2 acres transferred to the City of Memphis for realignment of Hayes Road (Table 1 and Figure 3). Remedial actions (RAs) on Dunn Field have been completed. The remaining property is being reviewed for suitability to transfer through competitive public sale.

The area surrounding DDMT was formerly residential and agricultural but is now characterized by commercial and manufacturing uses to the north and east and residential use to the south and west. A large residential area remains east of Dunn Field along a portion of and across Dunn Avenue from the MI's northern boundary. Residential areas are situated across Perry Road to the west and Ball Road south of the MI.

Airways Boulevard, on the east border of the MI, is the most heavily traveled thoroughfare in the area. It is developed with numerous small, commercial establishments, particularly in the area from DDMT south to the Airways Boulevard interchange on Interstate 240. Businesses along Airways Boulevard are typical of highway commercial districts and include convenience stores, liquor stores, restaurants, used car dealers, and service stations.

Other commercial establishments are located north, south, and west of DDMT. Most are small groceries or convenience stores that serve the immediate neighborhoods. Memphis Light, Gas, and Water (MLGW) operates a large substation located northwest of DDMT along East Person Avenue. The Burlington Northern Santa Fe Railroad and Illinois Central Railroad are north of Dunn Field. A number of large industrial and warehousing operations are located along the rail lines in the area.

Surface water drainage at DDMT is accomplished by overland flow to swales, ditches, concrete-lined channels, and a storm drainage system. The concrete-lined channels and storm drainage system are directed to Nonconnah Creek south of the site or to the west into Tarrant Branch a tributary of Nonconnah Creek. Dunn Field's surface drainage is achieved by overland flow to adjacent properties located to the north and west. The northeast quadrant of Dunn Field drains to the east, to a concrete-lined drain that empties into Cane Creek north of the site. Cane Creek is also a tributary of Nonconnah Creek. Water flowing in Nonconnah Creek drains into Lake McKeller, a tributary of the Mississippi River, about 6 miles west of the site (Figure 5). There are two surface water bodies on the golf course area, Lake Danielson and the Golf Course Pond which receive surface water drainage from the MI. Overflow from the two water bodies is channeled through concrete culverts beneath Ball Road and drains into Nonconnah Creek.

2.2 Site History

2.2.1 Initial Site Use

The 642 acres on which DDMT is located were used for cotton farming until purchased by the United States (U.S.) Army in 1940. The initial mission and function of DDMT were to provide stock control, storage, and maintenance services for the Army Engineer, Chemical and Quartermaster Corps. The installation was originally named Memphis General Depot, but has also been known as Memphis Quartermaster Depot, Memphis Armed Service Forces Depot and Memphis Army Depot.

During World War II, DDMT served as an internment center for 800 prisoners of war and performed supply missions for the Signal and Ordnance Corps. From 1963 until closure on 30 September 1997, DDMT was a principal distribution center for the Defense Logistics Agency (DLA), shipping and receiving a variety of materials including hazardous substances; textile products; food products; electronic equipment; construction materials; and industrial, medical, and general supplies. DDMT received, warehoused, and distributed supplies common to all U.S. military services in the southeastern U.S., Puerto Rico, and Panama. DDMT received approximately 4 million line items and shipped approximately 107,000 tons of material annually.

2.2.2 Environmental Background

As a result of DDMT's past operations, large quantities of industrial chemicals or hazardous substances were received, stored, repackaged, and shipped. These substances were received as packaged commodities from manufacturers in containers that ranged in size up to 55-gallon drums. While in storage, these substances were segregated by hazardous storage compatibility

groups to ensure appropriate safety conditions were met. Some of these items were spilled or leaked at the MI or were buried at Dunn Field. Lists of the specific materials handled at DDMT from 1942 to 1997 are not available.

From 1940 until 1948, an area at the southwest section of Dunn Field was used to landfill outdated or damaged food stocks. In 1948, 20 captured German bomb casings containing mustard agent were decommissioned in the southwest section of Dunn Field. The northwest section of the Dunn Field area was used as the landfill site for unusable, nonhazardous subsistence stocks from the late 1940s to mid-1960s. Additionally, small quantities of hazardous substances handled at DDMT were buried in the northwest section of Dunn Field.

DDMT generated Resource Conservation and Recovery Act (RCRA) hazardous wastes and for several years held a RCRA Part B permit for the storage of hazardous waste (TN 4210020570). Hazardous wastes generated by DDMT consisted of hazardous substances that reached shelf-life expiration dates and could no longer be used by the military services, and waste materials from vehicle maintenance and cleanup of small hazardous substance spills. Subsequent to issuing the RCRA permit, USEPA prepared a final Hazard Ranking System (HRS) Scoring Package for the facility in 1991. Based on the final HRS score, USEPA added DDMT to the NPL (57 Federal Register 47180 No. 199) in 1992.

In March 1995, USEPA, TDEC and DLA entered into a Federal Facilities Agreement (FFA), which outlined the process for investigation and cleanup of the sites at DDMT under CERCLA.

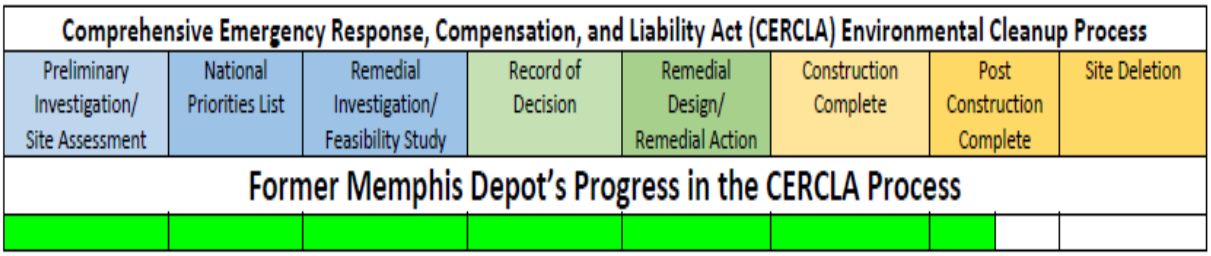
2.2.3 Site Closure and Cleanup Summary

In July 1995, DDMT was identified for closure under the BRAC process, which requires environmental restoration at DDMT to comply with requirements for property transfer. Project managers for DLA, USEPA and TDEC formed the BCT and divided the site into parcels to identify property available for transfer and to identify property requiring environmental cleanup prior to transfer.

The City of Memphis and Shelby County established the Memphis Depot Redevelopment Agency, which became the DRC, to plan and coordinate the reuse of DDMT. Between 2000 and 2010, the BCT identified all DDMT property as suitable to transfer as documented in BRAC Cleanup Plans. The former family housing area and the administrative area on the MI and the eastern portion of Dunn Field were found suitable for unrestricted reuse. The golf course was found suitable for recreational reuse only. The remainder of DDMT was found suitable for industrial reuse only. All of DDMT, except for western and northern sections of Dunn Field, have been transferred out of government control (Table 2 and Figure 3). See Sections 2.3.1.5 and 2.3.2.5 for more information about property transfer.

The Superfund cleanup process at DDMT is in the Post-Construction phase. Environmental investigations and RAs are addressed in more detail in Section 2.3. All RAs selected in the RODs have been implemented and several actions have been completed. USEPA has approved the Interim Remedial Action Completion Reports (IRACRs) for the MI, the Disposal Sites and Source Areas at Dunn Field, and the Off-Depot Groundwater and has concurred that

the treatment systems are operating properly and successfully. USEPA has also issued the *Preliminary Close-Out Report* (USEPA, 2010) documenting construction completion for all cleanup remedies at DDMT.



Groundwater sample results from LTM at the MI have shown reduction in contaminant concentration from the remedial action, but concentrations in approximately 95 LTM wells on the MI remain above the cleanup standards (HDR, 2020a). Due to contaminant levels above the cleanup standards at the MI and contamination migration onto the MI from offsite sources (Figures 6 and 7), the DA has recently completed an SRI for groundwater under the MI.

The SRI was conducted from 2015 to 2019 to gather additional information on the MI for site hydrogeology, extent of groundwater contamination and potential offsite sources of contamination. An investigation of potential vapor intrusion risk is also being performed to ensure the site remains protective of human health and the environment. The FFS will be performed after completion of the SRI to identify remedial alternatives that can meet the groundwater cleanup standards throughout the MI. An Explanation of Significant Differences (ESD) or a ROD Amendment will be prepared as necessary to document changes to the selected remedy. Further RA will be conducted after the FFS is completed and the selected remedy has been confirmed or revised. Based on the project schedule in the 2020 Site Management Plan (SMP) (HDR, 2020b), additional RA at the MI should be completed in 2025 followed by LTM until 2026; the MI Remedial Action Completion Report should be completed in 2027.

The Off-Depot Groundwater System currently operating west of Dunn Field was expanded in September 2020 with five additional air sparge wells in order to achieve RAOs. System operations will continue at least through July 2022. RAs for subsurface soil have been completed at the Source Areas and Disposal Areas of Dunn Field.

The extent of groundwater contamination at Dunn Field is shown on Figure 8. DA is conducting a groundwater investigation in the areas north and northeast of Dunn Field in an effort to identify the source of contamination moving across the north end of Dunn Field. DA is also investigating increased groundwater contaminant concentrations on the west-central side of Dunn Field to locate potential sources on Dunn Field.

Groundwater monitoring will continue until RAOs are met. The 2020 SMP project schedule projects RAs will be completed by 2021 followed by compliance monitoring in 2022; the Dunn Field Remedial Action Completion Report should be completed in 2023.

The site-wide Final Closeout Report is scheduled to be completed in 2028. After USEPA and TDEC review and approval of the Closeout Report, DDMT will petition to be removed from the NPL.

2.2.4 Early Community Involvement

DDMT established Information Repositories (IRs) in 1993 at four locations: DDMT, Memphis Main Branch Public Library, Cherokee Branch Public Library, and the Shelby County Health Department, Pollution Control Division. The IR provides the site's CIPs, RAB meeting minutes and presentations, newsletters/EnviroNews, media releases, fact sheets, and the site's Administrative Record (AR) for community review. The AR includes the site's technical documents including sampling plans, investigation and sampling results, feasibility studies, public health assessments, records of decision, findings of suitability to transfer, and other documents used by DA, USEPA and TDEC to make environmental cleanup decisions at DDMT.

The RAB for DDMT was established in 1994. The RAB included representatives from the Memphis City Council, Shelby County Commission and Shelby County Health Department (SCHD) as well as representatives from local community groups interested in the DDMT cleanup project including the Defense Depot Memphis Tennessee – Concerned Citizens Coalition and several neighborhood associations.

Community involvement activities at DDMT consisted of RAB meetings, distribution of the EnviroNews newsletter to over 4,000 community members, public briefings, and public comment periods and meetings. Community interviews conducted in 2004 indicated that community stakeholders were satisfied with the information provided and the work being done in the environmental restoration of DDMT. Awareness levels were very high; nearly all interviewees expressed some knowledge of the environmental issues at DDMT. Community outreach tools, such as the newsletter and fact sheets, were considered effective in reaching the community. Participants generally viewed DDMT's credibility as neutral or positive.

Community attendance at RAB meetings and other public meetings declined from 2004 through 2009. Due to the progress in RAs and decreased community participation, the RAB voted to adjourn at the October 2009 meeting. The CIL was established in 1994 in order for the community to request information and to voice concerns about contaminants and cleanup activities at DDMT. Calls to the CIL since 2010 are listed on Table 3. There have been 33 individual callers to the CIL. Of these, 13 callers had specific comments or requests for information about environmental cleanup at DDMT and 8 callers had specific comments about health issues believed to be caused by contaminants at DDMT or requests for information to file claims (Table 3). Additional information about community concerns is provided in Section 3.3.

2.3 Site Cleanup Activities

2.3.1 Main Installation

2.3.1.1 Early Removal Actions

Removal actions taken on the MI prior to the ROD are listed below with locations shown on Figure 9.

- Approximately 602 cubic yards (CY) of surface and subsurface soil were removed from the pentachlorophenol (PCP) dip vat area (Building 737) in 1985 because of elevated levels of PCP.
- Approximately 60,000 gallons of hazardous and petroleum/oil/lubricants materials from damaged drums were reclaimed and repackaged at Building 873 in 1985. Approximately 800 55-gallon drums were recouped in this open storage area and then staged for storage and distribution.
- Approximately 5,000 tons (3,700 CY) of surface soil in the housing area were removed in 1998 because of elevated levels of dieldrin. The housing area is an exception to the overall industrial land use for the MI and remediation levels were based on residential reuse.
- Approximately 530 tons (400 CY) of surface soil surrounding the cafeteria (Building 274) was removed in 1998 because of elevated levels of polychlorinated biphenyls.
- Approximately 980 CY of surface and subsurface soil near Buildings 1084, 1085, 1087, 1088, 1089 and 1090 were removed in 2000 because of elevated levels of metals and polyaromatic hydrocarbons.

2.3.1.2 Remedial Investigation

Site investigations from 1989 to 2001 are described in the *Memphis Depot Main Installation Remedial Investigation Report, Volumes I through IV* (CH2M HILL, 2000). The MI RI identified contamination in surface soil and ground water. Surface soil contaminants of concern (COCs) requiring cleanup consisted of metals, pentachlorophenol, polychlorinated biphenyls, polyaromatic hydrocarbons, and a pesticide, dieldrin.

Groundwater COCs requiring cleanup were limited to chlorinated volatile organic compounds (CVOCs) primarily tetrachloroethene, trichloroethene, carbon tetrachloride, and chloroform. CVOCs were not detected at high concentrations in soil samples on the MI.

According to the Agency for Toxic Substances and Disease Registry (ATSDR) *Public Health Assessment for Defense Depot Memphis Tennessee* (ATDSR, 2000) and *Health Consultation, Evaluation of Results, U.S. Environmental Protection Agency Investigation of Contaminants in Surface Soils near Surface Water Drainage Ditches from Memphis Depot* (ATSDR, 2003), soil contamination was limited to the area within the boundaries of DDMT, was not moving off site in surface water drainage ditches, and presented no apparent health hazard to the surrounding community. ATSDR determined that the community was not being exposed to groundwater contaminants as drinking water is provided by MLGW; therefore, ATSDR determine there were

no apparent health hazards from groundwater contamination. See Appendix D for chemical profile sheets for the COCs.

2.3.1.3 Record of Decision

The *Memphis Depot Main Installation Record of Decision (MI ROD)* (CH2M HILL, 2001) received final approval on September 6, 2001. The selected remedy contained the following components:

- Excavation, transport and offsite disposal (ET&D) of lead contaminated surface soil near Building 949.
- Deed restrictions and land use controls (LUCs), which include prevention of residential land use on the MI, except at the existing housing area; daycare restrictions; restrictions on groundwater use and drilling; and maintenance of a boundary fence around the golf course.
- Enhanced bioremediation treatment (EBT) of CVOCs in the most contaminated part of the groundwater plume.
- Long-term groundwater monitoring to document changes in plume concentrations and to detect potential plume migration to offsite areas or into deeper aquifers.

The area of lead contamination in soil near Building 949 (approximately 300 CY) was excavated and disposed offsite prior to final execution of the ROD. The action was taken under DLA's removal authority within CERCLA Section 104 in order to accommodate the economic redevelopment of the site.

2.3.1.4 Remedial Action

EBT was performed in groundwater at two treatment areas in the southwest and southeast areas of the MI from September 2006 through February 2009. CVOC concentrations were reduced over 90 percent in injection wells and over 80 percent in some monitoring wells. Injections were discontinued in 2009 based on the reduction in CVOC concentrations, results from additional source investigation, and trends in CVOC concentrations from the LTM results. In March 2010, USEPA approved the *Main Installation Interim Remedial Action Completion Report, Revision 1* (HDR|e^{2}M, 2010) that included DLA's demonstration that the MI remedy was operating properly and successfully.

Additional EBT was performed from November 2012 to November 2014 due to rebound in CVOC concentrations in LTM samples. While CVOC concentrations were reduced during the additional EBT, the RA was not sufficient to meet the RAOs for the MI (Figures 6 and 7). As stated in Section 2.2.3, the SRI was performed to provide additional on the extent of contamination in order to alternative remedial actions. Additional investigation of soil vapor and potential for vapor intrusion into buildings will continue in 2021. Further RA will be conducted after the FFS is completed and the selected remedy has been confirmed or revised. LTM will continue until RAOs for groundwater are met.

LUCs to prevent residential use and exposure to contaminated groundwater will remain in place until concentrations of COCs have been reduced to levels that allow for unlimited exposure and unrestricted use. The MI LUCs consist of deed and/or lease restrictions, Notice of Land Use Restrictions, City of Memphis/Shelby County zoning restrictions and SCHD groundwater well restrictions. DA is responsible for monitoring LUCs. Annual inspections are conducted to determine if the required LUCs remain effective and if land use restrictions are being properly implemented. The Notice of Land Use Restrictions for the MI was recorded at the City of Memphis/Shelby County Register of Deeds on January 26, 2005. Annual inspections to confirm that property owners comply with the MI LUCs have been performed and documented since 2005.

DA documents progress toward meeting the RAOs in Five-Year Reviews which are available to the public in the IR. Notices requesting public input on the Five-Year Reviews are placed in a local newspaper and mailed to city and county representatives as well as former RAB members. Upon achieving the RAOs in the MI ROD, DA will prepare a Remedial Action Completion Report documenting the cleanup activities for USEPA approval.

2.3.1.5 Property Redevelopment

All of the MI property has been transferred for reuse. The former family housing area and administrative area were found suitable for unrestricted reuse. The golf course was found suitable for recreational reuse only. The remainder of DDMT was found acceptable for industrial reuse only.

Parcels were made available for transfer through Findings of Suitability to Transfer (FOSTs) prepared by DLA and approved by DA. Four FOSTs have been completed for the MI with property transferred from DA to Alpha Omega Veterans (housing area), City of Memphis (golf course and police precinct) and the DRC (Memphis Depot Business Park). See Table 2 and Figure 3 for MI property transfer information. As noted in Section 2.2, the DRC sold the majority of the MI property to Mayfield Properties LP and Barnhart Crane. The warehouses on the MI are operated as the Memphis Depot Industrial Park. The current property owners, acreage and site use are listed on Table 1, and the properties are identified on Figure 4.

2.3.2 Dunn Field

2.3.2.1 Early Removal and Remedial Activities

Cleanup actions taken on Dunn Field prior to the Final ROD are listed below with locations shown on Figure 10.

The *Record of Decision for Interim Remedial Action (IRA) of the Groundwater at Dunn Field (OU-1)* (CH2M HILL, 1996) was signed in April 1996. Construction of the groundwater extraction system with seven extraction wells was completed in October 1998 and began operation in November 1998. The system was expanded in June 2001 with five additional extraction wells. After implementation of the selected remedy on Dunn Field, CVOC concentrations met the

ROAs and the IRA system was shutdown in January 2009. IRA system abandonment and removal was approved by USEPA and TDEC and completed in July 2010.

DLA conducted a CWM removal action at three sites on Dunn Field that began in May 2000 and was completed in March 2001. Approximately 914 CY of soil contaminated with mustard degradation by-products, and 19 CY of mustard-contaminated soil were excavated, transported, and disposed offsite. In addition, twenty-nine bomb casings were recovered from Site 24-A and disposed offsite.

In March 2003, DLA completed a removal action for lead contaminated surface soil at Site 60, a former pistol range in the Northeast Open Area. Approximately 930 CY of lead contaminated surface soil were excavated, transported, and disposed offsite.

2.3.2.2 Remedial Investigation

Site investigations are described in the *Memphis Depot Dunn Field Remedial Investigation Report* (CH2M HILL, 2002). Site records indicated that chemical warfare material, chlorinated lime, super tropical bleach, and calcium hypochlorite, food stocks, paints/thinners, petroleum/oil/lubricants, acids, herbicides, mixed chemicals, and medical waste were destroyed or buried in pits and trenches at Dunn Field disposal sites.

Subsurface soils, including those from the disposal sites in the Disposal Area affected groundwater quality in the shallow Fluvial Aquifer. CVOCs were detected in subsurface soils in the Disposal Area and in groundwater. The subsurface soil and groundwater COCs are carbon tetrachloride; chloroform; cis-1,2 dichloroethene; 1,1,2,2-tetrachloroethane; tetrachloroethene; 1,1,2-trichloroethane; trichloroethene; and vinyl chloride.

According to the ATSDR *Public Health Assessment for Defense Depot Memphis Tennessee* (ATDSR, 2000) and *Health Consultation, Evaluation of Results, U.S. Environmental Protection Agency Investigation of Contaminants in Surface Soils near Surface Water Drainage Ditches from Memphis Depot* (ATSDR, 2003), soil contamination was limited to the area within the boundaries of DDMT, was not moving off site in surface water drainage ditches, and presented no apparent health hazard to the surrounding community. ATSDR determined that the community was not being exposed to groundwater contaminants as drinking water is provided by MLGW; therefore, ATSDR determine there were no apparent health hazards from groundwater contamination. Areas of groundwater contamination are shown on Figure 8. Chemical profile sheets for the contaminants of concern are provided in Appendix D.

2.3.2.3 Record of Decision

The *Memphis Depot Dunn Field ROD* (CH2M HILL, 2004) was finalized in April 2004. The eastern portion of Dunn Field with approximately 41 acres was designated available for unrestricted use.

The components of the selected remedy are:

- ET&D of soil and material contained within disposal sites based upon results from a pre-design investigation
- Soil vapor extraction (SVE) to reduce volatile organic compound (VOC) concentrations in subsurface soils to levels that are protective of the intended land use and groundwater
- Injection of zero-valent iron (ZVI) within Dunn Field to treat CVOCs in the most contaminated part of the groundwater plume, and installation of a permeable reactive barrier (PRB) to remediate CVOCs within the offsite areas of the groundwater plume
- Monitored natural attenuation (MNA) and LTM of groundwater to document changes in plume concentrations, detect potential plume migration to offsite areas or into deeper aquifers, and track progress toward remediation goals.
- Implementation of LUCs: Deed and/or lease restrictions; Notice of Land Use Restrictions; City of Memphis/Shelby County zoning restrictions and SCHD groundwater well restrictions.

The selected remedy was revised through the *Dunn Field ROD Amendment, Revision 1* (e^2M, 2009a) finalized in March 2009. The ROD Amendment documented a fundamental change in the remedy for the offsite groundwater plume, which was the use of air sparging with soil vapor extraction (AS/SVE) instead of a PRB. The ROD Amendment also revised the criteria for the extent of the AS/SVE system and clarified the treatment objective.

2.3.2.4 Remedial Actions

Four RAs were conducted to implement the selected remedies for Dunn Field with locations shown on Figure 11:

- Early Implementation of Selected Remedy (EISR) for Off-Depot groundwater;
- Disposal Sites RA of ET&D;
- Source Areas RA of SVE, ET&D, and in situ thermal desorption (ISTD) in subsurface soils and ZVI injections in groundwater; and
- Off-Depot Groundwater RA of AS/SVE, implementation of LUCs, MNA, and LTM.

The EISR was performed to reduce CVOC concentrations in groundwater under the MLGW substation on Menager Road. ZVI injections were made from November 2004 through January 2005. Contaminant levels were reduced, but not as much as anticipated. In September 2005, USEPA approved the *EISR Interim Remedial Action Completion Report, Revision 1* (MACTEC, 2005); the report recommended decreased spacing between injection locations to achieve increased CVOC reduction.

The Disposal Sites RA was performed during two separate mobilizations, March through May 2005 and February through March 2006. Final confirmation samples met the cleanup standards. Approximately 2,700 CY of non-hazardous materials were transported and disposed offsite. A

total of approximately 234 CY of hazardous materials was transported and disposed offsite. USEPA approved the *Dunn Field Disposal Site RA Completion Report* (MACTEC, 2006) in August 2006.

The Source Areas RA consisted of Fluvial SVE (FSVE), additional ET&D and ISTD. ZVI injections were not required because groundwater objectives for the Source Areas remedy were achieved by the FSVE, ET&D and ISTD portions of the remedy. The FSVE system operated from July 2007 until July 2012; it was shutdown based on confirmation soil sample results demonstrating that RAOs had been met. The FSVE system removed approximately 4,000 pounds of VOCs from the subsurface soil beneath Dunn Field. CVOC concentrations in groundwater began to decrease shortly after FSVE operations began.

ET&D was performed at two locations (TA-1 and TA-3) that are shown as *Loess Excavations* on Figure 11. Approximately 210 CY of waste material and soils from TA-1 and 7,200 CY of drums, other debris and soil were excavated from TA-3; the soil and debris were disposed offsite.

ISTD treatment in the loess, 5 to 30 feet below ground surface, was performed in four areas covering 1.25 acres and operated continuously from May to November 2008 when the heaters were shut down in the final treatment area. Approximately 12,500 pounds of VOCs were removed during treatment. Final confirmation samples met the cleanup goals. The combined mass of VOCs removed by the FSVE and ISTD remedies (16,500 pounds) was slightly more than the estimated mass of VOCs (14,300 pounds) listed in the *Source Areas Final Remedial Design* (CH2MHILL, 2007).

USEPA approved the *Operating Properly and Successfully Demonstration, Source Areas Remedial Action* (e2M, 2009b) in October 2009 and approved the *Source Areas Interim Remedial Action Completion Report, Revision 1* (HDR|e2M, 2009) in November 2009.

The Off-Depot Groundwater RA included the AS/SVE system, LUCs and LTM. The AS/SVE system, located northwest of Dunn Field at the MLGW substation on Menager Road (Figure 11), began operation in December 2009. The AS/SVE system has removed approximately 87 pounds of VOCs from the groundwater through 2019. CVOC concentrations in groundwater at most Off-Depot Groundwater monitoring wells have been reduced to the cleanup goal. One well, MW-159, remains above the active treatment goal (Figure 8). In 2020, five additional air sparge wells were installed and became operational. AS/SVE system operations will continue until July 2022 or until the active treatment goal is achieved.

Since 2015, DA and TDEC have studied soil vapor and groundwater in the areas north and northeast of Dunn Field in an effort to locate the offsite source of contamination moving across the north end of Dunn Field and through the Off-Depot Groundwater System (Figure 8). DA performed a membrane interface probe at the northeast corner of Dunn Field in 2017 which did not find onsite contamination. In 2020, DA began an offsite groundwater investigation and installed nine monitoring wells in the neighborhoods north and northeast of Dunn Field to evaluate the presence of an offsite source.

Groundwater LTM results have shown increasing contaminant concentrations on the west-central side of Dunn Field near MW-87. DA began further investigation and risk assessment in 2020 to evaluate whether the property was suitable for transfer. The investigation will be completed in early 2021 and the report will be provided to USEPA and TDEC for review.

LUCs to limit use of the Disposal Area to light industrial land uses, prevent residential use of Dunn Field, and prevent exposure to contaminated groundwater will remain in place until concentrations of COCs have been reduced to levels that allow for unlimited exposure and unrestricted use. The Dunn Field LUCs consist of deed and/or lease restrictions, Notice of Land Use Restrictions, City of Memphis/Shelby County zoning restrictions and SCHD groundwater well restrictions. DA is responsible for monitoring of LUCs. An annual inspection is conducted to determine whether the required LUCs remain effective and that land use restrictions are being achieved. The Notice of Land Use Restrictions for Dunn Field was recorded at the City of Memphis/Shelby County Register of Deeds on June 11, 2009. Annual inspection to determine whether the required LUCs remain effective and that land use restrictions are being met have been performed and documented since 2009.

DA documents progress toward meeting the RAOs in Five-Year Reviews which are available to the public in the IR. Notices requesting public input on the Five-Year Reviews are placed in a local newspaper and mailed to city and county representatives as well as former RAB members. Upon achieving the RAOs for groundwater, DA will prepare a Final Remedial Action Completion Report for USEPA approval that provides the basis for removing DDMT from the NPL. Upon achieving the RAOs in the Dunn Field ROD Amendment, DA will prepare a RACR documenting the cleanup activities for USEPA approval.

2.3.2.5 Property Redevelopment

The eastern section of Dunn Field, containing approximately 41 acres, was determined in the Dunn Field ROD to be available for unrestricted reuse. Approximately 39 acres were transferred through competitive public sale in 2007 to Dunn Field Business Park I LLC, an affiliate of Troy, Michigan-based Stuart Frankel Development Co.; the property remains undeveloped. Approximately 2 acres were transferred through public benefit conveyance to the City of Memphis in 2005 for realignment of Hayes Road.

The remainder of Dunn Field, consisting of approximately 26 acres along the western and northern boundaries, is planned for transfer through competitive public sale. The property is currently undeveloped. The transfer has been delayed due to economic conditions, the presence of remediation equipment and monitoring wells on-site, and additional groundwater investigation. The property is currently undeveloped. See Table 2 and Figure 3 for Dunn Field property transfer information. The current property owners, acreage and site use are listed on Table 1.

2.3.3 Points of Contact

The DA points of contact for all questions regarding DDMT and the cleanup program are:

Primary:	Joan Hutton BRAC Environmental Coordinator (BEC) CALIBRE 2241 Truitt Street Memphis, Tennessee, 38114 (901) 774-3683 Joan.Hutton@calibresys.com
Secondary:	James C. Foster BRAC Program Manager G-9 DAIN-ISE 600 Army Pentagon Washington DC 20310-0600 (Reg Mail) NC3/Taylor Bldg/RM 1416 2530 Crystal Drive Arlington VA 22202 (FedEx) 703-545-2541; DSN 865 James.C.Foster10.civ@mail.mil
Contact the CIL at (901) 774-3683 and leave a message, to request information on DDMT's environmental cleanup project or to be added to or removed from the mailing list.	
Information about DDMT's Superfund site may also be found on USEPA's website https://cumulis.epa.gov/supercpad/cursites/csitinfo.cfm?id=0404159.	
AR and IR documents may be requested through the TDEC document request website at: https://www.tn.gov/environment/contacts/public-records-request.html. You may also call (901) 371-3000 for assistance in requesting documents.	

The regulatory agency remedial project managers (RPMs) for DDMT are:

USEPA:	Diedre Lloyd U.S. Environmental Protection Agency 61 Forsyth St., SW Atlanta, Georgia 30303 (404) 229-9500 Lloyd.Diedre@epa.gov
TDEC:	Jamie Woods Tennessee Department of Environment and Conservation 8383 Wolf Lake Drive Bartlett, Tennessee 38133-4119 (901) 371-3041 Jamie.Woods@tn.gov

For questions regarding health concerns, please contact the SCHD:

Chief of Epidemiology David Sweat, MPH 814 Jefferson Avenue Memphis, Tennessee 38105 (901) 222-9229 david.sweat@shelbycountytn.gov
Environmental Health Kasia Smith-Alexander 1826 Sycamore View Road Memphis, Tennessee 38134 (901) 222-9000 kasia.alexander@shelbycountytn.gov

The Office of the Staff Judge Advocate handles medical claims for the DA:

Office of the Staff Judge Advocate 101st Airborne Division (Air Assault) Attn: AFZB-JA-C Fort Campbell, KY 42223-5208 Bldg. 2765 Tennessee Ave. http://www.campbell.army.mil Legal Assistance: (270) 798-4432/6369 Claims: (270) 798-5011 Hours: Monday - Wednesday: 9 a.m. – 4:30 p.m. Thursday 1 p.m. – 4 p.m. Friday 9 a.m. – 3 p.m. Closed for lunch daily: 12 p.m. - 1 p.m.

3 Community Background

3.1 Community Profile

The demographic profile for the 38114 postal code containing DDMT was compiled from selected demographic and housing statistics in the 2010 U.S. Census of Population and Housing. The immediate area surrounding DDMT is composed of seven census tracts.

The 2010 census data for Memphis lists the population of Memphis as 646,889 (National Census Report, 2011). The DDMT area has a total population of 26,905. The ethnic composition of the population in the area is 92.5 percent African-American. The percentage of African-Americans in Memphis is 63.3. The primary spoken language for the community is English. No barriers to communication with the community have been identified. U.S. Postal Service has been the best method for reaching the target community.

The leading Environmental Justice concern has been the perceived impact of DDMT contamination on community health. The Public Health Assessments produced by ATSDR have not supported this perception. During 1998 through 2003, ATSDR attended RAB and community information sessions to discuss health concerns.

The area surrounding DDMT was formerly residential and agricultural but is now characterized by commercial and manufacturing uses to the north and east and residential use to the south and west. A large residential area remains east of Dunn Field along a portion of the MI's northern boundary. The residential areas surrounding DDMT were established in the 1940s and currently have 10,385 households. The average number of persons per household is 2.6, very close to the Memphis average of 2.5. Housing occupancy is 78%, which is lower than the city average of 86%.

Of note is the fact that 29.4% of the households have one or more persons 65 years old or older. This is about 9% higher than the city average. The percentage of owners living in their homes is about 3% less than the city average.

Located within 0.5 mile of DDMT are 26 churches (Table 4) and 4 schools (Table 5). The churches and schools are included on the DDMT mailing list. There are also two neighborhood parks in the area; Alcy Samuels Park located south of the MI and Alcy Warren Park located southwest of the MI.

Information on active neighborhood associations in the area is limited. A representative of the Alcy Ball Neighborhood Association contacted the CIL in 2019 and was added to the mailing list. The mailing list includes several neighborhood associations. No other neighborhood association representatives have been identified through past contacts.

The local government consists of the City of Memphis and Shelby County Mayors, Memphis City Council and Shelby County Commission. DDMT is within City Council District 4 and Super District 8 as well as Shelby County Commission District 10. See Appendix B for local

government points of contact. The SCHD Environmental Health division is also involved with the DDMT cleanup. See Section 2.3.3 for SCHD points of contact.

Stakeholders include current Memphis Depot Industrial Park property owners, tenants and employees; residents, churches and schools near the site and in areas where monitoring wells have been installed; and the federal, state, city and county officials representing DDMT districts. Stakeholders are included on the mailing list and receive the annual newsletter.

3.2 History of Community Involvement

DDMT has a longstanding commitment to encouraging effective community involvement through ongoing communication and community outreach activities. A chronological listing of community involvement activities conducted by DDMT from 1993 through 2020 is provided in Appendix E.

In February 1994, DDMT formed a Technical Review Committee consisting of representatives of DDMT, USEPA, TDEC, Shelby County Health Department, City Council and County Commission. The TRC converted to a RAB in July 1997 and added several community members. From 1994 until 2001 RAB meetings were generally held nine times per year. Beginning in 2002, RAB meetings were held four times per year (quarterly) until 2007 when meetings were held two times per year. The RAB elected to adjourn in 2009 based on lack of community participation at RAB meetings and upon selection of the final cleanup remedies.

Since adjournment of the RAB, community involvement activities include public comment periods for required documents, annual distribution of the newsletter, and fact sheet distribution notifying specific neighborhoods of upcoming investigation or cleanup activities in the area. DDMT also communicates with property owners and tenants when obtaining access to conduct work on private property. Notices of the Five-Year Review are placed in a local newspaper and notifications are mailed to the city and county mayors, city council and county commissioners representing the DDMT district, local health department, MLGW representative, USEPA, TDEC and the former RAB members.

Since 2010, DDMT has prepared an annual newsletter, EnviroNews, describing environmental restoration activities in December of each year. From 1994 through 2009, the newsletter was prepared and distributed more frequently. Currently, the annual newsletter is mailed to approximately 3,200 area residents, city and county officials, former RAB members, Memphis Depot Industrial Park tenants, and other interested parties. DDMT has received an average of three calls per year from community members to the CIL since 2010 (Table 3).

3.3 Key Community Concerns

The results of the 2004 community interviews indicated that the community believed DDMT was responding to their concerns in a forthright and timely manner and would continue to do so in the future. There were no specific concerns about ongoing or future cleanup activities at DDMT. From 2004 until 2009 when the RAB adjourned, the community voiced concerns at RAB meetings and through RAB members. The community was mostly concerned with perceived

health impacts from DDMT contaminants. RAB presentations and community information sessions included health risk and public health assessment information. The Shelby County Health Department representative on the RAB also responded to community health concerns, as needed. At RAB meetings, community and RAB members expressed general concerns relative to environmental issues as well as concerns about Dunn Field grass maintenance, the 2000 Public Health Assessment and property redevelopment. These concerns were forwarded to the appropriate agencies.

The RAB and community members were informed of the Technical Assistance Grant (TAG) program through placement of a USEPA TAG factsheet in the IR in 1995 and through discussions at the February 1995 and April 1996 RAB meetings. Following a request from the RAB, DLA awarded a grant in July 2001 for Hess Environmental to provide technical assistance to the RAB. Since that time, no requests for a TAG have been received. A USEPA TAG factsheet is included at Appendix F.

The most common community concern voiced during the site's environmental cleanup project has been the effect of site contaminants on public health in the surrounding communities. ATSDR conducted the required public health assessment in 1995. In response to community concerns, ATSDR conducted another public health assessment in 2000 based on the remedial investigation sampling. ATSDR evaluated surface soil, surface water, sediment, groundwater, and air exposure pathways. Both assessments determined that there were no completed exposure pathways to the surrounding communities; therefore, site contaminants presented no apparent health hazard to the surrounding community.

In response to community concerns regarding site contaminants moving off site into neighboring communities through storm water drainage systems, ATSDR conducted a public health assessment based on soil and sediment samples collected by USEPA in drainage ditches in 2003. The assessment determined that contaminant levels presented no apparent health hazard to the surrounding community. ATSDR conducted several public meetings and attended RAB meetings between 1998 and 2003 to address community concerns regarding exposure to site contaminants.

At RAB meetings, community members occasionally raised concerns about health impacts from DDMT contamination and protection of the surrounding community during cleanup activities, especially CWM removal actions. USEPA, TDEC and DLA representatives on the RAB addressed these concerns or, as needed, forwarded the concern to the appropriate agencies. Due to community concerns, CWM removal actions included placement of a containment dome over the CWM removal sites. The RAB adjourned in 2009 due to completion of decision documents, declining community attendance at RAB meetings and the RAB's satisfaction that there was sufficient public oversight of the cleanup program.

People living near the Off-Depot Groundwater RA construction site and whose property was surveyed during the July 2009 soil vapor monitoring activities voiced few concerns about the cleanup activities. Their main concerns pertained to drainage problems that were referred to the appropriate city agency and noise levels from the AS/SVE equipment that DLA addressed. The

community received hand-delivered notices of the upcoming construction and monitoring activities. Local media also received press releases regarding the site activities.

After 2009, the community voiced concerns via the CIL and each edition of the newsletter contained an invitation to call the CIL with concerns. Since 2010, one media outlet contacted the CIL requesting DDMT cleanup information for an article about redevelopment of the Memphis Depot Industrial Park. Since then, no other media outlets have contacted the CIL or DA requesting DDMT cleanup program information.

In 2018, a former RAB member contacted local media and USEPA regarding a youth development program that included a gardening program on a portion of the MI, which is identified for industrial use only. DA and USEPA informed the property owner that the program did not comply with the industrial reuse or MI land use controls in place and the program ended. DA collected soil samples of the garden area to provide further risk assessment information. DA received no other community concerns regarding the youth gardening program.

Table 3 summarizes community contacts to the CIL specifically about the DDMT environmental cleanup program; it does not include administrative or business-related CIL contacts such as former RAB members accepting dinner invitations, engineering professionals requesting data as part of the real estate purchase process, former employees requesting personnel records, or Memphis Depot Industrial Park/other DDMT property owner personnel requesting non-environmental program information.

Between 2010 and 2020, 33 community members contacted the CIL; 15 callers had questions about the DDMT cleanup program, and 8 callers had concerns that DDMT contamination caused health issues to themselves, their families and the neighborhoods surrounding DDMT (Table 3). DA directed callers with health concerns to contact the Shelby County Health Department. Beginning in 2016, callers requesting health care cost reimbursement for conditions believed to be caused by DDMT contamination have been directed to the DA Office of Staff Judge Advocate claims office at Fort Campbell, Kentucky. DA is aware of the community health concerns and provides callers with the appropriate agencies' contact information. See Section 2.3.3 for SCHD and Office of Staff Judge Advocate claims office points of contact. Some callers asked how to review DDMT cleanup documents and were directed to the IR. Callers were also invited to be added to the mailing list, if not already included.

3.4 Summary of Communication Needs

Previous community interviews documented overall satisfaction with the level of information provided about the cleanup program. The community uses the CIL only occasionally to express concerns and request information. Most calls are received after distribution of the annual newsletter distributed to about 3,000 addresses in which DA invites community members to call the CIL to provide comments, request information, and to be added to the mailing list.

Between 2010 and 2020, 33 community members contacted the CIL with 15 of the callers having questions about the DDMT cleanup program and 8 callers concerned that DDMT contamination caused health issues in themselves, their families and the neighborhoods

surrounding DDMT (Table 3). The most effective sources of information about the cleanup program were found to be the newsletter and hand-delivered notices.

All required decision documents for DDMT have been completed, although further investigation at the MI may result in changes to the MI ROD. The RAs have been completed or are operating properly to meet the RAOs. All DDMT property has been transferred for reuse, except the western and northern sections of Dunn Field. O&M of operating treatment systems as well as groundwater monitoring continue and have limited impact on the community. O&M activities are currently limited to the AS/SVE system located adjacent to the MLGW substation at the intersection of Menager Road and Ragan Street; inspections are made weekly and monitoring is performed bi-monthly. LTM is performed semiannually at wells located on the former DDMT property and in the surrounding area.

Based on this information and input from the community via the CIL, the community's communication needs are fulfilled by the current distribution of the annual newsletter, hand-delivered notices/factsheets, and documents available in the IR. Therefore, the community involvement program will continue focusing on fulfilling DoD guidance and NCP community involvement requirements, as well as providing information to the community about specific cleanup activities as necessary.

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4 Community Involvement Program

The overall goal of DDMT's community involvement program is to maintain positive community relations by meeting public involvement and information availability requirements. The community involvement activities described below incorporate the findings of previous community interviews and the recent community interactions.

DA will fulfill the regulatory requirements and *Management Guidance for the Defense Environmental Restoration Program* (DoD, 2012) requirements for community involvement in cleanup programs. The community involvement regulations are provided in the NCP and summarized in USEPA's Superfund Community Involvement Handbook (USEPA, 2016).

Community involvement activities during the Superfund remedial process are shown on the chart in Appendix G; an explanation of Superfund terms used in the chart is also provided. The chart shows limited activities for sites in the RA and O&M phase, such as DDMT. Future community involvement at DDMT will address community concerns received via the CIL and fulfill NCP community involvement requirements associated with five-year reviews; changes to a selected remedy, which may include an ESD or ROD amendment; remedial design; and deletion from the NPL. Additional community involvement activities will occur as needed to address community concerns as they arise throughout the Superfund cleanup process.

The community involvement requirements to be met by DDMT's community involvement program are:

Respond to Community Concerns

- DA will respond via phone calls, annual newsletter articles, or fact sheets to concerns that community members provide on the CIL or during required document public comment periods.

Cleanup Remedy Operation and Maintenance (including long term monitoring)

- The community and other potentially interested parties will be notified of upcoming Five-Year Reviews in the annual newsletter and in a public notice placed in local media. A separate letter regarding the Five-Year Review will be sent to former RAB members, civic officials and USEPA and TDEC remedial project managers.
- The annual newsletter, public notice and the letter will invite comments on the protectiveness of the selected remedies and provide the CIL phone number to request additional information or to provide comments.
- Comments from community members and DA responses will be included in the Five-Year Review.
- When completed and approved by USEPA, the Five-Year Review will be placed in the IR.
- A public notice will be placed in local media to announce the completion of a Five-Year Review and the availability of the report for public review.

- Copies of the public notices placed in local media prior to and after completion of the Five-Year Review will be provided to USEPA and TDEC remedial project managers.

Explanation of Significant Differences

- When completed and approved by USEPA, the ESD will be placed in the IR.
- The community will be notified by a public notice in local media that briefly summarizes the significant differences, including the reasons for such differences, and that the report is available in the IR.

ROD Amendment

- When completed and approved by USEPA, the investigation reports and Revised Proposed Plan will be placed in the IR.
- The community will be notified by a public notice in local media that the reports and Revised Proposed Plan are available for public review in the IR and of the 30-day Public Comment Period.
- A public meeting will be held at or near the site and a meeting transcript will be placed in the IR.
- After the 30-day Public Comment Period, a Responsiveness Summary will be completed and included in the ROD Amendment.
- When completed and approved by USEPA, the ROD Amendment will be placed in the IR.
- The community will be informed by a public notice in local media that the ROD Amendment is available in the IR.

Remedial Design

- After completion of the final engineering design, a fact sheet will be distributed, and a public notice in local media informing the community that a public meeting will be held to provide information and answer questions. Information will also be included in the annual newsletter.

Deletion from the NPL

- A Final Closeout Report (FCOR) documenting compliance with statutory requirements and providing a consolidated record of all removal and remedial activities for the entire site will be placed in the IR. The MI and Dunn Field RACRs will be incorporated as supporting documents in the FCOR.
- A Notice of Intent to Delete will be published in the Federal Register and in a local newspaper of general circulation that also notifies the community of a 30-day Public Comment Period.
- A 30-day Public Comment Period will be held, and a Responsiveness Summary completed and placed in the IR and the Deletion Docket.
- With USEPA and TDEC's approval, a Notice of Final Deletion will be placed in the Federal Register and the deletion docket will be placed in the IR.

4.1 Activity Plan

The public involvement and information availability requirements are described below with the objective, activity and timing.

4.1.1 Fulfilling Public Involvement Requirements

4.1.1.1 Designate a Point of Contact (POC) for the Community

- Objective: Provide a primary liaison between the community and DA, and to ensure prompt, accurate, and consistent responses and information dissemination about the site.
- Activity: DA will designate a BRAC Environmental Coordinator (BEC) to handle inquiries and serve as a POC for community members. Joan Hutton is the current BEC for DDMT. She will work closely with the USEPA and TDEC remedial project managers as well as contractors providing technical and community relations support. Contact information for the BEC and USEPA and TDEC remedial project managers is listed in Section 2.3.3.
- Timing: The BEC is currently in place and performs the POC responsibilities.

4.1.1.2 Assess Community Interest in Reestablishing the RAB at Sites Where the RAB Has Adjourned and All Environmental Restoration Decisions Have Been Made and Required Remedies Are in Place and Are Properly Operating

- Objective: Fulfill 32 CFR Part 202.10(c) requirement that when all environmental restoration decisions have been made and required remedies are in place and are properly operating at an installation, reassessment of the community interest for reestablishing the RAB is not necessary.
- Activity: Where the reassessment finds sufficient and sustained community interest at previously adjourned or dissolved RABs, the Installation Commander (BRAC Program Manager) should reestablish a RAB. Indicators of sufficient and sustained community interest include interest in the progress of the remedial actions, ongoing investigations or long-term monitoring, and specific requests to re-establish the RAB. A significant increase in community interest from that of the past several years would be needed to consider RAB re-establishment. To date, no CIL contacts or public comments have requested RAB re-establishment. If MI or Dunn Field remedial actions require changes resulting in an ESD or a ROD Amendment in the future, then DA will assess community interest in re-establishing the RAB as described above and through evaluation of community response to request for comments and attendance at a public meeting, if scheduled. DA will then prepare a memorandum to document the assessment and will include a recommendation to re-establish the RAB or not. The memorandum will be included in the AR and a copy will be placed in the IR. If the recommendation is to re-establish the RAB, members will be solicited through a letter to local officials and former RAB members and a public notice to the community published in a local newspaper.
- Timing: The installation will reassess community interest for reestablishing the RAB during preparation of new decision documents, five-year reviews and/or upon a significant

increase in CIL contacts, responses to requests for comments, media contacts, requests to review IR documents, or contacts from federal, state, county and city officials. Decision documents, five-year reviews and community contacts are discussed during monthly Site Management Team meetings and can be evaluated by DA and USEPA and TDEC remedial project managers.

4.1.1.3 Notify Public of Five-Year Review and Solicit Community Input Through Contact with Local Officials and Community Members

- Objective: Fulfill requirement to notify the community that the Five-Year Review will be conducted and notifying the community when the Five-Year Review is completed.
- Activity 1: DA will prepare a letter to local officials, former RAB members, and USEPA and TDEC remedial project manager and will publish a public notice to the community in a local newspaper of general circulation that a Five-Year Review will be conducted. The letter and notice should, at a minimum, provide:
  - The site name, its location and web address (if available).
  - The lead agency conducting the review.
  - A brief description of the selected remedy.
  - A summary of contamination addressed by the selected remedy.
  - How the community can contribute during the review process.
  - A contact point and telephone number for further information.
  - The scheduled date of completion of the Five-Year Review.
- Activity 2: DA shall prepare and publish a public notice to the community in the local newspaper that a Five-Year Review has been completed. At a minimum, the notice that a Five-Year Review has been completed should include:
  - The site name, its location, and web address (if available).
  - The lead agency conducting the review.
  - A brief description of the selected remedy.
  - A summary of contamination addressed by the selected remedy as provided in the initial notice.
  - A brief summary of the results of the Five-Year Review.
  - The protectiveness statement (a brief summary of data and information that provided the basis for determining protectiveness, issues, recommendations, and follow-up actions directly related to the protectiveness of the remedy).
  - Location of the IR where a copy of the Five-Year Review can be obtained or viewed.
  - A contact name and telephone number where community members can obtain more information or ask questions about the results.

  - The date of the next Five-Year Review or a statement and supporting rationale that Five-Year Reviews will no longer be required.

- Timing: Every five years. Notice that the Fourth Five-Year Review would be conducted was published on 15 March 2017 and notice of its completion was published on 25 April 2018.

4.1.2 Fulfilling Public Information Requirements

4.1.2.1 Establish and Maintain an IR

- Objective: Provide access to official environmental cleanup and other pertinent information about DDMT.
- Activity: The repository is a reference collection of DDMT information containing the AR file (documents used to make cleanup decisions and fulfill community involvement requirements), other site-specific information, the CIP, and information about the general Superfund process. The IR documents are currently in digital form accessible through the TDEC Memphis Environmental Field office document request website at: https://www.tn.gov/environment/contacts/public-records-request.html. The community may also call (901) 371-3000 for assistance in requesting documents. Upon request and for a fee to be determined by TDEC, specifically requested documents can be printed for pickup at TDEC's office, 8383 Wolf Lake Drive, Bartlett, TN 38133-4119. An index of repository documents will be updated bi-annually.
- Timing: The IR is currently in digital format and accessible through the TDEC Memphis Environmental Field Office document request website at: https://www.tn.gov/environment/contacts/public-records-request.html. The community may also call (901) 371-3000 for assistance in requesting documents. DA is responsible for providing IR documents to TDEC and for maintaining the IR document index.

4.1.2.2 Maintain the Mailing List

- Objective: Facilitate the distribution of site-specific information to the community who need or want to be kept informed about the DDMT environmental cleanup program.
- Activity: DA will maintain the existing mailing lists (Area and Civic/Requested). As of December 2020, the Area list has 2,872 addresses including residences, businesses, schools, churches and civic organizations surrounding DDMT; other community members who request addition to the mailing list, and Memphis Depot Industrial Park property owners/tenants. The Civic/Requested mailing list has 142 addresses including former RAB members; federal, state, city and county officials; local redevelopment agency representatives; Shelby County Health Department representatives; Tennessee Department of Health representatives; Memphis Light Gas and Water board members; U.S. Corps of Engineers representatives; DA contractors for the DDMT project; and DA, USEPA and TDEC representatives and DDMT remedial project managers. DA updates the mailing lists annually based on U.S. Postal Service returns of the annual EnviroNews (220 returns in January 2020) by 1) changing specific names to Current Resident on addresses returned one time as "Undeliverable as Addressed"; 2) deleting addresses

returned as “Vacant” for two consecutive years; 3) deleting addresses returned as “Undeliverable as Addressed” or “Address Not Found” for two consecutive years. DA updates the mailing list as needed following elections of federal, state, city and county officials.

Community members may request to be added to or removed from the Area mailing list by calling the CIL at (901) 774-3683. DA will update the mailing list a week of receiving such requests. DA uses the Area and Civic/Requested mailing lists to distribute the annual newsletter as well as to provide fact sheets and Five-Year Review notifications to former RAB members; federal, state, city and county officials; USEPA and TDEC remedial project managers, and others who request Five-Year Review notifications.

- Timing: DA is responsible for the mailing list and updates it as needed based on the annual newsletter returns, within a week of receiving community requests on the CIL for addition to or removal from the mailing list, and within a week of newly elected federal, state, county and city officials taking office.

4.1.2.3 Prepare and Distribute Newsletters and Fact Sheets about the DDMT Environmental Cleanup Program

- Objective: Provide the affected community with information about status of DDMT’s environmental cleanup program and about upcoming cleanup activities to be conducted in specific neighborhoods.
- Activity: DA will prepare and distribute the annual newsletter to addresses on the Area and Civic/Requested mailing lists. DA will prepare activity-specific fact sheets for upcoming field work in neighborhood areas, in the event of unexpected findings during field activities or in support of public comment periods such as for a new decision document. Field crews will have copies of fact sheets to provide upon request. Distribution by mail or hand delivery is determined by the area/group affected and on the number of planned recipients. In addition, copies of the annual newsletter and fact sheets will be available in the IR.
- Timing: DA distributes the annual newsletter, EnviroNews, in December of each year. Fact sheets will be prepared and distributed as needed for work to be conducted in specific neighborhoods.

4.1.2.4 Provide a Local or Toll-Free (800) Telephone Number for the Community to Contact

- Objective: Enable citizens to voice concerns or request information.
- Activity: DA will maintain the CIL and check for messages on a regular basis. DA currently has the RA contractor maintain the existing CIL at (901) 774-3683. The CIL is checked for messages every 2-3 days and the greeting is updated as needed. The contractor notifies the DA BEC via email within 2 hours of logging a call, responds per DA instructions and prepares a monthly call log. Table 3 provides a summary of community CIL contacts from 2010 through 2020.

- Timing: The community involvement line has been in use since at least 2004.

4.1.2.5 Update the CIP

- Objective: Identify and address community needs, issues, or concerns regarding the site or the cleanup remedy that are not currently addressed in this CIP.
- Activity: DA identifies community needs, issues, and concerns regarding DDMT environmental cleanup through CIL contacts, media contacts, comments received during required public comment periods, and contacts from federal, state, city or county officials. DA will update the CIP to address changes in cleanup remedies, land use, community concerns or other factors. DA will provide the draft CIP for USEPA and TDEC review and comment. USEPA and TDEC comments and responses to those comments will be included as an appendix to the CIP. DA will place the final approved CIP in the AR and will make it available to the public in the IR.
- Timing: This current CIP was prepared based on the time since the last revision in 2011 and the potential for a change to the selected remedy for the MI, including a ROD Amendment or ESD. Future updates to the CIP will be prepared as needed based on changed conditions. The Five-Year Review cycle will also be used to consider updates to the CIP as it requires a public comment period which may indicate changes in community concerns and interest in environmental cleanup at DDMT.

4.2 Time Frame for Community Involvement Activities

ACTIVITY	TIME FRAME
Designate a DA POC	POC identified in Section 2.3.3. Update as needed.
Prepare and distribute annual newsletter	Distribute annually in December.
Prepare and distribute site fact sheets	As needed.
Provide a telephone number for the community to contact the POC	CIL established.
Maintain a mailing list	Annually based on mailing returns from distribution of EnviroNews and as needed based on requests for inclusion.
Establish and maintain IR	IR established; maintained through semi-annual updates.
Notify public of the Five-Year Review process and of completion of the Five-Year Review	Every 5 years until Five-Year Reviews are not required.
Update the CIP	As needed.

5 References

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Tables

TABLE 1
PROPERTY OWNERSHIP AND USE
2020 COMMUNITY INVOLVEMENT PLAN
Defense Depot Memphis, Tennessee

Property Owner	Acreage[1]	Use
Main Installation		
Memphis Depot TIC LLC and DP 107 LLC	250.6	Warehousing/logistics – Memphis Depot Industrial Park managed by Colliers International. Buildings are leased to multiple tenants. Industrial use only.
Barnhart Crane & Rigging	143.8	Engineering, construction and maintenance of complex lifting and transportation equipment for heavy industry. Industrial use only; except administrative area in eastern MI approved for unrestricted use.
Economic Development Growth Engine of Memphis/Shelby Co.	69.8	Primarily undeveloped property for future warehousing/logistics or light industrial development. Industrial use only.
City of Memphis	46.7	Recreation - Golf Course operated by Vietnam Veterans Association Chapter 1113. Recreational use only.
Depot Owners Association	35.6	Memphis Depot Parkway and stormwater basins. Industrial use only.
Supply Chain Solutions, LLC	8.2	Warehousing/logistics. Industrial use only.
Alpha Omega Veterans Services	6.5	Homeless veterans housing and garden. Approved for unrestricted use.
Memphis Police Department	4.7	Airways Police Station. Approved for unrestricted use.
Dunn Field		
Dunn Field Business Park, LLC	39.4	Undeveloped property for future warehousing/ logistics or light industrial development. Approved for unrestricted use.
Army	26.2	Undeveloped. Industrial use only
City of Memphis	1.6	Realignment of Hayes Road.

Note:
1) Acreage is approximate

TABLE 2
PROPERTY TRANSFER STATUS
2020 COMMUNITY INVOLVEMENT PLAN
Defense Depot Memphis, Tennessee

FOST No.	Area	Date FOST signed	Acres[1]	Type of Conveyance	Type of Transfer (Transferee)	Date of Transfer[2]
1	MI	23-Feb-01	6.5	PBC	Deed (Alpha Omega Veterans)	26-Sep-01
2	MI	27-Sep-01	4.7	PBC	Deed (Memphis Police Department)	6-Feb-02
			13.4	EDC	Deed (DRC)	6-May-02
3	MI	1-Jul-04	302.5	EDC	Deed (DRC)	4-Apr-06
			46.7	PBC	Deed (Memphis)	18-Aug-06
4	DF	4-Mar-05	1.6	PBC	Deed (Memphis)	2-Sep-05
			39.4	CPS	Deed (Dunn Field Business Park, LLC)	17-Oct-07
5	DF	12-Jul-10	26.0			
6	MI	2-Aug-10	193.0	EDC	Deed (DRC)	30-Mar-11

Notes:
1): Listed acres are approximate
2): Date Federal Agency signed Quitclaim Deed
CPS: Competitive Public Sale
DF: Dunn Field
DOI/NPS: Department of Interior/National Parks Service
DRC: Depot Redevelopment Corporation
EDC: Economic Development Conveyance
MI: Main Installation
PBC: Public Benefit Conveyance

TABLE 3
COMMUNITY INVOLVEMENT CONTACT LIST 2010 – 2020
2020 COMMUNITY INVOLVEMENT PLAN
Defense Depot Memphis, Tennessee

Contacts	Number of Contacts	Subject of Contact	DA Response
2010			
Researcher	1	How to access RAB minutes online	Provided AR and DDMT website information
Community member #1	1	Caller lives adjacent to ASSVE system and called in 2009 regarding ASSVE construction causing water to back-up into house. Caller had misplaced City Drain maintenance POC provided to caller last year; City has not resolved reported storm drain issue; Caller still concerned problem caused by ASSVE system	Provided City Drain Maintenance POC and field crew manager met with homeowner to show how storm drain inlet adjacent to ASSVE compound was previously plugged with bucket; ASSVE crew removed bucket. Resolving storm drain and water in house was City action
Former RAB member #1	1	Requested information on chemical that City sprayed along Hayes Road fence line for portion of Dunn Field property transferred and now managed by Dunn Field Property LLC; Requested TDEC POC	Provided TDEC POC
Community member #2	1	Received EnviroNews. After reading articles wondered if drinking was water safe.	Provided drinking water information
City Attorney's Office	1	Looking for DDMT-CCC POC to include on Memphis Environmental Justice questionnaire in support of petition against USEPA; No questions regarding environmental justice or cleanup at DDMT	Provided DDMT-CCC POC
2011			
Community member #3	1	Unknown; caller asked to be called but did not provide reason or concern.	Returned call two times with no answer. Caller did not call back
Community member #4	1	Questions/concerns about health impacts from DDMT contamination. In 1990s received letter about cancer linked to DDMT neighborhood gardens. Spouse died from cancer	Provided information from Public Health Assessment and POC for Shelby County Health Department and TDEC
Community member #5	1 1 Email to USEPA	Questions/concerns about groundwater contamination and results of groundwater samples collected from wells on their street in 2005. Caller also contacted Turpin Ballard, USEPA, via email two times about possible impacts to their property from DDMT cleanup project	Returned call two times with no answer. Caller did not call back. Mr. Ballard responded to both emails and forwarded information to TDEC.
Community member #6	1	Former addressee deceased so please remove from mailing list. Please add caller to mailing list.	Revised mailing list accordingly.

TABLE 3
COMMUNITY INVOLVEMENT CONTACT LIST 2010 – 2020
2020 COMMUNITY INVOLVEMENT PLAN
Defense Depot Memphis, Tennessee

Contacts	Number of Contacts	Subject of Contact	DA Response
2012			
Local minister #1	1	Asked about job opportunities at DDMT.	Provided Colliers POC
Community member #7	1	Requested information about cancer studies due to number of neighbors with cancer. Spouse died from cancer. Believes cancer caused by DDMT contamination	Provided information from Public Health Assessment and POC for Shelby County Health Department and TDEC; also offered IR appointment to review health related documents – caller declined appointment
Memphis City Council administrative assistant	1	Requested information on DDMT restoration program meetings scheduled in future	Responded to question (no upcoming meetings) and offered IR appointment to review documents; offered declined
Community member #8	1	Saw public comment period notice in Commercial Appeal – wanted to comment on Five-Year Review. Grew up across street from DDMT. Please add to mailing list	Comments consisted of proposed uses of Dunn Field (solar panel farm) and employment apprenticeship program Revised mailing list accordingly
2013			
Local economic development agency representative	1	Request for speaker at local Brownfield Board to discuss land use controls and environmental issues at DDMT	Provided TDEC POC
Business owner	1	Requested information on opening a business at Memphis Depot Industrial Park.	Provided Colliers POC
Memphis Business Journal reporter	1	Requested update on cleanup program for article on Memphis Depot Industrial Park.	Responded to reporter's questions. Article briefly mentioned the environmental cleanup and focused mainly on the property transfer and reuse.
2014			
No contact.			
2015			
Community member #9	1	Questioned why caller received EnviroNews and asked what it was about.	Explained about DDMT mailing list and EnviroNews. Provided brief update on DDMT cleanup program. Caller had no further questions or concerns.
Community member #10	3	Concerned about health issues that caller believed came from DDMT environmental contamination. Husband died of cancer. Caller has many health issues and requested help paying for	Provided Shelby County Health Department POC and Army Office of Staff Judge Advocate POC. Also mailed Judge Advocate

TABLE 3
COMMUNITY INVOLVEMENT CONTACT LIST 2010 – 2020
2020 COMMUNITY INVOLVEMENT PLAN
Defense Depot Memphis, Tennessee

Contacts	Number of Contacts	Subject of Contact	DA Response
		treatments. Caller requested assistance completing the health claim forms.	health claim form to caller. Provided Judge Advocate claims phone number. BEC followed up with caller after sending claim form.
Community member #11	1	Concerns about health issues believed to be caused by DDMT environmental contamination. Mentioned lawsuit being put together by community members based on cancer cases in the neighborhoods around DDMT believed to be caused by DDMT environmental contamination. Please add to mailing list.	Caller also contacted BEC. Provided Shelby County Health Department and Army Office of Staff Judge Advocate POC. BEC mailed caller Judge Advocate health claim forms. Revised mailing list accordingly.
Community member #7 Previously called CIL in 2012	1 Email to BEC	Concerned about number of cancer cases in neighborhoods around DDMT. Caller's spouse died from cancer. Caller has cancer. Believes cancer caused by DDMT environmental contamination.	BEC responded to email and mailed Judge Advocate health claim forms. BEC followed-up with caller via email and phone calls.
2016			
Community member #12	1	Received EnviroNews and had questions about groundwater; believed DDMT contamination caused health issues in family members. Concerned about differences in EnviroNews from USEPA website information about DDMT	Provided Shelby County Health Department and Army Office of Staff Judge Advocate POC. Provided USEPA and TDEC POC. Mailed Judge Advocate health claim form to caller. BEC followed up with caller after sending claim form
Community member #10 Previously called CIL in 2015	5	Concerned about health issues that caller believed came from DDMT environmental contamination. Husband died of cancer. Caller has many health issues and requested help paying for treatments. Caller requested assistance completing the health claim forms. Caller filed claim and requested payment. Caller related that claim denied and needs someone to pay for health issues caused by DDMT contamination. Also mailed letter mailed to Memphis Depot Association requesting payment of claim. MDA forwarded letter to HDR Field Office; forwarded to Office of Staff Judge Advocate.	Provided Army Office of Staff Judge Advocate claims POC including phone number. Followed up with caller after each contact. Reiterated need to work with Judge Advocate office regarding claim
Community member #13	1	Caller's aunt (Community member #12) had contacted CIL and received health claim form. Caller requested information about the claim form and assistance in completing claim form for aunt.	Provided Army Office of Staff Judge Advocate claims POC. Provided IR document request process and TDEC document manager POC.

TABLE 3
COMMUNITY INVOLVEMENT CONTACT LIST 2010 – 2020
2020 COMMUNITY INVOLVEMENT PLAN
Defense Depot Memphis, Tennessee

Contacts	Number of Contacts	Subject of Contact	DA Response
		Requested data specific to health claim form.	
Community member #14	1 to USEPA; note left at HDR Memphis Field Office	Mother who lived near DDMT provided Caller with EnviroNews. Caller believed family and community cancer/health issues caused by DDMT environmental contamination. Wanted to file a health claim against Army. Wanted to review DDMT cleanup project documents for health assessment information. Requested to be added to mailing list. Note requested assistance with IR documents to obtain chemical information to complete claim form. Requested Freedom of Information Act claim information.	USEPA forwarded Caller's information to BEC. BEC mailed caller Judge Advocate health claim forms. Provided Shelby County Health Department POC. Provided IR document request information. Revised mailing list accordingly. Provided IR document request information again and TDEC document manager POC. Provided FOIA website information.
Community member #15	1	Received "paper" wanted to know what it was about.	Explained about DDMT mailing list and EnviroNews. Provided brief update on DDMT cleanup program. Caller had no further questions or concerns.
2017			
Community member #10 Previously called CIL in 2015 and 2016	3	Caller requested assistance in appealing claim that Judge Advocate denied. Requested that BEC pay claim. Health issues caused by DDMT contamination.	Reiterated need to work with Judge Advocate office regarding claim. USEPA forwarded contact information to BEC who responded to Caller. BEC contacted Judge Advocate office and provided Caller their response to contact Judge Advocate office. Followed up with caller after each contact.
Community member #16	1	Caller and Grandparent (Community member # 1) saw people at ASSVE and requested information about what was happening. Caller requested to be added to mailing list	Provided general information about ASSVE purpose and DDMT cleanup project. Mailed caller 2017 EnviroNews. Confirmed Grandparent on mailing list. Added caller to mailing list.
Former DDMT employee #1	1	Received EnviroNews but didn't understand it. Too many acronyms. Requested update on cleanup project	Provided general cleanup project update. Future EnviroNews articles will be written with less technical language

TABLE 3
COMMUNITY INVOLVEMENT CONTACT LIST 2010 – 2020
2020 COMMUNITY INVOLVEMENT PLAN
Defense Depot Memphis, Tennessee

Contacts	Number of Contacts	Subject of Contact	DA Response
Community member #14 Previously called CIL in 2016	1 Call to TDEC; contact forwarded to BEC	Received claim from Judge Advocate, but it is not enough to cover all the medical bills. Believes claim amount should be more because health issues caused by DDMT contamination	Reiterated need to work with Judge Advocate office on claim
2018			
Former RAB member #4	Contacted USEPA	Concerned about youth gardening program at Barnhart Crane property violating land use controls	BEC contacted Barnhart about land use controls; Barnhart ended youth gardening program
2019			
Community member #17	1	Received EnviroNews from a neighbor and had questions about cleanup project; also requested Army representative to speak at upcoming community meeting about DDMT cleanup project and potential impacts to elementary school proposed for construction in neighborhood. Intends to notify City school board about DDMT cleanup project	Provided general update on cleanup project including land use controls. No local Army representative available to attend meeting but forwarded request to TDEC and provided Caller with TDEC POC. Caller requested mailing address for BEC to mail registered letter requesting presence at community meeting and listing questions and concerns; intended to read response at meeting. Did not want to be added to mailing list at this time
Former DDMT employee #2	1	Another former employee provided Caller with EnviroNews. Questioned what was being done to help former employees made sick by DDMT's environmental disaster. Asked if RAB meetings still being held. Requested to be added to mailing list	Provided Shelby County Health Department and Office of Staff Judge Advocate POC. Reported that RAB disbanded in 2009. Revised mailing list accordingly
Community member #18	1	Moving; please remove me from mailing list	Revised mailing list accordingly
Community member #19	1	Requested to be added to mailing list; requested other neighbors also be added to mailing list. Wanted to provide neighbors' addresses in excel file and provided email to begin correspondence for providing the file	Revised mailing list accordingly. Called and emailed caller twice in 2019 with no response; called and emailed Caller twice in 2020 with no response
Community member #20	1	Received EnviroNews and requested more information about the cleanup project. Also concerned about cancer levels in the surrounding neighborhoods	Provided general DDMT cleanup project update and IR document access process. Provided Shelby County Health Department POC

TABLE 3
COMMUNITY INVOLVEMENT CONTACT LIST 2010 – 2020
2020 COMMUNITY INVOLVEMENT PLAN
Defense Depot Memphis, Tennessee

Contacts	Number of Contacts	Subject of Contact	DA Response
2020 (through 7 December)			
Community member #23	2	Asked about groundwater monitoring well installation and sampling schedule for well planned in Caller's backyard.	Provided well installation project schedule.

Note:
This CIL Contact List does not include 33 contacts from 22 callers to the CIL for administrative or business-only purposes: calls from RAB members replying to meeting invitations, former DDMT employees/relatives requesting personnel files, Federal Bureau of Investigation personnel requesting training/meeting space, legal/engineering professionals performing evaluations of DDMT or adjacent property for environmental reviews property purchase, Memphis Depot Industrial Park/Memphis Athletic Ministries personnel requesting non-environmental cleanup program information, or Department of Defense government surplus materials personnel requesting pickup of purchased materials.

TABLE 3
COMMUNITY INVOLVEMENT CONTACT LIST 2010 – 2020
2020 COMMUNITY INVOLVEMENT PLAN
Defense Depot Memphis, Tennessee

SUMMARY BY YEAR		
Number of People	Number of Contacts	Summary
People Making Contact in 2010: 5	Contacts in 2010: 5	Contacts about DDMT cleanup program: 2 Contacts about health issues: 0
People Making Contact in 2011: 5	Contacts in 2011: 6	Contacts about DDMT cleanup program: 1 Contacts about health issues: 1
People Making Contact in 2012: 4	Contacts in 2012: 4	Contacts about DDMT cleanup program: 1 Contacts about health issues: 1
People Making Contact in 2013: 3	Contacts in 2013: 3	Contacts about DDMT cleanup program: 2 Contacts about health issues: 0
People Making Contact in 2014: 0	Contacts in 2014: 0	Contacts about DDMT cleanup program: 0 Contacts about health issues: 0
People Making Contact in 2015: 4	Contacts in 2015: 6	Contacts about DDMT cleanup program: 1 Contacts about health issues: 5 (New callers= 3)
People Making Contact in 2016: 5	Contacts in 2016: 9	Contacts about DDMT cleanup program: 1 Contacts about health issues: 8 (New callers=2)
People Making Contact in 2017: 4	Contacts in 2017: 6	Contacts about DDMT cleanup program: 2 Contacts about health issues: 4 (New callers: 0)
People Making Contact in 2018: 1	Contacts in 2018: 1	Contacts about DDMT cleanup program: 1 Contacts about health issues: 0
People Making Contact in 2019: 5	Contacts in 2019: 5	Number of Contacts about DDMT cleanup program: 2 Contacts about health issues: 2
People Making Contact in 2020: 1	Contacts in 2020: 2	Number of Contacts about DDMT cleanup program: 0 Contacts about health issues: 0

Number of individual callers January 2010 through November 2020: 33
Number of individual callers about DDMT cleanup program: 13.
Number of individual callers about health issues: 8.

TABLE 4
CHURCHES WITHIN 0.5 MILE OF DDMT
2020 COMMUNITY INVOLVEMENT PLAN
Defense Depot Memphis, Tennessee

Apostolic Deliverance Temple 1369 Norris Rd Memphis TN 38106-8103	Love Temple Church of God in Christ 316 E Waldorf Ave Memphis, TN 38106	Power House Church of God in Christ 1546 Cane Rd Memphis TN 38106
Bethel AME Church 2011 E. Alcy Rd Memphis TN 38114	Macedonia Missionary Baptist 2093 Perry Rd Memphis TN 38106-7327	St. James Missionary Baptist 1930 Hearst Ave Memphis TN 38114
Calvary New Life Temple Church of God in Christ 2369 Airways Blvd Memphis TN 38114	New Bethel Full Gospel Baptist 2225 Ball Rd Memphis TN 38114-5214	St. Peter's Baptist 1410 Pillow St Memphis TN 38106
Castalia Missionary Baptist Church 1540 Castalia St Memphis TN 38114	New Friendship Missionary Baptist 1957 E. Alcy Rd Memphis TN 38114	Temple of Christ Baptist 1581 Ball Rd Memphis TN 38114
Charjean Baptist 2210 Charjean Rd Memphis TN 38114	New Hope Baptist 2350 Elvis Presley Blvd Memphis TN 38106-7700	True Peace Church 2451 Pecan Cir Memphis TN 38114
Christ the Living Word 1975 Perry Road Memphis TN 38106	New Little Rock Baptist 1499 Norris Rd Memphis TN 38106	The Truth Church 2019 Ball Rd Memphis TN 38114
Evangelist Baptist Church 1903 Ball Rd Memphis TN 38114	Norris Ave Missionary Baptist 1437 Norris Rd Memphis TN 38106	
Gateway Church of Christ 2201 Ketchum Rd Memphis TN 38114	Oak Hill Missionary Baptist 1725 Ragan St Memphis TN 38106	
Greater Abyssinia Church 1702 Silver St Memphis TN 38106	Pentecostal Missionary Baptist 1538 Norris Rd Memphis TN 38106	
HELP Outreach Ministries 2111 E Alcy Rd Memphis TN 38114	Pilgrim Christian Ministry 1665 Rayner St Memphis TN 38106	

TABLE 5
SCHOOLS WITHIN 0.5 MILE OF DDMT
2020 COMMUNITY INVOLVEMENT PLAN
Defense Depot Memphis, Tennessee

Alcy Elementary School 1750 E Alcy Rd Memphis TN 38114-5809	Hamilton High School 1363 E Person Ave Memphis TN, 38106-6995
City University School of Liberal Arts 1500 Dunn Ave Memphis TN 38106	KIPP Memphis Prep Academy 2230 Corry Rd Memphis, TN 38106

Figures

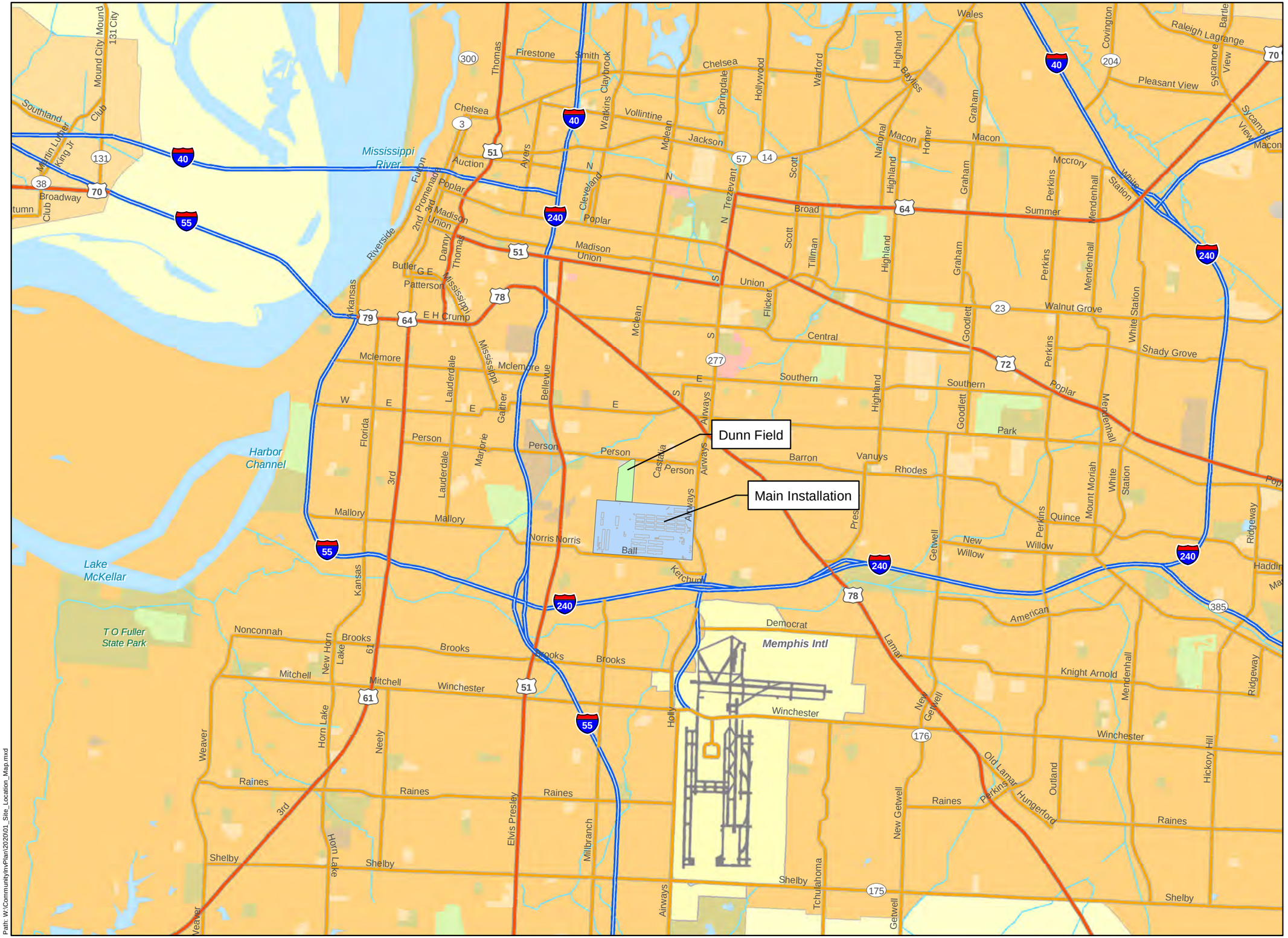

Figure 1

Site Location Map

2020 Community Involvement Plan

Defense Depot Memphis, Tennessee

N
W E
S

0 1 2
Miles

Projection: NAD 1927 StatePlane Tennessee
Units: Feet, Elevation Units: Feet, NAVD88

Date: 12/14/2020
Edition: Rev 0

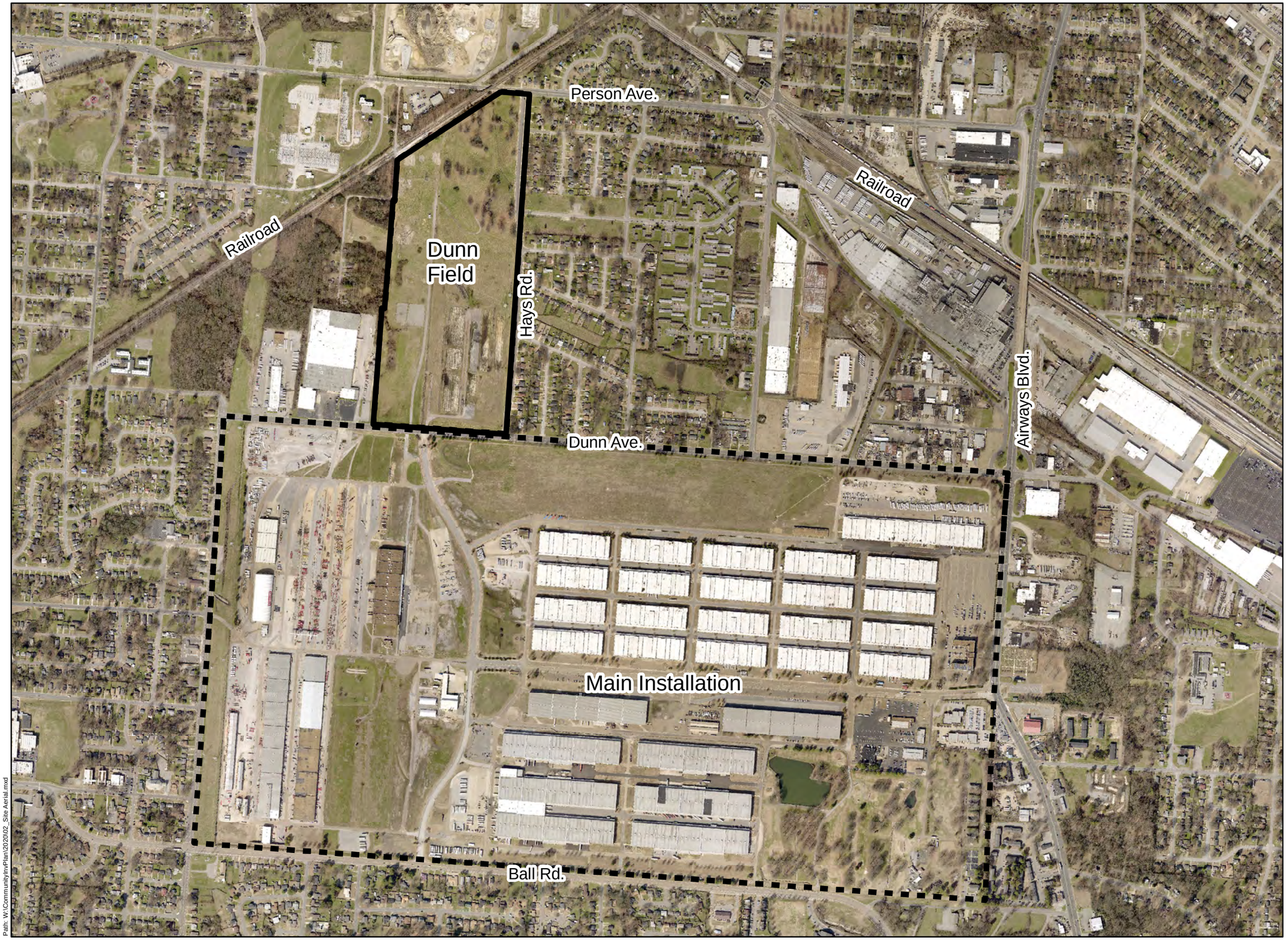

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Figure 2

Site Aerial Photograph

2020 Community Involvement Plan

Defense Depot Memphis, Tennessee

Legend

- Main Installation Perimeter
- Dunn Field Perimeter

Notes:
1. Aerial date: 2019.
2. Source: Shelby County TN Regional GIS Department.

N
W E
S

0 500 1,000
Feet

Projection: NAD 1927 StatePlane Tennessee
Units: Feet, Elevation Units: Feet, NAVD88

Date: 12/14/2020
Edition: Rev 0

Figure 3

Finding of Suitability to Transfer Map

2020 Community Involvement Plan

Defense Depot Memphis, Tennessee

Legend

Property Boundary

Date of Quitclaim Deed(s)[1]

FOST 1 *9/26/01*

FOST 2 *2/6/02 and 5/6/02*

FOST 3 *4/4/06 and 8/18/06*

FOST 4 *9/2/05 and 10/17/07*

FOST 5

FOST 6 *3/30/11*

Note:
1) Date of signature by Army or other agency on deed.

Buildings *490 - DDMT Assigned Number*

Roads

N E S W

0 500 1,000

Feet

Projection: NAD 1927 StatePlane Tennessee
Units: Feet, Elevation Units: Feet, NAVD88

Date: 12/14/2020
Edition: Rev 0

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Figure 4

Memphis Depot Land Use

2020 Community Involvement Plan

Defense Depot
Memphis, Tennessee

Legend

- Alpha Omega Veterans' Housing
- Barnhart Crane Administrative Area
- Barnhart Crane Operations Area
- DRC-Undeveloped
- Detention Basin
- Golf Course
- Memphis Depot Industrial Park
- Memphis PD Airport Precinct
- Supply Chain Solutions
- Property Boundary
- Roads
- Buildings

N
W E
S

0 500 1,000
Feet

Projection: NAD 1927 StatePlane Tennessee
Units: Feet, Elevation Units: Feet, NAVD88

Date: 12/14/2020
Edition: Rev 0

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Figure 5

Surface Drainage and Water Features

2020 Community Involvement Plan

Defense Depot
Memphis, Tennessee

Cane Creek

Golf Course Pond

Lake Danielson

Nonconnah Creek

Legend

- Surface Water Flow Direction
- Stream/Drainage Flow Line
- Property Boundary
- Surface Water
- Retention Basin

N
W E
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0 1,000 2,000
Feet

Projection: NAD 1927 StatePlane Tennessee
Units: Feet, Elevation Units: Feet , mean sea level

Date: 12/14/2020
Edition: Rev 1

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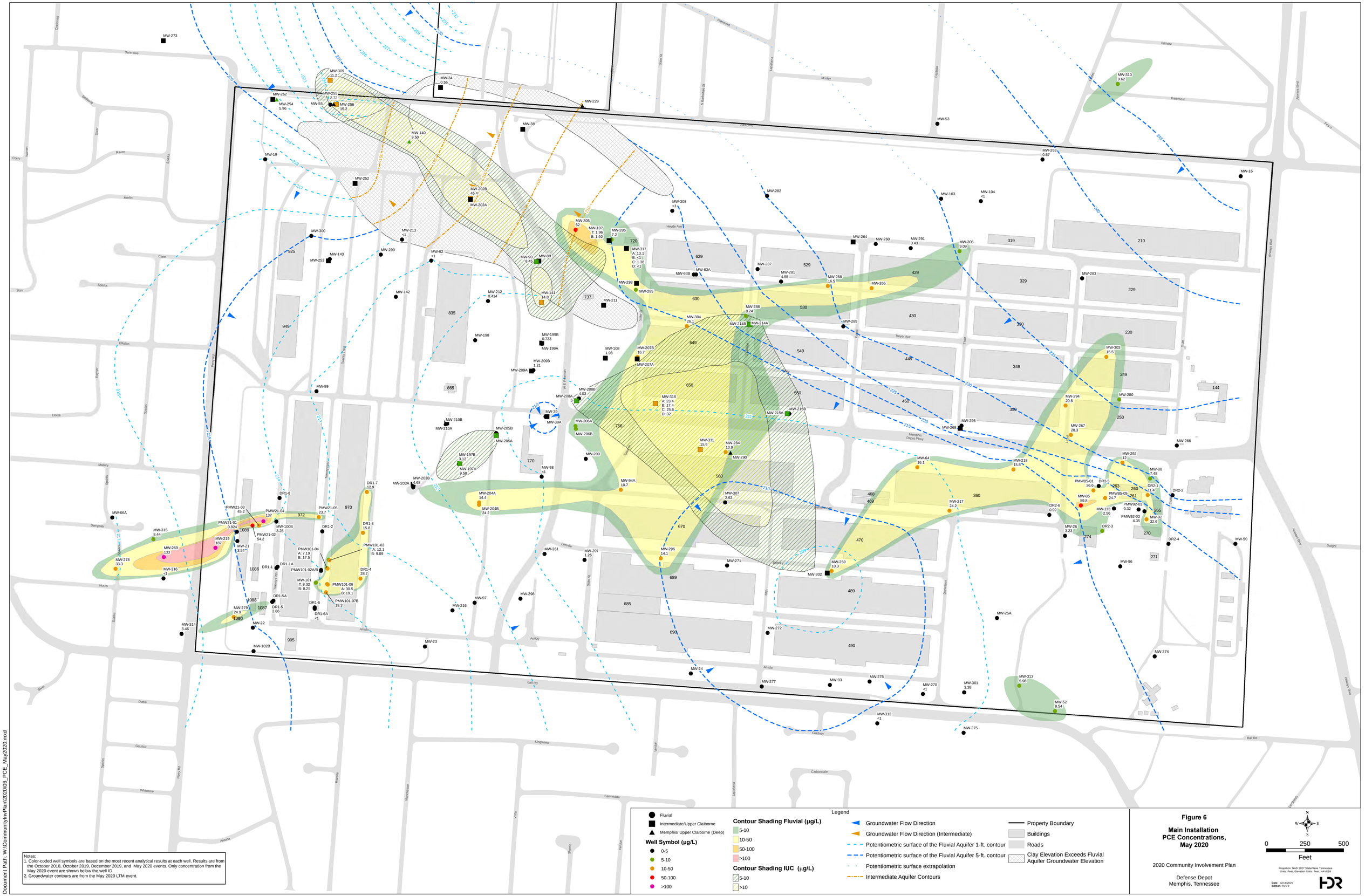

Legend
Fluvial
Intermediate/Upper Claiborne
Memphis/ Upper Claiborne (Deep)
Well Symbol (µg/L)
0-5
5-10
10-50
50-100
>100
Contour Shading Fluvial (µg/L)
5-10
10-50
50-100
>100
Contour Shading IUC (µg/L)
5-10
>10
Groundwater Flow Direction
Groundwater Flow Direction (Intermediate)
Potentiometric surface of the Fluvial Aquifer 1-ft. contour
Potentiometric surface of the Fluvial Aquifer 5-ft. contour
Potentiometric surface extrapolation
Intermediate Aquifer Contours
Property Boundary
Buildings
Roads
Clay Elevation Exceeds Fluvial Aquifer Groundwater Elevation
Notes:
1. Color-coded well symbols are based on the most recent analytical results at each well. Results are from the October 2018, October 2019, December 2019, and May 2020 events. Only concentration from the May 2020 event are shown below the well ID.
2. Groundwater contours are from the May 2020 LTM event.
Figure 6
Main Installation
PCE Concentrations,
May 2020
2020 Community Involvement Plan
Defense Depot
Memphis, Tennessee
N
W
E
S
0
250
500
Feet
Projection: NAD 1927 StatePlane Tennessee
Units: Feet, Elevation Units: Feet, NAVD88
Date: 12/14/2020
Edition: Rev 0
HDR
Document Path: W:\Community\nvPlan\2020\06_PCE_May2020.mxd

Notes:
1. Color-coded well symbols are based on the most recent analytical results at each well. Results are from the October 2018, October 2019, December 2019, and May 2020 events. Only concentration from the May 2020 event are shown below the well ID.
2. Groundwater contours are from the May 2020 LTM event.

Legend

Well Symbol (µg/L)
- Fluvial
- Intermediate/Upper Claiborne
- Memphis/ Upper Claiborne (Deep)
- 0 - 5
- 5-10
- 10-50
- 50-100
- >100

Contour Shading IUC (µg/L)
- 5-10
- >10

Contour Shading Fluvial (µg/L)
- 5-10
- 10-50
- 50-100
- >100

- Groundwater Flow Direction (Intermediate)
- Groundwater Flow Direction
- Intermediate Aquifer Contours
- Potentiometric surface of the Fluvial Aquifer 1-ft. contour
- Potentiometric surface of the Fluvial Aquifer 5-ft. contour
- Potentiometric surface extrapolation
- Property Boundary
- Roads
- Buildings
- Clay Elevation Exceeds Fluvial Aquifer Groundwater Elevation

Figure 7

Main Installation TCE Concentrations, May 2020

2020 Community Involvement Plan

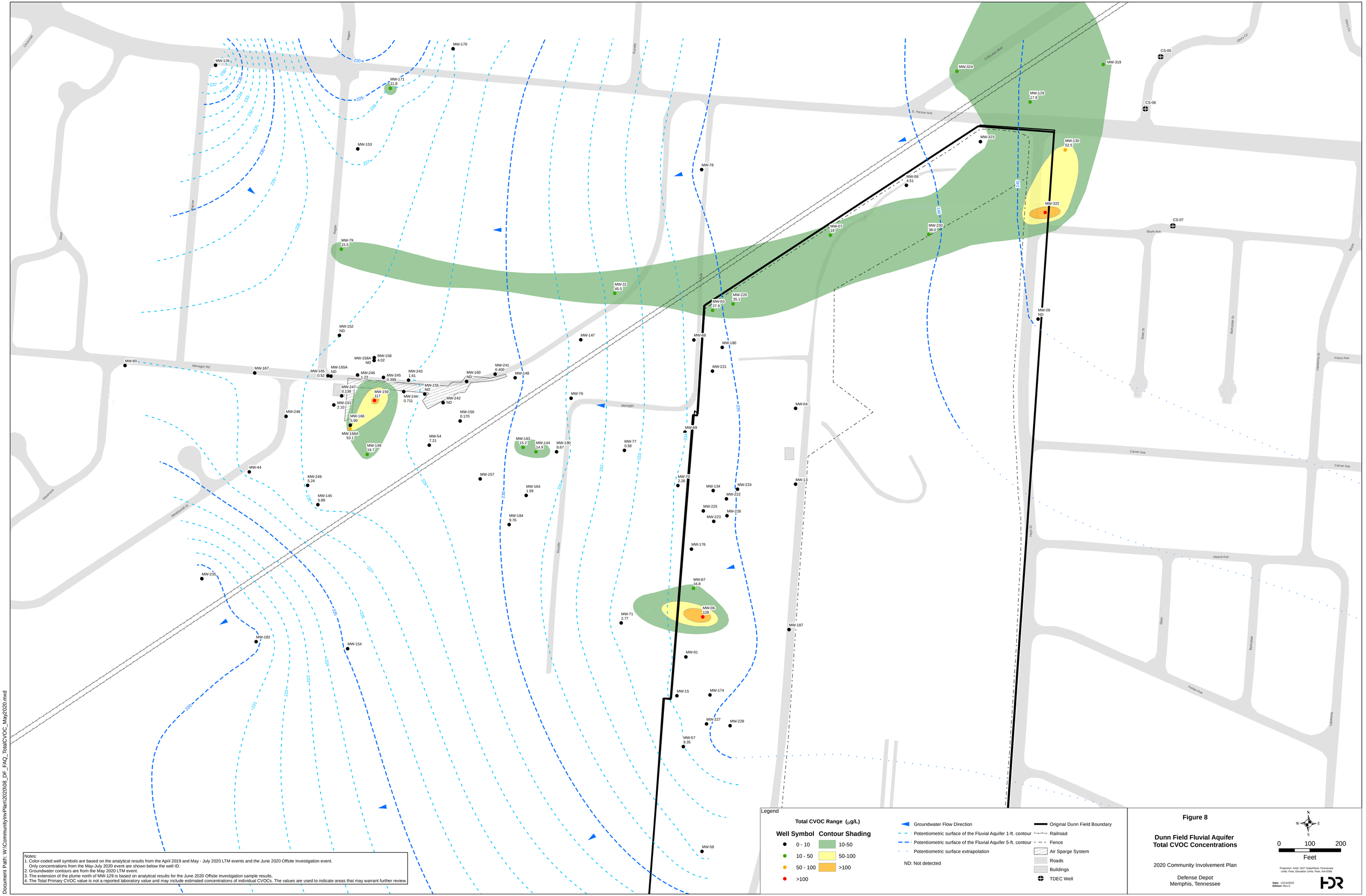
Defense Depot Memphis, Tennessee

0 250 500 Feet

Projection: NAD 1927 StatePlane Tennessee
Units: Feet, Elevation Units: Feet, NAVD88

Date: 12/14/2020
Edition: Rev 0

Document Path: W:\Community\nvPlan\2020\07_TCE_May2020.mxd



Notes:
1. Color-coded well symbols are based on the analytical results from the April 2019 and May - July 2020 LTM events and the June 2020 Offsite Investigation event. Only concentrations from the May-July 2020 event are shown below the well ID.
2. Groundwater contours are from the May 2020 LTM event.
3. The extension of the plume north of MW-129 is based on analytical results for the June 2020 Offsite Investigation sample results.
4. The Total Primary CVOC value is not a reported laboratory value and may include estimated concentrations of individual CVOCs. The values are used to indicate areas that may warrant further review.

Legend

Total CVOC Range (µg/L)

Well Symbol	Contour Shading
0 - 10	10-50
10 - 50	50-100
50 - 100	>100
>100	

- Groundwater Flow Direction
- Potentiometric surface of the Fluvial Aquifer 1-ft. contour
- Potentiometric surface of the Fluvial Aquifer 5-ft. contour
- Potentiometric surface extrapolation

ND: Not detected

- Original Dunn Field Boundary
- Railroad
- Fence
- Air Sparge System
- Roads
- Buildings
- TDEC Well

Figure 8

Dunn Field Fluvial Aquifer
Total CVOC Concentrations

2020 Community Involvement Plan

Defense Depot
Memphis, Tennessee

N
W E
S

0 100 200
Feet

Projection: NAD 1927 StatePlane Tennessee
Units: Feet, Elevation Units: Feet, NAVD88

Date: 12/14/2020
Edition: Rev 0

HDR

Document Path: W:\Community\nvPlan\2020\08_DF_FAQ_TotalCVOC_May2020.mxd

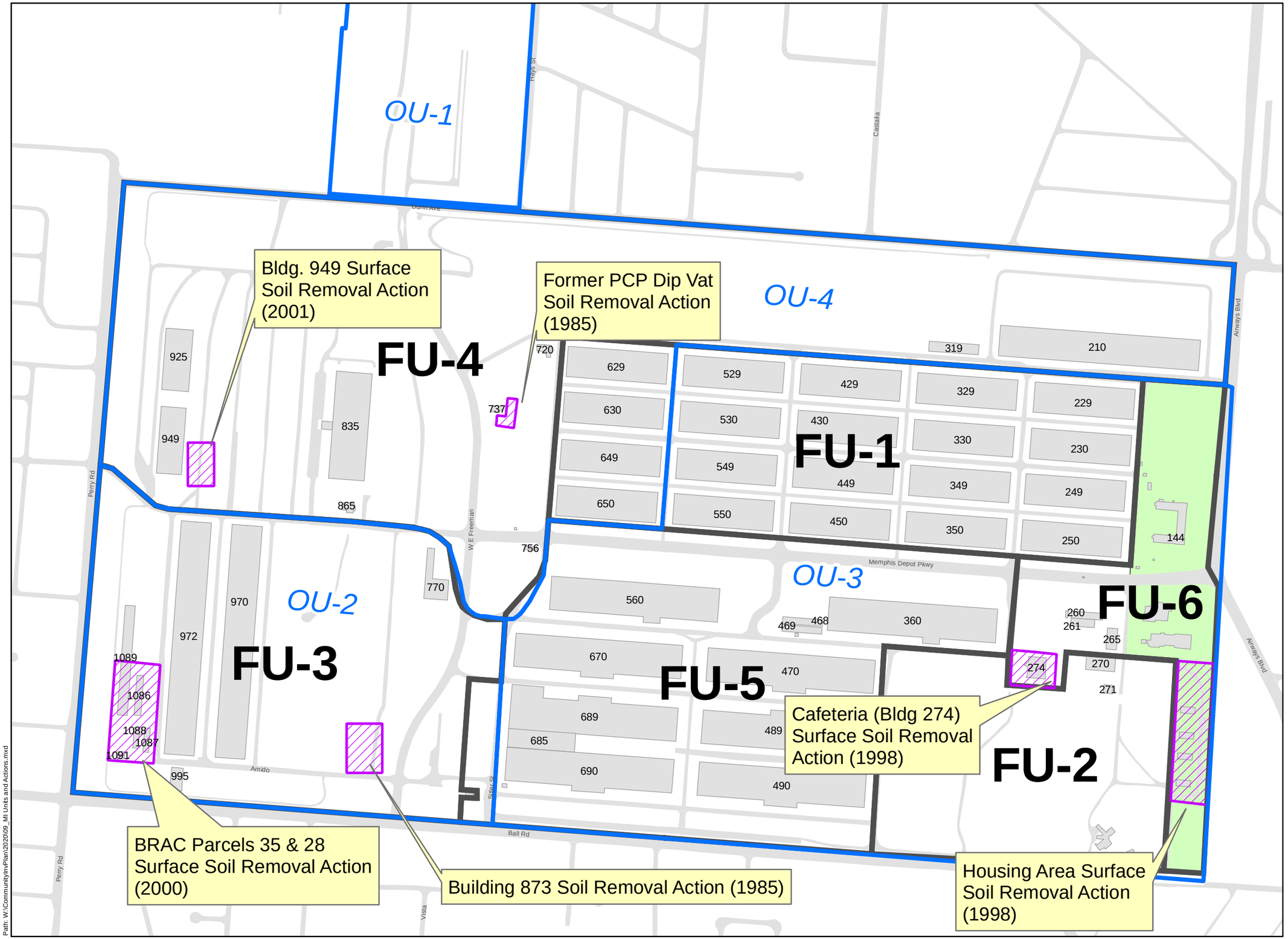


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Figure 9

Main Installation Response Actions

2020 Community Involvement Plan

Defense Depot Memphis, Tennessee

Legend

- Operable Units (OU-#)
- Past Response Actions
- Functional Unit Boundary (FU-#)
- Area Available for Unrestricted Use
- Buildings *490 - DDMT Assigned Number*
- Roads

N
W E
S

0 500 1,000
Feet

Projection: NAD 1927 StatePlane Tennessee
Units: Feet, Elevation Units: Feet, NAVD88

Date: 12/14/2020
Edition: Rev 0

CHEMICAL WARFARE MATERIAL REMOVAL ACTION (2001)

PISTOL RANGE REMOVAL ACTION (2003)

GROUNDWATER INTERIM REMEDIAL ACTION (2009)

CHEMICAL WARFARE MATERIAL REMOVAL ACTION (2001)

NORTHEAST OPEN AREA

DISPOSAL AREA

STOCKPILE AREA

E. Person Ave

Carver Ave

Carver Ave

Hays St

State

Ferber Ave

State St

Perry Rd

Dunn Ave

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Figure 10

Dunn Field Removal Actions and Interim Remedial Action

2020 Community Involvement Plan

Defense Depot Memphis, Tennessee

Legend

- Original Dunn Field Boundary
- IRA Recovery Well
- IRA Discharge Conveyance Line
- Area Designations
- Removal Actions
- Unrestricted Use Area
- Paved Area
- Roads
- Railroad

N

W E

S

0 250 500

Feet

Projection: NAD 1927 StatePlane Tennessee
Units: Feet, Elevation Units: Feet, NAVD88

Date: 12/14/2020
Edition: Rev 0

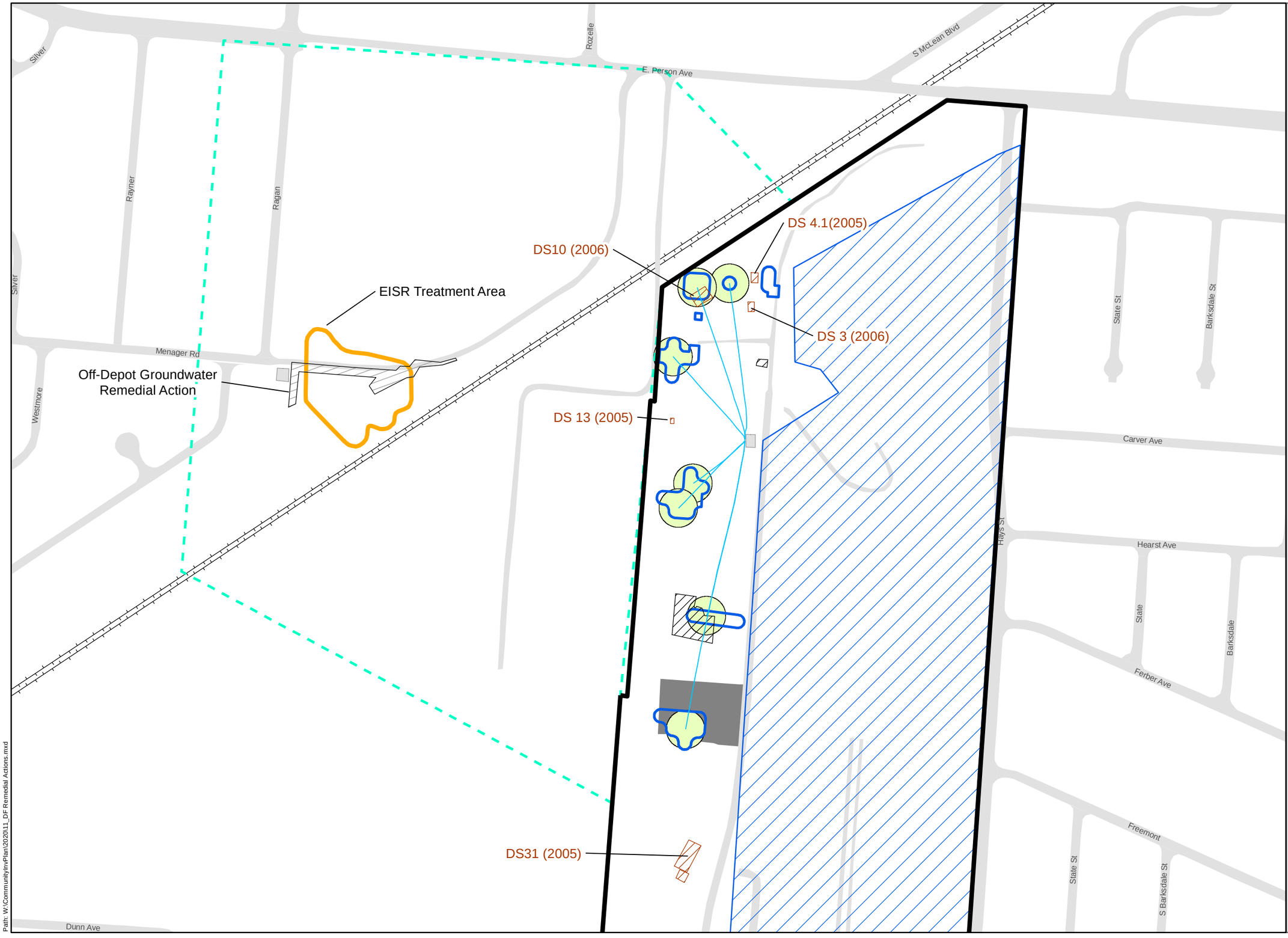

Figure 11

Dunn Field Disposal Sites, Source Areas and Off-Depot Groundwater Remedial Actions

2020 Community Involvement Plan

Defense Depot
Memphis, Tennessee

Legend

- Original Dunn Field Boundary
- Fluvial SVE Conveyance Line
- Disposal Sites Excavation Area
- Off Site Treatment Areas
- Off Depot Air Sparge Area
- EISR Treatment Area
- *Loess Excavation Areas*
- *Loess Thermal-Enhanced SVE Treatment Areas*
- Fluvial SVE Well 60-foot radius of influence
- Unrestricted Use Area from ROD
- Buildings
- Paved Area
- Roads
- Railroad

N
W E
S

0 250 500
Feet

Projection: NAD 1927 StatePlane Tennessee
Units: Feet, Elevation Units: Feet, NAVD88

Date: 12/14/2020
Edition: Rev 0

Path: W:\Community\nvPlan\20200111_DF Remedial Actions.mxd

A

Appendix A.

Responses to Comments from USEPA and TDEC

Responses to Comments from
U.S. Environmental Protection Agency (USEPA) Region 4 on:
2018 Community Involvement Plan, Revision 0, June 2018
Former Defense Depot Memphis, Tennessee
Comments Received: 23 March 2019

General Response: Included with these responses to USEPA comments is a revised Community Involvement Plan updated for community activities through 2020.has been.

USEPA Comments:

1) How will community input be solicited, incorporated and responded to for this DDMT Community Involvement Plan (CIP)?

Response 1:
Community input was solicited, incorporated, and responded to for the 2004 CIP. No additional public involvement activities were deemed necessary for this CIP update. A public comment period for the CIP is not required by Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) or National Contingency Plan (NCP). The 2018 CIP was intended as a general update to the previous CIP dated April 2011 for use by Army in meeting community involvement requirements.
Army maintains a Community Involvement Line (CIL) for community members to provide comments or request information. Sections 2.3.3, 3.4, 4.1.1.2 and 4.1.2.4 has been revised to document community contacts to the CIL and a table has been added: Table 3 CIL Contacts 2010 - 2020. Calls related to the DDMT environmental cleanup project were considered in preparation of the CIP.

a. Please include information in the CIP that TDEC was given the opportunity to review the CIP

Response 1a: Section 1 has been revised to state the CIP was submitted to USEPA and TDEC on 5 June 2018 and that the comments and responses have been provided in Appendix A.

b. Have any other stakeholders been given the CIP for comment?

Response 1b: This CIP Update was only provided to USEPA and TDEC for review.

2) Section 1, Overview of the Community Involvement Plan, 1st paragraph, 1st sentence: The CIP should also meet requirements in Emergency Planning and Community Right to Know Act (EPCRA)

Response 2: The USEPA Community Involvement Manual does not include EPCRA as a CIP compliance document. In addition, EPCRA no longer applies to the site as the federal government ceased handling hazardous materials at DDMT following closure in 1997.

3) Site History: should also include description of affected areas (or depict on map with reference in text) on the site along with the extent (any contamination offsite?) and any associated exposure concerns (in addition to potential vapor intrusion) and how it is being mitigated or addressed.

Response 3: Section 2.2.3 has been revised to summarize the current extent of contamination, onsite and offsite, including figures showing groundwater plumes. Exposure concerns and plans to address concerns will also be noted.

4) Provide an appendix that details the specific chemical names for each of the bulleted items in Section 2.1.2, Environmental Background or a reference where this information is located.

Response 4: Lists of specific materials handled at the site from 1942 to 1997 are not available. Appendix D has been added with ATSDR chemical profiles for the contaminants of concern. Section 2.3 has been revised to include summaries of remedial investigations for the MI (2.3.1.2) and Dunn Field (2.3.2.2).

5) Section 2.1.3, Site Closure and Cleanup Summary: This document section should relate that although the cleanup process is at a mature stage, there will still be many years before the site has reached final cleanup status.

Response 5: Section 2.2.3 has been revised to include the CERCLA cleanup process with the status at DDMT. The estimated time for completion from the 2020 SMP has also been included.

a. In fact, the site is undergoing additional remedial investigation and vapor intrusion investigations to ensure the site remains protective of human health and the environment and this information should be included in the CIP

Response 5a: Revisions to Section 2.2.3 per Response 3 note the SRI and VI study activities.

6) Please include information about how to be added to the Depot news mailing list

Response 6: Sections 2.3.3 Points of Contact and Section 4 have been revised to include information on addition or removal from the mailing list. The information is also provided in the annual EnviroNews, and callers to the CIL are asked if they are on the mailing list or would like to be added.

7) Section 2.2, Site Description/Location, page 2-4: please detail the name and number of schools, churches and their distance of the residential neighborhood from the DDMT site.

Response 7: Text in Section 3.1 Community Profile has been revised to reference Tables 4 and 5, which list schools and churches within ½ mile of DDMT.

a. Please include any water bodies that are near the DDMT site.

Response 7a: Revised text in Section 2.1 to note water bodies near DDMT, which are two small ponds on the golf course and the streams that receive runoff from DDMT.

8) Section 2.3.1.4, Property Redevelopment: It would be beneficial for the community members to understand what activities take place within their community along with the associated land use restrictions for any redeveloped property.
a. Please include information that includes the business activities and the associated land use controls for the businesses that are located on the DDMT property.
i. Please include information for each company/business mentioned in this paragraph

Response 8a: Table 1 has been added listing property owner, acreage and use and referenced in Sections 2.3.1.5 and 2.3.2.5. The land use restrictions are cited in Sections 2.3.1.3 and 2.3.2.3 and summarized in Sections 2.3.1.4 and 2.3.2.4.

9) Section 2.3.2.4, Property Redevelopment: Please include information for the 41 acres that were transferred in 2007 as outlined in #8 comment, above, inclusive of who property was sold to and the present use and land use controls.

Response 9: See Response 8a.

10) Section 3.1 Community Profile, page 3-1: In addition to the latest US Census Data, please include the following information for a comprehensive community profile:
a. Please identify stakeholder groups
b. Please identify leaders within the community
c. Please identify the local government structure for this community
d. Please identify community organization within the community
e. What is the primary spoken language? Are any other languages spoken?
f. Please outline any Environmental Justice concerns within the community
g. Were any interviews conducted within the community
h. When requested data is collected, please explain how this community profile was developed

Responses to Comments from
U.S. Environmental Protection Agency (USEPA) Region 4 on:
2018 Community Involvement Plan, Revision 0, June 2018
Former Defense Depot Memphis, Tennessee
Comments Received: 23 March 2019

i. Please include any barriers to communication or participation within the DDMT community. For instance, do most homes include access to computers or do they rely upon US Postal Service for most communications?

Response 10: The information requested has been incorporated in revision of Section 3.1 as noted below.

a. Stakeholders are federal, state, city and county officials whose districts include the DDMT area; property owners, tenants and employees at DDMT; area residents and leaders of churches and schools near DDMT.

b. Community leaders for the DDMT area are the Mayors for the city and county, City Council and County Commission members for the area and former members of the RAB (adjourned in 2009). Appendix B includes contact information for the elected officials and former RAB members.

c. See Response 10b.

d. The Alcy Ball Neighborhood Association is on the DDMT mailing list; no other community organizations have been identified through past contacts.

e. English is the main language of the DDMT community.

f. Environmental Justice concerns within the community are health-related issues based on CIL calls.

g. Community interviews were conducted during preparation of the 1999 and 2004 CIPs. No community interviews were conducted for this CIP update. Community input received during the 2012 FYR public comment period and calls to the CIL were used to update the CIP.

h. The community profile was developed from U.S. census data. Further data collection is not considered necessary.

i. No barriers to communication or participation have been identified. Community calls to the CIL usually occur following distribution of the newsletter indicating communication is reaching the target audience. The CIP includes communicating mainly through the US Postal Service for the annual newsletter distributed to the surrounding community, former RAB members, as well as city, county, state, and federal elected officials; notices in local newspapers; and fact sheets delivered to specific neighborhoods prior to work in the area.

11) Section 3.2, History of Community Involvement:

a. A brief history inclusive of the establishment of the RAB and its subsequent dissolution along with significant community involvement activities should be included in the document text of this section. This shouldn't include all activities mentioned in Appendix C but should convey an understanding of community involvement at this site and how it has changed since following dissolution of the RAB

i. for instance, community involvement as outlined in Appendix C only includes 4 items since 2010. However, there have been media inquiries and citizen inquiries/concerns expressed since 2010 that have necessitated involvement from all FFA signatories and actions from the US DA

ii. The media and citizen inquiries should be captured somewhere in this document along with specific actions that were taken to address community concerns

iii. This document should also address what actions will be taken to address community concerns that may arise in the future

Response 11a: Section 3.2 has been revised to provide history of the RAB through adjournment and of significant community involvement activities in that period and after adjournment. Text in Section 3.3 has been revised to summarize CIL contacts and concerns, and Table 3 has been added documenting calls to the CIL.

i: Section 3.3 provides information on the calls received since 2010. Community involvement in Appendix E includes activities performed by DDMT to include the community and is not meant to represent community/media inquiries.

ii: Section 3.3 has been revised to note historic and recent community concerns and information from community calls to the CIL and media inquiries. Table 3 has been added to provide information regarding community CIL contacts, media inquiries and actions taken.

iii: Actions to be taken are presented in Section 4.0. That section has been revised by adding "Respond to Community Concerns: DA will respond via phone calls, annual newsletter articles, or fact sheets to concerns or comments received via the CIL; raised by federal, state, county or city officials; and received during public comment periods.

b. Please include information in this section as to how an interested community member can be added or deleted from the mailing list for the EnviroNews annual newsletter and the RAB mailing list.

Response 11b. See Response 6 regarding changes to the mailing list. There is not a RAB mailing list.

12) Section 3.3, Key Community Concerns:

a. It's been over 14 years since the last community interviews were conducted in 2004 and as mentioned in the above comment, additional community concerns have been noted. Please consider conducting community interviews in the future to ascertain present community concerns for the DDMT community and a timeline for implementation of community interviews.

Response 12a: Interviews are not considered necessary at present. DA will continue to advertise the CIL in the annual newsletter, will continue to monitor the CIL, will provide required public comment periods on applicable documents, and will respond to community concerns as they occur.

b. Information regarding TAG program and procedures should be included in this CIP in the text and if appropriate in an appendix.

Response 12b: Information on the TAG program has been included in Appendix F.

c. A DOD or DDMT weblink should be provided where the community can find information about community outreach activities that are available for DOD SF sites

Response 12c: At present, DA does not have a website specific to DDMT. Section 2.3.3 has been revised to include the USEPA Superfund website containing DDMT site information (https://cumulis.epa.gov/supercpad/cursites/csitinfo.cfm?id=0404159).

d. There have been multiple community concerns identified in the Community Call Log or through communication with USEPA, TDEC or the US DA and these should be noted in this section along with actions that were taken to address these concerns.

i. Barnhart Garden concerns, potential contamination from DDMT and proximity to schools, health concerns from individuals, etc.

ii. Please include information about who/how to contact the appropriate individuals with regard to health concerns

iii. Please include information on how to access the AR and the IR within this document

iv. The development and distribution of Fact Sheets to address community concerns are an effective means to inform the surrounding communities and should be considered and used to inform the community surrounding the DDMT site. Please include an action plan for the distribution of fact sheets to address community concerns.

Response 12d: Section 3.3 has been revised to summarize community concerns based on calls to the CIL and other community contacts; Table 3 has been added to provide a listing of the calls.

i. All community contacts regarding environmental restoration activities and health concerns including those noted in the comment have been listed on Table 3.

ii. Section 2.3.3 revised to state that questions related to health concerns should be directed to the Shelby County Health Department and claims should be filed with the Office of Staff Judge Advocate

at Fort Campbell, KY. The contact information for Shelby County Health Department and Office of Staff Judge Advocate are included in Section 2.3.3 Points of Contact.

iii. Section 2.3.3 has been revised to address community access to the AR and the IR. Text has been updated regarding IR/AR access in Section 4.1.2.1.

iv. Section 4.1.2.3 includes the action plan for distribution of fact sheets. Factsheets are developed for upcoming field work in neighborhood areas, in the event of unexpected findings during field activities or in support of public comment periods such as for a new decision document.

13) Section 3.4, Summary of Communication Needs: Please see above comments which have outlined issues to be resolved with respect to communication needs at the DDMT site.

Response 13: See Response 12a.

a. Please explain that the Dunn Field property transfer has an approved FOST developed by the US DA which does not include approval of transfer from USEPA/TDEC

Response 13a: The sentence referring to planned transfer of the remaining portion of Dunn Field has been deleted. The current investigations at Dunn Field and the planned transfer are discussed in revisions to Section 2.3.2 Dunn Field per previous comments. Revisions will accurately note document approvals as warranted.

b. Please include information that additional remedial investigation is being performed concurrently with a vapor intrusion investigation.

Response 13b: See Response 5a.

c. Please delete the sentence or alter the next to the last sentence in this section which begins “Based on this information, the community currently ~~has few communication needs~~.” It is USEPA’s belief that the community surrounding the DDMT site requires additional communication/fact sheet distribution and this sentence and the CIP document in general should reflect this need.

Response 13c: The sentence has been revised to state the current level of communication is considered to meet the needs of the local community. USEPA can suggest fact sheets or other community involvement activities to Army when warranted for specific concerns

d. The DDMT Community Involvement Program needs to include additional focus on community informational needs and this document should specify what actions has been taken to ensure the community is informed and involved in DDMT cleanup actions.

Response 13d: Section 4 provides actions to be taken to ensure the community is informed and involved. Army believes that the current level of information provided to the community is sufficient.

14) Section 4.0 Community Involvement Program:

a. Please list the US DA personnel who is tasked with overseeing DDMT’s community involvement program? This contact should be listed in this section

Response 14a: The BRAC Environmental Coordinator oversees the community involvement program as noted in Sections 2.3.3 and 4.1.1.1.

b. 3rd Paragraph of this section: The CIP is considered a “living document” that is to be amended as required based on community concerns and needs. The CIP is required to identify community needs independent of what cleanup phase a Superfund Site is undergoing. Please modify the language in this section to reflect that the DDMT site will address community concerns as they arise throughout the SF cleanup process.

Response 14b: A final sentence has been added to state "Additional community involvement activities will occur as needed to address community concerns as they arise throughout the Superfund cleanup process."

c. Please modify the last sentence of the 3rd paragraph to reflect that future community involvement at the DDMT site will include addressing community concerns and needs throughout the SF cleanup process.

Response 14c: See Response 14b.

15) Section 4.0 Community Involvement Program, Cleanup Remedy Operation and Maintenance (including long term monitoring), bulleted items:

a. USEPA/TDEC will be provided with a copy of the letter that is sent regarding the FYR to former RAB members and civic officials

Response 15a: Revised statement to "... former RAB members, civic officials and USEPA and TDEC remedial project managers."

b. The CIP should include a way for any interested community member(s) to request a letter regarding the FYR be sent to them along with previous RAB members

Response 15b: Added a second bullet stating, "The newsletter, public notice and the letter will invite comments on protectiveness of the selected remedies and provide the CIL phone number to request additional information or provide comments." As long as interested community members are on the mailing list, they will receive the newsletter with notice of the upcoming FYR. Information on being added to the mailing list is provided per previous comments.

c. USEPA/TDEC will be provided a copy of the ad that is proposed to be announced the initiation and completion of the FYR.

Response 15c: Use of "an ad" has been replaced with "a public notice". A fifth bullet has been added "Copies of the public notices placed in local media prior to and after completion of the FYR will be provided to USEPA and TDEC remedial project managers."

16) Please refer to comments above and incorporate site-specific actions that will be undertaken to communicate with the community surrounding the DDMT site.

Response 16: See responses to comments above.

17) Section 4.1.1, Fulfilling Pubic Involvement Requirements:

a. Please define the acronym BEC in this section and explain the BEC's relationship to the US DA

Response 17: Revised text to "... designate a BRAC Environmental Coordinator (BEC) to handle ...". The relationship to Army is stated in the text. DA designates the BEC to handle inquiries and serve as a POC for community members.

18) Section 4.1.1.2, Assess community interest in reestablishing the RAB at sites where the RAB has adjourned by restoration activities continue:

a. 2nd bullet: Please explain how the community contacts to the CIL are used to assess community interest

Response 18a: As stated in Section 4.1.1.2, community contacts to the CIL and participation in community involvement activities has been used in consideration of re-establishing the RAB. The main community involvement activities at present are calls to the CIL, contacts from federal, state, county or city officials, comments on the FYRs and community review of the IR. Interest in the progress of remedial actions, ongoing investigations or long-term monitoring and specific requests to re-establish the RAB

would be indicators of community interest. The RAB requires a significant level of effort by the community members, local officials, Army and EPA/TDEC in order to be effective. A significant increase in community interest from that of the past several years would be needed to consider re-establishment. To date, no CIL contacts or public comments have requested RAB reestablishment. Revision of Section 3.2 per Response 11a notes the level of community involvement in recent years.

b. 2nd bullet: Please provide information about how and which community involvement activities are used to assess community interest

Response 18b: See Response 18a.

c. Please provide measures that has been used to assess sufficient and sustained community interest at the DDMT site

Response 18c: The assessment of community interest is qualitative. Army measures community needs, issues, and concerns regarding DDMT cleanup through CIL contacts, media contacts, comments received during required public comment periods, requests to review IR documents, and contacts from federal, state, city or county officials. Community contacts are discussed on monthly SMT calls and can be evaluated by Army and regulatory project managers.

d. Please provide the DDMT document which will recommend or not recommend the re-establishment or not of the RAB as an appendix to this document in future CIP submissions

Response 18d: According to 32 CFR 202(c), assessment of sufficient and sustained community interest in re-establishing the RAB should be made when changes to the remedial action become necessary. As Army proceeds with evaluation of the selected remedy for the MI through an ESD or ROD amendment, the community response to request for comments and a possible public meeting has been used to consider re-establishing the RAB.

19) Section 4.1.2 Fulfilling Public Information Requirements:
a. Please include language that explains the difference between an IR and the AR

Response 19a: Establishment of the IR and the AR and the differences have been added in Section 2.2.4.

b. Please include the address and contact information for viewing both the IR/AR

Response 19b: Sections 2.3.3 and 4.1.2.1 have been revised to include contact information and instructions on accessing the IR/AR.

20) Section 4.1.2.2, Maintain the mailing list: Please include information in this section that informs the public how an individual can be added to the DDMT mailing list

Response 20: Section 2.3.3 and Section 4.1.2.2 have been revised to include instruction on requesting addition/removal from the mailing list per Response 6. Responses to the sub-comments has been included in the revision.

a. include a list of items that are mailed to this mailing list

Response 20a: Section 4.1.2.2. has been revised to note items mailed to the Area and Civic/Requested mailing lists. The annual newsletter, EnviroNews, is the only item mailed to the entire Area and Civic/Requested mailing lists. Revisions also note that the FYR notice has been mailed to federal, state, county and city officials, USEPA and TDEC project managers and former RAB members on the Civic/Requested mailing list.

b. include a timeframe for updates to the mailing list

Response 20b: Section 4.1.2.2 has been revised to state that the mailing list is updated annually based on US Postal Service returns of the newsletter; as needed upon receipt of requests for addition; and after federal, state, county and city elections.

c. Please include the number of individuals that are included on the RAB mailing list

Response 20c: There is not a RAB mailing list. Section 4.1.2.2 has been revised to include the November 2020 mailing lists numbers: 2,872 addresses for the Area list and 142 addresses for the Civic/Requested list.

21) Section 4.1.2.3, Prepare and distribute fact sheets about the DDMT environmental cleanup program:
a. Please include what specific criteria that would need to be met for the development and distribution of an activity specific fact sheet?

Response 21a: Section 4.1.2.3, Activity, has been revised to note the following: Activity-specific fact sheets are developed for upcoming field work in neighborhood areas, in the event of unexpected findings during field activities or in support of public comment periods such as for a new decision document. Distribution by mail or hand delivery is determined by the area/group affected and on the number of planned recipients.

b. How would a specific area for fact sheet distribution be determined?

Response 21b: As stated in Responses 21a, factsheet distribution is determined by the area/group affected.

c. What specific work would trigger distribution of fact sheets to specific neighborhoods?

Response 21c: As stated in Responses 21a, work limited to a neighborhood triggers factsheet distribution to that specific neighborhood, such as for the 2020 well installation in the Glory Circle neighborhood.

22) Section 4.1.2.5, Update the CIP
a. Please provide information as to how the identification of community needs, issues, and concerns regarding the DDMT site cleanup has been determined.

Response 22a: Section 4.1.2.5, Activity, has been revised to state that community needs, issues, and concerns regarding DDMT cleanup are determined through CIL contacts, media contacts, comments received during required public comment periods, and contacts from federal, state, city or county officials.

b. Please provide information as to how community needs, issues and concerns has been addressed, once identified.

Response 22b: See Responses 12a and 22a. No changes to text needed in Section 4.1.2.5 as it provides general information regarding CIP updates.

c. Timing: Please explain how the time interval of 5 years was determined.

Response 22c: The interval has been revised to "**...** as needed based on changed conditions. The Five-Year Review cycle will also be used to consider updates to the CIP as it requires a public comment period which may indicate changes in community concerns and interest in environmental cleanup at DDMT." Activity at the site has been in Post-Construction phase since 2010 with ongoing cleanup system operations, monitoring, groundwater well installation and investigations. FYRs require a public comment

period and comments received are considered in determining community needs and concerns. The current CIP update was begun following the 4th FYR.

23) Table 4.2

a. the DA POC position should have an individual identified for the DDMT site

Response 23a: The DA POC is identified as the BEC in Sections 2.3.3 and in 4.1.1.1.

b. please include the information that there is also a mailing list for the RAB and when this mailing list is utilized

Response 23b: As stated in previous responses, there is not a "RAB mailing list".

24) A figure(s) needs to be included that delineates the plumes at the Main Installation and at Dunn Field, inclusive of any suspected offsite contamination and/or migration offsite

Response 24: See Response 3. Plume maps for the MI and Dunn Field(s) have been added and cited in Section 2.2.3.

25) The Memphis Depot Media List

a. is this a list of previous media contacts or contacts in the area or another alternative?

Response 25: Heading of Appendix C has been revised, "Memphis Media Points of Contact" and Appendix B heading, "Civic and Regulatory Points of Contact." The Media List identifies area media outlets for use in distributing press releases/public service announcements.

26) Appendix C, Historical Activities – Please include activities associated with garden concerns, media contacts and any calls to the CIL that weren't specific to an individual's health concerns

Response 26: Appendix C (to become Appendix E) provides a list of community involvement activities performed by DDMT. The garden concerns, media contact, and CIL calls are addressed in Sections 3.3 and 3.4.

27) Please include a flow chart or graphic that depicts the Superfund Cleanup process

Response 27: See Response 5. A Superfund Cleanup chart has been added in Section 2.2.3.

28) Please include any outreach and or community involvement activities to the DDMT SMP

Response 28: The SMP will note community involvement activities in the past year and planed activities in the following two years.

Draft Responses to Comments from
Tennessee Department of Environment and Conservation on:
2018 Community Involvement Plan
Former Defense Depot Memphis, Tennessee
Received: 9 October 2019

TDEC Comments:

1. Page 1-1, Paragraph 2. "…facilitating communication with the community regarding environmental issues." Might want to mention the RAB here? I know it's discussed in 2.1.4, but I fear it may be lost in the details of the document.

Response: A sentence has been added stating the Technical Review Committee (TRC) consisting of representatives from DDMT, USEPA, TDEC and the municipal government was established in 1994 and was converted to a Restoration Advisory Board (RAB) in 1997 with representatives from local community groups; additional information is provided in Sections 2.1.4 and 3.2.

2. Page 2-2, Paragraph 2. "Additionally, small quantities of hazardous substances were buried in the northwest section of Dunn Field." Might want to clarify exactly what hazardous substances, if known or refer to the list from last page.

Response: Revised to "... small quantities of hazardous substances handled at DDMT were buried ..." Lists of specific materials handled at the site from 1942 to 1997 are not available. Appendix D will be added with ATSDR chemical profiles for the contaminants of concern.

3. Page 2-8, Paragraph 4 "… 4,000 pounds of VOCs from …"and Paragraph 6 "…12,500 pounds of VOCs …". Maybe point out how well these align with MIP Investigation estimates? So it will be emphasized we left little to nothing in the source areas.

Response: The estimated mass of VOCs from Section 5.2.1 of the Dunn Field Source Areas RD (14,550 pounds) has been noted with comparison to the mass removed by SVE and ISTD.

4. Page 2-9, Paragraph 2. "… prevent residential use of Dunn Field …". Maybe point out that it was cleaned up to residential standards to show the aggressive nature of remediation efforts?

Response: The cleanup standards were based on commercial/industrial exposure, not residential exposure.

B

Appendix B.

Civic and Regulatory Points of Contact

APPENDIX B
CIVIC AND REGULATORY POINTS OF CONTACT
2020 COMMUNITY INVOLVEMENT PLAN
Defense Depot Memphis, Tennessee

Federal Elected Officials	
Senator Lamar Alexander (R-TN) The Clifford Davis/Odell Horton Federal Building 167 N Main St, Suite 1068 Memphis, TN 38103 Phone: (901) 544-4224 (*Senator-elect Bill Hagerty takes office Jan. 3, 2021 – no contact information available yet*)	**Senator Marsha Blackburn (R-TN)** 100 Peabody Place, Suite 1125 Memphis, TN 38103 Phone: (901) 527-9199
Congressman Steve Cohen (D-9th Dist.) The Clifford Davis/Odell Horton Federal Building 167 N Main St, Suite 369 Memphis, TN 38103 Phone: (901) 544-4131	
City, County and State Officials	
Memphis City Mayor Jim Strickland City Hall 125 N. Main St. Room 700 Memphis, TN 38103 Phone: (901) 576-6000 Email: mayor@memphistn.gov	**Shelby County Mayor Lee Harris** 160 N. Main Street, Suite 625 Memphis, TN 38103 Phone: (901) 222-2000 Email: officeofthemayor@shelbycountytn.gov
Memphis City Council Ms. Jamita Swearengen 125 N. Main, Room 514 Memphis, TN 38103 Phone: (901) 636-6775 Email: jamita.swearengen@memphistn.gov	**Memphis City Council** Mr. JB Smiley, Jr. 125 N. Main, Room 514 Memphis, TN 38103 Phone: (901) 636-6782 Email: jb.smileyjr@memphistn.gov
Shelby County Board of Commissioners Mr. Reginald Milton 160 N. Main, Suite 600 Memphis, TN 38103 Phone: (901) 222-1000 Email: reginald.milton@shelbycountytn.gov	**TN House of Representatives District 91** Ms. London Lamar 425 5th Avenue North, Suite 424 Cordell-Hull Bldg Nashville, TN 37423 Phone: (615) 741-3830
Tennessee State Senate District 29 Ms. Raumesh Akbari 425 5th Avenue North, Suite 762 Cordell-Hull Bldg Nashville, TN 37423 Phone: (615) 741-1767	**Economic Development Growth Engine/ Depot Redevelopment Corporation** Mr. Reid Dulberger President & Chief Executive Officer 100 Peabody Place, Suite 1100 Memphis, TN 38103-3652 Phone: 901-341-2100 Email: rdulberger@growth-engine.org

APPENDIX B
CIVIC AND REGULATORY POINTS OF CONTACT
2020 COMMUNITY INVOLVEMENT PLAN
Defense Depot Memphis, Tennessee

Shelby County Health Department Mr. David Sweat, MPH Chief of Epidemiology 814 Jefferson Avenue Memphis, TN 38105 Phone: (901) 222-9229 Email: david.sweat@shelbycountytn.gov	**Shelby County Health Department** Ms. Kasia Smith-Alexander, Administrator Environmental Health 1826 Sycamore View Road Memphis, TN 38134 Phone: 901-222-9000 Email: kasia.alexander@shelbycountytn.gov
Environmental Regulators	
U.S. Environmental Protection Agency Ms. Diedre Lloyd 61 Forsyth St., SW Atlanta, Georgia 30303 Phone: (404) 229-9500 Email: Lloyd.Diedre@epa.gov	**Tennessee Department of Environment and Conservation** Mr. Jamie Woods 8383 Wolf Lake Drive Bartlett, Tennessee 38133-4119 Phone: (901) 371-3041 Email: Jamie.Woods@tn.gov
Former Restoration Advisory Board Community Members	
Mr. Dave Bond 2410 Bridgeport Drive Memphis, TN 38114	Ms. Doris Bradshaw 1454 E. Mallory Memphis, TN 38106
Atty. Reginald Eskridge 1502 Harlem St., Suite 100 Memphis, TN 38114-2802	Ms. Elisabeth Young 2347 Saratoga Avenue Memphis, TN 38114-1703
Mr. Ulysses Truitt 2559 Bridgeport Drive Memphis, TN 38114	Mr. Stanley Tyler 1233 Tanglewood Street Memphis, TN 38114
Mr. Mondell Williams 2101 Blakewood Place Memphis, TN 38106	

C

Appendix C.

Memphis Media Points of Contact

APPENDIX C
MEMPHIS MEDIA POINTS OF CONTACT
2020 COMMUNITY INVOLVEMENT PLAN
Defense Depot Memphis, Tennessee

Outlet Name	Outlet	Address 1	Address 2	Zip	Phone	E-mail/Website
Print						
Commercial Appeal	Newspaper	495 Union Avenue	Memphis, TN	38103	(901) 529-2211	www.commercialappeal.com
Memphis Flyer	Newspaper	460 Tennessee Street	Memphis, TN	38103	(901) 521-9000	www.memphisflyer.com
Silver Star News	Newspaper	3144 Park Avenue	Memphis, TN	38114	(901) 452-8828	No website available
Memphis Daily News	Newspaper	PO Box 3663	Memphis, TN	38103	(901) 523-1561	www.memphisdailynews.com
Tri-State Defender	Newspaper	124 East Calhoun Street	Memphis, TN	38103	(901) 523-1818	www.tri-statedefender.com
Memphis Business Journal	Magazine, news and business	88 Union Avenue	Memphis, TN	38103	(901) 523-1000	www.bizjournals.com/memphis
Television Stations						
WLMT/WPTY-TV (UPN 30)	Television Station	2701 Union Avenue Ext.	Memphis, TN	38112	(901) 323-2430	www.upn30memphis.com
WREG-TV (CBS 3)	Television Station	803 Channel 3 Drive	Memphis, TN	38103	(901) 543-2333	www.wreg.com
WHBQ-TV (Fox 13)	Television Station	485 South Highland	Memphis, TN	38105	(901) 535-1313	www.myfoxmemphis.com
WMC-TV (NBC 5)	Television Station	1960 Union Avenue	Memphis, TN	38104	(901) 726-0555	www.wmctv.com
WKNO (PBS-10)	Television Station	PO Box 241880	Memphis, TN	38124	(901) 458-2521	www.wkno.org

APPENDIX C
MEMPHIS MEDIA POINTS OF CONTACT
2020 COMMUNITY INVOLVEMENT PLAN
Defense Depot Memphis, Tennessee

Outlet Name	Outlet	Address 1	Address 2	Zip	Phone	E-mail/Website
Radio Stations						
KJMS – FM 101.1	Radio Station	PO Box 11839	Memphis, TN	38111	(901) 259-1300	https://myv101.iheart.com/
KWAM – AM 990	Radio Station	112 Union Avenue	Memphis, TN	38103	(901) 260-5926	https://mighty990.com
KXHT – FM 107.1	Radio Station	6080 Mount Moriah	Memphis, TN	38115	(901) 375-9324	www.hot1071.com
WAVN – AM 1240	Radio Station	1336 Brookhaven Drive	Southhaven, MS	38671	(901) 295-9223	https://wavnthetrend.com
WBBP – AM 1480	Radio Station	250 East Raines Road	Memphis, TN	38109	(800) 544-3571	www.bbless.org
WCRV – AM 640	Radio Station	10550 Barley, Ste 100	Overland Park, KS	66212	913-642-7770	https://bottradionetwork.com/station/640-am-memphis-tn/#
WDIA – AM 1070	Radio Station	112 Union Avenue	Memphis, TN	38103	(901) 259-1300	https://mywdia.iheart.com
WEGR – FM 102.7	Radio Station	203 Beale Street	Memphis, TN	38103	(901) 259-1300	https://rock103.iheart.com
WEVL – FM 90.1	Radio Station	PO Box 40952	Memphis, TN	38174	(901) 528-0560	www.wevl.org
WHBQ – AM 560	Radio Station	6080 Mount Moriah	Memphis, TN	38115	(901) 375-9324	www.sports56whbq.com
WHRK – FM 97.1	Radio Station	112 Union Avenue	Memphis, TN	38103	(901) 259-1300	https://k97fm.iheart.com

APPENDIX C
MEMPHIS MEDIA POINTS OF CONTACT
2020 COMMUNITY INVOLVEMENT PLAN
Defense Depot Memphis, Tennessee

Outlet Name	Outlet	Address 1	Address 2	Zip	Phone	E-mail/Website
WKNO – FM 91.1	Radio Station	P.O. Box 241880	Memphis, TN	38111	(901) 325-6544	www.wknofm.org
WLOK – AM 1340	Radio Station	363 South Second Street	Memphis, TN	38103	(901) 527-9565	www.wlok.com
WMC – AM 790/ FM 100	Radio Station	1960 Union Avenue	Memphis, TN	38104	(901) 726-0555	www.radio.com/fm100memphis
WOWW – AM 1430	Radio Station	6080 Mount Moriah	Memphis, TN	38115	(901) 365-1430	https://flinn.com
WREC – AM 600	Radio Station	203 Beale Street	Memphis, TN	38103	(901) 259-1300	https://600wrec.iheart.com
WRVR – FM 104.5	Radio Station	504 Ridgeway Parkway	Memphis, TN	38119	(901) 384-5900	www.radio.com/1045theriver
WQOX – FM 88.5	Radio Station	333 Covington Pike	Memphis, TN	38128-3999	(901) 416-3460	https://www.voiceofscs.com
WYPL – FM 89.3	Radio Station	3030 Poplar Avenue	Memphis, TN	38111	(901) 415-2752	www.memphislibrary.org/wypl

D

Appendix D.

Contaminant of Concern Fact Sheets

Aldrin and Dieldrin- ToxFAQs™

CAS # 309-00-2 and 60-57-1

This fact sheet answers the most frequently asked health questions (FAQs) about aldrin and dieldrin. For more information, call the CDC Information Center at 1-800-232-4636. This fact sheet is one in a series of summaries about hazardous substances and their health effects. It is important you understand this information because this substance may harm you. The effects of exposure to any hazardous substance depend on the dose, the duration, how you are exposed, personal traits and habits, and whether other chemicals are present.

HIGHLIGHTS: Exposure to aldrin and dieldrin happens mostly from eating contaminated foods, such as root crops, fish, or seafood. Aldrin and dieldrin build up in the body after years of exposure and can affect the nervous system. Aldrin has been found in at least 207 of the 1,613 National Priorities List (NPL) sites identified by the Environmental Protection Agency (EPA). Dieldrin has been found in at least 287 of the 1,613 sites.

What are aldrin and dieldrin?

Aldrin and dieldrin are insecticides with similar chemical structures. They are discussed together in this fact sheet because aldrin quickly breaks down to dieldrin in the body and in the environment. Pure aldrin and dieldrin are white powders with a mild chemical odor. The less pure commercial powders have a tan color. Neither substance occurs naturally in the environment.

From the 1950s until 1970, aldrin and dieldrin were widely used pesticides for crops like corn and cotton. Because of concerns about damage to the environment and potentially to human health, EPA banned all uses of aldrin and dieldrin in 1974, except to control termites. In 1987, EPA banned all uses.

What happens to aldrin and dieldrin when they enter the environment?

- Sunlight and bacteria change aldrin to dieldrin so that we mostly find dieldrin in the environment.
- They bind tightly to soil and slowly evaporate to the air.
- Dieldrin in soil and water breaks down very slowly.
- Plants take in and store aldrin and dieldrin from the soil.
- Aldrin rapidly changes to dieldrin in plants and animals.
- Dieldrin is stored in the fat and leaves the body very slowly.

How might I be exposed to aldrin or dieldrin?

- Dieldrin is everywhere in the environment, but at very low levels.
- Eating food like fish or shellfish from lakes or streams contaminated with either chemical, or contaminated root crops, dairy products, or meats.
- Air, surface water, or soil near waste sites may contain higher levels.
- Living in homes that were once treated with aldrin or dieldrin to control termites.

How can aldrin and dieldrin affect my health?

People who have intentionally or accidentally ingested large amounts of aldrin or dieldrin have suffered convulsions and some died. Health effects may also occur after a longer period of exposure to smaller amounts because these chemicals build up in the body.

Some workers exposed to moderate levels in the air for a long time had headaches, dizziness, irritability, vomiting, and uncontrolled muscle movements. Workers removed from the source of exposure rapidly recovered from most of these effects.

Animals exposed to high amounts of aldrin or dieldrin also had nervous system effects. In animals, oral exposure to lower levels for a long period also affected the liver and decreased their ability to fight infections. We do not know whether aldrin or dieldrin affect the ability of people to fight disease.

Studies in animals have given conflicting results about whether aldrin and dieldrin affect reproduction in male animals and whether these chemicals may damage the sperm. We do not know whether aldrin or dieldrin affect reproduction in humans.

Agency for Toxic Substances and Disease Registry
Division of Toxicology and Human Health Sciences

ATSDR

CS265956-A

Aldrin and Dieldrin

CAS # 309-00-2 and 60-57-1

How likely are aldrin and dieldrin to cause cancer?

There is no conclusive evidence that aldrin or dieldrin cause cancer in humans. Aldrin and dieldrin have shown to cause liver cancer in mice. The International Agency for Research on Cancer (IARC) has determined that aldrin and dieldrin are not classifiable as to human carcinogenicity. The EPA has determined that aldrin and dieldrin are probable human carcinogens.

How can aldrin and dieldrin affect children?

Children can be exposed to aldrin and dieldrin in the same way as adults. There are no known unique exposure pathways for children. Children who swallowed amounts of aldrin or dieldrin much larger than those found in the environment suffered convulsions and some died, as occurred in adults. However, we do not know whether children are more susceptible than adults to the effects of aldrin or dieldrin.

We do not know whether aldrin or dieldrin cause birth defects in humans. Pregnant animals that ingested aldrin or dieldrin had some babies with low birth weight and some with alterations in the skeleton. Dieldrin has been found in human breast milk, therefore, it can be passed to suckling infants.

How can families reduce their risk for exposure to aldrin and dieldrin?

- Since aldrin and dieldrin are no longer produced or used, exposure to these compounds will occur only from past usage.
- Because aldrin and dieldrin were applied to the basement of some homes for termite protection, before buying a home families should investigate what, if any, pesticides have been used within the home.

Is there a medical test to show whether I've been exposed to aldrin and dieldrin?

There are laboratory tests that can measure aldrin and dieldrin in your blood, urine, and body tissues. Because aldrin changes to dieldrin fairly quickly in the body, the test has to be done shortly after you are exposed to aldrin. Since dieldrin can stay in the body for months, measurements of dieldrin can be made much longer after exposure to either aldrin or dieldrin. The tests cannot tell you whether harmful health effects will occur. These tests are not routinely available at the doctor's office because they require special equipment.

Has the federal government made recommendations to protect human health?

The EPA limits the amount of aldrin and dieldrin that may be present in drinking water to 0.001 and 0.002 milligrams per liter (mg/L) of water, respectively, for protection against health effects other than cancer. The EPA has determined that a concentration of aldrin and dieldrin of 0.0002 mg/L in drinking water limits the lifetime risk of developing cancer from exposure to each compound to 1 in 10,000.

The Occupational Safety and Health Administration (OSHA) sets a maximum average of 0.25 milligrams of aldrin and dieldrin per cubic meter of air (0.25 mg/m^3) in the workplace during an 8-hour shift, 40 hour week. The National Institute for Occupational Safety and Health (NIOSH) also recommends a limit of 0.25 mg/m^3 for both compounds for up to a 10-hour work day, 40-hour week.

The Food and Drug Administration (FDA) regulates the residues of aldrin and dieldrin in raw foods. The allowable range is from 0 to 0.1 ppm, depending on the type of food product.

References

Agency for Toxic Substances and Disease Registry (ATSDR). 2002. Toxicological Profile for Aldrin/Dieldrin. Atlanta, GA: U.S. Department of Health and Human Services, Public Health Service.

Where can I get more information?

For more information, contact the Agency for Toxic Substances and Disease Registry, Division of Toxicology and Human Health Sciences, 1600 Clifton Road NE, Mailstop F-57, Atlanta, GA 30329-4027.

Phone: 1-800-232-4636

ToxFAQs™ Internet address via WWW is http://www.atsdr.cdc.gov/toxfaqs/index.asp.

ATSDR can tell you where to find occupational and environmental health clinics. Their specialists can recognize, evaluate, and treat illnesses resulting from exposure to hazardous substances. You can also contact your community or state health or environmental quality department if you have any more questions or concerns.

ATSDR
AGENCY FOR TOXIC SUBSTANCES AND DISEASE REGISTRY

CARBON TETRACHLORIDE

CAS # 56-23-5

Division of Toxicology ToxFAQs™ **August 2005**

This fact sheet answers the most frequently asked health questions (FAQs) about carbon tetrachloride. For more information, call the ATSDR Information Center at 1-888-422-8737. This fact sheet is one in a series of summaries about hazardous substances and their health effects. It is important you understand this information because this substance may harm you. The effects of exposure to any hazardous substance depend on the dose, the duration, how you are exposed, personal traits and habits, and whether other chemicals are present.

HIGHLIGHTS: Carbon tetrachloride does not occur naturally. Exposure to this substance results mostly from breathing air, drinking water, or coming in contact with soil that is contaminated with it. Exposure to very high amounts of carbon tetrachloride can damage the liver, kidneys, and nervous system. Carbon tetrachloride can cause cancer in animals. Carbon tetrachloride has been found in at least 425 of the 1,662 National Priority List sites identified by the Environmental Protection Agency (EPA).

What is carbon tetrachloride?

Carbon tetrachloride is a manufactured chemical that does not occur naturally. It is a clear liquid with a sweet smell that can be detected at low levels. It is also called carbon chloride, methane tetrachloride, perchloromethane, tetrachloroethane, or benziform.

Carbon tetrachloride is most often found in the air as a colorless gas. It is not flammable and does not dissolve in water very easily. It was used in the production of refrigeration fluid and propellants for aerosol cans, as a pesticide, as a cleaning fluid and degreasing agent, in fire extinguishers, and in spot removers. Because of its harmful effects, these uses are now banned and it is only used in some industrial applications.

What happens to carbon tetrachloride when it enters the environment?

- ❏ It moves very quickly into the air upon release, so most of it is in the air.
- ❏ It evaporates quickly surface water.
- ❏ Only a small amount sticks to soil particles; the rest evaporates or moves into the groundwater.
- ❏ It is very stable in air (lifetime 30-100 years).
- ❏ It can be broken down or transformed in soil and water within several days.
- ❏ When it does break down, it forms chemicals that can destroy ozone in the upper atmosphere.
- ❏ It does not build up in animals. We do not know if it build up in plants.

How might I be exposed to carbon tetrachloride?

- ❏ Breathing contaminated air near manufacturing plants or waste sites.
- ❏ Breathing workplace air when it is used.
- ❏ Drinking contaminated water near manufacturing plants and waste sites.
- ❏ Breathing contaminated air and skin contact with water while showering or cooking with contaminated water.
- ❏ Swimming or bathing in contaminated water.
- ❏ Contact with or eating contaminated soil (pica child) at waste sites.

How can carbon tetrachloride affect my health?

High exposure to carbon tetrachloride can cause liver, kidney, and central nervous system damage. These effects can occur after ingestion or breathing carbon tetrachloride, and possibly from exposure to the skin. The liver is especially sensitive to carbon tetrachloride because it enlarges and cells are damaged or destroyed. Kidneys also are damaged, causing a build up of wastes in the blood. If exposure is low and brief, the liver and kidneys can repair the damaged cells and function normally again. Effects of carbon tetrachloride are more severe in persons who drink large amounts of alcohol.

If exposure is very high, the nervous system, including the brain, is affected. People may feel intoxicated and experience headaches, dizziness, sleepiness, and nausea and vomiting. These effects may subside if exposure is stopped, but in severe cases, coma and even death may occur.

CARBON TETRACHLORIDE
CAS # 56-23-5

There have been no studies of the effects of carbon tetrachloride on reproduction in humans, but studies in rats showed that long-term inhalation may cause decreased fertility.

How likely is carbon tetrachloride to cause cancer?

Studies in humans have not been able to determine whether or not carbon tetrachloride can cause cancer because usually there has been exposure to other chemicals at the same time. Swallowing or breathing carbon tetrachloride for years caused liver tumors in animals. Mice that breathed carbon tetrachloride also developed tumors of the adrenal gland. The Department of Health and Human Services (DHHS) has determined that carbon tetrachloride may reasonably be anticipated to be a carcinogen. The International Agency for Research on Cancer (IARC) has determined that carbon tetrachloride is possibly carcinogenic to humans, whereas the EPA determined that carbon tetrachloride is a probable human carcinogen.

How can carbon tetrachloride affect children?

The health effects of carbon tetrachloride have not been studied in children, but they are likely to be similar to those seen in adults exposed to the chemical. We do not know whether children differ from adults in their susceptibility to carbon tetrachloride.

A few survey-type studies suggest that maternal drinking water exposure to carbon tetrachloride might possibly be related to certain birth defects. Studies in animals showed that carbon tetrachloride can cause early fetal deaths, but did not cause birth defects. A study with human breast milk in a test tube suggested that it would be possible for carbon tetrachloride to pass from the maternal circulation to breast milk, but there is no direct demonstration of this occurring.

How can families reduce the risks of exposure to carbon tetrachloride?

❑ Discard any product that contains carbon tetrachloride that you may have at home and may have used in the past.

❑ Household chemicals should be stored out of the reach of children in their original containers.

❑ Sometimes older children sniff household chemical products to get high. Talk to your children about the dangers of sniffing chemicals.

Is there a medical test to determine whether I've been exposed to carbon tetrachloride?

Several sensitive and specific tests are available to measure carbon tetrachloride in exposed persons. The most convenient way is simply to measure carbon tetrachloride in the exhaled air. Carbon tetrachloride also can be measured in blood, fat, or other tissues. These tests are not usually done in the doctor's office because they require special equipment. Although these tests can show that a person has been exposed to carbon tetrachloride, the results cannot be used to reliably predict whether any adverse health effect might result. Because carbon tetrachloride leaves the body fairly quickly, these methods are best suited to detecting exposures that have occurred within the last several days.

Has the federal government made recommendations to protect human health?

The EPA has set a limit for carbon tetrachloride in drinking water of 5 parts of carbon tetrachloride per billion parts of water (5 ppb). The EPA has also set limits on how much carbon tetrachloride can be released from an industrial plant into waste water and is preparing to set limits on how much carbon tetrachloride can escape from an industrial plant into outside air.

The Occupational Safety and Health Administration (OSHA) set a limit of 10 ppm for carbon tetrachloride in workplace air for an 8-hour workday, 40-hour workweek.

References

Agency for Toxic Substances and Disease Registry (ATSDR). 2005. Toxicological Profile for Carbon Tetrachloride (Update). Atlanta, GA: U.S. Department of Health and Human Services, Public Health Service.

Where can I get more information? For more information, contact the Agency for Toxic Substances and Disease Registry, Division of Toxicology, 1600 Clifton Road NE, Mailstop F-32, Atlanta, GA 30333. Phone: 1-888-422-8737, FAX: 770-488-0093. ToxFAQs Internet address via WWW is http://www.atsdr.cdc.gov/toxfaq.html. ATSDR can tell you where to find occupational and environmental health clinics. Their specialists can recognize, evaluate, and treat illnesses resulting from exposure to hazardous substances. You can also contact your community or state health or environmental quality department if you have any more questions or concerns.

Chloroform - ToxFAQs™

CAS # 67-66-3

This fact sheet answers the most frequently asked health questions (FAQs) about chloroform. For more information, call the CDC Information Center at 1-800-232-4636. This fact sheet is one in a series of summaries about hazardous substances and their health effects. It's important you understand this information because this substance may harm you. The effects of exposure to any hazardous substance depend on the dose, the duration, how you are exposed, personal traits and habits, and whether other chemicals are present.

HIGHLIGHTS: Exposure to chloroform can occur when breathing contaminated air or when drinking or touching the substance or water containing it. Breathing chloroform can cause dizziness, fatigue, and headaches. Breathing chloroform or ingesting chloroform over long periods of time may damage your liver and kidneys. It can cause sores if large amounts touch your skin. This substance has been found in at least 717 of the 1,430 National Priorities List (NPL) sites identified by the Environmental Protection Agency (EPA).

What is chloroform?

(Pronounced klôr′ə-fôrm′)

Chloroform is a colorless liquid with a pleasant, nonirritating odor and a slightly sweet taste. It will burn only when it reaches very high temperatures.

In the past, chloroform was used as an inhaled anesthetic during surgery, but it isn't used that way today. Today, chloroform is used to make other chemicals and can also be formed in small amounts when chlorine is added to water.

Other names for chloroform are trichloromethane and methyl trichloride.

What happens to chloroform when it enters the environment?

- Chloroform evaporates easily into the air.
- Most of the chloroform in air breaks down eventually, but it is a slow process.
- The breakdown products in air include phosgene and hydrogen chloride, which are both toxic.
- It doesn't stick to soil very well and can travel through soil to groundwater.
- Chloroform dissolves easily in water and some of it may break down to other chemicals.
- Chloroform lasts a long time in groundwater.
- Chloroform doesn't appear to build up in great amounts in plants and animals.

How might I be exposed to chloroform?

- Drinking water or beverages made using water containing chloroform.
- Breathing indoor or outdoor air containing it, especially in the workplace.
- Eating food that contains it.
- Skin contact with chloroform or water that contains it, such as in swimming pools.

How can chloroform affect my health?

Breathing about 900 parts of chloroform per million parts air (900 ppm) for a short time can cause dizziness, fatigue, and headache. Breathing air, eating food, or drinking water containing high levels of chloroform for long periods of time may damage your liver and kidneys. Large amounts of chloroform can cause sores when chloroform touches your skin.

It isn't known whether chloroform causes reproductive effects or birth defects in people.

Animal studies have shown that miscarriages occurred in rats and mice that breathed air containing 30 to 300 ppm chloroform during pregnancy and also in rats that ate chloroform during pregnancy. Offspring of rats and mice that breathed chloroform during pregnancy had birth defects. Abnormal sperm were found in mice that breathed air containing 400 ppm chloroform for a few days.

Chloroform

CAS # 67-66-3

How likely is chloroform to cause cancer?

The Department of Health and Human Services (DHHS) has determined that chloroform may reasonably be anticipated to be a carcinogen.

Rats and mice that ate food or drank water with chloroform developed cancer of the liver and kidneys.

Is there a medical test to show whether I've been exposed to chloroform?

Although the amounts of chloroform in the air that you exhale and in blood, urine, and body tissues can be measured, there is no reliable test to determine how much chloroform you have been exposed to or whether you will experience any harmful effects.

The measurement of chloroform in body fluids and tissues may help to determine if you have come into contact with large amounts of chloroform, but these tests are useful for only a short time after you are exposed. Chloroform in your body might also indicate that you have come into contact with other chemicals.

Has the federal government made recommendations to protect human health?

The current EPA drinking water limit for total trihalomethanes, a class of chemicals that includes chloroform, is 80 micrograms per liter of water (80µg/L).

The EPA requires that spills or accidental releases of 10 pounds or more of chloroform into the environment be reported to the EPA.

The Occupational Safety and Health Administration (OSHA) has set the maximum allowable concentration of chloroform in workroom air during an 8-hour workday in a 40-hour workweek at 50 ppm.

Glossary

Carcinogenicity: A substance with the ability to cause cancer.

CAS: Chemical Abstracts Service.

Ingesting: Taking food or drink into your body.

Microgram (µg): One millionth of a gram.

Miscarriage: Pregnancy loss.

ppm: Parts per million.

References

Agency for Toxic Substances and Disease Registry (ATSDR). 1997. Toxicological Profile for Chloroform. Atlanta, GA: U.S. Department of Health and Human Services, Public Health Service.

Where can I get more information?

For more information, contact the Agency for Toxic Substances and Disease Registry, Division of Toxicology and Human Health Sciences, 1600 Clifton Road NE, Mailstop F-57, Atlanta, GA 30329-4027.

Phone: 1-800-232-4636

ToxFAQs™ Internet address via WWW is http://www.atsdr.cdc.gov/toxfaqs/index.asp.

ATSDR can tell you where to find occupational and environmental health clinics. Their specialists can recognize, evaluate, and treat illnesses resulting from exposure to hazardous substances. You can also contact your community or state health or environmental quality department if you have any more questions or concerns.

ATSDR
AGENCY FOR TOXIC SUBSTANCES AND DISEASE REGISTRY

1,2-DICHLOROETHENE
CAS # 540-59-0, 156-59-2, and 156-60-5

This fact sheet answers the most frequently asked health questions (FAQs) about 1,2-dichloroethene. For more information, call the ATSDR Information Center at 1-888-422-8737. This fact sheet is one in a series of summaries about hazardous substances and their health effects. This information is important because this substance may harm you. The effects of exposure to any hazardous substance depend on the dose, the duration, how you are exposed, personal traits and habits, and whether other chemicals are present.

HIGHLIGHTS: Exposure to 1,2-dichloroethene occurs mainly in workplaces where it is made or used. Breathing high levels of 1,2-dichloroethene can make you feel nauseous, drowsy, and tired. *cis*-1,2-Dichloroethene has been found in at least 146 of the 1,430 National Priorities List sites identified by the Environmental Protection Agency (EPA). *trans*-1,2-Dichloroethene was found in at least 563 NPL sites. 1,2-Dichloroethene was found at 336 sites, but the isomer (*cis*- or *trans*-) was not specified.

What is 1,2-dichloroethene?

(Pronounced 1,2-dī-klôr′ ō-ĕth′ēn)

1,2-Dichloroethene, also called 1,2-dichloroethylene, is a highly flammable, colorless liquid with a sharp, harsh odor. It is used to produce solvents and in chemical mixtures. You can smell very small amounts of 1,2-dichloroethene in air (about 17 parts of 1,2-dichloroethene per million parts of air [17 ppm]).

There are two forms of 1,2-dichloroethene; one is called *cis*-1,2-dichloroethene and the other is called *trans*-1,2-dichloroethene. Sometimes both forms are present as a mixture.

What happens to 1,2-dichloroethene when it enters the environment?

- 1,2-Dichloroethene evaporates rapidly into air.
- In the air, it takes about 5-12 days for half of it to break down.
- Most 1,2-dichloroethene in the soil surface or bodies of water will evaporate into air.
- 1,2-Dichloroethene can travel through soil or dissolve in water in the soil. It is possible that it can contaminate groundwater.
- In groundwater, it takes about 13-48 weeks to break down.
- There is a slight chance that 1,2-dichloroethene will break down into vinyl chloride, a different chemical which is believed to be more toxic than 1,2-dichloroethene.

How might I be exposed to 1,2-dichloroethene?

- Breathing 1,2-dichloroethene that has leaked from hazardous waste sites and landfills.
- Drinking contaminated tap water or breathing vapors from contaminated water while cooking, bathing, or washing dishes.
- Breathing 1,2-dichloroethene, touching it, or touching contaminated materials in the workplace.

How can 1,2-dichloroethene affect my health?

Breathing high levels of 1,2-dichloroethene can make you feel nauseous, drowsy, and tired; breathing very high levels can kill you.

When animals breathed high levels of *trans*-1,2-dichloroethene for short or longer periods of time, their livers and lungs were damaged and the effects were more severe with longer exposure times. Animals that breathed very high

levels of *trans*-1,2-dichloroethene had damaged hearts.

Animals that ingested extremely high doses of *cis*- or *trans*-1,2-dichloroethene died.

Lower doses of *cis*-1,2-dichloroethene caused effects on the blood, such as decreased numbers of red blood cells, and also effects on the liver.

The long-term (365 days or longer) human health effects after exposure to low concentrations of 1,2-dichloroethene aren't known. One animal study suggested that an exposed fetus may not grow as quickly as one that hasn't been exposed.

Exposure to 1,2-dichloroethene hasn't been shown to affect fertility in people or animals.

How likely is 1,2-dichloroethene to cause cancer?

The EPA has determined that *cis*-1,2-dichloroethene is not classifiable as to its human carcinogenicity.

No EPA cancer classification is available for *trans*-1,2-dichloroethene.

Is there a medical test to show whether I've been exposed to 1,2-dichloroethene?

Tests are available to measure concentrations of the breakdown products of 1,2-dichloroethene in blood, urine, and tissues. However, these tests aren't used routinely to determine whether a person has been exposed to this compound. This is because after you are exposed to 1,2-dichloroethene, the breakdown products in your body that are detected with these tests may be the same as those that come from exposure to other chemicals. These tests aren't available in most doctors' offices, but can be done at special laboratories that have the right equipment.

Has the federal government made recommendations to protect human health?

The EPA has set the maximum allowable level of *cis*-1,2-dichloroethene in drinking water at 0.07 milligrams per liter of water (0.07 mg/L) and *trans*-1,2-dichloroethene at 0.1 mg/L.

The EPA requires that any spills or accidental release of 1,000 pounds or more of 1,2-dichloroethene must be reported to the EPA.

The Occupational Health Safety and Health Administration (OSHA) has set the maximum allowable amount of 1,2-dichloroethene in workroom air during an 8-hour workday in a 40-hour workweek at 200 parts of 1,2-dichloroethene per million parts of air (200 ppm).

Glossary

Carcinogenicity: Ability of a substance to cause cancer.

CAS: Chemical Abstracts Service.

Fertility: Ability to reproduce.

Ingest: To eat or drink something.

Milligram (mg): One thousandth of a gram.

ppm: Parts per million.

Solvent: A chemical that can dissolve other substances.

References

This ToxFAQs information is taken from the 1996 Toxicological Profile for 1,2-Dichloroethene produced by the Agency for Toxic Substances and Disease Registry, Public Health Service, U.S. Department of Health and Human Services, Public Health Service in Atlanta, GA.

Where can I get more information? For more information, contact the Agency for Toxic Substances and Disease Registry, Division of Toxicology, 1600 Clifton Road NE, Mailstop F-32, Atlanta, GA 30333. Phone: 1-888-422-8737, FAX: 770-488-4178. ToxFAQs Internet address via WWW is http://www.atsdr.cdc.gov/toxfaq.html ATSDR can tell you where to find occupational and environmental health clinics. Their specialists can recognize, evaluate, and treat illnesses resulting from exposure to hazardous substances. You can also contact your community or state health or environmental quality department if you have any more questions or concerns.

ATSDR
AGENCY FOR TOXIC SUBSTANCES AND DISEASE REGISTRY

PENTACHLOROPHENOL

CAS #87-86-5

Division of Toxicology ToxFAQs™ **September 2001**

This fact sheet answers the most frequently asked health questions (FAQs) about pentachlorophenol. For more information, call the ATSDR Information Center at 1-888-422-8737. This fact sheet is one in a series of summaries about hazardous substances and their health effects. It is important you understand this information because this substance may harm you. The effects of exposure to any hazardous substance depend on the dose, the duration, how you are exposed, personal traits and habits, and whether other chemicals are present.

HIGHLIGHTS: Pentachlorophenol is a manufactured chemical which is a restricted use pesticide and is used industrially as a wood preservative for utility poles, railroad ties, and wharf pilings. Exposure to high levels of pentachlorophenol can cause increases in body temperature, liver effects, damage to the immune system, reproductive effects, and developmental effects. This substance has been found in at least 313 of the 1,585 National Priorities List sites identified by the Environmental Protection Agency (EPA).

What is pentachlorophenol?

Pentachlorophenol is a manufactured chemical that does not occur naturally. Pure pentachlorophenol exists as colorless crystals. Impure pentachlorophenol (the form usually found at hazardous waste sites) is dark gray to brown and exists as dust, beads, or flakes. Humans are usually exposed to impure pentachlorophenol (also called technical grade pentachlorophenol).

Pentachlorophenol was widely used as a pesticide and wood preservative. Since 1984, the purchase and use of pentachlorophenol has been restricted to certified applicators. It is no longer available to the general public. It is still used industrially as a wood preservative for utility poles, railroad ties, and wharf pilings.

What happens to pentachlorophenol when it enters the environment?

❏ Pentachlorophenol can be found in the air, water, and soil. It enters the environment through evaporation from treated wood surfaces, industrial spills, and disposal at uncontrolled hazardous waste sites.
❏ Pentachlorophenol is broken down by sunlight, other chemicals, and microorganisms to other chemicals within a couple of days to months.
❏ Pentachlorophenol is found in fish and other foods, but tissue levels are usually low.

How might I be exposed to pentachlorophenol?

❏ The general populations can be exposed to very low levels of pentachlorophenol in contaminated indoor and outdoor air, food, drinking water and soil.
❏ People who work or live near a wood treatment facility or in the production of utility poles, railroad ties, or wharf pilings may be exposed to pentachlorophenol in the air or by coming in contact with the treated wood.
❏ People living near hazardous waste sites may also be exposed to higher than usual levels of pentachlorophenol.

How can pentachlorophenol affect my health?

Studies in workers show that exposure to high levels of pentachlorophenol can cause the cells in the body to produce excess heat. When this occurs, a person may experience a very high fever, profuse sweating, and difficulty breathing. The body temperature can increase to dangerous levels, causing injury to various organs and tissues, and even death. Liver effects and damage to the immune system have also been observed in humans exposed to high levels of pentachlorophenol for a long time. Damage to the thyroid and reproductive system has been observed in laboratory animals exposed to high doses of pentachlorophenol. Some of the harmful effects of pentachlorophenol are caused by the other chemicals present in technical grade pentachlorophenol.

PENTACHLOROPHENOL
CAS #87-86-5

ToxFAQs™ Internet address is http://www.atsdr.cdc.gov/toxfaq.html

How likely is pentachlorophenol to cause cancer?

Some studies have found an increase in cancer risk in workers exposed to high levels of technical grade pentachlorophenol for a long time, but other studies have not found this. Increases in liver, adrenal gland, and nasal tumors have been found in laboratory animals exposed to high doses of pentachlorophenol.

The EPA has determined that pentachlorophenol is a probable human carcinogen and the International Agency for Cancer Research (IARC) considers it possibly carcinogenic to humans.

How can pentachlorophenol affect children?

Infants who were exposed to diapers and bedding which was accidentally contaminated with pentachlorophenol had high fevers, a large amount of sweating, difficulty breathing, and harmful effects on the nervous system and liver, and some died. Although these effects are similar to effects seen in adults exposed to pentachlorophenol, we do not know whether children and adults differ in their susceptibility to pentachlorophenol.

We do not know if exposure to pentachlorophenol will result in birth defects or other developmental effects in people. Death, low body weights, decreased growth, and skeletal effects have been observed in laboratory animals exposed to high levels of pentachlorophenol during development.

How can families reduce the risk of exposure to pentachlorophenol?

Pentachlorophenol was a widely used pesticide for a long time. Today its use is restricted and it can only be used by certified applicators. You may have old containers of pesticides in your attic, basement, or garage that contain pentachlorophenol. Removing these old containers will reduce your family's risk of exposure to pentachlorophenol.

If you live near utility poles and railroad tracks, you should prevent your children from playing, climbing, or sitting on them especially in the hot summer months.

Though pentachlorophenol has been found in some food, its levels are low. You can minimize the risk of your family's exposure by peeling and thoroughly washing fruits and vegetables before cooking.

Children should avoid playing in soils near hazardous waste sites where pentachlorophenol may have been discarded.

Is there a medical test to show whether I've been exposed to pentachlorophenol?

Tests are available to measure pentachlorophenol and its breakdown product in blood, urine, and body tissues. These tests cannot be performed in the doctor's office because they require the use of special equipment. Because pentachlorophenol leaves the body fairly quickly, these tests are best for finding exposures that occurred within the last several days. These tests do not tell you how much pentachlorophenol you have been exposed to and cannot be used to predict the occurrence, nature, or severity of toxic effects.

Has the federal government made recommendations to protect human health?

The EPA has set a limit for drinking water of 1 part of pentachlorophenol per billion parts of water (1 ppb).

The Occupational Safety and Health Administration (OSHA) has set a limit of 0.5 milligrams of pentachlorophenol per cubic meter of workplace air (0.5 mg/m^3) for 8 hour shifts and 40 hour work weeks.

References

Agency for Toxic Substances and Disease Registry (ATSDR). 2001. Toxicological Profile for Pentachlorophenol Atlanta, GA: U.S. Department of Health and Human Services, Public Health Service. Atlanta, GA: U.S. Department of Health and Human Services, Public Health Service.

Where can I get more information? For more information, contact the Agency for Toxic Substances and Disease Registry, Division of Toxicology, 1600 Clifton Road NE, Mailstop F-32, Atlanta, GA 30333. Phone: 1-888-422-8737, FAX: 770-488-4178. ToxFAQs Internet address via WWW is http://www.atsdr.cdc.gov/toxfaq.html. ATSDR can tell you where to find occupational and environmental health clinics. Their specialists can recognize, evaluate, and treat illnesses resulting from exposure to hazardous substances. You can also contact your community or state health or environmental quality department if you have any more questions or concerns.

Polychlorinated Biphenyls - ToxFAQs™

This fact sheet answers the most frequently asked health questions (FAQs) about polychlorinated biphenyls. For more information, call the CDC Information Center at 1-800-232-4636. This fact sheet is one in a series of summaries about hazardous substances and their health effects. It's important you understand this information because this substance may harm you. The effects of exposure to any hazardous substance depend on the dose, the duration, how you are exposed, personal traits and habits, and whether other chemicals are present.

HIGHLIGHTS: Polychlorinated biphenyls (PCBs) are a mixture of individual chemicals which are no longer produced in the United States, but are still found in the environment. Health effects that have been associated with exposure to PCBs include acne-like skin conditions in adults and neurobehavioral and immunological changes in children. PCBs are known to cause cancer in animals. PCBs have been found in at least 500 of the 1,598 National Priorities List (NPL) sites identified by the Environmental Protection Agency (EPA).

What are polychlorinated biphenyls?

Polychlorinated biphenyls are mixtures of up to 209 individual chlorinated compounds (known as congeners). There are no known natural sources of PCBs. PCBs are either oily liquids or solids that are colorless to light yellow. Some PCBs can exist as a vapor in air. PCBs have no known smell or taste. Many commercial PCB mixtures are known in the U.S. by the trade name Aroclor.

PCBs have been used as coolants and lubricants in transformers, capacitors, and other electrical equipment because they don't burn easily and are good insulators. The manufacture of PCBs was stopped in the U.S. in 1977 because of evidence they build up in the environment and can cause harmful health effects. Products made before 1977 that may contain PCBs include old fluorescent lighting fixtures and electrical devices containing PCB capacitors, and old microscope and hydraulic oils.

What happens to PCBs when they enter the environment?

- PCBs entered the air, water, and soil during their manufacture, use, and disposal; from accidental spills and leaks during their transport; and from leaks or fires in products containing PCBs.
- PCBs can still be released to the environment from hazardous waste sites; illegal or improper disposal of industrial wastes and consumer products; leaks from old electrical transformers containing PCBs; and burning of some wastes in incinerators.
- PCBs do not readily break down in the environment and thus may remain there for very long periods of time. PCBs can travel long distances in the air and be deposited in areas far away from where they were released. In water, a small amount of PCBs may remain dissolved, but most stick to organic particles and bottom sediments. PCBs also bind strongly to soil.
- PCBs are taken up by small organisms and fish in water. They are also taken up by other animals that eat these aquatic animals as food. PCBs accumulate in fish and marine mammals, reaching levels that may be many thousands of times higher than in water.

How might I be exposed to PCBs?

- Using old fluorescent lighting fixtures and electrical devices and appliances, such as television sets and refrigerators, that were made 30 or more years ago. These items may leak small amounts of PCBs into the air when they get hot during operation, and could be a source of skin exposure.
- Eating contaminated food. The main dietary sources of PCBs are fish (especially sportfish caught in contaminated lakes or rivers), meat, and dairy products.
- Breathing air near hazardous waste sites and drinking contaminated well water.
- In the workplace during repair and maintenance of PCB transformers; accidents, fires or spills involving transformers, fluorescent lights, and other old electrical devices; and disposal of PCB materials.

How can PCBs affect my health?

The most commonly observed health effects in people exposed to large amounts of PCBs are skin conditions such as acne and rashes. Studies in exposed workers have shown changes in blood and urine that may indicate liver damage. PCB exposures in the general population are not likely to result in skin and liver effects. Most of the studies of health effects of PCBs in the general population examined children of mothers who were exposed to PCBs.

Animals that ate food containing large amounts of PCBs for short periods of time had mild liver damage and some died. Animals that ate smaller amounts of PCBs in food over

several weeks or months developed various kinds of health effects, including anemia; acne-like skin conditions; and liver, stomach, and thyroid gland injuries. Other effects of PCBs in animals include changes in the immune system, behavioral alterations, and impaired reproduction. PCBs are not known to cause birth defects.

How likely are PCBs to cause cancer?

Few studies of workers indicate that PCBs were associated with certain kinds of cancer in humans, such as cancer of the liver and biliary tract. Rats that ate food containing high levels of PCBs for two years developed liver cancer. The Department of Health and Human Services (DHHS) has concluded that PCBs may reasonably be anticipated to be carcinogens. PCBs have been classified as probably carcinogenic, and carcinogenic to humans (group 1) by the Environmental Protection Agency (EPA) and International Agency for Research on Cancer (IARC), respectively.

How can PCBs affect children?

Women who were exposed to relatively high levels of PCBs in the workplace or ate large amounts of fish contaminated with PCBs had babies that weighed slightly less than babies from women who did not have these exposures. Babies born to women who ate PCB-contaminated fish also showed abnormal responses in tests of infant behavior. Some of these behaviors, such as problems with motor skills and a decrease in short-term memory, lasted for several years. Other studies suggest that the immune system was affected in children born to and nursed by mothers exposed to increased levels of PCBs. There are no reports of structural birth defects caused by exposure to PCBs or of health effects of PCBs in older children. The most likely way infants will be exposed to PCBs is from breast milk. Transplacental transfers of PCBs were also reported In most cases, the benefits of breast-feeding outweigh any risks from exposure to PCBs in mother's milk.

How can families reduce the risks of exposure to PCBs?

- You and your children may be exposed to PCBs by eating fish or wildlife caught from contaminated locations. Certain states, Native American tribes, and U.S. territories have issued advisories to warn people about PCB-contaminated fish and fish-eating wildlife. You can reduce your family's exposure to PCBs by obeying these advisories.
- Children should be told not play with old appliances, electrical equipment, or transformers, since they may contain PCBs.
- Children should be discouraged from playing in the dirt near hazardous waste sites and in areas where there was a transformer fire. Children should also be discouraged from eating dirt and putting dirty hands, toys or other objects in their mouths, and should wash hands frequently.
- If you are exposed to PCBs in the workplace it is possible to carry them home on your clothes, body, or tools. If this is the case, you should shower and change clothing before leaving work, and your work clothes should be kept separate from other clothes and laundered separately.

Is there a medical test to show whether I've been exposed to PCBs?

Tests exist to measure levels of PCBs in your blood, body fat, and breast milk, but these are not routinely conducted. Most people normally have low levels of PCBs in their body because nearly everyone has been environmentally exposed to PCBs. The tests can show if your PCB levels are elevated, which would indicate past exposure to above-normal levels of PCBs, but cannot determine when or how long you were exposed or whether you will develop health effects.

Has the federal government made recommendations to protect human health?

The EPA has set a limit of 0.0005 milligrams of PCBs per liter of drinking water (0.0005 mg/L). Discharges, spills or accidental releases of 1 pound or more of PCBs into the environment must be reported to the EPA. The Food and Drug Administration (FDA) requires that infant foods, eggs, milk and other dairy products, fish and shellfish, poultry and red meat contain no more than 0.2-3 parts of PCBs per million parts (0.2-3 ppm) of food. Many states have established fish and wildlife consumption advisories for PCBs.

References

Agency for Toxic Substances and Disease Registry (ATSDR). 2000. Toxicological profile for polychlorinated biphenyls (PCBs). Atlanta, GA: U.S. Department of Health and Human Services, Public Health Service.

Where can I get more information?

For more information, contact the Agency for Toxic Substances and Disease Registry, Division of Toxicology and Human Health Sciences, 1600 Clifton Road NE, Mailstop F-57, Atlanta, GA 30329-4027.

Phone: 1-800-232-4636.

ToxFAQs™ Internet address via WWW is http://www.atsdr.cdc.gov/toxfaqs/index.asp.

ATSDR can tell you where to find occupational and environmental health clinics. Their specialists can recognize, evaluate, and treat illnesses resulting from exposure to hazardous substances. You can also contact your community or state health or environmental quality department if you have any more questions or concerns.

Polycyclic Aromatic Hydrocarbons (PAHs) - ToxFAQs™

This fact sheet answers the most frequently asked health questions (FAQs) about polycyclic aromatic hydrocarbons (PAHs). For more information, call the CDC Information Center at 1-800-232-4636. This fact sheet is one in a series of summaries about hazardous substances and their health effects. This information is important because this substance may harm you. The effects of exposure to any hazardous substance depend on the dose, the duration, how you are exposed, personal traits and habits, and whether other chemicals are present.

HIGHLIGHTS: Exposure to polycyclic aromatic hydrocarbons usually occurs by breathing air contaminated by wild fires or coal tar, or by eating foods that have been grilled. PAHs have been found in at least 600 of the 1,430 National Priorities List (NPL) sites identified by the Environmental Protection Agency (EPA).

What are polycyclic aromatic hydrocarbons?

(Pronounced pŏl′ĭ-sī′klĭk ăr′ə-măt′ĭk hī′drə-kar′bənz)

Polycyclic aromatic hydrocarbons (PAHs) are a group of over 100 different chemicals that are formed during the incomplete burning of coal, oil and gas, garbage, or other organic substances like tobacco or charbroiled meat. PAHs are usually found as a mixture containing two or more of these compounds, such as soot.

Some PAHs are manufactured. These pure PAHs usually exist as colorless, white, or pale yellow-green solids. PAHs are found in coal tar, crude oil, creosote, and roofing tar, but a few are used in medicines or to make dyes, plastics, and pesticides.

What happens to PAHs when they enter the environment?

- PAHs enter the air mostly as releases from volcanoes, forest fires, burning coal, and automobile exhaust.
- PAHs can occur in air attached to dust particles.
- Some PAH particles can readily evaporate into the air from soil or surface waters.
- PAHs can break down by reacting with sunlight and other chemicals in the air, over a period of days to weeks.
- PAHs enter water through discharges from industrial and wastewater treatment plants.
- Most PAHs do not dissolve easily in water. They stick to solid particles and settle to the bottoms of lakes or rivers.
- Microorganisms can break down PAHs in soil or water after a period of weeks to months.
- In soils, PAHs are most likely to stick tightly to particles; certain PAHs move through soil to contaminate underground water.
- PAH contents of plants and animals may be much higher than PAH contents of soil or water in which they live.

How might I be exposed to PAHs?

- Breathing air containing PAHs in the workplace of coking, coal-tar, and asphalt production plants; smokehouses; and municipal trash incineration facilities.
- Breathing air containing PAHs from cigarette smoke, wood smoke, vehicle exhausts, asphalt roads, or agricultural burn smoke.
- Coming in contact with air, water, or soil near hazardous waste sites.
- Eating grilled or charred meats; contaminated cereals, flour, bread, vegetables, fruits, meats; and processed or pickled foods.
- Drinking contaminated water or cow's milk.
- Nursing infants of mothers living near hazardous waste sites may be exposed to PAHs through their mother's milk.

Polycyclic Aromatic Hydrocarbons

How can PAHs affect my health?

Mice that were fed high levels of one PAH during pregnancy had difficulty reproducing and so did their offspring. These offspring also had higher rates of birth defects and lower body weights. It is not known whether these effects occur in people.

Animal studies have also shown that PAHs can cause harmful effects on the skin, body fluids, and ability to fight disease after both short- and long-term exposure. But these effects have not been seen in people.

How likely are PAHs to cause cancer?

The Department of Health and Human Services (DHHS) has determined that some PAHs may reasonably be expected to be carcinogens.

Some people who have breathed or touched mixtures of PAHs and other chemicals for long periods of time have developed cancer. Some PAHs have caused cancer in laboratory animals when they breathed air containing them (lung cancer), ingested them in food (stomach cancer), or had them applied to their skin (skin cancer).

Is there a medical test to show whether I've been exposed to PAHs?

In the body, PAHs are changed into chemicals that can attach to substances within the body. There are special tests that can detect PAHs attached to these substances in body tissues or blood. However, these tests cannot tell whether any health effects will occur or find out the extent or source of your exposure to the PAHs. The tests aren't usually available in your doctor's office because special equipment is needed to conduct them.

Has the federal government made recommendations to protect human health?

The Occupational Safety and Health Administration (OSHA) has set a limit of 0.2 milligrams of PAHs per cubic meter of air (0.2 mg/m^3). The OSHA Permissible Exposure Limit (PEL) for mineral oil mist that contains PAHs is 5 mg/m^3 averaged over an 8-hour exposure period.

The National Institute for Occupational Safety and Health (NIOSH) recommends that the average workplace air levels for coal tar products not exceed 0.1 mg/m^3 for a 10-hour workday, within a 40-hour workweek. There are other limits for workplace exposure for things that contain PAHs, such as coal, coal tar, and mineral oil.

Glossary

Carcinogen: A substance that can cause cancer.

Ingest: Take food or drink into your body.

References

Agency for Toxic Substances and Disease Registry (ATSDR). 1995. Toxicological profile for polycyclic aromatic hydrocarbons. Atlanta, GA: U.S. Department of Health and Human Services, Public Health Service.

Where can I get more information?

For more information, contact the Agency for Toxic Substances and Disease Registry, Division of Toxicology and Human Health Sciences, 1600 Clifton Road NE, Mailstop F-57, Atlanta, GA 30329-4027.

Phone: 1-800-232-4636.

ToxFAQs™ Internet address via WWW is http://www.atsdr.cdc.gov/toxfaqs/index.asp.

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ATSDR
AGENCY FOR TOXIC SUBSTANCES AND DISEASE REGISTRY

1,1,2,2-TETRACHLOROETHANE

CAS # 79-34-5

Division of Toxicology and Environmental Medicine ToxFAQs™ **September 2006**

This fact sheet answers the most frequently asked health questions (FAQs) about 1,1,2,2-tetrachloroethane. For more information, call the ATSDR Information Center at 1-888-422-8737. This fact sheet is one in a series of summaries about hazardous substances and their health effects. It is important you understand this information because this substance may harm you. The effects of exposure to any hazardous substance depend on the dose, the duration, how you are exposed, personal traits and habits, and whether other chemicals are present.

HIGHLIGHTS: 1,1,2,2-Tetrachloroethane is a manufactured chemical that is no longer used much in the United States. Breathing high levels in a closed room can cause fatigue, vomiting, dizziness, and possibly unconsciousness. Breathing, drinking, or touching large amounts of 1,1,2,2-tetrachloroethane for a long period of time can cause liver damage, stomachaches, or dizziness. 1,1,2,2-Tetrachloroethane has been found in at least 329 of the 1,678 National Priority List (NPL) sites identified by the Environmental Protection Agency (EPA).

What is 1,1,2,2-tetrachloroethane?

1,1,2,2-Tetrachloroethane is a manufactured, colorless, dense liquid that does not burn easily. It is volatile and has a sweet odor.

In the past, it was used in large amounts to produce other chemicals, as an industrial solvent to clean and degrease metals, and as an ingredient in paints and pesticides. Commercial production of 1,1,2,2-tetrachloroethane for these uses has stopped in the United States. It presently is used only as a chemical intermediate in the production of other chemicals.

What happens to 1,1,2,2-tetrachloroethane when it enters the environment?

❏ Most 1,1,2,2-tetrachloroethane released to the environment eventually moves to the air or ground water.
❏ It does not attach to soil particles when released to land.
❏ When released to surface water, much of it will evaporate to the air while the rest may break down in the water.
❏ Breakdown of the chemical in the environment is slow; it takes about 1 year for half of the chemical to disappear from groundwater and 2 months in air.
❏ 1,1,2,2-Tetrachloroethane does not build up significantly in the bodies of fish or other organisms.

How might I be exposed to 1,1,2,2-tetrachloroethane?

❏ The general public is not expected to be exposed to significant amounts of 1,1,2,2-tetrachloroethane.
❏ 1,1,2,2-Tetrachloroethane is not commonly found in drinking water, soil, or food.
❏ Higher concentrations have been found occasionally in private well water that may have been used for drinking.
❏ You may be exposed to 1,1,2,2-tetrachloroethane if you live near a hazardous waste site that contains it or near an industrial building where the chemical is used.
❏ Since production of the chemical has stopped, most workers would not be exposed to it.
❏ If spills or accidents occur at work, exposure will likely be by breathing in vapors or through skin contact.

How can 1,1,2,2-tetrachloroethane affect my health?

1,1,2,2-Tetrachloroethane is not life-threatening unless you intentionally or accidentally drink more than a few spoonfuls at one time or spill a large amount so that you breathe it and get it on your skin. Breathing high levels in a closed room can cause fatigue, vomiting, dizziness, and possibly unconsciousness. However, most people recover from these effects once they are in fresh air. Breathing, drinking, or touching large amounts of 1,1,2,2-tetrachloroethane for a long period of time can cause liver damage, stomachaches, or dizziness.

The health effects of long-term (365 days or longer) exposure to low levels of 1,1,2,2-tetrachloroethane are not known. It is also not known whether 1,1,2,2-tetrachloroethane will cause reproductive effects in people.

1,1,2,2-TETRACHLOROETHANE
CAS # 79-34-5

ToxFAQs™ Internet address is http://www.atsdr.cdc.gov/toxfaq.html

How likely is 1,1,2,2-tetrachloroethane to cause cancer?

It is not known whether 1,1,2,2-tetrachloroethane causes cancer in humans. In a long-term study, 1,1,2,2-tetrachloroethane caused an increase in liver tumors in mice, but not in rats.

The International Agency for Research on Cancer (IARC) has determined that 1,1,2,2-tetrachloroethane cannot be classified as to its ability to cause cancer in humans, while the EPA has determined that it is a possible human carcinogen.

How can 1,1,2,2-tetrachloroethane affect children?

Exposure of children to large amounts of 1,1,2,2-tetrachloroethane will probably cause the same effects observed in adults (i.e., fatigue, vomiting, dizziness, liver damage, stomachache). It is not known whether children are more or less susceptible to the effects of 1,1,2,2-tetrachloroethane than adults.

No information is available regarding the detection of 1,1,2,2-tetrachloroethane in breast milk or in the fetuses of exposed women. However, based on similarities to other chlorinated chemicals, it is expected that 1,1,2,2-tetrachloroethane can cross the placenta from an exposed woman and reach the fetus.

A very small number of studies in animals do not suggest that 1,1,2,2-tetrachloroethane is a developmental toxin.

How can families reduce the risks of exposure to 1,1,2,2-tetrachloroethane?

❑ Exposure to high amounts of 1,1,2,2-tetrachloroethane is unlikely because the chemical is no longer used in household products.
❑ If you have old household products (i.e., cleaners, degreasers, and paints) at home that contain 1,1,2,2-tetrachloroethane, make sure they are stored out of the reach of children.

Is there a medical test to determine whether I've been exposed to 1,1,2,2-tetrachloroethane?

There are no medical tests to determine whether you have been exposed to 1,1,2,2-tetrachloroethane. Urine and blood tests are available, but are common to several other types of chemicals and would not specifically indicate exposure to 1,1,2,2-tetrachloroethane. The symptoms of 1,1,2,2-tetrachloroethane poisoning, such as stomachaches, fatigue, and dizziness, as well as the liver effects are common to many conditions and not useful to determine exposure to this chemical.

Has the federal government made recommendations to protect human health?

The EPA has decided that not more than 0.17 micrograms of 1,1,2,2-tetrachloroethane per liter of water (0.16 parts per billion [ppb] or about 1 drop in an above-ground pool) should be in lakes and streams, although no national drinking water standards have been set. EPA recommends that children do not drink water with more than 0.04 milligrams per liter (mg/L) of 1,1,2,2-tetrachloroethane for a period exceeding 10 days. EPA also requires that spills of 100 pounds or more of 1,1,2,2-tetrachloroethane to the environment be reported to the Agency.

The Occupational Safety and Health Administration (OSHA) has set a limit of 5 parts per million (ppm) in air to protect workers during an 8-hour workday, 40-hour workweek.

The National Institute for Occupational Safety and Health (NIOSH) recommends a limit of 1 ppm for 1,1,2,2-tetrachloroethane in workroom air over an 8- to 10-hour workday.

References

Agency for Toxic Substances and Disease Registry (ATSDR). 2006. Toxicological Profile for 1,1,2,2-Tetrachloroethane (Draft for Public Comment). Atlanta, GA: U.S. Department of Public Health and Human Services, Public Health Service.

Where can I get more information? For more information, contact the Agency for Toxic Substances and Disease Registry, Division of Toxicology and Environmental Medicine, 1600 Clifton Road NE, Mailstop F-32, Atlanta, GA 30333. Phone: 1-800-232-4636, FAX: 770-488-4178. ToxFAQs Internet address via WWW is http://www.atsdr.cdc.gov/toxfaq.html. ATSDR can tell you where to find occupational and environmental health clinics. Their specialists can recognize, evaluate, and treat illnesses resulting from exposure to hazardous substances. You can also contact your community or state health or environmental quality department if you have any more questions or concerns.

ATSDR
AGENCY FOR TOXIC SUBSTANCES AND DISEASE REGISTRY

1,1,2-TRICHLOROETHANE

CAS # 79-00-5

This fact sheet answers the most frequently asked health questions (FAQs) about 1,1,2-trichloroethane. For more information, call the ATSDR Information Center at 1-888-422-8737. This fact sheet is one in a series of summaries about hazardous substances and their health effects. It's important you understand this information because this substance may harm you. The effects of exposure to any hazardous substance depend on the dose, the duration, how you are exposed, personal traits and habits, and whether other chemicals are present.

HIGHLIGHTS: 1,1,2-Trichloroethane is primarily used as a solvent and a chemical intermediate in industry. Breathing high levels of it caused effects on the liver, kidney, and nervous system in animals. This chemical has been found in at least 45 of the 1,177 National Priorities List sites identified by the Environmental Protection Agency (EPA).

What is 1,1,2-trichloroethane?

(Pronounced 1,1,2-trī-klôr′ō-ĕth′ān′)

1,1,2-Trichloroethane is a colorless, sweet-smelling liquid. It does not burn easily, can be dissolved in water, and evaporates easily. It is used as a solvent (a chemical that dissolves other substances) and as an intermediate in the production of the chemical, 1,1-dichloroethane. 1,1,2-Trichloroethane is sometimes present as an impurity in other chemicals, and it may be formed when another chemical breaks down in the environment under conditions where there is no air.

What happens to 1,1,2-trichloroethane when it enters the environment?

- Most 1,1,2-trichloroethane released into the environment will go into the air.
- 1,1,2-Trichloroethane breaks down slowly in air; it takes approximately 49 days for half of it to break down.
- 1,1,2-Trichloroethane may enter the groundwater by filtering through the soil.
- It appears to stay in water for a long time; it takes years for it to break down.

How might I be exposed to 1,1,2-trichloroethane?

- Breathing outdoor air that contains it from industrial releases.
- Drinking contaminated water.
- Breathing contaminated workplace air.
- Touching it when used as a solvent in the workplace.
- Breathing air near a hazardous waste site that contains 1,1,2-trichloroethane.

How can 1,1,2-trichloroethane affect my health?

No information is available on how breathing or swallowing 1,1,2-trichloroethane may affect your health. Applying 1,1,2-trichloroethane to the skin of a person resulted in stinging and burning of the skin.

When animals breathed high levels of 1,1,2-trichloroethane, it affected the liver and kidneys. Nervous system effects, such as excitation and sleepiness, were also seen. When animals swallowed food or water containing 1,1,2-trichloroethane, effects on the stomach, blood, liver, kidneys, and nervous system were seen.

ToxFAQs Internet address via WWW is http://www.atsdr.cdc.gov/toxfaq.html

We do not know whether 1,1,2-trichloroethane can affect reproduction in people. Animal studies have not shown the chemical to affect normal reproduction and development.

How likely is 1,1,2-trichloroethane to cause cancer?

No information is available on whether or not 1,1,2-trichloroethane will cause cancer in people. Only one study is available on the ability of 1,1,2-trichloroethane to cause cancer in animals. This study found an increase in liver cancer in mice, but not in rats, who were fed the chemical for their lifetime.

The International Agency for Research on Cancer (IARC) has determined that 1,1,2-trichloroethane is not classifiable as to its carcinogenicity to humans.

Is there a medical test to show whether I've been exposed to 1,1,2-trichloroethane?

Samples of your breath, blood, and urine can be tested to determine if you have been recently exposed to 1,1,2-trichloroethane. These tests must be done soon after the exposure occurred. These tests will not tell you whether your health will be affected by 1,1,2-trichloroethane and are not routinely available in hospitals and clinics because they require special equipment.

Has the federal government made recommendations to protect human health?

The EPA has set a limit of 0.005 milligrams of 1,1,2-trichloroethane per liter of drinking water (0.005 mg/L).

Discharges, spills, or accidental releases of 100 pounds or more of 1,1,2-trichloroethane must be reported to the EPA.

The Occupational Safety and Health Administration (OSHA) has set a permissible exposure limit of 45 milligrams 1,1,2-trichloroethane per cubic meter of air (45 mg/m^3) for an 8-hour workday in a 40-hour workweek.

The American Conference of Governmental and Industrial Hygienists (ACGIH) and the National Institute for Occupational Safety and Health (NIOSH) also recommend an occupational exposure limit of 45 mg/m^3 for 1,1,2-trichloroethane.

The federal recommendations have been updated as of July 1999.

Glossary

Carcinogenicity: Ability to cause cancer.

CAS: Chemical Abstracts Service.

Milligram (mg): One thousandth of a gram.

National Priorities List: A list of the nation's worst hazardous waste sites.

Solvent: A substance that dissolves another substance.

References

Agency for Toxic Substances and Disease Registry (ATSDR). 1989. Toxicological profile for 1,1,2-trichloroethane. Atlanta, GA: U.S. Department of Health and Human Services, Public Health Service.

Where can I get more information? For more information, contact the Agency for Toxic Substances and Disease Registry, Division of Toxicology, 1600 Clifton Road NE, Mailstop F-32, Atlanta, GA 30333. Phone: 1-888-422-8737, FAX: 770-488-4178. ToxFAQs Internet address via WWW is http://www.atsdr.cdc.gov/toxfaq.html ATSDR can tell you where to find occupational and environmental health clinics. Their specialists can recognize, evaluate, and treat illnesses resulting from exposure to hazardous substances. You can also contact your community or state health or environmental quality department if you have any more questions or concerns.

Tetrachloroethylene - ToxFAQs™

CAS # 127-18-4

This fact sheet answers the most frequently asked health questions (FAQs) about tetrachloroethylene. For more information, call the ATSDR Information Center at 1-800-232-4636. This fact sheet is one in a series of summaries about hazardous substances and their health effects. It is important you understand this information because this substance may harm you. The effects of exposure to any hazardous substance depend on the dose, the duration, how you are exposed, personal traits and habits, and whether other chemicals are present.

HIGHLIGHTS: Tetrachloroethylene is a manufactured chemical used for dry cleaning and metal degreasing and in the aerospace industry. Exposure to very high concentrations of tetrachloroethylene can cause dizziness headaches, sleepiness, incoordination confusion, nausea, unconsciousness, and even death. Tetrachloroethylene has been found in at least 949 of the 1,854 National Priorities List sites identified by U.S. Environmental Protection Agency (EPA).

What is tetrachloroethylene?

Tetrachloroethylene is a nonflammable colorless liquid. Other names for tetrachloroethylene include perchloroethylene, PCE, perc, tetrachloroethene, and perchlor. Most people can smell tetrachloroethylene when it is present in the air at a level of 1 part in 1 million parts of air (1 ppm) or more.

Tetrachloroethylene is used as a dry cleaning agent and metal degreasing solvent. It is also used as a starting material (building block) for making other chemicals and is used in some consumer products.

What happens to tetrachloroethylene when it enters the environment?

- Tetrachloroethylene can be released into air, water, and soil at places where it is produced or used.
- Tetrachloroethylene breaks down very slowly in the air and so it can be transported long distances in the air. Half of the amount in the air will degrade in approximately 100 days.
- Tetrachloroethylene evaporates quickly from water into air. It is generally slow to break down in water.
- Tetrachloroethylene may evaporate quickly from shallow soils or may filter through the soil and into the groundwater below. It is generally slow to break down in soil.

How might I be exposed to tetrachloroethylene?

- When you bring clothes from the dry cleaners, they will release small amounts of tetrachloroethylene into the air.
- When you drink water containing tetrachloroethylene, you are exposed to it. You might also be exposed to tetrachloroethylene that is released into the air during showering and bathing.
- People residing near contaminated sites or dry cleaning locations may be exposed to higher levels than the general population.
- People working in the dry cleaning industries or using metal degreasing products may be exposed to elevated levels of tetrachloroethylene.

How can tetrachloroethylene affect my health?

Breathing high levels of tetrachloroethylene for a brief period may cause dizziness or drowsiness, headache, and incoordination; higher levels may cause unconsciousness and even death.

Exposure for longer periods to low levels of tetrachloroethylene may cause changes in mood, memory, attention, reaction time, and vision.

Studies in animals exposed to tetrachloroethylene have shown liver and kidney effects, and changes in brain chemistry, but we do not know what these findings mean for humans.

Tetrachloroethylene

CAS # 127-18-4

How likely is tetrachloroethylene to cause cancer?

Studies in humans suggest that exposure to tetrachloroethylene might lead to a higher risk of getting bladder cancer, multiple myeloma, or non-Hodgkin's lymphoma.

In animals, tetrachloroethylene has been shown to cause cancers of the liver, kidney, and blood system.

The Department of Health and Human Services (DHHS) considers tetrachloroethylene to be reasonably anticipated to be a human carcinogen. EPA considers tetrachloroethylene likely to be carcinogenic to humans by all routes of exposure. The International Agency for Research on Cancer (IARC) considers tetrachloroethylene probably carcinogenic to humans.

How can tetrachloroethylene affect children?

It is not known whether children are more susceptible than adults to the effects of tetrachloroethylene.

A few studies in humans have suggested that exposure to tetrachloroethylene increased the numbers of babies with birth defects, but these studies were not large enough to clearly answer the question. Studies in animals exposed by inhalation or stomach tube have not shown clear evidence of specific birth defects.

How can families reduce the risk of exposure to tetrachloroethylene?

- Tetrachloroethylene has been found in low levels in some food. You can minimize the risk of your family's exposure by peeling and thoroughly washing fruits and vegetables before cooking.
- Use bottled water if you have concerns about the presence of tetrachloroethylene in your tap water. You may also contact local drinking water authorities and follow their advice.
- Prevent children from playing in dirt or eating dirt if you live near a waste site that has tetrachloroethylene.
- Tetrachloroethylene is widely used as a scouring solvent that removes oils from fabrics, as a carrier solvent, as a fabric finish or water repellant, and as a metal degreaser/cleaner. Follow instructions on product labels to minimize exposure to tetrachloroethylene.

Is there a medical test to determine whether I've been exposed to tetrachloroethylene?

Tetrachloroethylene and its breakdown products (metabolites) can be measured in blood and urine. However, the detection of tetrachloroethylene or its metabolites cannot predict the kind of health effects that might develop from that exposure. Because tetrachloroethylene and its metabolites leave the body fairly rapidly, the tests need to be conducted within days after exposure.

Has the federal government made recommendations to protect human health?

The Occupational Safety and Health Administration (OSHA) has set an 8-hour time weighted average permissible exposure limit of 100 ppm, an acceptable ceiling exposure limit of 200 ppm, and a maximum peak of 300 ppm (not to be exceeded for more than 5 minutes of any 3-hour period).

The National Institute for Occupational Safety and Health (NIOSH) recommends that workplace exposure to tetrachloroethylene be minimized due to concerns about its carcinogenicity.

Reference

This ToxFAQs™ information is taken from the 2019 Toxicological Profile for Tetrachloroethylene produced by the Agency for Toxic Substances and Disease Registry, Public Health Service, U.S. Department of Health and Human Services, Public Health Service in Atlanta, GA.

Where can I get more information?

For more information, contact the Agency for Toxic Substances and Disease Registry, Division of Toxicology and Human Health Sciences, 1600 Clifton Road NE, Mailstop F-57, Atlanta, GA 30329-4027.

Phone: 1-800-232-4636

ToxFAQs™ on the web: www.atsdr.cdc.gov/ToxFAQs

ATSDR can tell you where to find occupational and environmental health clinics. Their specialists can recognize, evaluate, and treat illnesses resulting from exposure to hazardous substances. You can also contact your community or state health or environmental quality department if you have any more questions or concerns.

Trichloroethylene - ToxFAQs™

CAS # 79-01-6

This fact sheet answers the most frequently asked health questions (FAQs) about trichloroethylene. For more information, call the ATSDR Information Center at 1-800-232-4636. This fact sheet is one in a series of summaries about hazardous substances and their health effects. It is important you understand this information because this substance may harm you. The effects of exposure to any hazardous substance depend on the dose, the duration, how you are exposed, personal traits and habits, and whether other chemicals are present.

HIGHLIGHTS: Trichloroethylene is used as a solvent for cleaning metal parts. Exposure to very high concentrations of trichloroethylene can cause dizziness headaches, sleepiness, incoordination, confusion, nausea, unconsciousness, and even death. Trichloroethylene has been found in at least 1,051 of the 1,854 National Priorities List sites identified by the Environmental Protection Agency (EPA).

What is trichloroethylene?

Trichloroethylene is a colorless, volatile liquid. Liquid trichloroethylene evaporates quickly into the air. It is nonflammable and has a sweet odor.

The two major uses of trichloroethylene are as a solvent to remove grease from metal parts and as a chemical that is used to make other chemicals, especially the refrigerant, HFC-134a.

What happens to trichloroethylene when it enters the environment?

- Trichloroethylene can be released to air, water, and soil at places where it is produced or used.
- Trichloroethylene is broken down quickly in air.
- Trichloroethylene breaks down very slowly in soil and water and is removed mostly through evaporation to air.
- It is expected to remain in groundwater for long time since it is not able to evaporate.
- Trichloroethylene does not build up significantly in plants or animals.

How might I be exposed to trichloroethylene?

- Breathing trichloroethylene in contaminated air.
- Drinking contaminated water.
- Workers at facilities using this substance for metal degreasing are exposed to higher levels of trichloroethylene.
- If you live near such a facility or near a hazardous waste site containing trichloroethylene, you may also have higher exposure to this substance.

How can trichloroethylene affect my health?

Trichloroethylene was once used as an anesthetic for surgery. Exposure to moderate amounts of trichloroethylene may cause headaches, dizziness, and sleepiness; large amounts may cause coma and even death. Eating or breathing high levels of trichloroethylene may damage some of the nerves in the face. Exposure to high levels can also result in changes in the rhythm of the heartbeat, liver damage, and evidence of kidney damage. Skin contact with concentrated solutions of trichloroethylene can cause skin rashes. There is some evidence exposure to trichloroethylene in the work place may cause scleroderma (a systemic autoimmune disease) in some people. Some men occupationally-exposed to trichloroethylene and other chemicals showed decreases in sex drive, sperm quality, and reproductive hormone levels.

How likely is trichloroethylene to cause cancer?

There is strong evidence that trichloroethylene can cause kidney cancer in people and some evidence for trichloroethylene-induced liver cancer and malignant lymphoma. Lifetime exposure to trichloroethylene resulted in increased liver cancer in mice and increased kidney cancer and testicular cancer in rats.

The Department of Health and Human Services (DHHS) considers trichloroethylene to be a known human carcinogen. The International Agency for Research on Cancer (IARC) classified trichloroethylene as carcinogenic to humans. The EPA has characterized trichloroethylene as carcinogenic to humans by all routes of exposure.

Trichloroethylene

CAS # 79-01-6

How can trichloroethylene affect children?

It is not known whether children are more susceptible than adults to the effects of trichloroethylene.

Some human studies indicate that trichloroethylene may cause developmental effects such as spontaneous abortion, congenital heart defects, central nervous system defects, and small birth weight. However, these people were exposed to other chemicals as well.

In some animal studies, exposure to trichloroethylene during development caused decreases in body weight, increases in heart defects, changes to the developing nervous system, and effects on the immune system.

How can families reduce the risk of exposure to trichloroethylene?

- Avoid drinking water from sources that are known to be contaminated with trichloroethylene. Use bottled water if you have concerns about the presence of chemicals in your tap water. You may also contact local drinking water authorities and follow their advice.
- Prevent children from playing in dirt or eating dirt if you live near a waste site that has trichloroethylene.
- Trichloroethylene is used in many industrial products. Follow instructions on product labels to minimize exposure to trichloroethylene.

Is there a medical test to determine whether I've been exposed to trichloroethylene?

Trichloroethylene and its breakdown products (metabolites) can be measured in blood and urine. However, the detection of trichloroethylene or its metabolites cannot predict the kind of health effects that might develop from that exposure. Because trichloroethylene and its metabolites leave the body fairly rapidly, the tests need to be conducted within days after exposure.

Has the federal government made recommendations to protect human health?

The EPA set a maximum contaminant goal (MCL) of 0.005 milligrams per liter (mg/L; 5 ppb) as a national primary drinking standard for trichloroethylene.

The Occupational Safety and Health Administration (OSHA) set a permissible exposure limit (PEL) of 100 ppm for trichloroethylene in air averaged over an 8-hour work day, an acceptable ceiling concentration of 200 ppm provided the 8 hour PEL is not exceeded, and an acceptable maximum peak of 300 ppm for a maximum duration of 5 minutes in any 2 hours.

The National Institute for Occupational Safety and Health (NIOSH) considers trichloroethylene to be a potential occupational carcinogen and established a recommended exposure limit (REL) of 2 ppm (as a 60-minute ceiling) during its use as an anesthetic agent and 25 ppm (as a 10-hour TWA) during all other exposures.

Reference

This ToxFAQs™ information is taken from the 2019 Toxicological Profile for Trichloroethylene produced by the Agency for Toxic Substances and Disease Registry, Public Health Service, U.S. Department of Health and Human Services, Public Health Service in Atlanta, GA.

Where can I get more information?

For more information, contact the Agency for Toxic Substances and Disease Registry, Division of Toxicology and Human Health Sciences, 1600 Clifton Road NE, Mailstop F-57, Atlanta, GA 30329-4027.

Phone: 1-800-232-4636

ToxFAQs™ on the web: www.atsdr.cdc.gov/ToxFAQs

ATSDR can tell you where to find occupational and environmental health clinics. Their specialists can recognize, evaluate, and treat illnesses resulting from exposure to hazardous substances. You can also contact your community or state health or environmental quality department if you have any more questions or concerns.

Vinyl Chloride - ToxFAQs™

CAS # 75-01-4

This fact sheet answers the most frequently asked health questions (FAQs) about vinyl chloride. For more information, call the CDC Information Center at 1-800-232-4636. This fact sheet is one in a series of summaries about hazardous substances and their health effects. It is important you understand this information because this substance may harm you. The effects of exposure to any hazardous substance depend on the dose, the duration, how you are exposed, personal traits and habits, and whether other chemicals are present.

HIGHLIGHTS: Exposure to vinyl chloride occurs mainly in the workplace. Breathing high levels of vinyl chloride for short periods of time can cause dizziness, sleepiness, unconsciousness, and at extremely high levels can cause death. Breathing vinyl chloride for long periods of time can result in permanent liver damage, immune reactions, nerve damage, and liver cancer. This substance has been found in at least 616 of the 1,662 National Priority List (NPL) sites identified by the Environmental Protection Agency (EPA).

What is vinyl chloride?

Vinyl chloride is a colorless gas. It burns easily and it is not stable at high temperatures. It has a mild, sweet odor. It is a manufactured substance that does not occur naturally. It can be formed when other substances such as trichloroethane, trichloroethylene, and tetrachloroethylene are broken down. Vinyl chloride is used to make polyvinyl chloride (PVC). PVC is used to make a variety of plastic products, including pipes, wire and cable coatings, and packaging materials.

Vinyl chloride is also known as chloroethene, chloroethylene, and ethylene monochloride.

What happens to vinyl chloride when it enters the environment?

- Liquid vinyl chloride evaporates easily. Vinyl chloride in water or soil evaporates rapidly if it is near the surface.
- Vinyl chloride in the air breaks down in a few days to other substances, some of which can be harmful.
- Small amounts of vinyl chloride can dissolve in water.
- Vinyl chloride is unlikely to build up in plants or animals that you might eat.

How might I be exposed to vinyl chloride?

- Breathing vinyl chloride that has been released from plastics industries, hazardous waste sites, and landfills.
- Breathing vinyl chloride in air or during contact with your skin or eyes in the workplace.
- Drinking water from contaminated wells.

How can vinyl chloride affect my health?

Breathing high levels of vinyl chloride can cause you to feel dizzy or sleepy. Breathing very high levels can cause you to pass out, and breathing extremely high levels can cause death.

Some people who have breathed vinyl chloride for several years have changes in the structure of their livers. People are more likely to develop these changes if they breathe high levels of vinyl chloride. Some people who work with vinyl chloride have nerve damage and develop immune reactions. The lowest levels that produce liver changes, nerve damage, and immune reaction in people are not known. Some workers exposed to very high levels of vinyl chloride have problems with the blood flow in their hands. Their fingers turn white and hurt when they go into the cold.

The effects of drinking high levels of vinyl chloride are unknown. If you spill vinyl chloride on your skin, it will cause numbness, redness, and blisters.

Animal studies have shown that long-term exposure to vinyl chloride can damage the sperm and testes.

Agency for Toxic Substances and Disease Registry
Division of Toxicology and Human Health Sciences

ATSDR

CS265956-A

Vinyl Chloride

CAS # 75-01-4

How likely is vinyl chloride to cause cancer?

The U.S. Department of Health and Human Services (DHHS) has determined that vinyl chloride is a known carcinogen. Studies in workers who have breathed vinyl chloride over many years showed an increased risk of liver, brain, lung cancer, and some cancers of the blood have also been observed in workers.

How can vinyl chloride affect children?

It has not been proven that vinyl chloride causes birth defects in humans, but studies in animals suggest that vinyl chloride might affect growth and development. Animal studies also suggest that infants and young children might be more susceptible than adults to vinyl chloride-induced cancer.

How can families reduce the risk of exposure to vinyl chloride?

Tobacco smoke contains low levels of vinyl chloride, so limiting your family's exposure to cigarette or cigar smoke may help reduce their exposure to vinyl chloride.

Is there a medical test to determine whether I've been exposed to vinyl chloride?

The results of several tests can sometimes show if you have been exposed to vinyl chloride. Vinyl chloride can be measured in your breath, but the test must be done shortly after exposure. This is not helpful for measuring very low levels of vinyl chloride.

The amount of the major breakdown product of vinyl chloride, thiodiglycolic acid, in the urine may give some information about exposure. However, this test must be done shortly after exposure and does not reliably indicate the level of exposure.

Has the federal government made recommendations to protect human health?

Vinyl chloride is regulated in drinking water, food, and air. The EPA requires that the amount of vinyl chloride in drinking water not exceed 0.002 milligrams per liter (mg/L) of water.

The Occupational Safety and Health Administration (OSHA) has set a limit of 1 part vinyl chloride per 1 million parts of air (1 ppm) in the workplace.

The Food and Drug Administration (FDA) regulates the vinyl chloride content of various plastics. These include plastics that carry liquids and plastics that contact food. The limits for vinyl chloride content vary depending on the nature of the plastic and its use.

References

Agency for Toxic Substances and Disease Registry (ATSDR). 2006. Toxicological Profile for Vinyl Chloride (Update). Atlanta, GA: U.S. Department of Health and Human Services, Public Health Service.

Where can I get more information?

For more information, contact the Agency for Toxic Substances and Disease Registry, Division of Toxicology and Human Health Sciences, 1600 Clifton Road NE, Mailstop F-57, Atlanta, GA 30329-4027.

Phone: 1-800-232-4636.

ToxFAQs™ Internet address via WWW is http://www.atsdr.cdc.gov/toxfaqs/index.asp.

ATSDR can tell you where to find occupational and environmental health clinics. Their specialists can recognize, evaluate, and treat illnesses resulting from exposure to hazardous substances. You can also contact your community or state health or environmental quality department if you have any more questions or concerns.

E

Appendix E.

Historical Community Involvement Activities

APPENDIX E
HISTORICAL ACTIVITIES
2020 COMMUNITY INVOLVEMENT PLAN
Defense Depot Memphis, Tennessee

- 1993 – Initiated work on the development of a comprehensive CRP for the Memphis Depot.
- May 24, 1993 – Conducted a briefing on the DDMT environmental cleanup program; attended by 150 community members.
- May 1993 – Community Relations team interviewed members of the community and local environmental/citizens groups.
- August 10, 1993 – Conducted a public exhibition and discussion; attended by a few community members.
- February 17, 1994 – Formed a Technical Review Committee and held its first meeting; attended by community members and representatives from state, local and federal agencies.
- July 1994 – Converted the Technical Review Committee into the RAB.
- December 20, 1994 – Conducted a public comment meeting and period regarding the ROD for the proposed IRA for Groundwater at Dunn Field and the FFA.
- June 1996 – Informed community members through fact sheets of the installation of 16 new monitoring wells.
- November 25, 1997 – Conducted two focus group sessions to seek input from residents and community leaders within the DDMT community.
- January 1998 – Conducted a telephone survey of area residents to further explore the concerns and issues raised by the focus groups and to provide an assessment of perception, awareness and levels of concern.
- February 19, 1998 – Hosted a Community Information Session; attended by 15 members of the community.
- September 1998 – The Community and Depot RAB Co-Chairpersons discussed the cleanup program on a WEVL radio show called Center for Neighborhoods.
- September 19, 1998 – Hosted a Community Information Session; attended by 40 community members.
- October 1998 – The Community and Depot RAB Co-Chairpersons discussed the cleanup program on a Library Channel 18 (TV) show called Center for Neighborhoods.
- May 21, 1999 – Conducted a public comment meeting and a 60-day public comment period for the proposed removal action plans for the old paint shop and maintenance areas.
- June 17, 1999 – Hosted an Availability Session and a public comment meeting during a 60-day public comment period for the proposed Dunn Field CWM removal action plan.
- May/June 1999 – Conducted another series of focus groups and telephone surveys to measure the effectiveness of the CRP.
- November 1999 – DDMT's Community Relations Program wins a 1999 Silver Leaf Award of Merit from the International Association of Business Communicators.

APPENDIX E
HISTORICAL ACTIVITIES
2018 COMMUNITY INVOLVEMENT PLAN
Defense Depot Memphis, Tennessee

- December 8, 1999 – Conducted a public comment period for FOST #1.
- December 16, 1999 – Conducted an administrative RAB development session providing RAB members information from three guest speakers on public consultation and effective community relations practices.
- January 19, 2000 – Dr. Ted Simon of USEPA provided a detailed overview of the risk assessment process at a special training session for RAB members.
- March 2000 – BRAC Environmental Coordinator (BEC) spoke to Dunn Elementary School staff and school board officials regarding the CWM removal project.
- March 17, 2000 – Media Day conducted at the site of the CWM removal action project on Dunn Field, including a briefing of DDMT's CWM plan; attended by local and affiliated print and broadcast media.
- March 18, 2000 – Hosted a Community Information Session to update the community on DDMT's CWM cleanup activities; attended by 25 community members.
- May 2000 – Conducted CWM weekly briefings every Wednesday morning at 10:00 a.m.
- June 15, 2000 – Presentation to RAB and community summarizing the MI RI results.
- July 20, 2000 – Presentation to RAB and community summarizing the MI RI risk assessment results.
- August 17, 2000 – Conducted a public comment meeting during the 30-day public comment period for the MI Proposed Plan.
- September 21, 2000 – Presentation to RAB and community members on the removal action taken to clean up the former paint shop and maintenance area of the MI and on the CWM removal project.
- January 18, 2001 – Presentation to RAB and community members on the environmental program.
- March 15, 2001 – Presentation to RAB and community members on the Dunn Field groundwater pumping system.
- May 17, 2001 – Hosted a Media Day on Dunn Field to announce the completion of the CWM removal project.
- June 1 - 30, 2001 – Conducted a public comment period for FOST #2.
- July 19, 2001 – Presentation to RAB and community members on groundwater investigation results.
- July 2001 – A Technical Assistance and Public Participation Grant from the DLA was awarded to Hess Environmental Services to provide technical assistance to the RAB.
- August 2001 – Presentation to RAB and community members on the Dunn Field SVE system pilot project.

- September 2001 – Notified the community and the media that the ROD for the MI had been signed by DLA, USEPA and TDEC.
- October 2001 – Informed the community through a fact sheet about the removal of the railroad tracks on Dunn Road.
- November 2001 – Presentation to RAB and community members on the preliminary findings of the Dunn Field RI.
- February 2002 – Presentation to RAB and community members on the conclusions of the Dunn Field RI.
- February 2002 – Presentation to the RAB and community members on the environmental achievements of 2001 and the upcoming activities for 2002, 2003 and beyond.
- April 2002 – Presentation to the RAB and community members on the Dunn Field risk assessment process and results.
- June 2002 – Presentation to the RAB and community members on the Five-Year Review of the Dunn Field pump and discharge system.
- July 2002 – Informed the community through fact sheets and media release of the installation of additional groundwater monitoring wells in the community.
- August 2002 – Conducted a public comment period on the removal of surface soil containing lead from the former pistol range on Dunn Field.
- October 2002 – Presentation to the RAB and community members on the progress of the environmental cleanup program.
- February 2003 – Presentation to the RAB and community members on the Dunn Field Feasibility Study.
- May 15, 2003 – Conducted a public comment period and meeting on the Dunn Field Proposed Plan.
- June 2003 – Informed the community through fact sheets and media release of the installation of additional groundwater monitoring wells in the community.
- September 2003 – Informed the community through fact sheets and media release of the pre-design investigation of disposal sites on Dunn Field.
- October 2003 – Presentation to the RAB and community members on the progress of the environmental cleanup program.
- March 2004 – Presentation to the RAB and community members on the progress of the environmental cleanup program and the evolution of the cleanup team.
- March 2004 – Conducted a public comment period for FOST #3.

APPENDIX E
HISTORICAL ACTIVITIES
2018 COMMUNITY INVOLVEMENT PLAN
Defense Depot Memphis, Tennessee

- May 2004 – Informed the community through fact sheets and media release of the installation of additional groundwater monitoring wells in the community and of the signing of the Dunn Field ROD.
- July 2004 – Conducted interviews with community members as part of the process to update DDMT's CIP.
- August 2004 – Informed the community through a fact sheet and media release of the installation of additional groundwater monitoring wells in the community.
- October 2004 – Presentation to the RAB and community members on the results of the Groundwater Treatability Study and the Early Implementation of the Selected remedy (groundwater cleanup) in the community near Dunn Field.
- January 2005 – Conducted a public briefing on the Dunn Field Disposal Sites Remedial Design (RD).
- January 2005 – Conducted a public comment period for FOST #4.
- February 2005 – Hosted a Community Information Session on the ZVI cleanup technology.
- March 2005 – Completed the post-ROD CIP.
- May 2005 – Presentation to the RAB and community members on the progress of the environmental restoration program.
- July 2005 – Conducted a public briefing on the MI RD.
- October 2005 – Informed the community through fact sheets and media release of the RD investigation at Dunn Field.
- October 2005 – Presentation to the RAB and community members on the status of the environmental restoration program.
- February 2006 – Informed the community through fact sheets and media release of cleanup actions taking place at Dunn Field.
- March 2006 – Informed the community through fact sheets and media release of the installation of groundwater monitoring wells in the community.
- April 2006 – Presentation to the RAB and community members on the status of the environmental restoration program and the PRB study being conducted west of Dunn Field.
- May 2006 – Informed the community through fact sheets and media release of the groundwater cleanup activities on the MI and the PRB study being conducted west of Dunn Field.
- July 2006 – Informed the community through fact sheets of the sale of property at Dunn Field.

- October 2006 – Presentation to the RAB and community members on the status of the environmental restoration program and the sale of property on Dunn Field.
- April 2007 – Informed the community through fact sheets of site preparation for an SVE system at Dunn Field.
- April 2007 – Presentation to the RAB and community members on the progress of the environmental restoration program and SVE system on Dunn Field.
- August 2007 – Informed civic leaders through letters and community members through the EnviroNews of the public comment period for the Second Five-Year Review.
- October 2007 – Informed the community through fact sheets on continued cleanup actions for soil and groundwater at Dunn Field.
- December 2007 – Informed the community through fact sheets and media release about metal casings discovered at Dunn Field during soil excavation.
- April 2008 – Presentation to the RAB and community members on the progress of the environmental restoration program, Dunn Field Off-Depot Groundwater RD and Second Five-Year Review.
- May 2008 – Informed the community through fact sheets and media release of the move and consolidation of the Information Repositories into one repository located at the former Memphis Depot project office.
- June 2008 – Informed the community through fact sheets and media release on steam being released by the ISTD system on Dunn Field.
- October 2008 – Presentation to the RAB and community members on the progress of the environmental restoration program and the Dunn Field Revised Proposed Plan.
- October - November 2008 – Conducted a public comment period and meeting on the Dunn Field Revised Proposed Plan.
- February 2009 – Conducted a public briefing on the Dunn Field Off-Depot Groundwater RD.
- April 2009 – Informed the community through media releases that DDMT received the 2009 U.S. Secretary of Defense Environmental Restoration Award for outstanding work by an installation in DoD environmental programs.
- April 2009 – Informed the community through newspaper advertisement of the Dunn Field ROD Amendment approval by DLA, USEPA and TDEC.
- June 2009 – Informed the community through newspaper advertisement that the Information Repository (IR) at Cherokee Branch Library was consolidated with the DDMT location.
- July 2009 – Finalized the Off-Depot Groundwater Remedial Action Soil Vapor Monitoring Community Relations Plan. Informed the community through fact sheets and media releases

about construction of the Off-Depot Groundwater RA (AS/SVE) system and soil vapor monitoring to be conducted at several residences near the AS/SVE location.

- October 29, 2009 – Presentation to the RAB and community members on the progress of the environmental restoration program. RAB community members voted to adjourn effective this date.
- October 29, 2009 – Brig. Gen. Peter Talleri, Commander of the Defense Distribution Center marked the start of DDMT's final environmental cleanup action during a ribbon cutting ceremony. Informed the community of this important milestone through media releases.
- January 2010 – Informed RAB members through a letter and Memorandum for Record that the board had been adjourned.
- February 2010 – Presented RAB members with Commander's Coins and Star Notes as well as Certificates of Appreciation from DLA, USEPA and TDEC at a special ceremony in appreciation of their commitment to the DDMT RAB. Notified the community of the RAB adjournment through an advertisement in the Commercial Appeal.
- February 17, 2010 – Informed residents through letters of the results of soil vapor monitoring samples collected from their properties.
- March 2010 – Conducted a public comment period for FOST #5.
- June 2010 – Conducted a public comment period for FOST #6.
- July 19, 2010 – Informed residents through letters of the final results of soil vapor monitoring samples collected from their properties.
- March 2012 – Informed civic leaders through letters and residents through advertisement in *The Commercial Appeal* of the Third Five-Year Review public comment period.
- February 2013 – Informed community through advertisement in the Commercial Appeal that the Third Five-Year Review was finalized and available in the IR.
- March 2017 – Informed civic leaders through letters and community members through advertisement in *The Commercial Appeal* of the Five-Year Review public comment period.
- April 2018 – Informed community through advertisement in *The Commercial Appeal* that the Fourth Five-Year Review was finalized and available in the IR.
- May 2020 – Informed community through fact sheets distributed to the Glory Circle and Boyle/Hays neighborhoods of groundwater monitoring well installation in those neighborhoods.

F

Appendix F.

Technical Assistance Grant Factsheet

United States Environmental Protection Agency

Technical Assistance Grant (TAG) Program:
Fact Sheet

What Is a Technical Assistance Grant?

A technical advisor can help community members participate in decision making by helping them better understand what is going on at a Superfund site. There are many technical issues at Superfund sites that are hard for people to understand. The EPA's Technical Assistance Grant (TAG) program provides money to community groups so they can pay for advisors to interpret and explain site reports and conditions, and proposed cleanup plans and decisions.

EPA's cleanup decisions depend on several different things, including what studies say about site conditions, the kinds of wastes found, and the cleanup methods that would work at the site.

Who May Apply for a TAG?

Your group may apply for a TAG if your members' health, economic well-being, or enjoyment of the environment is, or may be, hurt by a Superfund site. Your group does not need to be incorporated as a nonprofit organization to apply for a TAG. However, to receive TAG funds, your group must incorporate for the purpose of participating in decision-making at the site. Tax-exempt status is not required to receive a TAG.

EPA encourages applications from groups that are interested in becoming more involved in the decision-making process for a nearby Superfund site, but need help understanding the technical issues and want to share information with the whole community. Here are a few types of community groups that can apply for a TAG:

- A community group or citizens' association which was formed because of issues and concerns it had about the site.
- A group that has been actively involved at the site and includes all the affected individuals and groups who joined in applying for the TAG.
- A group made up of several groups (like those described above) that came together to deal with community concerns about the site and its effects on the surrounding area.

Groups That Are Not Eligible for a TAG Are:

- Potentially responsible parties (PRPs), who are the individuals, cities/townships, or companies that may be responsible for, or may have contributed to, pollution problems at the Superfund site. PRPs can include facility owners, operators, transporters, or generators of hazardous waste.
- Groups representing or receiving money or services from a PRP.
- Academic institutions like colleges or universities.
- Groups affiliated with a national organization.
- Political subdivisions like states, counties, cities, townships or tribes.
- Groups created by, representing, or receiving money or services from any of the groups described above that are not eligible.

How Does My Group Apply for a TAG?

EPA is authorized to award only one TAG at a time for each Superfund site. To make sure that all eligible groups have an equal opportunity to apply for a single TAG, the application process follows these steps:

Step 1: Your group sends the EPA Regional TAG Coordinator a letter saying it is interested in a TAG. This "letter of intent" should include the name of the Superfund site or sites the TAG is for. It also should include the name, email address, daytime telephone number, and postal address of your group's contact person. The Regional TAG Coordinator will contact you to explain the application process.

Step 2: Before or while your group is preparing its application, you should:

- Apply for a DUNS number if your group doesn't already have one.
- Register your group in SAM.gov (this is a free service but may take 7-15 days to complete).
- Familiarize yourself with grants.gov and establish a profile on this website as you will be required to submit your completed application electronically through this site.
- Ask your Regional TAG Coordinator for a Funding Opportunity Number.

Step 3: EPA informs the rest of the community that your group is interested in a TAG. EPA notifies the community by publishing an ad in a local newspaper and through other means. The notice also explains that other groups interested in a TAG may contact your group and join with you or may submit their own Letter of Intent.

Step 4: Other interested groups in your community then have 30 days to get in touch with your group to talk about working together to submit one application to EPA as a coalition. Otherwise, all groups that intent to apply for the TAG must write EPA a letter of intent within this 30-day period.

Step 5: After the initial 30-day period, interested groups will have another 30 days to submit applications. If EPA receives more than one application, it will rank each applicant based on:

- How well the group represents the affected community,
- The group's plans for using a technical advisor, and

- The group's ability and plans to inform other community members about site-related information provided by the technical advisor.

EPA is available to provide help to all groups preparing TAG applications.

How Much Money Can My Group Receive?

Initially, EPA will award a TAG for up to $50,000. Additional funds may be available later.

To get a TAG, your group must contribute a matching share to the project. Your match must equal at least 20 percent of the total project costs. This match usually is not difficult to provide: most groups make their match by donating volunteer hours and other "in-kind" services. Sometimes, EPA can waive the matching-share requirement or require your group to contribute a smaller match. EPA will help your group determine what "in-kind" and donated services can be counted as your match.

How Does My Group Get Its TAG Money?

EPA reimburses your group for its eligible costs. Reimbursement means that your group must first incur a cost and then ask EPA to pay for it. For the most part, your group may not get money up front. New TAG recipients may ask for a one-time advance payment of up to $5,000. To get an advance payment, you must explain in your TAG application how your group plans to spend the advance payment. Your group can use the advance payment to pay some of the costs for starting up your group. Start-up costs might include opening a bank account, buying or leasing office supplies and equipment, or advertising for a technical advisor. You cannot use an advance payment to pay for incorporating your group or to pay a technical advisor or for other contractor services. (Although your group cannot use the advance payment to pay incorporation costs, your group can be reimbursed for incorporation costs later.)

What Can My Group Do with a TAG?

Your group must use most of its TAG money to pay for one or more technical advisors to help you understand information about the site. For example, you may want someone to explain how the site affects the air or water in the site area and someone else to evaluate any health issues related to the site. The technical advisor reviews and explains existing information about the site developed as part of the Superfund cleanup process. Technical advisor should produce reports that are easily understood by the community. Technical advisors cannot, however, conduct additional studies or generate any new data or information.

Here are some examples of what your group might pay a technical advisor to do:

- Review site-related documents from EPA or other agencies.
- Meet with your group and other community members to explain site information.
- Make site visits, when appropriate and necessary, to learn more about site activities.
- Travel to meetings and hearings about the site.
- Evaluate plans for reusing the site after it is cleaned up.
- Interpret and explain health-related information.
- Participate in public meetings.

- Consult with EPA technical staff.
- Assist your group in submitting public comments.
- Assist your group in drafting outreach materials such as flyers, newsletters, and web content.

Your group may use a small amount of its TAG funds to pay for administration costs such as supplies, office equipment, rent, and someone to administer your TAG. If your group incorporates as a non-profit organization just so it can receive a TAG, necessary and reasonable expenses for incorporation can also be charged to your TAG if your group is chosen to receive one. If EPA does not award a TAG to your group, however, you will not be reimbursed for the incorporation costs.

What Can't We Do with TAG Money?

There are several activities you cannot pay for with TAG money. Here are some examples:

- Travel expenses of group members (only technical advisor travel expenses can be paid).
- Attorney fees.
- Lawsuits or other legal actions, including preparing testimony or hiring expert witnesses.
- Lobbying.
- Social activities, fund raising or amusements.
- Tuition or training expenses for group members or technical advisors (except for one- time health and safety training for the advisor to gain access to the site).
- Collection of new health or primary data through, for example, medical testing or well drilling and sampling.
- Reopening or challenging final EPA decisions.
- Overseeing/directing EPA staff.
- Receiving technical assistance on non-Superfund-related issues.

How Does EPA Decide If Our Group Can Get a TAG?

The TAG application asks for information that will help EPA decide whether your group can manage a TAG. The application also asks your group to describe its history, goals, plans for using TAG funds, and how your group plans to share information learned from the technical advisor with the rest of your community. In your TAG application, your group must include a work plan and a budget that shows the time and resources the group will commit to TAG activities.

How Do We Find and Hire a Qualified Technical Advisor?

After EPA awards your TAG, your group needs to choose a qualified technical advisor. EPA has a list of sources where your group might find qualified advisors. You should choose a technical advisor who has the skills to address the specific issues and concerns at your site. A technical advisor must have these qualifications:

- Demonstrated knowledge of hazardous or toxic waste issues or relocation, redevelopment, or public health issues.

- College or university training, and preferably a degree, in the relevant fields.
- The ability to explain technical information to your community in ways you understand.

Like all grants awarded by EPA, TAGs have certain regulatory requirements. Besides finding an advisor with the right background for your community's needs, you must also find and hire your technical advisor in accordance with EPA's grant regulations. The grant regulations require that you go through certain steps to make sure you find your advisor through a fair and competitive process.

How Does My Group Manage Its TAG?

Your group must keep track of how it spends TAG funds. This means your group must:

- Create a bookkeeping system and keep complete financial records (lists of eligible invoices and tasks accomplished) of how TAG funds and your required matching funds or in-kind services are used.
- Draw funds for reimbursement so you can pay your technical advisor on time and in full. This should be completed quarterly or whenever you have incurred allowable costs.
- Prepare and give quarterly progress reports and other reports to EPA.

Your group can use a small amount of TAG funds to pay a grant administrator to manage the TAG. But remember: Most TAG money must go toward your technical advisor, so the cost for a grant administrator should be both reasonable and necessary. As with hiring a technical advisor, you must follow federal procurement regulations when hiring a grant administrator.

What If My Group Needs More Information?

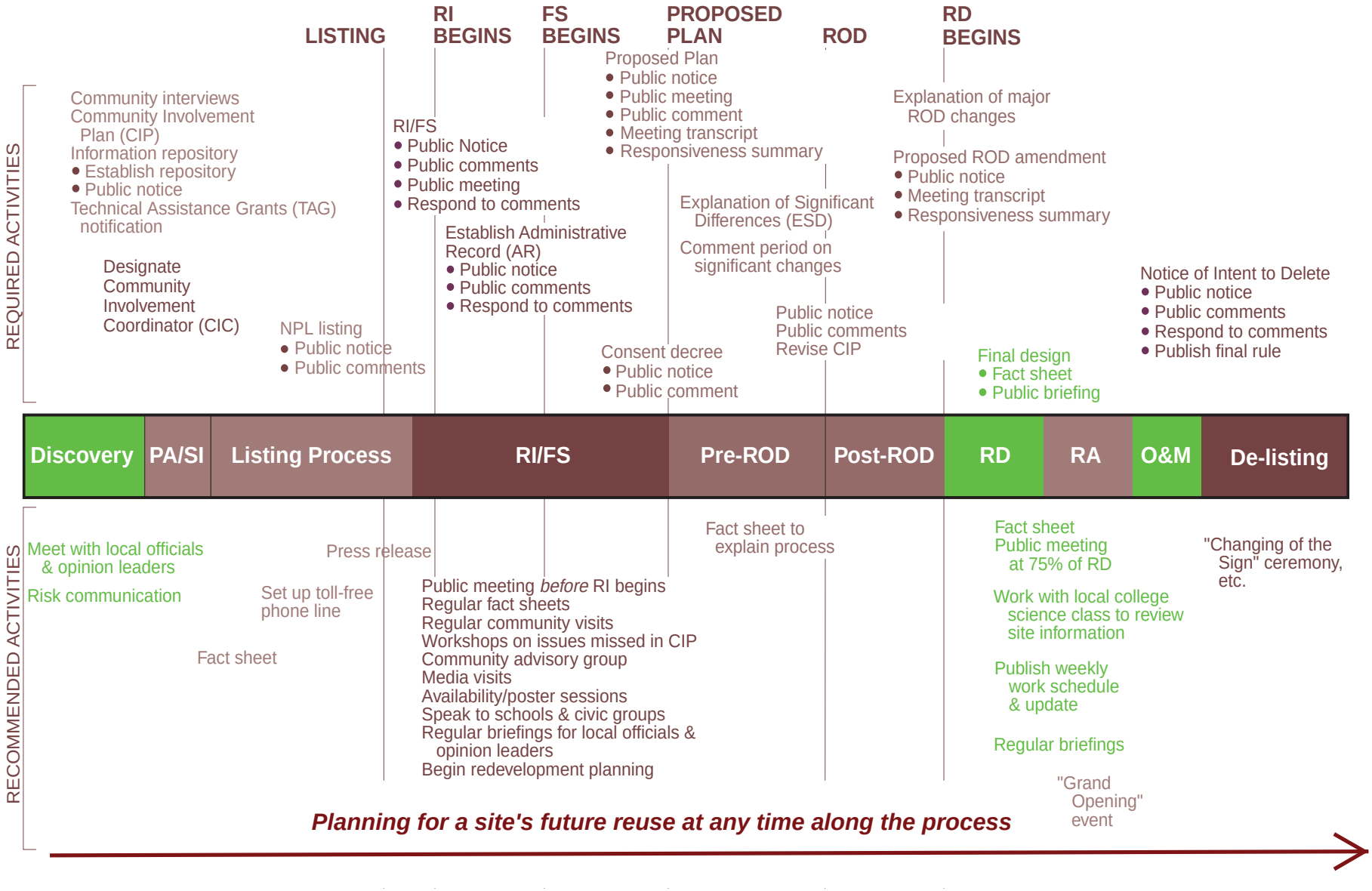
Visit the TAG program web site at: https://www.epa.gov/superfund/technical-assistance-grant-tag-program to contact the TAG coordinator for your region. The TAG coordinator will be available to further assist your group.

G

Appendix G.

Superfund Community Involvement Chart and Terms

Community Involvement Activities Throughout the Superfund Remedial Process



APPENDIX G
SUPERFUND TERMS
2020 COMMUNITY INVOLVEMENT PLAN
Defense Depot Memphis, Tennessee

Administrative Records: A compilation of documents supporting an administrative action; under Superfund, administrative actions often compel Potentially Responsible Parties (PRPs) to undertake or pay for hazardous waste site cleanups.

Community Involvement: The community relations activities (e.g., plan, implementation and responsiveness summary) that must be completed at a site to address community concerns.

Construction Complete: Remedies at a site often require physical construction (e.g., building of water treatment systems). A site is categorized as Construction Complete by meeting one of the following criteria: any necessary physical construction is complete, whether or not final cleanup levels or other requirements have been achieved; EPA has determined that the response action should be limited to measures that do not involve construction; or the site qualifies for deletion from the NPL.

Contaminants of Concern (COC): Chemicals identified during in-depth site studies (Remedial Investigation/Feasibility Study) that need to be addressed by a cleanup action because they pose a potential threat to human health or the environment.

Deletion from National Priorities List: Deletion of sites from the National Priorities List (NPL) may occur once all response actions are complete and all cleanup goals have been achieved. EPA has the responsibility for processing deletions with concurrence from the State. EPA can also delete portions of sites that meet deletion criteria.

Ecological Risk Assessment: An evaluation of possible adverse ecological effects that are occurring or may occur as a result of exposure to physical (e.g., site cleanup activities) or chemical (e.g., release of hazardous substances) factors at a site. These assessments often contain detailed information regarding the interaction of these factors with the biological community at the site.

Explanation of Significant Differences: A document outlining minor changes in the original remedy selected at a site as described in the Record of Decision (ROD), such as a contingent remedy.

Exposure: Contact with a substance by swallowing, breathing, or touching the skin or eyes. Exposure may be short-term (acute exposure), of intermediate duration, or long-term (chronic exposure).

Exposure Pathways: The way in which a person, species, or environment comes into contact with contamination. Types of Exposure Pathways include soil, air, groundwater, and surface water.

Feasibility Study: A study of a hazardous waste site intended to: (1) evaluate alternative remedial actions from technical, environmental, and cost effectiveness perspectives; (2) recommend the cost-effective remedial action; and (3) prepare a conceptual design , a cost estimate for budgetary purposes, and a preliminary construction schedule.

Five-Year Review: Five-year reviews generally are required by CERCLA or program policy when hazardous substances remain on site above levels which permit unrestricted use and unlimited exposure. Five-year reviews provide an opportunity to evaluate the implementation and performance of a remedy to determine whether it remains protective of human health and the environment. Generally, reviews are performed five years following the initiation of a CERCLA response action and are repeated every succeeding five years so long as future uses remain restricted. Five-year reviews can be performed by EPA or the lead agency for a site, but EPA retains responsibility for determining the protectiveness of the remedy.

Human Health Risk Assessment: An initial determination is made of the possibility for human contact (i.e., exposure) with contaminants at the site. If the possibility for exposure to contamination exists, the risk assessment is performed to determine if the site poses a risk to humans, and if so, identifies actions that can be taken to control any possible exposure to humans until site cleanup has been completed. Once complete, cleanup provides long-term human health and environmental protection at the site.

Information Repository (IR): A set of current information, technical reports, and reference documents regarding a Superfund site; it should be located in a public building that is convenient for local residents, such as a public school, city hall, or public library.

National Priorities List (NPL): The National Priorities List (NPL) is the list of national priorities among the known releases or threatened releases of hazardous substances, pollutants, or contaminants throughout the United States and its territories. Also known as Superfund.

Operable Unit (OU): During cleanup, a site can be divided into a number of distinct areas depending on the complexity of the problems associated with the site. These areas called operable units may address geographic areas of a site, specific site problems, or areas where a specific action is required. An example of a typical operable unit could include removal of drums and tanks from the surface of a site.

Operations and Maintenance: Site activities associated with a remedy that must be performed after the completion of a remedial action.

Post-Construction: Superfund Post-Construction is a cleanup phase where several activities are generally undertaken at sites following the construction of response actions. These activities include operation and maintenance and long-term response actions; five-year reviews, close-out reports, and deletion from the NPL. The goal of Superfund Post-Construction is to ensure that response actions provide for the long-term protection of human health and the environment.

Preliminary Assessment (PA): An assessment of information about a site and its surrounding area to determine whether a site poses little or no threat to human health and the environment or if it does pose a threat, whether the threat requires further investigation.

Proposed Plan: A cleanup plan that is made available to the public for comment.

Public Notice: Publication in the local newspaper of the availability of documents for public review, such as the administrative record, proposed plan, and deletion package.

Record of Decision (ROD): A public document that explains which cleanup alternative(s) will be used at National Priorities List sites.

Record of Decision (ROD) Amendment: A public document that explains a significant change(s) from the selected remedy stated in the ROD, such as the use of a new technology or the discovery of a new area of contamination.

Remedial Action (RA): The actual construction or implementation phase of a Superfund site cleanup that follows remedial design.

Remedial Design (RD): The development of engineering drawings and specifications for cleanup remedies and technologies.

Remedial Investigation (RI): An investigation intended to gather the data necessary to: (1) determine the nature and extent of problems at the site; (2) establish cleanup criteria for the site; (3) identify preliminary alternative remedial actions; and (4) support the technical and cost analyses of the alternatives.

Removal: A removal is a short-term cleanup intended to stabilize or clean up a site that poses an imminent and substantial threat to human health or the environment. Removals can occur at any stage of the Superfund cleanup process but are often the first response upon discovery of a hazardous substance at a site.

Restoration Advisory Board: Restoration Advisory Boards (RABs) foster teamwork by bringing community members together with DOD, DOE, and federal, state, and tribal government regulators to discuss cleanup issues at installations nationwide. These advisory boards involve regulators and the public participating in key federal facility cleanup decisions for specific installations.

Site Inspection (SI): The process of collecting site data and samples to evaluate relative risks to public health and the environment from releases of hazardous substances at a site through the air, surface water, or groundwater, and the exposure of receptors coming into contact with contamination.

Technical Assistance Grant: Technical Assistance Grants of up to $50,000 are provided to citizens' groups to obtain assistance in interpreting information related to cleanups at Superfund sites or those proposed for the National Priorities List. Grants are used by such groups to hire technical advisors to help them understand the site-related technical information for the duration of response activities.

Sources

https://www.epa.gov/superfund/superfund-glossary

https://www.epa.gov/superfund - Vocabulary Catalog; Superfund for Students and Teachers Glossary; Description: These words and phrases are scientific, medical, or environmental terms used in the Haz-Ed materials; Publishing Organization: Office of Land and Emergency Management; Last Update: October 1, 2010