EPA

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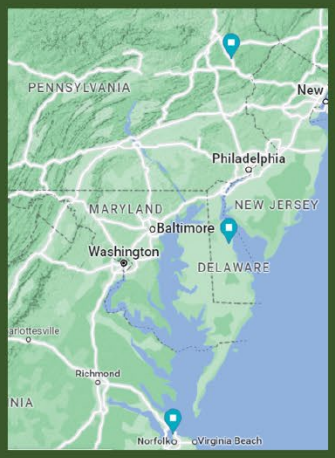


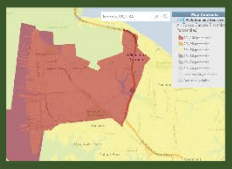


Environmental Justice Pilot Project Report

EPA Region 3






Project Participants

- EPA Region 3 Staff
- EPA Office of Land and Emergency Management, Federal Facilities Restoration and Reuse Office
- Pilot Team from the Dover Air Force Base Site (Delaware)
- Pilot Team from the Tobyhanna Army Depot Site (Pennsylvania)
- Pilot Team from the Naval Station Norfolk/ Naval Support Activity Site (Virginia)

Executive Summary

This report describes the results of a pilot project undertaken to develop a process and methods to promote the consistent, systematic application of environmental justice considerations at federal facility National Priorities List (NPL) sites. This project was not intended to be a communications project. Rather, it was developed to help project teams build environmental justice considerations into their everyday work. Its intent is to maximize efforts within existing frameworks, throughout the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) process. Objectives of the pilot project include:

- Develop recommendations on the use of tools to identify communities with environmental justice concerns that may be disproportionately impacted.
- Determine how to analyze needs and/or gaps pertaining to both engagement and protection.
- Identify options to improve engagement and refine the government's understanding of potential risks and disproportionate impacts so that they can be addressed through cleanup actions.
- Develop suggestions to document work within the framework of the existing CERCLA process efficiently and effectively.

The three participating sites are in EPA's Mid-Atlantic Region. They represent different lead federal agencies and communities. The sites are the Dover Air Force Base site in Delaware (EPA ID: DE8570024010), the Naval Station Norfolk/Naval Support Activity Hampton Roads site in Virginia (EPA ID: VA6170061463) and the Tobyhanna Army Depot site in Pennsylvania (EPA ID: PA5213820892). Each site was represented by a project team (the "pilot team"). Each pilot team included representatives involved in the CERCLA process at each site, including staff from EPA Region 3, other federal agencies and state agencies.

This report is for managers and project teams from EPA, other federal agencies and state agencies who are involved in CERCLA cleanups at federal facilities. It assumes a basic understanding of the CERCLA process.

The pilot teams developed a flexible and iterative six-step process (Figure 1 below) to incorporate environmental justice-related concerns into CERCLA investigations.

Step 1: Identify Potentially Vulnerable Communities 	Screened nearby communities for information related to demographics, health and other environmental justice-related factors.
Step 2: Identify Sources and Releases 	Integrated information about the communities with knowledge related to site-specific chemicals, sources and releases.
Step 3: Develop Questions to Guide Engagement 	Developed questions to address site-specific gaps and guide community outreach and engagement.
Step 4: Engage 	Selected outreach strategies to apply to reach and engage with different communities to deepen and support analyses.
Step 5: Assess and Protect 	Applied information and learning outcomes to refine the pilot teams' conceptual understanding of communities that may have been exposed to site contamination.
Step 6: Document Work 	Documented the results referencing the CERCLA process as well as different community settings and variable levels of past engagement.

Figure 1: The pilot teams' six-step process for incorporating environmental justice-related concerns into CERCLA investigations and the tasks they performed to test the six-step process.

The report documents the pilot teams' efforts and challenges encountered during the pilot project. The report's appendices include references, background information on environmental justice, and a description of available guidance and tools. Concise Reference Guides accompany the report; they are designed to provide tips to assist project teams with program implementation recommendations.

Agencies, Offices and Programs

EPA

EPA	United States Environmental Protection Agency
FFRRO	Federal Facilities Restoration and Reuse
OLEM	Office of Land and Emergency Management
OSRTI	Office of Superfund Remediation and Technology Innovation
OCPA	Office of Communications, Partnerships, and Analysis
OUST	Office of Underground Storage Tanks

Other Agencies and Organizations

AFCEC	Air Force Civil Engineer Center
CDC	Centers for Disease Control and Prevention
CEQ	Council on Environmental Quality
DNREC	Delaware Department of Natural Resources and Environmental Control
DoD	U.S. Department of Defense
IDQTF	Intergovernmental Data Quality Task Force
NEJAC	National Environmental Justice Advisory Council
PADEP	Pennsylvania Department of Environmental Protection
VDEQ	Virginia Department of Environmental Quality

Acronyms

ACS	American Community Survey
ADP	Action Development Process
AFB	Air Force Base
BRAC	Base Realignment and Closure
CEJST	Climate and Economic Justice Screening Tool
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CIMC	Cleanups In My Community
CIP	Community Involvement Plan
CRP	Community Relations Plan
CSM	Conceptual Site Model
CUPP	College/Underserved Community Partnership Program
DQO	Data Quality Objective
ECHO	Enforcement Compliance and History Online
EE/CA	Engineering Evaluation / Cost Assessment
EJ	Environmental Justice
EJI	Environmental Justice Index
FUDS	Formerly Used Defense Site
GIS	Geographic Information System
ID	Identification
ISS	Installation Support Section
JBLE	Joint Base Langley-Eustis
LUST	Leaking Underground Storage Tank

NEPA	National Environmental Policy Act
NPL	National Priorities List
PCB	Polychlorinated Biphenyl
PFAS	Per- and Polyfluoroalkyl Substances
QAPP	Quality Assurance Project Plan
RAB	Restoration Advisory Board
RCRA	Resource Conservation and Recovery Act
ROD	Record of Decision
RMP	Risk Management Plan
RPM	Remedial Project Manager
SAP	Sampling and Analysis Plan
STEM	Science, Technology, Engineering and Mathematics
SVI	Social Vulnerability Index
TCA	Trichloroethane
UF	Uncertainty Factor
UFP	Uniform Federal Policy
UST	Underground Storage Tank
VOC	Volatile Organic Compound

Acknowledgments

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Table of Contents

I. Pilot Project Overview

This report describes a process for integrating environmental justice (EJ) considerations consistently and systematically into Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) cleanups. EJ is the fair treatment and meaningful involvement of all people regardless of race, color, national origin or income, with respect to the development, implementation and enforcement of environmental laws, regulations and policies.[1] This goal will be achieved when all people receive:

- The same degree of protection from environmental and health hazards.
- Equal access to the decision-making process to have a healthy environment in which to live, learn and work.

Executive Order (EO) 14096 further deepens the commitment to take a whole-of government approach to EJ, by making clear that EJ is a duty of all executive branch agencies. The EO directs agencies to consider measures to address and prevent disproportionate and adverse environmental and health impacts on communities including cumulative impacts, emphasizing notification and risk communication. EO 14008, enacted in 2021, expands on the U.S. government's commitment to making EJ a part of the mission of every agency. It directs federal agencies to develop programs, policies and activities that address the disproportionate health, environmental, economic and climate impacts on disadvantaged communities. Federal agencies must develop and implement policies and strategies that strengthen compliance and enforcement, incorporate EJ considerations in their work, and increase community engagement. Following this direction, EPA's Office of Land and Emergency Management (OLEM) developed an Environmental Justice Action Plan. This pilot project is one example of how EPA, other federal agencies and the states intend to strengthen the federal commitment to the implementation of EO 14008 at Superfund sites.

This report describes the results of a pilot project to develop a process and methods to promote the consistent and systematic application of EJ considerations at federal facility National Priority List (NPL) sites. The intent is to maximize efforts within existing frameworks, throughout the CERCLA process. The pilot project's objectives included:

- Develop recommendations for the use of tools to identify communities with EJ concerns that may be disproportionately impacted.
- Determine how to analyze needs and/or gaps pertaining to both engagement and protection.
- Identify options to improve engagement and refine the government's understanding of the relationship among potential vulnerabilities, risks and disproportionate impacts, so that they can be addressed through cleanup actions.
- Develop suggestions to document work efficiently and effectively within the framework of the existing CERCLA process.

[1] EPA's definition of EJ is available at https://www.epa.gov/environmentaljustice. The webpage also provides background information on EPA's EJ program.

This report is for managers and project teams from EPA, other federal agencies and state agencies, who are involved CERCLA cleanups at federal facilities. It assumes a basic understanding of the CERCLA process. It has three sections:

I. Pilot Project Overview
II. Pilot Process for Integrating Environmental Justice Considerations in CERCLA
III. Pilot Project Sites

This project was not intended to be a communications project. Rather, it was developed to help project teams build EJ considerations into their everyday work. The report appendices include references, background EJ information, and a description of available guidance and tools. Concise Reference Guides also accompany the report; they are designed to provide tips to assist project teams with program implementation recommendations.

The three participating federal facility NPL pilot sites are in EPA's Mid-Atlantic Region. They represent different federal agencies and communities. The sites are the Dover Air Force Base site in Delaware (EPA ID: DE8570024010), the Naval Station Norfolk/ Naval Support Activity Hampton Roads site in Virginia (EPA ID: VA6170061463) and Tobyhanna Army Depot site in Pennsylvania (EPA ID: PA5213820892). Each site participating in this pilot project was represented by a site project team (the "pilot team"). Each pilot team included representatives involved in the CERCLA process at each site, including staff from EPA Region 3, other federal agencies and state agencies. Figure 2 below shows the locations of each of the sites.

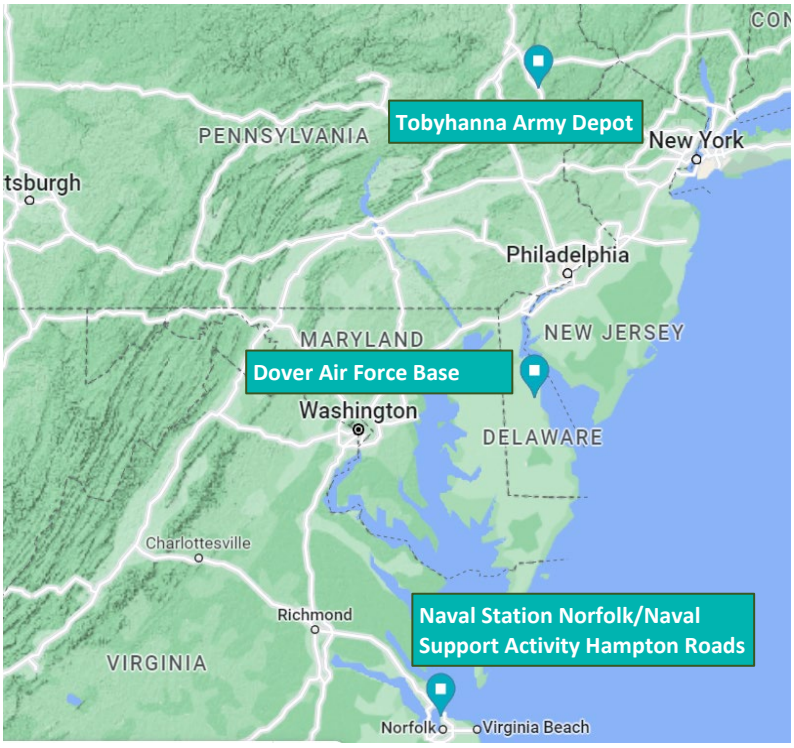

Figure 2: The locations of the three pilot sites.

The three facilities represent different issues and settings. All three sites have achieved EPA's construction completion milestone. Each site has ongoing environmental concerns.

- The Dover Air Force Base site is near a small city. It is mostly surrounded by agricultural land. It is in early stages of its Remedial Investigation for per- and polyfluoroalkyl substances (PFAS).
- The Naval Station Norfolk/Naval Support Activity Hampton Roads site is in an urban area. It has focused on completing the mitigation of a groundwater contamination area with potential vapor intrusion near a newly built elementary school (Camp Allen Elementary School).
- The Tobyhanna Army Depot site is surrounded by state game lands. A PFAS investigation was started recently. To date, community outreach efforts have been focused mostly south of the site, while outreach efforts have been limited north of the site.

The kickoff meeting for the pilot project brought together the three pilot teams. It took place in June 2022, with an initial focus on the use of screening tools. The pilot teams discussed how to use the information gathered. The structure for the process was identified by September 2022. Each pilot team then applied the process to their site to identify and assess communities, analyze gaps in engagement and protection, and explore options to address these gaps. Full-group meetings provided opportunities to share ideas among the pilot teams. Individual pilot team meetings enabled each team to work through site-specific issues. A draft summary was produced in November 2022. The focus then shifted to identifying next steps in the pilot study.

II. Pilot Process for Integrating Environmental Justice Considerations in CERCLA

While guidance, tools and strategies to consider and address EJ concerns are available, there is a lack of cohesive, systematic processes to help CERCLA project teams apply them in efficient, meaningful ways. The pilot teams chose to explore how to use tools in sequence (process methods) to identify communities that may be more vulnerable to risks, leading to disproportionate impacts. The pilot teams also considered options to improve engagement with communities and to refine our understanding of the relationships among community vulnerabilities and the potential for risks and disproportionate impacts. The pilot teams also suggested ways to document work transparently and comprehensively.

The Six-Step Process

The pilot teams developed a six-step process to incorporate EJ-related concerns into CERCLA investigations (see Figure 1). The process is flexible and iterative in nature. It combines community information gleaned from screening tools with site-specific knowledge of sources, releases and potential exposure scenarios to generate questions to guide community engagement. Each community provides key information that deepens and supports the analysis. Learning outcomes from each step results in revisions and refinements to have a better conceptual understanding of communities that may be exposed to contamination.

Step 1: Identify Potentially Vulnerable Communities

Getting to know potentially affected communities strengthens cleanups and outcomes at CERCLA sites (U.S. EPA, 2021). For communities that may be disproportionately impacted, it may be necessary to use multiple strategies to reach and connect with people. A useful first step can be using Geographic Information System (GIS) and mapping tools and data to screen nearby communities to identify areas with potential EJ concerns or potential vulnerabilities that could result in disproportionate impacts. Having this knowledge can encourage proactive community engagement and promote the fair treatment and meaningful involvement of affected communities in CERCLA-related activities.

The pilot teams employed several strategies to screen and characterize communities. For example, they:

- Assessed community characteristics using computer-based screening tools such as EJScreen, FedFacts, EnviroAtlas, and the Climate and Economic Justice Screening Tool (CEJST). These tools and other resources are described in detail in Appendix C.
- Identified indicators for potential vulnerabilities and disproportionate impacts, including:
    - Demographics and socioeconomic status
    - Language and cultural factors
    - Sources of pollution
    - Land use
    - Health burdens

When using EJScreen, the 80th national percentile has been used as a starting point for identifying geographic areas in the United States that may warrant further consideration (EJScreen Technical Guidance). That is, if any of the EJ indexes for areas under consideration are at or above the 80th percentile nationally, then further review may be appropriate.

- Noted conditions and circumstances that may result in barriers to engagement. Examples include:
    - Low-income status
    - Lack of transportation
    - Childcare needs
    - Language barriers
    - Educational barriers
    - Under-resourced and underserved status, in terms of access to resources such as health care, fresh food, internet access and green space
- Determined if a site has tribal and/or indigenous people in the vicinity or using nearby resources that may be impacted by site contaminants or who expressed interest in the site.
    - Searched active and archived sites in EPA's Superfund Enterprise Management System database: https://cumulis.epa.gov/supercpad/CurSites/srchsites.cfm.
    - Reviewed EPA's website on Environmental Justice and Indigenous People: https://www.epa.gov/environmentaljustice/environmental-justice-tribes-and-indigenous-peoples.
- Integrated results to create visual and narrative "maps" of areas with potentially vulnerable communities.
- Identified issues requiring follow-up to confirm conditions and scenarios identified during the use of screening tools that are indicative of potential vulnerabilities and/or disproportionate impacts. Confirmation of these conditions and scenarios would provide more specificity to support action to engage and protect public health.

The pilot teams found that identifying the size of the study area of potential site impacts varies based on several considerations. They include how far potential site impacts may extend (e.g., contaminated groundwater, releases to air) and whether potentially contaminated natural resources (e.g., fishing and recreation areas) may attract visitors as well as nearby residents.

Step 1 accomplishes two important policy objectives. First, it addresses the principle of fair treatment by further evaluating adverse and disproportionate impacts and identifying ways to prevent or mitigate such impacts. Second, it addresses the principle of meaningful involvement by fostering enhanced community engagement in the CERCLA process. EPA recommends including the results of any analysis in the Administrative Record for a site's CERCLA activities as part of indicating whether and how community concerns were addressed (U.S. EPA, 2022b).

Step 2: Identify Sources and Releases

This step identifies locations of known and potential sources and releases of site contaminants that may have direct or indirect impacts on nearby communities. Impacts range from known direct exposures to concerns about potential exposures. The analysis should include all potentially contaminated media and exposure pathways, starting with the existing Conceptual Site Model (CSM).

The pilot teams analyses covered the nature of the releases, impacted media, fate and transport, exposure pathways as well as current and potential future land use of impacted areas. Identifying how site conditions may affect potentially impacted communities is key in focusing outreach strategies to support engagement to address gaps and challenges and engage the most-burdened communities.

Step 3: Develop Questions to Guide Engagement

By evaluating the information on potentially impacted communities from Step 1 and site data from Step 2, the pilot teams identified information gaps and then developed questions to guide community engagement. Questions can help elucidate what groups are most affected, why they are affected and what can be done to remedy the problems, which is important to identifying and addressing EJ (Environmental Law Journal, 2008 and Loyola Law Review, 2020). These questions serve three purposes:

- Guide project teams in the ground-truthing of data.
- Facilitate the refinement of engagement strategies needed to address these gaps.
- Identify opportunities to protect peoples' health.

Effective engagement helps us learn about community concerns and activities that enable us to update and refine our understanding of community vulnerabilities and exposure scenarios. The screening tools help us ask the right questions.

For example, while online screening tools may identify many factors contributing to disproportionate impacts, unresolved questions may remain. Sample questions based on the pilot teams' use of the online screening tools are listed below.

EJScreen

EJScreen identifies communities with higher populations of people who speak a language other than English.

- Are people literate in that language?
- Do these populations also speak or read English?
- How do the communities receive information (i.e., is there a trusted publication, radio station, church or other source)?
- Do people live in or frequent areas that may be affected by site-specific chemicals?
- Are there cultural or ethnic organizations that represent these populations?

EJScreen identifies communities with higher populations of low-income families headed by single heads of households.

- Do families have easy access to transportation and childcare that would allow them to attend community engagement meetings, such as Restoration Advisory Boards (RABs)?
- Are local jobs primarily shift work?
- Do families have internet access to attend online meetings/public sessions, or to access websites?
- Do they live in or frequent areas that may be impacted by site chemicals?
- Are they active in neighborhood religious organizations where community engagement could take place?

EJScreen identifies communities with additional at-risk health concerns, such as high asthma rates.

- Are there site-specific contaminants or remedial action options that may be associated with or could exacerbate asthma symptoms?
- Do people live downgradient from chemical releases that may be associated with or could exacerbate asthma symptoms?
- Are there related demographic or socioeconomic factors that could decrease resilience and increase potential impacts?
- What is healthcare access like in the communities?

Private Domestic Well Map

This mapping tool identifies where domestic (private) water wells are located and how many people are using them.

- Are wells registered with the state or county?
- Are there unregistered wells?
- What are the demographics and socioeconomic status of the communities with private wells?
- Are wells potentially downgradient from site-specific contamination and hydrologically connected?

EnviroAtlas

EnviroAtlas identifies local land uses, including land that is used for hunting and fishing, as well as other recreation activities.

- Are there potential pathways that connect local land use, and associated recreational activities, with contamination sources?
- Is it possible that the hunting and fishing provides a large percentage of the communities' food supply?
- Do recreators live nearby or come from further away?
- Who manages the land? What types of engagement do they have with the communities?
- Do we know if natural resources (e.g., fish and game as well as recreational land and water) are contaminated by a site?

The questions above hint at potential barriers to effective participation and engagement (e.g., language, education, limited access to transportation, residing outside the area) as well as possible vulnerabilities that could amplify impacts (e.g., age, economics, health effects). Collectively, this information can help tailor outreach and engagement strategies to the needs of each community.

Step 4: Engage Communities

Community input can inform decisions when investigating sites and estimating risks. The pilot teams' work confirmed the value of CERCLA project teams seeking community input early enough to help shape risk assumptions and conclusions. During Remedial Investigations, project teams should:

- Engage the community when determining the exposure pathways and reasonably anticipated future land use.
- Determine if the site includes sensitive subpopulations.
- Identify if non-site-related health risks create sensitive populations.
- Use site-specific information to inform the baseline risk assessment.
- Communicate exposure assumptions to the community.
- Include community input in the site's Remedial Investigation Report.

Initial engagement efforts enable us to identify options for improving engagement and refining our understanding of the potential for risks and disproportionate impacts. Initial outreach strategies should be rooted in step 1 and step 2 findings (key community data and site information) and designed to answer questions identified in Step 3. We can then refine engagement strategies over time, as more is learned about community concerns and preferences. Successful engagement may also require special efforts to connect with populations historically underrepresented in decision-making and with a range of education levels, literacy and proficiency in English.

The pilot teams chose to focus on the key community engagement considerations below:

- Convey issues in ways that are tailored to each population (e.g., translation, timing, location).
- Bridge cultural and economic differences that affect participation.
- Use communication techniques that enable more effective interactions with other participants.
- Develop partnerships on a one-to-one basis or a small-group basis to ensure representation.
- Build trust between governments and potentially affected communities.
- Convene other responsible parties to promote holistic discussions of community needs.
- Develop stakeholder capacities, such as limitations associated with childcare and transportation, to participate effectively in future decision-making processes (U.S. EPA, 2015).

EPA recently published How to Get to Know Communities and Cultures: Methods for Remediation, Removal, and Redevelopment Projects (U.S. EPA, 2021a), which provides a useful framework and systematic methodology to synthesize information gathered using existing EPA practices and strategies to better support meaningful engagement. This reference is particularly useful when transitioning from computer-based screening to community outreach and engagement.

More broadly, EPA has extensive community engagement resources available (see https://www.epa.gov/superfund/superfund-community-involvement-tools-and-resources).

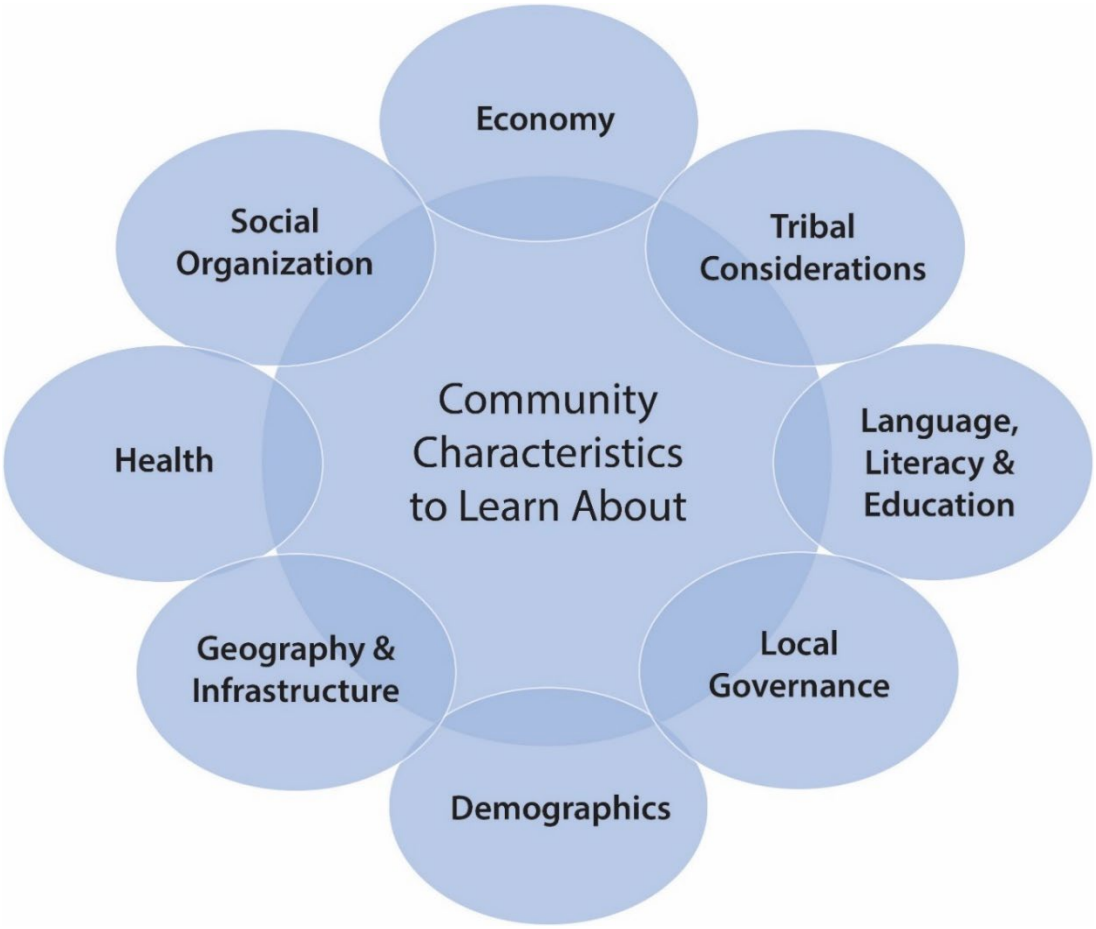

Figure 3: Community characteristics to learn about.
Source: EPA. 2021a. How to Get to Know Communities and Cultures: Methods for Remediation, Removal, and Redevelopment Projects.

Traditionally, RABs have been the main tool for community engagement at U.S. Department of Defense (DoD) federal facility sites. Established, regular meetings allow for more controlled dissemination of information. RAB members may be selected for their interest in and knowledge of a facility. However, it may be difficult to ensure that all communities and constituencies are represented; some people may not be able to attend meetings regularly or may not be comfortable doing so. Diverse representation on a RAB can successfully extend outreach. Teams should commit to using multiple and diverse strategies for reaching represented and underrepresented communities.

Targeted outreach strategies such as newspaper postings and newsletters can be useful, but it may be difficult to know if people are reading the information or understanding it fully. In some cases, it may work well to engage people more directly, through door-to door canvassing, attending local events and scheduling one-on-one meetings. Engagement through social media may be preferred in some communities. It may be useful to engage through local businesses as well. EPA's Community Involvement Toolkit (https://www.epa.gov/superfund/superfund-community-involvement-tools-and-resources) provides more information on community outreach tools. EPA has also prepared a summary on the use of social media tools for community engagement (U.S. EPA, 2019b).

Teams should consider partnering with other agencies and community-based organizations as a way to improve community engagement for several reasons. Partnering can bring more services and information to communities, and particularly to communities that may be more vulnerable. There may be multiple stressors in a community, with site contamination being only one of them. Partnering with local health and community agencies can bring attention to community concerns unrelated to the site that affect vulnerability and resilience more broadly, such as the presence of food deserts or a lack of access to health care.

Partnering and collaboration may involve identifying collaborators both within and outside of team organizations. For example, there may be EJ coordinators in your federal or state agency who can help identify vulnerable communities, or there may social science researchers interested in testing novel outreach tools and strategies. Identifying partners and collaborators could be a useful metric to demonstrate effort in outreach and engagement.

Partnering with other state and federal agencies should also be considered. For example, there may be state or federal projects in the immediate area that could impact the community. Collaboration on outreach and engagement may be beneficial.

Additional state and federal resources may be available to communities. For example, staff from the Agency for Toxic Substances and Disease Registry (ATSDR) could provide advice on understanding community health concerns.

Partnering with local schools to host booths during school events or share presentations during parent-teacher meetings can be an effective way to reach busy parents who may not otherwise have time to attend regular RAB meetings.

Partnering with local universities can help communities in need of technical assistance, at no cost to the community. EPA established the College/Underserved Community Partnership Program (CUPP) in 2011 to provide a creative approach to partnering and delivering technical assistance to underserved communities (U.S. EPA, 2022c). It enlists colleges and universities to assist these communities through student internships, practicums and capstone projects. Communities receive vital assistance and services on a voluntary basis and at no cost. Students gain practical experience developing solutions to enhance quality of life for communities.

Partnering with trusted local organizations such as religious groups, clubs and interest groups can be an effective way to build trust, particularly in communities skeptical of government actions. This strategy proved to be effective during the water crisis in Flint, Michigan, once it was recognized that stakeholders no longer trusted government officials.

Partnering and collaboration is more effective when the goals, roles and responsibilities are well defined. Examples of roles and responsibilities include:

- Distributing educational materials.
- Sharing outreach responsibilities.
- Explaining testing results.
- Identifying needs, concerns and interests.

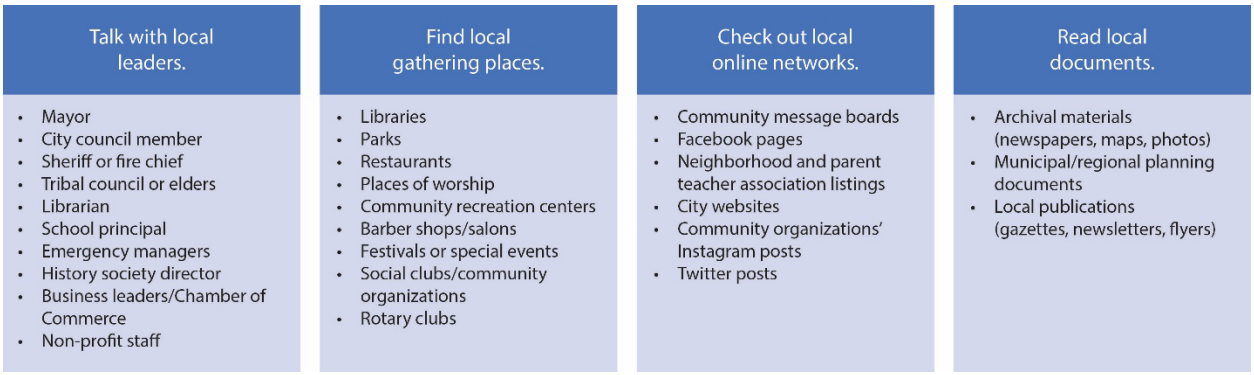

Figure 4: Learning about communities through community resources.
Source: EPA. 2021a. How to Get to Know Communities and Cultures: Methods for Remediation, Removal, and Redevelopment Projects.

Step 5: Assess and Protect

Use the information from screening tools, site investigations and community engagement to ensure that the scope of the investigation is sufficient to characterize and evaluate risks to human health, including parts of a community that may be more highly exposed and disproportionately impacted. This assessment and evaluation should consider if the information collected suggests new exposure pathways to consider or modifications/adjustments to existing exposure pathways, or if there are qualitative considerations that need to be added to the risk assessment and carried through risk management options.

For example, teams should seek community input at the outset of, and iteratively throughout, any project to help shape risk assumptions and conclusions on issues such as:

- Current land use and reasonably anticipated future land use, including:
    - Drinking water sources
    - Hunting and fishing
    - Farming and gardening
    - Recreation activities
- The presence of sensitive subpopulations.
- Whether other conditions, such as other sources of pollution, demographics, socioeconomic information and health risks, create sensitive or more vulnerable populations.

This information should inform the refinement of CSMs, sampling plans and risk assessment assumptions. Key findings from quantitative and qualitative analyses need to be shared with decision-makers.

ATSDR was established by Congress in 1980 under CERCLA. ATSDR is required by law to conduct a public health evaluations at each of the sites on the NPL. The aim of these evaluations is to find out if people are being exposed to hazardous substances and, if so, whether that exposure is harmful and should be stopped or reduced. It is also possible for communities to petition ATSDR to conduct a public health evaluation. Project teams can work with communities and ATSDR to consider options.

***Best Practice:* Consider Unintended Consequences**

In some cases, remedial actions can have unintended consequences on the nearby communities. EPA's Guidance on Considering Environmental Justice During the Development of a Regulatory Action (U.S. EPA, 2015) provides a useful framework for considering how potential CERCLA actions may impact populations with EJ-related concerns, specifically, if the CERCLA actions:

- Result in new disproportionate impacts on minority populations, low-income populations and/or indigenous peoples.
- Exacerbate existing disproportionate impacts on minority populations, low-income populations and/or indigenous peoples.

For example, the generation of diesel emissions from heavy equipment used in the remedial process could have adverse effects on air quality that could be discussed up front. Alternatively, remedial activities could result in increased truck traffic, which could prompt consideration of truck-route options. In other cases, remedial actions can present opportunities to address existing disproportionate impacts on minority populations, low-income populations and/or indigenous peoples.

Step 6: Document Work

Since the goal is to develop methods that promote consistent and systematic application of EJ considerations at federal facility NPL sites throughout the CERCLA process, it is also necessary to document analyses, findings, key messages and actions in meaningful ways. The pilot teams are documenting EJ considerations in one or more site-specific documents to ensure future site decisions incorporate EJ. These methods should be woven into planning and investigation processes. CERCLA-related documents that can capture EJ-related information are discussed below.

EJ Considerations in Community Involvement Plans (CIPs)

CIPs are site-specific strategies to promote meaningful community involvement throughout the Superfund cleanup process. The CIP should incorporate information gathered from screening tools and initial engagement efforts, including whether communities may be more vulnerable and/or might bear a disproportionate burden of exposure or environmental health effects due to race/ethnicity, national origin or income compared to other communities (i.e., communities with EJ concerns).

There are multiple opportunities to capture relevant information about potentially impacted and vulnerable communities in a CIP. A good CIP starts with good information about the community. EPA's Community Involvement Tool (https://www.epa.gov/superfund/superfund-community-involvement-tools-and-resources) provides information and examples on how to construct a meaningful CIP (U.S. EPA, 2019c). Highlights directly related to the pilot project include:

- Describe the releases and affected areas (a.k.a., "the site"), including relevant history, type and extent of contamination, and environmental exposures and concerns, both related to the site and in a broader sense.

- Take a holistic look at environmental exposure and concerns (including contamination and other community stressors that may not be related directly to the Superfund site).
- Describe the community in a comprehensive community profile that includes demographics, local government structure, local economy, community assets and any relevant community characteristics.
- Identify key community needs, questions and concerns, as well as expectations and unique needs of the community (e.g., translation and disability services) or unique cultural behaviors, customs and values.
- Outline a comprehensive plan to address community needs, concerns and expectations, outreach activities and community involvement mechanisms.
- Identify approaches to reach or engage the community and any additional special services or approaches needed to address unique needs of the community.

The CIP should be a "living" document and is most effective when it is updated or revised as site conditions change (U.S. EPA, 2020). For example, the pilot team at the Tobyhanna Army Depot site is updating the site's CIP to include communities north of the facility, based on the results from screening tools. As noted previously, EPA's Community Involvement Toolkit (https://www.epa.gov/superfund/superfund-community-involvement-tools-and-resources) provides a wealth of information on community outreach tools. EPA has also prepared a summary on the use of social media tools for community engagement (U.S. EPA, 2019b).

EJ Considerations When Scoping Remedial Investigations

Scoping for the Remedial Investigations follows the Uniform Federal Policy for Quality Assurance Project Plans (UFP-QAPP) (IDQTF, 2005) (https://www.epa.gov/sites/default/files/documents/ufp_qapp_worksheets.pdf). The UFP-QAPP consists of a series of worksheets that provide a systematic planning process to help focus data collection so that the type, quality and quantity of data will be suitable for their intended uses and agreed upon before the start of data collection.

Several worksheets are well suited for gathering information pertaining to EJ-related concerns such as potential vulnerable populations and people who may be disproportionately impacted by site contaminants. This is critically important because the UFP-QAPP identifies the sampling needs and data quality objectives (DQOs) that set the foundation for collecting and analyzing samples during risk assessment. In other words, the UFP-QAPP identifies who may be exposed, through which media, based on land use, and then specifies sampling and analysis requirements to inform risk assessment.

Worksheet #10 is the CSM. This tool uses text, figures and tables to convey succinctly what is known about a site, including sources, releases, fate and transport, contaminated media and, importantly, receptors in various exposure scenarios, such as residential, construction and recreational scenarios. The CSM is updated as new data are collected. As with the QAPP in general, the level of detail in the CSM should be based on the graded approach.

The CSM's narrative can include a description of known or potential vulnerable populations. It also outlines how these populations may be exposed via land and resource use, or cultural activities, based on the information gathered using tools such as EJScreen, as well as other knowledge about the communities. Having this information in the CSM ensures that sampling will be of sufficient quality to inform risk assessment.

Worksheet #11 articulates the DQOs for the project and are rooted in the CSM. Worksheet #11 also explains the basis for the sampling design. Since it builds on the CSM, this underscores the need to embed the EJ considerations in the QAPP. For example, are the DQOs sufficient to answer exposure questions for all subpopulations? Similarly, Worksheet #17 – Sample Design and Rationale – includes more specificity on sampling requirements and is also based on the CSM and DQOs. Worksheet #17 serves as the basis for the Sampling and Analysis Plan (SAP).

EJ Considerations in Remedial Investigations

The Remedial Investigation Report should be shaped by information obtained through community engagement, including anticipated future land use, the presence of sensitive subpopulations and community health risks., and the results of sampling and analysis activities as specified in the UFP-QAPP. The site-specific information collected during the Remedial Investigation helps refine the CSM, interpretation of sampling results and support the baseline risk assessment. What is most important is to intentionally and systematically document the impact of the findings from screening, community engagement and sampling on the interpretation of the Remedial Investigation.

EJ Considerations in Risk Assessments

EJ-related considerations of known or potential vulnerable populations and/or people who may otherwise be disproportionately impacted can be incorporated in each of the three main components of the risk assessment (exposure assessment, toxicity assessment and risk characterization). In addition to the Risk Assessment Guidance for Superfund, Section 5 of EPA's Technical Guidance for Considering Environmental Justice in Regulatory Analysis (U.S. EPA, 2016) is a helpful resource. For example, the pilot team at the Naval Station Norfolk/Naval Support Activity Hampton Roads site is aware that risks from poor ambient air quality may impact potential risks from vapor intrusion. The team will be looking for opportunities to incorporate these considerations in its risk assessment documents.

The exposure assessment should include any exposure scenarios associated with populations or groups of concern who may have different exposure routes, pathways or contact scenarios from the general population. Unique exposure pathways based on life stages and other relevant categories may also be considered. The exposure assessment should build on and refine the CSM included in the QAPP.

The toxicity assessment should document consideration of susceptible or vulnerable populations. In rare cases, there may be dose-response data that considers differential response in more vulnerable populations. In general, there are no data to quantify the potential for differential responses in, for example, low-income children of color.

Cumulative Impacts

Cumulative impacts are the totality of exposures to combinations of chemical and non-chemical stressors and their effects on health, well-being and quality-of-life outcomes. Ongoing research pertaining to cumulative impact assessment will help assessors better understand how multiple sources and stressors may affect some groups disproportionately.

While this project is not designed to resolve these issues, we expect that qualitative consideration of additional sources of exposure and non-chemical stressors could provide important context and this can be accomplished within the existing framework, for example, in the "uncertainties" section of the risk assessment. One important challenge will be how to share quantitative and qualitative risk information in meaningful and useful ways to support collaboration and partnering with other responsible parties and government entities to promote broader problem-solving.

Exposure Resources

EPA ExpoBox: https://www.epa.gov/expobox/exposure-assessment-tools-lifestages-and-populations-highly-exposed-or-other-susceptible

EPA Memorandum on Traditional Ecological Knowledge: https://semspub.epa.gov/src/document/11/500024668

Amendments to Superfund Hazard Ranking System Guidance Incorporating Native American Traditional Lifeways: http://semspub.epa.gov/src/document/11/175862

EPA generally relies on uncertainty factors (UFs) to address both uncertainties in the risk assessment for non-carcinogens. One way to think about vulnerable populations is in terms of variability. EPA typically uses an UF of 10 to account for variation in the general population and is intended to protect sensitive subpopulations (e.g., the elderly and children) (U.S. EPA, 1989). It is not clear if the UF of 10 is sufficient to account for multiple sensitivities and vulnerabilities that may be present in certain communities, and there is some indication that it is not (e.g., see National Academies of Science, 2009). The uncertainties associated with the potential impact of vulnerabilities such as race, ethnicity and low socioeconomic status generally remain unquantified. However, risk assessors should consider factors that can be addressed qualitatively, in accordance with existing guidance, in the risk characterization section.

During the risk characterization phase, quantitative risks are calculated based on the results of both the exposure and toxicity assessments. Adjustments are also made based on variability and uncertainties due to data gaps. In some cases, it may be possible to assess uncertainty quantitatively, but many of parameters of interest to EJ have not been quantified (e.g., it is not possible to define a probability distribution, which is a prerequisite to many methods), so they cannot be included.

In most cases, a qualitative approach is the most practical approach to describing uncertainty in Superfund site risk assessments given the use of the information (e.g., identifying areas where the results may be misleading). Often, the most practical approach to characterizing parameter uncertainty will be to develop a quantitative or qualitative description of the uncertainty for each parameter and to simply indicate the possible influence of these uncertainties on the final risk estimates (U.S. EPA, 1989). This is yet another place to capture a discussion of vulnerabilities, data gaps and uncertainties related to EJ that could not be quantified in the risk assessment but provide important context for the interpretation of risk.

Risk characterization also serves as the bridge between risk assessment and risk management and is therefore a key step in the ultimate site decision-making process (U.S. EPA, 1989). An important consideration may be how best to identify and package key messages, both quantitative and qualitative, that should be carried forward into the risk management phase.

Feasibility Study Reports

The Feasibility Study Report includes the development and screening of the remedial action alternatives, including a detailed analysis of each alternative. However, in actual practice, the point where the first phase ends and the second phase begins is not so distinct. Therefore, the development and screening of alternatives are discussed together to better reflect the interrelatedness of these efforts. Although this may appear to be a straightforward technical evaluation, community characteristics may inform several of the steps. For example, remedial action objectives should reflect any concerns for vulnerable populations that may be disproportionately impacted. Also, candidate technologies should be reviewed

for the potential to have negative impacts, such as increased diesel emissions or increased dust generation, on nearby communities.

Proposed Plans

Proposed Plans and Engineering Evaluation/Cost Assessments (EE/CAs) present the lead agency's preliminary recommendation for addressing contamination, the alternatives evaluated, and the rationale for the recommendation, and solicit public input on proposed responses. A Proposed Plan should include community feedback on the alternatives studied in the detailed analysis phase of the Remedial Investigation and Feasibility Study and on the Preferred Alternative. Community feedback should be solicited throughout the Remedial Investigation and Feasibility Study process, such that the required public review and comment is not a community's first review opportunity. The evaluation of alternatives and the selection of the Preferred Alternative should include documentation of which, and to what extent, EJ-related concerns relating to vulnerable and/or disproportionately impacted populations were considered.

Teams can: 1) explain how EPA considered community input throughout each section of the Proposed Plan or EE/CA; 2) in Proposed Plans, explain how EPA sought and adjusted decisions in the "Site Background – Description of major public participation activities" section; and 3) in EE/CAs, explain how EPA sought and adjusted decisions in the "Site Description and Background" section, in particular the subsections about "surrounding land use and populations", "possible pathways of exposure", and "identification of sensitive populations"; 4) explain throughout decision documents the role of community input in shaping EPA's decisions; and 5) explain if community-specific factors such as health disparities and disproportionate or cumulative environmental impacts shaped decisions that formed the basis for the response.

Records of Decision (RODs)

A site's ROD should also summarize how community-specific factors such as health disparities and disproportionate impacts informed the response action selection. EPA's ROD guidance (U.S. EPA, 1999b) includes a section on community engagement. In addition, community acceptance is one of the nine criteria used during remedy selection. Community engagement strategies can be summarized in the ROD's section on community engagement, with community concerns and preferences summarized to support community acceptance.

Five-Year Review Reports

Several parts of a Five-Year Review Report are particularly relevant to EJ considerations. The Community Involvement section should be a prompt to determine if community characteristics have changed. Question B assesses changing exposure and risk conditions. Question C reviews whether any new information could call remedy protectiveness into question. The Issues and Recommendations section can address any needs to address changing conditions. The protectiveness determinations should consider the consequences of changing conditions. Each of these parts of a Five-Year Review Report is discussed in greater detail below.

Community Involvement Section

At minimum, EPA recommends that community involvement activities include notifying the community that the Five-Year Review will be conducted, notifying the community of completion and providing the resulting report in the site's local information repository. Interviews with community members are

advised. If there are established community groups associated with the site, they should be briefed (U.S. EPA, 2022d).

EPA has developed guidance and tools to facilitate community engagement during Five-Year Reviews at federal facility sites, available at https://www.epa.gov/fedfac/five-year-review-federal-facility-cleanups. The project team should consider whether there are neighborhoods that may not be well engaged due to barriers such as language isolation, or socioeconomic considerations that can make it difficult for people to engage. For example, the pilot team at the Dover Air Force Base site developed an announcement for an upcoming Five-Year Review that has a QR code that enables users to read the public announcement, access the Administrative Record, and contact the remedial project manager (RPM) in Spanish and Creole (the two most common languages other than English used by nearby communities).

Understanding community demographics and potential vulnerabilities is key to developing a meaningful outreach and engagement program. In preparation for a Five-Year Review, it is advisable to review community characteristics and any recent changes in the characteristics.

Actions that project teams can take during Five-Year Reviews include:

- Run EJScreen and similar tools to refresh the team's understanding of community characteristics, environmental burdens and other factors that could result in barriers to meaningful engagement.
- Reference the site's CIP, including checking existing outreach lists to ascertain if there are parts of the community (neighborhoods, for example) not being reached.
- Strategize to expand targeted outreach and engagement.

Question A Section: Is the remedy functioning as intended?

Question A focuses on the technical performance of the remedy and encompasses all components of performance. If an updated understanding of the community changes any of the underlying assumptions in the risk assessment, then this could also change remedy performance. For example, if the dominant language in a community has changed from English to Spanish, institutional controls such as signage and educational materials that are in English may no longer be effective and would need to be revised to be bilingual.

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

This question can be used to assess new or changing exposure pathways that may be related to EJ concerns. This is an opportunity to check underlying assumptions regarding land use, activities and exposure pathways to make sure that they still support the risk assessment. Demographic data can change and tools such as EJScreen use data that is frequently updated, such as the American Community Survey, which is updated every five years. This simple yet important step builds on support for outreach and engagement efforts while also ensuring protectiveness.

Have new land uses and/or exposure pathways come to light since the previous Five-Year Review? Are there changing demographics that may be associated with changes in land use and/or exposure pathways?

Depending on the answers to these questions, an addendum to the risk assessment may be necessary. In some cases, the changes in exposure pathways can be evaluated qualitatively. It is important to include well-documented lines of evidence.

Issues and Recommendations Section

If the project team identifies any issues that require follow-up, these items should be identified in the Five-Year Review Report's Issues and Recommendations section, along with a timeline for resolution.

Protectiveness Section

There are potential scenarios that could call into question the protectiveness of the remedy. One example: there is now a larger population of non-English speakers near a site and new signage in several languages may be required to alert neighbors of land use controls. The Five-Year Review should consider and address changes in the community demographics that could affect protectiveness.

Pilot Project Challenges and Lessons Learned

1. There is no substitute for community engagement. Engaging with communities near a federal facility NPL site results in information that can be used to improve engagement, build trust, understand concerns, identify potentially vulnerable populations and learn about potential exposure pathways not considered previously. This information allows project teams to refine CSMs, produce strong risk assessments and provide key information to decision-makers.
2. Community outreach and engagement takes time, resources and skill.
3. Although CERCLA assigns the Other Federal Agency the primary responsibility for community engagement at federal facilities, there are potential important roles for EPA and state representatives that should be considered and expanded. EPA would benefit from a discussion of roles and responsibilities, to promote complementary outreach and engagement work.
4. Because protection and engagement go hand in hand, it makes sense to include risk assessors and community involvement coordinators in discussions of community characterization early in a project. Risk assessors can help identify exposure pathways and data needs for risk assessment. Their input on the CSM, the development of DQOs and feedback on SAPs will strengthen scoping and planning and ensure that the risk assessment will meet the needs of decision-makers.
5. There are opportunities to review and update the CSM at many checkpoints in the CERCLA process. The process discussed above should be sufficiently flexible to support a review at any point.

III. Pilot Project Sites

Dover Air Force Base Site

The Dover Air Force Base federal facility NPL site (https://cumulis.epa.gov/supercpad/cursites/csitinfo.cfm?id=0300191) is in Kent County, Delaware, 3.5 miles southeast of the city of Dover. It includes about 4,000 acres of land, including annexes, easements and leased property. The Base opened in December 1941. Since then, various military services have operated on site. The present host organization is the 436th Airlift Wing, a part of the U.S. Air Force's Air Mobility Command. Its mission is to provide global airlift capabilities, including transport of cargo, troops, equipment and relief supplies.

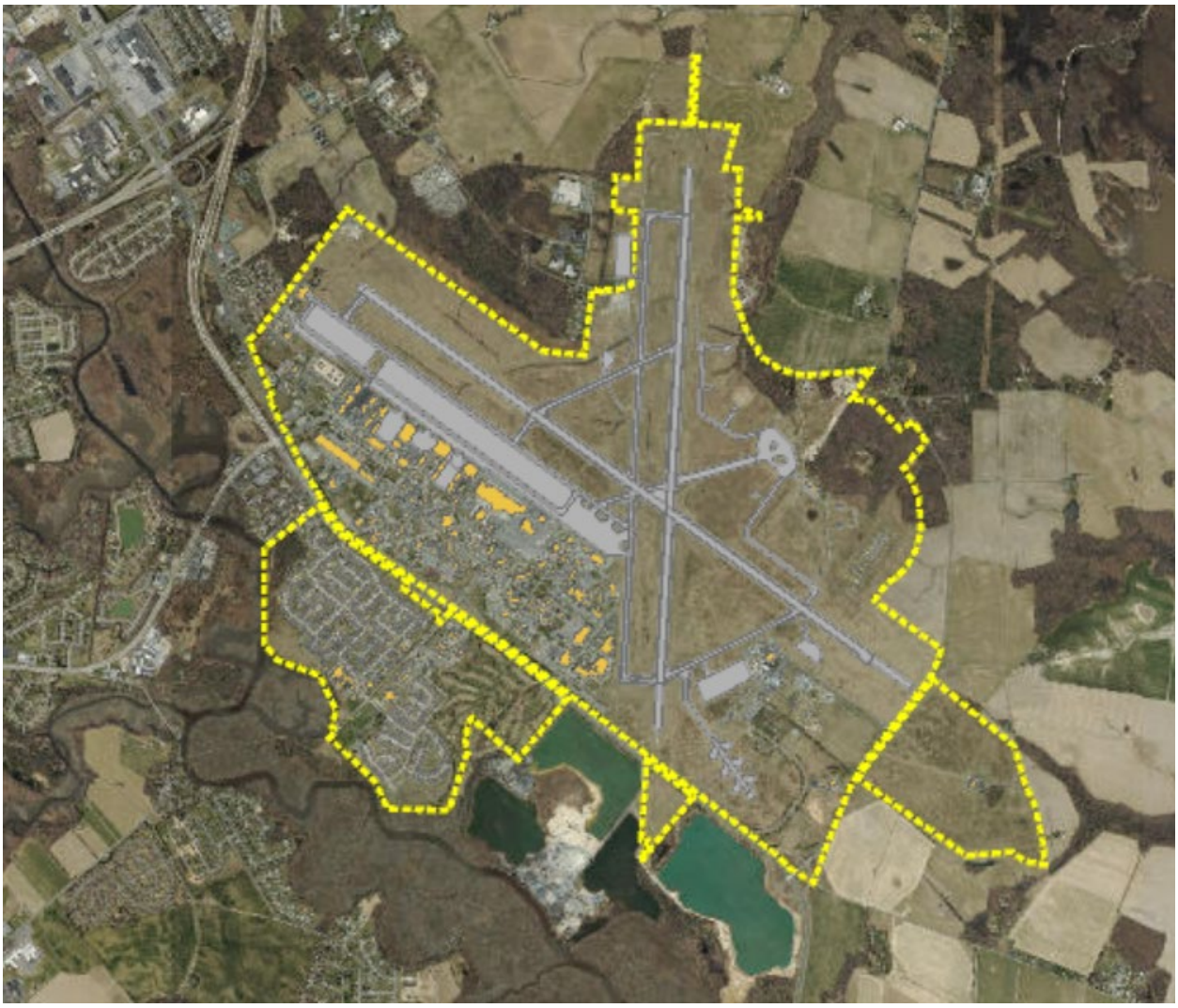

Figure 5: Aerial view of the Dover Air Force Base site.

Environmental investigations began at the site in 1983. In March 1989, EPA listed it on the NPL. Highlights of environmental restoration activities at the site to date include:

- 1991 – completion of initial Site Inspections.
- 1992 – remediation of soil and structures at a former fire training area.
- 1993 – completion of base-wide Remedial Investigation field sampling activities that identified fuel and chlorinated solvent contaminants requiring remediation.
- 1994 to 2002 – completion of base-wide Remedial Investigation Reports; final remedies implemented at all fuel-release sites; all required soil remedial actions completed; conditional closure achieved at 11 fuel-release sites; innovative technology interim actions implemented to start addressing chlorinated solvent groundwater contamination.
- 2003/2004 – completion of Feasibility Studies for all identified sites.
- 2005/2006 – final RODs completed for all remaining sites; completion of remedial design and remedial action construction phases for all remaining sites. Construction completion milestone achieved for all identified sites.
- 2007 to 2014 – continuation of remedial action operations for fuel and chlorinated solvent groundwater remedies; site closeout of 11 sites with regulatory approval.
- 2014 to present – Remedial Action Operations and Long-Term Management activities ongoing at 11 operable units; monitoring of groundwater cleanup progress is ongoing. One additional site closed with regulatory approval in 2021.

In 2014, the U.S. Air Force conducted the first PFAS investigation at the site. It identified four locations where PFAS from aqueous film-forming foam had been released into the environment. Subsequently, base-wide inspections for PFAS took place from 2015 to 2017, with Expanded Site Inspections continuing through 2021. The Site Inspections identified 12 on-base PFAS release sites and nine off-base private wells impacted by PFAS. The U.S. Air Force installed filtration systems on the affected private wells. Remedial Investigations are ongoing at the 12 identified PFAS release sites.

Step 1: Identify Potentially Vulnerable Communities

The pilot team used EJScreen to characterize communities next to the site. The pilot team first reviewed a 1-mile radius polygon (about 10 square miles in area) around the site, which included a community population of under 10,000 people (based on the use of EJScreen). To be as inclusive as possible, the pilot team decided to create a larger polygon that incorporates the larger Dover/Camden region. This larger polygon (about 35 square miles in area) was expanded to the north and west, primarily in the direction of more densely populated areas. It included about 55,000 people.

This larger polygon reflects a larger population which is more diverse and older, with a slightly higher education level and a slightly higher per-capita income, than the population in the original polygon. EJScreen data also indicate the area includes a greater concentration of poverty, health disparities (particularly related to asthma), female householder families under the poverty level, children under 5, larger concentrations of linguistically isolated communities and broadband gaps.

Table 1: Snapshot of Dover-Area Demographics

	Dover Air Force Base	On-Base Housing	1-Mile Radius	Expanded Area of Analysis
Population	39,403 (2020 Census)	2,810 (2020 Census)	8,845	55,901
Age Breakdown	2020 ACS 5-Year Estimates	2020 ACS 5-Year Estimates		
Median Age	33.8 years	24.7 years		
Under 5	4.8%	14.1%	10%	7%
Under 18	19.1%	35.7%	28%	23%
18 and Older	80.9%	64.3%	72%	77%
65 and Older	16.7%	1.8%	10%	15%
Ethnicity	2020 Census	2020 Census		
American Indian and Alaska Native	<1%	<1%	1%	1%
Asian	3%	3%	4%	3%
Black or African American	44%	16%	22%	36%
Native Hawaiian and Pacific Islander	<1%	1%	<1%	<1%
Other	4%	3%	2%	2%
Two or More Races	9%	14%	4%	5%
White	40%	63%	66%	53%
Race*				
Hispanic or Latino	8%	15%		
Not Hispanic or Latino	38%	57%		
Education	2020 ACS 5-Year Estimates	2020 ACS 5-Year Estimates		
High School Graduate or Higher	87.9%		90%	88%
Bachelor's Degree or Higher	25.5%	39.1%	27%	28%
Median Household Income	$48,500 (2020 ACS 5-Year Estimates)	$50,445 (2020 ACS 5-Year Estimates)	$25,650 (Per Capita)	$27,934 (Per Capita)
Language Spoken at Home	11.9% Language other than English (2020 ACS 5-Year Estimates)	11.2% Language other than English (2020 ACS 5-Year Estimates)	14% other than English	12% other than English

Source: Data compiled from Census.gov, American Community Survey (ACS) 5-Year Estimates and EJScreen.
**Race-related data only available for Dover and On-base housing – data are from Census.gov.*

The analysis considered multiple stressors in EJScreen to identify areas with communities that may be disproportionately impacted. The stressors included pollution and sources, socioeconomic indicators, and health disparities. In summary, several factors indicating the potential for disproportionate impacts were found in overlapping areas. The area of the expanded polygon is shown below. The expanded

polygon includes about 47,000 more people than the 1-mile-radius polygon and reflects similar demographic percentage values, with some exceptions:

1. Ethnic percentages varied slightly. The white population decreased by 13% and the black population increased by 13%.
2. Population by age matured, with the greatest increases in the 18^{+} and 65^{+} age groups. The number of people in the under-18 and under-5 age groups decreased.
3. Per-capita income increased by only $2,400.

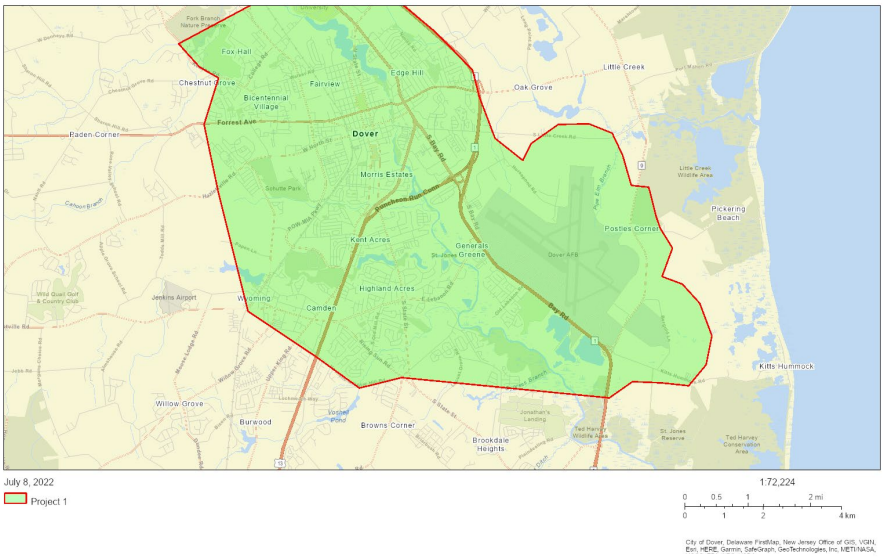

Figure 6: The expanded polygon used by the pilot team at the Dover Air Force Base site, which includes communities with potential disproportionate impacts.

Based on the analysis, low-income communities are located north and northwest of the site. These areas generally overlap with other indicators of potential vulnerability and/or disproportionate effects, such as higher percentages of people of color, single female head of household families below the poverty level, potential for language isolation, lack of broadband access, and health disparities such as asthma and lower life expectancy.

Overall, the analysis points to communities with multiple indicators of EJ concerns and/or disproportionate impacts. They include:

- Low-income status
- Single family head of household, below poverty level
- People of color
- Children under 5
- Other sources of pollution, notably air toxics
- Health disparities
- Linguistic isolation
- Lack of access to services (e.g., broadband, full-service supermarkets, transportation, health care)

Step 2: Identify Sources and Releases

Contaminants addressed at the site include fuels and their degraded components, lindane, and perchloroethylene and its degraded components. Remedial approaches employed to remediate and control these plumes include land use controls, in-situ bioremediation, soil vapor extraction, pump-and-removal of fuels and monitored natural attenuation. While these legacy contaminants do have human and environmental health risks, they have been contained on site. As of 2022, investigations have identified three distinct areas of PFAS impacts that extend to drinking water off-base. The full identification of nature and extent of PFAS contamination is not complete, so it is not yet known if there are releases impacting other areas that might result in more exposure pathways. Potential impacts on nearby recreational and agricultural areas are of particular interest.

It is possible that the PFAS investigation may identify more off-base impacts. For example, there are fish populations with measurable levels of PFAS in the St. Jones River. There is no direct evidence to date that the site is a source of contamination. However, as the investigation continues, maps will need to be updated along with analysis to determine if there are more impacts on known or potential vulnerable communities.

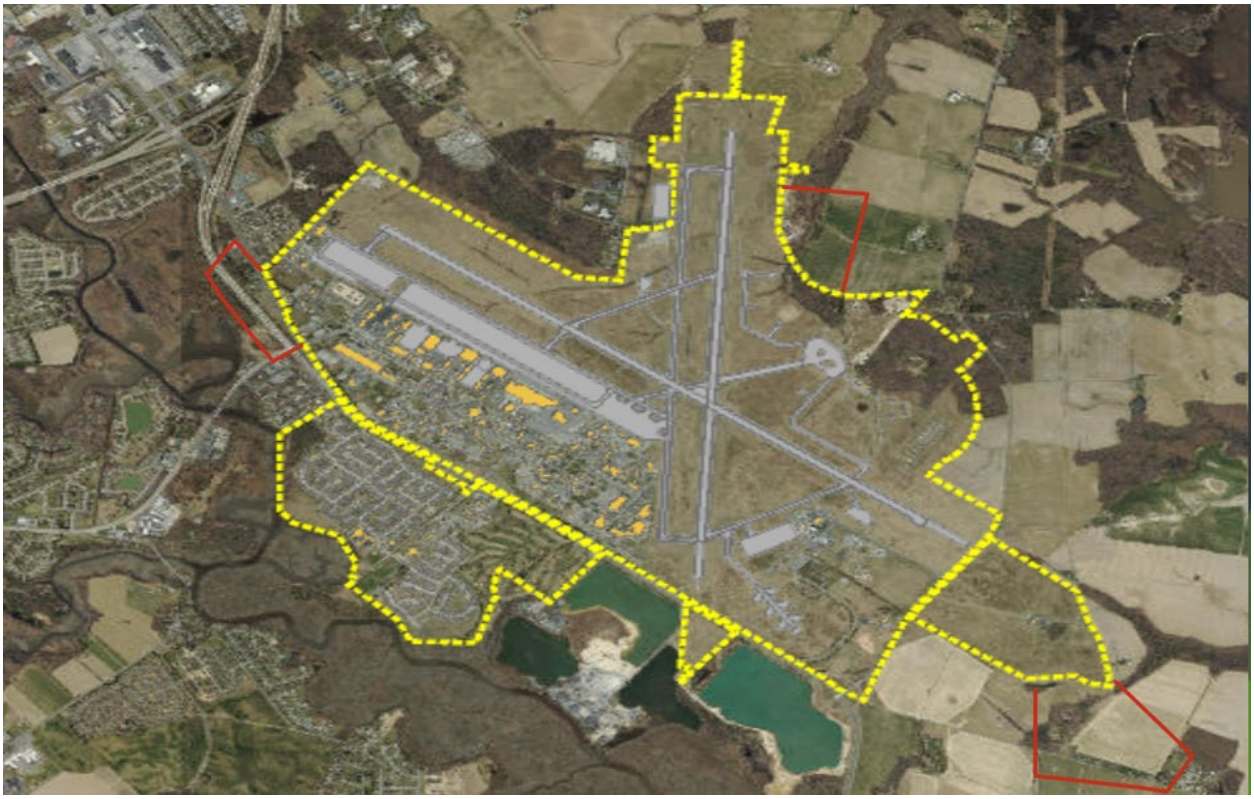

Figure 7: This aerial view shows off-base drinking water areas affected by PFAS at the Delaware Air Force Base site. Red polygons indicate known off-base contamination. The greatest distance to contamination is less than a half mile.

Step 3: Develop Questions to Guide Engagement

The pilot team identified communications as a potential barrier to outreach and engagement. This is because diverse languages are spoken in the area, with the potential for language isolation. Based on the EJScreen Summary report for the site, Spanish is the second-most-common language spoken at home in the area. The pilot team also gained the insight that French/Creole is often spoken in the area, with nearly 2% of the population speaking French or Creole at home. The team had not previously been aware of a significant French/Creole-speaking population in the area.

The pilot team considered several explanations for this finding, including crossover with French Creole and Creole-speaking immigrants. The pilot team confirmed that Haitian and other Creole-speaking people live in the area. They also identified a higher percentage of German-speaking people than anticipated; there is a large Amish population near the site, and Amish communities often speak German. Other languages spoken in the area include Japanese, Chinese, Korean and Tagalog.

Several factors enumerated in Step 1 (e.g., people of color, low-income status, limited access to healthcare, transportation and other services) may also be associated with disproportionate impacts, which need to be explored through community engagement.

Based on this information, the pilot team developed questions to help shape community engagement strategies to connect with communities who may be disproportionately impacted and inform the pilot team's understanding of community concerns and interests.

Question: Are there low-income and/or non-English-speaking communities with contaminated wells?

The pilot team considered the potential for rural, low-income families to live in housing with shallow, unregistered private wells. The pilot team believes that all wells identified in the area have been sampled, regardless of background, socioeconomic status or other considerations, and its response was based on measured PFAS levels. The only way that a well would not have been sampled was if a tenant or property owner refused access or did not respond to the sampling request.

Low-income and/or non-English-speaking families may experience different or additional exposure pathways, such as gardens maintained with shallow wells and subsistence fishing/hunting/foraging in contaminated areas. Community engagement efforts will need to provide this information.

Also, low-income, single-parent head-of-households may not have time to learn about potential health risks from contaminated wells. It may be difficult for these community members to attend meetings. The timing and location of meetings should consider community preferences and needs. Translators can be made available.

The pilot team believes that non-English-speaking families may not know what questions to ask about their wells because they may not fully understand risks conveyed in English, and may be limited in their ability to advocate for themselves. Although initial and subsequent canvassing was extensive, some of the wells monitored or treated with point-of-entry treatment systems are used by people who may be linguistically isolated. The pilot team is in contact with all known property owners and renters who are affected. Should more contamination be found, more outreach information will need to be developed to ensure accessibility of information for property owners and renters.

Question: Who may be fishing or hunting in areas with PFAS contamination?

Low-income families may be more likely to fish frequently to supplement their diets (subsistence fishing). In 2019, residential fishing licenses out-numbered residential hunting licenses by a ratio of more than three to one (44,960 to 13,267). The difference was even greater for out-of-state licenses (nearly 18:1). In absence of new survey data, it will be difficult to identify how many people fished in the area (nor can the amount of unlicensed fishing/hunting that occurs in the area be known). Fishing may be an important activity in the area.[2]

The pilot team notes exposures from fishing are possible, despite the fish consumption limits currently in place. It is possible that not everyone knows about or understands the consumption limits. It may be useful to determine if there are non-English-speaking families that are fishing in the area, as they may find it more challenging to interpret fish advisories. Also of note, people who have arrived recently from other countries may eat different species of fish or prepare them differently, resulting in higher exposures. Community engagement efforts for the site should ascertain more details about local fishing practices.

Since it is also possible that people using natural resources or recreation areas with PFAS contamination may not live next to the site, it might be useful to review how fish consumption limits are conveyed to the public to make sure they are effective in reaching the target audience.

To date, there are no documented PFAS impacts on identified recreational areas. However, the PFAS investigation is expanding. Recreation areas close to the site, which may be impacted by PFAS, do not allow swimming. The most likely exposure pathways for recreational users would be soil and sediment exposure. As the PFAS investigation continues, characteristics of potentially impacted communities will be considered in order to tailor outreach efforts to identify points of contact and shape engagement strategies to meet the needs of impacted communities.

Step 4: Engage Communities

Current Engagement Activities

The site has a CIP that is updated every two years. Typical public engagement includes direct mailings to stakeholders and affected citizens, newspapers ads and social media posts. There is currently no RAB, but the Base is ascertaining the level of community interest in one. Targeted strategies have been used to assess specific neighborhoods, including driving through areas to identify changes, new populations

[2] Delaware Department of Natural Resources and Environmental Control (DNREC). Fish and Wildlife. Recreational Licensing. Retrieved in January 2023 from https://dnrec.alpha.delaware.gov/fish-wildlife/licenses.

State of Delaware. Delaware Open Data Portal. Delaware Fishing Licenses and Trout Stamps. 2022. Retrieved in January 2023 from https://data.delaware.gov/Energy-and-Environment/Delaware-Fishing-Licenses-and-Trout-Stamps/5bd6-z97c.

State of Delaware. Delaware Open Data Portal. Delaware Hunting Licenses and Waterfowl Stamps. 2022. Retrieved in January 2023 from https://data.delaware.gov/Energy-and-Environment/Delaware-Hunting-Licenses-and-Waterfowl-Stamps/93vd-5wzi.

and unregistered wells. Community interest surveys/assessments have resulted in minimal correspondence (the most recent survey circulated in fall 2022 had 10 responses).

The U.S. Air Force Civil Engineer Center (AFCEC) has updated its community assessment and Community Relations Plan/Community Involvement Plan (CRP/CIP), and will be exploring the application of findings from pilot process steps 1-3 to expand and enhance community engagement activities. AFCEC has created a new template for assessing communities that launched in early 2023 and includes specific EJ language and provides guidance in its updated CRP/CIP (also scheduled for 2023). Based on this study and an emphasis to improve community engagement, AFCEC is revising and clarifying the threshold guidance for RABs. As such, the responses from 2022 solicitations now meet the threshold to establish a RAB and Dover Air Force Base is organizing responses and reaching out to newly found stakeholders, such as the Haitian Coalition of Delaware. However, the Base anticipates increasing community outreach efforts to engage stakeholders throughout the PFAS investigation process since community feedback has been minimal from traditional outreach strategies.

Strategies to Increase Engagement

As described in Step 3, the pilot team developed several questions based on available data, to identify potential exposure scenarios resulting in disproportionate impacts. The questions need to be fact checked. The main mechanism for doing this is engaging the community to better characterize potential exposure scenarios. At the site, options considered by the pilot team included:

- Add Spanish and French/Creole translations to public announcements.
- Garner support from foundations and organizations, such as the Central Delaware NAACP, the Delaware Hispanic Commission and the Central Delaware Chamber of Commerce to participate in meetings, as an opportunity to share information that could lead to enhanced community support.
- Identify other impacted sites in the vicinity, such as brownfields sites. There may be active community groups/networking options associated with these sites that the pilot team can leverage for access to communities.
- Engage academic partners to develop research projects aimed at better understanding community concerns and needs.
- Organize an open house or other community-focused event at local bazaars, festivals and farmers markets.
- Create a focused community newsletter for community stakeholders.
- Survey newly identified communities and community groups to ascertain interest.

Social media is used frequently to reach broader audiences. Social media is a powerful communication and engagement tool that can be measurable to a degree (e.g., re-posts, likes, comments, influencers). Its impact is limited to people who have access to broadband and cell phones.

- Increase the use of social media posts to include social media ads: larger circulation or targeted advertising for the region using common social media platforms.
- Distribute door hangers with a QR code or website link for communities and developments in the region.
- Disseminate flyers with contact information, including QR codes, at local points of gathering, including: houses of worship, community mailboxes, state/county/city parks, municipal

buildings, bulletin boards (post offices, libraries, city hall), YMCA/recreation centers, grocery stores and restaurants, community groups and centers (e.g., the Haitian community group, the Sankofa Cultural Arts Center).

Employ innovative strategies to engage with communities who lack access to broadband and cell phones with messaging services:

- Expand newspaper advertising to include smaller, independent and/or targeted community newspapers.
- Host tables/displays at community events and settings: fairs, festivals, Spence's Bazaar, NASCAR, food banks and food distribution centers, and soup kitchens.

Under-served and under-resourced communities with gaps in services (e.g., lack of broadband, reliable transportation) or linguistically isolated may be harder to reach via traditional methods of communication. One approach may be to seek out specific points of contact, collaborators who can help to connect with underserved members of the community:

- Clergy and religious group leaders
- Homeowner association leaders
- Civic leaders (mayors/town councils)
- Honorary Commanders Group
- Community nonprofits
    - Off-base (e.g., the Haitian Community Center)
    - On-base (e.g., the Hispanic Organization of Latin Americans)
- Chamber of Commerce
- Schools/university community liaisons
- Kent County groups
    - Office of Development and Planning
    - Community groups (e.g., the Rotary Club, event planners)
    - County safety meetings and the Local Emergency Planning Council

Step 5: Assess and Protect

As the PFAS Phase I Remedial Investigation progresses, information on the nature and extent of the contamination will be evaluated for potential impacts on communities with EJ concerns, such as the recently identified Haitian community. Tailored community engagement strategies, based on options identified in Step 4, will help the pilot team identify potentially impacted populations and as well as ensure the exposure scenarios are accounted for in the CSM, SAP and risk assessment.

Step 6: Document Work

As the Remedial Investigation of PFAS contamination moves forward, the pilot team will consider the opportunities below to capture and document community engagement findings.

CIP

- Expand the plan's EJ section to include discussion of the pilot program.
- Incorporate information from the pilot program report regarding initial findings and questions still being explored.
- Add potential outreach and engagement strategies discussed in the pilot program report.

QAPP and SAP Development for More PFAS Investigations

- Modify CSMs to include findings from community engagement, land use scenarios and other activities.
- Include a summary of the efforts to characterize communities and identify people who may be more vulnerable or disproportionately impacted in the description of receptors.

Remedial Investigation Report

- Incorporate community outreach efforts and evaluate engagement results to further refine CSMs.
- Revise the report as new information becomes available about the location of PFAS contamination.

Risk Assessment

- Include exposure scenarios based on hypotheses and outcomes from community engagement.
- Include qualitative information and include discussion of factors that may increase vulnerability/decrease resiliency.

Dover Air Force Base, as well as other U.S. Air Force installations, will continue to identify other management activities where EJ considerations are being addressed. In addition, day-to-day operational processes that incorporate EJ principles will be evaluated. Furthermore, the pilot team plans to implement standard procedures to document EJ implementation strategies, as outlined in this report, as well as document processes such as community action group and tribal engagement activities that have been ongoing at the Base for many years.

Naval Station Norfolk/Naval Support Activity Hampton Roads

The Naval Station Norfolk/Naval Support Activity Hampton Roads federal facility NPL site (https://cumulis.epa.gov/supercpad/cursites/csitinfo.cfm?id=0302858) is located directly northwest of Norfolk in eastern Virginia. The 4,630-acre facility provides shore facilities and logistics support for U.S. Navy vessels and aircraft. Shipyard activities include metal forming, repair and installation of mechanical and electrical equipment, metal fabrication and plating. Wastes generated at the facility include halogenated and non-halogenated solvents, corrosives, paint wastes, wastes from electroplating operations, petroleum products, and oils and lubricants. In addition, the facility manages used oils, construction debris, polychlorinated biphenyls (PCBs), contaminated oils and trash. Past operations and disposal practices contaminated soil, sediment and groundwater with hazardous chemicals. EPA added the site to the NPL in April 1997. Following cleanup, operation and maintenance activities are ongoing. The site has achieved EPA's construction complete milestone. A few remedy optimization projects are ongoing. A PFAS preliminary assessment/site investigation is also underway.

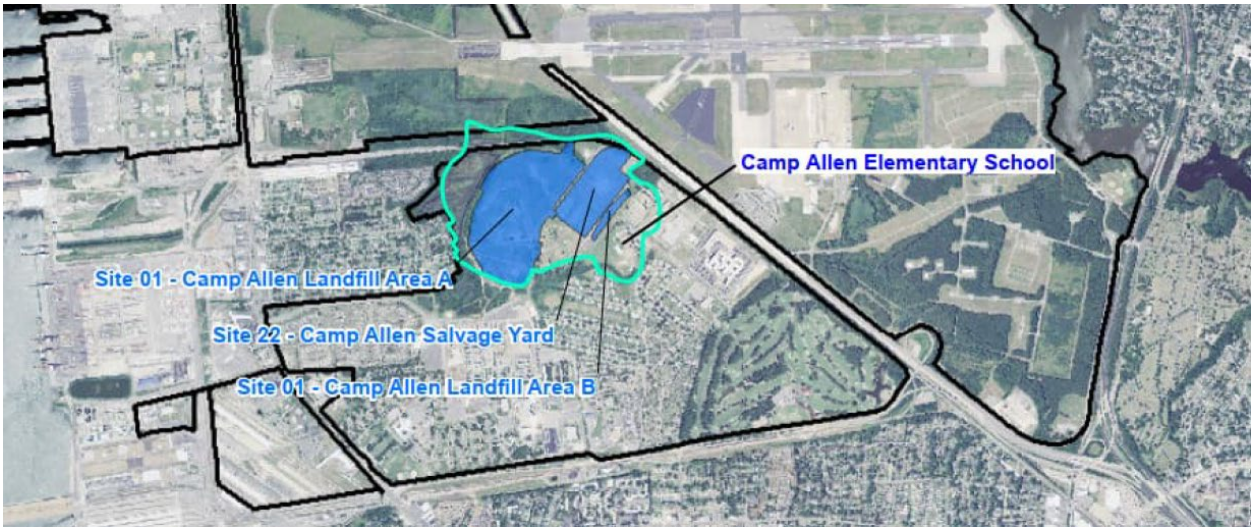

Figure 8: Aerial view of the Naval Station Norfolk/Naval Support Activity Hampton Roads site.

Highlights of environmental restoration activities at the site to date include:

- 1994: the removal of buried drums at Site 1.
- 1998 to 2008: completion of base-wide Remedial Investigations; RODs completed for many waste sites and remedies implemented at sites; groundwater monitoring wells, soil vapor extraction systems and covers installed, as needed.
- 2010: construction completion milestone achieved.
- 2010 to present: remedial action optimization and long-term management activities continue at operable units; groundwater cleanup and vapor extraction progress continues to be monitored at some sites.
- 2022: site's PFAS investigation started.

Step 1: Identify Potentially Vulnerable Communities

The site comprises Naval Station Norfolk and Naval Station Activity Hampton Roads, which are under different commands. The site is in an urban community that is low-to-moderate income, has a younger age-skewed population demographic (50% of the population is under age 35), and has residential communities on base and off base.

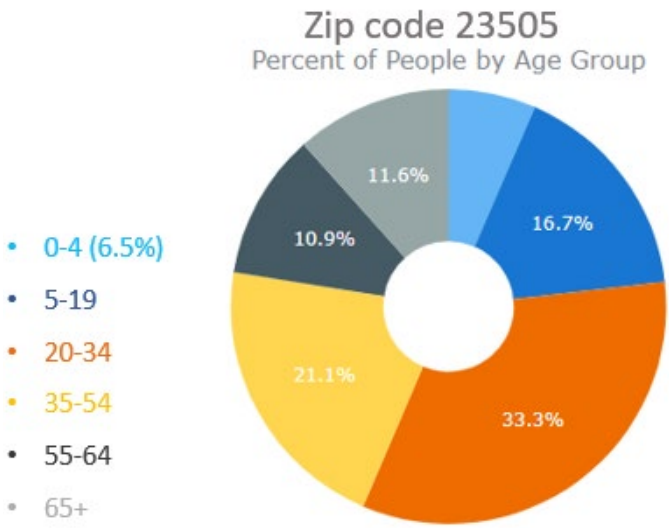

Figure 9: Community age distribution in the area around the Naval Station Norfolk/Naval Support Activity Hampton Roads site. Source: CDC EJ Dashboard Feb 2023

Communities on site and nearby include industrial and residential areas with high percentiles for many air quality indices in EJScreen. There are multiple sources of pollution – a port and highways with significant air quality impacts – in addition to the base. The result is that living adjacent to the site and commercial port activities means living with increased health risks due to the presence of air toxics.

In addition to increased health risks from air toxics, many young families live in the area. One neighborhood with a high index of households with children younger than age 5 is close to an operable unit, the Site 1 Camp Allen Landfill, with active remediation/optimization for groundwater contamination. This area also includes a new elementary school with vapor intrusion barriers in place. Some residential areas are managed specifically for military personnel. Accordingly, occupancy can turn over more frequently than the demographic indices in EJScreen and other tools, which are based on Census data. Two federally recognized tribes, the Nansemond Indian Nation and the Pamunkey Indian Tribe, are also in the area. They may be impacted by contaminant releases and have expressed interest in site activities.

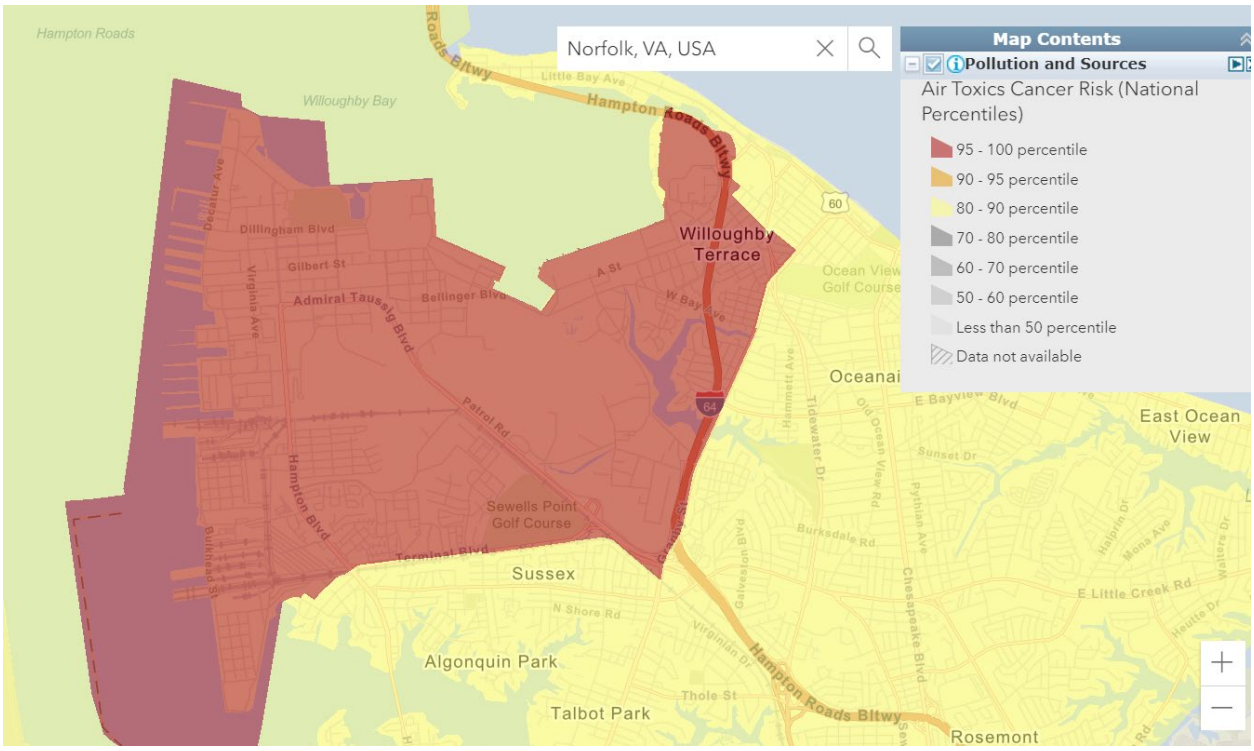

Figure 10: EJScreen map highlighting ambient air quality risks.

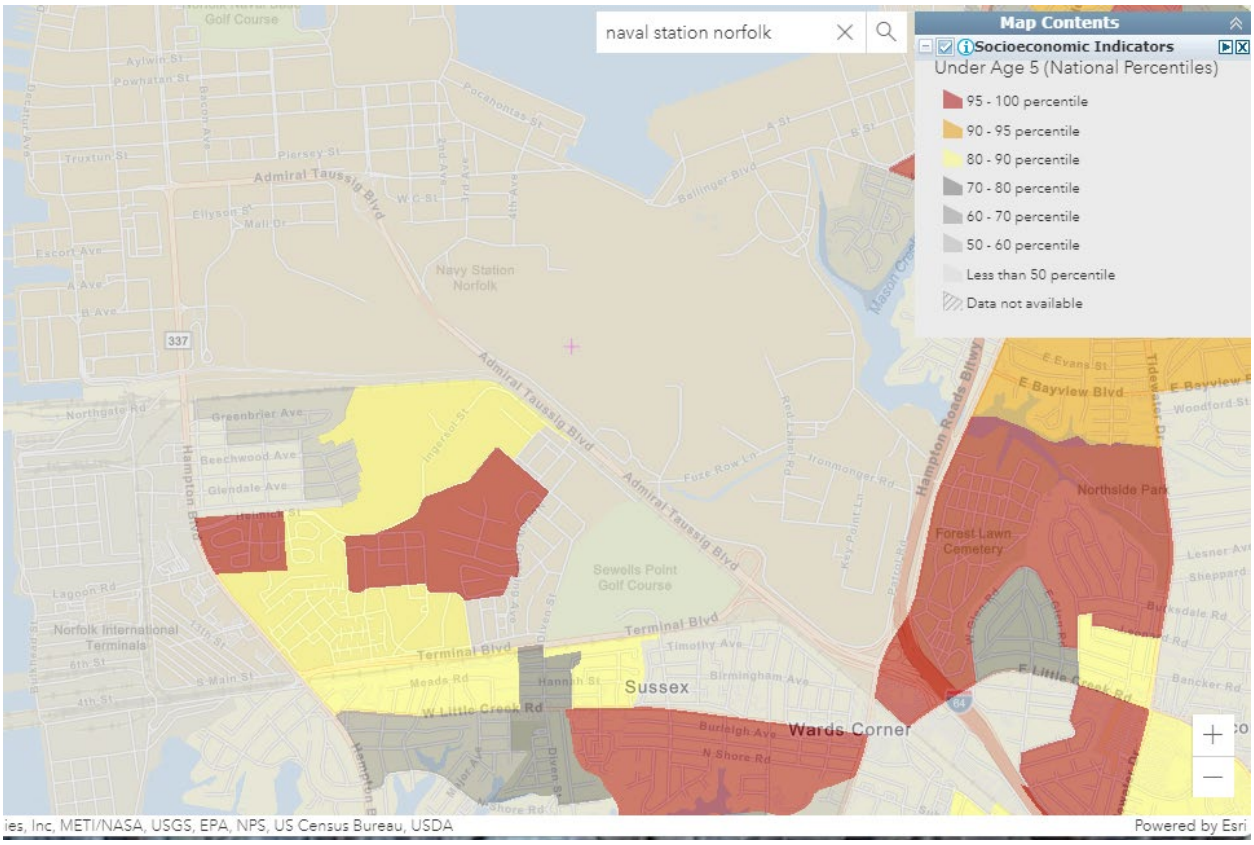

Figure 11: This EJScreen map shows the location of Site 1 as well as area communities with higher percentages of people of color.

Step 2: Identify Sources and Releases

Site 1 includes off-base contamination of groundwater but there are no identified active exposure pathways. Ongoing Site 1 remedy optimization includes monitoring and studies, with vapor intrusion of volatile organic compounds (VOCs) as the primary concern. The pilot team agreed to focus on neighborhoods next to Site 1. These neighborhoods have EJ indices indicative of high percentages of households with children under age 5 and multiple high air pollution indices that can compound impacts of potential exposure from vapor intrusion.

Step 3: Develop Questions to Guide Engagement

Certain community characteristics could be indicative of barriers to engagement. People in some neighborhoods may speak languages other than English, such as Spanish and Asian languages. People may benefit from information presented in multiple languages. In addition, consideration should be given to community members who require accommodation for hearing and visual assistance.

Several neighborhoods are likely to experience significant resident turnover, with military personnel transferring frequently, which makes it difficult to sustain communication efforts. Community meetings to date have not drawn significant attendance. Some people may not be focused on the issues pertaining to the sites. Parents with young children may not have a lot of time to attend meetings.

The site's CIP was updated in 2021, after a 2020 survey yielded high response rates (10% from randomly selected addresses within a 1-mile radius of the site). Responses indicate that the community is interested in receiving more information about the site. A little more than half of the respondents said they are concerned about environmental issues related to the site. They cited concerns about groundwater, surface water and soil contamination; most respondents said they believed the environmental releases affect community areas near the site. The community survey included questions on how respondents receive information about local news and events, and how they would like to receive updates – such as by website postings, mailings or emails, or via the *Virginia Pilot* (a local paper) – with an opportunity to add specifics. Survey results will help focus ongoing information sharing with the community. Other survey questions, about the site's information repository, the trustworthiness of information sources (U.S. Navy, EPA, state agencies), and the preferred frequency of communication will also inform the methods and sources of communication.

The next step for the pilot team was to develop questions to help shape community engagement strategies that will help to connect with communities who may be disproportionately impacted and inform its understanding of community concerns and interests.

Question: How far out should we look to set community boundaries?

There are several considerations to keep in mind when determining how to define community boundaries. A typical 1-mile boundary around an operable unit can be entirely on base, or it may not reach people who are interested and/or impacted. Primary considerations for defining community boundaries should include people who are interested and people who are impacted. Impacts may be

directional and, in some cases, can extend off base for quite a distance. Anyone who may be affected should be contacted. At the same time, there may be people who are not directly impacted by contaminants, but who live nearby and have concerns. It is important to share information with them as well.

At this site, families living next to it will be interested and may also be impacted. Families with children attending the elementary school will be interested in the cleanup process. These homes may be outside a 1-mile radius of the site. It will be important to get feedback from community members regarding their level of interest and desired involvement.

Question: How can we account for residential turnover?

Communities on and near military bases may experience frequent turnover, as military members are frequently deployed to other locations. It may be useful to identify institutions where people gather, including schools, churches, local civic organizations and community areas, as points of contact to identify new community members for outreach and engagement.

Questions: Are the children attending the local elementary school also living in areas with elevated ambient air toxics risks? The school is also located in an area with elevated ambient air toxics risks. How might this affect the added risk from vapor intrusion? The risk assessment should consider the impacts of ambient air toxics risks, including both cancer and non-cancer endpoints.

Question: Are we missing neighborhoods with residents who speak languages other than English?

Due to the temporal limitations of EJScreen and transience of the military community, the screening data may not represent the community's actual composition. It is possible that linguistically isolated populations may be in the area. Through community outreach, the pilot team should try to identify marginalized populations and adjust engagement strategies to be as inclusive as possible.

Question: Is there a need for accommodations for hearing and visual assistance, to help ensure accessibility to site information and meetings?

In a diverse urban environment such as Norfolk, it is likely that there are community members with communication challenges that limit accessibility to information. All U.S. Navy communications should be compliant with Section 508 of the Rehabilitation Act (29 U.S.C. § 794d), as amended by the Workforce Investment Act of 1998 (P.L. 105-220). This requires federal agencies to develop, procure, maintain, and use information and communications technology that is accessible to people with disabilities, regardless of whether they work for the federal government. In addition, the pilot team should be willing to provide sign language translation services as needed.

Questions: How are the water bodies used? The Elizabeth River hosts major ports, industrial and other transportation uses, recreation, and fishing/shellfish harvests. Shellfish consumption from Willoughby Bay is not allowed, but is it possible that people ignore these restrictions? Does recreational boating result in exposures?

The pilot team expects that there are people who fish and harvest shellfish despite restrictions. This may be due to necessity or a lack of understanding of the restrictions. Recreational boating could result in exposures. Community outreach should include contacting fishers and boaters to clarify their use of the area's water resources.

Step 4: Engage Communities

Current Engagement Activities

The RAB was discontinued in 2010, and there is no regular communication with the community regarding the restoration program. A survey sent as part of a revision to the CIP asked about how and when respondents would like more information about the restoration program. The U.S. Navy maintains the site's information repository at a local library and online. Because the site's remedy is construction complete, most activities focus on remedy optimization and long-term monitoring of established remedies. U.S. Navy leadership at Naval Station Norfolk and Naval Support Activity Hampton Roads is considering whether to re-establish a RAB and/or engage with community members through other means. The Pilot Team will also be exploring the application of findings from pilot process steps 1-3 to expand and enhance community engagement activities.

Strategies to Increase Engagement

The groundwater plume remaining at Site 1 is an area of continued community impact. There is an opportunity to re-engage with neighborhoods in the area.

Because there has not been recent site-related communication with the Norfolk community, including Site 1-adjacent neighborhoods, the next step is establishing contact with key communicators and then setting up means of receiving feedback and building opportunities for ongoing engagement. Those key communicators – residential property managers and school officials – are a link to communicating with local residential and school communities, as they likely have existing avenues of communication with residents, staff and student families. The 1-mile radius used for the EJScreen mapper will hopefully overlap with interested community members who responded to the CIP survey. Engaging with people in the school community, who do not necessarily live within a mile of the site but who work or send their children to school near Site 1, will test the hypothesis that the school community is interested in Site 1 restoration work.

- Engagement with residents in neighborhoods next to Site 1. Work with Public Private Venture (previously Lincoln Military Housing) about sending information to current residents and distributing information to new residents as they join the community. Some of these houses have monitoring wells in their yards.
    - Update the fact sheet for Site 1. Must be approved by the Public Affairs Office and the Installation Commanding Officer:
        - Include a link to the Administrative Record.
        - Include information for follow-up with the Public Affairs Office.
        - Include a specific ask for interest in further information and/or an "open forum" event.
    - Talk to the Public Affairs Office and the Community Planning Liaison Officer about:
        - Updating the fact sheet.
        - Planning an open forum event.
        - Using social media for communications.

- Engagement with the school community. The U.S. Navy will establish lines of communication with school representatives and the city of Norfolk.
    - Follow school and city representatives' leads about how to communicate with parents and school staff about the status and future of the Site 1 project. Potential activities include attendance at parent-teacher meetings or other parent events or a question-and-answer session with teachers and facilities staff. School representatives can share information relevant to barriers to engagement such as local languages spoken, and help identify any potential for linguistic isolation that may not be reflected by the mapping tools.
- Documentation – integration of engagement efforts into the site management plan, internal documents defining "trigger" dates or actions requiring outreach to the school and surrounding communities, and possible integration of the information into future Five-Year Review Reports as it relates to risk to future receptors, as well as future CIPs (updated about every two-to-three years).

Step 5: Assess and Protect

Site 1 is the selected focus of the site's pilot team. The pilot team anticipates using community engagement to inform remedial action optimization activities and sharing the results of Site 1 studies with the community. The question about whether to focus on a 1-mile boundary around an operable unit will be adjusted to incorporate the catchment area for Camp Allen Elementary School. Working with school leadership and any parent organizations will help the pilot team answer questions about language proficiency and community transience, and address accessibility concerns at engagement events.

As the remedy optimization investigation progresses, the main question will be: are there exposures leading to unacceptable risks? The answer to this question will determine next steps. The pilot team will consider potential impacts on communities with EJ concerns and related vulnerabilities, such as local air pollution and income inequalities. Tailored community engagement strategies, based on options identified in Step 4, will help the pilot team engage with people who may be impacted and to ensure that the identified vulnerabilities are accounted for in the risk assessment.

Step 6: Document Work

CIP

The site's CIP was updated in 2021. It includes a section on EJ, noting people of color and low-income population patterns from EJScreen, and familiarity speaking English, according to the American Community Survey. The results of the CIP survey directly address the question about community perception of the impacts of environmental releases on the community.

- Incorporate EJ-related information from the pilot project when implementing CIP outreach tasks.

Remedial Action Optimization

- Modify the Site 1 CSM and review the QAPP to enhance documentation of rationale based on community characteristics, including findings from community engagement, land use scenarios, community environmental exposures and related information.
- Use community engagement strategies when preparing the site's ROD Amendment.
- Document enhanced public notice activities in the site's Administrative Record.

Risk Assessment

- Include an exposure scenario-based outcome of community engagement.
- Include a qualitative discussion of factors that may increase vulnerability/decrease resiliency such as ambient air pollution in the city of Norfolk.

QAPP and SAP Development for Additional PFAS Work

The site in the initial stage of a PFAS investigation on base, with a focus on soil and groundwater contamination. CSMs have yet to be developed.

- Modify the CSMs to include findings from community engagement, land use scenarios and related information.
- Include a summary of efforts to characterize communities and identify people who may be more vulnerable or disproportionately impacted in the description of receptors.

Tobyhanna Army Depot

The 1,333-acre Tobyhanna Army Depot federal facility NPL site (https://cumulis.epa.gov/supercpad/cursites/csitinfo.cfm?id=0302464) is in Monroe County, Pennsylvania. It is about 15 miles southeast of Scranton and next to the village of Tobyhanna. It covers about 2.2 square miles (1,400 acres). Today, it hosts DoD's largest full-service electronics maintenance facility.

Figure 12: Aerial view of the Tobyhanna Army Depot.

From the 1950s to early 1960s, the U.S. Army used areas on the southern part of the site for burning and disposal of garbage, construction rubble, scrap metal, drums and solvents. Drum staging and disposal of building materials and construction waste took place on another part of the site.

In August 1990, EPA added the site to the NPL, initiating the Remedial Investigation. Contaminated soil and sediments were removed and taken off-post for disposal. Remaining impacts on surrounding communities are associated with groundwater contamination from stored solvents. After cleanup, EPA took part of the site off the NPL in 2001. Monitored natural attenuation groundwater sampling is ongoing.

The Tobyhanna State Park Reserve borders the site to the north, east and west. The village of Tobyhanna borders it to the south. Surrounding land uses include light industrial, residential and recreational areas. Residential areas are within 200 feet of the site to the south, southeast and east.

More recently, 1,4-dioxane has been identified as a chemical of emerging concern due to the past use of 1,1,1-trichloroethane (TCA) on site. In addition, PFAS has been identified as chemicals of emerging concern due to past base activities, including the landfilling of plating waste. A Site Inspection for PFAS confirmed the presence of PFAS on site. The site is at the outset of the Remedial Investigation phase to determine the nature and extent of the PFAS contamination.

Highlights of environmental restoration activities at the site include:

- Impacted homes were provided with clean drinking water from the Base's drinking water system.
- Sites were initially monitored semi-annually. Due to the success of the monitored natural attenuation remedy, monitoring now takes place on an annual basis.
- A pollinator program, including three apiaries, was established on the former landfill area to provide beneficial site reuse.
- The acreage affected by impacted unexploded ordnance was reduced by clearance activities to reuse the site for mission purposes.
- Buildings with vapor barriers were erected on the former construction landfill area.
- Hummler Run, a high-quality cold-water fishery, was restored to beneficial use by contaminated sediment removal.

Step 1: Identify Potentially Vulnerable Communities

The site is in northern Monroe County in northeast Pennsylvania. It is close in Interstate 380, which provides access to the Scranton and Stroudsburg metropolitan areas. A comparison of Census data from 2010 to 2020 indicates that the area's population has remained stable.

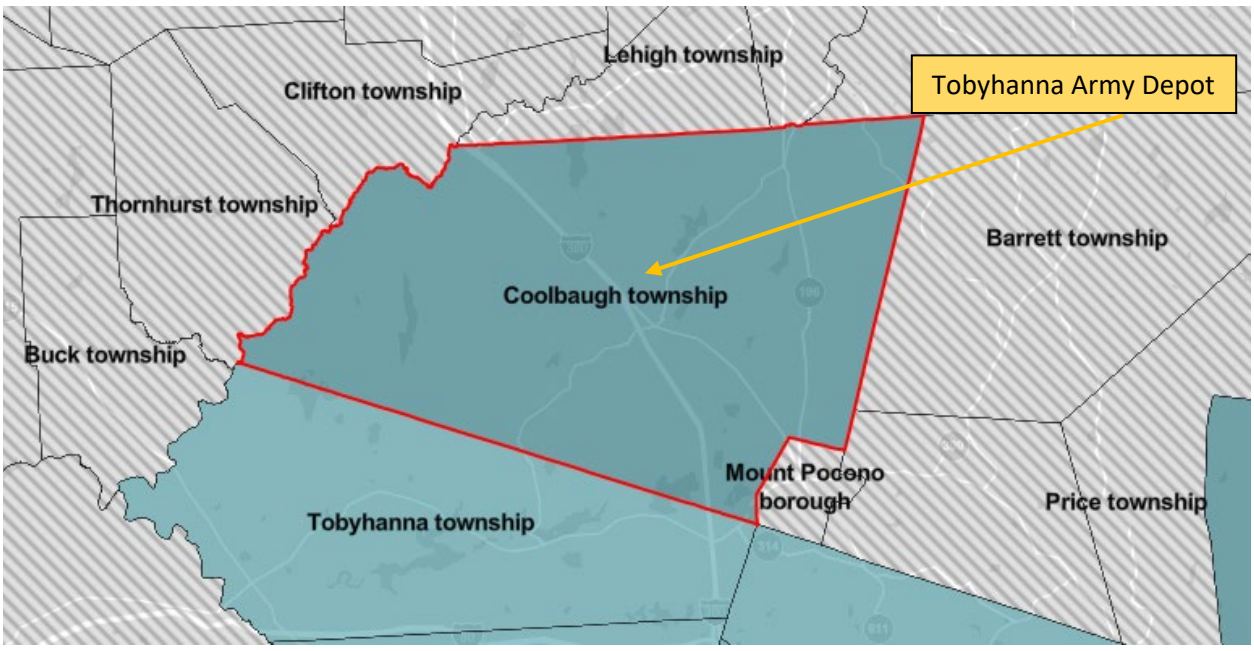

Figure 13: Map of the site and surrounding localities.

Based on a review of area demographics using EJScreen, it appears that communities near the site are more diverse than in the past. Of particular interest, nearly a quarter of the population speaks a language other than English. It is not clear if this means there is a significant language barrier, though. According to additional demographic information in EJScreen, Spanish is the main language other than

English spoken in surrounding communities. There are low-income communities east and north of the Base, as well as higher rates of unemployment.

Table 2: Area Demographics Overview Near Tobyhanna Army Depot

	Coolbaugh Township	Tobyhanna Township
Total population	20,863	8,354
Persons age 65+	15.2%	18.9%
Race other than white	53.9%	17.1%
Language other than English	25.5%	18.1%
Bachelor's degree or higher	23.9%	24.5%
Disabled	13.4%	18.5%
Persons in poverty	15.7%	15.8%
Foreign born persons (2016 to 2020)	15.3%	8.0%
Population in the labor force	57.0%	56.0%

Source: Data are from https://www.census.gov (2020 data).

Completion of higher education in the area lags the national average. There is also a higher-than-average number of single-parent households in the area, which could be an important barrier to participation.

Another finding of interest, based on an assessment using EnviroAtlas, is the use of lands surrounding the site for recreation opportunities such as hunting, fishing and swimming. These visitors may include people from outside the area who may not be counted in population totals, so the total extent of the potentially impacted community is unknown.

On-base housing at the site is being privatized. Only two single-family homes are available for habitation.

Step 2: Identify Sources and Releases

Cleanup is addressing known solvent contamination in groundwater in areas south of the site. Most residences are connected to the Base's water supply, so there is no known exposure pathway to drinking water. There are other homes that have not been affected by the contamination that continue to use private wells.

In addition, studies are underway to determine the nature and extent of PFAS contamination. Several data gaps will be addressed by this investigation. It is possible that more potential exposure pathways will be identified.

There are areas with unexploded ordnance, both on site and off site. The land off site is categorized as a Formerly Used Defense Site (FUDS), and these investigations are separate from CERCLA actions at the site. There is an opportunity to re-initiate community engagement to amplify communication efforts.

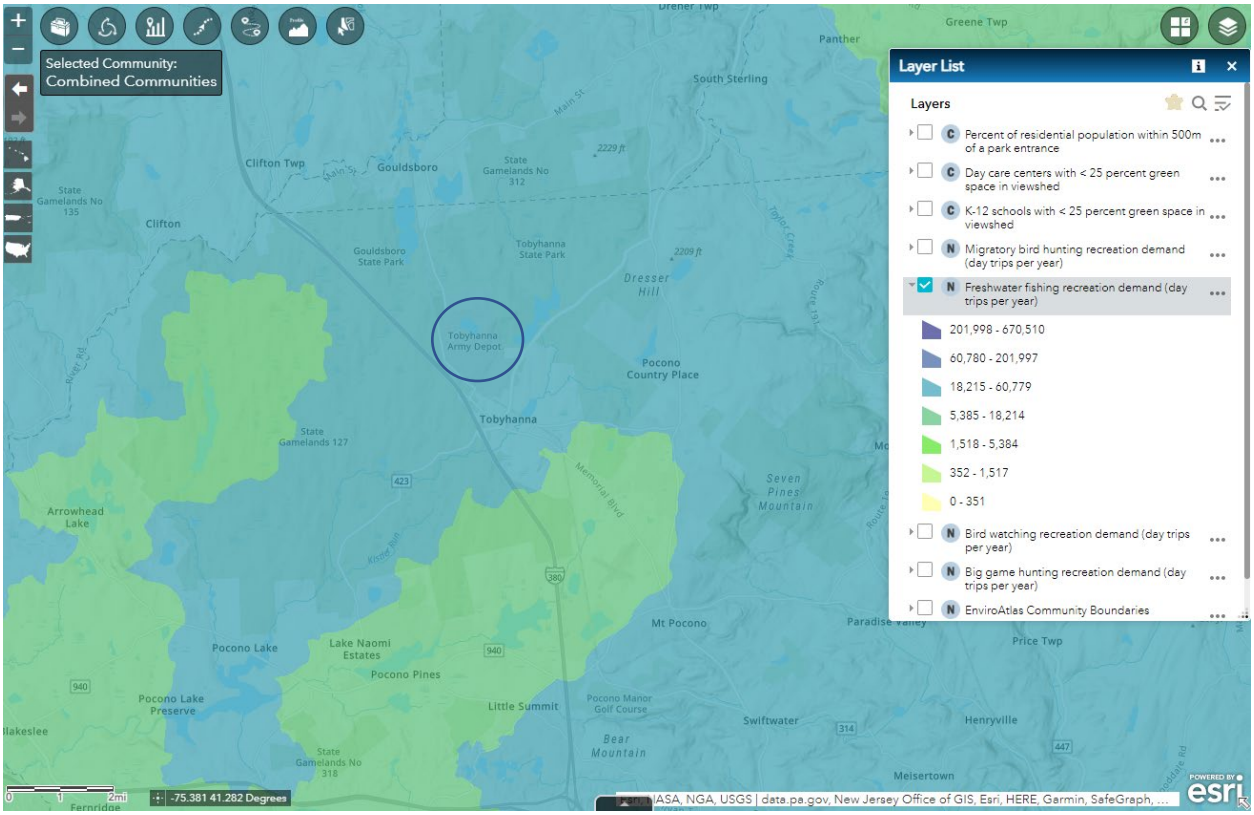

Figure 14: Fishing areas near the site, identified by EnviroAtlas.

Step 3: Develop Questions to Guide Engagement

Based on lack of responses to public notices, there appears to be little interest in forming an RAB. It is not clear why this is the case. It could be due to a several factors:

- The community trusts the cleanup efforts.
- There are no perceived impacts on community members.
- Outreach has missed some stakeholders who might be interested.

In addition, current outreach efforts in English may not be an effective way to reach people who speak a language other than English. Single parents and low-income populations may find it difficult to find time to participate in site outreach activities.

There are also communities north of the site that may be potentially impacted. The pilot team is concerned that these communities may not recognize the potential for local impacts from site contaminants.

The next step is to develop questions to help shape community engagement strategies that will help to connect with communities who may be disproportionately impacted and inform the pilot team's understanding of community concerns and interests.

Question: Do communities north of the site recognize that they may be impacted by site-related contaminants such as PFAS?

The pilot team is concerned that these communities consider the state lands to be a "buffer" between the communities and the site. At this time, it is not clear if PFAS may be present in this area. Parts of these state properties were affected by unexploded ordinance.

The communities may be confused about the administrative differences among unexploded ordinance, chlorinated solvents and PFAS cleanups, since the cleanups fall under different authorities. This is an opportunity for the pilot team to liaise with the organization responsible for unexploded ordinance cleanups to make sure they are coordinating and sharing information, including stakeholder lists.

Question: Is there adequate communication with surrounding communities?

Current outreach efforts do not reach all people in surrounding communities equally well. Different communities may prefer different types of communication.

- Determine if online access to the site's Administrative Record and other site information would be useful.
- Assess current social media efforts. Outreach and engagement efforts should be diverse, yet flexible, to adjust to community needs, interests and preferences. Consider if translation services are needed.

Question: Are there opportunities to engage schools on science, technology, engineering and mathematics (STEM)-related issues?

Engaging with schools may provide multiple benefits. Engagement with schools can help inform families while also increasing interest (students and their families) in environmental issues and STEM. It can also be a gateway to informing communities about site investigations and remedial activities.

Step 4: Engage Communities

Current Engagement Activities

Current engagement strategies include active Facebook and other social media pages for site updates and use of the *Scranton Times* newspaper for legal notices. The pilot team will now explore how the findings from pilot process steps 1-3 can be used to expand and enhance community engagement activities.

Strategies to Increase Engagement

New strategies will focus on outreach to the communities north of the site that may be using natural resources that could be impacted by site contaminants.

Prior to outreach, the pilot team should first liaise with the FUDS program manager to understand their outreach efforts and what resulted in the most effective engagement. In addition, the pilot team should review the "footprint" of current outreach activities and the success of any prior efforts.

One next step could be to identify leaders of area organizations who are familiar with how the northern properties are used. These leaders could include conservation organization staff, state park managers and state game lands managers.

More strategies to consider include:

- Update the site's Community Relations Plans:
    - Conduct community interviews.
    - Reach out to housing or homeowner associations to leverage their networks and communication efforts.
    - Link relevant documents to EPA's Superfund profile page for the site.
- Set up a site webpage on the base's official website, to provide remote access to the site's Administrative Record and to track accomplishments.
- Plan for routine and regular engagement at community events, such as fairs and festivals, by preparing display table exhibits to highlight remedial program accomplishments.
- Identify potential partners by engaging with area schools and universities.
- Identify potential partners by engaging with county and township groups:
    - Office of Development and Planning
    - Civic leaders (mayors, town councils)
    - Community groups (e.g., the Rotary Club, event planners)
    - County safety meetings and the Local Emergency Planning Council
- Honorary Commanders Group
- Chamber of Commerce

The pilot team also expressed interest in partnering with area schools to highlight the educational aspects of the remedial program, linking it to STEM education. Ideas include:

- Developing an "adopt a school" program to partner with schools on practical aspects of science education.
- Hosting a display table exhibit at parent-teacher association meetings.

It is important to use initial outreach to identify any communities that may experience significant barriers to engagement, including people who are linguistically isolated that would need translation services, or single-parent homes that might need assistance with childcare. In these cases, more outreach strategies should be considered. Local resources to contact for more information may include:

- Clergy and religious groups
- Ethnic restaurant owners
- Food banks, food distribution centers and soup kitchens

Step 5: Assess and Protect

Questions that the pilot team will assess include:

- Are communities north of the site aware of potential contamination issues at the state lands?
- How will the PFAS investigation affect nearby communities?
- How is the U.S. Army Corps of Engineers engaging with nearby communities regarding the cleanup of FUDS unexploded ordinance, and can EPA coordinate with those efforts?

For these projects, a broader net will be cast to engage surrounding communities as well as people who may be accessing natural resources next to the site, as outlined in Step 4 above. The Remedial Investigation is the next step in the PFAS investigation. The information gathered from the pilot team's community engagement efforts, including anticipated future land uses nearby, the presence of vulnerable subpopulations, other community health risks that need to be taken into consideration, and disproportionate impacts, will enhance this investigation. If off-site sampling is necessary during the Remedial Investigation, the pilot team will strive to inform and involve the affected communities. Further details of how the pilot team's community engagement efforts will be part of the Remedial Investigation process are noted in Step 6 below.

The pilot team will also reach out to the U.S. Army Corps of Engineers to identify current community engagement processes regarding the FUDS unexploded ordinance remediation in the nearby state game lands and state park. The pilot team will seek to understand their community engagement strategies, including public guidance and information they may have developed on unexploded ordinance awareness. The pilot team's goal is to share details it has obtained on community outreach and engagement to ensure that its information is also reaching vulnerable populations. For example, do the unexploded ordinance pamphlets or signage need to be produced in other languages?

Step 6: Document Work

As the site's Remedial Investigation of PFAS contamination moves forward, the following opportunities should be considered for inclusion based on information gleaned from community engagement:

CIP

- The CIP will be updated during the Remedial Investigation based on information from initial community outreach and engagement, as identified in Step 4.

QAPP and SAP Development

- QAPP and SAP development will include a summary of efforts to characterize communities and identify people who may be more vulnerable or disproportionately impacted in the description of receptors.
- CSMs in the QAPP/SAP will also be modified to include findings from community outreach, land use scenarios and related information.

Remedial Investigation Report

- Outreach results will be used to further refine CSMs (e.g., add, modify or delete exposure pathways).
- Outreach efforts will be revised accordingly, as the location of PFAS contamination is delineated. If contamination is found in off-site communities, outreach and engagement efforts will need to be increased.

Risk Assessment

- The risk assessment will include more exposure scenarios based on screening and outcomes of community engagement activities, such as hunting and fishing.
- The risk assessment will also include a qualitative discussion of factors that may increase vulnerability/decrease resiliency in neighboring communities.

APPENDIX A: REFERENCES

Bullard, Robert D., Mohai, Paul, Saha, Robin, and Wright, Beverly. 2008. Toxic Wastes and Race at Twenty: Why Race Still Matters After All of These Years. Environmental Law. Vol. 38, No. 2, pp. 371-411. https://www.jstor.org/stable/43267204.

Environmental Justice Interagency Work Group. 2016. Promising Practices for EJ Methodologies in NEPA Reviews: Report of the Federal Interagency Working Group on Environmental Justice & NEPA Committee. March 2016. https://www.epa.gov/sites/default/files/2016-08/documents/nepa_promising_practices_document_2016.pdf.

Executive Order 12866: Regulatory Planning and Review. October 1993. Federal Register 58:190, p. 51735. http://www.archives.gov/federal-register/executive-orders/pdf/12866.pdf.

Executive Order 12898: Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations. February 1994. Federal Register 59:3, p. 7629. http://www.archives.gov/federal-register/executive-orders/pdf/12898.pdf.

Executive Order 13175: Consultation and Coordination with Indian Tribal Governments. November 2000. Federal Register 65:218, p. 67249. https://federalregister.gov/a/00-29003.

Executive Order 14008: Tackling the Climate Crisis at Home and Abroad. February 2021. Federal Register 86:19, p. 7619. https://www.regulations.gov/document/EPA-HQ-OPPT-2021-0202-0012.

Executive Order 14096: https://www.whitehouse.gov/briefing-room/presidential-actions/2023/04/21/executive-order-on-revitalizing-our-nations-commitment-to-environmental-justice-for-all.

Intergovernmental Data Quality Task Force (IDQTF). 2005. Uniform Federal Policy for Quality Assurance Project Plans. March 2005. https://www.epa.gov/sites/default/files/documents/ufp_qapp_v1_0305.pdf.

National Academies of Science. 2009. Science and Decisions: Advancing Risk Assessment. https://nap.nationalacademies.org/catalog/12209/science-and-decisions-advancing-risk-assessment.

U.S. EPA. 1989. Risk Assessment Guidance for Superfund, Volume I. Human Health Evaluation Manual (Part A). Interim Final. December 1989. https://www.epa.gov/sites/default/files/2015-09/documents/rags_a.pdf.

U.S. EPA. 1991. Incorporating Citizen Concerns into Superfund Decision-making (Superfund Management Review: Recommendation #43B). January 1991. https://semspub.epa.gov/work/11/174494.pdf.

U.S. EPA. 1999a. Federal Facilities Stakeholder Involvement: A Blueprint for Action. June 1999. https://www.epa.gov/sites/default/files/documents/action.pdf.

U.S. EPA. 1999b. Guide to Preparing Superfund Proposed Plans, Records of Decision, and Other Remedy Selection Decision Documents. July 1999. https://www.epa.gov/superfund/record-decision-rod-guidance.

U.S. EPA. 2014. EPA Policy on Environmental Justice for Working with Federally Recognized Tribes and Indigenous Peoples. July 2014. https://www.epa.gov/sites/default/files/2017-10/documents/ej-indigenous-policy.pdf.

U.S. EPA. 2015. Guidance on Considering Environmental Justice During the Development of Regulatory Actions. May 2015. https://www.epa.gov/environmentaljustice/guidance-considering-environmental-justice-during-development-action.

U.S. EPA. 2016. Technical Guidance for Assessing Environmental Justice in Regulatory Analysis. June 2016. https://www.epa.gov/environmentaljustice/technical-guidance-assessing-environmental-justice-regulatory-analysis.

U.S. EPA. 2019a. EJSCREEN Technical Guidance. https://www.epa.gov/sites/default/files/2021-04/documents/ejscreen_technical_document.pdf.

U.S. EPA. 2019b. Social Media Toolkit. March 2019. https://semspub.epa.gov/src/document/HQ/100001966.

U.S. EPA. 2019c. Community Involvement Tool. Undated. https://semspub.epa.gov/src/document/HQ/100002210.

U.S. EPA. 2020. Superfund Community Involvement Handbook. March 2020. https://semspub.epa.gov/work/HQ/100002505.pdf.

EPA. 2021a. How to Get to Know Communities and Cultures: Methods for Remediation, Removal, and Redevelopment Projects. November 2021. https://www.epa.gov/emergency-response-research.

U.S. EPA. 2021b. Superfund Remediation and Redevelopment for Environmental Justice Communities. May 2021. https://www.epa.gov/sites/default/files/2021-06/documents/superfund_remediation_and_redevelopment_for_environmental_justice_communities_may_2021_report.pdf.

U.S. EPA. 2022a. EJ Action Plan: Building Up Environmental Justice in EPA's Land Protection and Cleanup Programs. October 2022. https://www.epa.gov/environmentaljustice/environmental-justice-action-plan-epas-land-protection-and-cleanup-programs.

U.S. EPA. 2022b. EJ in Air Permitting Principles. https://www.epa.gov/caa-permitting/ej-air-permitting-principles-addressing-environmental-justice-concerns-air.

U.S. EPA. 2022c. College/Underserved Community Partnership Program Web Page. Updated April 4, 2022. https://www.epa.gov/environmentaljustice/collegeunderserved-community-partnership-program).

U.S. EPA. 2022d. Five-Year of Federal Facility Cleanups Web Page. Updated November 8, 2022. https://www.epa.gov/fedfac/five-year-review-federal-facility-cleanups.

U.S. EPA. 2022e. Population Surrounding 1,877 Superfund Sites. https://www.epa.gov/superfund/population-surrounding-1877-superfund-sites.

Villa, C. 2020. Remaking Environmental Justice. Loyola Law Review. Vol. 66, pp. 469-521.

APPENDIX B: ENVIRONMENTAL JUSTICE – BACKGROUND INFORMATION

Environmental justice (EJ) is the fair treatment and meaningful involvement of all people regardless of race, color, national origin or income, with respect to the development, implementation and enforcement of environmental laws, regulations and policies.[3] This goal will be achieved when all people receive:

- The same degree of protection from environmental and health hazards.
- Equal access to the decision-making process to have a healthy environment in which to live, learn and work.

EPA defines potential EJ concern as "the actual or potential lack of fair treatment or meaningful involvement of minority populations, low-income populations, tribes, and indigenous peoples in the development, implementation and enforcement of environmental laws, regulations and policies" (U.S. EPA, 2015). For analytic purposes, this concept refers more specifically to "disproportionate impacts on people of color, low-income populations, and/or indigenous peoples" (U.S. EPA, 2015, U.S. EPA, 2016).

Executive Order (EO) 14008 expands on the federal government's commitment to making EJ a part of the mission of every agency by directing federal agencies to develop programs, policies and activities address the disproportionate health, environmental, economic and climate impacts on disadvantaged communities. This commitment furthers EO 12898 by building on the consensus principles outlined in the 1999 Federal Facilities Environmental Restoration Dialogue Committee, Final Report (U.S. EPA, 1999a).

More recently, EO 14096 further deepens the commitment to take a whole-of government approach to EJ, by making clear that EJ is a duty of all executive branch agencies. The EO directs agencies to consider measures to address and prevent disproportionate and adverse environmental and health impacts on communities including cumulative impacts, emphasizing notification and risk communication.

Federal agencies have been directed to develop and implement policies and strategies that strengthen compliance and enforcement, incorporate EJ considerations in their work and increase community engagement. Following this direction, EPA's OLEM developed an Environmental Justice Action Plan. It includes projects, tools and practices that will occur across all parts of OLEM. It has been shared with OLEM's Regional EPA partners, other national programs and EPA leadership.

To ensure equal access to the decision-making process, outreach and engagement strategies should be tailored to meet community needs. Communities have different capacities and structures for engaging on complex issues, such as issues associated with Superfund cleanups. Factors such as community leadership, participation, education and skills, resources, and organizational capacities are important to consider when developing engagement strategies. Development of a community engagement strategy should include an analysis of community capacities and structures. More information on characterizing community capacity is available in EPA's 2016 Technical Guidance for Assessing Environmental Justice in Regulatory Analysis (U.S. EPA, 2016).

[3] EPA's definition of EJ is available at https://www.epa.gov/environmentaljustice. The webpage also provides background information on EPA's EJ program.

Protection of communities is a function of addressing differential (higher/more frequent) exposures to environmental stressors as well as susceptibility to increased health effects. In an assessment of potential EJ concerns, "it is important to assess both the potential for higher exposures to a given environmental stressor and the potential for higher susceptibility to adverse effects of the stressor for population groups of concern. Potential contributors to differential health risk and adverse health impacts can thus be identified based on how they may increase exposure or how they may increase susceptibility in response to exposure" (U.S. EPA, 2016).

Environmental Justice and Superfund Sites

Historically, people living in communities within 3 miles of a Superfund site are likely to be non-white, linguistically isolated and/or below the poverty level. These communities disproportionately carry the burden for environmental contamination (U.S. EPA, 2022e). Because EJ-related EOs apply to all federal agencies and all programs within these agencies, EPA and our federal partners have an opportunity to collaborate on the development of tools, methods and approaches to use CERCLA cleanups to advance towards our shared goal of achieving EJ. EPA is committed to collaborate with other federal agencies to provide support, guidance and recommendations to address potential environmental concerns and disproportionate impacts.

Environmental Justice and Tribes

The fair treatment and meaningful involvement of indigenous peoples and communities is vital to effectively protect human health and the environment in Indian country and throughout the country. EPA's Policy on Environmental Justice for Working with Federally Recognized Tribes and Indigenous Peoples comprises 17 principles that, when implemented individually and together, can help improve administration of EPA's programs, support the fair and effective implementation of federal environmental laws, and provide protection from disproportionate impacts and significant risks to human health and the environment (U.S. EPA, 2014).

While written to direct EPA's responsibilities when engaging with tribes, the principles are also useful in guiding consideration of EJ for tribal and indigenous populations in other contexts, including consideration of engagement and protection at NPL sites. For example, the principles address the importance of mutual understanding and respect in relationships with indigenous peoples and communities. The principles stress the importance of open communication and meaningful involvement with indigenous peoples and communities, through the identification of key points of contact. Effective communication will help EPA better understand tribal and indigenous communities, including unique and diverse exposure pathways.

APPENDIX C: USEFUL GUIDANCE DOCUMENTS

EPA. 2021. How to Get to Know Communities and Cultures: Methods for Remediation, Removal, and Redevelopment Projects. November 2021. https://cfpub.epa.gov/si/si_public_record_Report.cfm?dirEntryId=353552&Lab=CESER.

> This report provides a social science-based methodology for learning about key characteristics and constituencies of communities, cultures and affected populations near contaminated sites. Learning about communities supports building relationships and trust as well as culturally informed cleanups. It can also help identify vulnerabilities that lead to disproportionate impacts. This methodology can be used as a basis for generating knowledge for site characterization and assessment, risk communication, the development of a CIP and outreach and engagement with local social actors and organizations.

U.S. EPA. 2016. Technical Guidance for Assessing Environmental Justice in Regulatory

Analysis. June 2016. https://www.epa.gov/environmentaljustice/technical-guidance-assessing-environmental-justice-regulatory-analysis.

> This technical guidance outlines technical approaches and methods to help EPA analysts analyze potential EJ concerns for regulatory actions. It discusses contributors and causes of disproportionate impacts, including social context, higher exposures and increased susceptibility, and how these factors influence risk.
>
> The guidance describes questions that can aid in scoping potential disproportionate and EJ concerns, prompting consideration of how geographic location, ethnicity, race, gender and baseline health status can influence risk, and which exposure routes and pathways are relevant.

Environmental Justice Interagency Work Group. 2016. Promising Practices for EJ Methodologies in NEPA Reviews: Report of the Federal Interagency Working Group on Environmental Justice & NEPA Committee. March 2016. https://www.epa.gov/sites/default/files/2016-08/documents/nepa_promising_practices_document_2016.pdf.

> The Promising Practices report compiles methodologies from current EPA practices concerning the interface of EJ considerations. Developed to assist in the preparation and review of National Environmental Policy Act (NEPA) documents, it also covers methods and strategies relevant to CERCLA, such as using EJScreen to characterize communities.

U.S. EPA. 2015. Guidance on Considering Environmental Justice During the Development of Regulatory Actions. May 2015. Retrieved from https://www.epa.gov/environmentaljustice/guidance-considering-environmental-justice-during-development-action.

> This guidance underscores the importance of identifying potential EJ concerns during the development of regulatory actions and identifies key steps throughout the Action Development Process (ADP) where EJ should be considered (Part 2). While the guidance applies specifically to the rule-making stages in the development of regulatory actions, rule-writers consider EJ in the development of risk assessments, analytical tools, guidance documents and other actions that support development of regulatory actions.

APPENDIX D: COMPUTING RESOURCES FOR CHARACTERIZING POTENTIALLY IMPACTED COMMUNITIES

EPA Tools

EJScreen

EPA's EJScreen is an EJ mapping and screening tool that provides EPA with a nationally consistent dataset and approach for combining environmental and demographic indicators. EJScreen users choose a geographic area; the tool then provides demographic and environmental information for that area. This is the principal tool for characterizing communities next to federal facilities. Users can download reports that summarize search findings.

To summarize how environmental indicators and demographics come together in the same location, EJScreen uses EJ Indexes. EJScreen has 12 EJ Indexes that reflect 12 environmental indicators. In the EJ Indexes, environmental indicators are combined with information about the low-income and minority population in a Census block group. EJScreen presents results in terms of percentiles, allowing community comparisons with the rest of the state, an EPA Region or the nation.

The 12 EJ Indexes are:

- Particulate Matter 2.5
- Ozone
- Diesel Particulate Matter
- Air Toxics Cancer Risk
- Air Toxics Respiratory Hazard Index
- Traffic Proximity
- Lead Paint
- Risk Management Plan (RMP) Facility Proximity
- Hazardous Waste Proximity
- Superfund Proximity
- Underground Storage Tanks (USTs) and Leaking UST (LUSTs)
- Wastewater Discharge

Users can also look at the factors independently. In addition, EJScreen offers several more maps based on demographic and socioeconomic data (U.S. Census data as well as the American Community Survey) as well as indicators of other stressors, such as certain health indicators and access to medical care.

EnviroAtlas

EPA's EnviroAtlas highlights relationships between communities, land use and environmental quality. The mapping functions help identify potential land uses that, when combined with site contaminant data, may indicate possible exposure pathways. Such land use relationships can trigger deeper investigations into land uses, to characterize relevant activities to inform site sampling and risk assessment.

The information gathered can be used to update CSMs, which include descriptions of contaminant sources, releases, transport pathways and potential receptors. Accurate and complete CSMs are required as part of ensuring that samples are collected in appropriate media and that risks are analyzed for potentially exposed receptors.

FedFacts

The FedFacts website consolidates detailed information and metrics regarding federal facility sites, including:

- NPL sites
- Non-NPL sites
- Base Realignment and Closure Act (BRAC) sites
- Resource Conservation and Recovery Act (RCRA) sites

The site includes the Cleanups at Federal Facilities Mapping Application, which enables users to map and list Federal Facility Docket sites and drill down to details about those cleanups and other, related information. This is particularly useful to identify more potential source areas in the region.

Cleanups in My Community (CIMC)

CIMC enables users to map and list hazardous waste cleanup locations and grant areas and identify details about those cleanups, grants and other related information. By default, the map displays all cleanup sites identified by EPA. The About the Data webpage provides more information on CIMC's scope. The Filter Cleanup Type button above the map and the Basic and Advanced tabs within the filter enable users to filter the cleanups. To view information for a cleanup location, users click the location on the map. Clicking the hyperlink in the window that appears provides detailed cleanup information. Cleanup sites can be turned off and on using the checkboxes above the map.

Layers on the right side of the map that can be added include:

- Opportunity Zones
- Impaired waters
- Sea level rise scenarios
- Flood zones
- Water monitoring stations
- Wastewater permitted facilities
- Air pollution areas
- Toxic Release Inventory locations
- Congressional districts
- Tribal areas and federal lands
- Various basemaps

Enforcement Compliance and History Online (ECHO)

EPA's ECHO website enables users to search for facilities in communities to assess their compliance with environmental regulations. Users access ECHO to:

- Search for facilities.
- Investigate pollution sources.
- Search for EPA enforcement cases.
- Examine and create enforcement-related maps.
- Analyze trends in compliance and enforcement data.

Private Domestic Well Map

This mapping tool identifies the locations of domestic (private) water wells and how many people are using them. Understanding the density and geospatial location of private domestic wells, and housing units relying on them, improves detection and response efforts. EPA developed this mapping tool based on two methods to estimate private well density. The maps combine reported wells in 20 states with available well log data and the net housing unit method that is available in all 50 states for estimating domestic well use. The maps do not display the location of private wells. The value of this mapping tool is its identification of areas that may be vulnerable to groundwater contamination based on the presence of private wells.

Other Federal Tools

Climate and Economic Justice Screening Tool (CEJST)

CEJST helps federal agencies identify disadvantaged communities that are marginalized, underserved and overburdened by pollution. These communities are in Census tracts that are at or above the thresholds in one or more of eight categories of criteria. The current version of the tool evaluates likelihood of disadvantage based on a combination of climate change, energy, health, housing stock, legacy pollution, transportation, water and wastewater, and economic development, each in combination with low-income status. The current version of the tool will be updated based on more feedback and research. CEJST was developed by the Council on Environmental Quality (CEQ).

Centers for Disease Control and Prevention (CDC) EJ Dashboard

This web-based application allows users to evaluate several screening factors, including community characteristics, environmental exposures, health burdens and EJ indexes. Assessments are based on zip code. Evaluating communities surrounding a facility may require the use of multiple zip codes. Community characteristics include demographics and social vulnerability as well as a description of the built environment (e.g., access to parks). The social vulnerability index (SVI) uses U.S. Census data to determine the social vulnerability of every Census tract. Census tracts are subdivisions of counties for which the U.S. Census collects statistical data. The SVI ranks each tract across 15 social factors, including poverty, lack of vehicle access and crowded housing, and groups them by theme.

The EJ Dashboard also provides more information on environmental exposures, health and EJ. Environmental Exposures presents environmental pollutant data, including water quality, age of housing, PM 2.5 and ozone. It also includes factors related to climate change. Under “Health Burden”, users can examine health vulnerability based on access to health insurance, hospitals and disability, as well as infant mortality and percentage of low birth weights. The Environmental Justice Index (EJI) is a calculation based on the combined rankings of the Environmental Burden Module, the Social Vulnerability Module and the Health Vulnerability Module. The EJI represents a measure of cumulative effects on human health and well-being.

APPENDIX E: COMMUNITY ENGAGEMENT TOOLS AND STRATEGIES

Superfund Community Involvement Tools and Resources

The Superfund Community Involvement Toolkit provides Regional Superfund site teams, community involvement staff and others with a practical, easy-to-use aid for designing and enhancing community involvement activities. The toolkit helps users avoid some of the pitfalls common to the community involvement process. It enables them to quickly review and adapt a variety of community involvement tools to engage the community during all stages of the Superfund removal and remedial processes.

Community Ombudsman (Delaware)

The Delaware Department of Natural Resources and Environmental Control (DNREC) uses ombudsmen to support community engagement. There are three ombudsmen roles at DNREC. The Community Ombudsman serves as a liaison between DNREC and communities throughout the state. The Small Business Ombudsman provides regulatory advisory services. The Waste and Hazardous Substances Ombudsman assists with DNREC community involvement efforts related to waste management. DNREC also established an environmental justice coordinator position to develop processes to ensure meaningful involvement and equitable access to green spaces, public recreation opportunities, and information and data on potential exposure to environmental hazards.

DNREC's ombudsmen provide key services, helping communities identify and understand environmental problems and helping DNREC understand the needs of communities. The ombudsmen facilitate exchanges of information about environmental concerns and departmental programs. The ombudsmen's roles are consistent with recommendations in the 2021 report Superfund Remediation and Redevelopment for Environmental Justice Communities by the National Environmental Justice Advisory Council (NEJAC). The report calls for "support and funds for an ombudsperson role whose responsibilities would include improving community access to information and amplifying community voices in decision-making," which would bolster more intensive community engagement practices at Superfund sites. The report is available at https://www.epa.gov/sites/default/files/2021-05/documents/superfund_remediation_and_redevelopment_for_environmental_justice_communities_may_2021.pdf.