

**METRO CONTAINER SUPERFUND SITE
NATURAL RESOURCE DAMAGE ASSESSMENT
DRAFT ASSESSMENT PLAN**

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Prepared by:

United States Department of Commerce
National Oceanic and Atmospheric Administration

United States Department of Interior
Fish and Wildlife Service

Commonwealth of Pennsylvania
Fish and Boat Commission
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List of Acronyms

CAS	Chemical Abstracts Service
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CFR	Code of Federal Regulations
COC	Contaminants of Concern
COPC	Contaminants of Potential Concern
CSDGM	Content Standard for Digital Geospatial Metadata
DOC	United States Department of Commerce
DOI	United States Department of Interior
Eco-SSL	EPA Ecological Soil Screening Level
FGDC	Federal Geographic Data Committee
HaBREM	Habitat-Based Resource Equivalency
HEA	Habitat Equivalency Analysis
HMW	High Molecular Weight
ISO	International Organization for Standardization
KG	Kilogram
KM	Kilometer
LAT	Lead Administrative Trustee
LOAEL	Lowest Observed Adverse Effect Level
LOU	Letter of Understanding
LMW	Low Molecular Weight
MG	Milligram
MOU	Memorandum of Understanding
NCP	National Oil and Hazardous Substances Pollution Contingency Plan
NOAA	National Oceanic and Atmospheric Administration
NOI	Notice of Intent
NPL	National Priorities List

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NRDAR	Natural Resource Damage Assessment and Restoration
PADEP	Pennsylvania Department of Environmental Protection
PAHs	Polycyclic Aromatic Hydrocarbons
PAS	Preassessment Screen
PCB	Polychlorinated Biphenyls
PFBC	Pennsylvania Fish and Boat Commission
PRP	Potentially Responsible Party
QA/QC	Quality Assurance/Quality Control
QAP	Quality Assurance Plan
REA	Resource Equivalency Analysis
RMI	River Mile
USC	United States Code
USEPA	United States Environmental Protection Agency
USFWS	United States Fish and Wildlife Service
VOCs	Volatile Organic Compounds

1. INTRODUCTION AND BACKGROUND INFORMATION

The U.S. Department of Commerce (DOC), acting through the National Oceanic and Atmospheric Administration (NOAA), U.S. Department of the Interior (DOI), acting through the U.S. Fish and Wildlife Service (USFWS), and the Commonwealth of Pennsylvania, acting through the Pennsylvania Fish and Boat Commission (PFBC) and Department of Environmental Protection (PADEP) (collectively, the “Trustees”) are designated to act on behalf of the public as Trustees for natural resources (40 CFR §§ 300.600-605).

Natural resource trustees are authorized to pursue claims for natural resource damages under Section 107(f) of the Comprehensive Environmental Response, Compensation, and Liability Act as amended (CERCLA), 42 USC § 9607(f), and Section 311 of the Federal Water Pollution Control Act (also known as the Clean Water Act (CWA)), as amended, 33 USC § 1321. The Trustees undertake this task when natural resources have been, or may have been, injured by releases of hazardous substances. CERCLA regulations (43 CFR Part 11) establish an administrative process for conducting a natural resource damage assessment and restoration (NRDAR) to determine and quantify injury; determine the damages; and identify, select, and

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implement restoration to compensate the public for the injured natural resources and lost services.¹

While following these regulations is optional (43 CFR § 11.10), trustees who conduct an assessment consistent with these regulations are entitled by law to a rebuttable presumption in any subsequent litigation concerning the natural resource damages claim (42 U.S.C. § 9607(f)(2)(C); 43 CFR § 11.10). This Assessment Plan is one of the documents identified in the CERCLA NRDAR regulations. Its purpose is “to ensure that the assessment is performed in a planned and systematic manner and that methodologies selected... can be conducted at a reasonable cost” (43 CFR § 11.30(b)). The Trustees are making this Assessment Plan available for public comment, including comment by the Potentially Responsible Parties (PRP), for a period of thirty days (43 CFR § 11.32(c)).

The Metro Container Superfund Site is located in Trainer, Delaware County, Pennsylvania, along the Delaware River (39.82642, -75.39903). The U.S. Environmental Protection Agency (USEPA) designated site is comprised of two adjacent properties totaling 10.4 acres located at the southwest corner of 2nd and Price Streets (“Metro Property”) (Figure 1). Surrounding the Metro Property are a petroleum refinery, auto salvage operation, metal scrap operation, and rail yard. The Metro Property is located adjacent to Stoney Creek, a tidally influenced tributary of the Delaware River, which is approximately 1,000 feet south of the Metro Property. USEPA initiated a removal response action in 1988 to mitigate migration of contaminants from the Metro Property. Several PRPs assumed completion of the removal action, including the shipment of hazardous waste for offsite disposal, in 1990. USEPA added the Metro Container Corporation Site to the National Priorities List (NPL) under CERCLA in March 2012 and performed two time-critical removal actions for soils at the Site from 2013 to 2016. The USEPA remedial process is ongoing. The natural resource damages assessment (NRDA) area encompasses the Metro Property and anywhere released hazardous substances and/or oil have come to be located.

¹ The term “*services*” is defined in 43 CFR § 11.14(nn) as the “physical and biological functions performed by the resource including the human uses of those functions. These services are the result of the physical, chemical, or biological quality of the resource.”



Figure 1. Metro Container Superfund Site Map. The “Metro Property” highlighted in yellow is the footprint of 10.4-acre Superfund Site with Stoney Creek (Suspected Surface Water Migration Pathway) denoted.

Various companies have occupied the Metro Property since the late 19th century. Industrial activities on the property fell into the three categories described below: Petroleum-Related Operations, Chemical Manufacturing Operations, and Drum-Reconditioning Operations. Soil and groundwater at the Site are contaminated with polychlorinated biphenyls (PCBs), inorganic elements, polycyclic aromatic hydrocarbons (PAHs) and volatile organic compounds (VOCs). Buried containment structures and piping systems used by past owner/operators contained sludges and non-aqueous phase liquids (NAPL) and in many areas remain connected to Stoney Creek. Sediments in the mudflats are contaminated with PAHs, PCBs, mercury, and other hazardous substances.

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The Delaware Oil Works operated a Facility on the Metro Property in the 1880s and 1890s. Wax houses, tanks of oil and tar, and several stills were components of this oil-related facility. According to newspaper accounts, the Delaware Oil Works was extensively burned in 1886 and again in 1896 (USEPA, 2014a). By 1913, the Metro Property was occupied by Manufacturers Paraffine Company, who may have continued refining petroleum products and appear to have operated through at least 1917.

The 1917 Sanborn fire insurance map indicates the presence of tanks or containments for oils, wax, tar, brine, and acid (USEPA, 2014a). It appears that most of the storage may have been underground during this time period. Additionally, at this time, the westernmost portion of the Metro Property adjacent to Stoney Creek had not yet been filled in, and there was a small pond that fed into Stoney Creek in the location of the former disposal lagoon and former concrete holding tank.

Stauffer Chemical Company (Stauffer) operated on the Metro Property from 1920 to 1959. Stauffer used a Main Building (containing ovens used in the manufacturing process) with a boiler house, gas house, and storage areas along the northern portion of the Site. Additionally, there were also two rectangular basins (containing storage tanks), a lagoon/impoundment in the southwest corner of the property, a reservoir/cooling tower, a waste burner, several aboveground storage tanks, and a small rectangular feature west of the Main Building identified as a separator.

Stauffer primarily manufactured carbon bi-sulphide (CAS No. 75-15-0; carbon disulfide, dithiocarbonic anhydride) (MWH, 2005). The manufacturing process reportedly used natural gas with vaporized sulfur in the presence of a catalyst to produce carbon disulfide. Carbon disulfide manufacturing is performed in ovens heated with hardwood charcoal, where the carbon disulfide was recovered from the overhead gases.

Operations in the 1960s, 1970s, and 1980s involved the cleaning and re-painting of drums sent to the Facility, then owned by the Joseph A. Ries Company, followed by Universal Container Corporation, and finally by Metro Container Corporation. According to the 2005 MWH report, at the height of Metro Container's operations (in the mid-1980s), "approximately 450,000 to 500,000 drums per year" were refurbished at the Site. Drum contents included hazardous materials including PCBs, paints, solvents, petroleum products, and other substances.

Photographs and reports prepared by USEPA and the Commonwealth of Pennsylvania show that liquids related to Metro Property processes were stored in a lagoon/impoundment and in one of the two rectangular basins that Stauffer formerly used for storage tanks. In aerial photographs taken in 1965 and 1970, the lagoon appeared to be square, approximately 12,000 to 15,000 square feet in size (0.28 to 0.35 acres), and to contain a dark liquid. The partially filled lagoon, present on a 1982 aerial photograph, was approximately 5,000 square feet (or 0.12 acres) in size. The lagoon was no longer visible on aerial photography by 1985.

Additionally, a 1965 aerial photograph shows that the two rectangular concrete basins and the reservoir/cooling tower were still present, but the reservoir/cooling tower and one of the rectangular basins were gone in a 1970 aerial photograph.

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Sanborn fire insurance maps and other site records document the presence of storage tanks distributed throughout the property. The tanks supported the reclaiming process and included storage of acid, alum, caustic, toluene, No. 5 Fuel Oil, waste oil, spent caustic, dissolved air floatation sludge, wastewater, chemicals, and paints (MWH, 2005).

A. Purpose of the Assessment Plan

The purpose of this Assessment Plan is to describe the Trustees' approach for conducting a NRDA in a cost-effective manner. This Assessment Plan outlines the Trustees' proposed approaches for determining and quantifying natural resource injuries and damages associated with those injuries which includes two primary components of a damages claim: 1) the cost to restore, rehabilitate, replace, and/or acquire equivalent resources for the injured resources, and 2) "compensable value," or the monetary value of the natural resource services that were lost pending the restoration of injured resources to their "baseline" condition.

Injury means a measurable adverse change, either long- or short-term, in the chemical or physical quality or the viability of a natural resource, resulting either directly or indirectly from exposure to a discharge of oil or release of a hazardous substance (43 CFR § 11.14(v)). Damages is a legal term for the amount of money sought by Trustees as compensation for injury, destruction, or loss of natural resources; damages include the costs of assessing injuries, as well as the costs of restoration (42 USC §§ 9601(6), 9607(a)(4)(C); 43 CFR § 11.14(l) and §11.15).

By developing an Assessment Plan, the Trustees ensure that the NRDAR will be completed at a reasonable cost relative to the magnitude of damages sought. The Trustees also intend for this Plan to communicate proposed assessment methodologies to the public, including the PRPs, so that these groups can productively participate in the assessment process.

The Assessment Plan (Plan), as currently written, describes the Trustees' understanding of the studies and identifies other processes (e.g., data review and analysis) that may be needed to confirm exposure to the releases and quantify injury to natural resources and their services. Inclusion of a study within this Plan does not guarantee that it will be undertaken, and studies not included within the Plan may be deemed necessary at a later date. The Plan provides an initial prioritization of efforts the Trustees will take during the Injury Assessment process. Additional plans describing assessment studies, if any, will be tiered off this Plan, and made available for public comment prior to finalization.

B. Authority to Conduct a NRDAR

The NRDAR is being conducted jointly by the Trustees pursuant to their respective authorities and responsibilities as natural resource trustees. The Trustees have each been designated as a natural resource trustee pursuant to Section 107(f) of CERCLA, 42 U.S.C. § 9607(f); Section 311(f)(5) of the CWA, 33 U.S.C. § 1321(f)(5); and Subpart G of the National Oil and Hazardous Substances Pollution Contingency Plan (NCP), 40 CFR §§ 300.600 - 300.615.

Under these authorities, the Trustees act on behalf of the public to seek damages for the injury, loss, or destruction of natural resources belonging to, managed by, controlled by, or appertaining

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to the State or United States, that resulted from releases of hazardous substances. This authority includes implementing a NRDAR to evaluate the injury, loss, or destruction of natural resources and their services due to releases of hazardous substances.²

The President has designated federal trustees in the NCP (40 CFR § 300.600) and through Executive Order 12580, dated January 23, 1987, as amended by Executive Order 13016, dated August 28, 1996. Pursuant to the NCP, the Secretary of the DOI acts as a Trustee for natural resources and their supporting ecosystems, managed or controlled by the DOI. In this matter, the USFWS is acting on behalf of the Secretary of the DOI as Trustee for natural resources under its jurisdiction, including but not limited to migratory birds and endangered and threatened species and their habitats. The Secretary of Commerce acts as a Trustee for natural resources and their supporting ecosystems managed or controlled by the DOC and for natural resources managed or controlled by other federal agencies that are found in, under, or using waters navigable by deep draft vessels, tidally influenced waters, or waters of the contiguous zone, the exclusive economic zone, and the outer continental shelf. The Secretary of Commerce has delegated their authority to act as a Trustee to the Administrator of NOAA. The Commonwealth of Pennsylvania acts as a Trustee for natural resources and their supporting ecosystems, managed or controlled by the Commonwealth. In this matter, the PADEP and PFBC is acting on behalf of the Commonwealth as Trustees for natural resources under their jurisdiction, including but not limited to groundwater, sediments, macroinvertebrates, and fishes and their habitats and services.

The Trustees decided to proceed with this NRDAR based on the results of a Preassessment Screen (PAS) dated September 2022 (fully executed on 11/04/2022, Natural Resource Trustees 2022a); 43 CFR §§ 11.23-11.25).

In the PAS, the Trustees determined:

- A discharge of oil and/or a release(s) of a hazardous substance occurred;
- Natural resources the Trustees may assert trusteeship under CERCLA have been or are likely to have been adversely affected by the release;
- The quantity and concentration of the discharged oil or released hazardous substances is sufficient to potentially cause injury to natural resources;
- Data sufficient to pursue an assessment are readily available or likely to be obtained at a reasonable cost; and
- Corrective action carried out or planned do not or will not sufficiently remedy injury to natural resources without further action.

The Trustees therefore concluded that all preassessment screening criteria were met, natural resources over which Trustees may assert trusteeship have been or may have been injured, and several viable PRPs have been identified.

² The trustees must use CERCLA NRDAR regulations for injuries resulting from a discharge or release of a mixture of oil and hazardous substances. 15 CFR § 990.20(c).

C. NRDAR Process Overview

It is the intent of the Trustees to conduct the Metro Container Superfund Site NRDAR consistent with the CERCLA NRDAR regulations at 43 CFR Part 11. These regulations describe the process by which Trustees may conduct a NRDAR. This process includes the following three phases:

- Preassessment,
- Assessment (including the Assessment Plan, injury determination, quantification, and damages determination phases), and
- Post-Assessment (i.e., damages recovery and restoration planning and implementation).

To date, as noted above, the Trustees have completed the Preassessment Phase. The following administrative and preassessment planning documentation is available on the DOI NRDAR website for the Metro Container Superfund Site:

- Notice of Intent. The Trustees sent a notice of intent (Natural Resource Trustees, 2022b) to initiate a NRDAR to PRPs on February 16, 2023 (43 CFR § 11.32(a)(2)(iii)(A)-(B)).
- Preassessment Screen and Determination. The Trustees finalized a PAS on November 4, 2022, which provided the basis for the Trustees' determination that further investigation was warranted based on review of readily available information of the effects of releases associated with the Site (Natural Resource Trustees, 2022a).

The Trustees are now in the Assessment Phase, which may include, as necessary:

- Assessment Plan (43 CFR §§ 11.30 - 11.38),
- Injury Determination, including pathway determination (43 CFR §§ 11.61-11.70),
- Quantification of injuries, including baseline services determination and resource recoverability analyses (43 CFR §§ 11.70-11.73), and
- Damages Determination (43 CFR §§ 11.80-11.84).

Determination of damages will include an analysis of a reasonable number of possible restoration alternatives. The Trustees will evaluate each of the possible alternatives based on all relevant considerations, including the following factors, pursuant to 43 CFR § 11.82(d):

- Technical feasibility,
- The relationship of the expected costs of the proposed actions to the expected benefits,
- Cost-effectiveness,
- The results of any actual or planned response actions,
- Potential for additional injury resulting from the proposed actions,
- The natural recovery period,
- Ability of the resources to recover with or without alternative actions,
- Potential effects of the action on human health and safety,
- Consistency with relevant Federal, State, and tribal policies, and
- Compliance with applicable Federal, State, and tribal laws.

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The Trustees anticipate providing this analysis in a separate plan, to be made available for public review.

D. Identification of the Potentially Responsible Parties (PRPs)

Based on information available at this time, and in accordance with the statutory provisions in section 107(a) of CERCLA, the Trustees have identified³ the following entities as PRPs for the Metro Container Facility and its releases to Stoney Creek and into the Delaware River:

- Exxon Mobil Corporation/Exxon Mobil Oil Corporation
- BP Products North America Inc.
- BP Lubricants USA Inc.
- Atlantic Richfield Company
- E.I. DuPont de Nemours and Company
- Chevron Environmental Management Company/Chevron USA Inc.
- Superfund Management Operations, a series of Evergreen Resources Group, LLC on behalf of Sunoco, Inc. (f/k/a Sun Refining and Marketing Company, f/k/a Sun Oil Company)
- Rohm and Hass Company (c/o The Dow Chemical Company)
- Tunnel Barrel & Drum Company, Inc.
- Veolia ES Technical Solutions, LLC
- Bayer Crop Science, Inc. (Stauffer Management Company)

Additional entities may be identified during the course of the NRDA.

The Trustees have invited, and will continue to encourage, the active participation of the PRPs in the implementation of this damage assessment. It is the intention of the Trustees to work cooperatively with PRPs at each stage of the assessment and to take advantage of the expertise that PRPs may be able to provide.

E. Coordination with Other Activities

The CERCLA NRDAR regulations support, to the extent possible, the coordination of a damage assessment with other investigations being performed pursuant to the NCP (i.e., cleanup activities). Consistent with 43 CFR § 11.31(a)(3), the Trustees recognize the benefit of coordinating assessment activities associated with sites that may have significant contaminants of potential concern (COPCs). Integration of Trustee considerations into remedial activities may resolve certain natural resource damages liability or decrease the cost of assessment activities.

The Trustees intend to continue to coordinate with the USEPA and Pennsylvania response agencies on the remedial activities for the Site. Trustee assessment activities discussed in this

³ See Administrative Order on Consent for the Remedial Investigation/Feasibility Study for the Metro Container Superfund Site (Docket No. CERC-03-2015-0168DC).

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Plan make use of existing data generated through the remediation process, and other research and data collection efforts.

Coordination among the Trustees is also an essential component of a cost-effective damage assessment 43 CFR § 11.34(a)(4). The Trustees signed a Memorandum of Understanding (MOU) in 2022 listing the USFWS as the Lead Administrative Trustee (LAT).

F. Public Participation

Public participation is an important part of the NRDAR process. To that end, the Trustees will make this Assessment Plan available to the public, including the PRPs, for review and comment for a thirty-day period (43 CFR § 11(c)). Interested individuals, organizations, and agencies may submit comments by June 4, 2025 via email to Carrie_Blakeslee@fws.gov or via mail to:

Carrie Blakeslee
US Fish and Wildlife Service
110 Radnor Road, Suite 101
State College, PA 16801

The Trustees will review and consider all public comments and input on the Assessment Plan received during the public comment period prior to finalizing the Assessment Plan. The Trustees will prepare a responsiveness summary to the comments that will be included as an Appendix to the final version of this Assessment Plan.

Development of the Assessment Plan, the public comment process, and finalization of the Assessment Plan is performed solely by the Trustees. Based on the public's comments or other information, the Trustees may modify the Assessment Plan at any time. In the event of a significant modification, the Trustees will provide the public with an opportunity to comment on that amendment (43 CFR § 11.32(e)).

G. Timeline

The activities in this plan are expected to take a reasonable amount of time to accomplish. If new information becomes available as this assessment progresses, and additional studies are deemed warranted, updates to this plan and the timeline will be made publicly available.

2. ASSESSMENT AREA

Assessment Area is defined as:

The area or areas within which natural resources have been affected directly or indirectly by the discharge of oil or release of a hazardous substance and that serves as the geographic basis for the injury assessment (43 CFR 11.14(c)).

The Assessment Area, also referred to as the Site, for the Metro Container Superfund NRDAR includes the location of released hazardous substances and oil included on the industrial

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property, Stoney Creek (tidal tributary to the Delaware River), and the adjacent riparian and mudflat habitat. Although there are other hazardous substances, available data documents the area of PCB contamination to cover 10.4 acres of upland, 1.6 acres of creek riparian habitat, 10.65 acres of river mudflat, and approximately 8.7 acres of river riparian habitat. Due to the tidal nature of this area, contamination may extend both downstream and upstream from the confluence with Stoney Creek. To date, the ongoing remedial action is investigating the downstream extent of contamination from the Site. At this time, sufficient sampling data are not available to evaluate the potential impacts of releases from the Site along the right descending bank and Pennsylvania floodplain of the Delaware River and the wildlife they support. This area will be investigated further to determine if it is included in the Assessment Area.

A. Summary of Releases

The Metro Container Superfund NRDA will focus on direct and indirect injuries stemming from exposure to released hazardous substances and oils, including mixtures as defined in Section 101(14) of CERCLA, 42 U.S.C. § 9601(14). PAHs, PCBs, mercury, and other metals are the pollutants of primary ecological concern at the Site. These contaminants of concern (COCs) are listed as hazardous (List of Hazardous Substances and Reportable Quantities under CERCLA, 40 CFR §§ 302.1 and 302.4), and as toxic pollutants pursuant to 40 CFR § 401.15, as amended. PAHs, PCBs, and mercury are regarded to have no known biological function, and their presence in living organisms is harmful and potentially hazardous. The COPCs that will be the focus of the injury analysis will be chosen as part of the assessment process.

B. Confirmation of Exposure

PAHs, PCBs, mercury, and other hazardous substances (as defined by CERCLA) have been released at and from the Metro Property and have accumulated in the on-site soil and the sediments of Stoney Creek and the nearby mudflat of the Delaware River, likely injuring natural resources and services. The USEPA Site has a record of environmental violations that resulted in hazardous substance releases and soil contamination (MWH, 2005). Exposure to hazardous substances has been observed in surface water, groundwater, sediment, soil, and some biological resources at the Site.

i. Exposure to Surface Water

Wastewater and surface water runoff migrated from the upland portion of the Site to Stoney Creek and directly into the Delaware River. Historic aerial photographs clearly demonstrate that the surface water channels were present between the Metro Property and the wetlands in the river floodplain.

USEPA conducted surface water sampling in Stoney Creek in 2007. However, the analysis for site-related organic contaminants (e.g., PAHs, PCBs, chlorinated pesticides) was not sufficiently sensitive to assess potential effects to aquatic resources. Concentrations of the inorganic contaminants arsenic, cobalt, manganese, silver, and zinc were 2 to 100-fold higher than the concentrations known to cause harm to aquatic life. Reports produced by the PRPs (GHD, 2019

and 2020) present surface water data for Stoney Creek. In 2018, surface water at one seep had 88.2 µg/L total PAHs. Copper, lead, and manganese exceeded ecological benchmarks near the confluence, but data for other COCs (i.e., arsenic, cadmium, and mercury) were not included.

ii. Exposure to Groundwater

Sampling conducted on the Site in 2007 and 2017 indicates the groundwater near the creek is contaminated with arsenic, cyanide, and manganese at concentrations exceeding aquatic criteria. Detection limits for PAHs, PCBs, and chlorinated pesticides were above aquatic criteria, preventing an assessment of potential effects to aquatic life from groundwater discharges. Groundwater analyses conducted in 2019 demonstrate continued exceedances of criteria for metals and some organic COCs. Groundwater at the Site migrates predominantly toward Stoney Creek with a smaller area of the Site flowing directly toward the river (GHD, 2018), chronically contaminating Stoney Creek near its confluence with the river. To date, efforts to sample water discharges at seeps along the creek bank have been unsuccessful due to the intermittent pattern of discharge. Additional sampling with detection limits below aquatic criteria is warranted at wells adjacent to the creek and at seeps along the creek using passive samplers.

iii. Exposure to Sediments

COC contamination was detected in sediments from both Stoney Creek and the mudflat at its confluence with the Delaware River. Sediment samples from Stoney Creek were 2 to 10 times greater than ecological benchmarks for arsenic, cadmium, chromium, copper, lead, mercury, nickel, and zinc, with maximum total PAHs of 26.3 ppm and total PCBs of 8.1 ppm (MWH, 2005). In 2007, Stoney Creek sediment total PCB (Aroclor based) concentrations ranged from 2 to 9.5 mg PCB/kg (Tetra Tech, 2007). Comparison of the total PCB congeners (Aroclor based) in Stoney Creek sediments to those in groundwater samples from wells on the property clearly demonstrated that the PCBs found in Stoney Creek had migrated from the property. In 2009, USEPA's samples from the river mudflat at the creek's confluence had PCB concentrations up to 40.4 ppm and PAH concentrations (16 parent PAHs quantified in USEPA Method 610) up to 33.5 ppm, as well as elevated concentrations of copper and lead (Tetra Tech, 2009). Sampling by USEPA and the PRPs demonstrated that sediments in Stoney Creek are highly transient and migrate to the river mudflat in most storm events. Samples collected by the PRPs from a spatially-limited area of the river mudflat in 2017 through 2019 had PCB concentrations up to 5.6 ppm, concentrations of PAHs up to 96.88 ppm, and concentrations of mercury up to 6.2 ppm (GHD, 2020). An ecological risk assessment has not yet been conducted. However, concentrations of PAHs, PCBs, and mercury greatly exceed ecological screening values in large portions of the mudflat (Natural Resource Trustees, 2022a).

iv. Exposure to Soils

On-site soil investigations revealed cadmium, chromium, copper, lead, selenium, vanadium, and zinc contamination was prevalent across the Site (USEPA, 2007a). As shown in Table 1, surface soil concentrations (<2 feet below ground surface) significantly exceeded safe levels for birds. Surface soil concentrations of these same metals also routinely exceeded protective

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concentrations for plants, soil invertebrates and mammals. An USEPA Ecological Soil Screening Level (Eco-SSL) for mercury has not been derived. USEPA Region 4 uses 0.013 mg total mercury/kg as its avian screening benchmark (USEPA, 2014b). Total mercury concentrations in surface soils ranged from 0.068 to 5.5 ppm (Tetra Tech, 2007) exceeding the USEPA benchmark.

Table 1. Soil Concentrations (ppm) in Comparison to Avian Eco-SSL (ppm)

METAL	PROPORTION	MAXIMUM	ECO-SSL	SOURCE	RATIO
Cadmium	18/18	251	0.77	USEPA 2005a	326
Chromium	14/18	722	26	USEPA 2008	28
Copper	16/18	2100	28	USEPA 2007b	75
Lead	17/18	4370	11	USEPA 2005b	397
Selenium	18/18	10.1	1.2	USEPA 2007c	8
Vanadium	18/18	128	7.8	USEPA 2005c	16
Zinc	18/18	10300	46	USEPA 2007d	224

The USEPA Eco-SSL for low molecular weight (LMW) PAH risk to soil invertebrates and mammals are 29 ppm and 100 ppm, respectively, while for high molecular weight (HMW) PAHs the values are 18 ppm for soil invertebrates and 1.1 ppm for mammals (USEPA, 2007e). No avian Eco-SSL was derived due to the limited number of PAH studies for birds at the time of Eco-SSL publication. Only one surface soil sample within the industrial footprint exceeded protective levels for LMW PAHs (USEPA, 2007a). For HMW PAHs, all five samples exceeded the protective level for mammals, but none exceeded for soil invertebrates (USEPA, 2007a).

Recent soil samples collected between the industrial footprint and the river documented a remaining potential source area with HMW PAHs of 2,116 to 3,722 ppm and LMW PAHs of 41.5 to 57.1 ppm (Ramboll Environ, 2017) which are 2 to 300 times greater than soil benchmarks.

Numerous studies of PCB toxicity to birds were reviewed by Sample et al. (1996). They identified 1.8 mg/kg per day in the diet of pheasants as the lowest observed adverse effect level (LOAEL). Using this concentration, they determined that American robin and American woodcock are avian species at high risk to PCBs in soil. Efrogmson et al. (1997) derived a soil remediation goal of 0.655 ppm to protect American woodcock. The mean concentration of PCBs (Aroclor based) in surface soils was 25.7 ppm (1.5 – 101) (Tetra Tech, 2007). Soil sampling in 2017 has identified the highest PCB contamination along Stoney Creek with surface concentrations from 0.1-57.7 ppm and areas removed from the creek with up to 10 ppm (GHD, 2020).

v. Exposure to Biological Resources

PCB levels are monitored in fish tissue along the Delaware River by Pennsylvania (PA), Delaware, and New Jersey (NJ). The fillets of freshwater fish commonly consumed, such as carp, catfish, sunfish, bass, perch, and walleye, are regularly tested for contaminants. PCB

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concentrations found in these species collected in PA ranged from 0.05 to 3.7 ppm (Natural Resource Trustees, 2022a). In DE, NJ and PA, consumption advisories have been established in the tidal zone of the Delaware River for several fish species, including striped bass, channel and white catfish, white perch, and American eel, primarily due to PCB levels found in their fillets, but also due to concerns with mercury, dioxins, and furans (DNREC, 2018; NJDEP, 2024; PADEP, 2024).

Mercury concentrations in fish, including striped bass, were assessed from 2004 to 2007 by the Delaware River Basin Commission (DRBC, 2010). DRBC found that mercury in fish within the tidal portion of the river are within the 3 meals/week dietary recommendations category as described by USEPA (2025).

Parent PAHs or their metabolites are not typically sampled in fish tissues. Data for these COCs were not readily available for evaluation.

No data on concentrations of any COC are currently available for benthic invertebrates, freshwater mussels, reptiles, birds, or mammals near the Site.

3. AFFECTED NATURAL RESOURCES

Natural resources for which natural resource damages may be sought include, “land, sediment, biota, air, water, groundwater, drinking water supplies, and other such resources belonging to, managed by, held in trust by, appertaining to, or otherwise controlled by the United States... [or] State...” (43 CFR § 11.14(z)). The CERCLA NRDAR regulations group these natural resources into five categories: surface water resources, ground water resources, air resources, geologic resources, and biological resources.

The Assessment Area supports a variety of natural resources and services potentially affected by hazardous substances and oil released at and from the Site. The following paragraphs briefly summarize select features of the natural resources that the Trustees are currently considering assessing for injury.

A. Surface Water Resources

Surface water resources in the Assessment Area include water, suspended sediment, and bed and bank sediments (43 CFR § 11.14(pp)). Surface water may be considered injured if, for example, there is an exceedance of an applicable water quality or drinking water standard as a result of an unpermitted release (43 CFR § 11.62(b)(1)) or if other resources (e.g., fish) are injured as a result of exposure to the concentrations in the surface water (43 CFR § 11.62(v)). Surface water supports other biological resources, so surface water has both direct and indirect impacts on the health of biological resources. For example, contaminated sediments can cause injury to benthic invertebrate populations, which in turn can result in injuries to resident fish populations for whom the invertebrates are a source of food. Similarly, injury to invertebrates and/or fish resulting from exposure to contaminated sediments and surface water can lead to injury in local

insectivorous (insect eating) or piscivorous (fish eating) bird populations. In addition, contaminated sediments serve as a source of continuing releases of hazardous substances to water.

Surface water resources provide a suite of ecological and human services. Ecological services include, but are not limited to, habitat for trust species, including food, shelter, breeding areas, and other factors essential to survival. Human use services provided by surface water resources include, but are not limited to, recreational fishing, boating, and canoeing.

B. Groundwater Resources

Groundwater resources include the water in a saturated subsurface zone and the rocks or sediments through which this water flows. Groundwater resources serve as a potential pathway for contaminants to migrate from their source to surface water resources. Groundwater may be determined to be injured if concentrations of substances are in excess of applicable water quality criteria for public water supplies or the contaminated groundwater causes injury to other resources (43 CFR § 11.62(c)).

C. Geologic Resources

Geologic resources include soils and sediments that are not otherwise accounted for under the definition of surface water or groundwater resources. Geological resources, including soil and sediment resources in riparian and other wetland areas, provide habitat for natural resources such as migratory birds and also provide other services that regulate ecosystems and water quality, while offering human services and access to recreational fishing. Geologic resources may be injured if, for example, concentrations of substances in the soil are sufficient to cause injury to groundwater or a toxic response to soil invertebrates (43 CFR § 11.62(e)).

D. Biological Resources

Biological resources include natural resources, as defined earlier, and other biota, including, terrestrial and aquatic plants, threatened, endangered, or state sensitive species, other legally protected species, and other living organisms not listed (43 CFR § 11.14(f)). Insects, amphibians, reptiles, birds, mussels, fish, and small mammals serve as food sources for higher trophic level animals including raptors and predatory mammals. Biological resources also provide a range of human services including fishing and wildlife viewing. Among other causes, injury to a biological resource could occur if exposure to released hazardous substances and oil cause the biological resource death, disease, or reduction in reproduction or if there is a directive to limit or ban consumption (43 CFR § 11.62(f)).

Despite its urban location, the health and wellbeing of the fish and wildlife habitat surrounding the property is vital (Figure 2). Stoney Creek provides habitat for aquatic invertebrates, amphibians, and fish. The creek riparian corridor, trees between the property and the railyard, and trees on the river shoreline provide habitat for numerous bird species. The tidal mudflat at

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the confluence of Stoney Creek and the Delaware River is a critical habitat for birds, fish, and reptiles. The Trustees may choose to focus the NRDA on a few representative resources including some of those listed below.

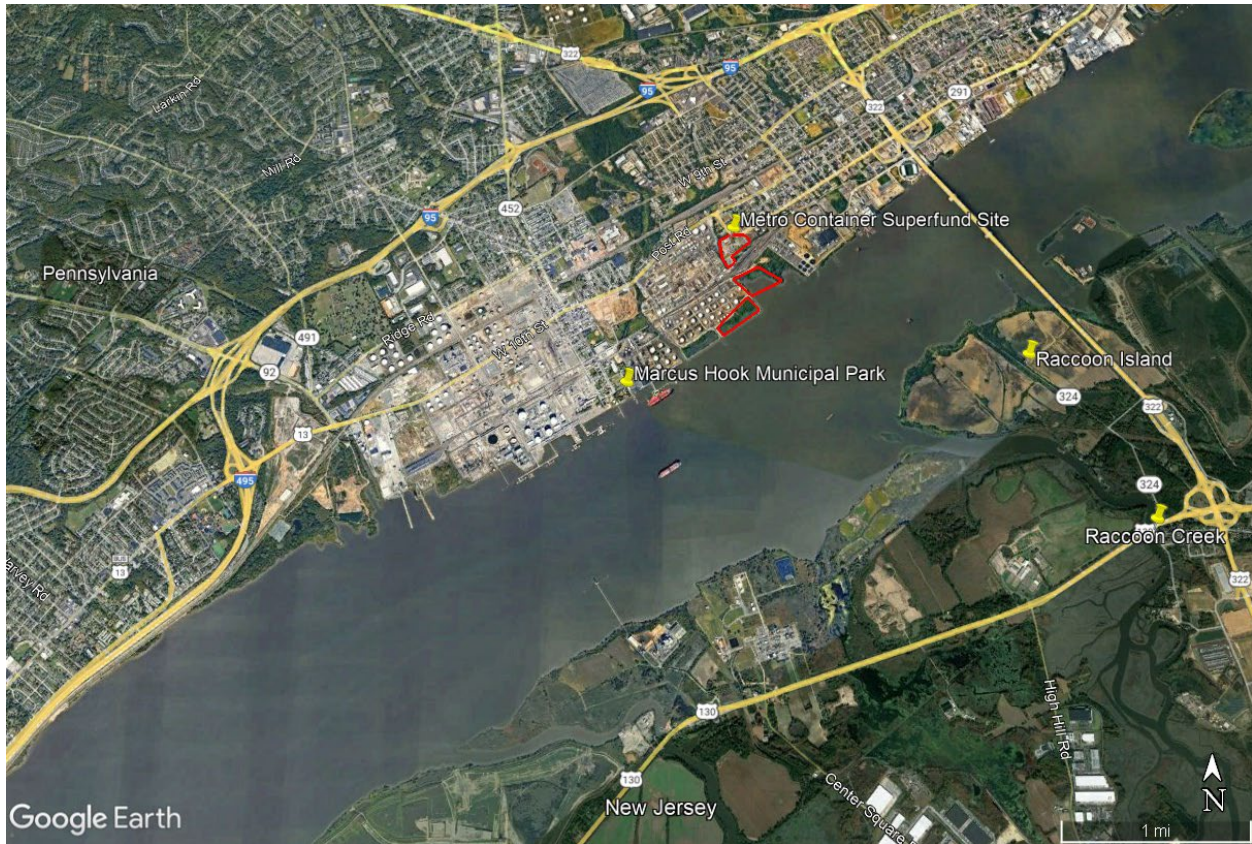


Figure 2. Metro Container Superfund Site Map with the Potentially Impacted Areas.

Figure 2 highlights potentially impacted areas, outlined in red, but impacts of tidal influences are not fully known. The Site is located at RMI 80.38 between Commodore Barry Bridge (RMI 81.90) and the Delaware-Pennsylvania state line (RMI 78.83). Woodbury Creek, NJ (RMI 91.57) is upstream of the Site, Raccoon Creek, NJ (RMI 80.66) is directly across from the Site, and Salem River, NJ (RMI 58.37) is downstream of the Site.

i. Aquatic Organisms

Immediately adjacent to the Metro Property, the Delaware River provides habitat for aquatic species. Fish species captured in seines from 2007 to 2017 (NJDEP, 2018) are listed in the PAS (Natural Resource Trustees, 2022a). Many of these species, including American Shad (*Alosa sapidissima*), Striped Bass (*Morone saxatilis*), Alewife (*Alosa pseudoharengus*), Blueback Herring (*Alosa aestivalis*), and Atlantic Menhaden (*Brevoortia tyrannus*), utilize the tidal river and estuary as spawning and/or nursery habitat (DRBC, 2015). Additional species not targeted by seining include the federally endangered Atlantic (*Acipenser oxyrinchus oxyrinchus*) and Shortnose (*Acipenser brevirostrum*) Sturgeons. Atlantic Sturgeon have been documented to

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successfully reproduce in the tidal river and the area (Hale et al., 2016). Furthermore Hale et al. 2016 determined the Marcus Hook area provides important nursery functions and is significant juvenile habitat as 79.1 percent of telemetered sturgeon detections were within a 2-km area around Marcus Hook. Shortnose Sturgeon use the area of the river in the vicinity of Philadelphia as part of their seasonal migration pattern (O'Herron et al., 1993). In August of 2017, NOAA designated critical habitat for the Atlantic Sturgeon Distinct Population Segment in the main stem Delaware River from Trenton to the mouth of Alloway Creek (NOAA, 2017).

Native freshwater mussels are also listed in the PAS and occur along the New Jersey riverbank in the vicinity of the Site (Natural Resource Trustees, 2022a) with no surveys currently available along the Pennsylvania riverbank. A preliminary survey adjacent to Raccoon Island, NJ by Partnership for the Delaware Estuary malacologists documented shells of Eastern Elliptio (*Elliptio complanata*), Tidewater Mucket (*Leptodea ochracea*; NJ threatened species), Yellow Lampmussel (*Lampsilis cariosa*; NJ threatened species), and Alewife Floater (*Utterbackiana implicata*; formerly *Andonata implicata*). As long-lived, relatively sedentary creatures that process large amounts of water through their soft tissues, they can accumulate high concentrations of bioaccumulative contaminants which are transferred to fish and birds that include mussels in their diets. Some species of mussels are particularly sensitive to water quality and contaminants. Therefore, population abundance, species diversity, and contamination of freshwater mussels are bioindicators of freshwater system health, particularly over long periods of time (PDE, 2017).

ii. Birds and Mammals

Surveys for birds and mammals at the site have not been conducted. Directly across from the Site, Raccoon Island contains diverse habitat types including riparian, shoreline, and wetland areas. These areas provide habitat for a number of wildlife species, such as breeding and migrating birds, mink (*Neovison vison*), and muskrat (*Ondatra zibethicus*), as well as a variety of amphibians, reptiles, and insects. Numerous species of birds have also been observed from the Marcus Hook Municipal Park and are listed in the PAS (Natural Resource Trustees, 2022a). Several nesting pairs of the federally protected bald eagle (*Haliaeetus leucocephalus*) occur in the vicinity of the Site, with one directly across the river at Raccoon Creek (NJDEP, 2017). Peregrine falcons (*Falco peregrinus*) nest on the Commodore Barry Bridge approximately 1 mile upstream of the site (DRPA, 2018). Bald eagles and peregrine falcons eat and feed their nestlings shorebirds, ducks, and gulls that feed in and along the river. Bald eagles also eat a substantial number of fish. As upper trophic level predators, bald eagle and peregrine falcon are potentially exposed to high concentrations of PCBs via food chain bioaccumulation.

iii. Amphibians and Reptiles

The Delaware River and surrounding habitats support a diverse community of amphibian and reptile species, including several State Listed Species presented in full in the PAS (Natural Resource Trustees, 2022a). The Delaware River provides habitat for the Pennsylvania Threatened Northern Red-bellied Cooter (*Pseudemys rubriventris*), and adjacent upland habitat

is important for suitable nesting sites. Additionally, the tidal Delaware River and associated Atlantic Coastal Plain habitat support a variety of State Listed amphibian species which are under threat from development and degradation of water quality (PGC-PFBC, 2015).

4. INJURY ASSESSMENT AND PATHWAY DETERMINATION APPROACH

This Assessment Plan sets forth assessment studies or activities the Trustees intend to pursue as part of the Metro Container Superfund NRDA.

During the injury assessment, the Trustees quantify the effects of the release(s) of hazardous substances and oil on the natural resources to determine whether there is a measurable adverse effect (“injury”) to the resource as a result of the exposure. For purposes of NRDAR, the Trustees measure the extent of the injury, estimate the baseline condition and/or baseline services of the injured natural resources, determine the recoverability of the injured natural resources, and estimate the reduction in services that resulted from the release(s) of hazardous substances (43 CFR § 11.70(c)).

Baseline is defined as the condition or conditions that would have existed in the assessment area had the releases of the hazardous substances under investigation not occurred (43 CFR § 11.14(e)). Baseline conditions may be established based on the review of historical, pre-release data and information, or by control areas that exhibit similar physical, chemical, and biological conditions as the assessment area and lack exposure to the releases (43 CFR § 11.72).

At this time, the Trustees have determined that further assessment is appropriate for (1) surface water, sediment, groundwater and/or porewater resources; and (2) biological resources including birds, benthic invertebrates, mussels, and fish; and (3) associated recreational losses.

A. Temporal

The temporal scope of this NRDA will be based on determining injuries to natural resources and corresponding reductions in natural resource services from the time of the initial release through the return of the injured resource to baseline conditions. This scope may change as more information is revealed through the remedial action process or other means discovered during the assessment.

B. Use of Available Data

The Trustees’ general approach to the NRDA is to review the existing data, analyze gaps, and then undertake additional studies or activities including testing and sampling as needed. This approach minimizes the cost of the assessment and maximizes the use of existing information.

C. Intent to Perform a Type B Assessment

As part of the assessment planning process, the Trustees decide whether to conduct a simplified assessment (Type A) or a comprehensive assessment (Type B) (43 CFR §§ 11.33-11.36). The Type A procedures, which use minimal field observations and computer models to generate a damage claim, are limited to the assessment of relatively minor, short duration discharges or releases (43 CFR § 11.34). Considering the releases and that additional site-specific data can be collected at reasonable cost, the Trustees have concluded that the use of Type B procedures is appropriate at this Site.

The Trustees must confirm that at least one of the natural resources identified as potentially injured in the PAS has been exposed to a released hazardous substance before including any Type B methodologies in the Assessment Plan (43 CFR § 11.37). The PAS identified several resources and their services that were potentially exposed as a result of the releases of hazardous substances from the Metro Property, including:

- Birds
- Fish
- Freshwater mussels
- Aquatic invertebrates
- Surface water, including sediments
- Groundwater
- Supporting habitat for natural resources, including food, shelter, breeding, foraging, rookeries, and other factors essential for survival

Multiple natural resource categories are confirmed as exposed to hazardous substances (see Section 2 B, Confirmation of Exposure) released from the Metro Property. Information describing the methods that confirm additional resources have been exposed and potentially injured will be described in the sections below under Pathway Determination and Injury Assessment.

D. Pathway Determination

Pathway is defined as the “route or medium through which oil or a hazardous substance is or was transported from the source of the... release to the injured resource” (43 CFR § 11.14(dd)), Determinations involve identifying the sources of hazardous substances and tracing the fate and transport of the substances through the environment to the resources (e.g., through surface water and sediments to mussels). Pathways may be determined by demonstrating the presence of a hazardous substance in a resource or by using a model that demonstrates that the route served as a pathway (43 CFR §11.63(a)(2)).

Contamination emanating from the USEPA Site has migrated through numerous pathways with the potential to adversely affect the ecological system of the Delaware River and Stoney Creek. Primary pathways through which resources may have been exposed to hazardous substances and

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oil from the Metro Property are likely to include groundwater discharge, overland runoff and sedimentation, outfall discharges, surface water transport in Stoney Creek and the Delaware River, and through the food chain. Unpermitted discharges from the Site into the river reported by the U.S. Coast Guard in 1988 led to the initial USEPA removal actions (USEPA, 1989) and subsequent NPL listing. Consideration will be given to other potential sources of contamination, given the industrial nature of the area, and attribution of contamination to the Site will be calculated when necessary.

Potential contaminant pathways into ecological receptors include direct uptake and indirect exposure. Direct uptake mechanisms include dermal contact, absorption, ingestion, or inhalation of contaminated sediment and surface water. In addition to these direct uptake mechanisms, ecological receptors may be indirectly exposed by consuming contaminated food or prey items. Of these potential exposure routes, benthic invertebrates and fish are primarily expected to be exposed via direct contact with sediment and surface water. Benthic filter feeders, such as freshwater mussels, obtain food by passively filtering the surrounding water and are thus especially vulnerable to toxic compounds in the water column and sediment (Woolnough et al., 2020). Upper trophic level receptors are primarily expected to be exposed by dietary ingestion, making them vulnerable to bioaccumulation.

Bioaccumulation is the process of contaminants being stored in the tissues of biological receptors. This process may lead to biomagnification, where higher levels of contaminants are accumulated with each level of the trophic system. PCBs are bioaccumulative compounds and can potentially have impacts on certain resources such as aquatic fish, floodplain mammals, and migratory birds. PCBs are stored in the fatty tissues of affected organisms. Due to the biomagnifying properties of PCBs, predators and organisms higher on a many-tiered food chain are at a greater risk of accumulating high levels. As part of the assessment activities, the Trustees will trace contamination of biota (i.e., fish, mussels, and birds) via tissue and chemical analysis for site-related hazardous substances.

5. INJURY ASSESSMENT

The injury assessment, including both injury determination and quantification, is the process that informs the Trustees' ultimate claim for natural resource restoration costs and, if warranted, "compensable values," or compensation for losses incurred prior to the completion of restoration activities (43 CFR 11.83(c)(1)). The Trustees expect to evaluate injury associated with the natural resources and services using the assessment activities and objectives described below.

The Trustees' defined injury assessment categories combine multiple natural resources that are defined in the regulations (43 CFR § 11.14(z)) (i.e., surface water resources, ground water resources, geologic resources, and biological resources).

A. Injury Assessment for Aquatic and Shoreline Resources

The Trustees anticipate focusing assessment of aquatic resources on surface water, sediment, and

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tissue data and the pathway(s) to affect biological resources. The Trustees foresee the assessment of shoreline resources focusing on mudflat and riparian habitat. The Trustees will review data and information gathered as part of the USEPA remediation process, data collected by the PRPs, other research and data collection efforts associated with the Site, USEPA screening values, published injury thresholds, and other relevant published screening values, standards, and/or benchmarks to determine injury. The Trustees will consider peer-reviewed literature on the harmful effects of COCs released at and from the Facility on surface water and biological resources that reside in aquatic (e.g., fish) and shoreline habitats (e.g., mudflat). During the NRDA, the Trustees will conduct additional sampling with detection limits below ecological criteria where needed and continue to evaluate any new or relevant data sources that may inform the injury determination and quantification.

i. Aquatic Resources Evaluation

Surface water and aquatic-dependent biological resources within the Assessment Area may have been injured by direct contact with dissolved, floating, or suspended chemicals in the water column, direct contact with contaminated sediments, ingestion of contaminated surface water and sediment during foraging or feeding, inhalation of chemicals, and/or indirect contact through ingestion of contaminated prey species. The Trustees will evaluate the concentrations of COCs in surface waters (i.e., water column), sediments, invertebrates, and/or fish to determine and quantify the degree to which these substances may be causing injury. Specific assessment activities include:

A. Screening of chemical contaminants in surface waters, sediment, invertebrates, and/or fish

The objectives of this assessment activity include:

- Identify the highest surface water, sediment, invertebrates, and/or fish concentrations for released hazardous substances;
- Identify ecological benchmarks and injury thresholds for COCs;
- Compare the concentrations of COCs to applicable ecological benchmark or injury thresholds; and
- Develop a database of retained COCs for analysis.

B. Assessing trends of contaminant data and performing data analysis

This assessment activity will identify baseline contaminant concentrations and temporal patterns of chemical contaminant concentrations above baseline and determine if quantifiable injuries to surface water resources and encrusting organisms occurred from exposure to hazardous substances. The Trustees will use data quality objectives approach (USEPA, 2000; USEPA, 2006a, b, and c) to perform a data analysis to:

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- Identify the frequency of detection of chemical concentrations in surface water, sediment, invertebrates, and/or fish, by geographic sub-areas and time;
- Determine if there are any gaps in available data as they relate to invertebrates and/or fish exposure to present COCs;
- Analyze and apply appropriate statistics on selected data to compare chemical concentrations in the Assessment Area to baseline concentrations or other appropriate chemical observations;
- Visualize data using charts and graphs; and
- Describe and document results.

C. Performing geospatial analysis

The purpose of this activity is to determine the geographic and temporal extent of injury or contamination. Information from the above activities (i.e., A. Screening of chemical contaminants in surface waters, sediment, invertebrates and/or fish; B. Assessing trends of contaminant data and performing data analysis) will be used during this analysis. ArcGIS™ or similar mapping program will be employed to perform data interpolation and visualization techniques that can quantify the geographical extent of injury or contamination.

The objectives of this task may include the following:

- Identify data that are appropriate for interpolation and visualization;
- Visualize data using charts, graphs, and/or maps; and/or
- Delineate the number of acres of impacted area by magnitude of contamination or magnitude of injury.

ii. Shoreline Resources Evaluation

Shoreline resources within the Assessment Area may have been injured by direct contact with dissolved, floating, or suspended chemicals in the water column, direct contact with contaminated sediments, absorption of chemicals by mudflat plants, and/or uptake of chemicals by encrusting organisms during feeding. Assessment activities for shoreline resources are expected to focus on mudflat and riparian habitats. The Trustees will evaluate exposure and magnitude of effects from exposure to releases by performing assessment activities and/or relying upon assessment activities undertaken for other resources. These objectives may include:

A. Delineating shoreline habitat types

The Trustees will:

- Identify data sources that delineate habitat types or could be used to delineate habitat types (e.g., environmental sensitivity index maps, imagery);
- Identify, delineate, and visualize habitat types using maps; and

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- Delineate the number of acres and/or shoreline miles of each shoreline community being assessed.

B. Delineating spatial and temporal extent of Releases

Using data generated as part of the Aquatic Resources Evaluation, the Trustees will:

- Visualize the product release extent using maps; and
- Delineate the number of acres injured as a result of the releases.

C. Collecting and compiling shoreline data

The Trustees will:

- Evaluate available data associated with background and marsh in the Assessment Area. Important marsh metrics may include but are not limited to: mudflat width, percent cover, stem density, and species present;
- Compile and review relevant research about species presence and life cycle data; and
- Compile and review relevant research about the effects of COCs on shoreline biota such as macroinvertebrates and mussels.

D. Quantifying shoreline injury

The Trustees will use information and data previously discussed to determine whether habitat(s) is impacted. If a habitat is impacted, the Trustees will:

- Classify the injury to each habitat type (spatial and temporal);
- Visualize the classified habitat types using maps; and
- Delineate the number of acres and/or shoreline miles of impacted habitat by magnitude of contamination or magnitude of injury.

B. Injury Assessment for Groundwater Resources

Remedial investigation has indicated that COCs associated with the releases have leached through the substrates and entered the groundwater. Groundwater at the Site migrates predominantly toward Stoney Creek with a smaller area of the Site flowing directly toward the river (GHD, 2018). It has been shown that contaminated groundwater continues to chronically contaminate Stoney Creek near its confluence with the river and that groundwater resources potentially connect with sediments and surface water transporting COCs to other resources. The Trustees will focus on assessing ground water resources as a pathway for the releases to make their way to other natural resources being evaluated as part of the injury assessment.

C. Injury Assessment for Birds

There are many species of birds that use the Assessment Area for all or part of their lifecycle. The Trustees will focus their assessment activities on determining whether, and to what extent birds have been injured as a result of exposure to releases from the Site. Specific assessment activities may include:

A. Compiling and evaluating data

The Trustees will compile data from a variety of sources to assess injury. In general terms, this includes information about bird biology, habitat use, and toxicology information. Data or information may include but is not limited to:

- Data generated as part of the injury assessment for other resources (e.g., aquatic and shoreline resources, groundwater resources);
- Life history information;
- Bird population density information;
- Toxicology and mortality information;
- Peer reviewed studies;
- USFWS bird survey data;
- Response documents and data; and
- USEPA remedial documents and studies

B. Investigating the pathway

The Trustees will:

- Identify the sources of hazardous substances and trace the fate and transport of the substances through the environment (e.g., through soil, surface water, sediments, or food webs).
- Evaluate indicators of exposure and establish the connection between exposure and the mortality or injury of birds due to the releases.
- Conduct additional analyses as appropriate. Examples that may be considered include tissue analyses to assess chemical exposure or characterization of physiological markers of exposure, such as hemolytic anemia or immunological responses. Specific studies to define the exposure, injury, and mortality to birds due to releases from the Site will be presented in individual study plans and provided to the public for review.

C. Quantifying bird injury

Following data compilation and completion of tasks previously discussed, the Trustees will determine:

- The geographical extent of injury;

- Number and type of birds that were potentially injured; and
- Duration of injury.

D. Injury Assessment for Human/Recreational Use

The loss of services is the result of a person (1) declining to recreate (2) consuming a less preferred alternative or option (e.g., avoidance of sites or activities), (3) enjoying activities less as a result of the of limitations (i.e., fish consumption advisories), closures, or diminished quality of the resources (i.e., dead marsh) as a result of releases. More generally, compensable losses include changes to “recreational quality, public access, or recreation demand” (43 CFR § 11.71(e); Elliot Bay Trustees, 2019). The Trustees will evaluate impacts associated with the releases on the human use of public natural resources by performing assessment activities with the objectives of:

A. Identifying impacts on the human use of public natural resources

- Identify impacts to recreational opportunities caused by releases at the Site (e.g., fish consumption advisories);
- Obtain data and/or information about the human/recreational use impact and the duration of these impacts caused by the releases from the Site and/or the response to the releases; and
- Quantify lost/substitute/diminished trips according to data obtained during investigation.

B. Performing recreational use data collection activities

In order to establish the baseline level of services, the Trustees will identify and acquire recreational use data in or near the Assessment Area prior to the releases. The Trustees will also initiate data collection to supplement the pre-existing data as well as determine impacts from the releases on visitor use. These data collection activities will inform the quantification of human use injuries.

- Request recreational-use data from natural resource management agencies with jurisdiction in or near the Assessment Area; and
- Collect on-site primary recreational-use data (i.e., videography, on-site recreation-use counts, and automatic traffic counts).

C. Valuation of human use injuries

The Trustees will use data from previously mentioned activities to quantify lost human use that occurred as result of releases associated with the Site. The Trustees may use a travel cost or other methods to determine the valuation portion of human/recreational use losses.

6. APPROACH TO DAMAGES DETERMINATION

In the damages determination phase, the Trustees determine the monetary value (damages) of the compensation for injuries to natural resources and their services resulting from the releases of

hazardous substances (CERCLA §§ 107(a)(4)(C), 107(f)(1); 43 CFR § 11.15). The measure of damages is the cost of (i) restoration, or rehabilitation of the injured natural resources to a condition where they can provide the level of services available at baseline, (ii) the replacement and/or acquisition of equivalent natural resources capable of providing such services, and/or (iii) the compensable value⁴ of all or a portion of the services lost to the public for the time period from the release pending restoration to baseline (43 CFR § 11.80(b)).

The CERCLA NRDAR regulations provides a non-exhaustive description of various methodologies the Trustees may use in their damages determination, including Habitat Equivalency Analysis (HEA), Resource Equivalency Analysis (REA), and Habitat-Based Resource Equivalency (HaBREM) and travel cost (43 CFR § 11.83).

HEA is a service-to-service or resource-to-resource approach that can account for changes in baseline services while estimating interim losses of services. The fundamental concept in HEA is that compensation for lost ecological services can be provided by restoration projects that provide comparable services.

REA is a resource-to-resource approach to injury quantification that assumes that services lost and restored are comparable, an approach similar to HEA (Desvousges et al., 2018). REA generally refers to a stepwise replacement model for killed or injured species.

HaBREM refines the use of organism-based metrics to integrate injuries to multiple species (Baker et al., 2020). During the assessment process, the Trustees will determine the most appropriate method to determine damages which may include other models.

A. Baseline

In order to quantify injuries, the Trustees must quantify baseline conditions, which include the physical, chemical, and biological conditions and their associated services for natural resources. Baseline is “the condition or conditions that would have existed at the assessment area had the discharge of oil or release of the hazardous substance under investigation not occurred” (43 CFR § 11.14(e)). The baseline conditions for each resource and/or service will be taken into account when determining the level of injury and the amount of restoration required to offset the injury.

B. Aquatic, Shoreline, Bird, and Groundwater Damages Determination

The Trustees are assessing exposure of natural resources to the Metro Property-related hazardous substances, oil, and response actions and are determining whether natural resources or their services have been injured or lost. As part of the assessment, the Trustees determine the amount of restoration that is necessary to compensate the public for identified injuries to these resources

⁴ Compensable value is the amount of money required to compensate the public for the loss in services provided by the injured resources between the time of the release and the time the resources are fully returned to their baseline conditions, or until the resources are replaced and/or equivalent natural resources are acquired (43 CFR §11.83(c)). This is also referred to as “interim loss.”

and their associated services for the period between the onset of injury and the resource's return to baseline ("scaling").

The Trustees will likely use models, such as HEA or REA, to scale losses associated with aquatic, shoreline, bird, and groundwater resources with restoration. The Trustees plan to use a restoration-based approach to determine damages for ecological injuries (43 CFR § 11.83(b)). This means that the damages sought would equal the costs associated with restoring the natural resource and associated services that were injured. For example, this could include costs associated with acquiring, preserving, and restoring habitat that supports the injured resource.

C. Human/Recreational Use Damages Determination

The Trustees may assess the value of recreational use that was lost as a result of the fish consumption advisory related to the releases at and from the Site. The Trustees may also examine other methodologies for determining lost human/recreational use on and around the Site. The Trustees will consider existing information and information collected as part of the NRDA.

D. Restoration and Compensation Determination Plan

Implementation of the damage determination phase is dependent upon completion of a Restoration and Compensation Determination Plan (RCDP). The RCDP lists a range of restoration alternatives, includes the selection of one alternative and the rationale supporting that selection, identifies the methodologies the Trustees will use to determine the costs of the selected alternative, and identifies the methodologies the Trustees will use to determine compensable values. The RCDP will contain sufficient detail to evaluate the alternatives and select the one that is most appropriate.

Existing data are not sufficient to develop the RCDP concurrently with the Assessment Plan for the Metro Container Superfund Site. Accordingly, the RCDP development for this case is dependent on completion of the injury determination and quantification phase. The RCDP for this case will be made available for a separate public review, as appropriate. Nevertheless, this chapter is intended to provide the PRPs and the public with a clear sense of the anticipated nature and scope of the damage determination.

7. DATA MANAGEMENT

Assessments employing Type B methods are required to develop a Quality Assurance Plan ("QAP") that adheres to the requirements of the NCP and guidance provided by USEPA (43 CFR § 11.31(c)(2)). The purpose of the QAP is to ensure that data are of sufficient quality to be used for injury assessment and damage determination. For any new Trustee-led data collections, there will be an associated QAP that will be developed and made publicly available. The data management procedures described below are general and will pertain to existing data or data collection activities not led by the Trustees.

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The QAPs developed for this damage assessment will be modeled after USEPA requirements for Quality Assurance (QA) Project Plans (USEPA 2001) and USEPA Guidance for QA Project Plans (USEPA 2002a). In general, each QAP should provide sufficient detail to demonstrate that:

- The project's technical and quality objectives (i.e., data quality objectives) are identified;
- The intended measurements or data acquisition methods are appropriate for achieving project objectives;
- Assessment procedures are sufficient for confirming that data of the type and quality needed and expected are obtained; and
- Any limitations on the use of the data can be identified and documented.

Accordingly, the plans developed for this assessment will address the four general elements identified by USEPA guidance as described below:

- 1) Project Management - documents that the project has a defined goal(s), that the participants understand the goal(s) and the approach to be used, and that the planning outputs are documented;
- 2) Data Generation and Acquisition - ensures that all aspects of project design and implementation including methods for sampling, measurement and analysis, data collection or generation, data handling, and Quality Control (QC) activities are identified and documented;
- 3) Assessment and Oversight - assesses the effectiveness of the implementation of the project and associated QA and QC activities; and
- 4) Data Validation and Usability - addresses the QA activities that occur after the data collection or generation phase of the project is completed.

Data availability will be managed in compliance with USFWS procedures to ensure that it is accurate and accessible for this NRDAR. The final study plans and other documents for this case are housed on the DOI Damage Assessment and Restoration Tracking System website and are available to the public.

Raw data will be housed within a USFWS digital data repository characterized by a persistent identifier. The repository allows for both public and private access so that confidentiality can be maintained if deemed appropriate.

Various data sources are available to assess baseline conditions and inform understanding of natural resource injuries that occurred as a result of releases from the site. Data sources will be screened to verify that supporting documentation is sufficient to allow for an evaluation of the reliability and usability of the information. Individual injury assessment study plans and reports will discuss any relevant uncertainties. Analytical data will be validated by an independent third party using the QAP and USEPA Guidance on Environmental Verification and Validation (USEPA 2002b). Required information will differ with data and information types, but may include:

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- Sampling methodology, including information on sample locations, environmental media sampled, and measurement units;
- Chemical analysis, including information on detection limits and methodology accompanying quality assurance/quality control (QA/QC) data or separate QA/QC report;
- Raw data or data tabulations (e.g., rather than figures only); and
- Agreement that the data collection methods/analysis were appropriate (e.g., agreed upon by technical experts in a published in a peer reviewed journal; approved by the USEPA for use in the remedial process; or agreed upon by the Trustees).

The Trustees may compile data from multiple sources to assess injury. Quality checks will be made on all data that is keyed into an electronic format. Metadata will meet an acceptable metadata standard such as ISO 17025, 25 Pa. Code Chapter 252, FGDC CSDGM, or ISO 19115. Digital repositories will meet appropriate guidelines with persistent identifiers and machine-readable open formats.

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