Tri-State Mining District Watershed

Kansas, Missouri, and Oklahoma

U.S. Environmental Protection Agency, Region 7

June 2023

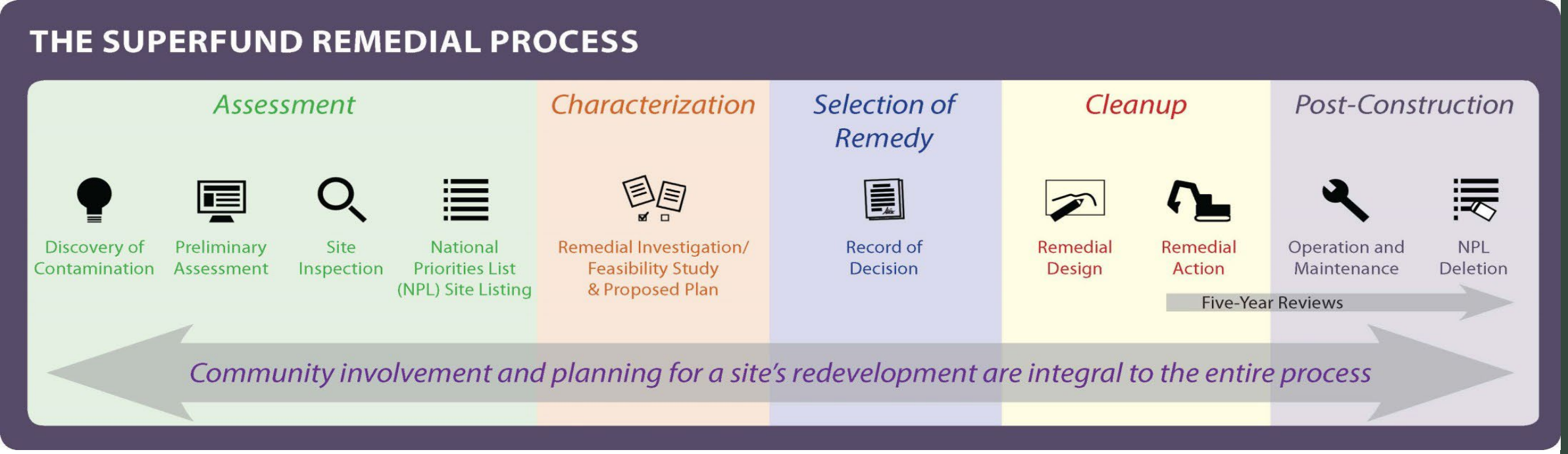
Overview

- Introduction to Superfund and its processes
- Learn about the Tri-State Mining District
- Identify the current status of each Superfund site in the overall Superfund process
- Review the watershed and the site operable units that pertain to it
- Explore ways to keep communities and families safe from lead hazards

What is Superfund?

- In 1980 Congress established the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) – also known as “Superfund”
- This act allows the EPA to clean up contaminated sites and requires potentially responsible parties to perform cleanups or reimburse the government for EPA-led cleanup work
- The National Oil and Hazardous Substances Pollution Contingency Plan, more commonly called the National Contingency Plan (NCP), is the federal government's blueprint for responding to both oil spills and hazardous substance releases
- Goals of Superfund:
  - Protect human health and the environment by cleaning up contaminated sites
  - Make potentially responsible parties pay for cleanup work
  - Involve communities in the Superfund process
  - Return Superfund sites to productive use

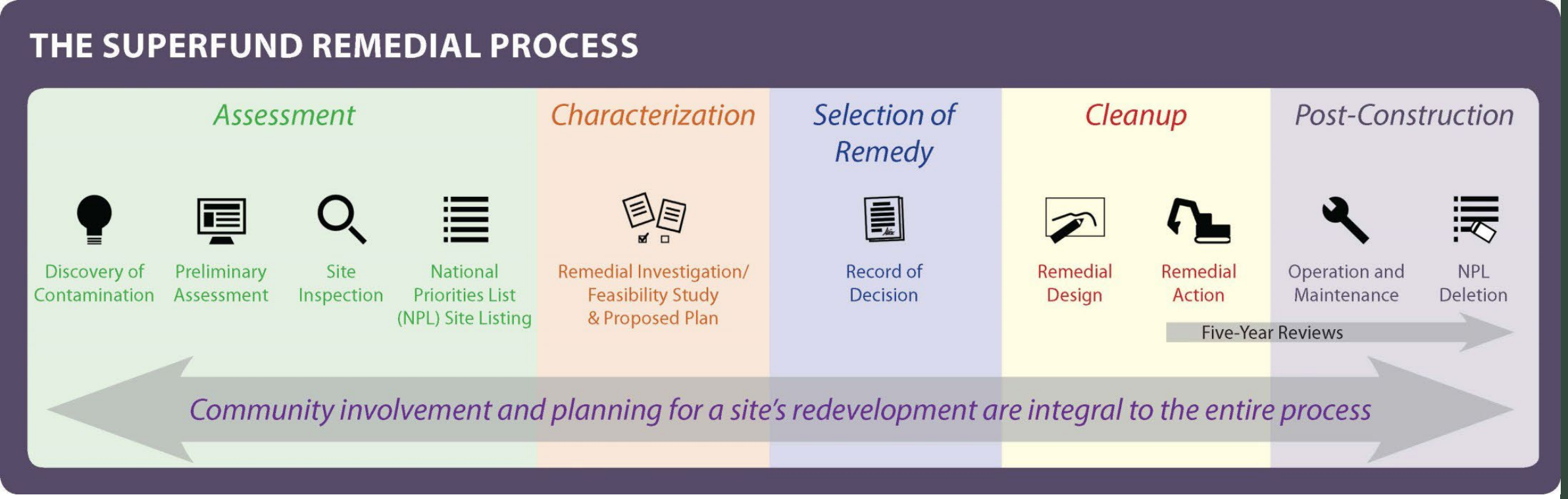
For additional information: www.epa.gov/superfund/what-superfund
Superfund community guide: https://semspub.epa.gov/work/HQ/175197.pdf



The Superfund Process

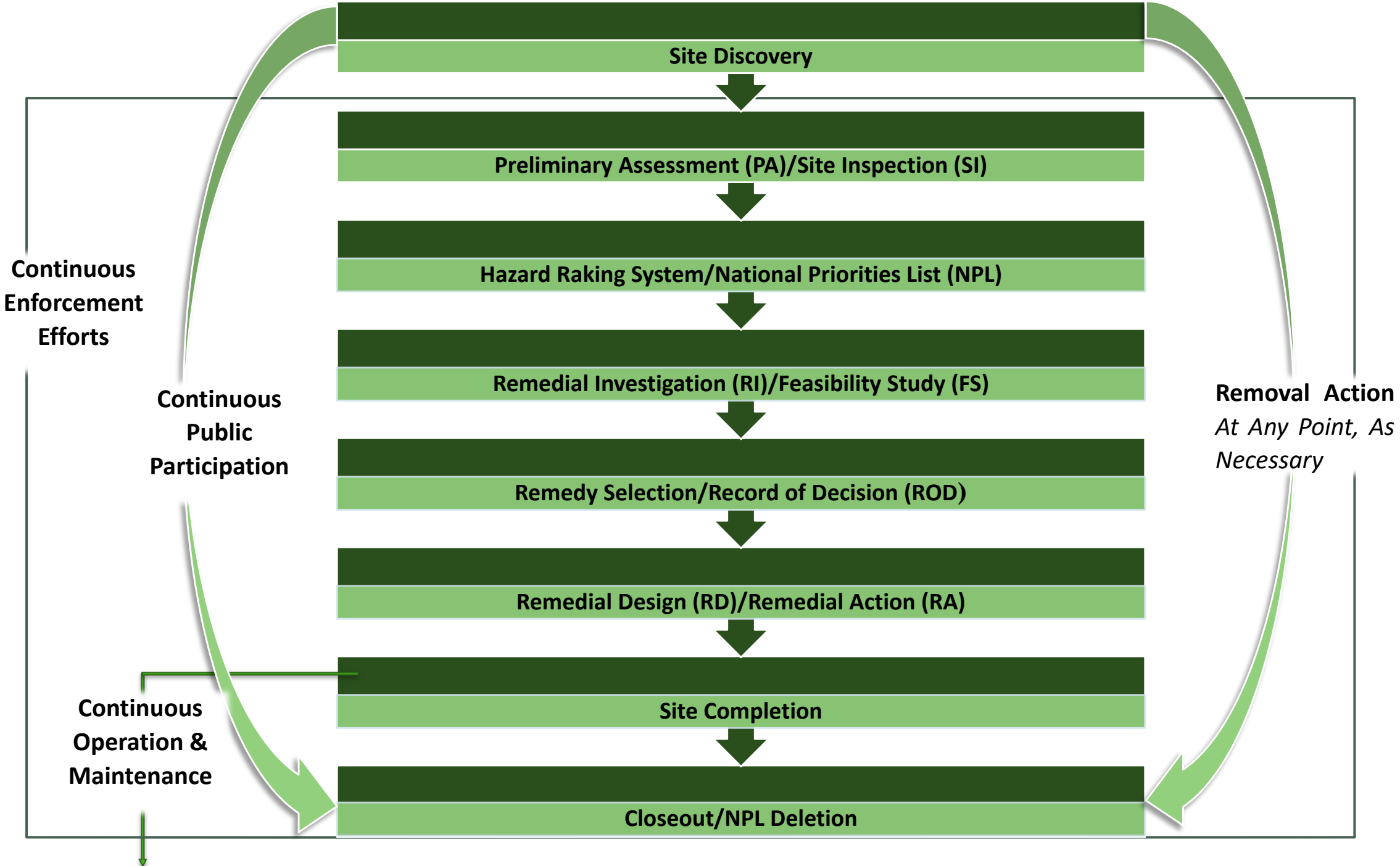
1. A preliminary assessment and site inspection of discovered contamination
2. National Priorities List (NPL) site listing process is launched
3. Remedial investigation and feasibility study (RI/FS) is conducted to characterize the site
4. The Record of Decision (ROD) documents EPA's selected remedy, based on a weighing of alternatives
5. Remedial Design/Remedial Action (RD/RA) detail the cleanup plans and procedures

*A removal action can happen at any point during this process, as necessary



The Superfund Process (continued)

6. Operation and Maintenance activities may follow the cleanup actions to ensure that the remedy continues to perform as intended and remains protective of human health and the environment
7. National Priority List Deletion is achieved once site completion determines that no further response is required at the site, all cleanup levels have been achieved, and the site is deemed protective of human health and the environment
8. Five Year Reviews are conducted as a comprehensive assessment of the performance of an environmental cleanup and its ongoing protectiveness of human health and the environment


Site Discovery
Preliminary Assessment (PA)/Site Inspection (SI)
Hazard Raking System/National Priorities List (NPL)
Remedial Investigation (RI)/Feasibility Study (FS)
Remedy Selection/Record of Decision (ROD)
Remedial Design (RD)/Remedial Action (RA)
Site Completion
Closeout/NPL Deletion
Continuous Enforcement Efforts
Continuous Public Participation
Continuous Operation & Maintenance
Removal Action
At Any Point, As Necessary

Details on the Characterization Process

This section is focused on the characterization of the full remedial process

Site Characterization: Remedial Investigation (RI)

The RI is an in-depth study designed to gather data needed to determine the nature and extent of contamination at a Superfund site

During the RI, a Superfund site is characterized according to its contamination (location, identification, concentration, etc.) and according to its site characteristics: geography, geology/soil types, climate, groundwater table and flow

The investigation involves the further evaluation of the nature and extent of the contamination on site, in addition to assessing potential threats to human health and the environment

Site Characterization: Feasibility Study (FS)

The FS is the mechanism for the development, screening, and detailed evaluation of alternatives for remedial actions

This report establishes site cleanup criteria, identifies preliminary alternatives for remedial action, and supports technical and cost analyses of alternatives

Data collected in the RI influence the studies and additional field investigations development of remedial alternatives in the FS, affecting the scope of treatability

Details on Remedy Selection

This section is focused on the remedy selection portion of the full remedial process

Proposed Plan

Based on results of the RI/FS, EPA will develop a Proposed Plan for cleaning up the site

The Agency will hold a meeting by issuing a public notice through the local media to notify the community. Interested members of the community can then comment and discuss the Proposed Plan

Before selecting the remedy, EPA will develop a Responsiveness Summary to formally respond to public comments received. If, based on public comments, the Proposed Plan is changed substantially, EPA will issue an explanation of the changes made and invite public comment on the changes

Record of Decision (ROD)

-The ROD presents the cleanup plan for addressing site contamination

-This document furthermore certifies that the remedy complies with CERCLA, outlines the technical goals of the remedy, provides background information on the site, summarizes the analysis of alternatives, and explains the rationale for the remedy selected

-The ROD additionally marks the transition from the RI/FS stage to the RD/RA stage in the remedial process

ROD Criteria

Threshold

- Overall protection of human health and the environment
- Compliance with applicable or relevant and appropriate requirements (ARARs)

Balancing

- Long term effectiveness and permanence
- Short-term effectiveness
- Reduction of toxicity, mobility or volume through treatment
- Implement ability and cost

Modifying

- State and supporting agency acceptance
- Community acceptance

The nine evaluation criteria are separated into three groups:

Threshold Criteria:
These are minimum requirements that each response measure must meet to be eligible for selection as a remedy

Balancing Criteria:
These are factors by which tradeoffs between response measures are addressed so that the best options will be chosen, given site-specific data and conditions

Modifying Criteria:
New information or comments from the state or the community on the Proposed Plan here may modify the preferred response measure or cause another response measure to be considered

No Action, Interim Action, Early Action & Contingency Remedy RODs

- No Action RODs may be issued under the following circumstances:
  - When the site, a specific problem, or area of a site poses no current potential risk
  - When CERCLA does not provide authority for remedial action
  - When previous response eliminated the need for further remedial response
- Interim Action RODs are limited in scope and may be used:
  - To take quick action to protect human health and the environment from imminent threat short term while a final remedial solution is being developed
  - To temporarily stabilize a site or operable unit (OU)
- Early Action RODs may be either interim or final and selected before the completion of a RI and FS for a given OU
- Contingency Remedy RODs may be appropriate to use when there is significant uncertainty about the ability of remedial options to achieve remediation levels

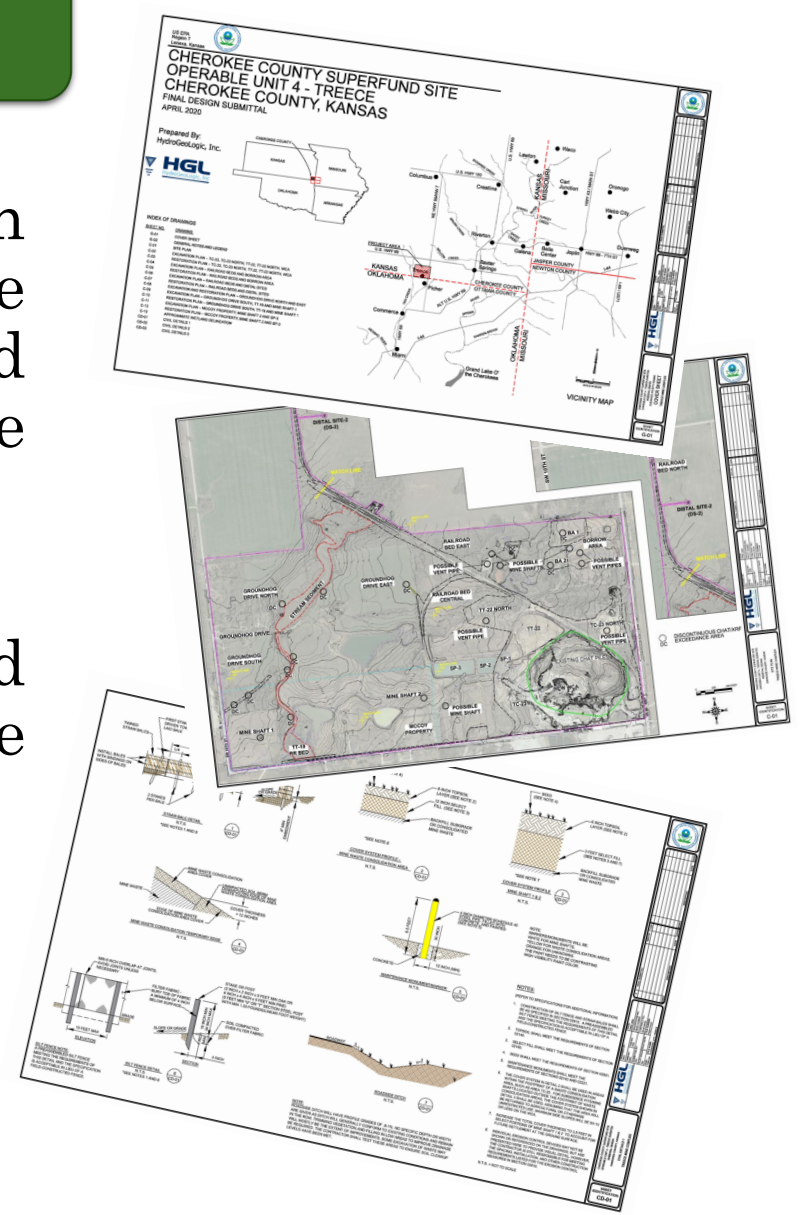
Details on Cleanup

This section is focused on the Remedial Design and Remedial Action portion of the full remedial process each Superfund Site is currently under

Remedial Design (RD)

- RD is an engineering phase during which additional technical information and data are incorporated into technical drawings and specifications developed for implementing the remedial action

- These specifics are based upon the detailed description of the Selected Remedy and the cleanup criteria provided in the ROD



Remedial Action (RA)

- Remedial action follows design, and involves the actual construction or implementation of site cleanup activities
- A remedial action completion report is prepared upon finalizing remedial action, either for a specific remediation project or an operable unit
- Upon completion of the remedial construction activities for the final operable unit at the site, a Preliminary Site Closeout Report (PCOR) is prepared which documents NPL site construction completion

Details on the Tri-State Mining District

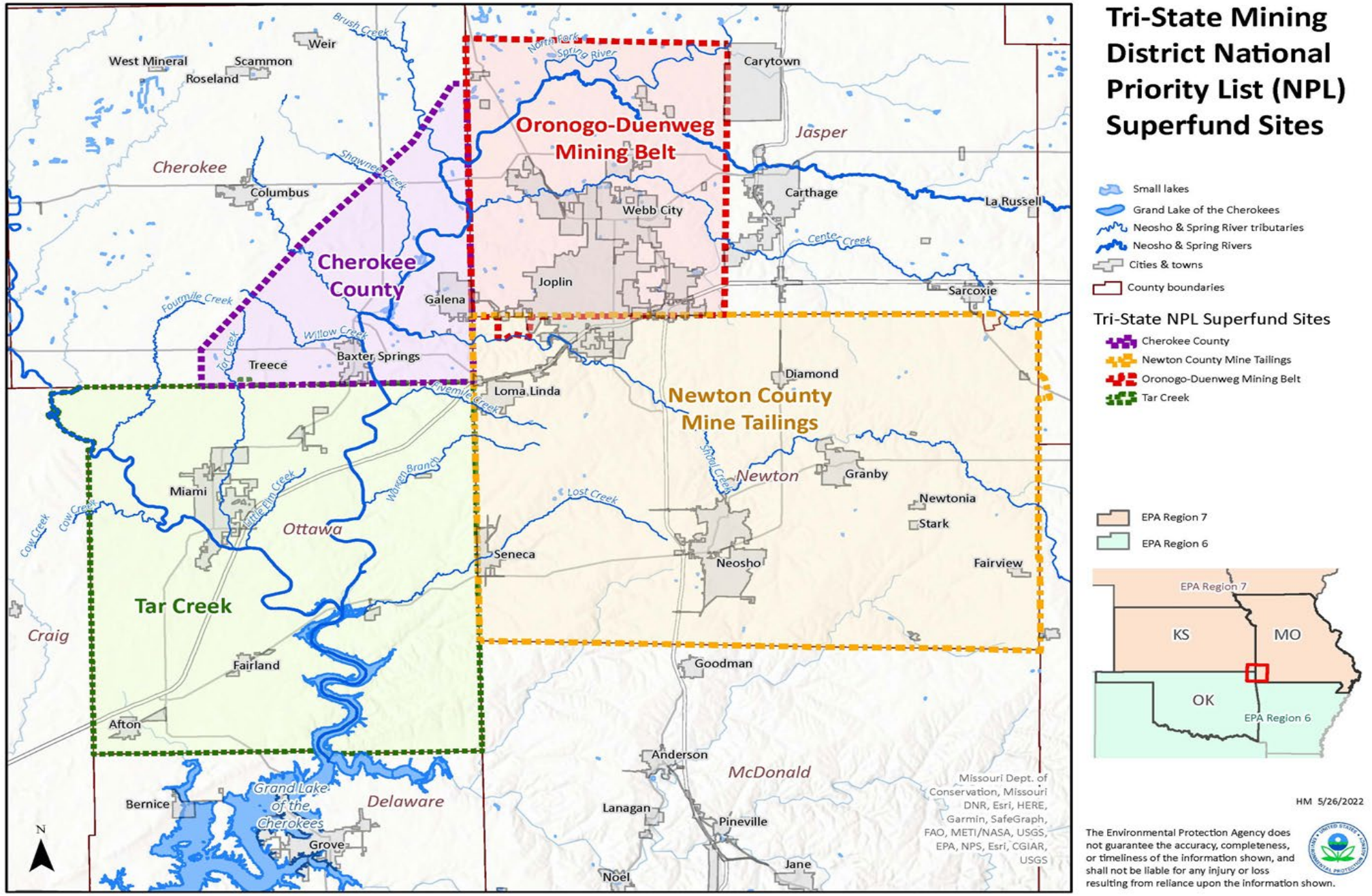
This section is focused on the Superfund sites within Tri-State currently undergoing remedial processes

Tri-State Mining District

- The Tri-State Mining District (TSMD) was once one of the richest lead and zinc ore deposits in the world encompassing about 2,500 square miles in Oklahoma, Kansas, and Missouri
- Mining, milling, and smelting of lead and zinc ores began in the 1850s and continued in some areas until the 1970s

Four Superfund sites are located within the TSMD in two EPA Regions:

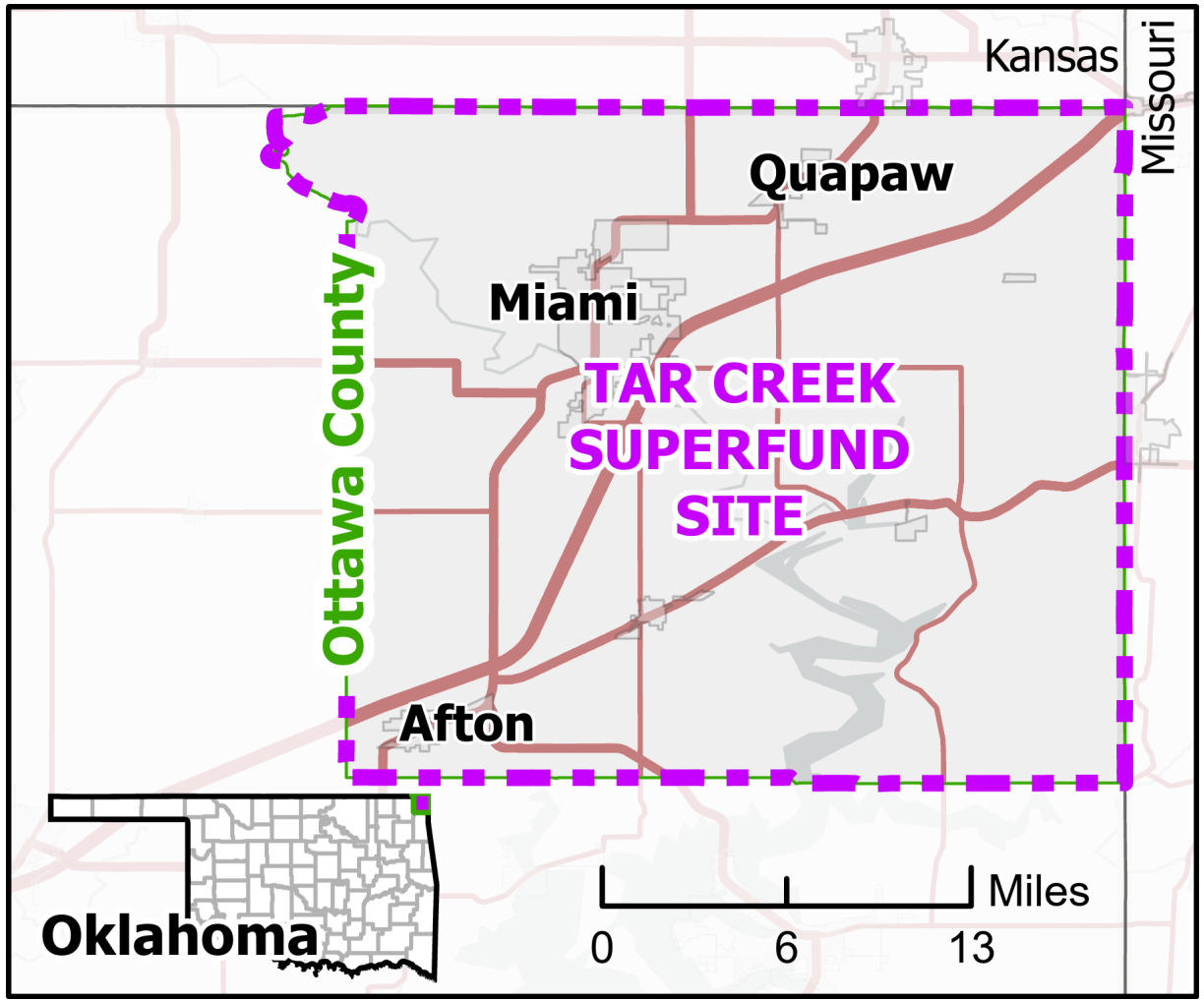
- Region 6:
  - Tar Creek (Ottawa County, Oklahoma)
- Region 7:
  - Cherokee County (Cherokee County, Kansas)
  - Oronogo-Duenweg Mining Belt (Jasper and portions of Newton County, Missouri)
  - Newton County Mine Tailings (Newton and portions of Lawrence County, Missouri)


Tri-State Mining District National Priority List (NPL) Superfund Sites
Small lakes
Grand Lake of the Cherokees
Neosho & Spring River tributaries
Neosho & Spring Rivers
Cities & towns
County boundaries
Tri-State NPL Superfund Sites
Cherokee County
Newton County Mine Tailings
Oronogo-Duenweg Mining Belt
Tar Creek
EPA Region 7
EPA Region 6
KS
MO
OK
HM 5/26/2022
The Environmental Protection Agency does not guarantee the accuracy, completeness, or timeliness of the information shown, and shall not be liable for any injury or loss resulting from reliance upon the information shown.
Missouri Dept. of Conservation, Missouri DNR, Esri, HERE, Garmin, SafeGraph, FAO, METI/NASA, USGS, EPA, NPS, Esri, CGIAR, USGS
N
Oronogo-Duenweg Mining Belt
Cherokee County
Newton County Mine Tailings
Tar Creek
Cherokee
Jasper
Newton
Ottawa
Craig
Delaware
McDonald
West Mineral
Scammon
Roseland
Weir
Carytown
Columbus
Webb City
Carthage
La Russell
Joplin
Galena
Sarcoxie
Treece
Baxter Springs
Loma Linda
Diamond
Granby
Newtonia
Stark
Miami
Seneca
Neosho
Fairview
Goodman
Fairland
Afton
Bernice
Grand Lake of the Cherokees
Grove
Anderson
Lanagan
Pineville
Jane
Noel
Brush Creek
North Fork Spring River
Shawnee Creek
Center Creek
Fourmile Creek
Willow Creek
Tar Creek
Fivemile Creek
Warren Branch
Turtle Elm Creek
Lost Creek
Shoal Creek
Cow Creek

How Mining Creates Toxic Waste

- Toxic metals such as lead, zinc, and cadmium are released into the environment through mining operations, waste rock, and tailings
- Chat is the left-over waste rock produced when bedrock is separated from ore-bearing minerals, and the left-over fragments are left in piles on the earth's surface
- Tailings have undergone mechanical and chemical processes to extract the metal which result in more fine-grained crushed rock mixed with water
- Both are dangerous as they allow toxic metals to contaminate the surrounding ground water, soil, sediment, and surface water

Tar Creek Superfund Site
Ottawa County, Oklahoma (EPA Region 6)

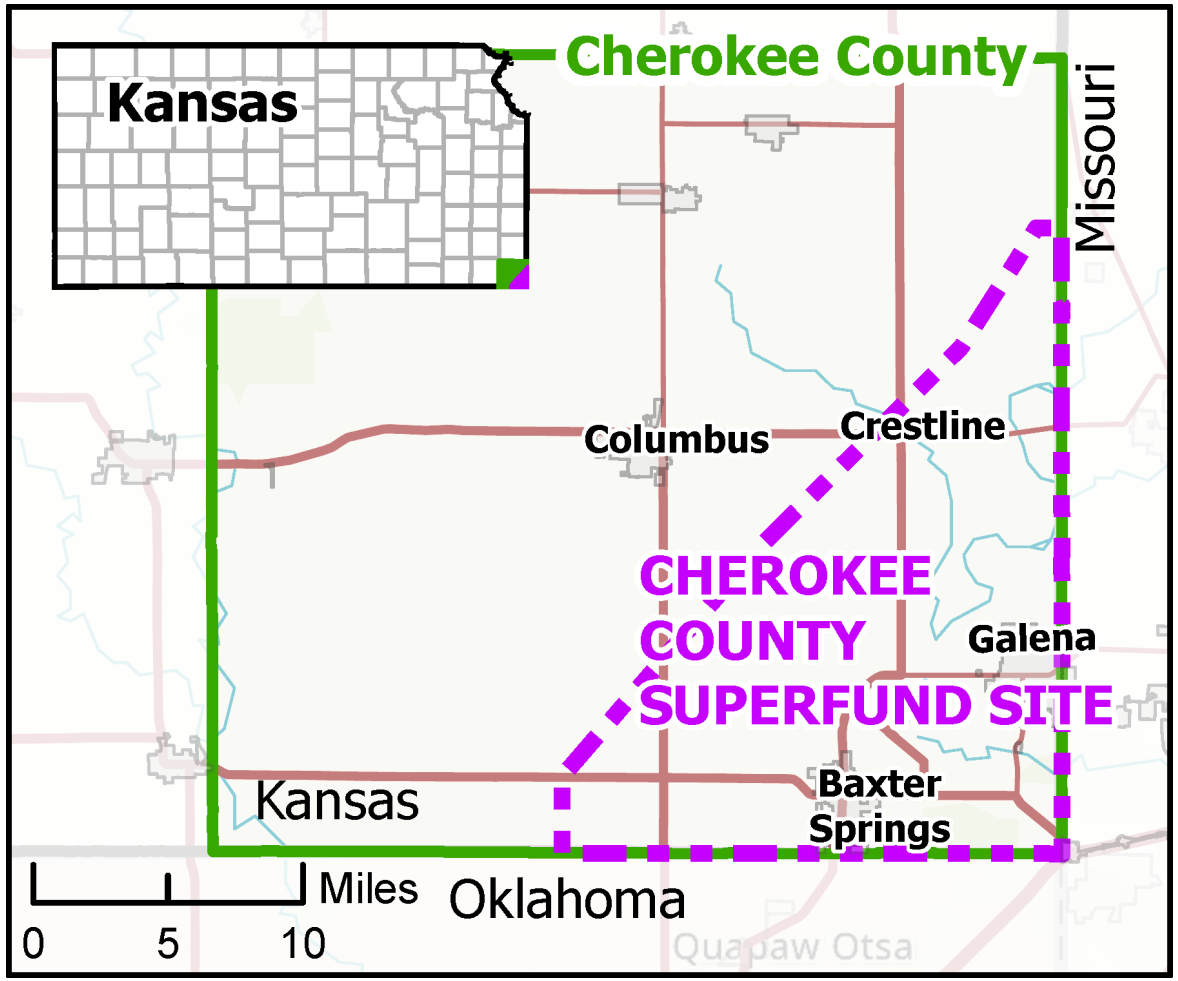


- Based on production records maintained by the U.S. Department of Interior (DOI), Bureau of Mines, a total of 181,048,872 tons of crude ore was produced from the Oklahoma portion of the TSMD
- In 1979 acid mine water began flowing to the surface and draining into Tar Creek
- EPA placed the site on the NPL in 1983
- This is the first NPL site to have a cleanup conducted by a Native American tribe - Quapaw Nation

Additional information: Tar Creek Superfund site: https://epa.gov/superfund/tar-creek

Cherokee County Superfund Site

Cherokee County, Kansas (EPA Region 7)

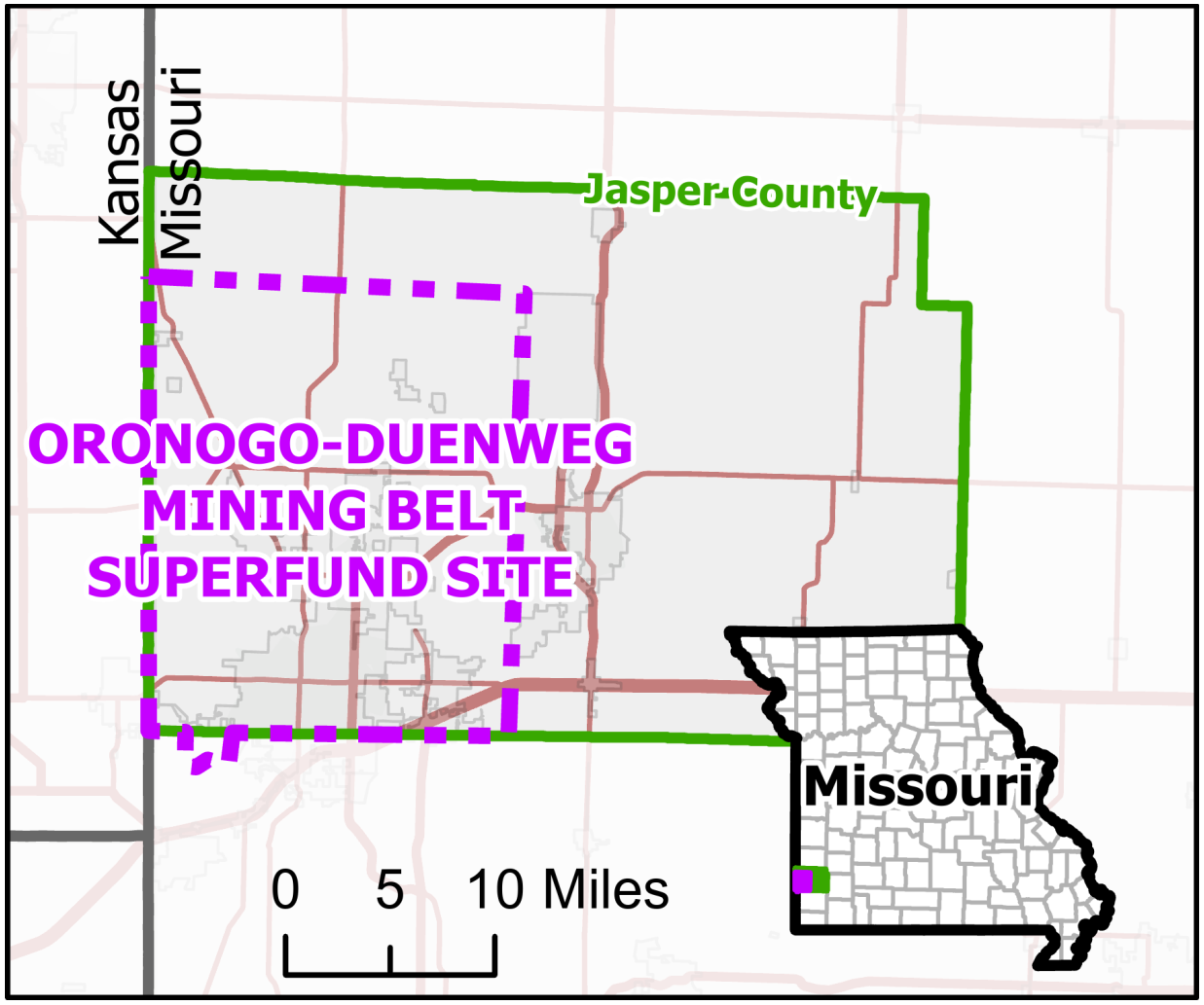


- Covering 115 square miles, 4,000 acres of this Superfund Site holds mine tailings from over 100 years of widespread lead and zinc mining that ended in 1970
- EPA placed the site on the NPL in 1983. Cleanup focuses on consolidation and disposal of wastes to reduce human and ecological exposures
- Heavy metals in these wastes are a continuing source of surface soil and groundwater contamination in the Spring River and Tar Creek watershed

Additional information: Cherokee County Superfund site: https://epa.gov/superfund/cherokeecounty

Oronogo-Duenweg Mining Belt Superfund Site

Jasper and Newton County, Missouri (EPA Region 7)

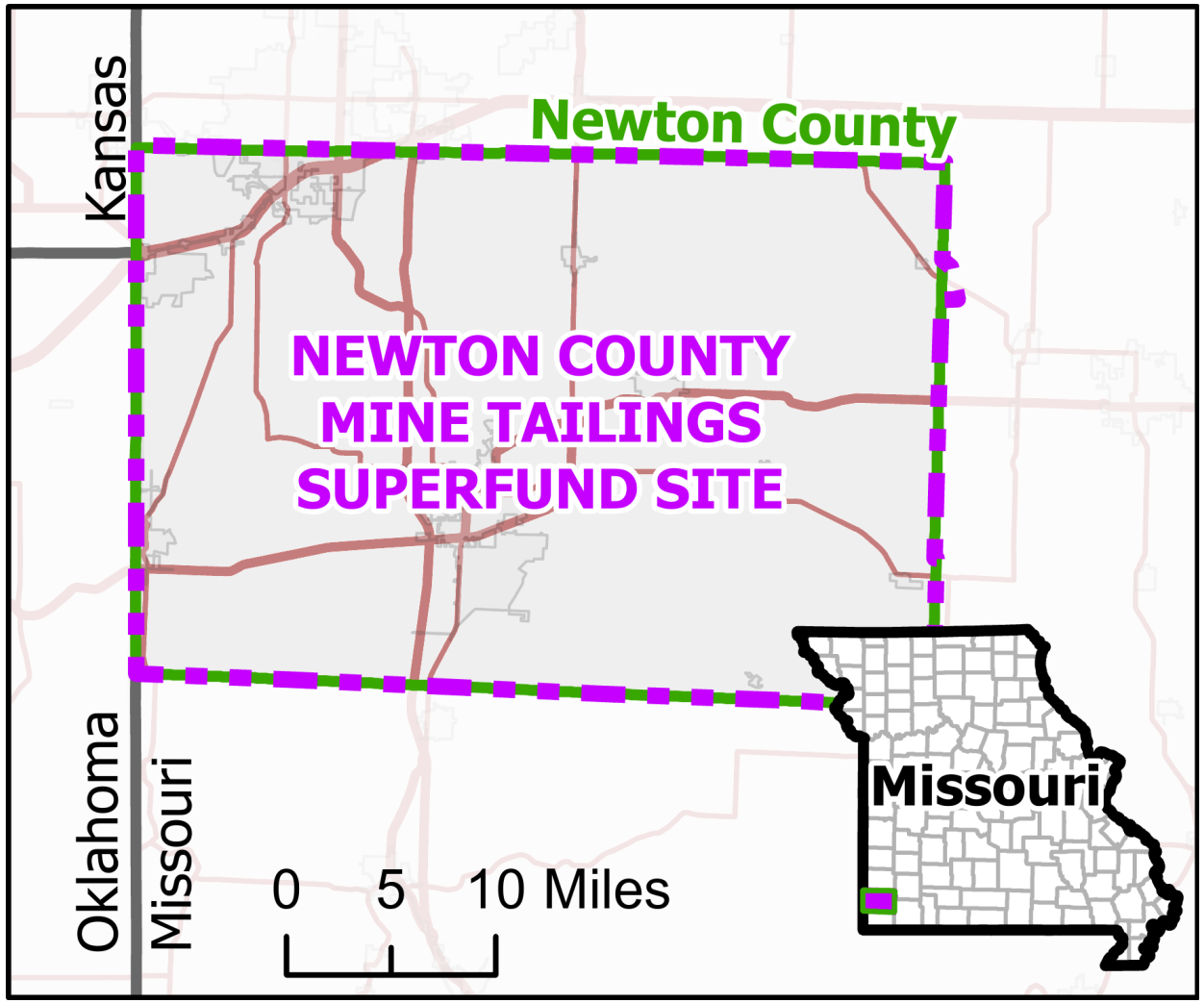


- This site consists of 250 square miles in and around Joplin, Missouri
- EPA placed the site on NPL in 1990
- Distribution of nearly 150 million tons of mining and milling wastes across an 11,000-acre area, as well as the 10 million tons of waste remaining on site

Additional information: Oronogo-Duenweg Mining Belt Superfund site:https://www.epa.gov/superfund/oronogoduenwegmining

Newton County Mine Tailings Superfund Site

Newton and Lawrence County, Missouri (EPA Region 7)



- The site covers all of Newton County, Missouri and a portion of Lawrence County, Missouri
- EPA added this site on the NPL in 2003
- The site is separated into five subdistricts that generally include the 14 mining camps:
  - Granby
  - Spring City/Spurgeon
  - Wentworth
  - Diamond
  - Stark City

Additional Information: Newton County Mine Tailings Superfund Site https://epa.gov/superfund/newtoncountymine

Mine Waste Source Control

Mine waste (chat and tailings) are the source of heavy metal contamination in the TSMD. EPA has selected clean up strategies that include source control and exposure control.

To meet the need for source control, there are remediation goals and remedy components for addressing the mine waste such as promoting proper surface drainages and managing erosion.

For exposure control, the remedy includes institutional controls such as zoning or deed restrictions.

The removal actions for contaminated residential yard soil and alternative water supplies to replace the contaminated private residential water wells continues to address immediate health risks to communities.

Residential yards additionally represent public use areas, and child high-use areas (such as child-care facilities, public parks, and playgrounds).

Tri-State Mining District Cleanup Progress

*as of: November 2022

Tar Creek Superfund Site Oklahoma	Cherokee County Superfund Site Kansas
Nearly 3,000 residential yards and high-access areas remediated	Over 800 residential yards and high-access areas remediated
Over 4 million tons of mining waste and soil remediated	14.5 million tons of mining waste and soil remediated
Plugged over 83 abandoned ground water wells	Two rural water wells were constructed, 60 miles of pipeline to serve nearly 500 households
Approximately 800 acres are ready for reuse	Nearly 2,800 acres are ready for reuse
Cleanup of a former smelter facility	Cleanup of former Eagle Pitcher facility

Tri-State Mining District Cleanup Progress

*as of: November 2022

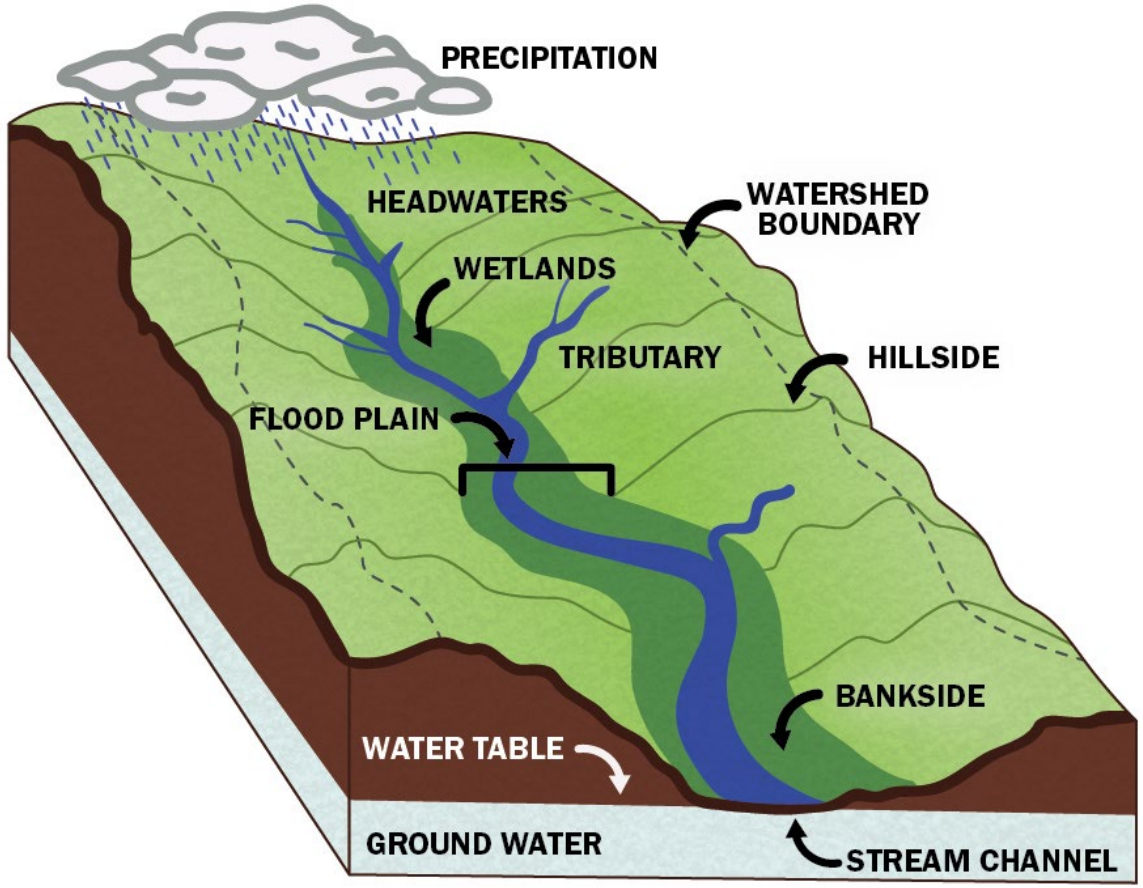
Oronogo-Duenweg Mining Belt Superfund Site Missouri	Newton County Mine Tailings Superfund Site Missouri
Nearly 2,800 residential yards and high-access areas remediated	400 residential yards and high-access areas remediated
15 million tons of mining waste and soil remediated	900 thousand tons of mining waste and soil remediated
100 households with supporting public water supply expansions	100 miles of public water supply lines and over 100 individual wells
Approximately 4,500 acres are ready for reuse	Approximately 100 acres are ready for reuse

Details on the Watersheds of Tri-State Mining District

This section is focused on the watersheds within Tri-State currently undergoing remedial characterization

What is a Watershed?

- A watershed is defined as an area where precipitation is collected and drains into a common outlet such as a river or creek
- A watershed may include large, flowing streams that are referred to as **perennial**.
- Streams that have periodic flow or flow only during rain events are referred to as **intermittent** and **ephemeral**.

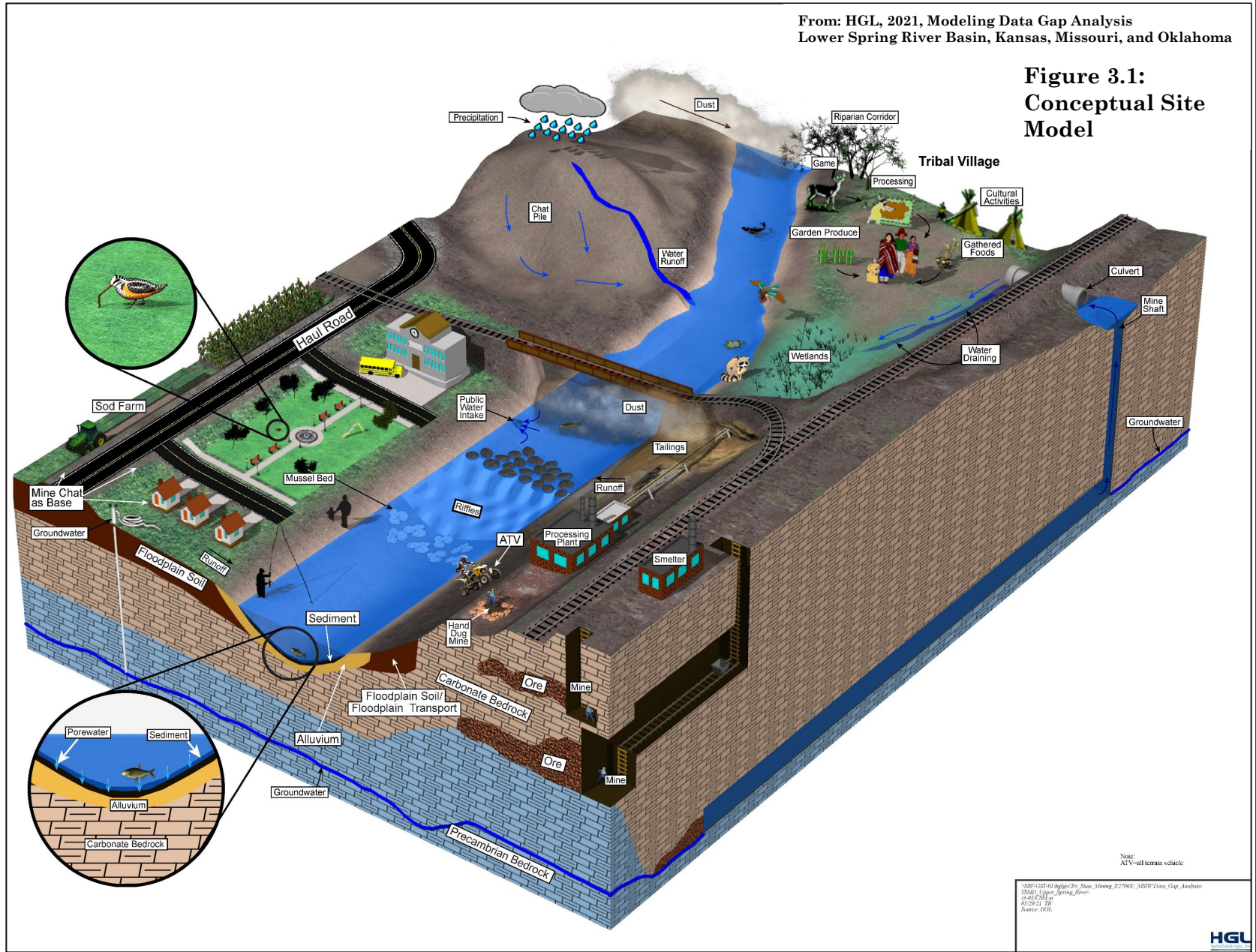


Watershed Conceptual Site Model

- The figure illustrates mine waste sources (smelter emissions, tailings piles, and other waste piles) release mechanisms and transport pathways
- Transport mechanisms for pollutants include surface erosion and runoff, collapsing tailings and waste piles into the watershed basin drainage network, and sediment transport
- Humans may experience exposure to pollutants when they contact contaminated sediments, soils, surface water, and fish tissue

From: HGL, 2021, Modeling Data Gap Analysis
Lower Spring River Basin, Kansas, Missouri, and Oklahoma

Figure 3.1: Conceptual Site Model



Tri-State Mining District Watersheds

- Within TSMD, the Spring River, Neosho River, and Lost Creek watersheds comprise the overarching TSMD watersheds for EPA purposes
- The three watersheds are impacted by mine waste sources upgradient and adjacent to streams and rivers throughout all the TSMD Superfund sites
- For EPA study purposes, the TSMD watersheds are separated into Upper and Lower units

Upper and Lower Watersheds of the TSMD

- <u>The Upper TSMD watershed is currently defined as:</u>
  - Spring River watershed up to the two dams at Empire Lake in Kansas and upstream into Missouri

- <u>The Lower TSMD watershed is currently defined as:</u>
  - Spring River watershed from the Empire Lake dams and downstream to the lake-head delta at Grand Lake O' the Cherokees
  - Neosho River watershed from its confluence with Fourmile Creek to the lake-head delta at Grand Lake O' the Cherokees
  - Lost Creek watershed from its headwaters to the lake-head delta at Grand Lake O' the Cherokees

Site Operable Units

- During cleanup, a site can be divided into several distinct areas depending on the complexity of the contamination associated with the site

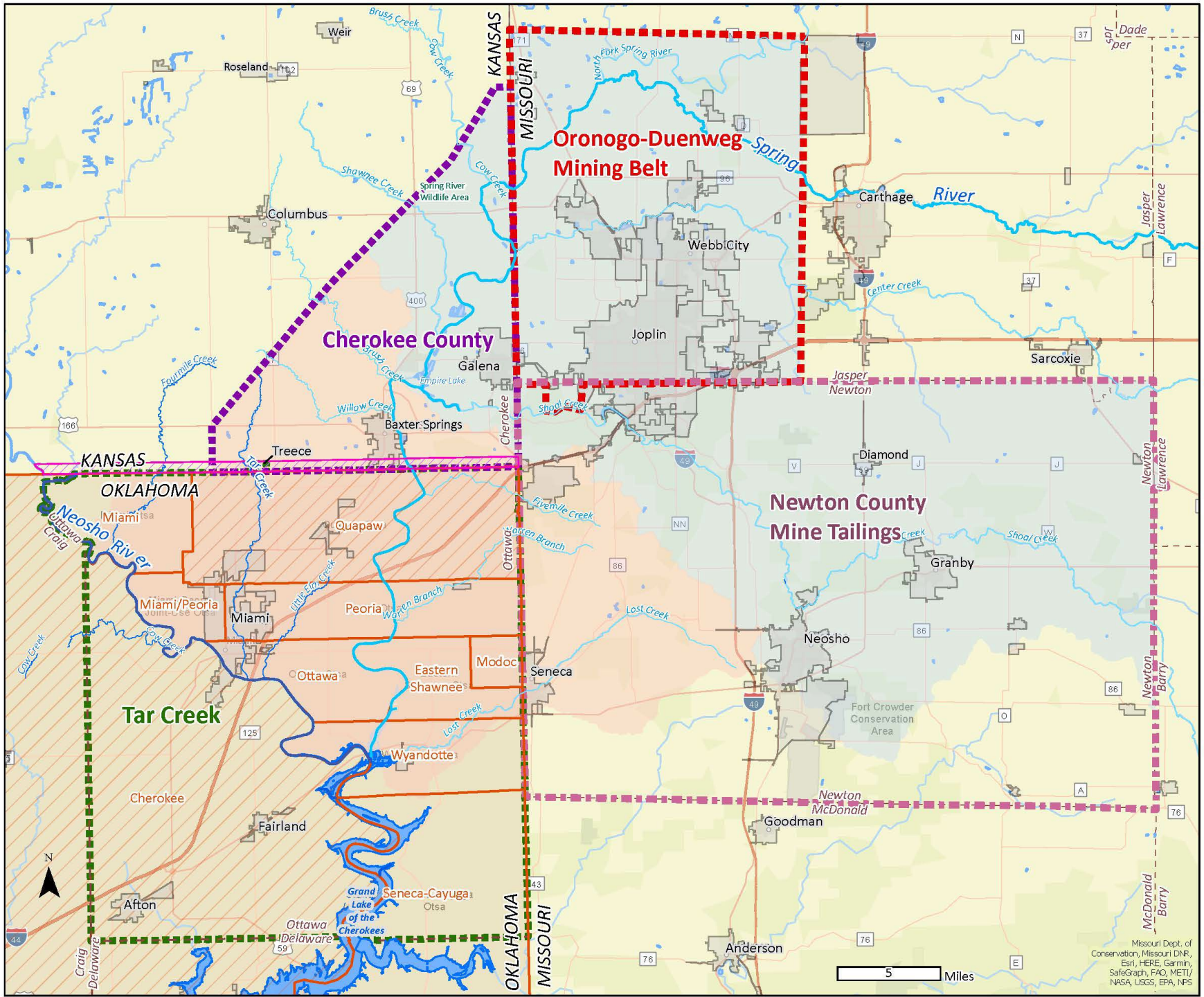
- These areas are called operable units (OUs) and address the designated areas where specific action is required

- For the TSMD watersheds there are five OUs outlined within the four TSMD sites to track activities and remedial process efforts

Operable Units of TSMD Watershed

- Cherokee County (Kansas)
  - OU2 Spring River Basin
  - OU9 Tar Creek Watershed
- Newton County Mine Tailings (Missouri)
  - OU3 Spring River Watershed
- Oronogo-Duenweg Mining Belt (Missouri)
  - OU5 Spring River Basin
- Tar Creek (Oklahoma)
  - OU5 Surface Water and Sediments

Tri-State Mining District Watershed Study Areas



National Priority List (NPL) Superfund Sites in the Tri-State Mining District

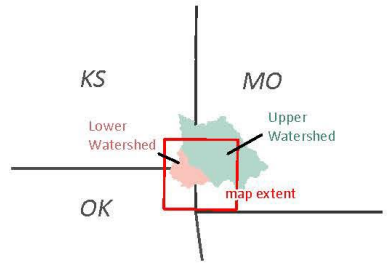
- Cherokee County
- Newton County Mine Tailings
- Oronogo-Duenweg Mining Belt
- Tar Creek

Watershed Study Areas within NPLs

- Upper TSMD Watershed: Upper Spring River
- Lower TSMD Watershed: Lower Spring River and Neosho River

Other Map Features

- Neosho River
- Spring River
- Grand Lake of the Cherokees
- Cities & towns
- County boundaries
- Neosho River tributaries
- Spring River tributaries
- Other lakes
- Tribal Reservations
- Tribal Service Areas
- Quapaw Strip



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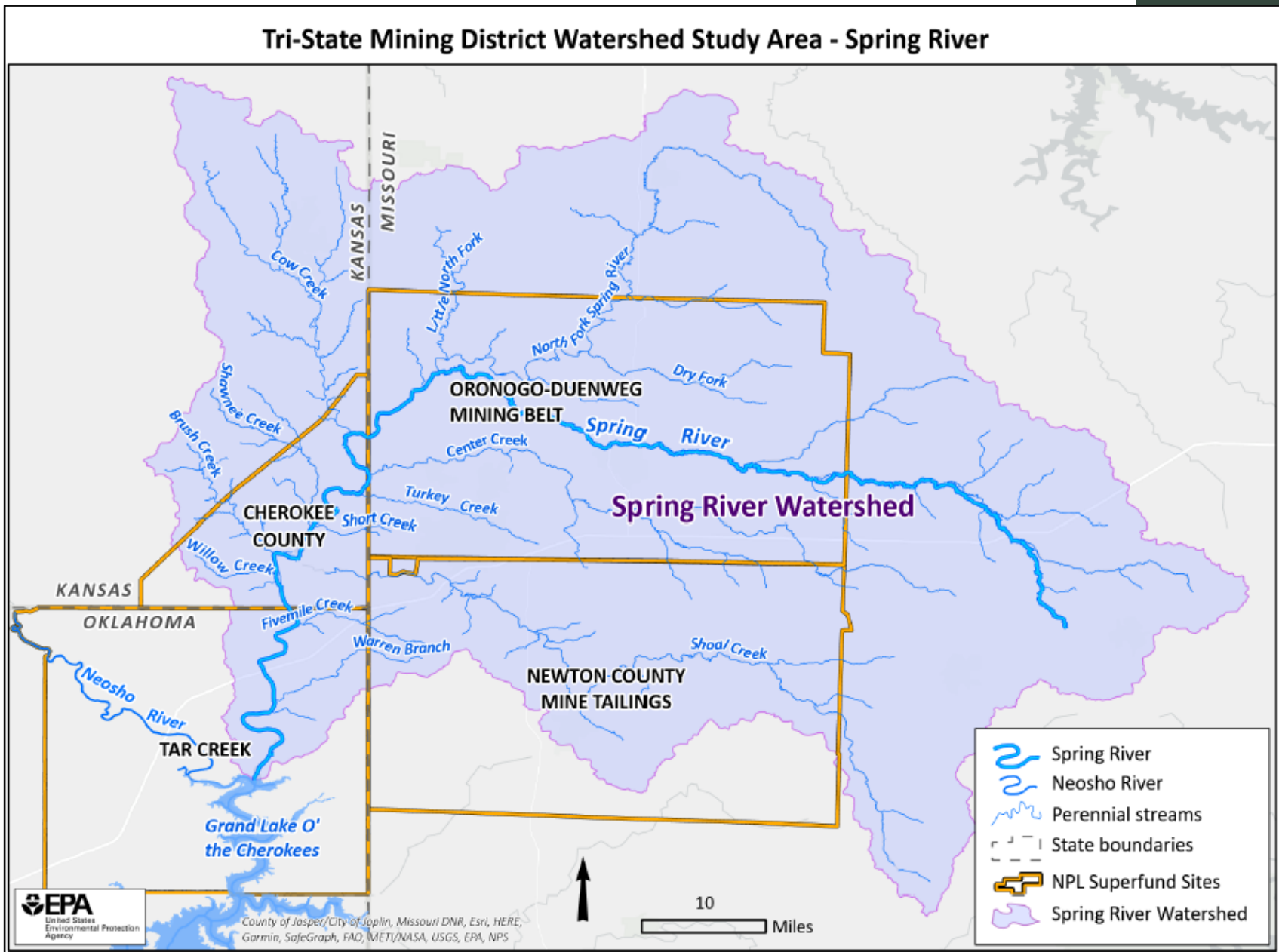
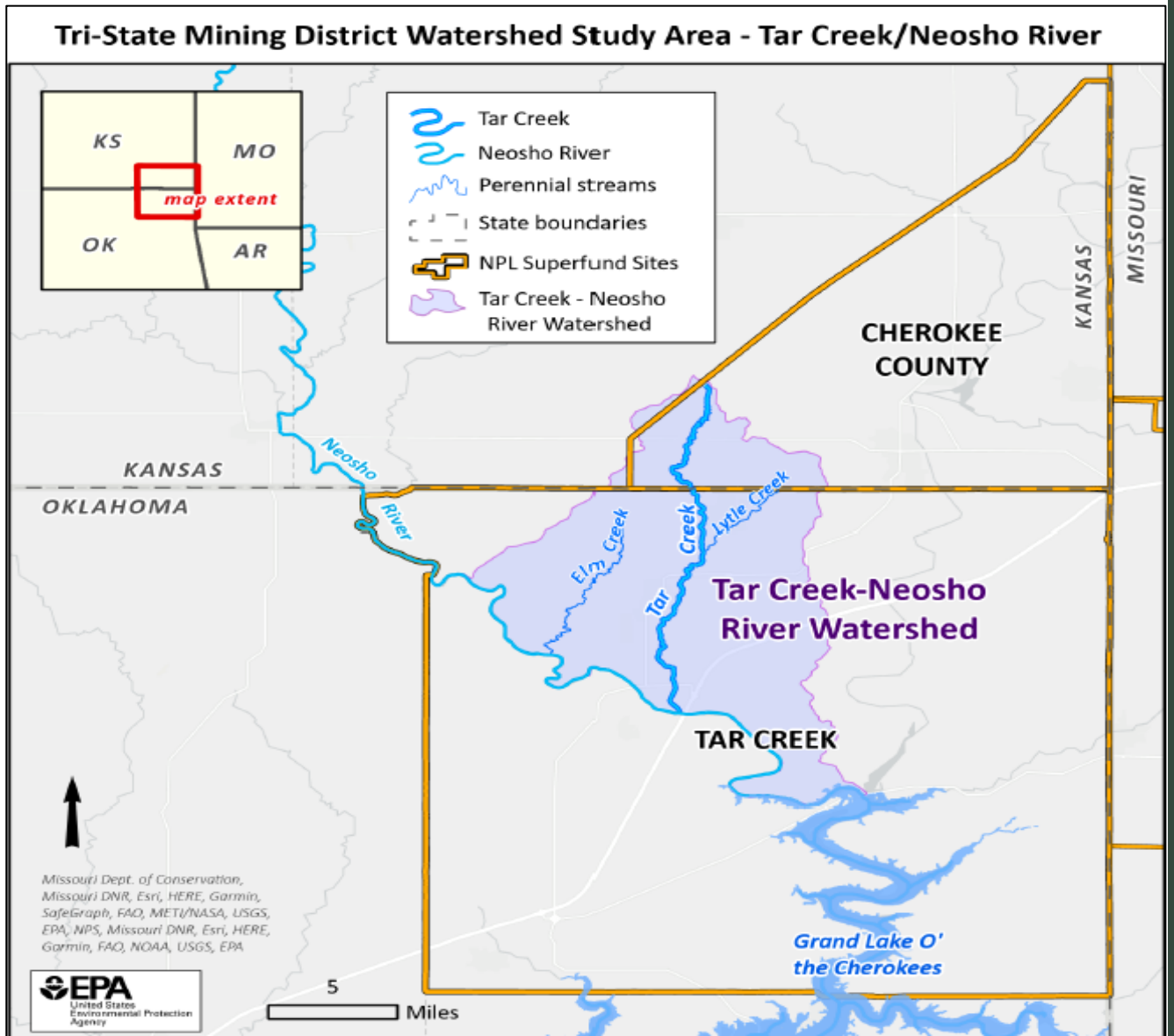
Spring River Basin Watershed

- The entire Spring River basin drains about 2,550 square miles of land in Missouri, Kansas, and Oklahoma. From its headwaters in the Ozark Highlands, the Spring River flows 125 miles to its confluence with the Neosho River, which together constitute the headwaters of Grand Lake O' the Cherokees
- The Spring River watershed includes:
  - Cow Creek
  - Shawnee Creek
  - Brush Creek
  - Center Creek
  - Turkey Creek
  - Short Creek
  - Shoal Creek
  - Willow Creek
  - Fivemile Creek
  - Warren Branch
  - North Fork Spring River



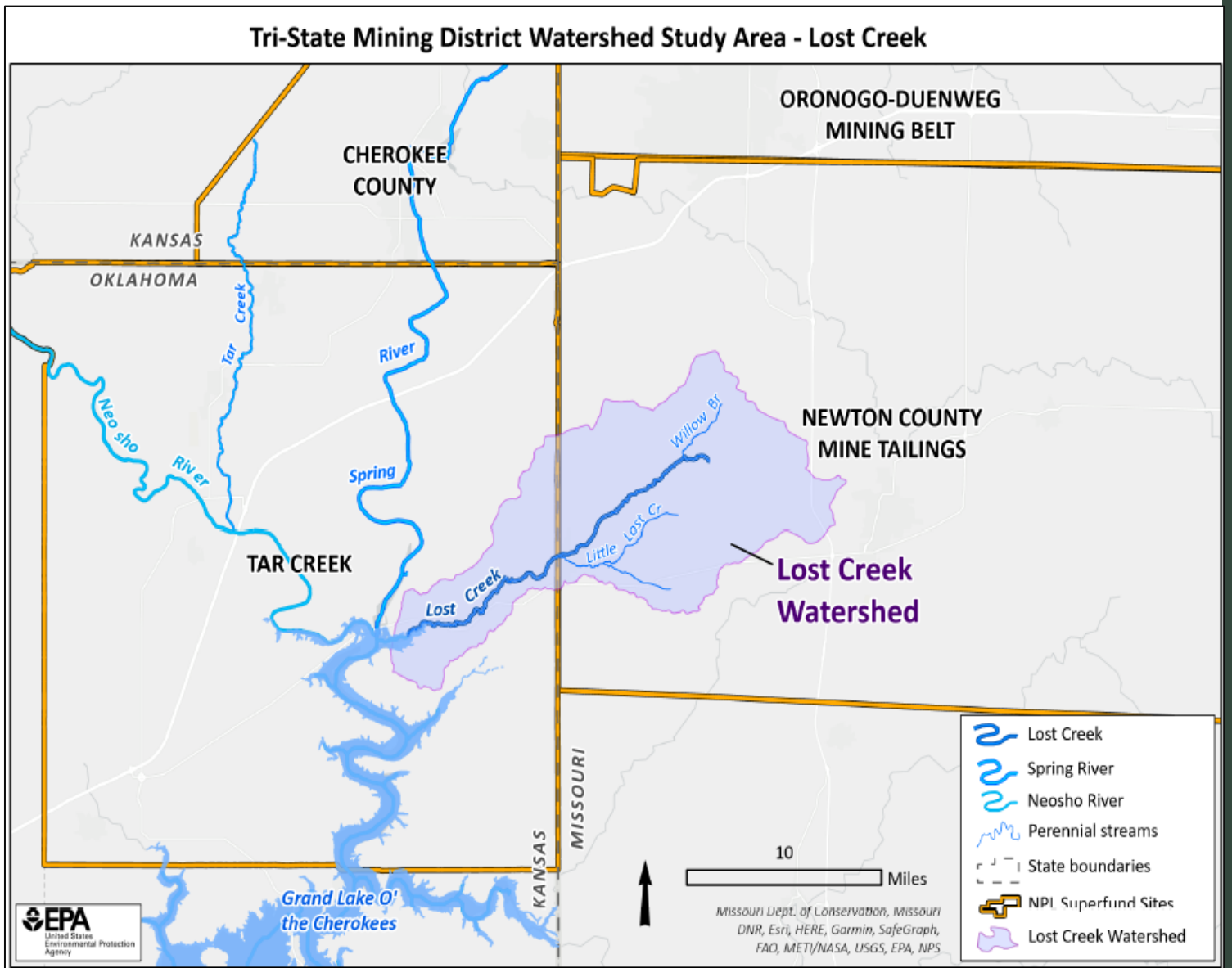
Neosho River Watershed

- The full Neosho River watershed is 6,129 square miles but only 143 square miles of watershed reside within the boundaries of the Cherokee County and Tar Creek Superfund sites
- The Neosho River watershed includes
  - Tar Creek
  - Lytle Creek
  - Elm Creek



Lost Creek Watershed

- The Lost Creek watershed falls within both the Tar Creek and Newton County Superfund sites
- The Lost Creek, Spring River, and Neosho River watershed meet to form the headwaters of the Grand Lake O' the Cherokees
- The Lost Creek watershed includes
  - Little Lost Creek
  - Willow Branch



Mine Waste Source Control in the Watershed

Sources of environmental contaminants in the watershed are dominated by releases and discharges associated with historical mining, milling, and smelting operations

The mine waste features of the TSMD are widely dispersed in with varying degrees of connectedness to surface water and some of the highest priorities for remediation (such as residential yards) may not directly influence surface water

Source control identification and prioritization are currently being conducted under the TSMD watershed RI/FS process

Besides upland source control, high-priority in-stream interim actions are being considered to include areas with high-mobility, high-concentration sediment

This allows actions to be taken to prevent the further migration of contamination where cleanup is being addressed

Remedial Focus in Tri-State Mining District Watershed

-The TSMD watershed areas have over 500 miles of perennial, intermittent, and ephemeral steam segments within the Spring River, Neosho River, and Lost Creek watersheds.

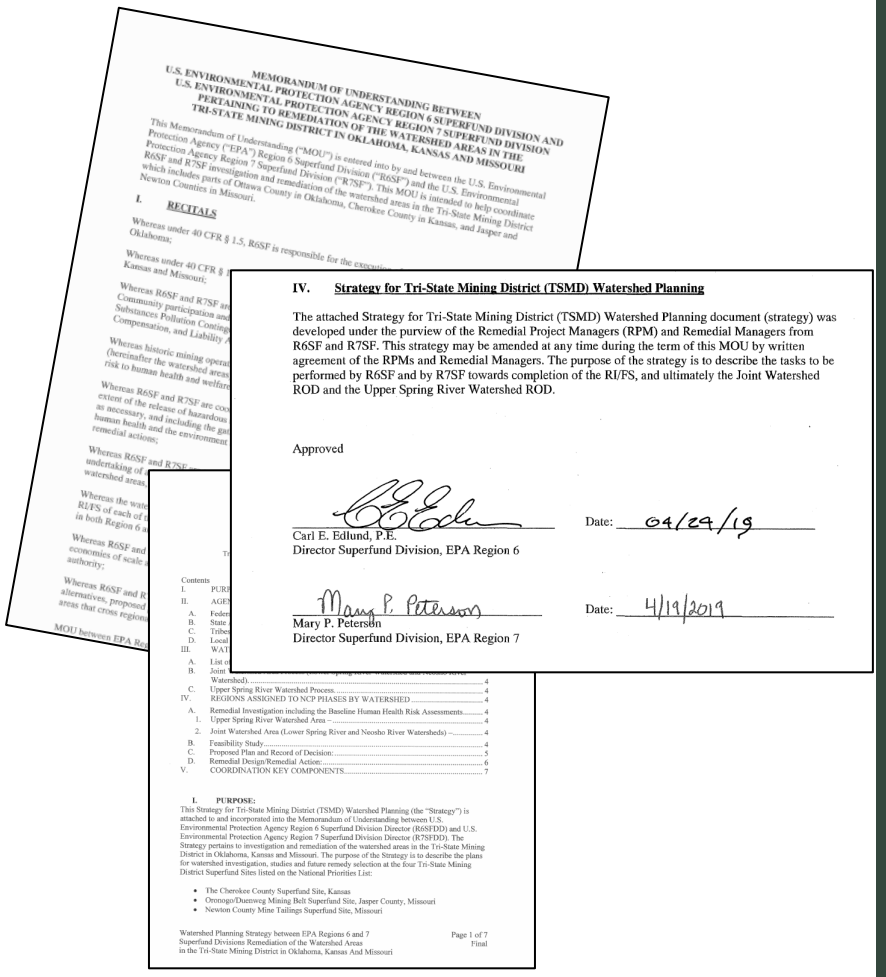
- The focus of the current RI/FS efforts is on the surface water and sediment of only the perennial streams. The other stream segments were studied previously by EPA and generally addressed under separate site actions.

- Study efforts are underway to characterize the movement of surface water and sediment within the watershed system

-This includes the sub-watersheds and floodplain soils that may be moved during flooding events and transported downstream

R6/R7 Memorandum of Understanding for TSMD Watershed Coordination

- Documentation of ongoing and future coordination related to the watershed work
  - ❖Identified lead EPA regions for different portions of the RI/FS (Characterization Phase) process
- This memorandum included a strategy document
  - ❖Included partner and stakeholder comment period
- Signed April 2019



MEMORANDUM OF UNDERSTANDING BETWEEN
U.S. ENVIRONMENTAL PROTECTION AGENCY REGION 6 SUPERFUND DIVISION AND
U.S. ENVIRONMENTAL PROTECTION AGENCY REGION 7 SUPERFUND DIVISION
PERTAINING TO REMEDIATION OF THE WATERSHED AREAS IN THE
TRI-STATE MINING DISTRICT IN OKLAHOMA, KANSAS AND MISSOURI

IV. Strategy for Tri-State Mining District (TSMD) Watershed Planning

The attached Strategy for Tri-State Mining District (TSMD) Watershed Planning document (strategy) was developed under the purview of the Remedial Project Managers (RPM) and Remedial Managers from R6SF and R7SF. This strategy may be amended at any time during the term of this MOU by written agreement of the RPMs and Remedial Managers. The purpose of the strategy is to describe the tasks to be performed by R6SF and by R7SF towards completion of the RI/FS, and ultimately the Joint Watershed ROD and the Upper Spring River Watershed ROD.

Approved

Carl E. Edlund, P.E.
Director Superfund Division, EPA Region 6
Date: 04/29/19

Mary P. Peterson
Director Superfund Division, EPA Region 7
Date: 4/19/2019

Contents

I. PURPOSE:

This Strategy for Tri-State Mining District (TSMD) Watershed Planning (the "Strategy") is attached to and incorporated into the Memorandum of Understanding between U.S. Environmental Protection Agency Region 6 Superfund Division Director (R6SFDD) and U.S. Environmental Protection Agency Region 7 Superfund Division Director (R7SFDD). The Strategy pertains to investigation and remediation of the watershed areas in the Tri-State Mining District in Oklahoma, Kansas and Missouri. The purpose of the Strategy is to describe the plans for watershed investigation, studies and future remedy selection at the four Tri-State Mining District Superfund Sites listed on the National Priorities List:

- The Cherokee County Superfund Site, Kansas
- Oronogo/Duenweg Mining Belt Superfund Site, Jasper County, Missouri
- Newton County Mine Tailings Superfund Site, Missouri

Watershed Planning Strategy between EPA Regions 6 and 7
Superfund Divisions Remediation of the Watershed Areas
in the Tri-State Mining District in Oklahoma, Kansas And Missouri

Page 1 of 7
Final

RI/FS Characterization Phase in TSMD Watershed

EPA

- RI report of the Lower TSMD watershed was compiled in 2020
- RI report of the Upper TSMD watershed is currently being conducted

- There are ongoing efforts for the human health and ecological risk assessments to support the risk assessment component of the characterization process
- Advancements in the characterization process have allowed efforts in the Upper and Lower TSMD watersheds to be combined. This achieves a watershed-wide approach moving forward to further continuity and consistency in decision making

Next Steps in RI/FS for TSMD Watershed

EPA

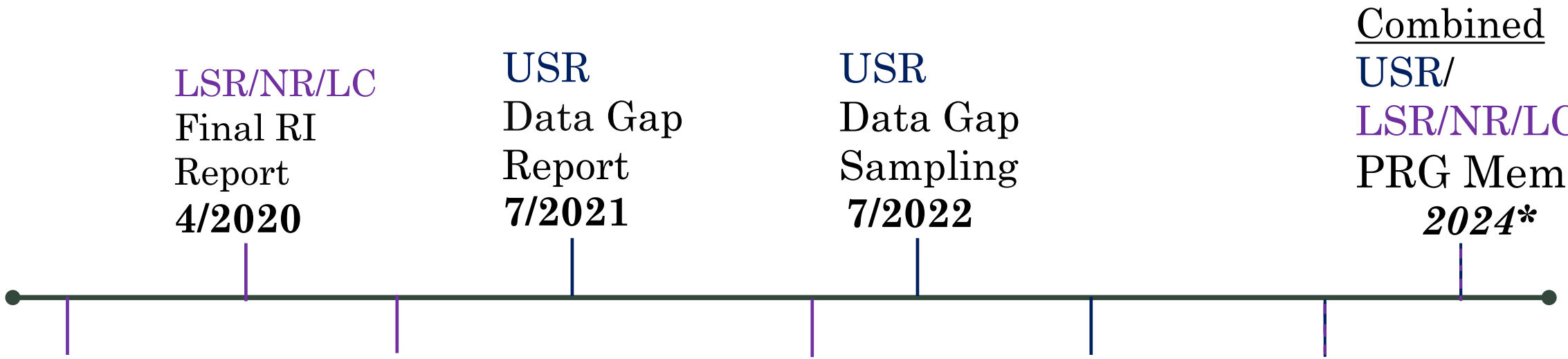
- Has characterized several areas within the TSMD watershed that pose an immediate threat to human health and the environment

- Is nearing the completion of current RI efforts in the TSMD watershed

- Has ongoing pilot projects to support FS efforts in addition to planned modeling of the movement of surface water and sediment within the TSMD watersheds

- EPA is proposing the use of phased and short-term response actions while characterization is ongoing to define the complex nature of the TSMD watersheds

TSMD Watershed Actions



Legend:
Estimated timeframe ***Year****
Upper Spring River (USR) ___
Lower Spring River/Neosho River/Lost Creek (LSR/NR/LC) ___

TSMD Watershed Actions

- Feasibility Study - Upper and Lower TSMD Watersheds
- General approach is to build the tools for the toolbox under the FS throughout all watersheds
  - Sediment Traps: differ in construction based on stream type/flow/particle size of contaminants. Committed to testing 2-3 different types of sediment traps.
  - Dredging: may differ based on the type of water body. A limited dredging and materials sorting pilot was conducted in 2019-2020 in Short Creek, Kansas and completed performance monitoring.
  - Biochar: study of use of biochar material to trap metals in-stream from seeps of mine-impacted water in Elm Creek and Central Mill repository in Oklahoma; completed performance monitoring.
  - Bank Stabilization: construction in 2019; completed performance monitoring.

Watershed	Potential Pilot Study Activities	Target Timeframe	States	Lead Region
Upper	Constructed wetland pilot	2023	MO/KS	R7
Lower	Sediment trap pilot	TBD	KS	R7
Lower	Biochar/Sediment Trap pilot	2023/2024	OK	R6

TSMD Watershed Pilot Studies

Short Creek, KS

- The dredging pilot study removed approximately 5,000 cubic yards of material from Short Creek and then sorted to identify if a certain size of material had higher concentrations of metals than others.
- The sediment trap downstream of the dredging pilot was tested to see if it could catch finer sized material that generally has higher concentrations of metals

Turkey Creek, MO

- The bioengineered bank stabilization pilot was conducted to study the remedial technology to isolate contaminated floodplain soils in place

Biochar Pilots

- This pilot test used sorbent bags containing natural material (biochar) that were submerged in streams to capture dissolved metals and eliminate the need for treatment plants.

Elm Creek

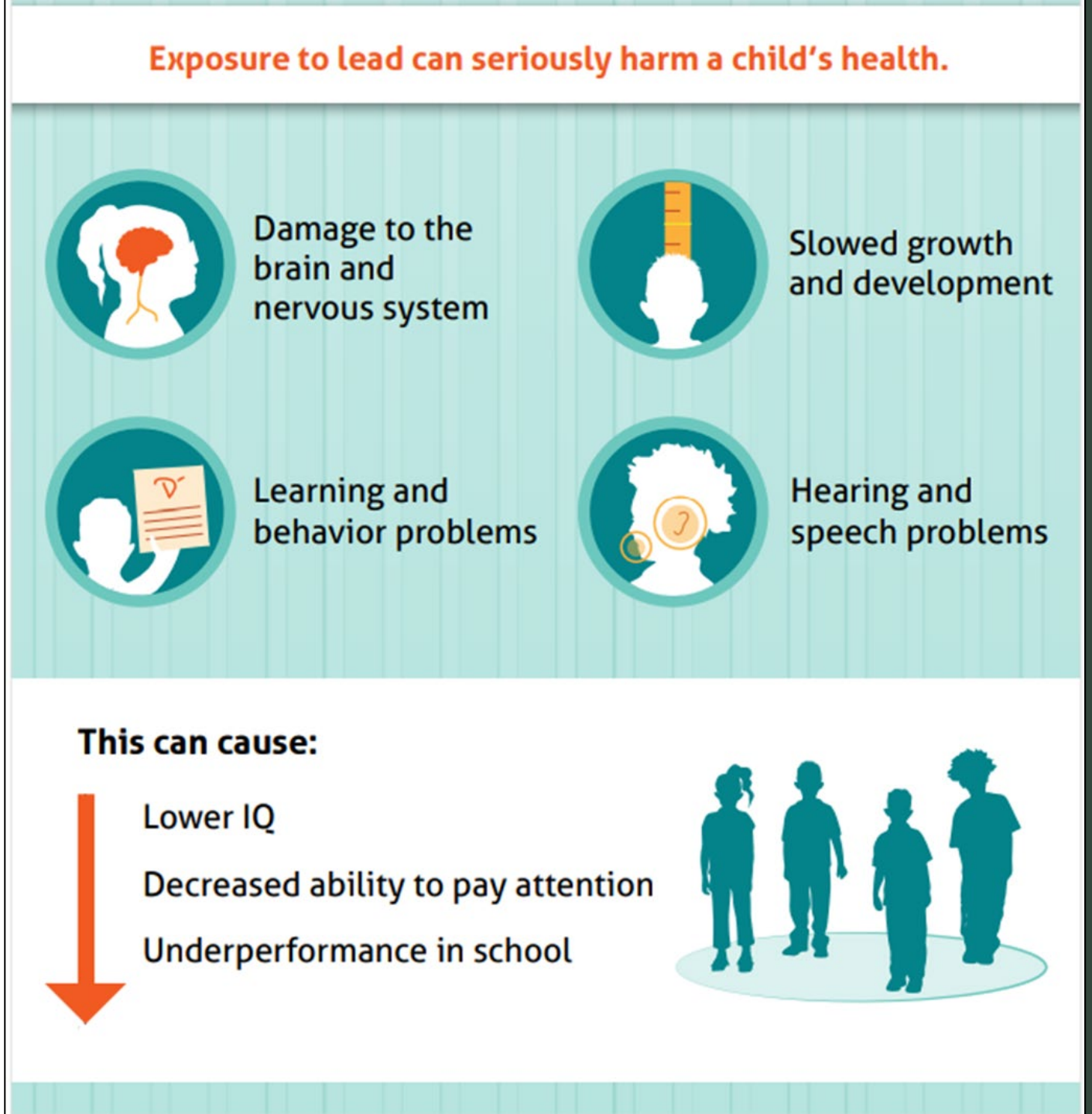
Central Mill Repository Seep

Details on Keeping Communities Safe

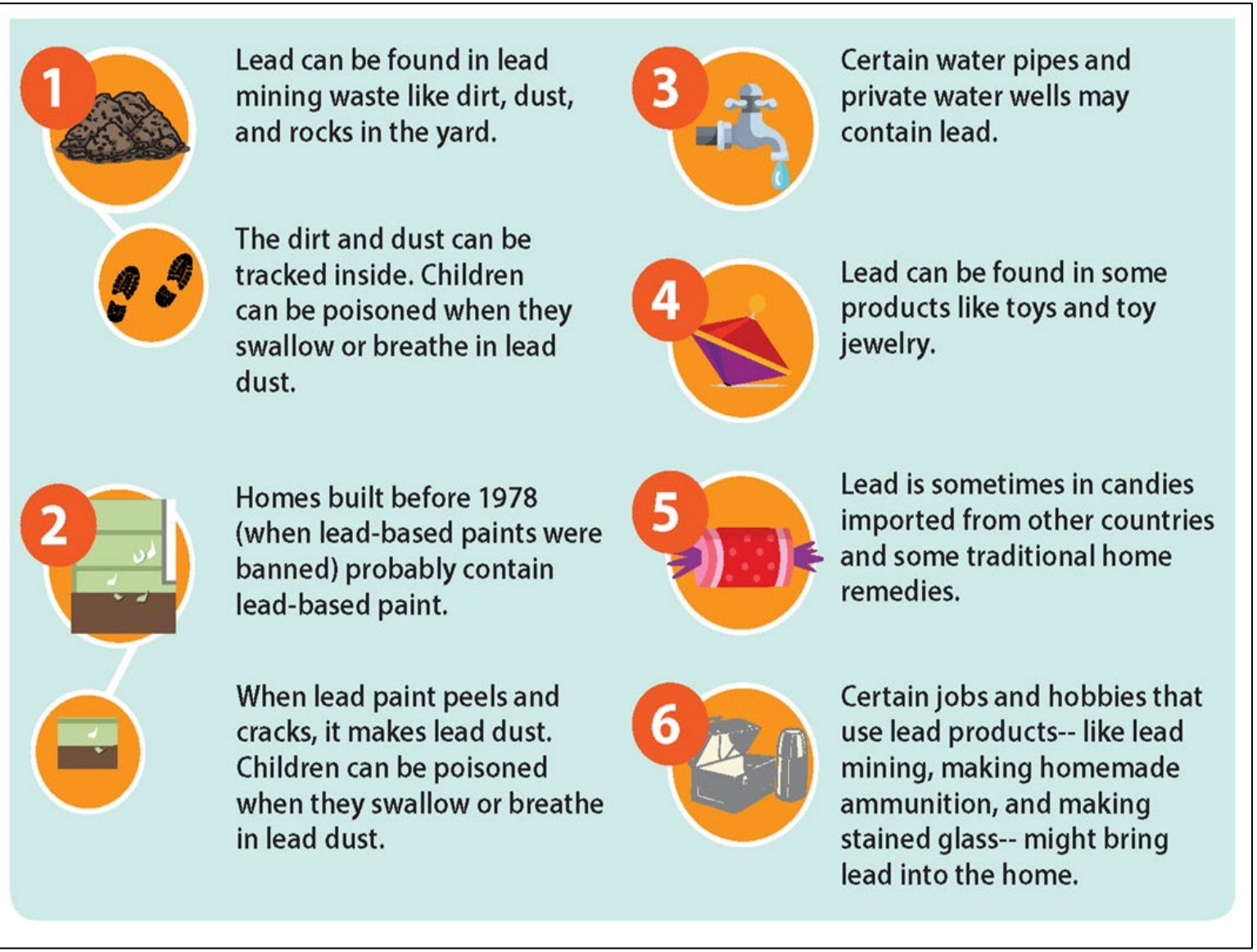
This section identifies lead health hazards and provides information on how to locally become involved.

Potential Lead Health Effects in Children and Adults

- Lead exposure may cause lifelong negative health effects in children. Children under 7 are most at risk for lead exposure. This is due to:
  - Children's rapidly growing bodies and frequent hand to mouth behaviors
- Those pregnant and nursing are also vulnerable to lead exposure because they can pass lead to the child/children.
- Health affects in children and adults:
  - Headache
  - Fatigue
  - Stomach pain and constipation
  - Loss of appetite
  - Insomnia (trouble sleeping)
  - Mood changes (irritability, depression)
  - Seizures



Minimizing Lead Exposure



- Homes built before 1978 (date lead-based paints regulated in U.S.) probably contain lead-based paint
- When the paint peels and cracks, it makes lead dust. Children can be exposed to lead when they swallow or breathe in lead dust
- Certain water pipes may contain lead
- Lead can be found in some products such as toys and jewelry
- Lead is sometimes in candies or traditional home remedies

More Information on Your Child's Health

Talk with your child's doctor or your local Health Department with questions and about a simple blood lead level test:

Health Departments in the TSMD:

- Ottawa County, OK: https://oklahoma.gov/health/locations/county-health-departments/ottawa-county-health-department.html
- Cherokee County, KS: https://cherokeecountyks.gov/main/departments/health-department
- Jasper County, MO: https://www.jaspercounty.org/health_department/
- Newton County, MO: https://www.newtoncountyhealth.org/

Contact ATSDR with questions:

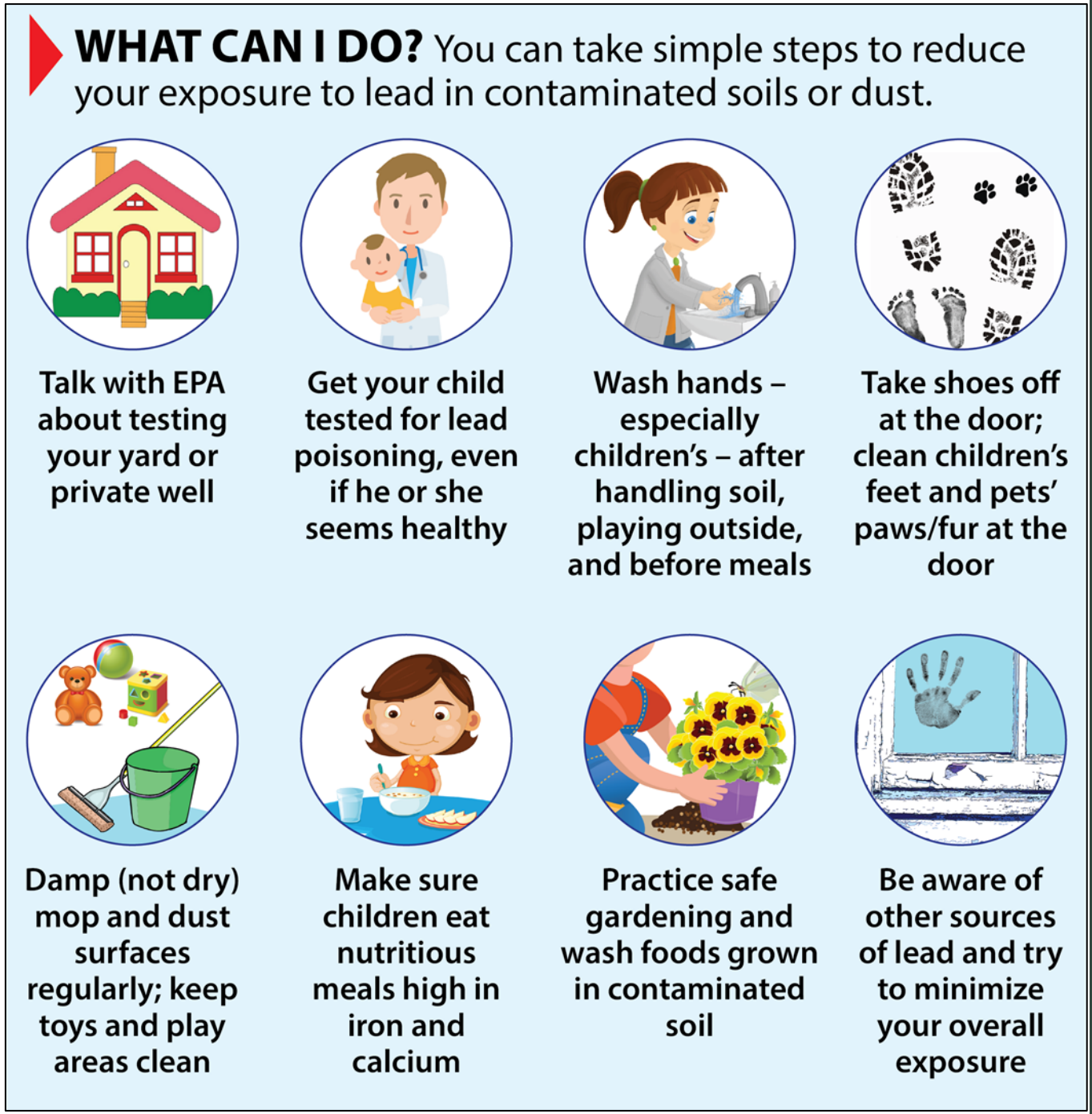
ATSDR Regional Representative:

Cory Kokko

Phone: 913-217-5981

ckokko@cdc.gov

For more information, visit: https://www.epa.gov/mo/protect-your-family-lead-hazards-historic-lead-mining-areas-fact-sheet-august-2022



Environmental Justice & Superfund

- 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
- Populations living in and around Superfund Sites experience unique burdens and vulnerabilities
- Central consideration of these environmental justice populations is given when integrating cleanup, redevelopment, and other beneficial uses with both the cleanup and reuse aligned with the community's needs and vision

For more information about EJ and Superfund, visit:
https://www.epa.gov/environmentaljustice/superfund-remediation-and-redevelopment-environmental-justice-communities

How to Be Involved

- Contact your EPA Community Involvement Coordinator (CIC) and EPA Project Managers
- Participate in public meetings, comment periods, and provide input
- Participate in community interviews for the Community Involvement Plan
- Learn more about technical assistance opportunities

For more information about community involvement, visit:
https://www.epa.gov/superfund/superfund-community-involvement

EPA Contact Information

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Additional information:

Region 6, Tar Creek Superfund Site: https://epa.gov/superfund/tar-creek
Region 7, Cherokee County Superfund Site: https://epa.gov/superfund/cherokeecounty
Region 7, Newton County Mine Tailings Superfund Site: https://epa.gov/superfund/newtoncountymine
Region 7, Oronogo-Duenweg Mining Belt Superfund Site: https://www.epa.gov/superfund/oronogoduenwegmining