

FROM
REMEDICATION
TO
RESTORATION: A
TAR CREEK
STORY



SPEAKER: PAIGE
FORD, QUAPAW
NATION



POINTS OF DISCUSSION

- Tri-State Mining District History
- Tar Creek Superfund (Remedial Action)
- Quapaw Nation's Involvement
- Completed and Active Projects in OU4
- Interim Measures (Howe)



TRI-STATE MINING DISTRICT

- The Tri-State Mining District (TSMD) was one of the world's leading zinc and lead mining lands from 1850 to 1970. TSMD spanned nearly 2,500 square miles within parts of Missouri, Kansas, and Oklahoma.

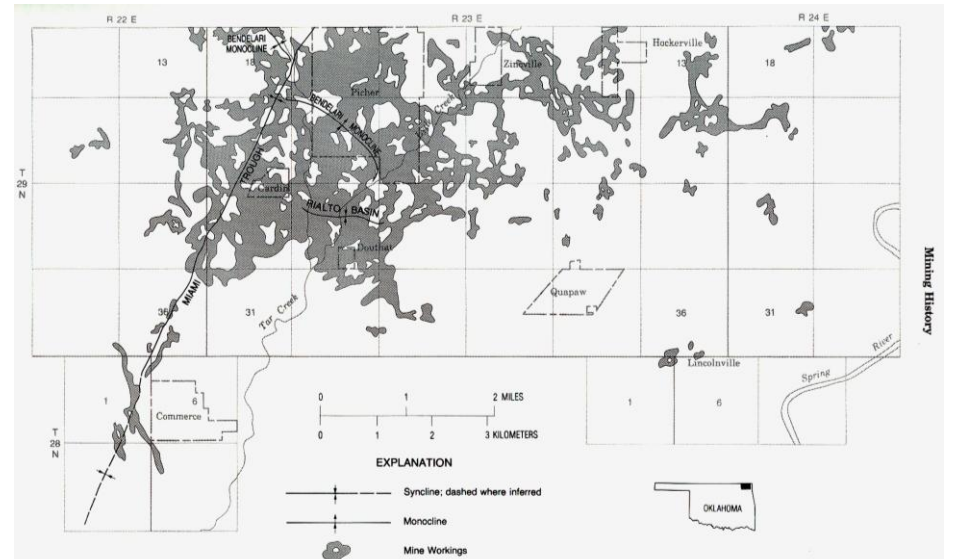
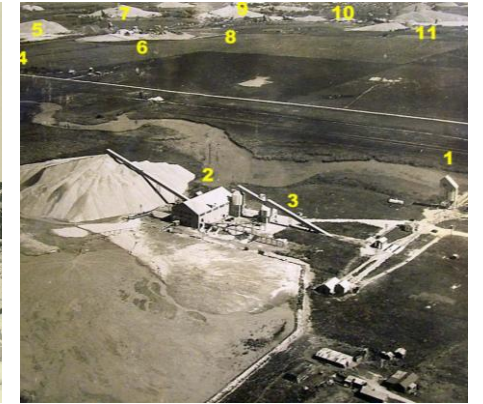
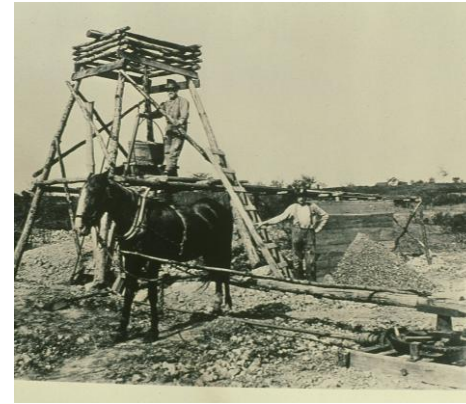
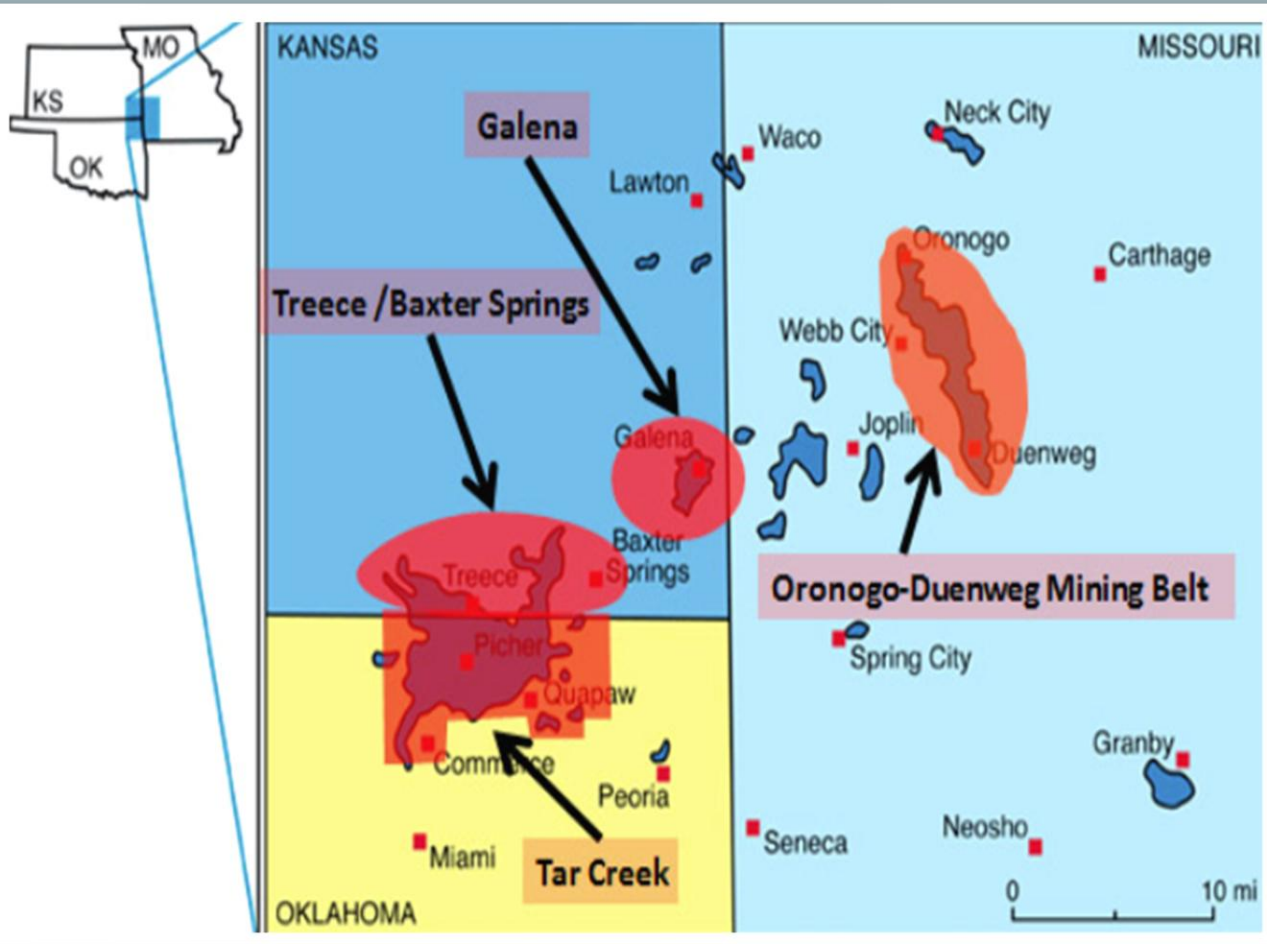
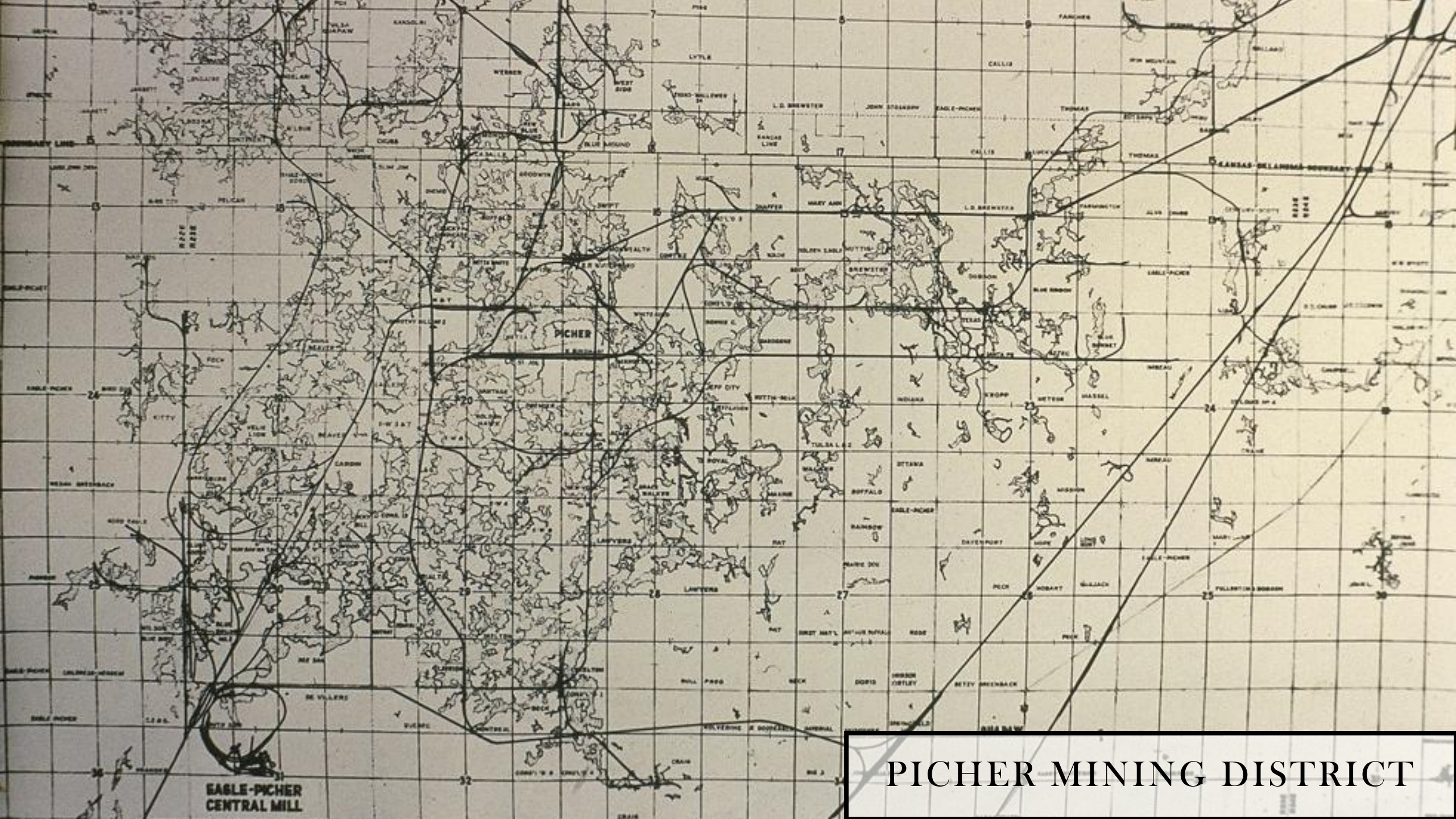


Figure 1. Generalized distribution of underground-mine workings, Picher Field, Oklahoma (modified from McKnight and Fischer, 1970).

OVERVIEW OF TSMD



- TSMD produced lead and zinc for ~ 100 years.
- Peoria Mining Land Company (in Ottawa County), 1891.
- Lead discovery in Picher OK, (1905-08).
- Production spiked during WWI, continuing into WWII.
- Accounted for 55% of total zinc production in the US.



PICHER MINING DISTRICT



TAR CREEK MINING HISTORY

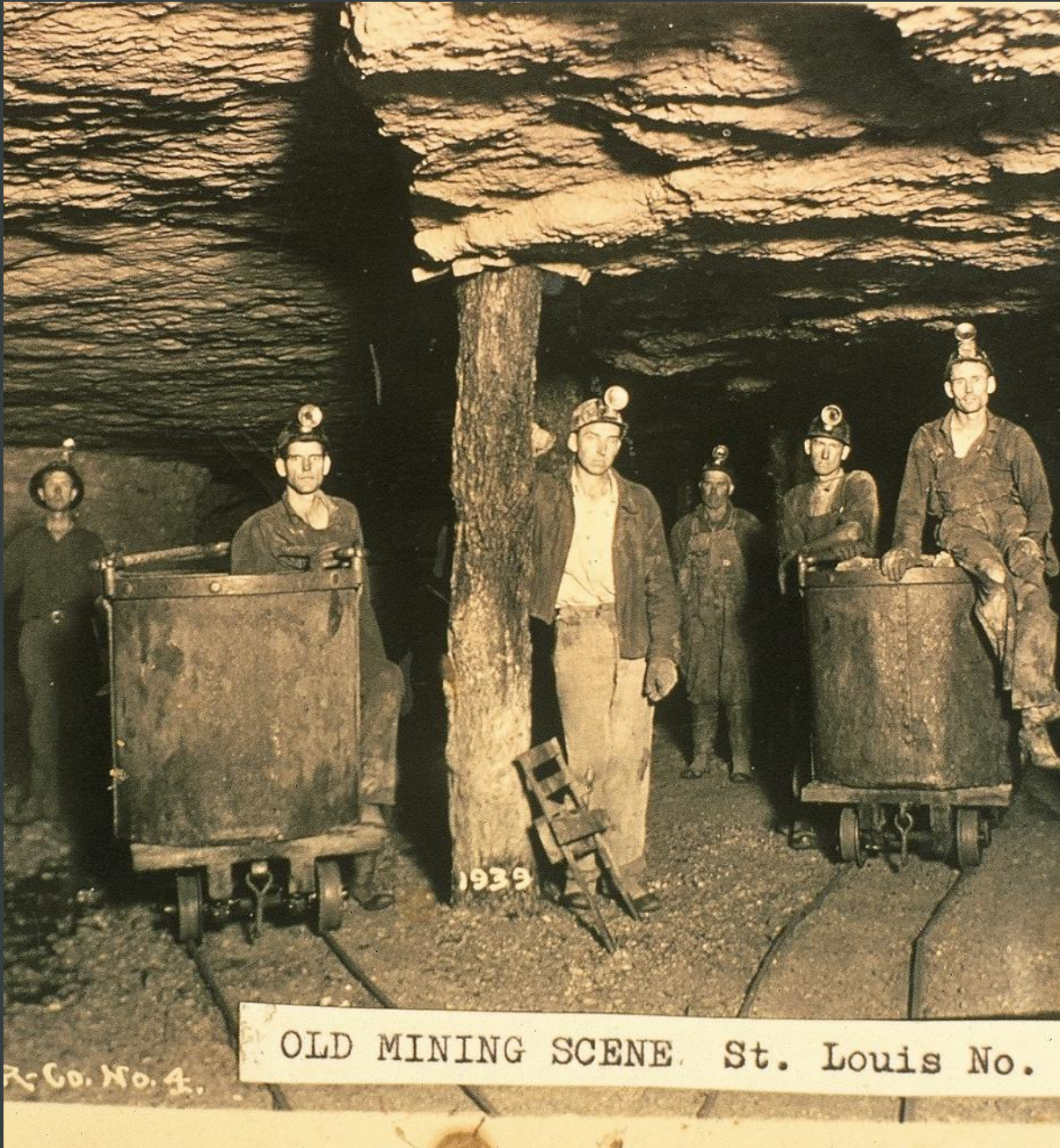
- Lead and zinc ore discovered in northeastern Oklahoma between 1900-1904.
- The operations lead towns to populate in the area
 - Picher, Cardin, Douthat, Commerce, Zincville, Century, Lincolnville, etc.
- 1908-1930 TSMD mines gained \$222 million in zinc, and \$88 million in lead production. Northeastern OK being the largest contributor each year.

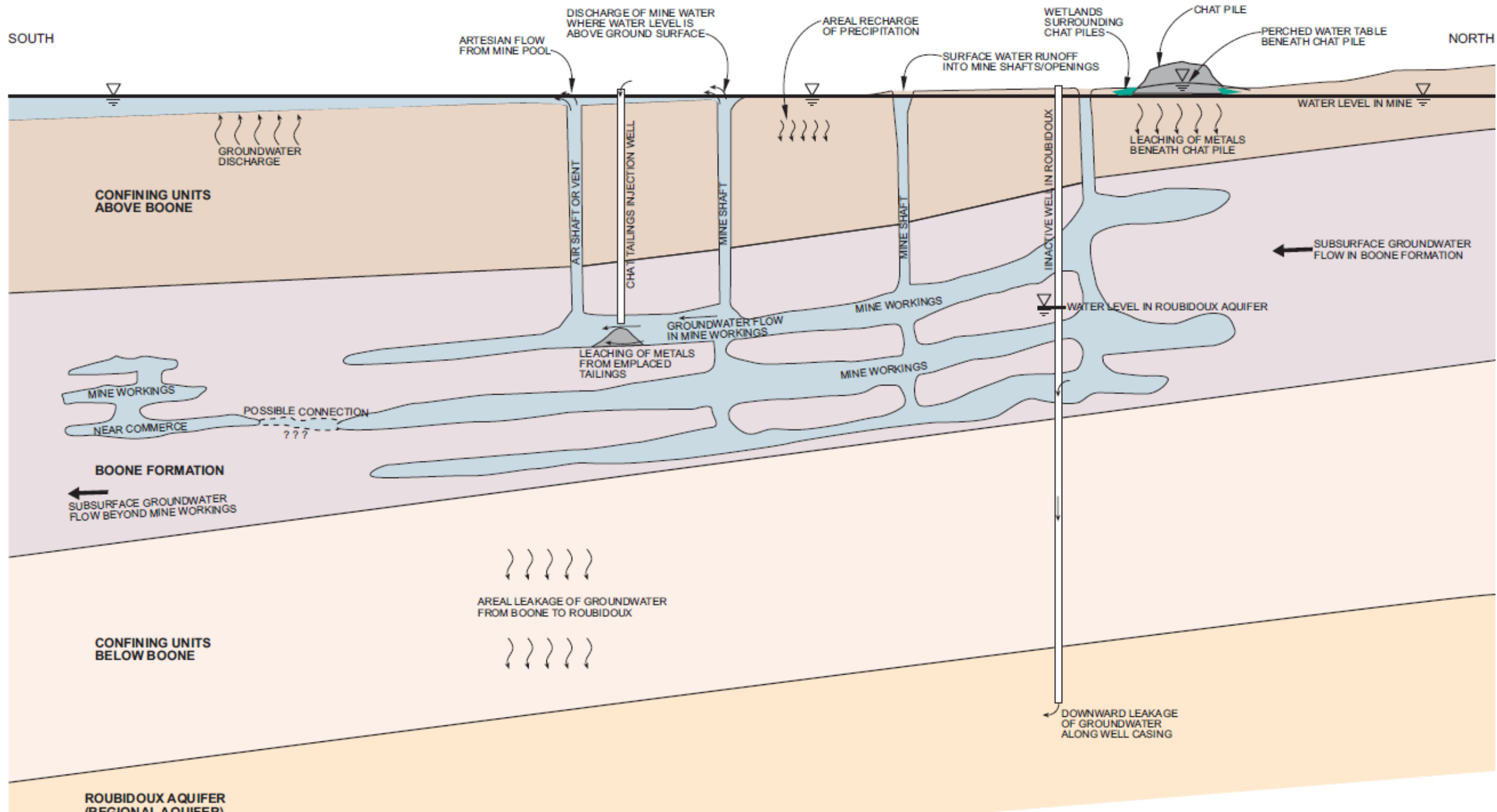
MINING PROCESS AT TAR CREEK

- The workers retrieved ore by room and pillar mining operations. Mine shafts could be 400 ft below surface level, with columns between the mining rooms for stability.
- Water pumps displaced water from the Boone aquifer to keep the mines operable.



Photo taken from Admiralty Mine





MINING PROCESS AT TAR CREEK (CONT.)

Isolating process of lead and zinc ore consisted of crushing, sieving, and floatation separation methods.

Resulted in massive piles and tailings ponds referred to as chert (waste). More commonly know as chat.



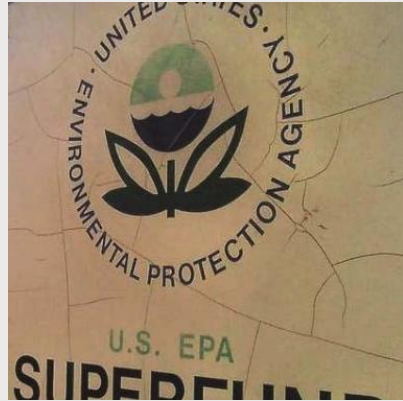
The End of an Era

1970



Mining activities cease, shutting down major operations in Picher, OK.

1980



Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA)

1981



TSMD is listed on the National Priorities List (NPL)

1983



Former town of Picher named the Tar Creek Superfund Site

2008



Record of Decision (ROD) finalized for Tar Creek Superfund

Recognizing the Problem

ADDRESSING THE PROBLEM

The Tar Creek Superfund site is separated into five Operable Units (OUs).

Under the National Contingency Plan

Operations separated by geological portions of site-specific problems.

Each OU to reach a Record of Decision after various Remedial Investigation and Feasibility Studies (RI/FS).

Operable Units (OUs)	Operation	Record of Decision
OU1	Surface and Groundwater	1984
OU2	Residential Areas	1997
OU3	Eagle-Picher Mining Complex – Abandoned Mining Chemicals	Removal Action – 2000
OU4	Chat, Mines, Mills, and Waste	2008
OU5	Surface Water and Sediments	TBD

Quapaw Nation's Involvement

- Remedial Action (RA) began for OU4 in 2010.
 - Remedial Goals for Contaminants of Concern
 - Lead 500 mg/kg
 - Zinc 1,100 mg/kg
 - Cadmium 10 mg/kg
- By 2013, Quapaw Nation requested to conduct Superfund RA on a tribally significant area of land known as Catholic 40.
 - Historically relevant to the tribe and within the Beaver Creek watershed.

CATHOLIC 40

Before Remediation



During Remediation





AFTER REMEDIATION



SINCE 2013...

8,877,070.41 tons of material has been removed. 2,045,106.16 tons of the total for chat (marketable) processing.

6,437,857.25 tons removed from Tribal / Restricted sites.

2,415,462.66 tons removed from State / Unrestricted sites.

Approximately 722.3 acres remediated.

Currently eight active sites as of May 2025.

13 completed Tribal projects

8 completed state projects.



SMELTER SITE

Before



After



TRAILS END

Before (2019)



After (2025)



WHERE DOES THE CHAT GO?

If the chat is sold as marketable, the chat will be transported to an active chat processor.

If the chat is unmarketable (i.e. source material) the chat will be transported to the Central Mine Tailings Pond Repository.

This includes contaminated transition zone soils, bull rock ore piles, chat-crete foundations, etc.

In other circumstances, source material will be consolidated and capped on-site.



HOWE IM

- Howe Pile (CP021) – Large chat pile along Tar Creek between the Oklahoma – Kansas Border.
- Remedial Action under three Co-operative Agreements: Distal 13, Marketable Chat, Howe Interim Measures
 - Removed Marketable - 270,789.44 tons
 - Removed Source Material and Marketable combined - 569,013.05 tons.
- Sediment canal along the remaining chat base, and one sediment pond.
- A constructed 1-acre wetland installed to capture various seeps and/or mine water discharge from the site until further remedial activities can be conducted.
 - Approximately 8,000 trees and aquatic vegetation were planted in and around the constructed wetland, including the embankment along Tar Creek on the Howe project site.
- Full remediation will continue for the Howe after sites upstream are remediated and/ or passive treatment systems are put in place.

Before Remediation (2019)



During Remediation (2023)



After Remediation (2024)



Current Conditions (2025)





QUAPAW NATION'S ENVIRONMENTAL MISSION

'The mission of the Quapaw Nation Environmental Department is to protect human health, the environment, and the cultural heritage of the Quapaw people through applying scientific methods in understanding impacts to our natural world. The Environmental Department can provide Tribal members with information regarding water quality, air quality, illegal solid waste dumps, recycling, Tar Creek site issues (including some chat sales information), and other environmental issues affecting Quapaw Tribal lands and Northeast Ottawa County.'
(Quapaw Tribe Environmental Webpage)



THANK YOU

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