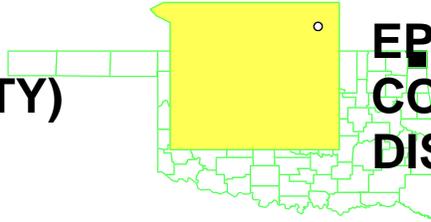


TAR CREEK (OTTAWA COUNTY)



EPA REGION 6 CONGRESSIONAL DISTRICT 02

OKLAHOMA
EPA ID# OKD980629844

Ottawa County
Updated: June 28, 2004

Site Description

Location: The Tar Creek Superfund Site (hereinafter “the Site”) is part of the Tri-State Mining District which includes northeastern Oklahoma, southeastern Kansas, and southwestern Missouri. Specifically, the Site includes the Old Picher Field lead and zinc mining area located in northeastern Ottawa County.

Population: Approximately 19, 556 people live in the surrounding area.

Setting: The Site consists of five mining cities, Picher, Cardin, Quapaw, Commerce, and North Miami, and other areas within Ottawa County. Chat piles are located throughout the communities.

Hydrology: The principal groundwater-bearing units within the Site are the Mississippian Boone Formation and the Cambro-Ordovician Roubidoux Formation. The shallow Boone Aquifer is contaminated. The deep Roubidoux Aquifer, the drinking water source for the area, meets drinking water standards.

The headwaters of Tar Creek are located in Cherokee County, Kansas; the creek flows southward through the Site and into the Neosho River. Lytle Creek is a major tributary of Tar Creek. The headwaters of Beaver Creek are located north of Quapaw; the creek flows through the Quapaw powwow grounds and into the Spring River. Tar Creek and Beaver Creek are impacted by acid mine drainage.

Wastes and Volumes

- The principal pollutants are lead, cadmium, and zinc.
- Approximately 75 million tons of chat remain on the surface of the ground.
- Flotation ponds (wet or dry ponds containing mine tailings) cover approximately 800 acres.

Present Status and Issues

OU1 (Surface Water/Groundwater)

- 3rd Five Year Review is underway.
- EPA is funding the ODEQ to monitor ground water in the Roubideax aquifer, groundwater monitoring activities are on-going.

OU2 (Residential Properties)

- As of October 2003, 2,031 residential yards and public areas have been remediated since the inception of cleanup in Quapaw, Cardin, Picher, Commerce, and North Miami.
- The EPA is funding ATSDR and Ottawa County Health Department (OCHD) to provide community health education and blood lead screening for the five-city mining area. The OCHD also works with local health professionals including Indian Health Service physicians to provide education to the medical community.

OU4 (Chat Piles, Mine and Mill Residue, Smelter Waste, and Flotation Ponds)

- The Respondents provided the draft Data Gap Analysis to EPA, ODEQ BIA and the Quapaw Tribe, for comments, on June 23, 2004.

Memorandum of Understanding (MOU) Activities

- On March 25, the EPA, USACE and DOI hosted a joint meeting in Miami, Oklahoma, to present coordinated activities and projects underway and upcoming for holistic solutions for the Tar Creek area. The State and the University of Oklahoma also participated in this event.

Site Assessment and Ranking

National Priorities List (NPL) History
Site Hazard Ranking System Score: 58.15
Proposed Date: 7/27/81
Final Date: 9/08/83

Site Map and Photographs*

Site photographs can be viewed on the internet at www.epa.gov/earth1r6/6sf/6sf-ok.htm.

Site History:

- Underground mining for lead and zinc by the room-and-pillar method began in 1891 and lasted through early 1970. As water filled the mines, the native sulfide minerals dissolved creating acid mine water. Acid mine drainage containing high concentrations of heavy metals began discharging into Tar Creek in 1979 from natural springs, boreholes, and open mine shafts.
- The Governor of the State of Oklahoma established the Tar Creek Task Force in 1980 to investigate the acid mine drainage into Tar Creek.
- In 1981, the Site was proposed to the National Priorities List (NPL).
- The Site was listed on the NPL in 1983.

OU1

- The EPA signed a Record of Decision (ROD) for Operable Unit 1 (OU1) in June 1984.
- Monitoring for OU1, initiated in 1987, consisted of surface water, acid mine water discharges, and mine water levels to assess the effectiveness of the diking and diversion. To assess the effectiveness of the well plugging operations, water samples from 21 deep Roubidoux wells located both inside and outside of the mining area were collected and analyzed in 1991 and 1992.
- The first Five Year Review was issued in April 1994.
- The EPA issued the second Five Year Review report in April 2000. The full text for this report can be found at www.epa.gov/earth1r6/6sf/6sf-decisiondocs.htm
- The EPA provided funding to the U.S. Army Corps of Engineers (USACE) to perform an acid mine drainage study of Beaver Creek (OU4) and provide a recommendation for a passive treatment system design (e.g., constructed wetlands).
- Five new monitoring/water supply wells (three in the Picher-Cardin area, one in Commerce, and one in Quapaw) were drilled into the deep aquifer. The Picher #5 and a Picher-Cardin well are producing good quality water. The wells drilled in Commerce and Quapaw are producing water high in iron and sulfate content. The ODEQ is planning additional testing to determine if the poor quality of the produced water is due to a well integrity problem (OU1).
- The plugging of 5 water wells by ODEQ, to prevent the downward migration of acid mine water (OU1), was completed in April 2004.

OU2

- From August 1994 through July 1995, the EPA conducted sampling of soils in High Access Areas (e.g., day care centers, school yards, and playgrounds) and residential properties.
- In August 1997, the OU2 ROD was issued to address the residential areas.
- Remedial actions of these residential areas originally began in June 1996 as an emergency removal and continued in January 1998 as a remedial action. Approximately 1,542 lead-contaminated residential yards were remediated.
- From October 2001 to May 2002, 105 Indian-owned properties were remediated.

- Remediation of 8 schools and school properties (7 in Miami, 1 in Picher) was completed in August 2002.
- A survey of visible chat at Nichols Elementary and Washington Elementary playgrounds was performed in February 2003

OU3

- On March 28, 2000, a emergency removal action was performed at the Eagle-Picher laboratory in Cardin, OK. During this removal drums were sampled, categorized and transported to appropriate facilities for proper disposal. The Eagle-Picher Office Complex work was completed within that year and no further action is required..

OU4

- The EPA provided funding to the Quapaw Tribe and the Inter-Tribal Environmental Council (ITEC) to conduct an RI/FS for two industrial properties located in Cardin (OU4). This project was funded as a pilot project. A draft RI was prepared and responses to EPA and the Quapaw Tribe's comments were provided on October 4, 2002. The findings will be included into the RI/FS for OU4.
- The EPA provided funding to the Quapaw Tribe and ITEC to submit a work plan for the Beaver Creek Watershed RI/FS Project (OU4). A draft work plan was submitted to EPA, the Quapaw Tribe, ODEQ, the BIA Miami office, and the University of Oklahoma in September 2002. The Plan will be incorporated into the RI/FS for OU4.
- On December 9, 2003 the EPA signed the Administrative Order on Consent (AOC) with the Department of Interior and two mining companies to conduct the Remedial Investigation/Feasibility Study (RI/FS) on Operable Unit 4 (OU4). This agreement allows EPA to determine feasible cleanup options for the chat. This document and its attachment are available on the EPA internet homepage at: www.epa.gov/region6/6xa/tar_creek_aoc.pdf and www.epa.gov/region6/6xa/tar_creek_atch.pdf
- In accordance with the terms of the AOC, EPA, in coordination with ODEQ and the Quapaw Tribe provided the Respondents with the Preliminary Remedial Action Objections and diagrams for the Human Health and Ecological conceptual site model.
- The draft Scoping Phase Work Plan was submitted to EPA, ODEQ and the Quapaw Tribe for comments on January 21, 2004. EPA also forwarded this document to the 9 tribes to review and provide comments. A meeting was conducted February 10, in Dallas, Texas to discuss/resolve the comments. Attendees included representatives from ODEQ, the Quapaw Tribe, BIA, BLM, USACE, USGS and EPA's Tribal Liason. All parties are coordinating efforts to share information to minimize duplication of efforts. The revised document was approved by EPA on March 22, 2004.
- Monthly team meetings are conducted between EPA, ODEQ, and the Quapaw Tribe, to discuss OU4 RI/FS activities and hear the status of the various projects each entity is pursuing related to OU4 and MOU activities.
- EPA met with the representatives from the 9 tribes on March 4, 2004, to hear suggestions and discuss the best approach for obtaining their comment on deliverables associated with OU4 RI/S activities; input and participation in the OU4 risk assessments (that will reflect the way of life for a typical tribal member); and in attending meetings with the

- Respondents to discuss comments that have been provided on RI/FS deliverables.
- On April 5-6, 2004, EPA in coordination with the Quapaw Tribe and the University of Tulsa's Tribal Director, conducted a site tour and EPA held its first Ecological Risk Assessment meeting with its contractor, representatives from ODEQ, Environmental Directors of 4 tribes (Wyandotte Nation, Miami, Eastern Shawnee, Quapaw, Seneca-Cayuga), and the University of Tulsa Tribal Environment Management Services Director, at the Quapaw Tribal office located in Quapaw, OK.

MOU Activities

- EPA staff attended the Quarterly Stakeholders Meeting on October 8, 2002 to participate in discussions involving the status of site activities being pursued by several different Federal, State and local organizations.
- EPA representatives attended the U.S. Army Corps of Engineers public meetings on October 7 and 9, 2003, involving their plans to complete of the Spring River Watershed Management Plan by August 2004.
- EPA participated in the co-hosted MOU meeting by USACE and EPA in Tulsa, OK on 1/22/04. Representatives from DOI (and their various offices), ODEQ, the Quapaw Tribe, Senator James Inhofe and Representative Brad Carson's offices, and the State of Oklahoma Secretary of the Environment were in attendance. The objective and intent of the MOU were discussed, including the Watershed Management Plan. A second meeting was held February 11, with the downstream tribes on ongoing activities in the Tar Creek and Spring River watersheds. Representatives from EPA, USACE, DOI, BIA, ODEQ and the tribes in that area were in attendance. All parties agreed to conduct combined public meetings and utilize one newsletter to inform the public on the status of various projects being implemented in and around the Tar Creek area. The is available on the EPA internet homepage at:
<http://www.epa.gov/earth1r6/6sf/6sf-decisiondocs.htm> under the category titled "Other".
- EPA attended the USACE's 2nd public meeting on 2/24/04. The USACE informed the public on the multiple projects associated with the Watershed Management plan, the coordination between Federal, State and Tribes, and the time frame for having a final report completed.

Health Considerations:

- Lead-contaminated soils and chat piles are a source of exposure to the population, especially to young children. A percentage of young children living in the five-city mining area are known to have blood lead levels in excess of the 10 µg/dL (micrograms per deciliter) standard set by the Center for Disease Control (CDC). The percentage of children with elevated blood lead levels remain well above state and national averages.
- Children are the most sensitive population for lead exposures. Chronic exposure can deleteriously affect the immune system, blood system, nervous system, and kidneys. Harmful effects include premature births, smaller babies, decreased mental ability in the infant, learning difficulties, and reduced growth in young children.

Record of Decision (ROD)

Operable Unit 1: ROD signed on June 6, 1984

Operable Unit 2: ROD signed on August 27, 1997

The OU1 ROD addressed (1) the surface water degradation by the discharge of acid mine water, and (2) the threat of contamination of the Roubidoux Aquifer, the regional water supply, by downward migration of acid mine water from the overlying Boone Aquifer through abandoned wells connecting the two. Recharge was to be prevented by utilizing diking and diversion structures to stop the surface water of Tar Creek from entering the two collapsed mine shafts in Kansas which were identified as the main inflow points. Additionally, the remedy called for preventing the downward migration of acid mine water into the Roubidoux Aquifer by plugging 66 abandoned wells. During remediation, an additional 17 wells were identified and addressed, bringing the total to 83 wells. Construction activities were concluded on December 22, 1986. (Additional information about this ROD is located on the internet at: www.epa.gov/superfund/sites/rodsites/0601269.htm).

The OU2 ROD addressed the residential areas. Construction continues on the residential yard cleanups. The full text for this ROD is located on the internet at: www.epa.gov/earth1r6/6sf/6sf-decisiondocs.htm

Community Involvement

- Community meetings were held in Picher, Commerce, and Quapaw on August 14, 15, and 16, 2000.
- An Open House was held in Picher on August 16, 2001.
- The EPA, ODEQ, and the Quapaw Tribe participate in quarterly stakeholders meetings.
- An Open House was conducted June 18, 2002.
- The EPA and the ODEQ met with the Mayors of Picher, Cardin, Commerce, North Miami, the County Commissioner, and Quapaw representatives on July 8 -11, 2002, to provide a letter and fact sheet on the acceptable and unacceptable uses of chat. Mailings of this document were sent to all the mining communities.
- EPA conducted two information meetings on October 7, 2002, to discuss the upcoming yard remediation work planned for the towns of Cardin, North Miami, Picher, Quapaw, and Commerce.
- First in a series of Memorandum of Understanding (MOU) Stakeholders meetings was conducted on January 22, 2004.
- March 25, a roll-out meeting for the MOU was conducted at the Miami Civic Center.
- The Site Repository is located at: Miami Public Library, 200 North Main Street, Miami, OK 74354. The telephone number for the repository is 918-541-2292. This repository contains information about the Site and is available to the public.
- In June 2004, a series of informal meetings were held with citizens to discuss continuing concerns related to alleged damage to homes as a result of the remediation work.

Technical Assistance Grant

- **Availability** Notices were published on 7/24/00, 10/12/00, and 12/18/00
- Letters of Intent (LOI) received from John Ballard (Inter-Tribal Environmental Council; 515G Southeast; Miami, OK) on 9/12/2000, Rebecca Jim (Local Environmental Action Demanded (LEAD); 19257 S. 4403 Dr.; Vinita, OK, 74301) on 12/01/00, and Ed Keheley (Tar Creek Basin Committee; 2020 South 640 Road; Quapaw, OK, 74363) on 12/08/00. All but LEAD withdrew their LOIs.
- LEAD was awarded a TAG of \$50,000 on 5/01/01. Rebecca Jim, the Executive Director for LEAD, can be reached at 918-256-5269 for information concerning the implementation of the TAG. Gary Lawley selected as Technical Advisor.
- Budget/project period: 5/18/01 - 5/17/04
- Compliance review was conducted and the TAG is in non-compliance and the grantee has received notice. If the group applies for a second TAG a pre-award compliance review will be conducted before a new award will be made.

Site Contacts

EPA Remedial Project Managers:	Mike McAteer, OU2	214-665-7157
	Ursula Lennox, OU1 and OU4	214-665-6743
EPA Community Coordinator:	David Birdsong	214-665-2221
EPA Site Attorney:	Jim Costello	214-665-8045
EPA State Coordinator:	Roberta Hirt	214-665-8079
EPA Regional Public Liaison:	Arnold Ondarza	1-800-533-3508
EPA Toll-Free Telephone Number:		1-800-533-3508
ODEQ Program Manager:	Kelly Dixon	405-702-5156
ODEQ Project Managers:	Dennis Datin, P.E.	405-702-5125
	David Cates, P.E.	405-702-5133
Quapaw Environmental Program Director:	Tim Kent	918-542-1853
Quapaw Superfund Program Manager:	Vacant	

Enforcement

- The EPA entered into a Consent Decree (CD) for OU1 with 6 mining companies (ASARCO Inc., Blue Tee Corp., Childress Royalty Comp. Inc., The Doe Run Resources Corp., Gold Fields Mining Corp., NL Industries, Inc.) settling their liability for costs paid by the United States in responding to the release or threat of release of hazardous substances. The CD was filed on June 10, 1991, in the U.S. District Court (Northern District of Oklahoma).
- On August 25, 1995, the EPA issued a notice to the Potentially Responsible Parties (PRPs) 6 mining companies and to the U.S. Department of the Interior (DOI) offering them the opportunity to conduct and finance the removal activities described in the EPA's August 15, 1995, Action Memorandum for OU2. The PRPs did not undertake the emergency removal.
- The EPA issued Special Notice to the PRPs on November 17, 1995, to conduct the Remedial Investigation and Feasibility Study (RI/FS) and Remedial Design (RD) for OU2, residential areas. The PRPs declined to perform the RI/FS/RD. As an alternative,

the PRPs offered to perform a Community Health Action and Monitoring Program (CHAMP). The CHAMP consisted of the health monitoring of the children in the contaminated residential areas, cleaning of homes in the contaminated area, and education program for the residents. EPA agreed, and the PRPs implemented CHAMPs; however, since housecleaning and education did not provide a permanent remedy, EPA went forward with RI/FS/RD for OU2.

- In 1996, the EPA settled its claims with a bankrupt mining company which had the largest operation at the Site.
- EPA issued an Action Memo on March 21, 1996, calling for an emergency removal to address residential contamination. The PRPs declined to participate in the removal.
- The EPA issued Special Notice to the PRPs on December 19, 2000, requesting that they perform and finance the RI/FS for OU4, the non-residential portion of the Site.

Benefits

- The cleanup of lead-contaminated soils from over 2,000 residential yards and high access areas located within the five-city mining area has significantly reduced the exposure of the population, especially young children.
- Recent independent studies comparing blood lead data collected in 1997 to data from 2000 show an approximately 50% decrease in the number of children living in Picher and Cardin between the ages of one and six years old with blood lead levels equal to or greater than the 10 µg/dL standard set by the CDC. This reduction in the number of children with elevated blood lead levels is attributed to the residential yard cleanups and extensive educational efforts by federal, state, county, and tribal entities.
- Abandoned well plugging has reduced the potential for contaminants in the shallow Boone Aquifer to migrate to the Roubideax drinking water aquifer.