

## **Literature Review of Articles Related to Reports Prepared under the TAG Grant**

The following is a list of most of the literature reviewed for these summary reports, as well as some of the key information from this literature, where it was available. This group of references is listed in chronological order.

There are six sets of references in the various sections of the Governors Task Force Report of October 2000, in addition to the ones listed below.

**Reed, W. W., S. L. Schoff, and C. C. Branson, 1955 Groundwater Resources of Ottawa County Oklahoma, USGS Bulletin 72**  
Reported water quality of the Boone Formation was good except in the Tristate Mining Area

**Hantush, M.S. 1960 Modification of the theory of leaky aquifers, Journal of Geophysical Research v. 65**

**Benoit, R.L. et al 1969; A limnological reconnaissance of an impoundment receiving heavy metals with emphasis on diatoms and fish, in Aggus et al, 1982**

**McKnight, E.T. and R. P. Fischer, 1970 Geology and ore deposits of the Picher Field, Oklahoma and Kansas, USGS Professional Paper 165 pp**

**Eaton, J.G. 1974; chronic cadmium toxicity to the bluegill, Transactions of the Am. Fish. Soc. 103**

**OWRB Publication 100, 1976 Memo to Homer Stewart, Chief of the Bureau of Mines**

Results included a summary of history and overview of the Oklahoma mining area

**Playton, S. J., and R. E. Davis, 1977 Preliminary Report on Water Quality in Abandoned Zinc Mines in NE Oklahoma and SE Kansas. USGS Open File Report 77-163 and 78-294**

This paper predicted acid water mine discharges would occur in 1979. Said there was 10 billion gallons of contaminated water in the mines

**Barks, J.H., 1977 Effects of abandoned lead and zinc mines and tailings piles on water quality in the Joplin area, Missouri USGS Water Resources Investigations**

**USGS, 1977, National Sediment Criteria, in EPA region 6 report, proposed toxic criteria for water, fish tissue and sediments**

**Forstner, U. and F Prosi, 1979, Heavy Metals pollution in freshwater ecosystems, in Biological Aspects of Freshwater Pollution Permangon Press NY, NY.**

**Keefer, D.H. and E.J. Fenyves, 1980 Radiation exposure from radium 225 ingestion, in Natural Radiation Environment, v III, USDOE Tech Info Center**

**Jarman, Ron, 1980 Evaluation of Tar Creek Situation and Board Recommendations, in Appendix to OWRB Publication 100.**

**Stated a large reservoir of contaminated water existed beneath the Picher mining field. This water was unfit to drink and contamination of the Roubidoux Formation, the Neosho River and Grand Lake may be occurring.**

**Martinez, David. 1980 Field Report on Biological Reconnaissance of Tar Creek. Progress Report to EPA Region 6.**

**Said Tar Creek was experiencing severe impacts from mine water discharge but that fish, aquatic insects, frogs and snakes were found at nearly all stations studied. Said aquatic organisms had been able to adapt to high metals concentrations**

**Adams, J.C., 1980 Tar Creek Water Quality Reconnaissance Regarding Groundwater Discharge from Abandoned Lead and Zinc Mines of Ottawa County, Okla., OWRB Publication #10.**

**This report summarized the impacts to ground and surface waters in the area. Said zinc was lethal to fish and aquatic life in lower Tar Creek and the discharge to Tar Creek from the City of Miami was very high in Zinc.**

**Playton, Stephen, et al, 1980 Chemical Quality of the Water in Abandoned Zinc Mines in Northeastern Oklahoma and Southeastern Kansas. USGS Circular 82**

**OWRB Task Force Report, 1981 Summary of Data Collected by the Governors Task Force Regarding Groundwater Discharge from Abandoned Lead and Zinc Mines of Ottawa Co. Okla. from 1979 through March 1981.**

**This report summarized the data from the other reports.**

**Hittman and Associates, Inc. 1981 Interim Report on Surface and Groundwater Contamination from Lead and Zinc Mines, Picher Mining District, Ottawa Co., Okla. OWRB Report**

**This was a key report to the Task Force and included data from surface water and groundwater studies. Stated concentrations of zinc from Tar Cr. will pose a problem to fish and aquatic life as it enters the Neosho River and Grand Lake.**

**Aggus, LR et al, 1982 Effects of acid-mine drainages from Tar Creek on fishes and benthic macroinvertebrates in Grand Lake, Okla. Tar Creek Environmental Effects Subcommittee**

**Encon Environs Control Services, Inc. 1982 Tar Cr. Field Investigation, Task 1 Identification of Major Infiltration Areas. Prepared for OWRB.**

**Purpose was to define the principal surface water inflow to the underground mines of the Picher District. Decided the major inflow points were along Lytle Cr. and upper Tar Cr. in Kansas. This was a key study in deciding what alternative to select in the ROD.**

**Hittman and Associates, Inc., 1982 Preliminary Assessment of Contamination From Kansas and Missouri, with Identification of Data Sources, Task III 2 & 3**

**Report said heavy metals from mines in Kansas contributed significantly to loading in Spring River, and most of this came sporadically (after heavy rains) from acid mine water and runoff from chat piles; said mining in Missouri was a major source of contamination to the surface waters of Oklahoma.**

**OWRB Task Force Reports, 1983: The following were Task Force Reports that were summarized in the RI/FS and the ROD.**

**a) Identification and Assessment of Potential Remediation Alternatives, Task II.1.4, Under an EPA Grant**

**b) Investigation of Potential Sources of Water Supply as Alternatives to the Roubidoux Formation, Task II.5, An EPA Contract**

**c) Treatment Options of Roubidoux Water Supplies, Tar Cr. Investigation, Task II, an EPA Grant**

**f) Detailed Contingency Plan for Selected Alternative Water Supply Options, Task II, EPA Grant**

**g) Evaluation of Treatment Alternatives, Tar Creek Feasibility Investigation, Task II.4.A.b, an EPA Grant**

**h) Short and Long Term Environmental Effects of Acid Mine Drainage on the Grand Lake System, Environmental Effects Subcommittee of the Governors Task Force,**

**Said one source of contamination to Tar Creek was the mine tailings; sediment was long term sink for heavy metals and should be removed from Tar Creek, and Tar Creek did not impact the Neosho River.**

**I) Assessment of Environmental Impacts and Legal Aspects Associated With Treatment Alternatives, Task II.4.A.h**

**j) Remedial Alternatives Analysis Information Package for the Tar Creek Task Force, Alternatives Task Force Report**

**k) Report of the Human Health Effects Subcommittee of the Tar Creek Task Force**

**Results from studies of Tar Creek, Neosho River, Spring River and Grand Lake indicated water was safe for human consumption, fish were safe for human consumption and there was no increase in heavy metals in the Neosho below the Tar Creek outlet**

**l) Effects of Acid Mine Discharge on Surface Water in the Tar Creek Area, Ottawa Co. Okla. Task II. EPA Grant**

**Sampled surface water, sediment and fish tissue in Tar Creek, Neosho River and Spring River, estimated heavy metal daily loadings 1 mile above mouth of Tar Creek, the mouth of Tar Creek, and in the Neosho and Spring Rivers, lead averaged 8 lbs a day 1 mile above the mouth, 0 at the mouth and approximately 360 lbs a day in the Neosho and Spring Rivers**

**m) Assignment of Appropriate Alternatives to Inflow Points, Tar Creek. Feasibility Investigation by Charles Bolinger, Task II.3.D**

**Presented six alternatives and recommended rerouting Tar Creek near the Muncie Mine**

**n) Evaluation of Heavy Metals in Core Samples Collected from the Neosho River, Spring River and Upper Grand Lake**

**Results indicated Lead, Cadmium, Chromium and Copper were higher in Tar Creek, the Neosho River, and Spring River and in Upper Grand Lake sediments than in the lower Lake and much higher than statewide averages.**

**Aggus, L.E., L. E Vogele and W.C. Rainwater, 1983 Effects of Acid Mine Drainage from Tar Cr. on Fishes and Macro invertebrates in Grand Lake, Okla. USFWS Grant, Prepared for the Tar Creek Environmental Effects Subcommittee, National Reservoir Research Program, Arkansas.**

**Results were as follows:**

- a) Neosho and Spring River contribute large quantities of heavy metals to the Grand Lake system,**
- b) Heavy metals rapidly precipitate out in the hard waters of these rivers and upper Grand Lake and enter the sediments**
- c) Flooding and other disturbances resuspend large amounts of sediment and probably heavy metals**
- d) Plankton and particulates are high in heavy metals, presenting an opportunity for heavy metals to enter the food chain**
- e) Fish assimilate heavy metals to varying degrees in Grand Lake each year (gave estimated lbs per year)**
- f) Heavy metals were present in fish tissue to varying degrees, depending on species, location, etc. Lead and zinc were concentrated in fish liver tissue.**

**g) Plankton in the Spring and Neosho Rivers had high concentrations of heavy metals.**

**h) Suggested sediment coring could give a good historic picture of heavy metal deposition in Grand Lake.**

**Oklahoma Geological Survey Norman, Okla. 1983 Stability Problems and Hazard Evaluation of the Oklahoma Portion of Tristate Mining Area,**

**Summary paper for Tristate Mining Area; area covers 2,540 acres, contains 1,064 known shafts, of which 481 are open and 58 should be fenced; has an estimated 146 chat piles.**

**U.S. EPA, 1984 Record of Decision for the Tar Creek Superfund Site in Ottawa County, Oklahoma,**

**Contains a summary of much of the information listed in the previous citations, including a discussion of the selected alternatives. Most of the information in this documented is discussed in the body of this report.**

**Luza, Kenneth V. 1986 Stability problems Associated with Abandoned Underground Mines in the Picher Field, Northeastern Oklahoma; USGS Circular no 88.**

**Parkhurst, D.L. 1987 Chemical analyses of water samples from the Picher Mining Area, USGS Open File Report 87**

**Christensen, Scott C., et al 1994 Geohydrology and Water Quality of the Roubidoux Aquifer, Northeastern Oklahoma, OGS Circular 96**

**Said large concentrations of radium 226 were a problem with the Roubidoux Aquifer.**

**U. S. EPA, Region 6. 1994 Five Year Review, Tar Creek Superfund Site, Ottawa County, Oklahoma**

**A summary of this Report is found in the body of this document.**