

## **IMPACTED STREAM CORRIDORS**

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**FIELD INVESTIGATION REPORT**

July 2004 Water Operations Technical Support Field Investigation Report

# IMPACTED STREAM CORRIDORS

## INTRODUCTION

The Tar Creek drainage area has been greatly disturbed by 70 years of mining activity that has resulted in a watershed system of poorly draining tributaries and creeks that are commonly bank full of water during non-flood periods. New channels were developed in response to the creation of chat piles, tailing ponds, dikes, railroad tracks, and roads. Once maintenance of these human works ceased, natural processes further disrupted the alterations, and additional intermittent stream channels developed. Often such development was influenced by the subsidence of mines and the collapse of mine shafts. Infiltration of surface water into open mine shafts and boreholes further contributes to environmental degradation by enhancing the fluctuations of water in the mine workings which results in chemical reactions, acid mine drainage, and the filling of underground mine working which can activate surface seeps that impact surface water quality. Without reconstruction of floodplain corridors in the intensively mined area and improvement of geomorphology characteristics downstream of the intensively mined area, the Tar Creek watershed will continue to function as it presently does with frequent flooding in the area and heavy metals continuing to move downstream to the Neosho River. Stream corridor restoration upstream of Miami could improve the drainage at the Tar Creek upper basin and improve the riparian corridor ecosystem in the entire watershed. The first activity is to conduct a geomorphology assessment of the watershed to identify the best approach. A map showing the Tar Creek watershed 100-year floodplain is shown in Figure 1.

## TAR CREEK AND LYTLE CREEK NORTH OF HIGHWAY 69

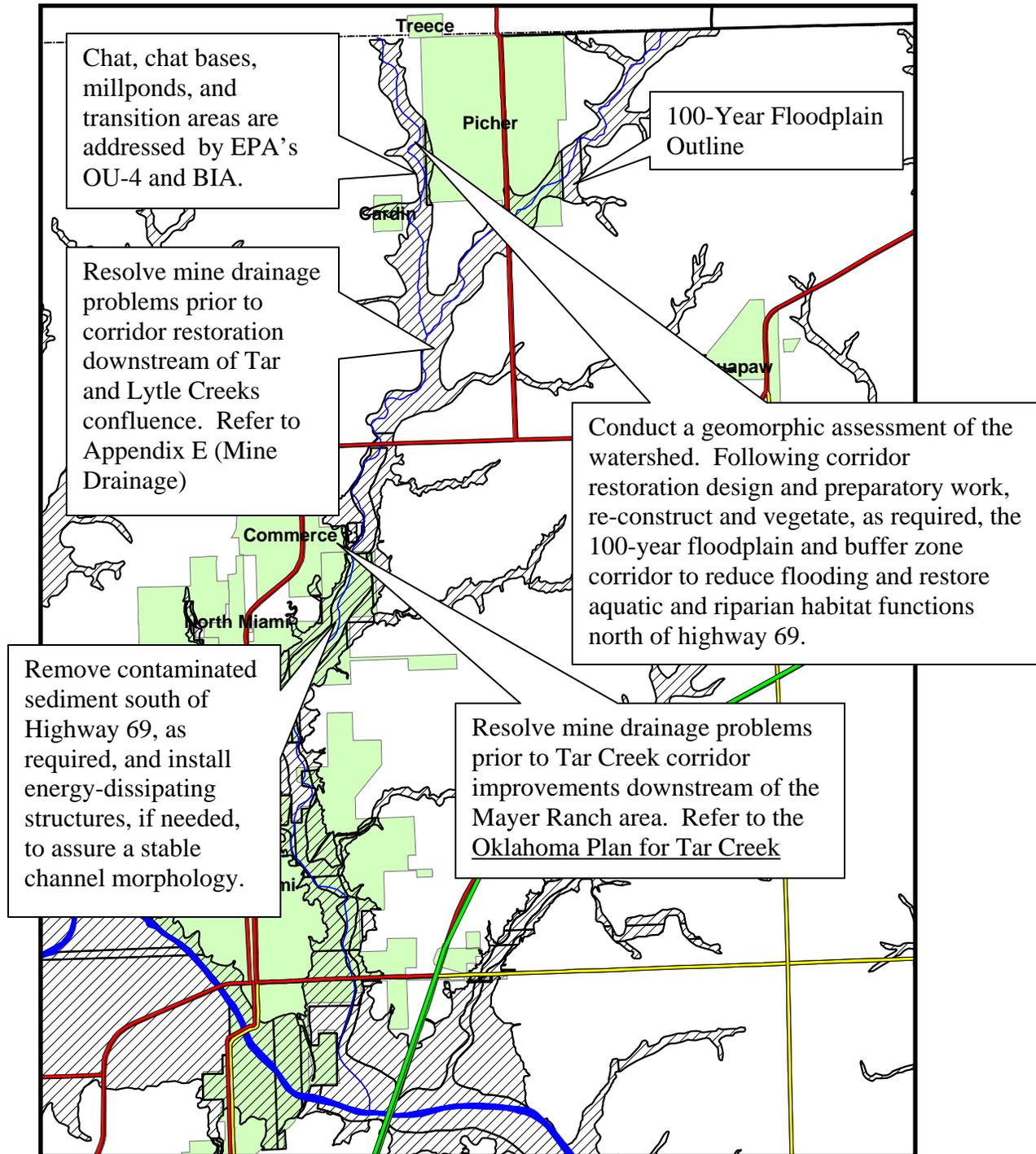
Consideration should be given to utilizing a coordinated approach to restore the Tar Creek and Lytle Creek floodplain corridor north of Highway 69 to reduce flooding and improve the ecosystem. Working with Federal and State agencies, the recommended interactive process for consideration is to implement the following coordinated actions within the 100-year floodplain and buffer zone<sup>1</sup>:

- Seal mine shafts (exposed and buried) and collapsed areas to reduce surface water runoff into mine workings and stabilize ground conditions.
- Remove and dispose of mining waste, including sediments as required.
- Construct temporary and/or permanent barriers, as required, to preclude acid-mine drainage from adjacent areas into the buffer zone. Temporary barriers would be removed following completion of the cleanup of remaining chat piles, chat bases, millponds, and transition areas outside the buffer zone.
- Reconstruct and vegetate the floodplain and buffer zone corridor to reduce flooding and restore aquatic and riparian habitat functions.

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<sup>1</sup> Using guidance provided by 30 CFR Part 817, the buffer zone is defined here as a distance of at least 100 feet beyond the FEMA established 100-year floodplain of the watercourse under consideration.

Figure 1. Stream Corridor Restoration Strategy



Prior to initiating stream corridor restoration along Tar Creek south of the Tar Creek and Lytle Creek confluence, the mine drainage problems in this area will need to be resolved (refer to the discussion on mine drainage).

**TAR CREEK SOUTH OF HIGHWAY 69**

Contingent on the results of the geomorphology assessment, the anticipated action for the Tar Creek channel downstream of Highway 69 is to remove contaminated sediment, as required, and install energy-dissipating structures, if needed, to assure stable channel morphology. Prior to initiating stream corridor restoration along Tar Creek south of Commerce, the mine drainage problems at the Mayer Ranch site will need to be resolved. The mine drainage problem at the Mayer Ranch site is being addressed by Oklahoma University as part of the Oklahoma Plan for Tar Creek.

**COST ESTIMATE**

The geomorphology of Tar Creek and Lytle Creek corridors are generally moderately to severely impacted north of Highway 69, and Tar Creek is impacted south of Highway 69 (Refer to Figure 2). The preliminary cost estimate is about \$26.7 million and is based on information from the July 2000 Tar Creek Superfund Task Force Drainage and Flooding Subcommittee Report (page 45); cost of a recently constructed channel improvement project in Bixby, Oklahoma (about \$1.6 million/mile); and cost of a recently constructed Riverine Restoration project along the North Canadian River in Oklahoma City (\$2.5 million/mile total and \$0.7 million/mile for dredging and stream bank work).

Reach	Costs in \$1,000,000						
	Y1	Y2	Y3	Y4	Y5	Y6	Total
Tar/Lytle Creek from Highway 69 to OK/KS line	1.22	5.10	5.10	5.10	0.36		16.88
Tar Creek downstream of Highway 69					4.74	5.10	9.84
Totals	1.22	5.10	5.10	5.10	5.10	5.10	26.72

The following report documents a field investigation with discussions on conducting a geomorphic assessment of the Tar Creek watershed, developing a channel restoration plan, and monitoring.

**Figure 2. Stream Miles Used to Develop Preliminary Cost Estimate**

