

Abandoned Coal Mines in Tulsa County

Fact Sheet

Oklahoma Conservation Commission, Oklahoma Geological Survey,
and Oklahoma Department of Mines
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(Contact information at bottom)

INTRODUCTION

In February 2008 several articles appeared in the Tulsa news media about underground coal mines and potential problems that can occur from such mines. Part of the reporting included discussion of underground coal mines in and around the Tulsa Fairgrounds area.

The Oklahoma Conservation Commission's (OCC) Abandoned Mine Land (AML) Division, in cooperation with the Oklahoma Geological Survey and the Oklahoma Department of Mines, has developed this fact sheet to provide information on what is known about the past coal mining in Tulsa County, what investigations have been undertaken, and the potential for problems resulting from possible future land subsidence over abandoned coal mines. Land subsidence is a geologic hazard as defined by the United States Geological Survey (USGS).

BACKGROUND

There are four state and federal agencies with some expertise and jurisdiction over coal mining in Oklahoma. The Oklahoma Department of Mines (ODOM) is the state agency responsible for issuing permits and regulating active surface and underground coal mines. The Oklahoma Conservation Commission (OCC) is the state agency responsible for reclaiming abandoned coal mines (both surface and underground) that were mined prior to the enactment of the federal Surface Mining Control and Reclamation Act of 1977. The Oklahoma Geological Survey (OGS) is the state agency responsible for the scientific investigation and reporting of the state's land, water, mineral and energy resources. The Office of Surface Mining (OSM) of the U.S. Department of the Interior is the federal agency responsible for regulating surface coal mining and the surface effects of underground coal mining. OSM works in conjunction with the Oklahoma Department of Mines and the Oklahoma Conservation Commission to regulate active coal mining and reclaim abandoned mine lands.

Coal mining in Tulsa County has been by both underground and surface mining methods. Commercial underground coal mining began in Tulsa County after the turn of the 20th century. The available underground mine maps for Tulsa County on file at the Oklahoma Department of Mines range in date from 1910 to 1955. The Oklahoma Geological Survey has published research reports and maps of coal mining in Tulsa County. The most important is by Hemish, L.A., published in 1990, entitled *Coal Geology of Tulsa, Wagoner, Creek and Washington Counties, Oklahoma: Oklahoma Geological Survey*

GM-33. Another is by Oakes, M.C., et al., published in 1952, entitled *Geology and Mineral Resources of Tulsa County, Oklahoma: Oklahoma Geological Survey, Bulletin 69*, 234p. Also, the Tulsa Geological Society has compiled additional information that can be found in Knight, W.V., 1972, *Coal and Coal Mining in the Tulsa Area*, a document included in A.P. Bennison, W.V. Knight, W.B. Creath, R.H. Dott, and C.L. Hayes, eds., *Tulsa's Physical Environment – a symposium: Tulsa Geological Society Digest*, v. 37, p. 243-251.

Typically the coal beds that have been mined in Tulsa County are 28 to 34 inches thick, dip 0-3 degrees west-northwestward and are 0 to 90 feet below the surface. The majority of the areas where coal has been mined by underground methods are 20 feet or greater in depth, but there are areas mined by underground methods where the coal bed is less than 20 feet in depth. Geologic study and drilling will show actual depths of abandoned mines at specific locations.

OCC is in consultation with OGS to review existing blueprint maps and previous studies of coal mining in Tulsa County in an effort to better determine the areas that have been mined by underground methods. While maps exist for many of the underground mines in Tulsa County, it is not a complete set. Examination of these maps indicates that there are other areas known to have been mined but for which maps are not available. The available mine maps may lack data such as depth (from surface to mine rooms) and room height (from floor to mine roof). There is also the challenge of correlating the old maps to features on the surface. OCC is in the process of electronically scanning the old mine maps that are available and then overlaying the maps on aerial photographs of the surface. This has been accomplished for an area around the Tulsa Fairgrounds but remains incomplete for most of Tulsa County. The project is being undertaken to provide a resource to OCC mine reclamation staff who are charged with investigating subsidence incidents due to underground mines in Tulsa County and in other areas of the state.

THE AML EMERGENCY PROGRAM

1. OCC operates the AML Emergency Program under the auspices of the federal OSM. Before OCC can implement the Emergency Program to address an event, OSM must issue a statement declaring a coal-related abandoned mine land emergency to exist. In areas known to have underground mining, OCC investigates all reports that could possibly be related to the underground mining.

Investigations to date in Tulsa County

- (a) OCC's records show the location of an open subsidence in a city street and residential yard east of the Sears store at E. 17th St. and S. Erie Ave. on May 16, 1997. OCC consulted with the City of Tulsa whose street maintenance workers fixed the problem as a street repair project.
- (b) On Oct. 30, 2000, OCC received a contact from a landowner located at 1202 S. Darlington regarding the possibility of subsidences at 1208 and 1214 S. Darlington. No open hole was observed and no additional reports have been received to date.

- (c) In March 2003 OCC received a contact from Mr. Joe Etheridge regarding a subsidence adjacent to his driveway at 2324 S. Toledo Ave. Investigation revealed a 4 feet deep, 8 feet long and 5 feet wide concrete box. Upon examination it was determined to be the remains of a water cistern or cellar and was not related to coal mining.
2. If a home is damaged by subsidence due to underground mining, OCC can do work to stabilize the home's foundation or, in some situations, move the home. However, the program does not provide funds to repair damage to the house caused by the subsidence. Some states offer mine subsidence insurance to property owners in areas that are undermined, but the State of Oklahoma has no mine subsidence insurance program. Oklahoma Sen. Richard Lerblance (D-Hartshorne) introduced mine subsidence insurance legislation in the 2007 Legislative Session but the bill did not pass.
 3. OCC is not allowed to use federal AML Emergency Program funds from OSM to perform exploratory drilling in the area to assess the potential of subsidence until a subsidence event occurs.
 4. During the time period since OCC first assumed responsibility for the AML Emergency Program in 1998 to the current date of April 23, 2008, OCC's Abandoned Mine Land Program has reclaimed 43 AML emergency projects at a cost of \$801,403.26. None of the emergency AML projects were in Tulsa County.

CONCLUSIONS

1. OCC has electronically scanned more than 60 coal mine maps from the Oklahoma Department of Mines. Dates of these maps range from 1910 to 1955. Based on information from available mine maps and geological reports from the Oklahoma Geological Survey (OGS), the OCC and OGS find that the Dawson coal in Tulsa County is 28-34 inches thick and dips less than 5 degrees west-northwestward. Data from OGS map GM-33, Plate 1, shows the mined part of the Dawson coal bed to be mostly 20-90 feet below the surface; however, there are small areas where the coal is less than 20 feet below ground.
2. OCC, ODOM and OGS have no knowledge of health concerns or issues related to water in the underground coal mines in the Tulsa Fairgrounds area.
3. Only one confirmed mine-related incident in Tulsa County has been reported to OCC since the inception of the Oklahoma AML Program in 1982. However, OCC, ODOM and OGS believe there is some potential geologic hazard for subsidence above abandoned underground coal mines in Tulsa County. The degree of potential geologic hazard depends on depth to the mine and occurrence of a rigid sandstone bed (layer) in the rock interval between the top of the mine and the surface. Shallow depth and absence of a rigid sandstone layer suggest a higher geologic hazard for subsidence. On the other hand, greater depth and presence of a rigid sandstone layer suggest a lower geologic hazard for subsidence. In order to assess the degree of potential geologic hazard one must drill exploratory holes to measure the depth to the mine and to determine the presence or absence of a rigid sandstone layer.

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