

Addendum to Park Guide 4 Muddy Creek Oil Field



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Introduction

Pennsylvania was the center of the booming American petroleum industry in the late 19th and early 20th centuries, tapping into oil reservoirs left by shallow seas and swamps 360 to 300 million years ago. As the oil craze grew and these earliest reservoirs were depleted, the industry moved on to new and better opportunities, leaving behind the history and heritage of oil in its place. Muddy Creek oil field was discovered in Butler County in 1891 during the midst of this early boom (Richardson, 1936).

Oil History

Created by masses of organic material from ancient zooplankton, algae, and other marine life that is compressed, heated, and then cooled, oil and gas formed in source rocks where deep seas and lakes once covered the land millions of years ago (Flaherty and Flaherty, 2002).

The Chinese began drilling as early as 347 B.C., using crude drill bits and bamboo poles. The Babylonians used petroleum, in its asphalt form, for building the Towers of Babylon. Persians employed it for

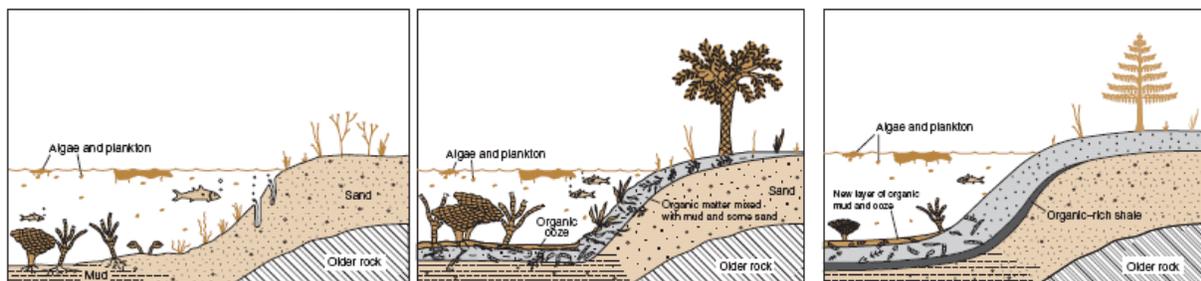
medicinal and lighting uses. Baghdad's streets were paved with tar in the 8th century. By the 9th century, Azerbaijanis began to use naphtha, a petroleum product, for heating and lighting (Encyclopaedia Britannica, 2010).

Oil was first discovered in the Americas in Trinidad on the shores of Pitch Lake in 1595. In 1632, a Franciscan monk, Joseph de la Roche d'Allion, discovered oil springs in New York, and a Russian, Peter Kalm, mapped oil springs in Pennsylvania in 1748. The American oil business did not come in to full force, however, until Drake's first well along Oil Creek in Titusville, Pennsylvania in 1859. By 1925, the United States surpassed Russia as the leading petroleum-producing country (Encyclopaedia Britannica, 2010).

Pennsylvania Oil History

The first record of oil in Pennsylvania was in 1768 by David Zeisberger, a Moravian missionary, at the junction of Tionesta Creek and Allegheny River, now approximately the site of the borough of Tionesta in Forest County. The Seneca Indians dammed small pools along the banks of Oil Creek, which allowed the Seneca to skim the oil off the top of the water (Giddens, 1947).

In 1844, "rock oil" began to flow



Creation of gas shale petroleum deposits over geologic time (Flaherty and Flaherty, 2002)

out of salt wells. It tainted the salt, so it was poured into nearby canals and waterways as a waste product, with no idea of its worth. When a canal caught fire in Tarentum because of the layer of oil floating on it, the use of oil for lighting and heating was considered in earnest. Samuel M. Kier, Jr., the inventive mind behind most petroleum uses in America, used “rock oil” in all its forms: for lighting, medicine, and lubrication. He boxed up the thicker “butter” form, and bottled the unrefined liquid form, and sold both as medicines. In fact, Kier sent the petroleum butter out west and sold it for fifty cents per pint during the gold rush in 1849, marketing it as a medicinal treatment for burns and bruises. The excess petroleum, until it was widely used as a lighting fuel, was sold at \$1.50 a gallon (Giddens, 1947;



David Zeisberger, the Moravian missionary who recorded the first findings of oil in Pennsylvania (www.explorepahistory.com/displayimage.php?imgId=2484)

Henry, 1873).

In 1852, Kier was the first to distill oil in Pennsylvania. As his refining process became more efficient, he produced the first lighting oil, which would burn without smoking or noise. Kier treated the oil using acids and a “Virna burner,” a lamp he invented to burn oil, and refined it until it was similar in composition to the gasoline of today. By working out the kinks in the refining process, he effectively halted the manufacture and sale of coal oil, which was produced from shale, mineral wax, and cannel (or candle coal), a coal that burns bright with little ash (Henry, 1873).

Now enter “Colonel” Edwin L. Drake, who as the local representative for the Seneca Oil Company in Titusville, first drilled for oil in Pennsylvania. His application of salt well drilling techniques swept the petroleum business away, and Pennsylvania became the leading producer of oil in the world in the 19th and early 20th centuries. Pennsylvania oil is one of the “sweetest” crudes available, needing very little refinement, and is still used today in some of the highest quality lubricating oils (Giddens, 1947).

In 1858, Drake traveled to Tarentum to research the salt well drilling process and improve upon the notion of boring into the ground for oil. Even with this insight, however, it still took Drake over a year to finish his well and find oil. Delays and weather worked against him until August 27, 1859, when his driller, William “Uncle

Billy” Smith, encountered petroleum at 69.5 feet. From the time petroleum was first found in Tarentum-area salt wells to when “Colonel” Drake completed his well, crude oil had doubled in value (Giddens, 1947).

Butler County and Muddy Creek Oil Field

Around the turn of the 20th century, Butler County was one of the centers of the oil business in southwestern Pennsylvania. To this end, Muddy Creek oil field played an important role, providing much of the oil to the refineries in East Butler (Stokes, 2001; Williams, 2008).

Oil was originally transported to refineries by horse and wagon. The horse and wagon teams had many drawbacks, especially in the thick mud that was created around the drilling sites. The mud was so toxic that contact with it caused many of the horses to be hairless from the neck down. In addition, wagons became stuck in the mud and drivers lost their place in line to deliver, which translated to lost profits. When pipelines were introduced to the industry, oil tycoons jumped at the chance for a cheaper and more efficient way to transport their product to the refineries. During this time, strikes and blockage of pipeline construction work were common occurrences because the wagon teamsters did not want to relinquish their tenuous hold on the petroleum transportation business (Giddens, 1947).

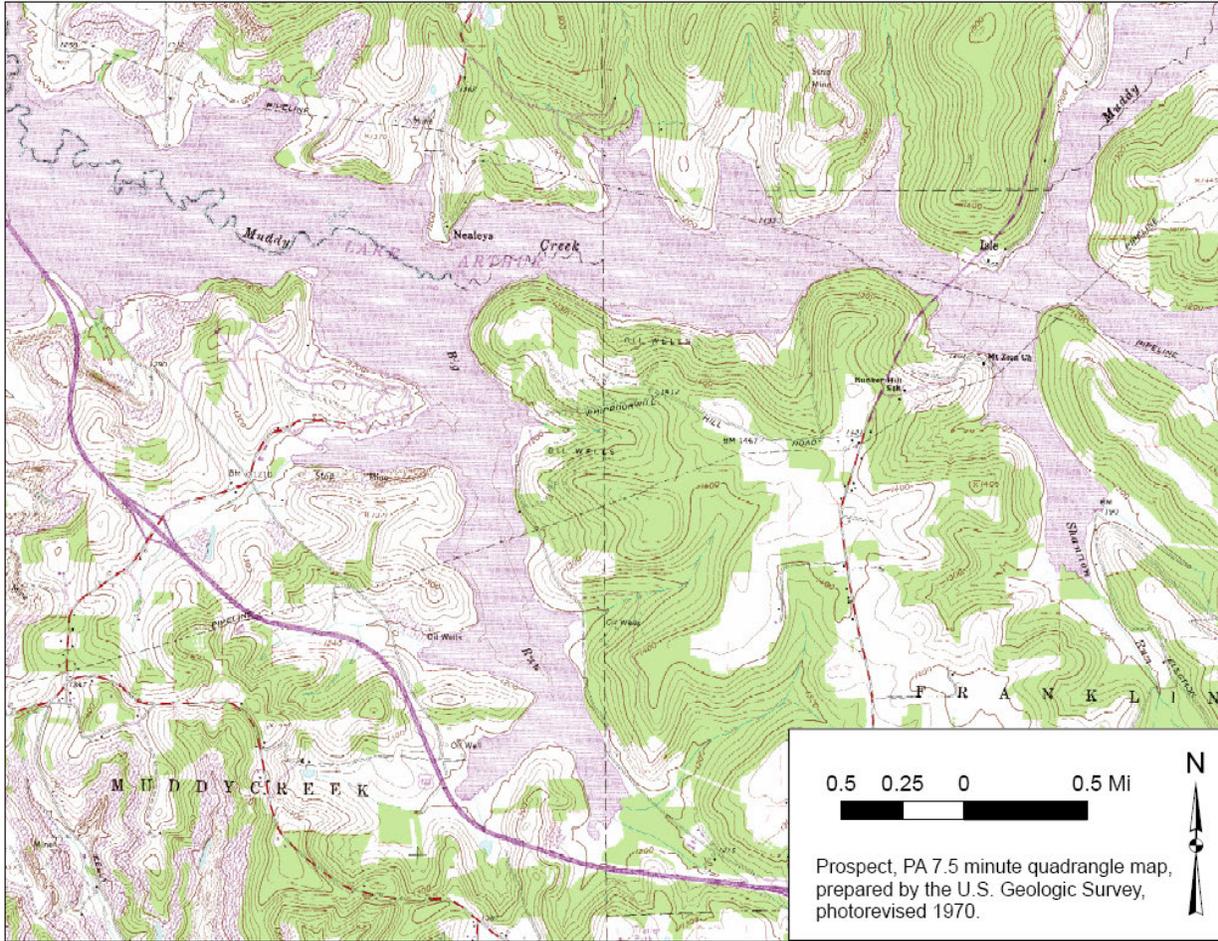
Oil was first discovered in Muddy

Creek oil field two miles north of Prospect in 1891 on the Daniel Shanor farm. The discovery well initially produced four barrels of oil per day from the Berea Sandstone (Lytle, 1950; Flaherty, 2003). By July 17, 1891, Muddy Creek oil field had 23 wells producing around 250 barrels a day (Boyle, 1898). Bessemer gas engines, fueled by natural gas, operated the wells in Muddy Creek oil field. One gas engine could operate as many as 17 wells at a time (Stokes, 2001). The producing reservoir in Muddy Creek oil field, the Berea Sandstone, was described by Lytle (1950) to range “from a dark gray, hard, fine grained sandstone, to a coarse-grained sandstone. The oil pay is found in the upper part of the sand. If a coarse sand is found in the bottom of the sandstone, fresh water is usually encountered.”

Approximately 250 oil wells were completed in Muddy Creek oil field. These wells did not produce large amounts, but gave a steady supply of two or three barrels a day over a period of several years (Lytle, 1950; Flaherty, 2003). The oil was piped to a central collection tank, located on the old Whippoorwill Hill Road (now Christley Road) by Big Run on the Leisey Farm (Stokes, 2001), and then sent to the refineries.

Moraine State Park and Lake Arthur

Prior to the flooding of

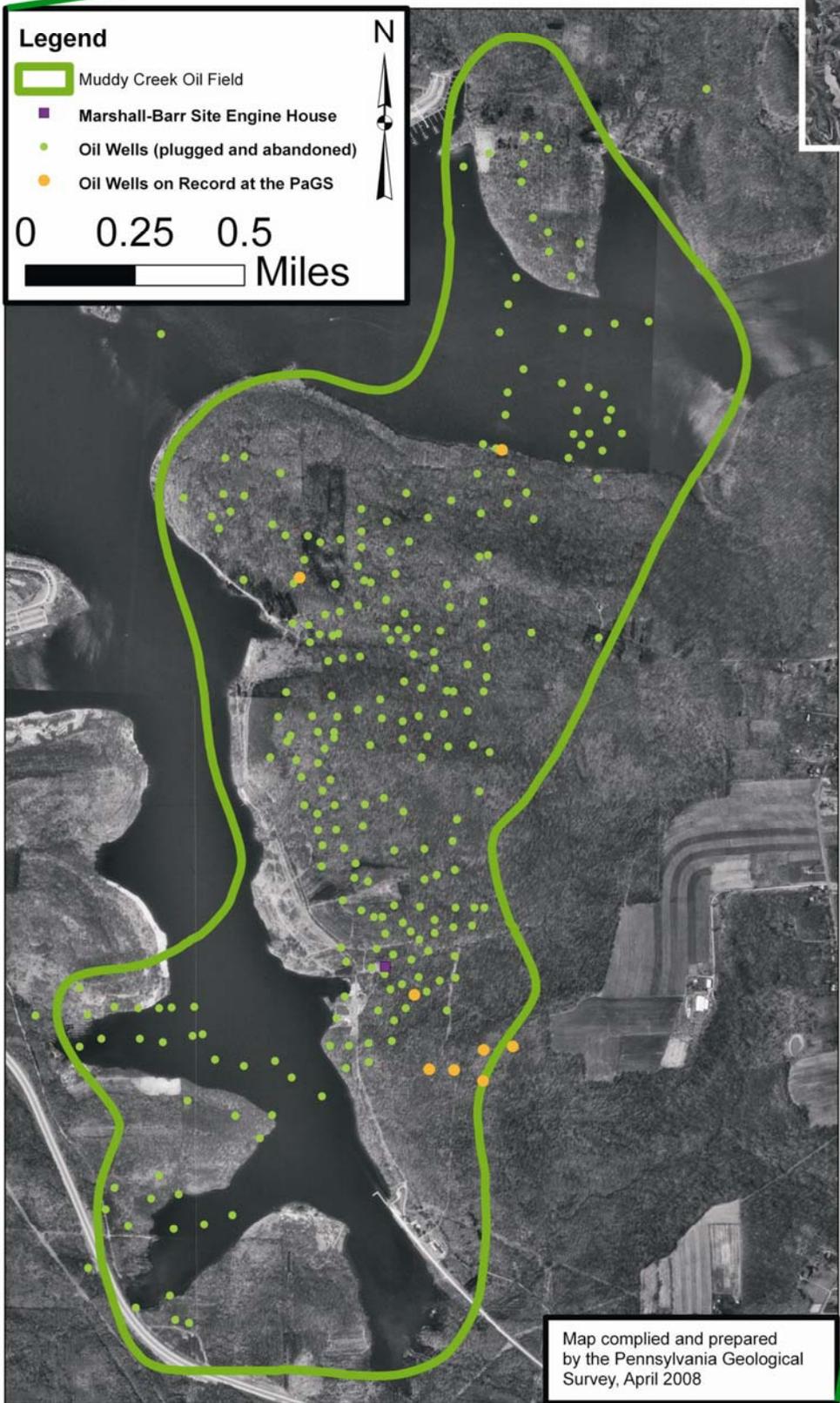


Topographic map of Moraine State Park and Lake Arthur.

Muddy Creek and its tributaries, most of the oil wells in this area were plugged, and associated pipelines, tanks, and pumping equipment were also removed. The Pennsylvania Department of Forest and Waters (predecessor of today's Department of Conservation and Natural Resources) maintained operation of 46 Muddy Creek oil wells until the lake and park were completed (Stokes, 2001). Several of the plugging certificates for these wells remain on file at the Pennsylvania Geological Survey in Pittsburgh, PA.

The Marshall-Barr Site

Well No. 19 on the old Marshall-Barr tract of land was drilled in 1932 to a depth of 974 feet and produced oil for over 30 years. When the Commonwealth of Pennsylvania purchased the lands now known as Moraine State Park, the Marshall-Barr tract was selected as the site for a pumping oil well exhibit. Lack of funding prevented its refurbishment in the 1960s, but with assistance from volunteers at the park as well as from the Steam Engine and Old Equipment Association (Portersville, PA) in the 1990s, the Marshall-Barr site is now a



The Muddy Creek oil field (as it existed in the early 20th century) juxtaposed against modern aerial photography of Lake Arthur.

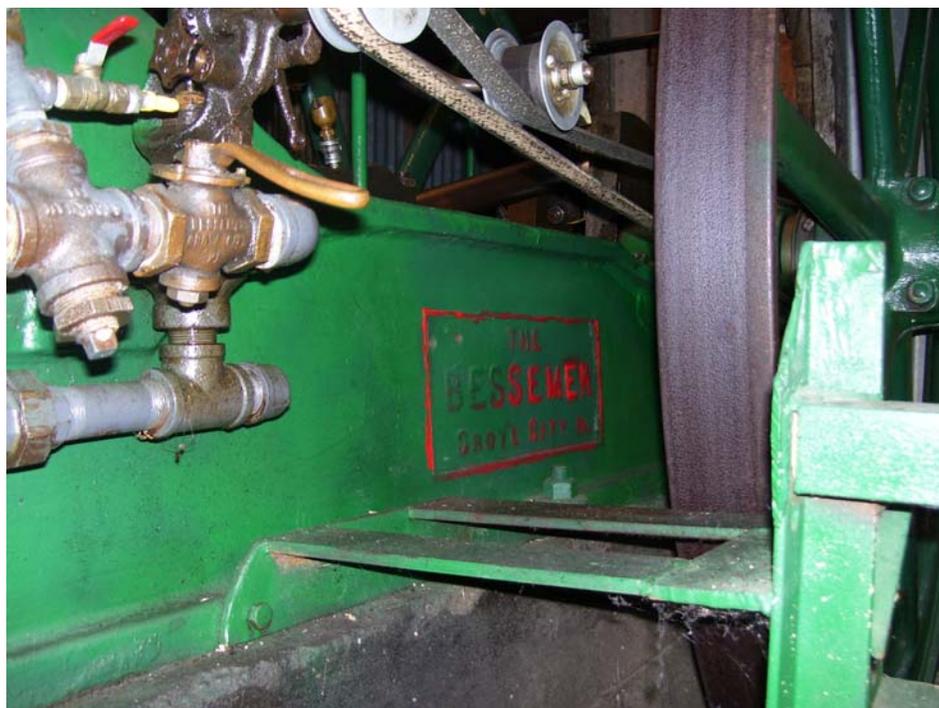
fitting homage to the once-thriving oil industry in Muddy Creek valley. The site contains an old Bessemer gas engine, an engine house, and the necessary equipment, like hangers and pumping jacks (Stokes, 2001).



One of several oil pumpjacks at the restored Well No. 19 site (Photo: K. Carter, October 2007).



Bessemer gas engine, as seen from inside the restored pumphouse (Photo: K. Carter, October 2007).



The Bessemer gas engine used to operate the oil pump at the Marshall-Barr site was manufactured in Grove City, PA (Photo: K. Carter, October 2007).

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Restored Marshall-Barr Site near the shores of Lake Arthur (Photo: K. Carter, October 2007).