

HISTORY OF LOCK AND DAM NO. 10: A HISTORIC PRESERVATION LESSON PLAN FOR FOURTH GRADE STUDENTS



by
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Prepared for



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Kentucky | West Virginia | Wyoming
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Unit Planning Template

Subject(s)/Course(s): Social Studies **Grade/Level:** Fourth

Integration with other content areas (if applicable): Reading

Estimated time for implementation: Approximately two weeks of 45–60 minute daily lessons

Connections to previous/future learning: builds upon fourth grade students' study of Kentucky history and settlement while introducing topics, including trade on the Ohio and Mississippi Rivers and transportation technologies, that will be discussed in future United States history classes

Standards

This lesson plan addresses two of the Education Goals identified for all students as enumerated in the Kentucky Academic Standards, March 2019:

- Goal 1:** Students are able to use basic communication and mathematics skills for purposes and situations they will encounter throughout their lives.
- Goal 2:** Students shall develop their abilities to apply core concepts and principles from mathematics, the sciences, the arts, the humanities, social studies, practical living, and vocational studies to what they will encounter throughout their lives.

Goal 1 is addressed by the reading and writing standards, while Goal 2 is addressed by the social studies standards. This lesson plan addresses the following concepts and practices from the above standards within the context of Kentucky River history and the development of the lock and dam system with Lock and Dam No. 10 serving as a case study.

Social Studies Standards

4.E.MI.1 (Microeconomics)

Explain the role of producers, consumers, products, and labor in economic markets.

Students will study and discuss the role of producers, consumers, products, and labor in economic markets as they relate to central Kentucky and the Kentucky River.

4.E.ST.1 (Specialization, Trade, and Interdependence)

Explain how trade leads to increasing economic interdependence.

Students will learn how trade on the Kentucky River and the interdependence between major cities, including Louisville, Cincinnati, and New Orleans, along with eastern and central Kentucky, led to the construction of a series of lock and dams along the river.

4.E.KE.1 (Kentucky Economics)

Predict how producers in colonial Kentucky used the factors of production to make goods, deliver services, and earn profits.

Students will discover how the development of the Kentucky River as a transportation route influenced the production and distribution of goods and impacted the economy of central and eastern Kentucky.

4.G.HI.1 (Human Interactions and Interconnections)

Explain how cultural, economic, and environmental characteristics affect the interactions of people, goods, and ideas from European Exploration to the Thirteen Colonies.

Students will analyze how the development of the Kentucky River as a transportation and trade route affected the movement of people and goods between Kentucky and major ports along the Ohio and Mississippi Rivers.

4.G.HE.1 (Human Environment Interaction)

Analyze how geographic features created challenges and opportunities for the development of Colonial America.

Students will study and describe how the Kentucky River presented challenges and provided opportunities for advancement in central Kentucky from the pre-settlement period to the mid-twentieth century.

4.G.GR.1 (Geographic Reasoning)

Analyze how location and regional landforms affect human settlement, movement, and use of various natural resources, using maps, photographs, and other geographic representations.

Students will use geographic tools, including maps and photographs, to analyze the geography of the Kentucky River and the surrounding region and to describe how the river influenced settlement, movement, trade, and technology from the late eighteenth to the mid-twentieth century.

4.G.KGE.1 (Kentucky Geography)

Compare how the movement of people, goods, and ideas in Colonial America and modern Kentucky were affected by technology.

Students will describe how technological innovations to the craft traveling on the river and the creation of the lock and dam system impacted the development of the Kentucky River and the economy of central and eastern portions of the state.

4.H.CH.2 (Change and Continuity)

Describe the impact innovation and human ingenuity had on the development of the United States from European Exploration to the Thirteen Colonies.

Students will analyze how the invention of the steam engine drove the development of the lock and dam system on the Kentucky River and how the introduction of the internal combustion engine impacted trade on the river.

4.H.CE.1 (Cause and Effect)

Utilize chronological sequences of events to explain causes and effects of historical developments from European Exploration to the Thirteen Colonies.

Students will explore the evolution of the Kentucky River as a transportation and trade route from the pre-settlement period to the mid-twentieth century and will discover how advancements in technology, the railroad, and the World Wars affected the river's history and use.

4.I.U.E.1 (Using Evidence)

Integrate evidence from two or more sources to answer compelling and supporting questions.

Students will draw upon a variety of primary and secondary resources in each lesson to answer reading assessment and critical thinking questions.

4.I.U.E.3 (Using Evidence)

Develop claims with evidence to answer compelling and supporting questions.

Students will be asked to integrate textual evidence to support their responses to reading assessment and critical thinking questions.

Reading and Writing Standards

RL.4.1 (Key Ideas and Details)

Refer to details and examples in a text when explaining what the text says explicitly and when drawing inferences from the text.

Students will locate key ideas or information in a passage and apply their knowledge of text features (e.g., pictures, maps, drawings, charts, captions, diagrams, headings) to answer questions about a passage.

RL.4.4 (Craft and Structure)

Determine the meaning of words and phrases as they are used in a text, including but not limited to figurative language such as metaphors and similes, and describe and explain how those words and phrases shape meaning.

Students will interpret the meaning of specialized vocabulary (words and terms specific to understanding the content) within the context of each passage.

Unit Organizer

Traveled by Native Americans, white settlers, and steamboats alike, the Kentucky River today is a popular recreational destination known for its beautiful scenery and unique geological features. It also serves as a source of drinking water for portions of eastern and central Kentucky. Through an examination of primary documents, photographs, and a case study of an early twentieth-century lock and dam, this lesson allows students to explore the history of the Kentucky River as a transportation route in order to understand the important role that it played in the development of the state and to better appreciate how the river's history shaped the landscape and culture of Kentucky.

Essential Questions

- How and why did the Kentucky River become such an important means of transportation in central and eastern Kentucky?

- How did advancements in transportation technology during the nineteenth and twentieth centuries impact travel and trade on the river?
- What is a slackwater navigation system and how was it implemented on the Kentucky River?
- In what ways does the history of Lock and Dam No. 10 reflect the development of the Kentucky River and the changes to river commerce during the late nineteenth and early twentieth centuries?

Connections to Literacy

This unit presents students with a number of readings including primary and secondary historical accounts. Questions following the readings measure student comprehension and ask students to apply the reading's specific content to the larger themes of the unit.

Connections to Career/Workplace

This unit explores the history of the Kentucky River and the lock and dam system. It includes information about the duties of the positions of lockmaster and lockman at the Kentucky River locks, as well as the agricultural, manufacturing, and shipping industries as they relate to the river. It also requires students to engage with documentary and physical evidence to apply the analytical skills of the historian. More generally, the unit provides students with multiple opportunities to practice their reading and writing skills and to develop their visual perception and spatial analysis abilities.

Resources/Technology

This unit includes copies of the readings, primary documents, and high-resolution photographs necessary to complete each lesson. Teachers may choose to print these materials or to present them to students in an electronic version such as a power point presentation.

An Introduction for Teachers

Teaching with Historic Places

The following lesson plans were based on the models provided by the Teaching with Historic Places program, which “uses properties listed in the National Park Service's National Register of Historic Places to enliven history, social studies, geography, civics, and other subjects” (Teaching with Historic Places website: <https://www.nps.gov/subjects/teachingwithhistoricplaces/index.htm>). National Register-listed properties, historic sites and museums, and state and national parks or battlefields are particularly appropriate for incorporating into classroom lessons because they are acknowledged to be significant and often have been preserved or restored to maintain historical integrity. In most cases, a body of research about the property already exists and can be utilized to develop classroom activities.

Kentucky contains a wide variety of historic resources associated with river trade and transportation, including historic houses and buildings, steamboats, and lock and dams. Many of these continue to function as private residences, businesses, or government-operated facilities, but some, like Lock and Dam No. 10 near Boonesboro, Kentucky, are open to the public as museums and interpretative sites. Whether private or public, these places preserve the collective history of Kentucky’s many waterways and serve as physical reminders of the important role of river travel in the development of the state. In addition to Lock and Dam No. 10, which houses the Kentucky River Museum, other river-related sites and museums in Kentucky include: Riverside at the Farnsley-Moremeyn Landing in Louisville, Kentucky; the Butler-Turpin State Historic House in Union, Kentucky; the *Belle of Louisville* steamer in Louisville, Kentucky; the *Dixie Belle* riverboat at Shaker Village in Harrodsburg, Kentucky; the McAlpine Lock and Dam Visitors Area in Louisville, Kentucky; the Portland Museum in Louisville, Kentucky; the Green River Museum at Woodbury Lock in Woodbury, Kentucky; and the River Discovery Center in Paducah, Kentucky.

Many of Kentucky’s historic river resources and sites are listed in the National Register of Historic Places. Although Lock and Dam No. 10, which serves as the case study for this unit, is not currently listed in the National Register, it has been determined eligible for listing in the National Register of Historic Places as part of the Kentucky River Navigation system. The National Register of Historic Places is the official list of the country’s historic places that are worthy of preservation. The list is maintained by the National Park Service and contains over 80,000 properties located in almost every county in the United States. It includes buildings (such as houses, commercial buildings, and churches), structures (such as bridges, canals, and roadways), sites (such as gardens, battlefields, and cemeteries), and objects (such as sculptures, monuments, and fountains) that are at least 50 years old and are significant in the history of a city, a county, a state, or the nation. These places may be associated with a significant historical event or person, they may be excellent examples of an architectural style or type, or they may be archaeological sites with the potential to contain information about history or prehistory. Also, these places must have historical integrity, which means that they should retain the character-defining features that allow the property to convey its historical associations. Historical location, setting, design, materials, workmanship, association, and feeling are all considered when evaluating integrity. If a property is 50 years old, is historically significant, and has integrity, then it is eligible for listing in the National Register.

Listing in the National Register of Historic Places is an honor that draws attention to important historic sites and promotes their preservation. It can generate pride in the property owner and the community, encouraging them to learn more about local history and to care for their historic properties. Also, sites that are listed may be eligible for historic preservation tax credits that can offset some of the expenses of

restoration projects. Thus, the National Register is an important tool that preservationists use to promote historic preservation in their communities and across the nation. Copies of the National Register nominations for the *Belle of Louisville* steamboat, Riverside at the Farnsley-Moremen Landing, and other historic resources in Kentucky related to river history and transportation are on file at the Kentucky Heritage Council. Many are also available online through the National Park Service at <http://www.nps.gov/nr/>. Teachers are encouraged to utilize these resources to develop additional extension activities that allow students to apply the preservation ideas that they learned in this unit to other properties in their community.

About this Unit

Through a series of focused lessons, this unit presents the history of the Kentucky River as a transportation route and the development of the lock and dam system. The buildings, structures, and documentary records of Lock and Dam No. 10 in Boonesboro, Kentucky, serve as a case study for understanding this history, providing meaningful visual and human connections for the students. By linking history to a specific place, these lessons also teach the importance of historic preservation and encourage students to think about the significant places in their own lives.

Using real places to teach students about history can generate excitement and curiosity by bringing the past to life. Students become historians as they examine primary sources, actively engaging the material to ask questions and draw conclusions. Once students learn to see old buildings and objects as clues about the past, they can take this skill with them into their homes and communities and begin to appreciate their surroundings in new ways.

The history of the Kentucky River is integral to the geography, economics, politics, and history of Kentucky, as river travel and trade was a fixture of central Kentucky life from the late eighteenth to the early twentieth century. At Lock and Dam No. 10, one can experience life on the Kentucky River over a hundred years ago. The lock and dam, the lockhouses, other structures, and the artifacts therein provide tangible connections to an “extinct lifestyle” lived by the lockmasters and their families along the Kentucky River. The preservation and restoration efforts undertaken on the site help bring history to life and reinforce the connection between past and present.

This project was funded by the Kentucky River Authority. The Kentucky Heritage Council provided valuable resources and guidance in the creation of these lesson plans. Special thanks go to Jack Winburn at Fort Boonesborough State Park for helping with the research for this project and to Jenimarie Sowers for generously sharing information about her family’s life and history at Lock and Dam No. 10.

Suggested Resources

In addition to the sources listed in the bibliography, teachers may wish to consult the following sources in order to better incorporate the river trade, transportation, and historic places in their classrooms:

Clark, Thomas D. *The Kentucky*. Lexington: The University of Kentucky Press, 1992.

Kotar S.L. and J.E. Gessler. *The Steamboat Era: A History of Fulton’s Folly on American Rivers, 1807–1860*. London: McFarland & Company, Inc., Publishers, 2009.

National Park Service’s *Teaching with Historic Places* website and lesson plans:
<http://www.nps.gov/nr/twhp/index.htm>

An Introduction for Students

Inquiry Question



The “John J. Kelly” passing through Lock and Dam No. 4 at Frankfort. Courtesy of the University of Kentucky Archives.

Present students with this photograph of a boat going through a lock. Ask them to carefully examine the lock, the boat, and the background. Ask students, based on their experience growing up in Kentucky, if they know what and where this is being depicted. Use this image to initiate a discussion of the Kentucky River and its history as an important transportation route.

Locating the Site

Explain to students that the following unit will examine the development of the lock and dams along the Kentucky River first by examining the river’s use as a transportation route and then by focusing on Lock and Dam No. 10 as a case study.

To help contextualize these lessons, teachers should use power point presentations or other visual representations to present students with the following modern and historic maps:

Map 1: Map of the United States

Source: D. G. Beers and Company. *Atlas of Bourbon, Clark, Fayette, Jessamine, and Woodford Counties, KY*. Philadelphia, 1877. Available online at the Library of Congress Digital Collections:

<https://www.loc.gov/item/2005627107/>

Map 2: Map of Kentucky

Source: D.J. Lake and Company. *An Atlas of Carroll and Gallatin Counties, Kentucky*. Philadelphia, 1883. Available online at Kentucky County Library:

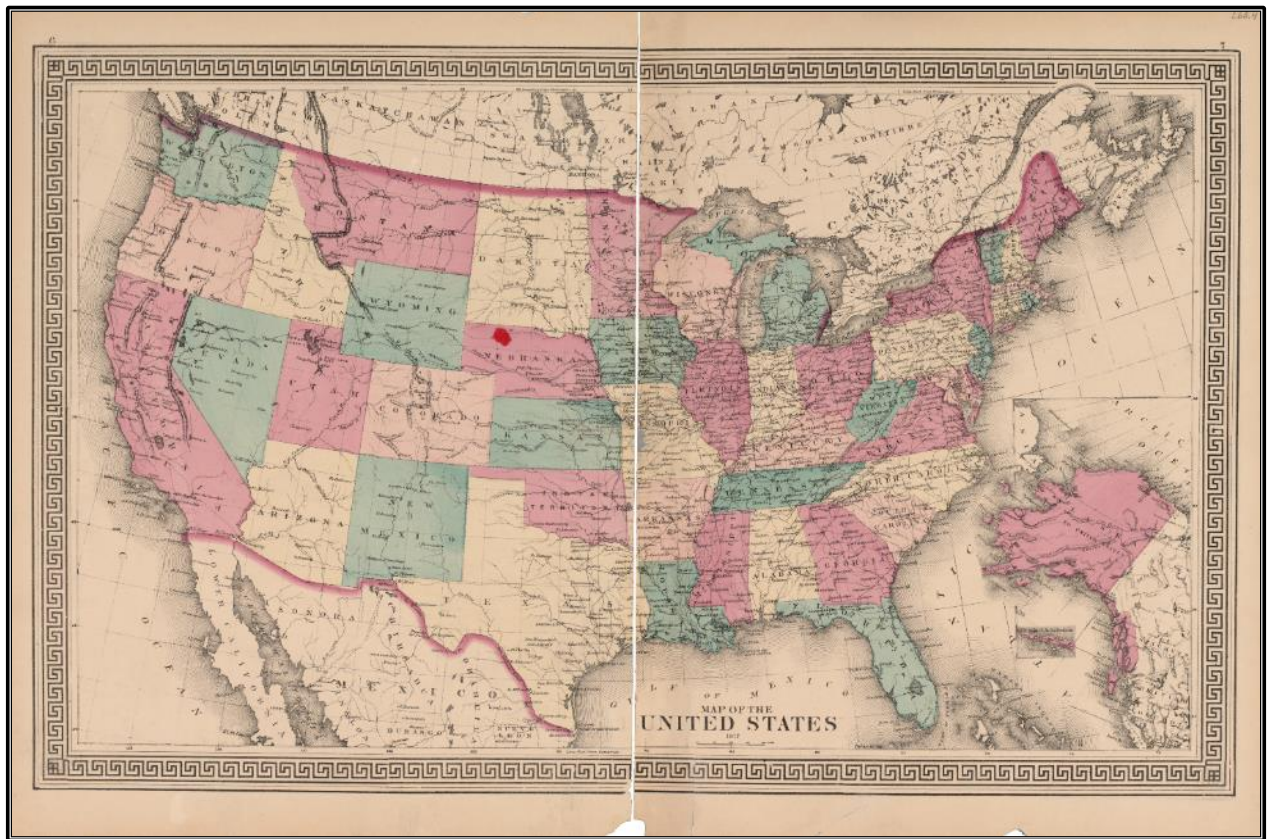
<https://www.kentonlibrary.org/kcpl/genealogy/maps/Atlas%20of%20Carroll-Gallatin/files/assets/basic-html/index.html#1>

Map 3: Map of the Kentucky River Basin

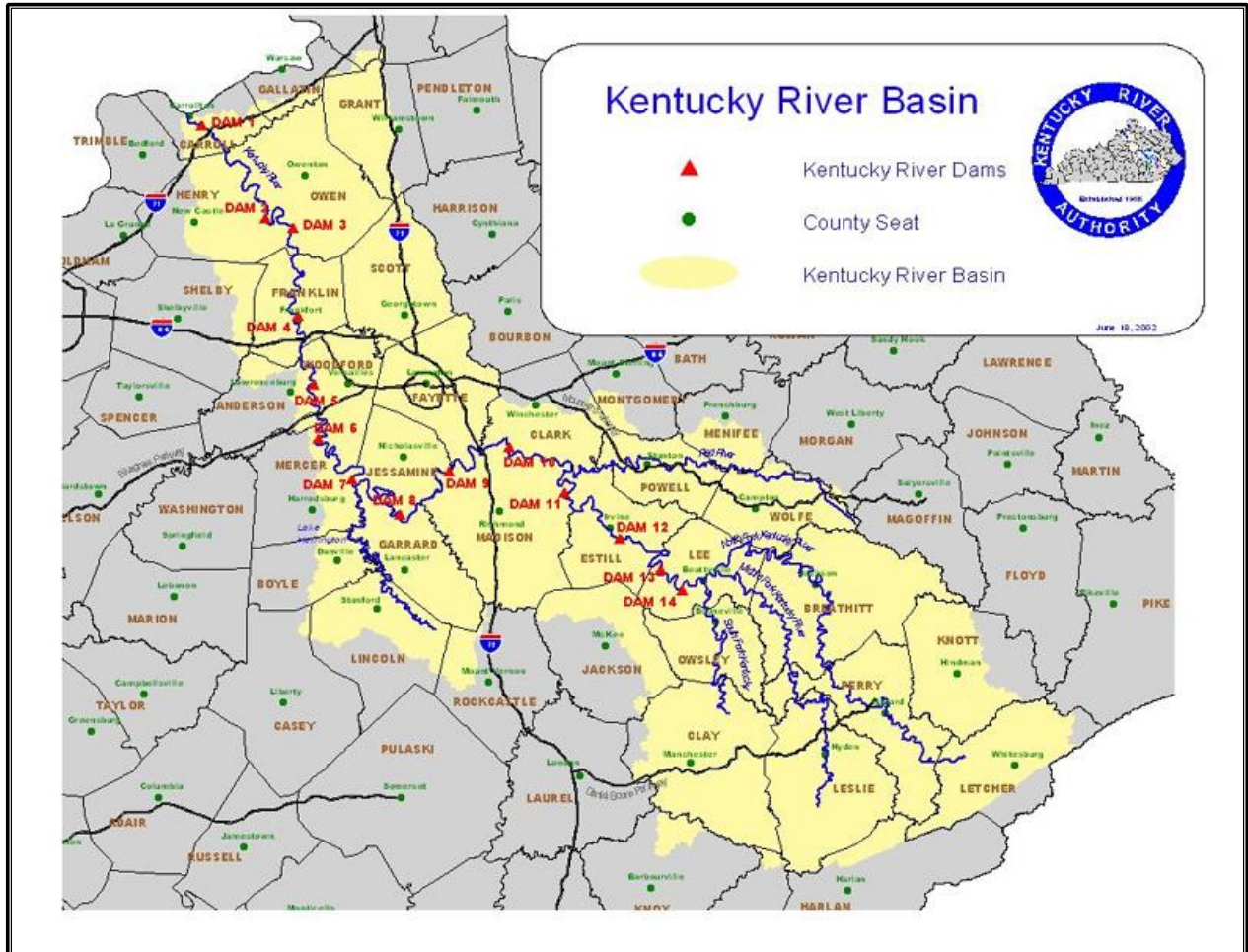
Source: Kentucky River Authority. *Kentucky River Basin*. Frankfort, 2015. Available online at the Kentucky Watershed Watch: <https://www.uky.edu/OtherOrgs/KRWW/>

Map 4: Map of Lock and Dam No. 10 and surrounding area

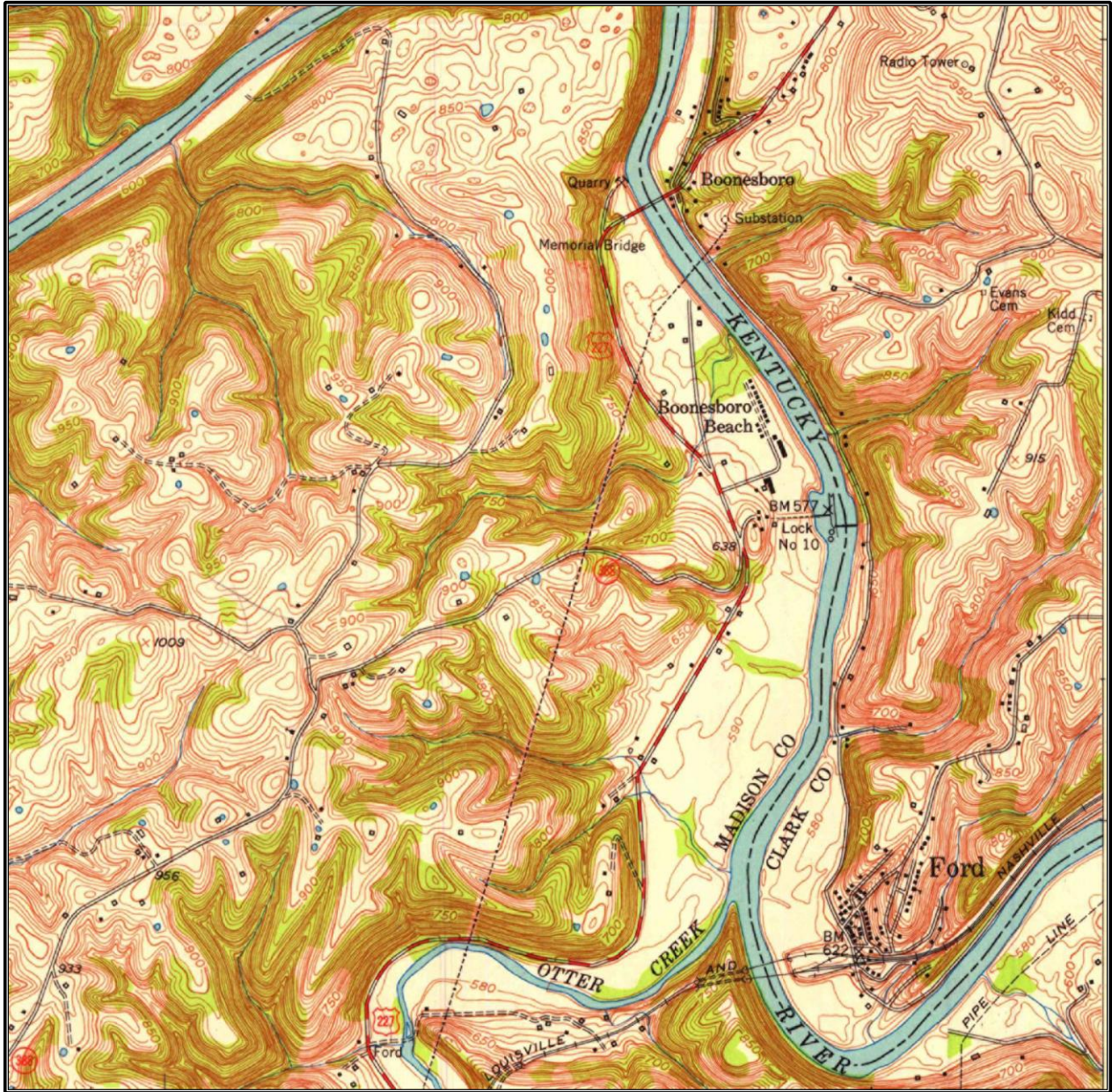
Source: 1952 Ford, Kentucky, 15-minute topographic quadrangle. United States Department of the Interior, Washington, D.C. Available online at the United States Geological Survey Historical Topographical Map Explorer: <https://livingatlas.arcgis.com/topoexplorer/index.html>



Map 1. Identify Kentucky on the map of the United States.



Map 3. Identify the Kentucky River's watershed and the location of Lock and Dam No. 10 along the Kentucky River.



Map 4. Identify Lock and Dam No. 10 and its relative location to Boonesboro and Ford, Kentucky.

Kentucky River: History as a Transportation Route

Glossary

The glossary contains a list of vocabulary words included in Readings 1–4 of this section. When you see an underlined term or phrase in the reading, return to this glossary to learn its meaning.

Antebellum: the period of time before a particular war, in this case the Civil War.

Barge: a flat-bottomed boat used to carry cargo on a river or canal.

Flatboat: a flat-bottomed boat used to transport cargo on shallow waterways.

Keelboat: a long, narrow, crescent-shaped boat used to transport cargo on rivers, canals, and shallow lakes.

Lock: an enclosed chamber along a river or canal with gates at either end used to raise or lower boats, ships, or other vessels between two different levels of a river or canal.

Lock chamber: the main part of a lock that a boat enters when going through the lock. The chamber is sealed off by gates at the top and bottom, and it is filled with or emptied of water to raise or lower the boat.

Navigable: describing a body of water, such as a river, stream, or canal, that is deep and wide enough to provide passage for a boat or ship and is free of obstacles, such as rocks, sandbars, or waterfalls.

Propel: to drive, push, or move an object, such as a car, boat, or plane, in a particular direction.

Prow: the front-most part of the boat located above the waterline used to cut through the water.

Slackwater: a period or area of still or slow moving water resulting from the change of the tide or the construction of a canal or channel.

Vessel: a ship or a large boat.

Reading 1: An Introduction to the Use of the Kentucky River as a Transportation Corridor

The Kentucky River is approximately 255 miles long, beginning in southeastern Kentucky and flowing through central Kentucky to the Ohio River. Following a northwesterly course, the three forks of the Kentucky River (the North, Middle, and South Forks) merge in Lee County near Beattyville. The river then winds its way from Beattyville in the coal-rich mountains of eastern Kentucky through the rolling hills of the central Bluegrass region, and then empties into the Ohio River at Carrollton in Carroll County. In total, the Kentucky River Basin covers about 7,000 square miles, or about one-sixth of the state. The river meanders through the Cumberland Plateau, the Knobs, the Lexington Plain, and the Outer Bluegrass physiographic regions of Kentucky. As it flows through the Bluegrass Region, it is lined by steep, limestone cliffs known as the Palisades, which were formed over millions of years as the river eroded the surrounding rock.

The Kentucky River served as a major transportation route for early peoples of the region. Prior to the arrival of Europeans, Native Americans established communities near the river. They traveled the river in dugout canoes carved from hardwood trees, and they depended on the river for food, water, transportation, and trade. During the 1700s, the river carried white settlers from the Ohio River into the central and

Appalachian regions of the state. Like the Native Americans, these Europeans relied on the resources provided by the river, but they also quickly realized that the river could be used for commercial purposes. Water-powered mills, saltworks, and ironworks sprung up along and near the riverbanks, and flatboats and keelboats floated up and down the river transporting furs, tobacco, hemp, minerals, timber, and other goods. Commercial traffic along the Kentucky River linked the central and Appalachian regions of the state with Louisville, Cincinnati, and New Orleans. Goods traveled from the Kentucky River to the Ohio River and then down the Mississippi River to the “Crescent City.” The invention of the steamboat during the early 1800s advanced trade along this popular route. The first steamboat floated down the Kentucky River in 1815, revolutionizing commercial travel in the region. Steamboats quickly proved to be the fastest, most reliable method of transporting agricultural products, manufactured goods, news, and passengers in and out of the state.

Narrow and winding with frequent periods of flooding and low water, sandbars, and rocky shallows, the Kentucky River was difficult to navigate. As river transportation became more important to the state’s economy, plans were made to build a series of lock and dams along the river to improve navigability and to expand access southward along the river. Constructed over two periods between 1836 to 1842 and 1891 to 1917, the fourteen lock and dams along the Kentucky River extend from Carrollton on the Ohio River to Beattyville in Lee County in the southeastern part of the state. River traffic had already begun to decline by the time the lock system was completed in 1917. The growth of the railroad during the late nineteenth and early twentieth centuries introduced a faster way to transport goods and passengers. Steamboats were replaced by gas-powered boats, which were too large to fit through the narrow locks along the Kentucky River, and the rising popularity of automobiles led to the construction of a network of roadways throughout the state. Unable to compete with modern transportation, travel along the Kentucky River decreased, and the river was mostly used by logging and industrial operations during the early twentieth century. After World War II, most of these industries vanished, and river traffic through the majority of the locks consisted of coal barges or recreational boats. Today, a few recreational boats continue to pass through the locks closer to the Ohio River (Locks 1–4). The upper river locks, Locks 5–14, were decommissioned in 1990 and are no longer in use.

This reading was written by Cultural Resource Analysts, Inc., utilizing the following resources:

Briley, John B. and Leonard P. Curry

1992 Steamboats. In *The Kentucky Encyclopedia*, edited by John E. Kleber, p 852–853. University Press of Kentucky, Lexington.

Ellis, William E.

1992 Kentucky River. In *The Kentucky Encyclopedia*, edited by John E. Kleber, p 510–511. University Press of Kentucky, Lexington.

Johnson, Leland R. and Charles E. Parrish

1999 *Kentucky River Development: The Commonwealth’s Waterway*. United States Army Corps, Louisville District, Louisville, Kentucky.

Supplemental Reading 1. Excerpt from *The Topographical Description of the Western Territory of North America* by Gilbert Imlay, 1793 (pg. 29).

Amongst the natural curiosities of this country, the winding banks, or rather precipices of Kentucky, and Dick’s Rivers, deserve the first place. The astonished eye there beholds almost every where three or four hundred feet of solid perpendicular limestone rock; in some parts a fine white marble, either curiously arched, pillared, or blocked up into fine building stones. There precipices, as was observed before, are like the sides of a deep trench or canal; the land above being level, except where creeks set in, and crowned with fine groves of red cedar. It is only at particular places that this river can be crossed, one of

which is worthy of admiration; a great road large enough for wagons made by the buffalo, sloping with an easy descent from the top to the bottom of a very large steep hill, at or near the river above Lees-Town*.

*Lees-Town was a community on the Kentucky River near present-day Frankfort

Supplemental Reading 2. Excerpt from *A Tour of the United States of America*, by John Ferdinand Dalziel Smythe, 1784.

The whole length of the Kentucky, including its meanders, from the source of the Warrior's branch in the Allegany mountains, to the confluence of the Kentucky with the Ohio, is certainly between four and five hundred miles, containing a body of land on each side, that cannot be surpassed, and scarcely equaled by any in the universe, for fertility of soil, abundance of game, excellence of climate, and every other beauty and advantage imaginable, excepting the difficulty of access to it.

1. What is a river basin? Use the dictionary and other reference materials to define this term. Based on the reading and your research, describe the Kentucky River Basin in your own words.
2. What were some of the Kentucky River Basin's notable features mentioned by early visitors to the region?
3. Why do you think the Kentucky River was important to native peoples and early settlers in Kentucky?

Reading 2. Using the Kentucky River in the Late Eighteenth Century to Carry Goods to Market

By the late eighteenth century, agriculture and small industries were flourishing in Kentucky, and early Kentuckians looked to the river as a way to access markets beyond their borders. The mountains to the east and the region's many unimproved roads prevented goods from traveling quickly over land to cities in New England and the South. The Kentucky River proved to be a much faster and more profitable alternative and also provided access to the Ohio and Mississippi River trade route to New Orleans. In 1787, General James Wilkinson sent a fleet of flatboats loaded with tobacco, hams, and butter from Frankfort to New Orleans. Although the Spanish, who held New Orleans at the time, had closed the city to American trade, Wilkinson received permission to enter the city and quickly established a secret alliance with Spain. Wilkinson's success inspired others to follow in his footsteps, and soon the Kentucky River was filled with flatboats bound for New Orleans full of goods from across the Bluegrass region, including flour, tobacco, iron, whiskey, and hemp. Warehouses and boatyards popped up along the riverbanks, and river communities, including Frankfort and Carrollton (then referred to as Port William), became busy commercial ports as river trade prospered.

Flatboats were the main type of boat used to navigate the Kentucky River during the late eighteenth and early nineteenth centuries. They were used to transport goods and passengers from one place to another and to float logs down the Kentucky River. These boats were typically made of wide, sawn Poplar boards and were 12 to 25 feet wide and 20 to 60 feet long with a small cabin for the crew. A long oar called a *gouger* was positioned at the stern, or back, of the boat for steering. Oars along the side, known as *side burns* or *sweeps*, propelled the boat forward and backward. Flatboats could be used for upstream travel, but their flat-bottom design made them perfect for floating with the river's current. Even so, a journey by flatboat to New Orleans and back could take upward of four months. Since travel upriver was slow and difficult, most flatboats were sold and taken apart upon reaching their destination. The crew returned home over land, most likely along the Natchez Trace, a trail established by Native Americans that extended from Mississippi to Tennessee and was a popular route for boatman traveling home from New Orleans. Wood from the boats was used to construct buildings in New Orleans or was resold for other purposes. According to one source, more flatboats arrived in New Orleans from Kentucky from 1805 to 1807 than from any other western state or territory. As a result, this type of boat became known in New Orleans as the "Kentucky boat."

This reading was written by Cultural Resource Analysts, Inc., utilizing the following resources:

Ellis, Elliott William

2000 *The Kentucky River*. The University Press of Kentucky, Lexington, Kentucky.

Robinson, Michael C.

1983 *History of Navigation in the Ohio River Basin*. United States Army Engineer Institute for Water Resources, Alexandria, Virginia.

Supplemental Reading 1. Entry from the *Journal of a Tour of Unsettled Parts of North America in 1796 and 1797* by Francis Baily, October 15, 1796 (pg. 146–147).

These boats, which may be more properly termed rafts, are built without one particle of iron in their composition; they are generally from 30 to 40 feet long and about 12 feet broad, and consist of a framework fastened together with wooden pins which constitutes the bottom of the boat, and to this is fastened a flooring, which is well calked to prevent leaking; the sides are about breast high, and made of thin plank; and sometimes there is a rude kind of covering, *intended* to keep the rain out. These boats draw very little water, not enough to sink the framework at the bottom under the water, and are generally furnished with a pair of oars, not so much to expedite their progress as to keep them from the shore when they are driven

towards it by the current; and there is a pole projecting from the stern, to steer them with. When they are going downstream, it is immaterial which part goes foremost; and their whole appearance is not much unlike a large box floating down with the current.

Supplemental Reading 2. Entry from the *Journal of a Tour of Unsettled Parts of North America in 1796 and 1797* by Francis Baily, April 10, 1797 (pg. 238).

Port William (the spot from which I now write) contains about sixty houses, and is pleasantly situated on the eastern side of the mouth of the Kentucky [River]. The Ohio [River], opposite this place, is about 600 yards wide, and the Kentucky appears to me to be about 100 [yards wide]. There are a number of boats at this season of the year that come down the river Kentucky from the interior parts of the state laden with flour, tobacco, hemp, &c., which they take down to New Orleans; and Port William is generally made a landing place, where they stop before they proceed down the Ohio.

1. Describe and draw a flatboat. What do you think the boatmen traveling on the Kentucky River would have seen on their journey from Kentucky to New Orleans?
2. What types of products were shipped along the Kentucky River? Why was the trade route to New Orleans important to the Kentucky economy?

Reading 3. Technological Improvements to Craft Plying the River during the Nineteenth Century

During the nineteenth century, keelboats, steamboats, and other new types of vessels made trade on the Kentucky River faster and more profitable. Keelboats were introduced after the Revolutionary War, but they became popular for shipping goods up and down western rivers during the early 1800s. This type of boat was usually 30 to 75 feet long and 5 to 10 feet wide with a pointed pro and a shallow keel. The keel, which was located along the bottom of the boat, served as the backbone of a keelboat and extended the full length of the hull. The center of the boat usually contained a cabin or cargo box sheltering the goods or passengers during transport. Some keelboats had masts and sails, but more often they were propelled by a series of oars or long poles along the side of the vessel operated by the crew. The steersman stood on top of the central cabin and used a long oar located at the stern (back) to steer the boat. Keelboats were ideal for traveling upstream. It was difficult for flatboats to travel upriver, but the long, sleek design of the keelboat provided a faster and safer means of moving against the river's current.

Steamboats revolutionized trade and transportation on the Kentucky River. The first successful steamboat in the United States, the *Clermont*, was built by Robert Fulton in 1807. A few years later, in 1811, the *New Orleans* steamed down the Ohio River, and in January of 1812 it became the first steamboat to navigate the Mississippi River to New Orleans. The success of the *New Orleans* created interest in the use of steam power to transport Kentucky goods to cities on the Ohio and Mississippi Rivers, and by 1815, steamboats of all sizes traveled on the Kentucky River. Before railroads became widespread, steamboats played an important role in transportation and communication in central Kentucky. Known as "packet" boats, steamboats were used to carry passengers, mail, livestock, and other goods, such as tobacco, corn, hemp, salt, whiskey, iron, farming equipment, and furniture. Steamboats were also used to tow barges and remove sandbars and debris by dredging the river. Steamboats also provided a much more comfortable way to travel. Wealthy passengers would stay in sleeping quarters, known as staterooms, on the upper decks of the ship. These were usually simple and contained a bunk and a washstand, but staterooms could be larger and more elaborate depending on the size of the boat. The staterooms were organized around a central hall in the main cabin, which served as the lounge and dining room for the passengers. Some boats also had a barbershop, bar, or dancehall. Passengers who could not afford a first class ticket stayed on the lower decks, which were open to the elements and were used to store the boat's cargo. Steamboats were sometimes transformed into floating entertainment palaces known as showboats, with theaters, ballrooms, and saloons, and these boats stopped at towns on the river. Steamboats of the nineteenth and early twentieth centuries were powered by a steam engine, which consisted of a boiler filled with water heated by a wood- or coal-burning firebox to produce steam. The steam turned a large wooden paddlewheel situated along either the side or back of the boat. Much larger than the earlier flatboats and keelboats that traveled on the river, steamboats could carry heavy loads over great distances without the need of a large crew. They were also safer, faster, and more reliable.

The invention of the internal combustion engine and the automobile during the late nineteenth century led to the creation of the first gasoline-powered boats. Although companies began producing gas-powered boats during the late 1890s, they did not become widespread until the early twentieth century. The new engines were smaller and more compact than steam engines but offered additional speed. Later, gas engines became more powerful, allowing vessels to haul or push larger loads. Gas- and diesel-powered boats soon replaced steamboats, with only a few steamboats operating on the Kentucky River by 1920. The expansion of the railroad, the invention of the automobile, and the improvements to roadways had significantly decreased river traffic by the 1920s. Towboats and barges, however, continued to navigate the Kentucky River, particularly between Frankfort and the Ohio River. Diesel-powered tugboats and towboats hauled barges downstream filled with natural resources and agricultural products, such as coal, grain, corn, and tobacco. Small gas-powered boats towed logs through the newly completed lock and dam system to lumber mills along the river, like the one in Ford, Kentucky, just upstream from Boonesboro. River traffic shifted away from commercial transport after World War I as the logging industry declined and trains and trucks

were used to haul coal and agricultural products. Towboats continued to move barges filled with coal, sand, and gravel along the river. Their modern engines allowed them to move larger loads than steamboats and early gas-powered vessels could. However, the size of the barges they towed or pushed was limited by the width of the locks along the Kentucky River, making river transport less profitable. As commercial traffic faded, recreational motorboats and other pleasure vessels became a common sight on the Kentucky River.

This reading was written by Cultural Resource Analysts, Inc., utilizing the following resources:

Baldwin, Leland D.

1969 *The Keelboat Age on Western Waters*. University of Pittsburgh Press, Pittsburgh, Pennsylvania.

Ellis, Elliott William

2000 *The Kentucky River*. The University Press of Kentucky, Lexington, Kentucky.

Johnson, Leland R. and Charles E. Parrish

1999 *Kentucky River Development: The Commonwealth's Waterway*. United States Army Corps, Louisville District, Louisville, Kentucky.

Robinson, Michael C.

1983 *History of Navigation in the Ohio River Basin*. United States Army Engineer Institute for Water Resources, Alexandria, Virginia.

Supplemental Reading 1. Excerpt of "Steam Boat News" published in the *Kentucky Gazette* October 30, 1818.

New Orleans, Oct. 5.

We are gratified to learn, that colonels James and Richard M. Johnson have commenced the building of a steam boat at Leestown, one mile below Frankfort. She will be about 120 feet in length, will carry about 120 tons, is to be called the Elkhorn, and is designed as a trader on the Mississippi and Ohio to enter the Kentucky and ascend as high as Frankfort whenever circumstances and the state of the water will permit. About 30 hands are now employed upon her, and she will be finished in about 20 days. We hail this as the commencement of an effort which will exhibit to us the importance of the navigation of the Kentucky river, and give a new spring to the trade of this place and the central parts of the state. A few more individuals with equal industry, enterprise, and public spirit, would soon teach us how to realize the advantages of our natural situation. We wish this attempt all the success which its authors can deserve or hope.

Supplemental Reading 2. "Floating Theatre," published in the *Frankfort Roundabout*, June 3, 1893.

Orke & McNair's Voyager Company gave several entertainments this week upon their floating theatre, both at the Bellepoint and the city wharfs. The company is a fair one and was well patronized. They have a barge, the lower deck of which consists of a hall for theatrical purposes, while the upper deck is fitted up in a regular steamboat style, with staterooms for the accommodation of the company. They have a towboat which tows them around from place to place in different rivers, and can travel about very cheaply and comfortably.

1. In what ways were steamboats superior to flatboats and keelboats?
2. What do you think “revolutionized” means in this context? How did the steamboat “revolutionize” trade on the Kentucky River?
3. How and why did the invention of the internal combustion engine affect steamboat travel on the Kentucky River?

Reading 4. Technological Improvements Utilized to Open the River to Greater Traffic

River travel was central to the Kentucky economy during the early nineteenth century. However, steamboats could not even travel on a regular basis to Frankfort on the Kentucky River because of the sandbars, snags, and other obstructions along the river. State officials quickly realized that improvements to the river were necessary to support the growing commercial steamboat industry. In 1818, the state government approved funds to clear the river from Frankfort to Carrollton, which would allow for regularly scheduled steamboat travel. Even with the 1818 river improvements, navigation was not possible when the river was low during the dryer summer and autumn months. Steamboat travel, however, provided comfort, economy, and speed, which overland travel did not offer at the time.

Year-round river navigation was necessary to support the state's economy. In 1835, the Commonwealth began statewide transportation improvements that included slackwater projects on the Kentucky River. The projects consisted of the construction of 15 lock and dams, although only 14 would be completed. The lock chambers were designed to fit the largest steamboats, towboats, and barges of the day: 38 feet wide and 175 feet long. Each lock would raise or lower the boat 14 to 17 feet and create a navigable channel along the entire length of the river from the Ohio River near Carrollton to Beattyville in Lee County. Tolls would be charged for passage through the locks, and the money would fund the maintenance and operation of the lock and dams.

The Kentucky legislature authorized the construction of the first five lock and dams, which were built between 1836 and 1842. Lock and Dam No. 1 was located at Horseshoe Bend near Carrollton, Carroll County; No. 2 at Six Mile Ripple in Lockport, Henry County; No. 3 at Cedar Creek Ripple near Monterey, Owen County; No. 4 at Lee's Ripple in Frankfort, Franklin County; and No. 5 at Steele's Ripple near Tyrone, Woodford County. The dams were constructed of stone-filled timbercribs, which were built by framing pens that resembled log cabins and setting them side by side before filling them with stone. Once filled, the cribs were topped with planks. The locks were constructed of stone and featured wooden gates. Each lock and dam had a lockhouse, where the operator and his family would live. During the antebellum, both passenger and freight travel flourished on the navigable portion of the Kentucky River. However, the completion of the railroad between Frankfort and Louisville and the outbreak of the Civil War disrupted commerce on the river.

By the late 1870s, many of the lower river locks were in poor condition. Despite a decrease in river traffic, there was a push to restore the five existing locks and to continue with the construction of the lock and dams along the upper portion of the river. With the system incomplete, trade could still not flow year-round above Frankfort. Goods from Appalachia would pile up during the warmer months awaiting winter and spring rains to allow the shipment of goods down the river. The system of lock and dams on the Kentucky River were placed under federal management in 1880. Under direction of the United States Army Corps of Engineers, the repairs to Locks 1–5 were completed by 1886. Lock and Dam No. 6 was completed in 1896 and was located at Finn's Ripple, a mile downstream from Oregon, Kentucky, on the Mercer and Woodford County line. Lock and Dam No. 7, located on the Mercer and Jessamine County line within sight of High Bridge near Shakertown, was completed in 1897. Lock and Dam No. 8 was completed in 1900 and was located on the Garrard and Jessamine County line. Like the lock and dams constructed on the lower portion of the river during the antebellum, these new structures featured stone locks and timbercrib dams.

At the turn of the twentieth century, commercial trade on the river had declined due to the rise of the railroad, but work continued on the upper river locks. Locks No. 9–12 were completed in less than a decade, between 1901 and 1910. They featured concrete dams and concrete locks with steel doors. The Flood of 1913 delayed the construction of the remaining structures. Lock and Dam No. 13, near the community of Pinnacle in Lee County in southeast Kentucky, was not completed until 1915. Lock and Dam No. 14 in Heidelberg, also in Lee County, was the final lock to be constructed. It opened for operation in January 1917, almost 100 years after a lock and dam system was first proposed.

This reading was written by Cultural Resource Analysts, Inc., utilizing the following resources:

Grier, Bill

1996 *The Five Lives of the Kentucky River*. Kentucky River Authority, Louisville, Kentucky.

Johnson, Leland R. and Charles E. Parish

1999 *Engineering the Kentucky River: The Commonwealth's Waterway*. U.S. Army Corps of Engineers, Louisville District, Louisville, Kentucky.

Supplemental Reading 1. Excerpt from *The American Almanac and Repository of Useful Knowledge for the Year 1837* by Charles Bowen.

The works on the lower portion of the river have been placed under contract (to be completed in November, 1838). These comprise five lock and dams, which will form a slack-water navigation of 100 miles from the mouth of the river, being 25 miles above Frankfort. The average cost of each lock and dam will exceed \$100,000. The locks are to be made of cut stone, and the dams of timber cribs and stone. An abundance of the finest materials are found on the banks, and it is calculated that they will be the most splendid works of the kind in the Union.

The upper portion of the improvement will be placed under contract as soon as the necessary surveys can be made.

This river passes through the centre of the state and a fine rich country; there are 15 counties bordering on it, furnishing a population of more than 170,000. The productions of these counties, and of others contiguous and tributary to it, are chiefly agricultural; but several of them contain inexhaustible resources of coal, iron, salt, and lumber. It is anticipated that the market of Louisville alone can be supplied with salt, iron, coal, and lumber, equal in value to a million dollars annually, in addition to the markets of Lexington, Frankfort, and other places on the line of the river and adjacent thereto. These articles are now brought there chiefly from Ohio, Pennsylvania, and Virginia.

1. Why were the lock and dams built on the Kentucky River? What purpose did they serve?
2. How do you think the completion of the lock and dams impacted life on the Kentucky River? How did it change the river itself?

Supplemental Reading 2. Table showing toll rates for vessels on the Kentucky River by Thomas Page, published in *Annual Report of the Auditor of Public Accounts for the Fiscal Year Ending October 10, 1855* published by the Kentucky State Auditor's Office, Frankfort, 1856 (pg. 37).

Doc. No. 6.] INTERNAL IMPROVEMENT REPORT. 37

Rates of toll to be collected from all Steamboats, Keelboats, Flatboats, Rafts, and other crafts carrying freight on the Kentucky river Navigation, from and after the 11th day of October, 1855:

Ascending freight, per mile, per hundred,	1/2 mill.*
Descending freight, per mile, per hundred,	1/2 mill.
Cabin passengers, over 12 years old, per mile,	5 mills.
Children, servants and deckers,	3 mills.
Horse, mule, jack, jenny, or cattle, per mile,	5 mills.
Hogs or sheep, per mile,	2 mills.
Beef, pork, and lard, per barrel, per mile,	2 mills.
All kinds of liquor, per barrel, per mile,	3 mills.
All dry barrels, per mile,	1 1/2 mills.
Salt, salt fish, and other wet barrels, per mile,	1 1/2 mills.
Lard, per keg, per mile,	1/4 mill.
Sacks of corn or wheat, 2 1/2 bushels, per mile,	1/2 mill.

Household and kitchen furniture, farming utensils, and goods shipped by the lot, other than articles herein enumerated, six per cent. upon charge of transportation when ascending, and four per cent. when descending, per lock.

Tobacco, per hogshead, for passing No. 1, 30 cents; No. 2, 15 cents; No. 3, 10 cents; No. 4, 6 cents; No. 5, 4 cents.

Rafts of timber, &c., 15 feet wide and under, 3 cents per lineal foot.
 Rafts of timber, 15 feet wide and under 20, 5 cents per lineal foot.
 Rafts of timber, 20 feet wide and under 30, 6 cents per lineal foot.
 Rafts of timber, 30 feet wide and under 36, 7 cents per lineal foot.
 Skiffs passing lock 50 cents each.

Lockage, two dollars per lock, on steamboats, and loaded flatboats.

These rates of toll to be charged on steamers to McCoun's Ferry, 95 miles; nothing from above that point.

Empty flatboats or keelboats, to pay 3 cents per lineal foot, per lock.
 Loaded flatboats or keelboats, to pay 6 cents per lineal foot, per lock.
 Flatboats, keelboats and rafts, coming from above Brooklin Ferry, to pay nothing.

D. R. HAGGARD, P. B. I. T.

FRANKFORT, October 11, 1855.

* A "mill" is equal to 1/10th of a cent, or 1/1000th of a dollar.

3. According to the table, how much would it cost for a steamboat to pass through a lock on the Kentucky River?

Image 1



Image 1. Scene showing the steep ridges and rich farmland along the Kentucky River circa 1934, from the Lafayette Studios Photograph Collection housed in the Special Collections Research Center at the University of Kentucky, online at ExploreUK, <https://exploreuk.uky.edu/>.

Image 2

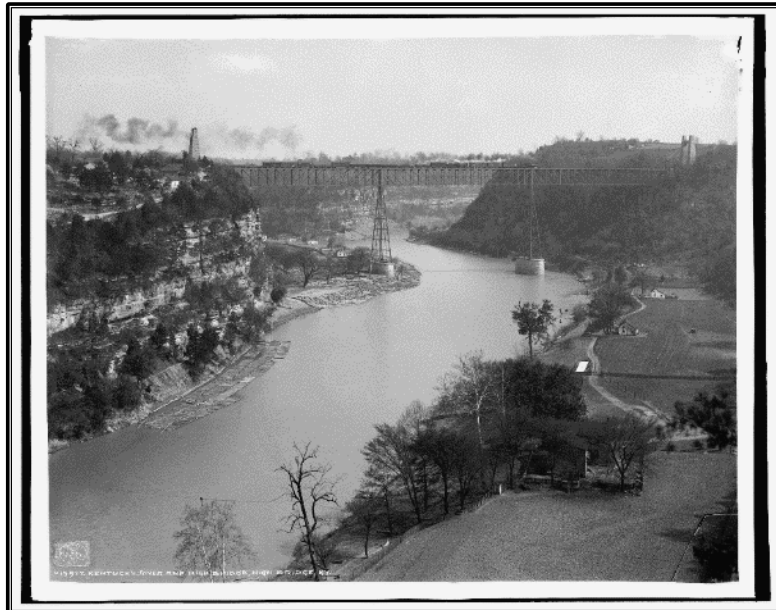


Image 2. View of the Kentucky River at High Bridge near Shakertown, Kentucky circa 1907. Note the steep limestone cliffs, known as the Palisades, along the river. From the Detroit Publishing Company Photograph Collection of the Library of Congress, online at the Library of Congress Digital Collections, <https://www.loc.gov/>.

1. How do these photographs illustrate what you've read about the Kentucky River and its development?

Image 3.



Image 3. Engraving of a flatboat on the Ohio River housed in the Library of Congress Prints and Photographs Division, online at the Library of Congress Digital Collections, <https://www.loc.gov/>.

Image 4.



Image 4. Postcard titled "Logging on the Kentucky River," from the Kentucky Room Digital Archives of the Lexington Public Library, online at <https://www.lexpublib.org/digital-archives>.

1. The images above depict two ways that flatboats were used during the nineteenth century: floating logs and transporting cargo and passengers. Imagine what sights, experiences, and challenges you might encounter while traveling on a flatboat.

Image 5.

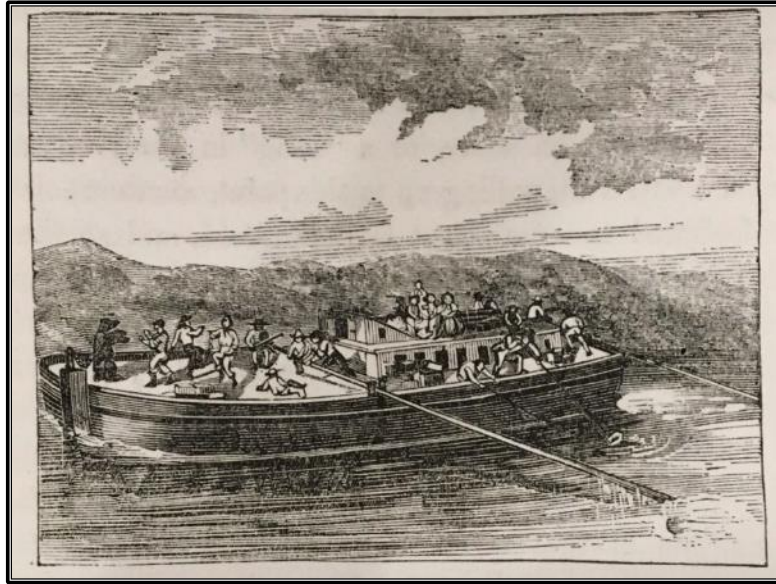


Image 5. Illustration of a keelboat titled “Early Navigation on Western Waters,” included in the 1856 *Lloyd's Steamboat Directory and Disasters on the Western Waters*, pg. 33. From the Kentucky River Museum Collections, available online at <https://www.hathitrust.org/>.

Image 6.



Image 6. Illustration of the steamer “Kentucky” on the Kentucky River. From the Kentucky Room Digital Archives of the Lexington Public Library, online at <https://www.lexpublib.org/digital-archives>.

1. Based on what you learned in Reading 3, what distinguishes the keelboat in Image 5 from the flatboat pictured in Image 3? Are there any similarities?
2. How do you think traveling on a steamboat during the nineteenth century differed from traveling on modern planes and trains today? How do you think race and/or class impacted a passenger's experience?

Image 7.



Image 7. Construction of the timbercrib dam at Lock and Dam No. 5 circa 1885. From the Records of the Office of the Chief of Engineers, 1789–1999 housed at the National Archives, online at the National Archives Catalog, <https://catalog.archives.gov/>.

Image 8.

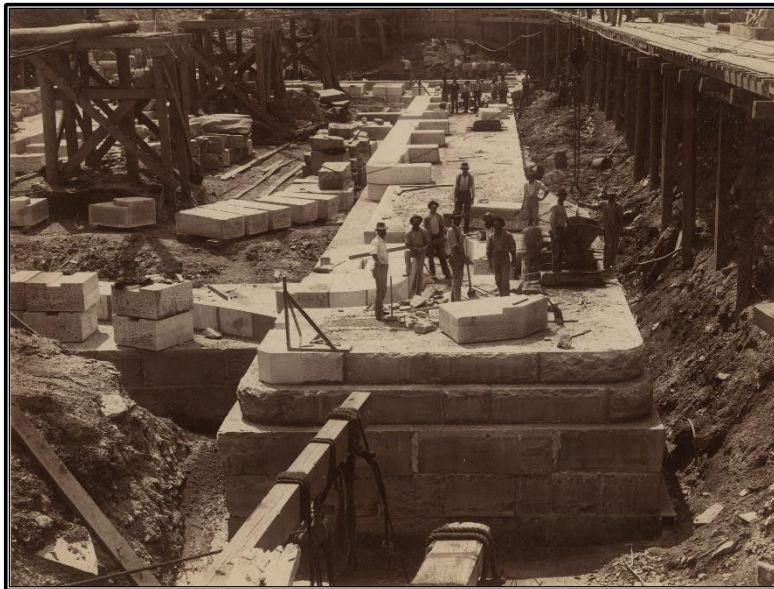


Image 8. Construction of the stone lock walls at Lock and Dam No. 7 circa 1896 from the Records of the Office of the Chief of Engineers, 1789–1999 housed at the National Archives, online at the National Archives Catalog, <https://catalog.archives.gov/>.

Image 9

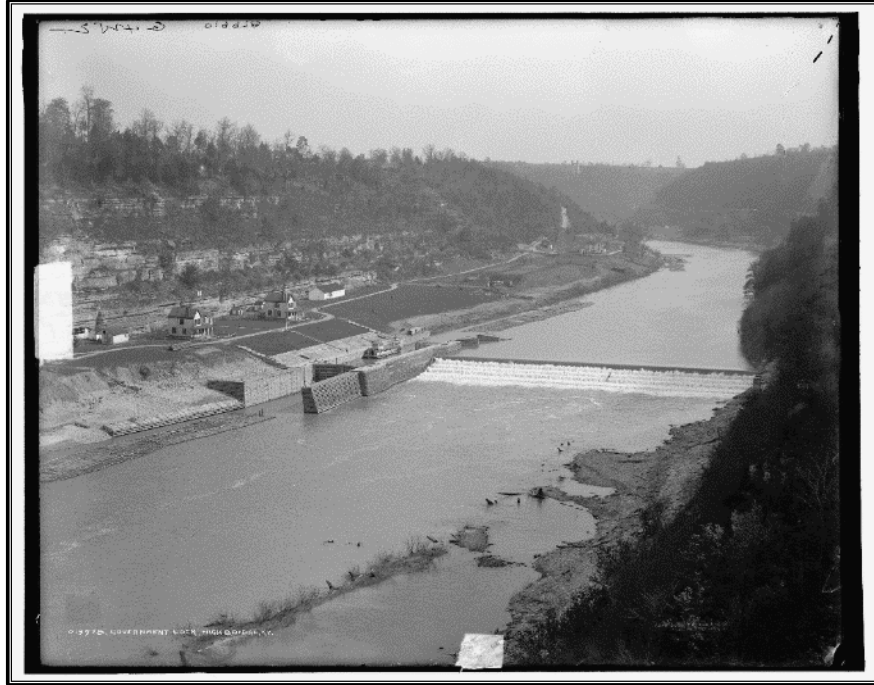


Image 9. View of Lock and Dam No. 9 near High Bridge circa 1907 from the Detroit Publishing Company Photograph Collection of the Library of Congress, online at the Library of Congress Digital Collections, <https://www.loc.gov/>.

1. What is different about the construction sites depicted in Images 7 and 8? Do they look like other construction sites you've seen? What challenges do you think the workers encountered while building the Kentucky River locks?
2. How does Image 9 illustrate what you've read about lock and dams on the Kentucky River? Can you identify the lock, the dam, and the lockhouses? Based on the description in Reading 4, do you think the lock and dam are examples of timbercrib or poured concrete construction? Why?

Activity 1

The Kentucky River has been used to transport goods and passengers since the late eighteenth century. Depending on the destination and the condition of the river, the trip could take days, weeks, or even months. Ask students to imagine that they are passengers or workers on a steamboat traveling from Frankfort to Carrollton, Kentucky. Have students review historic maps provided below and research archival photographs of steamboats and towns on the river they might pass along the way. Then, based on their research, have students create a journal with 5–10 entries recording what they might see, do, feel, or smell on their journey. The journal entries should be dated and written in first-person, and should include descriptions of the landscape, river, weather, boat, other passengers or workers, activities, events, etc. Students may also use the interactive Map Locator Tool from University of Kentucky’s website to explore the Kentucky River Basin:

http://www.uky.edu/WaterResources/Watershed/KRB_AR/map_locator_tool.htm

Source: Sanborn Fire Insurance Company, 1896 Frankfort Sanborn Fire Insurance Maps, available online from the Library of Congress at https://www.loc.gov/item/sanborn03166_003/

Source: D.J. Lake and Company, 1882 Atlas of Henry and Shelby Counties, available online from the Shelby County Historical Society at <https://www.shelbykyhistory.org/uploads/8/2/5/8/8258599/1882-atlasofhenryandshelbycos.pdf>

Source: Maps and historic images of Owen County, available online from Northern Kentucky Views at http://www.nkyviews.com/owen/owen_main.htm

Source: D.J. Lake and Company, 1883 Atlas of Carroll and Gallatin Counties, available online from the Kenton County Public Library at <https://www.kentonlibrary.org/kcpl/genealogy/maps/Atlas%20of%20Carroll-Gallatin/files/assets/basic-html/index.html#1>

Lock and Dam No. 10

Glossary

The glossary contains a list of vocabulary words included in Readings 1–3 in this section. When you see an underlined term or phrase in the reading, return to this glossary to learn its meaning.

Berm: a flat strip of land, raised bank, or barrier bordering a river or canal typically used for flood control.

Capstan: a rotating device used to wind rope or cables in order to move heavy loads.

Derrick: a type of crane with a pivoting arm used to move heavy loads.

Miter: a joint made between two pieces of wood or other material set at a 90-degree angle.

Reading 1. An Introduction to the History and Construction of Lock and Dam No. 10

Lock and Dam No. 10 is located near Boonesboro on the Madison and Clark County line, approximately 176.4 miles from the mouth of the Kentucky River at the Ohio River. It was one of the first lock and dams on the river to be constructed entirely of concrete. The switch from wood and stone to concrete cut construction time in half and, since concrete is more durable, it also reduced maintenance costs. The lock gates were made of steel, which was stronger than the earlier wooden gates and needed to be replaced less often. In 1902, the United States Army Corps of Engineers hired the Mason and Hoge Company of Frankfort to construct Lock and Dam No. 10. First, an earthen cofferdam was built, which most likely was made from layers of compacted clay and sand covered with wood planks. The dam served as a temporary barrier during construction to keep water away from the site. The construction crew could only build the dam while the river was low. A sudden rise in the water levels would bring work to a halt and threaten the work site. Once the river was diverted, the water inside the cofferdam was pumped out using steam-powered pumps, and the crew began to clear the riverbed. The workers moved river sand, rock, and dirt by shovel. Steam-powered derricks lifted materials in and out of the work site. Unlike Locks No. 1–8, which featured timbercrib dams and stone locks, Lock and Dam No. 10 was constructed of poured concrete. The lock and dam were cast in place by pouring concrete in wooden forms. Once the concrete was cured, the forms were removed, and the process was repeated until the section of the lock or dam was complete. The dam was finished in 1903, and the lock was finished the following year. The lock walls are 52 feet apart, and the chamber is 148 feet in length. When closed, the mitered steel lock gates meet in a shallow “V” shape. This design, developed by Leonardo da Vinci in the fifteenth century, forms a secure seal and reduces leaks. Two lockhouses, one for the lockmaster and another for his assistant, and several outbuildings were also built on the lock and dam site.

In February 1905, the upper portion of the Kentucky River channel froze and the river level rose. Suspended in the icy river were thousands of logs waiting to be floated to sawmills downriver. In March, the weather warmed, the ice melted, and the river rose enough to break the log jam, releasing a wave of water and logs that crashed into Lock and Dam No. 10, overflowing the existing structures. A new channel formed west of the lock, leaving the lock in the middle of the river. The water also destroyed the upper lockhouse and the office that were built on the flat land next to the river. After the incident, the practice of floating loose logs downstream ended, and logs had to be tied into rafts and pushed or towed downstream.

When the waters receded, an auxiliary dam was constructed west of Lock and Dam No. 10. Completed

in 1905, the auxiliary dam was 6 feet higher than the original dam in order to keep the water from flowing around the new dam extension. The new dam featured a timbercrib base with a concrete top. The lock remained in the middle of the river, and throughout the remainder of the early twentieth century it could only be accessed by rowing a boat from the Madison County side of the river. The lower lockhouse, which survived the flood, was moved to the hill overlooking the river soon after the flood. The upper lockhouse was rebuilt near the lower lockhouse in 1906 and became the lockmaster's residence. Except for the homes of successful farmers and businessmen, the lockhouses were typically some of the most state of the art dwellings situated near the river. The 1905 flood washed out the low, flat area, known as the esplanade, next to the lock, creating Boonesboro Beach. A resort was built in 1909, and the beach remained a popular tourist attraction during the early and mid-twentieth century.

This reading was written by Cultural Resource Analysts, Inc., utilizing the following resources:

Grier, Bill

1996 *The Five Lives of the Kentucky River*. Kentucky River Authority, Louisville, Kentucky.

Johnson, Leland R. and Charles E. Parish

1999 *Engineering the Kentucky River: The Commonwealth's Waterway*. U. S. Army Corps of Engineers, Louisville District, Louisville, Kentucky.

Ellis, Elliott William

2000 *The Kentucky River*. The University Press of Kentucky, Lexington, Kentucky.

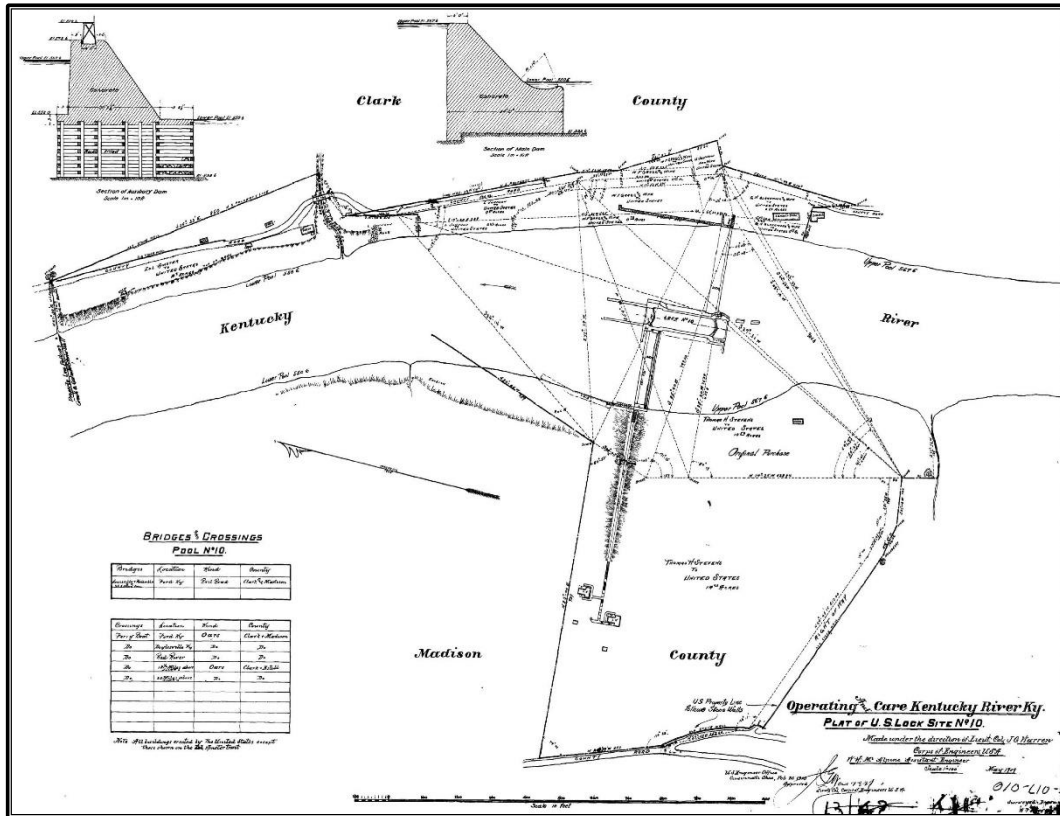
Supplemental Reading 1. Newspaper article about the 1905 flood, publication unknown, courtesy of Kentucky River Museum Collections.

The weekend flash flood recalled to John A. Walters, Sr., Ford, an odd incident that occurred at Lock and Dam No. 10 at Boonesboro during a high water period in 1906. It was the year before he moved to the lock site to serve a long term as lockmaster.

Seems that new quarters had just been built close to the Kentucky for the new lockmaster, a man by the name of Ross, when a terrific rise came in the river. In those days, there was no concrete fill built along the bank near the lock location and the water began to eat toward the house and eventually claimed it. –Now the unusual twist. Mr. Walters says that a cistern* had been dug and walled with brick but that only a small quantity of water had been run into it. The invading flood waters ate away the earth until one side was exposed and then slipped around to gnaw the soil at the other side. Finally, nothing remained to retain the cistern, similar to a huge jug. It was buoyant enough to float and the water it contained kept it from overturning. It bobbed down the stream about 100 yards before coming to rest against some water-bound trees.

*An underground storage basin used for storing water. It is usually constructed of brick or stone and lined with cement.

Supplemental Reading 2. *Plat of U.S. Lock Site No. 10* showing the lock and dam, lockhouses, and adjacent parcels. Produced by the United States Army Corps of Engineers in 1909.



1. What's the difference between a timbercrib and a poured concrete dam? Why do you think the United States Army Corps of Engineers decided to use concrete for Locks No. 9–14?
2. Why do you think the United States Army Corps of Engineers provided such nice, big houses for the lockmaster and lockman? Why were they some of the best houses on the river?

Reading 2. How a Lock and Dam Works

Slackwater navigation was essential to the success of the commercial steamboat industry on the Kentucky River during the early to mid-nineteenth century. A slackwater system transforms the river into a canal through a series of lock and dams. A lock is a mechanism used to raise or lower a boat between different water levels along the river. A dam is a barrier that prevents the flow of water and raises the water's level, forming a reservoir or pool behind the dam. A series of still water, or "slackwater," pools are formed by the construction of dams across the river. Although the depth can change depending on the time of year and the weather, these pools maintain a water level, known as a pool stage, deep enough to form a continuously navigable channel. Along the Kentucky River, these pools were designed to be a minimum of six feet deep to hold the largest steamboats and towboats of the day.

Locks are used to allow boats to move along the river channel. Since the dam holds back the river, raising the water level above the lock, the channel is typically deeper above the dam than below it. A lock is an enclosed chamber along a river or canal with metal gates at either end. Once a vessel enters the lock, the lockmaster closes the upper or lower gate, and the water level is raised or lowered through a series of valves that move the water in and out of the chamber. When traveling downriver, the locking process consists of three main stages. First, with the lower gate closed, the lock chamber is filled to match the pool stage of the upper river using the filling valves located at the bottom of the chamber. The valves are operated by levers along the top of the lock. Gravity pulls the water through the valves and into the chamber, and the filling valves are closed once the correct water level is reached. Second, the boat enters the lock chamber through the upper gates. The upper gates are closed using capstans located along the top of the lock. At this stage, the drain valves are opened to empty the water from the lock chamber. Finally, boat exits through the lower gates once the water level inside the chamber matches the level of the lower river. This process is reversed when a boat is traveling upriver.

Together, the lock and dams resemble a water staircase, allowing vessels to move from one water level to the next as the river moves through different topography and elevations. They also allow boats to navigate over sandbars, rapids, and waterfalls along a river, if necessary. Boats were able to pass over the dams and avoid moving through the locks during periods of high water because the water level was above the dams. During the low water season between July and October, the consistent pool stage maintained by the dams allowed commercial and passenger traffic to continue to move along the river. Although river commerce had diminished by the time the system of lock and dams was completed in 1917, the slackwater improvements successfully increased the navigability of the Kentucky River and provided year-round travel along the waterway.

This reading was written by Cultural Resource Analysts, Inc., utilizing the following resources:

Hay, Jerry M.

2006 *Beyond Bridges: Rediscovering America's Waterways*. J.R. Simpson and Associates, Florissant, Missouri.

Johnson, Leland R. and Charles E. Parish

1999 *Engineering the Kentucky River: The Commonwealth's Waterway*. U. S. Army Corps of Engineers, Louisville District, Louisville, Kentucky.

Verhoeff, Mary

1917 *The Kentucky River Navigation*. John P. Morton Company, Louisville, Kentucky.

1. How does gravity assist in the function of the lock?
2. Why do you think the river was low between July and October each year? What might cause the water level to rise or fall?
3. How did the lock and dams improve the navigability of the Kentucky River?

Reading 3. Daily Operation of Lock and Dam No. 10

Once it was placed into service in 1905, the lockmaster at Lock and Dam No. 10 was responsible for the daily operation and maintenance of the lock and dam. He also oversaw repairs, supervised employees, regulated river traffic, and maintained the grounds, buildings, and machinery. The lockmaster kept a daily log detailing the weather conditions, river levels, and the number, type, and cargo of the boats passing through the lock. The position of the lockman, who served as the lockmaster's assistant, was introduced in the 1880s. He assisted with the locking process, helped maintain the machinery and the grounds, and oversaw operations while the lockmaster was away.

The workers and their families lived in lockhouses situated close to the river. Typically, the lockmaster occupied the upper house and the lockman lived in the lower lockhouse. The government also provided outbuildings for storing equipment and stables and barns for keeping livestock. Located miles from town, life on the lock and dam reservation was fairly isolated. The lock workers and their families had to be self-sufficient and produce most of what they needed. They planted gardens with corn, potatoes, and other vegetables, and they raised livestock, including cows, pigs, and chickens.

The lockmaster's logbooks from Lock and Dam No. 10 record the variety of tasks completed by the lockmaster and lockman on a daily basis. A day of work could include locking through a dozen boats or no boats at all, fixing a faulty valve, clearing brush, hauling coal, building a chicken coop, or picking corn. The lockmaster and lockman would alternate shifts to ensure that a boat could pass through the lock at any time of the day or night. A boat would signal by blowing the ship's horn or by ringing a bell positioned along the river. At Lock and Dam No. 10, the bell was located outside the office on an earthen berm next to the river.

Operating a lock was a difficult job. Before modern electric systems were installed, the lock gates and valves were moved manually. The process often required both the lockmaster and the lockman, and, depending on the condition of the river and the size of the boat, could take anywhere from 15 minutes to several hours. Safety and precision were important. If a boat was locked through too quickly, it could bounce against the walls of the lock and become damaged. If a boat moved too close to the lock gates, it could be pulled into the doors by the current created by opening the valves. Thanks to the skill and accuracy of the lockmasters and lockmen operating along the Kentucky River, few serious accidents occurred.

This reading was written by Cultural Resource Analysts, Inc., utilizing the following resources:

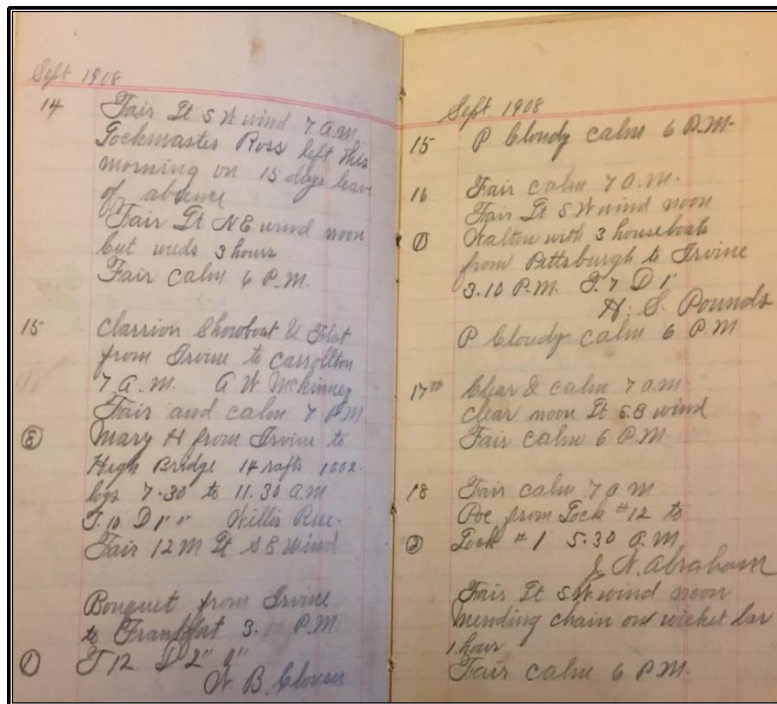
Ellis, Elliott William

2000 *The Kentucky River*. The University Press of Kentucky, Lexington, Kentucky.

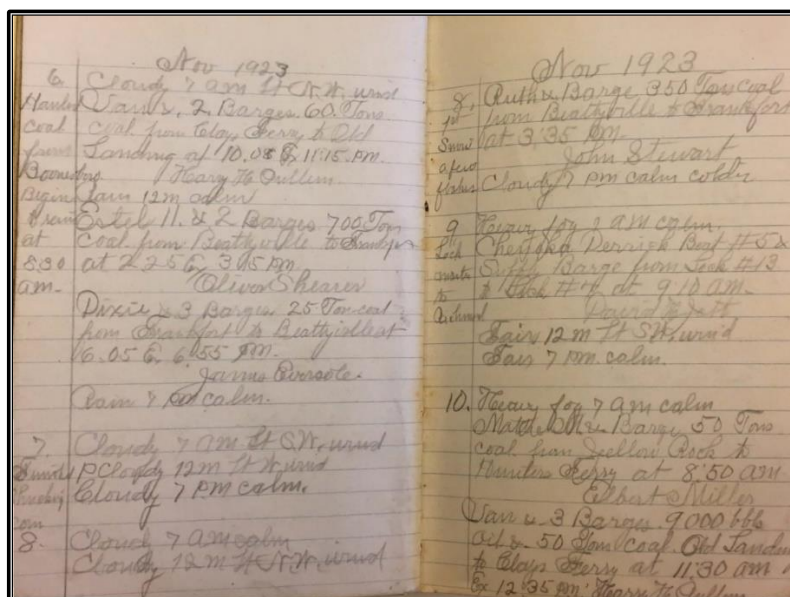
Johnson, Leland R. and Charles E. Parish

1999 *Engineering the Kentucky River: The Commonwealth's Waterway*. U.S. Army Corps of Engineers, Louisville District, Louisville, Kentucky.

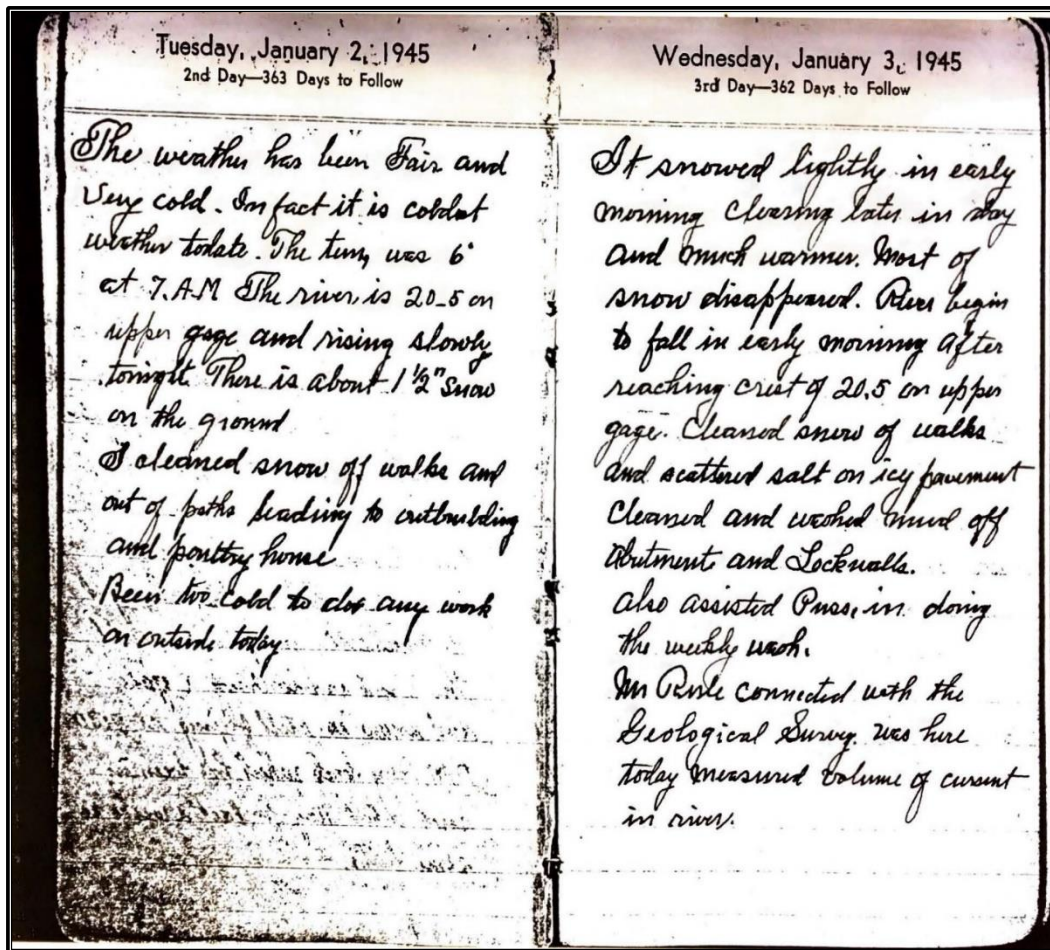
Supplemental Reading 1. Entry from John A. Walters, Sr.'s lockmaster's logbook, September 14–18, 1908, detailing weather, river conditions, and the boats passing through the lock. Courtesy of the Martin F. Schmidt Research Library at the Kentucky Historical Society.



Supplemental Reading 2. Entry from John A. Walters, Sr.'s lockmaster's logbook, November 6–10, 1923, detailing weather, river conditions, and the boats passing through the lock. Courtesy of the Martin F. Schmidt Research Library at the Kentucky Historical Society.

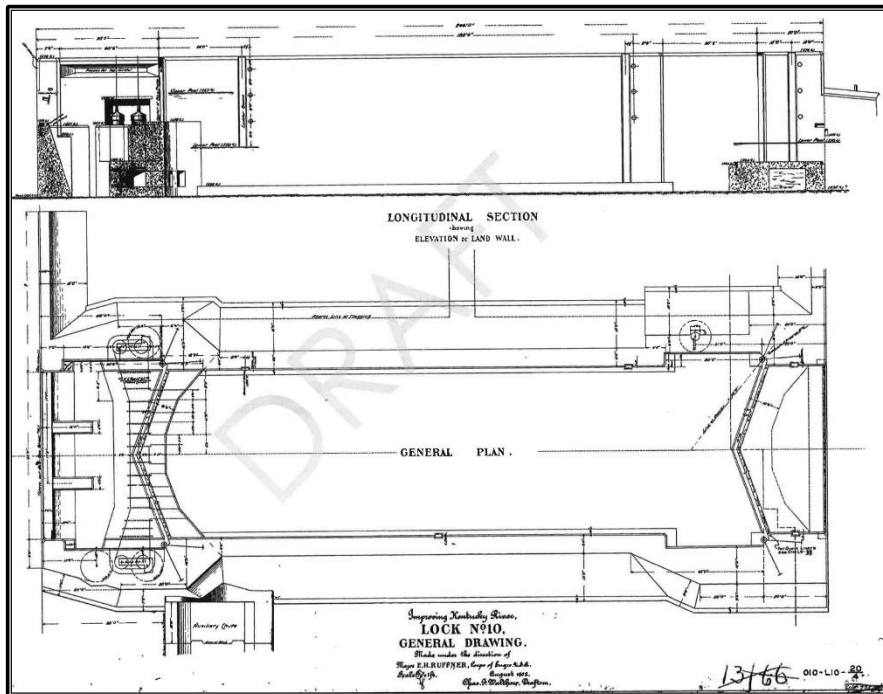


Supplemental Reading 3. Entry from John A. Walters, Jr.'s lockmaster's logbook, January 2-3, 1945, detailing weather, river conditions, and the work completed at the lock. Courtesy of the Martin F. Schmidt Research Library at the Kentucky Historical Society.



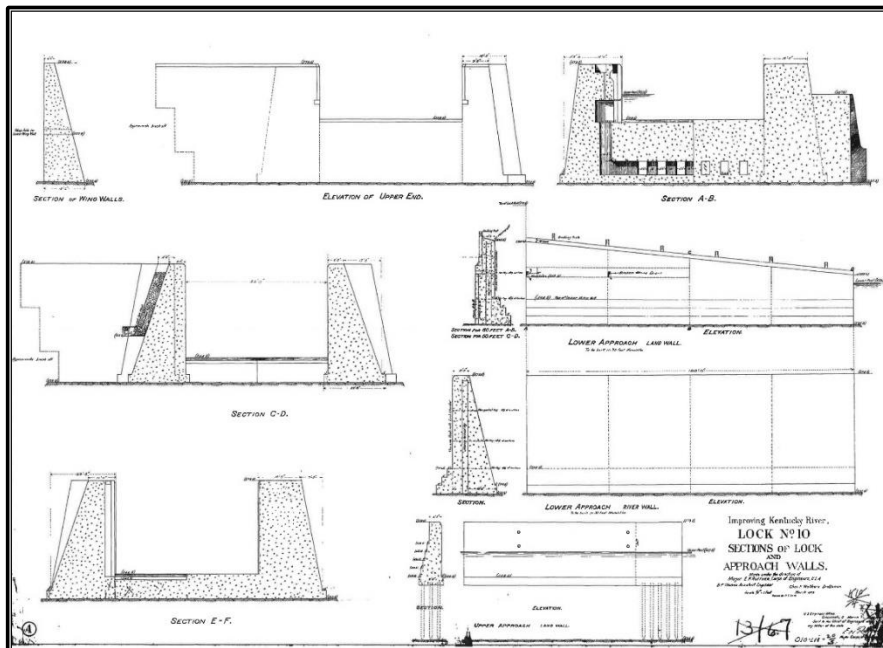
1. What was a typical day like for the lockmaster and lockman? Besides operating the lock, what other responsibilities did they have at Lock and Dam No. 10?
2. Based on the context, what do you think “self-sufficient” means? What do you think some of the difficulties were of living so far from town? How was life on the lock and dam reservation different or similar to your experience?
3. Why did the lockmaster and lockman keep a log book? Why was it important to record the temperature, river gauges, and information about river traffic?

Construction Drawing 1



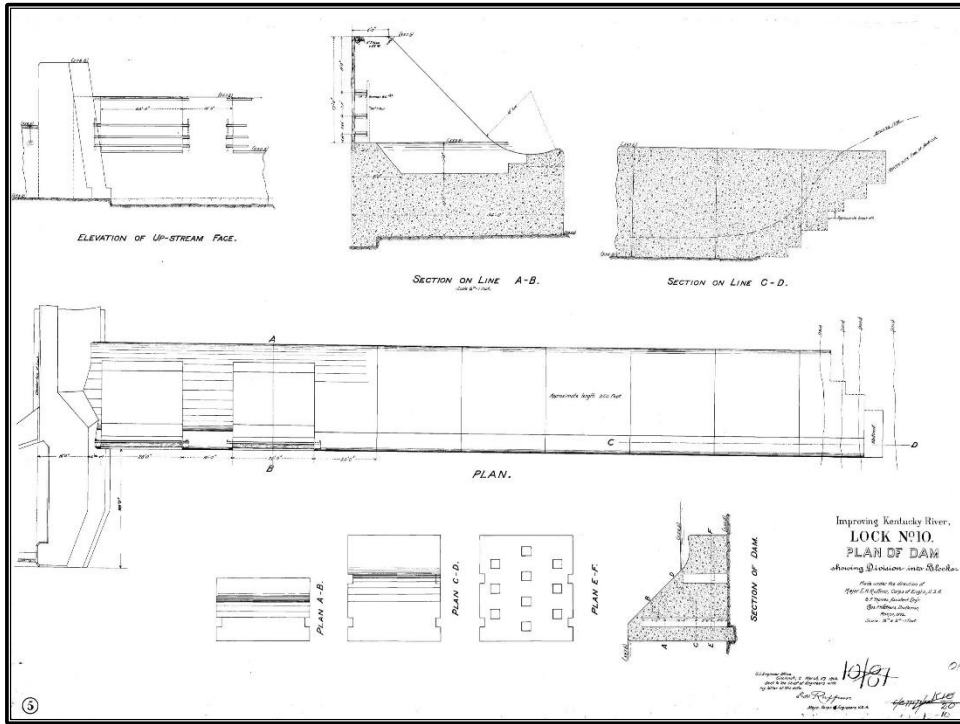
Section Drawing 1. United States Army Corps general plan of Lock and Dam No. 10 and approach, 1902, courtesy of Stantec.

Construction Drawing 2



Section Drawing 1. United States Army Corps section drawing of Lock and Dam No. 10 and approach, 1902, courtesy of Stantec.

Construction Drawing 3



Section Drawing 2. United States Army Corps section drawings of dam at Lock and Dam No. 10., 1902, courtesy of Stantec.

1. What is being depicted in the construction drawings? What is the purpose of these drawings and why were they important?

Image 1.

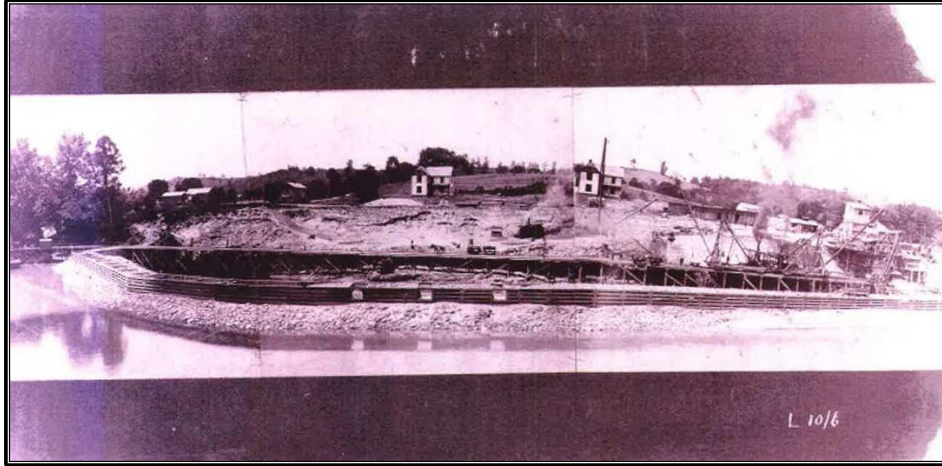


Image 1. Composite photograph showing the cofferdam around the Lock and Dam No. 10 site circa 1902. Note the lockhouses in their original location near the river. Courtesy of Stantec.

Image 2.

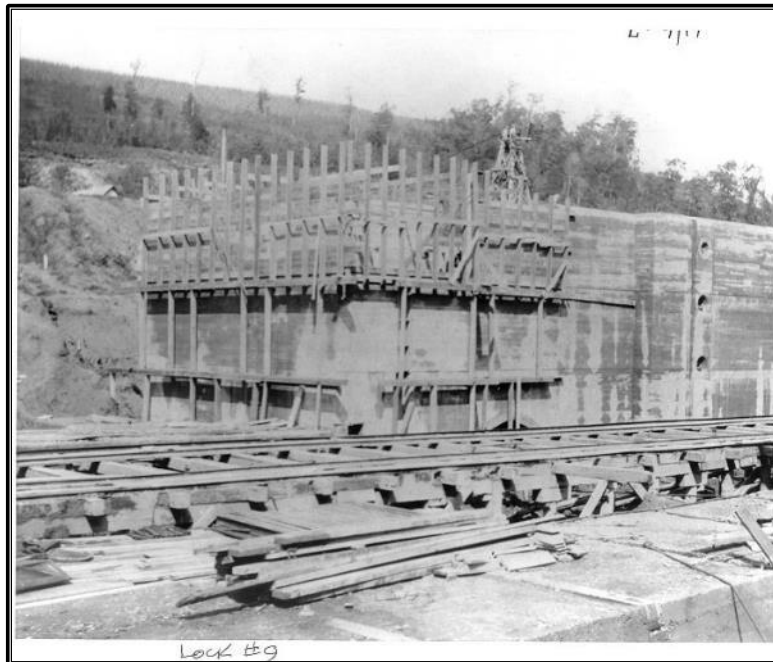


Image 2. Construction photograph of Lock and Dam No. 9 showing wood form used to mold the concrete, courtesy of Stantec.

1. What is a cofferdam and how was it used during the construction of Lock and Dam No. 10?
2. The use of structure concrete to construct bridges, roads, and buildings was a new development in the early twentieth century. Based on Reading 1, why did the United States Army Corps of Engineers switch from building stone locks and timbercrib dams to using concrete?

Image 3.

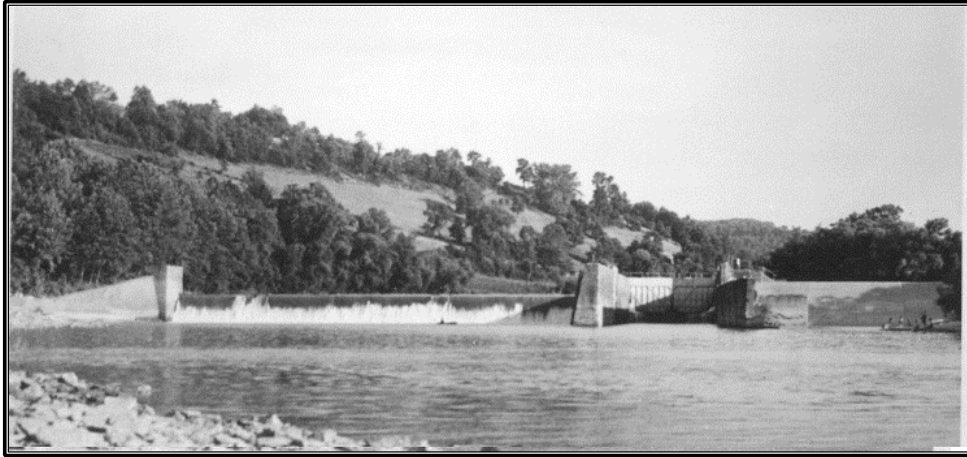


Image 3. Historic photograph of Lock and Dam No. 10 from the early to mid-twentieth century. Housed in the Kentucky River Museum Collections.

Image 4.



Image 4. View of Lock and Dam No. 10 from downriver, circa 2016. Courtesy of Cultural Resource Analysts, Inc.

Image 5.



Image 5. View of auxiliary dam from downriver, circa 2016. Courtesy of Cultural Resource Analysts, Inc.

Image 6.

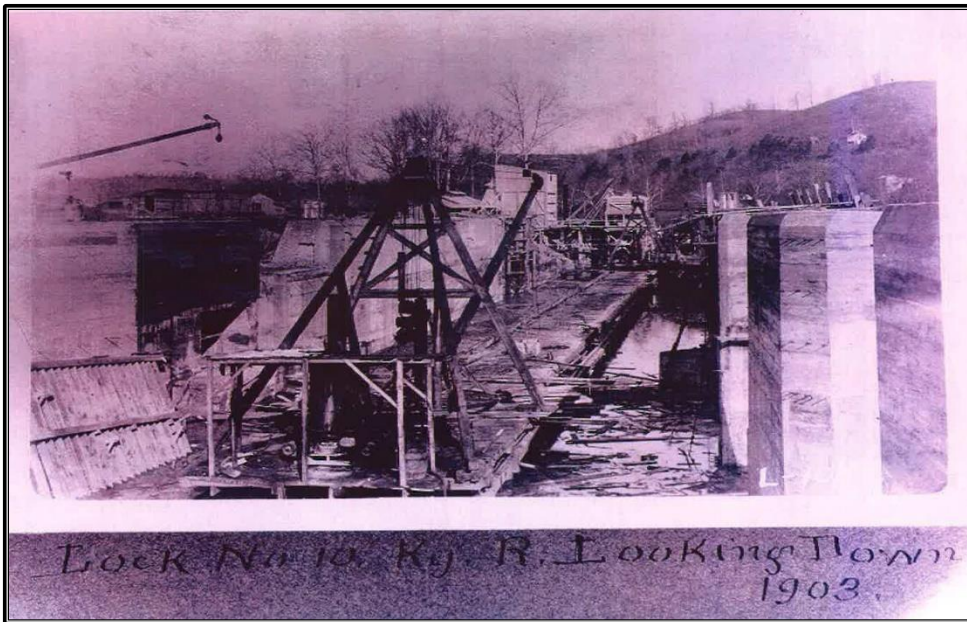


Image 6. Construction photograph of the lock chamber, looking downriver, circa 1903. Courtesy of Stantec.

Image 7.



Image 7. View of lock chamber and lower gates looking upriver, circa 2016. Courtesy of Cultural Resource Analysts, Inc.

Image 8.



Image 8. View of lock chamber and upper gates looking downriver, circa 2016. Courtesy of Cultural Resource Analysts, Inc.

2. Based on Reading 1, why do the upper and lower lock gates meet at an angle? Why do the doors sit in a shallow “V” shape rather than straight across like normal doors?

Image 9.



Image 9. Image of the steamboat “John J. Kelly” going through a lock on the Kentucky River, from the Shropshire Collection housed in the Special Collections Research Center at the University of Kentucky, online at ExploreUK, <https://exploreuk.uky.edu/>.

1. “Locking through” refers to the processes of moving a boat in and out of the lock. Based on what you learned in Reading 2, do you think the steamboat in Image 8 is “locking through” upstream or downstream? Why?

Image 10.



Image 10. Image of United States Army Corps of Engineers quarter boats going through the lock at Lock and Dam No. 10 from the Kentucky River Museum Collections.

1. Image 9 depicts a steamboat going through Lock and Dam No. 10. What do you think the role of the lockmaster and the crew of the boat were during this process? What would they have to do while “locking through”?

Diagram 1.

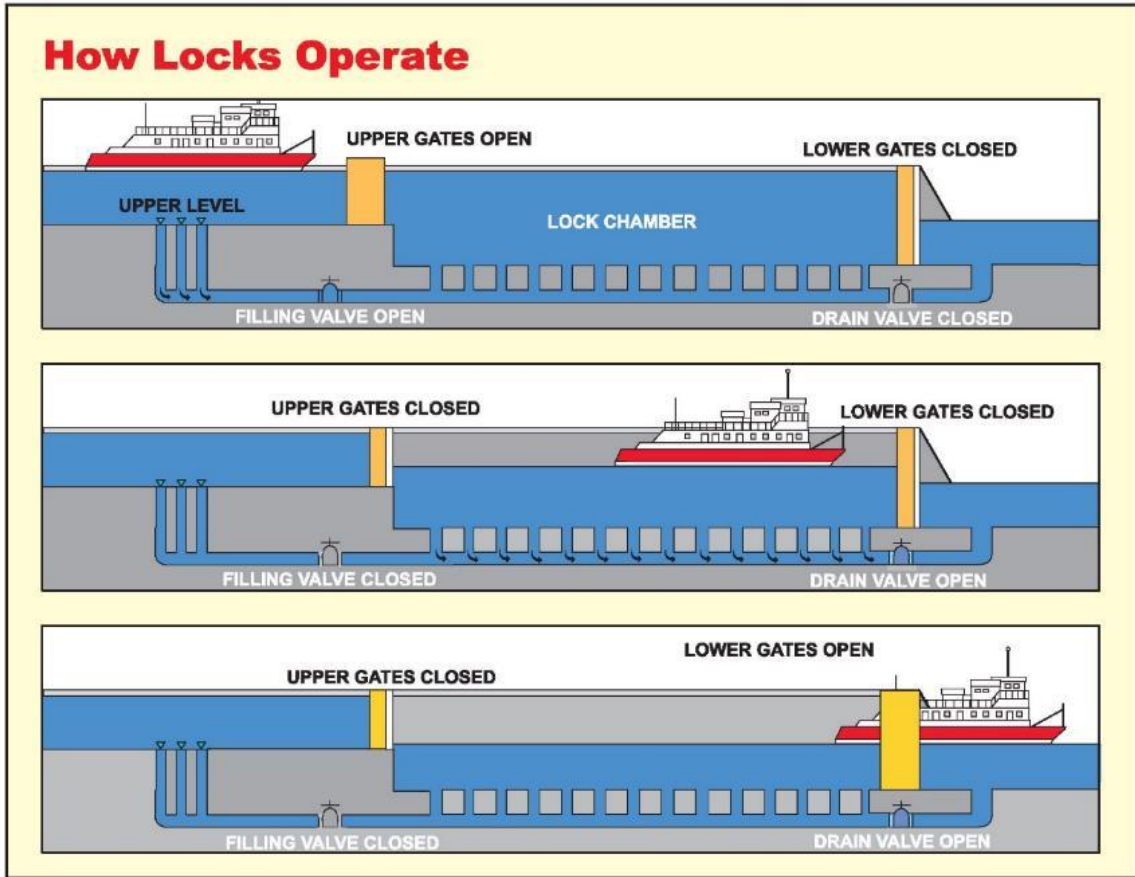
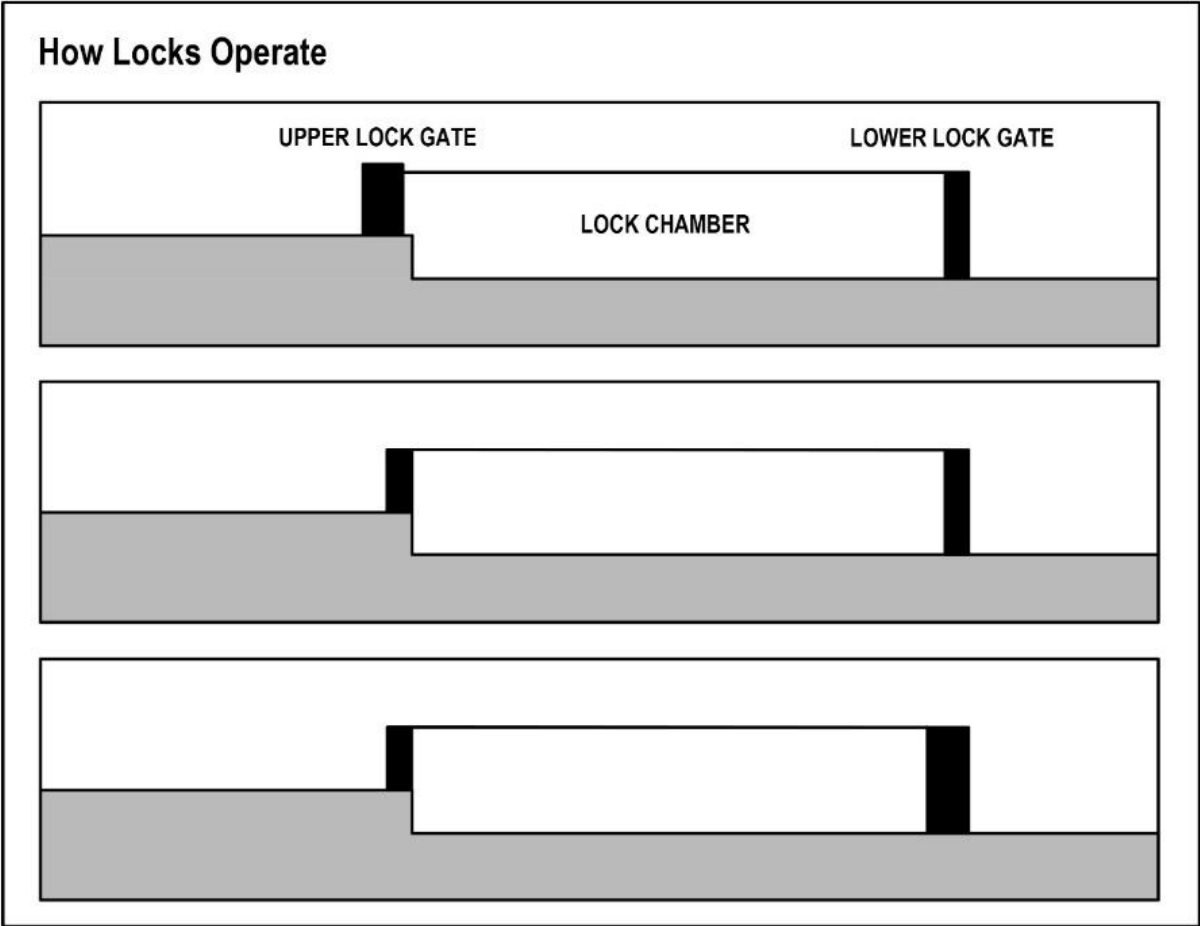


Diagram 1. Diagram showing how a lock operates. Courtesy of the United States Army Corps of Engineers, Louisville District, available online at <https://www.lrl.usace.army.mil/Missions/Civil-Works/Navigation/Locks-and-Dams/>.

Diagram 2.



Activity 1

This activity uses Reading 2 to help students develop a better understanding of how a lock works. Copies of a diagram showing the locking process are provided with the photographs.

1. Begin by explaining to students that they are going to be working with a diagram of a boat going through the lock downstream. Explain that the diagram will be a cross section, which is viewed as if the object had been cut in half. Provide students with other examples of cross-section diagrams. Choose familiar examples, such as a house, or the Earth. Review the drawings to make sure that students understand the concept.
2. Next, distribute copies of Reading 2 to the students. Tell students that you are going to read the article out loud and that they should follow along with their copy. Every time the reading mentions a component of the lock or one of the three stages in the locking process, students should underline or highlight that word or phrase so that they are sure to include it in their drawing.
3. After completing the reading, review Images 1–10 and Construction Drawings 1–2, and indicate the features discussed in the text to give students a better understanding of the lock and its components, including the lock chamber and the upper and lower gates. Then, using colored pencils or markers, have the students draw complete Diagram 2. Ask them to draw the position of the boat, the upper and lower lock gates, and the water level at each of the three stages of the locking process.
4. Once students have completed their diagrams, show them the complete “How Locks Operate” diagram from the United States Army Corps of Engineers (Diagram 1). Although their diagram may not look exactly like the provided image, they should be able to identify some similarities since most river locks operate on the same basic principles.

The Walters – Growing Up in a Lockmaster’s Family

Glossary

The glossary contains a list of vocabulary words included in Readings 1–4 in this section. When you see an underlined term or phrase in the reading, return to this glossary to learn its meaning.

Cistern: an underground container used for storing water usually constructed of brick or stone and lined with cement.

Log boom: a barrier placed in a river designed to collect or hold timber floated down the river.

Restore: to repair or renovate a building to return it to its original condition.

Standardize: to make objects of the same type have the same basic features, i.e. size, form, materials, or appearance.

Water gauge: an instrument or device used to measure the depth or quantity of water or to indicate the height of its surface.

Reading 1. An Introduction to the Walters Family

John Adams Walters, Sr. served as lockmaster at Lock and Dam No. 10 from 1914 to 1941 and from 1942 to 1946. Walters was born in 1877 in Estill County and was the son of William Henry and Martha Wilson Walters. He spent most of his life working on the Kentucky River. As a young man, he operated log booms, rode log rafts down the river, and worked for the Burt and Brabb Lumber Company on the Kentucky River in Ford, Kentucky. In 1906, Walters was hired as a laborer at Lock and Dam No. 10, and by 1908, he had worked his way up to lockman. In 1912, he became lockmaster at Lock and Dam No. 7 near Shakertown. He transferred back to Lock and Dam No. 10 in 1914, replacing the first lockmaster, Bert Ross, whom he served under as lockman. Walters and his wife, Jennie, lived in the upper lockhouse with their ten children, Annie, Ethel, Martha, Emma, Ruby, Dorothy, Alice, John Adams, Jr., Mary, and Mabel. Lockkeeping was often a family tradition and most lock workers came from river families during the early years of the lock and dam system. Following in his father’s footsteps, John “Jay” Walters, Jr. became lockmaster at Lock and Dam No. 10 after his father retired in 1941. In 1942, Jay enlisted in the United States Army and served in the 480th Engineer Maintenance Company during World War II. Walters, Sr. was reinstated as lockmaster until his son returned from the war in 1946. Jay married Delphia Robinson around 1948 and had three children: Marion, Barbara, and John Adams, III. Three generations of the Walters family lived on the reservation until Walters, Sr. and his wife moved away in 1952. Walters, Sr. died a few years later in 1959. Jay and his wife Delphia stayed on the reservation until they moved in June 1975. Jay died shortly after they left the reservation. Today, the upper lockhouse, which became the Kentucky River Museum in 2002, tells the story of the Walters family and their time at Lock and Dam No. 10.

This reading was written by Cultural Resource Analysts, Inc., utilizing the following resources:

Ellis, Elliott William

2000 *The Kentucky River*. The University Press of Kentucky, Lexington, Kentucky.

Scraggs, Deirdre A.

2012 *John Adams Walters, Jr. Papers* [finding aid]. University of Kentucky Special Collections Research Center, Lexington, Kentucky. Electronic document, <https://exploreuk.uky.edu/fa/findingaid/?id=xt7qzb616h5m>, accessed November 14, 2019.

Wheatley, Susan

2002 *John Adams Walters, Sr. Papers, 1905-1958* [finding aid]. Eastern Kentucky University, Special Collections and Archives, Richmond, Kentucky. Electronic document, <http://www.findingaid.eku.edu/?p=collections/findingaid&id=145&q=&rootcontentid=41371>, accessed November 11, 2019.

Supplemental Reading 1. Entry for John A. Walters, Sr. and family in the 1940 United States Census.

State Kentucky Incorporated place _____ Ward of city _____ Unincorporated place _____
County Madison Township or other division of county Mag Dist 3 Block No. _____ Enumeration _____
DEPARTMENT OF COMMERCE—BUREAU OF THE CENSUS
S. D. No. 12 E. D. No. 76-8 Sheet No. 7 B
SIXTEENTH CENSUS OF THE UNITED STATES: 1940
Enumerated by me on Apr 18-19 1940
POPULATION SCHEDULE
William Jay Linton

LOCATION	HOUSEHOLD DATA	NAME	RELATION	PERSONAL DESCRIPTION	EDUCATION	PLACE OF BIRTH	RESIDENCE, APRIL 1, 1940													PERSONS 16 YEARS OLD AND OVER—EMPLOYMENT STATUS																																																																																																																																																																																																																																											
							IN WHAT PLACE DID THIS PERSON LIVE 10 YEARS AGO	IN WHAT PLACE DID THIS PERSON LIVE 5 YEARS AGO	IN WHAT PLACE DID THIS PERSON LIVE 1 YEAR AGO	IN WHAT PLACE DID THIS PERSON LIVE 6 MONTHS AGO	IN WHAT PLACE DID THIS PERSON LIVE 3 MONTHS AGO	IN WHAT PLACE DID THIS PERSON LIVE 1 MONTH AGO	IN WHAT PLACE DID THIS PERSON LIVE 2 WEEKS AGO	IN WHAT PLACE DID THIS PERSON LIVE 1 WEEK AGO	IN WHAT PLACE DID THIS PERSON LIVE 1 DAY AGO	IN WHAT PLACE DID THIS PERSON LIVE 1 HOUR AGO	IN WHAT PLACE DID THIS PERSON LIVE 15 MINUTES AGO	IN WHAT PLACE DID THIS PERSON LIVE 5 MINUTES AGO	IN WHAT PLACE DID THIS PERSON LIVE 1 MINUTE AGO	IN WHAT PLACE DID THIS PERSON LIVE 30 SECONDS AGO	IN WHAT PLACE DID THIS PERSON LIVE 15 SECONDS AGO	IN WHAT PLACE DID THIS PERSON LIVE 5 SECONDS AGO	IN WHAT PLACE DID THIS PERSON LIVE 1 SECOND AGO	IN WHAT PLACE DID THIS PERSON LIVE 1/2 SECOND AGO	IN WHAT PLACE DID THIS PERSON LIVE 1/4 SECOND AGO	IN WHAT PLACE DID THIS PERSON LIVE 1/8 SECOND AGO	IN WHAT PLACE DID THIS PERSON 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SECOND AGO	IN WHAT PLACE DID THIS PERSON LIVE 1/72057594037927936 SECOND AGO	IN WHAT PLACE DID THIS PERSON LIVE 1/144115188075855872 SECOND AGO	IN WHAT PLACE DID THIS PERSON LIVE 1/288230376151711744 SECOND AGO	IN WHAT PLACE DID THIS PERSON LIVE 1/576460752303423488 SECOND AGO	IN WHAT PLACE DID THIS PERSON LIVE 1/1152921504606846976 SECOND AGO	IN WHAT PLACE DID THIS PERSON LIVE 1/2305843009213693952 SECOND AGO	IN WHAT PLACE DID THIS PERSON LIVE 1/4611686018427387904 SECOND AGO	IN WHAT PLACE DID THIS PERSON LIVE 1/9223372036854775808 SECOND AGO	IN WHAT PLACE DID THIS PERSON LIVE 1/18446744073709551616 SECOND AGO	IN WHAT PLACE DID THIS PERSON LIVE 1/36893488147419103232 SECOND AGO	IN WHAT PLACE DID THIS PERSON LIVE 1/73786976294838206464 SECOND AGO	IN WHAT PLACE DID THIS PERSON LIVE 1/147573952589676412928 SECOND AGO	IN WHAT PLACE DID THIS PERSON LIVE 1/295147905179352825856 SECOND AGO	IN WHAT PLACE DID THIS PERSON LIVE 1/590295810358705651712 SECOND AGO	IN WHAT PLACE DID THIS PERSON 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Abbreviated entry for John A. Walters Sr. and family in the 1940 United States Census.

Household Data			Name	Relation	Personal Description				Education		Place of Birth	Residence, April 1, 1935	Employment status			
Number of household in order of visitation	Home owned or rented	Value of home, or monthly rental	Name of each person in this household	Relationship to head of household	Sex	Color or race	Age	Marital Status	Attended school or college any time since March 1 1940	Highest grade completed	If born in the United States, give the State, Territory, or possession. If foreign born, give county in which birthplace was situated on January 1, 1937.	City, town, or village. Enter "R" for all other places	Occupation	Industry	Income in 1939	
124	R	10	Walters, John A.	Head	M	W	63	M	No	8	Kentucky	Same house	Lock Keeper	Lock 10 KY River	\$1,038	
			Jennie Mable	Wife	F	W	60	M	No	8	Kentucky	Same house	Housewife			
			Alice	Daughter	F	W	27	S	No	E3	Kentucky	Same house	School Teacher	Grade	\$672	
			John A. Jr.	Son	M	W	24	S	No	H4	Kentucky	Same house	US Engineer Dept.		\$630	
			Wilma	Daughter	F	W	21	S	Yes	H4	Kentucky	Same house				
			Harney, Martha	Daughter	F	W	36	M	No	C4	Kentucky	Same house	House work			
			Letch, Mary Katherine	Daughter	F	W	33	M	No	H4	Kentucky	Same house	House work			
			Nancy Lynn	Granddaughter	F	W	2/12	S	No		Kentucky	Same house				
125	R	5	Tipton, Fred M.	Head	M	W	54	M	No	8	Kentucky	Same house	Helper US Lock 10	Kentucky River	\$980	
			Rosa	Wife	F	W	51	M	No	8	Kentucky	Same house	Housewife			

Supplemental Reading 2. Entry from the lockmaster's logbook, February 18, 1945, noting the weather, condition of the river, and the arrival of a letter from John "J.A." Walters, Jr. from England.

<p>FEB. 16—1805—The Liberia Herald, the first paper printed in Africa, appeared at Monrovia, edited by Charles L. Forbes of Boston. 1859—Death of Professor James S. Thayer at Cambridge, Mass. FEB. 17—1857—First ship passed through Suez Canal. 1859—Philippines demonstrate for early independence.</p>	<p>FEB. 16—1861—Jefferson Davis inaugurated president of the Confederate States of America, at Montgomery, Alabama. 1899—American-Canadian Boundary Commission adjourns. FEB. 16—1899—Order of the Knights of Pythias was founded at Washington. 1919—Albert Smith makes non-stop flight of 8 hours and 42 minutes.</p>
<p>FEBRUARY 16</p> <p>Rain accompanied by lightning and thunder in early morning which ceased about 7 A.M. hail changing to rain about 5:30 P.M. which lasted only a short time. I repaired an old gun rack which he had as my desk for that 35 years. C. C. Stumbaugh brought his team down in late afternoon and hauled me a load of something up from Old Annabell. Andy Doyle did this morning he was a fine man.</p>	<p>FEBRUARY 18</p> <p>The weather has been bright and sunny but was cold. all the snow is gone. River has risen steadily today and upper gage registered 18.0 at 7 P.M. Fred and Rosa attended church today. Mary Diet, Pass, and Elmyr Syme called on Mrs. Richards, a shot while this afternoon. I wrote J.A. a letter this afternoon the is still in England or at least was when he wrote last.</p>
<p>FEBRUARY 17</p> <p>Rain last night changing to sleet and snow in early forenoon and continuing til almost noon. Cloudy and cold in afternoon. Some of the snow which fell in forenoon melted this afternoon. River is about 1 foot over auxiliary dam and is rising. I looked through drawers in my desk and filed letters and old records and prepared form to report weather in various stages etc.</p>	<p>FEBRUARY 19</p> <p>The weather was mostly fair and continued cold with moderate SE winds today. The river has risen very slowly today and is about Stationary tonight. I filled huts in road leading into observation. Shelled some corn and cut up straw for feed for the cows.</p>

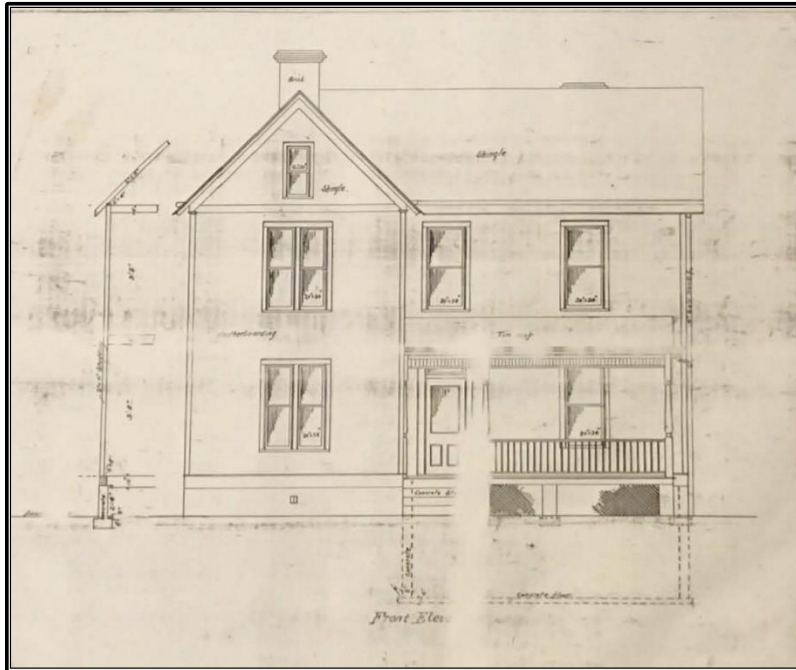
1. Looking at the 1910 census record, what was John A. Walter's Sr.'s occupation? In what industry was he engaged? What does this census record tell us about the Walters family?
2. Why do you think lock keeping became a family tradition? Why might John Walters, Jr. have decided to follow in his father's footsteps?
3. Review the log book entry above. What differences do you see between this entry and the entries from the 1908 and 1923 logbooks you looked at earlier? What does this tell you about changes on the river?

Reading 2. Buildings Associated with the Lock and Dam No. 10 Reservation

The lockmaster, lockman, and their families lived on government-owned land near the lock and dam known as the Lock and Dam No. 10 reservation. The United States Army Corps of Engineers created standardized design plans for the lockhouses and support buildings built on the lock and dam reservations. The buildings at Lock and Dam No. 10 are similar to those constructed by the United States Army Corps of Engineers at the other locks along the Kentucky River. The upper and lower lockhouses are each two stories in height and have a “T” shaped plan when viewed from above. They feature a kitchen, dining room, and sitting room on the first floor and three bedrooms on the second floor.

In addition to the lockhouses, the Corps provided a variety of buildings for the lock workers and their families. At Lock and Dam No. 10, a small office was constructed along the berm that extends from the dam to the lockhouses. This was the second office built on the reservation. The first office was swept away by the floodwaters in March 1905. Here, the lockmaster and lockman oversaw the daily operation of the lock and made entries in the logbook. Next to the office is a bell that a ship’s captain or crew would ring when they wanted to pass through the lock. Ringing the bell notified the lockmaster that a boat was waiting at the lock. A barn for keeping livestock was built at the base of the hillside just below the lockhouses and two chicken houses were located in the backyard of the dwellings. The upper and lower lockhouses each had a separate laundry building where the family washed their clothes, and a coal house to store coal for the stove and fireplaces. The lockhouses did not originally have running water. Water for cooking and bathing was pumped from a cistern outside. Water was collected from the roofs of the dwellings where the gutters would divert the runoff to the underground cisterns. There were no bathrooms inside the houses, and instead the families used outhouses, also called privies. A two-seated privy was included in the laundry building near the lower lockhouse, but detached outhouses were also located to the rear or side of both houses. Garages were added to the property as automobiles became more popular, and storage sheds were used to house the lock mechanisms and other equipment used in daily life on the reservation. Today, the lockhouses, office, lower lockhouse laundry building and coal house, upper lockhouse laundry building, and barn remain on the former reservation and have been restored to reflect their historic appearance.

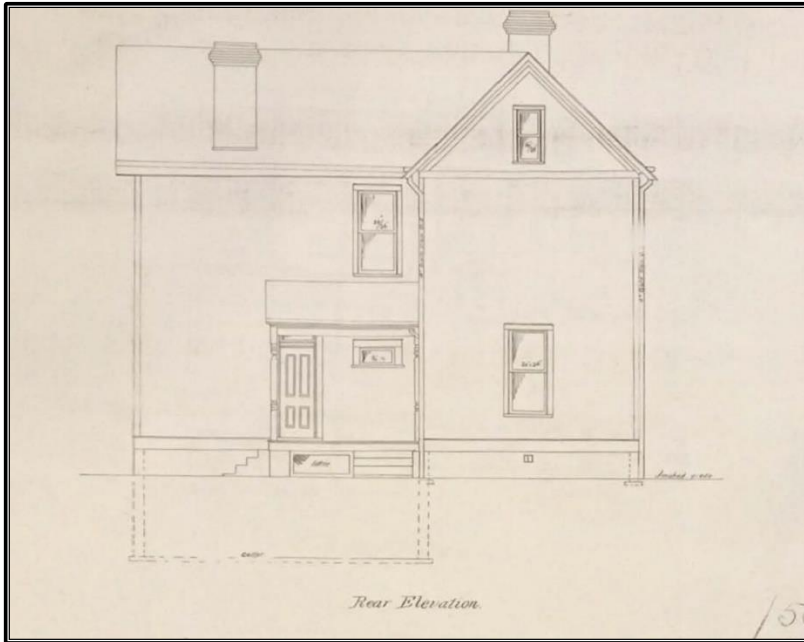
Drawing 1. Elevations of the lockhouses at Lock and Dam No. 10. Drawn by E.O. Young and H.A Scholze under the direction of Major J.G. Warren of the United States Army Corps of Engineers, 1906.



Front elevation of lockhouse.

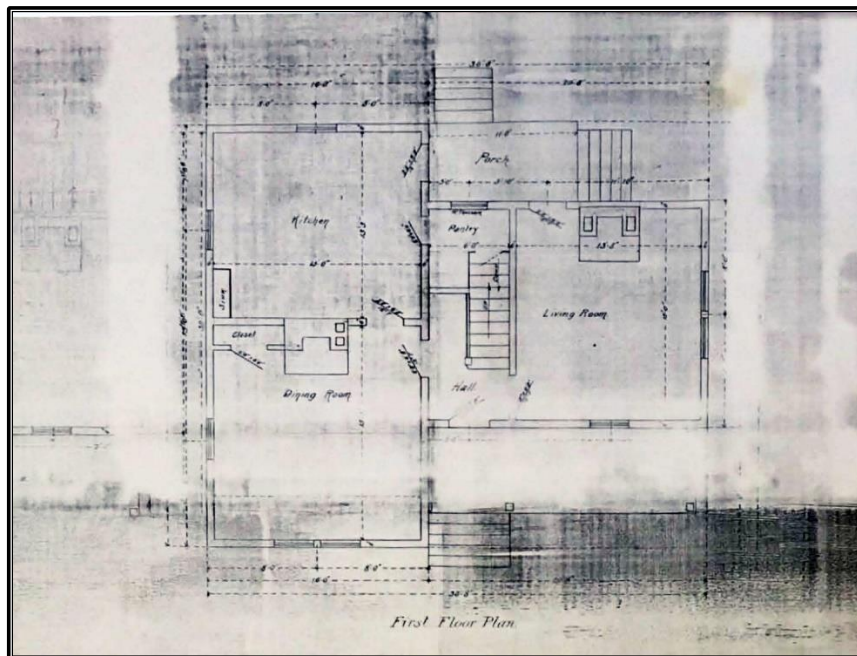


Side elevation of lockhouse.

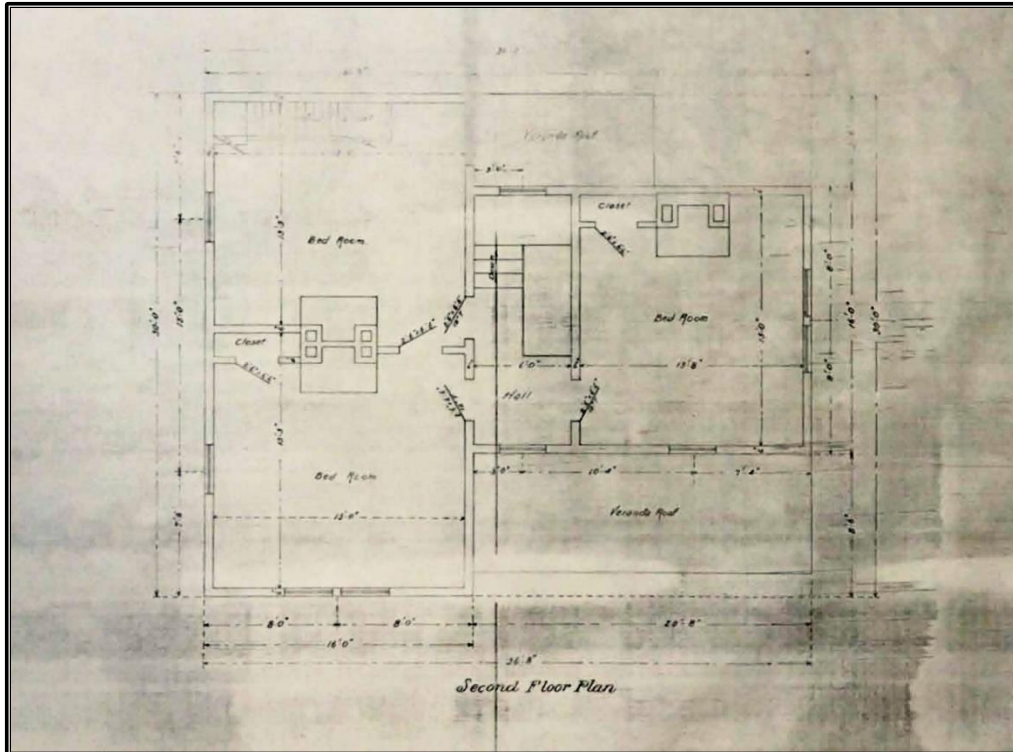


Rear elevation of lockhouse.

Drawing 2. Floorplans of lockhouses at Lock and Dam No. 10. Drawn by E.O. Young and H.A Scholze under the direction of Major J.G. Warren of the United States Army Corps of Engineers, 1906.



Plan of the first floor of lockhouse.



Plan of the second floor of lockhouse.

1. Why do you think the United States Army Corps of Engineers created “standardized design plans” for the lockhouses and outbuildings at the lock and dams along the Kentucky River? Why would that be beneficial?

2. The floorplans show the layout of the first and second floors of the lockhouse. How is the lockhouse different or similar to your house? Why do you think there is a fireplace in almost every room?

Reading 3. An Interview with Jenimarie Sowers – Memories of Lock and Dam No. 10

The following reading includes a summary of an interview with Jenimarie Sowers, granddaughter of John A. Walters, Sr., conducted by Trent Spurlock and Lauren Poole on December 16, 2019.

Jenimarie Sowers is the granddaughter of John A. Walters, Sr., who served as lockmaster at Lock and Dam No. 10. Her mother, Dorothy, grew up on the Lock and Dam No. 10 reservation. Jenimarie's family ran a country store on Boonesboro Road only a few miles from Lock and Dam No. 10 and she and her family often came to visit her grandparents and, later, her aunt and uncle on the reservation. In her interview, Jenimarie tells stories about the Walters family and her memories of life at the lock and dam. Today, Jenimarie continues to share the history of the Walters family and Lock and Dam No. 10 as a summer tour guide at the upper lockhouse, which became the Kentucky River Museum in 2002.

Jenimarie began visiting her family at the lock and dam as a child. Almost every weekend, members of the Walters family would get together on the reservation. Many of Jenimarie's cousins spent their entire summer vacations down by the river. The first lockman, Fred Tipton, was John Walters's brother-in-law, so gatherings at the lock were like a big family reunion. There would be singing, dancing, swimming, and fishing, and the children would play games, including checkers, cards, and hopscotch. The women of the Walters family would prepare an "absolute feast" with everything from ham and fried chicken to mashed potatoes, green beans, and homemade biscuits. It was not all fun and games, though. During their stay on the reservation, the older cousins were expected to help out with household chores. They would sweep the stairs and the porch, dust the house, help with the dishes, and hang the laundry outside to dry.

At night, the visiting members of the family would sleep in every nook and cranny of the house. There were ten children in the Walters family alone and even more aunts, uncles, and cousins. With only three bedrooms in the lockhouse, the family had to get creative. In the summer, when the weather was warm, all the outbuildings on the reservation were cleared out and turned into sleeping quarters. Double beds were also placed in the attic and according to Jenimarie, "you ain't lived 'til you slept up there in heat of summer." Jenimarie remembers sleeping three or more to a bed, but "you did anything to come" because it was "that wonderful, magical place....and we didn't care what hardships there were as long as we could get here."

One favorite family tradition was breakfast on the beach. The family would gather biscuits, eggs, sausage, homemade butter, jams, and jellies into a basket and head down to Boonesboro Beach. They went swimming, cooked breakfast, and spent the day on the beach enjoying the sunshine. The beach was a popular tourist attraction when Jenimarie was a child. In 1909, Dr. David Williams built a resort along the river near Boonesboro Beach, which attracted hundreds of visitors every year until it closed in the 1950s or 1960s. It had a hotel, rental cabins, and a dance hall. The resort also had a tennis court, a field for baseball, and bathhouses on the beach. Jenimarie recalls listening to the sounds of the resort as she fell asleep while staying with her family on the reservation.

During these family gatherings, the lockmaster and lockman were still responsible for the operation of the lock. They would get up before dawn and raise the American flag before heading down to take the air temperature and record the upper and lower water gauges. Lanterns that had been placed on the lock at night to guide boats on the river were removed in the morning. When they were not locking through boats, the lockmaster and lockman did maintenance work on the lock and dam reservation. Jenimarie remembers that "they had to keep all this mowed with the big swing blades...they had their own chickens and eggs and they had the cows that they milked." The lockmaster and lockman were responsible for keeping the reservation "spick and span."

Every year, the United States Army Corps fleet would come up the river to repair the lock. They came from Lock and Dam No. 4 at Frankfort, which served as headquarters for all the lock and dams on the Kentucky River. One boat in the fleet would have a crane to lift the lock gates out of the water for repairs and another boat would have a dredge for clearing the river of obstructions and excess sediment. The United States Army Corps officials would also perform regular inspections of the lock and dam and the reservation.

The lockhouses, outbuildings, and the grounds had to be well maintained and the lock had to be in good working order. After their work was done, the “boat boys,” as they were known, would visit the Walters family on the reservation. In the evenings, there would be singing, dancing, card games, and “plenty of noise.” “The boat boys...you considered them family,” says Jenimarie. The arrival of the fleet was an exciting time on the reservation.

1. The Walters family was very close and enjoyed spending time together. What kinds of activities do you do with your family?
2. Breakfast on the beach was on the Walters’ favorite family tradition. Does your family have any traditions? If so, describe them.
3. A dredge is a piece of equipment used to scoop or drag up excess sand and sediment from the bottom of the river. Why was it important to dredge the river on a regular basis? What would happen if the river was not dredged?

Reading 4. End of an Era — the Closing of the Lock and Dams

During the mid- to late nineteenth century, the expansion of the railroad diverted passengers and freight away from the river. A railway connecting Frankfort to Louisville was completed in 1851, and rail lines leading to Lexington, Cincinnati, and other major cities would soon follow. Bridges were built across rivers and streams, and by 1880 there were approximately 93,000 miles of railroad track in the United States. Roads were also being improved. Many of the major thoroughfares in Kentucky were surfaced with macadam, an early paving material made of broken stone and tar, substantially improving wagon travel. In contrast, travel on the river had become slow and unpredictable due to the deterioration of Locks 1–5 during the 1850s and 1860s. Passengers and freight could be delivered from Frankfort to Louisville 16 hours faster by rail than by boat. In many areas of the state, overland transportation quickly became a faster and cheaper alternative to the steamboat.

The restoration of Locks No. 1–5 during the late nineteenth century briefly restored commercial steamboat traffic on the river. Goods from the Appalachian Mountains, primarily coal, timber, whiskey, produce, and other agricultural products, flowed along the river throughout the 1880s. Encouraged by their success, the United States Army Corps renewed their efforts to extend slackwater navigation along the upper portion of the Kentucky River to increase use of the river throughout the year. However, during the mid-1880s, the railroads dropped their rates to compete with river transports, regaining much of the commercial traffic. In 1889, a railroad was extended into the eastern mountains of Kentucky, diverting freight traffic away from the river. Even after Locks No. 6 and 7 were completed in the 1890s, commerce on the river declined. Timber and coal continued to move along the Kentucky River during the early twentieth century, but passenger and other forms of freight traffic diminished. During World War I, a railcar shortage and the extraction of coal and oil in eastern Kentucky to supply the war effort renewed commercial interest in the river, but it was short lived. By the time the Lock and Dam No. 14 was completed in 1917, the heyday of the river was over. The last passenger boat traversed the Kentucky River in 1921. Steamboats were replaced with gas-powered boats and diesel towboats, many of which were too large to fit through the locks on the Kentucky River. The final commercial steamboat passed through the slackwater system in 1938.

Although timber, coal, sand, and gravel continued to move along the river, recreational boats made up a significant portion of river traffic during the early twentieth century. The Commonwealth promoted the river as a tourist destination. At Lock and Dam No. 10, Boonesboro Beach, which had been created by the construction of the lock and dam and the flood of March 1905, remained a popular attraction. The lock was located near the original site of Fort Boonesborough, a frontier fort established by Daniel Boone and his men in 1775, and a monument was placed at the site in 1907 to commemorate the historic fort. Two years later, Dr. David Williams capitalized on the renewed interest in Fort Boonesborough and the growing tourism industry along the river to build a resort near Boonesboro Beach. People flocked to the resort to enjoy the river, the beach, and the medicinal qualities of the nearby spring water. Recreational boats and pleasure crafts were the primary vessels plying the Kentucky River until World War II. The United States Army Corps of Engineers maintained the lock and dam system and kept the locus opened for the recreational season from May 15 to October 15. During World War II, coal from eastern Kentucky was shipped down the river by barge to fuel wartime industries. Coal barges replaced recreational boats during the war, but during the post-war period, coal transport faded and commercial river traffic dwindled drastically.

By the mid-twentieth century, improvements to the railroad and highway systems made river transportation obsolete. Once again, the river became a tourist destination, and recreational boats were a common sight. The Boonesboro Beach resort near Lock and Dam No. 10 operated through the mid-twentieth century, and Boonesboro Beach remained popular until it was closed in 1988. In the 1950s and 1960s, the Pioneer National Monument Association acquired land containing the original site of Fort Boonesborough and established Fort Boonesborough State Park. A replica of Fort Boonesborough was built

on the site in 1974. In addition to tourism, a few industries along the river continued to provide enough revenue to keep all locks in operation into the 1970s. In 1975, the locks were closed during the winter months. In 1979, the Corps initiated plans to discontinue the use of Lock Nos. 5–14, but they remained open for limited seasonal use through the 1980s due to public pressure. Some commercial freight continues to pass through Locks 1–4 between Frankfort and the Ohio River, but Locks No. 5–14 were decommissioned in 1990. Today, Lock and Dam No. 10 is owned by the Kentucky River Authority and is managed by the state park. The lockhouses and outbuildings were restored in 1996 and, in 2002 the upper lockhouse became the Kentucky River Museum.

This reading was written by Cultural Resource Analysts, Inc., utilizing the following resources:

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Supplemental Reading 1. "Five Thousand Bathers at Boonesboro Beach," published in *The Bourbon News*, August 3, 1917.

FIVE THOUSAND BATHERS AT BOONESBORO BEACH.

Last Sunday was a record-breaker for attendance at the Boonesboro bathing beach. It was estimated by a Lexington man who is an expert at judging the size of a crowd that five thousand people were assembled there.

They came by hundreds from Lexington, Paris, Winchester, Georgetown, Cynthiana, Mt. Sterling, Harrodsburg, Richmond, Danville and dozens of small towns in Central Kentucky. There were over one thousand people in bathing at one time during the afternoon.

Boonesboro is fast becoming one of the most famous bathing resorts in the State and when the Dixie and Boone Highways are completed it is destined to become one of the most famous in all the Southland.

Supplemental Reading 2. "Corps to Close 10 Locks on Kentucky River," published in the *Messenger-Inquirer Sun*, September 27, 1981.

Corps to close 10 locks on Kentucky River

Associated Press

LEXINGTON — Ten of the 14 locks along the Kentucky River will be closed Thursday when the new federal budget takes effect, according to the Army Corps of Engineers.

Only the four locks between the Ohio River at Carrollton and Frankfort will continue to operate. The other 10 river locks will be welded shut.

Congress has appropriated no money for further operation and maintenance of the century-old lock and dam system between Beattyville and Frankfort. Routine dredging will also come to a halt.

The economic move was proposed by the corps 15 months ago, but it was

abandoned after vocal opposition from boaters, politicians, water utilities and people whose jobs depend on the river traffic.

The locks reopened last April on a limited schedule.

By that time, however, President Reagan had submitted to Congress a budget that did not include the \$1.2 million to \$1.8 million needed to operate the locks another year.

Congress did not restore the funds, and on May 20, the corps announced that Locks 5 through 14 would be closed permanently on Oct. 1.

Opponents, who say they were caught off-guard, have only recently started efforts to find a way to keep the

locks open.

Kentucky House Speaker William Kenton, D-Lexington, said last week that he planned to have the Legislative Research Commission fire off a protest resolution in Washington.

County judge-executives from affected central Kentucky counties plan to make a final plea to corps officials.

Local officials and water utility executives are predicting possible dire consequences for cities that depend on the Kentucky River for water if dredging is not continued.

The 11 full-time and 20 part-time corps employees who will lose their jobs operating and maintaining the locks have expressed anxiety over

their futures.

Pleasure boaters, meanwhile, are taking what may be their last chance to travel the river.

Charlie Milward, a Versailles resident who recently joined friends in a final voyage upriver, said he isn't happy about the closure.

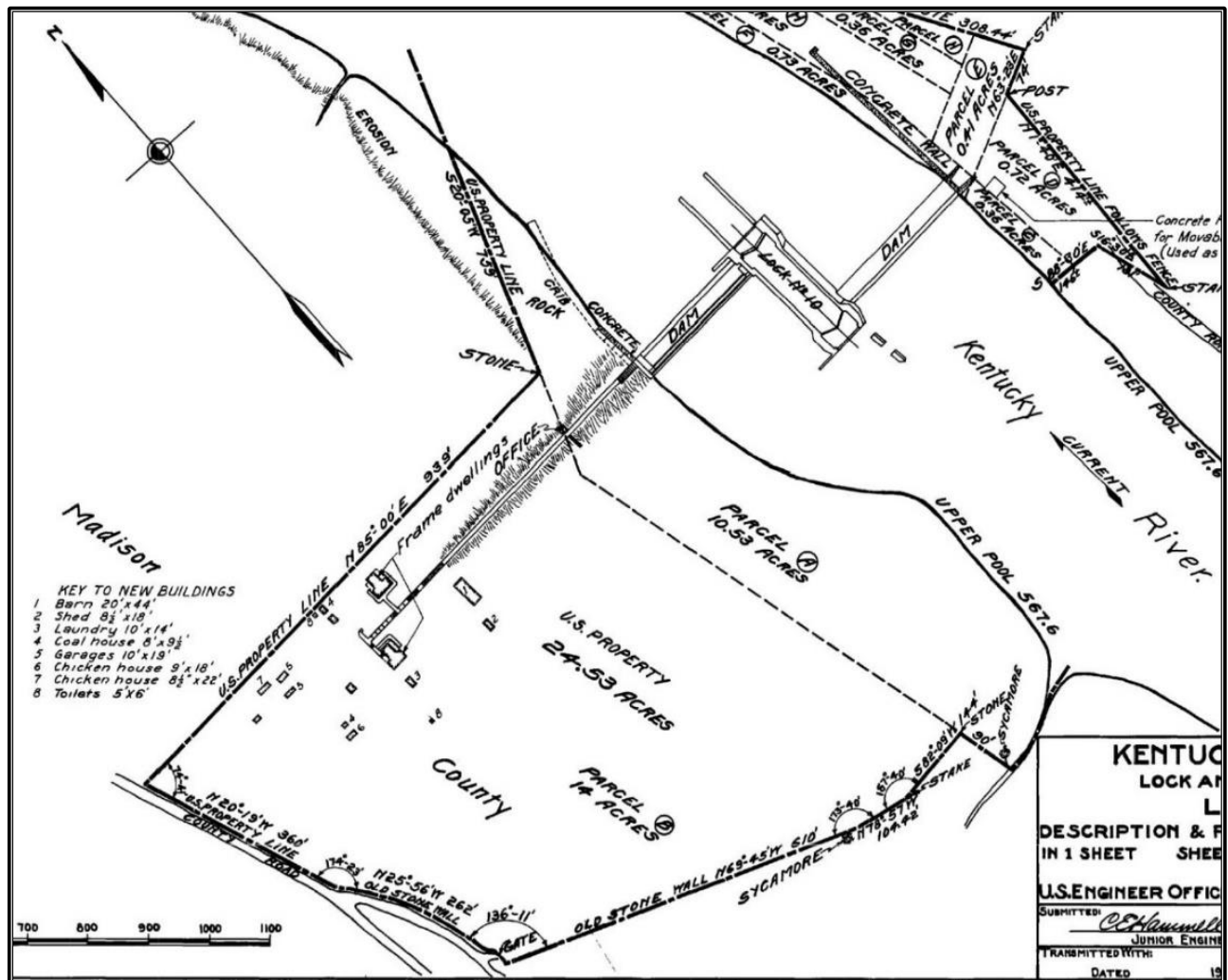
"The lock-and-dam system could provide a livelihood for a sizable group of people," he said.

But corps spokesman Chuck Schumann said the cold, hard facts of life dictate otherwise.

He said several attempts to restore commercial navigation between Frankfort and Beattyville in recent years proved "very short-termed."

1. How do you think the reduction in commercial and passenger traffic on the Kentucky River affected communities along the river? How might they have adapted to the focus on tourism during the early to mid-twentieth century?
2. Locks No. 5–14 were closed in 1990 and are no longer in use. What do you think should be done with the lock and dams? Should they be preserved and turned into a history museum like Lock and Dam No. 10?

Map 1



Map 1. Portion of 1925 plat map of Lock and Dam No. 10 showing the lock and dam, lockhouses, and other structures associated with the reservation. Courtesy of Stantec.

1. Look at the site plan included in the plat map. A site plan is a view of a site from above. Can you identify the lockhouses? What kinds of outbuildings do you see represented? Is there anything you do not recognize?

Image 1.

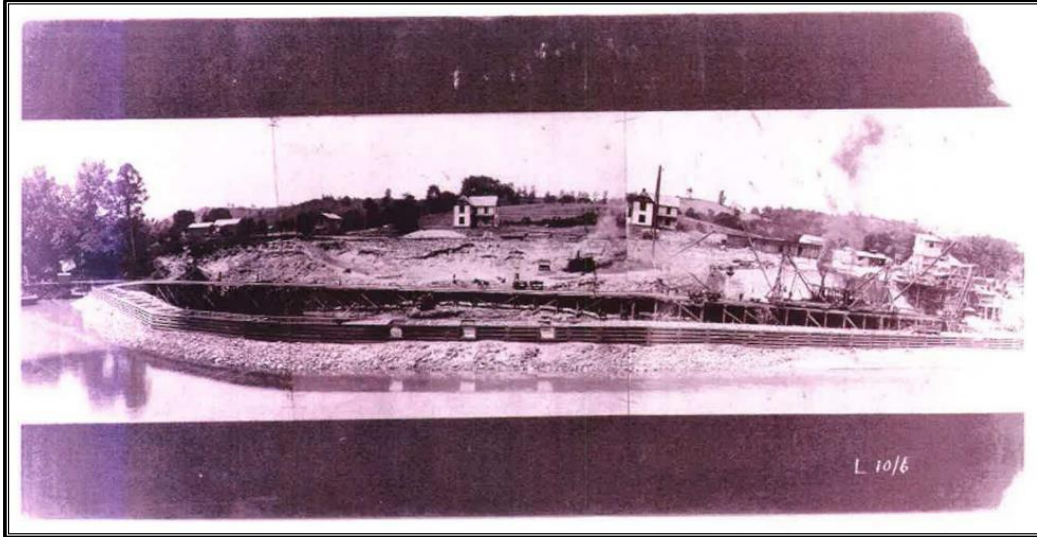


Image 1. Historic photograph of the construction of Lock and Dam No. 10 circa 1903 with the lockhouses in the background. Courtesy of Stantec.

Image 2

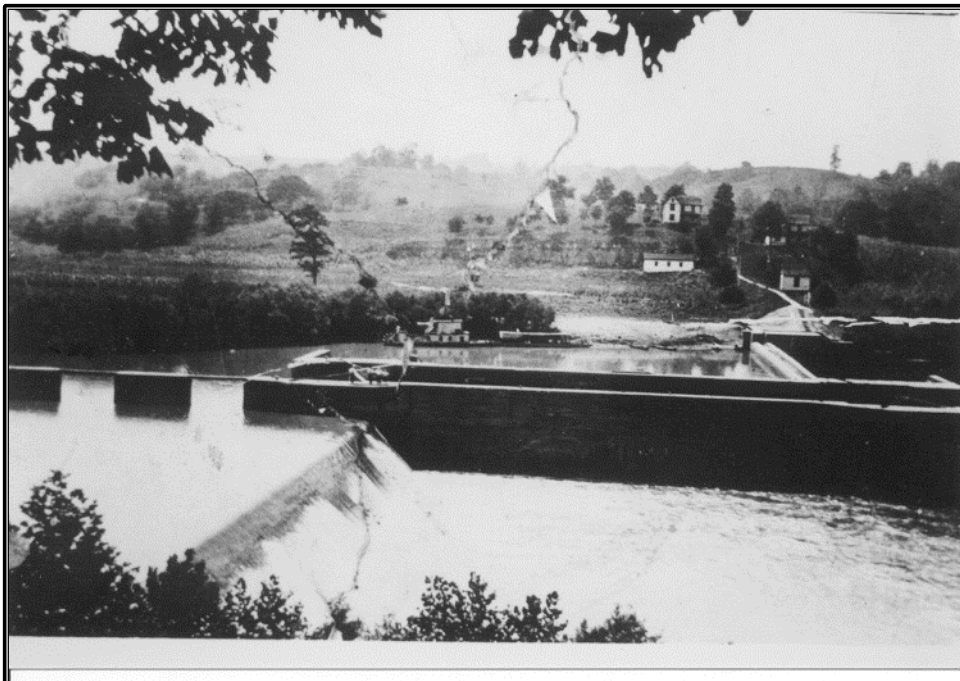


Image 2. Historic image of the Lock and Dam No. 10 and the reservation from the Clark County side of the Kentucky River. Courtesy of the Kentucky River Museum Collections.

Image 3



Image 3. View of Lock and Dam No. 10 and the reservation from the Clark County side of the Kentucky River, circa 2016. Courtesy of Cultural Resource Analysts, Inc.

1. Image 1 shows the upper and lower lockhouses in their original position along the river. The upper lockhouse (left) was destroyed in the 1905 flood and the lower lockhouse (right) was relocated to the top of the hill. Compare and contrast Image 1 and Image 2, which was taken after the 1905 flood. What differences do you notice? Is there anything missing? What do you notice about the surrounding landscape?
2. Based on the readings, can you identify any of the buildings in Images 2 and 3?
3. Refer to the site plan above. Why were the lockhouses at Lock and Dam No. 10 oriented toward the river instead of the road like most houses? Why were they positioned on top of a hill?
4. What sort of impression of the reservation do you get from this view point? What does the quality of construction and the materials of the lockhouses and outbuildings communicate about Lock and Dam No. 10?

Image 4



Image 4. Historic photograph of the lock office and berm with the lock and dam in the background from the Kentucky River Museum Collections.

Image 5



Image 5. View of the lock office, circa 2016. Courtesy of Cultural Resource Analysts, Inc.

1. A berm is a raised ridge or embankment along a river or a canal. Why do you think a berm was constructed at Lock and Dam No. 10? What is its purpose?
2. Why is there a bell located outside the lock office? Why would the lockmaster or lockman not spend the entire day in the office?

Image 6



Image 6. Historic photograph of the upper lockhouse at Lock and Dam No. 10 from the Kentucky River Museum Collections.

Image 7



Image 7. View of the front of the upper lockhouse at Lock and Dam No. 10, circa 2016. Courtesy of Cultural Resource Analysts, Inc.

Image 8



Image 8. View of the back of the upper lockhouse, circa 2016. Courtesy of Cultural Resource Analysts, Inc.

Image 9.



Image 9. View of the front of the lower lockhouse, circa 2016. Courtesy of Cultural Resource Analysts, Inc.

1. Compare and contrast the historic and recent pictures of the upper lockhouse above. Do you see any differences?
2. How would you describe the house? What are its primary materials and character-defining features?

Image 10



Image 10. Historic image of the lower lockhouse laundry and coal house from the Kentucky River Museum Collections.

Image 11



Image 11. View of the lower lockhouse laundry building and coal house, circa 2016. Courtesy of Cultural Resource Analysts, Inc.

Image 12



Image 12. View of the upper lockhouse laundry house, circa 2016. Courtesy of Cultural Resource Analysts, Inc.

1. Refer to the site plan on the plat map of the reservation. Can you tell where the historic photograph was taken? Based on what you've learned in the lesson so far, can you identify the buildings in the background?
2. Why are the laundry house, coal house, and privies separate from the main house? Why do you think the laundry houses both have a chimney?
3. The lower lockhouse laundry house has the laundry room and coal storage on one side and a privy on the other. What would be the benefit of having a multi-purpose outbuilding?

Image 13



Image 13. View of the barn located down the hill from the upper and lower lockhouses, circa 2016. Courtesy of Cultural Resource Analysts, Inc.

1. Find the barn on the site plan. This barn is a livestock barn and was used to house the reservation's cows. Milking the cows was a daily chore for the lockmaster and lockman. How is the barn similar to or different from the other barns you've seen on farms in Kentucky? Why do you think the barn was located so far away from the house?

Image 14

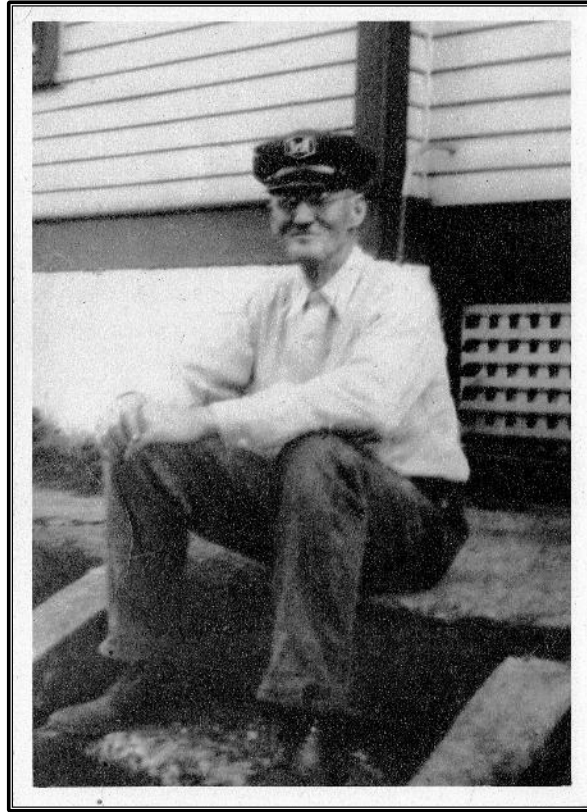


Image 14. John A. Walters Sr. at Lock and Dam No. 10 from the Kentucky River Museum Collections. Note the United States Army Corps of Engineers emblem on his hat.

Image 15



Image 15. The Walters family, including John Walters Sr. (far left), and his wife, Jennie (second to the left), and all 10 children, from the Kentucky River Museum Collections.

Image 16.



Image 16. Photograph of Jenimarie Sowers as a child outside the upper lockhouse at Lock and Dam No. 10 circa 1940, from the Kentucky River Museum Collections.

Image 17.



Image 17. Photograph of Jenimarie Sowers inside the upper lockhouse, circa 2019.

1. Why do you think Jenimarie continues to share stories about her family and life at the lock and dam as a tour guide at the Kentucky River Museum? What do you think that place means to her? Is there a place that you and your family visit that holds special meaning to you?

Image 18.



Image 18. Postcard of steam engine and railroad tracks on a cliff overlooking the Kentucky River from the Postcard Collection housed in the Special Collections Research Center at the University of Kentucky, online at ExploreUK, <https://exploreuk.uky.edu/>.

Image 19.



Image 19. Historic photograph of people at Boonesboro Beach from the Kentucky River Museum Collections.

1. If the railroads were steering commercial traffic away from the Kentucky River, why do you think the United States Army Corps of Engineers continued to build the remaining lock and dams?
2. What kind of activities do you think people did at Boonesboro Beach? What do you think made it so attractive to tourists?

Image 20.



Image 20. Historic photograph of Boonesboro Beach Resort from the Kentucky River Museum Collections.

Image 21.



Image 21. Advertisement for the Boonesboro Beach Hotel published in *The Courier-Journal*, June 18, 1926. Courtesy of the Kentucky Digital Newspaper Program at the University of Kentucky Special Collections Research Center, online at <https://kentuckynewspapers.org/kdnp/mcm.php>.

1. The National Trust for Historic Preservation defines heritage tourism as “traveling to experience the places, artifacts, and activities that authentically represent the stories and people of the past.” Are the Lock and Dam No. 10 and the Kentucky River Museum heritage tourism sites? Why? Can you think of any other places you have visited on field trips or with your family that fit this definition?

Activity 1

The Kentucky River Museum preserves the history of Lock and Dam No. 10. The lower lockhouse contains displays and interpretive boards with information about the Kentucky River and the lock and dam system. The upper lockhouse features the Walters' furniture, photographs, and other personal items, which were collected by the museum's curator with the help of the Walters family and their descendants. These items tell the story of the Walters family and their time on the reservation. Have students create a "family history museum." Help students develop a list of interview questions and instruct students to interview one or more family member(s) (parents, aunts/uncles, grandparents, etc.) about their family history. Have students write a short (2–3 paragraphs) family history based on their interview. Ask students to identify three (3) items associated with events or people included in their family history, such as photographs, documents, books, or other artifacts. For example, a student may choose to bring in their grandfather's pocket watch, their mother's childhood toy, and a family photograph. Alternatively, if the chosen items are large, delicate, or valuable, have students take or draw pictures to include in their display. Have students set up their "museums" on the desks and walk around the classroom to view their classmates' displays. Ask students to pick a display and write down a brief summary of what they learned about their classmate's family history.

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Photographs

Historic photographs courtesy of the following:

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