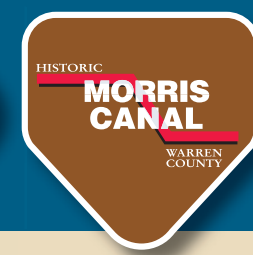


Appendix O.

Morris Canal Interpretative Panels

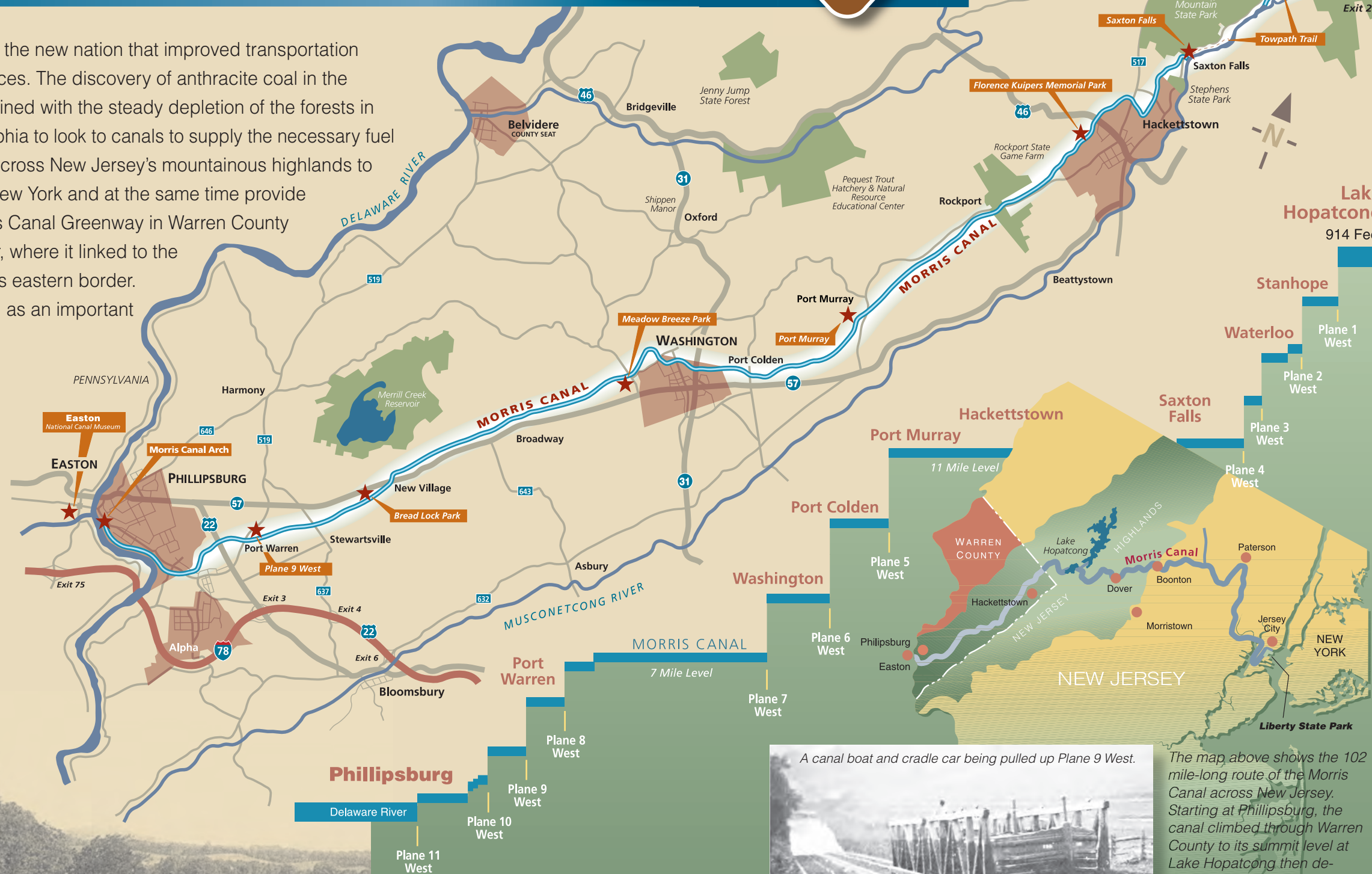
MORRIS CANAL GREENWAY



The successful completion of New York's Erie Canal in 1825 demonstrated to the new nation that improved transportation routes were the key to unlocking the country's great wealth of national resources. The discovery of anthracite coal in the mountains of northeastern Pennsylvania at the end of the 18th century, combined with the steady depletion of the forests in northern New Jersey, led entrepreneurs in New Jersey, New York and Philadelphia to look to canals to supply the necessary fuel for the burgeoning Industrial Revolution. The Morris Canal was constructed across New Jersey's mountainous highlands to supply coal to the industries and cities in the northern part of the state and New York and at the same time provide transportation for goods from these urban centers into rural areas. The Morris Canal Greenway in Warren County follows the route of this historic canal from Phillipsburg on the Delaware River, where it linked to the Lehigh and Delaware Canals, to the historic village of Waterloo at the county's eastern border. The Greenway preserves both the remains of the canal and its natural setting as an important part of county history.

The Morris Canal 1824 - 1924

On its 100+ mile long route from the Delaware River to New York Harbor, the Morris Canal had to overcome a combined elevation change of 1,674 feet. To accomplish this, canal engineers had to construct a system of 23 locks and 23 inclined planes, achieving a world record and earning the Morris Canal the title "Mountain Climbing Canal". To supply water for the canal, Lake Hopatcong was enlarged and used as a reservoir. Additional water supply was obtained by creating Lake Musconetcong, damming Greenwood Lake, and building a seven-mile-long feeder canal to access the Pequannock and Wanaque River watersheds. In the 1840's, the canal was enlarged to 40 feet wide and 5 feet deep and the inefficient water wheels originally employed on its inclined planes were replaced with water-powered reaction turbines. Ninety-foot-long canal boats pulled by mule teams, carrying up to 70 tons, crossed the state in just five days. The major cargos were coal going east and iron ore going west. Along the way, boat basins at locks, inclined planes and other locations provided convenient places for boatmen to stop for repairs and supplies, as well as for goods to be loaded and unloaded. Small villages like Port Murray, Port Colden, Rockport and Port Warren developed at these locations with boatyards, warehouses, general stores and other necessary services. The 1860's were the canal's most prosperous years followed by a slow decline as faster, year-round, railroad services became available. In 1872 the canal was leased to the Lehigh Valley Railroad but continued to serve its customers until it was finally abandoned in 1924.



The Morris Canal is listed on the State and National Registers of Historic Places and is considered part of the Morris Canal Greenway. For more information, please visit our web site at www.morriscanal.org

The Mountain Climbing Canal

The locks and Inclined planes formed a staircase that enabled the canal to climb up and over the New Jersey Highlands. The diagram above shows the canal ascending one step at a time from Phillipsburg to the summit level at Lake Hopatcong. At each plane a boat was floated into a wheeled cradle car submerged in the canal. The boat and cradle car were then pulled up the plane using water power. To do the work, water from the canal level above was used to turn a huge reaction turbine located a third of the way down the plane. The turbine turned a cable drum that wound a heavy wrought iron cable that was attached to the cable car and pulled it up or down the plane.

A canal boat and cradle car being pulled up Plane 9 West.



The map above shows the 102 mile-long route of the Morris Canal across New Jersey. Starting at Phillipsburg, the canal climbed through Warren County to its summit level at Lake Hopatcong then descended, crossed the coastal plain and ended at Jersey City on New York Harbor.



Lock 6 West near Port Colden.

MORRIS CANAL GREENWAY



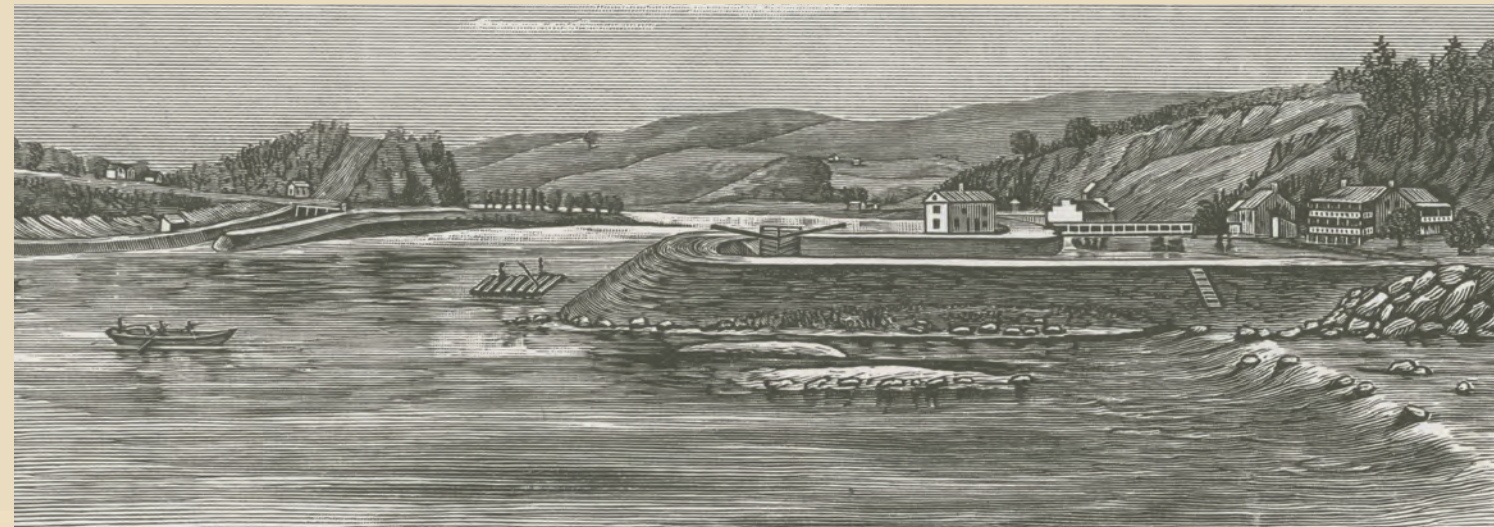
PORT DELAWARE ARCH

In 1830 the Morris Canal was opened for transporting coal from mines in Pennsylvania to developing markets in New Jersey. By 1832 a cable ferry system was being used to bring coal boats across the Delaware River from the terminus of the Lehigh Canal to the entrance of the Morris Canal. Boats could move in either direction across the river by being lashed to a rowboat. In turn the rowboat was attached by two ropes, a short one at the bow and a longer one at the stern, to a cable stretched across the river. The current helped move both boats from one side of the river to the other. The mules that pulled the boats and their drivers crossed the river just upstream on the free bridge.

Originally the canal boats entered the Morris Canal via a guard lock to Inclined Plane 11 West. By 1835 a "port" was beginning to develop for loading and unloading cargo to be transported on the canal. This was later called Port Delaware.

To accommodate larger boats the canal was enlarged in the 1850s and the inclined plane was rebuilt. At that time the large cut limestone arch replaced the lock at the entrance and allowed boats to pass through directly onto the cradle car which ran on the inclined plane raising them 35 feet to the canal prism. As part of the enlargement, the water wheel that originally powered the inclined plan was replaced with a more powerful reaction turbine and the chain that was used to pull the boats was replaced with wire rope. After removing the lock, flood damage control was needed to protect the rails of the inclined plane. The arch was built with a slot down which large planks could be lowered vertically to close off the entrance, acting as a stop gate, and to keep out silt and floating debris during floods.

On the far right of this 1830 engraving can be seen the basin at the terminus of the Lehigh Canal on the Pennsylvania side of the river. In the center of the basin, locks allowed boat to head south on the Delaware Division Canal. Farther to the left other locks allowed boat access to the river and the cable ferry that crossed to the Morris Canal. In the distance can be seen the original entrance lock and large earthen embankments.



To the left, a canal boat is shown leaving the cradle car at the bottom of Inclined Plane 11 West. In the distance another boat just inside the stone arched entrance waits to cross the river by the cable ferry.



The massive walls of the stone arch at the entrance to the Morris Canal were built higher than the highest flood waters. Inside the arched entrance can be seen the slot down which wooden planks could be lowered to keep out debris and silt from the river.

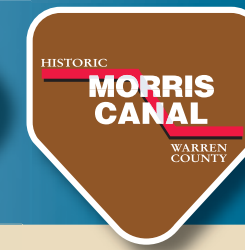


Morris Canal Entrance Arch

In the center of this recent view looking south from Easton on the Pennsylvania side of the Delaware River, the stone wall and arch protecting the entrance to the Morris Canal can be seen, dwarfed, beneath more modern railroad bridges.

The Morris Canal is listed on the State and National Registers of Historic Places and is considered part of the Morris Canal Greenway. For more information, please visit our web site at www.morriscanal.org

MORRIS CANAL GREENWAY



MILLPOND PARK

SOUTH MAIN STREET HERITAGE AREA

The area along South Main Street from Green's Bridge to Sawmill Street is rich in industrial history. Some remains can still be seen today.

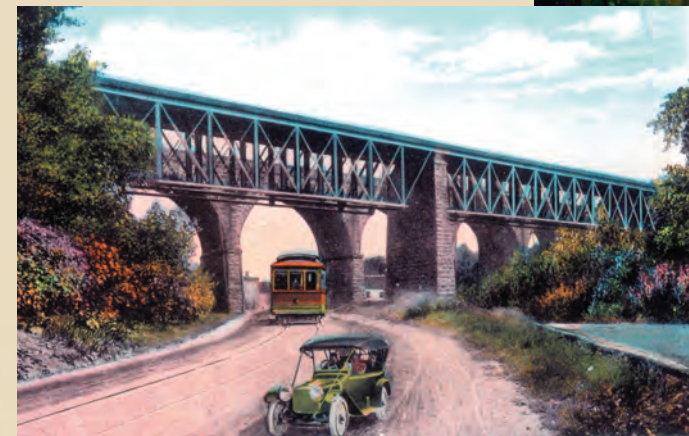
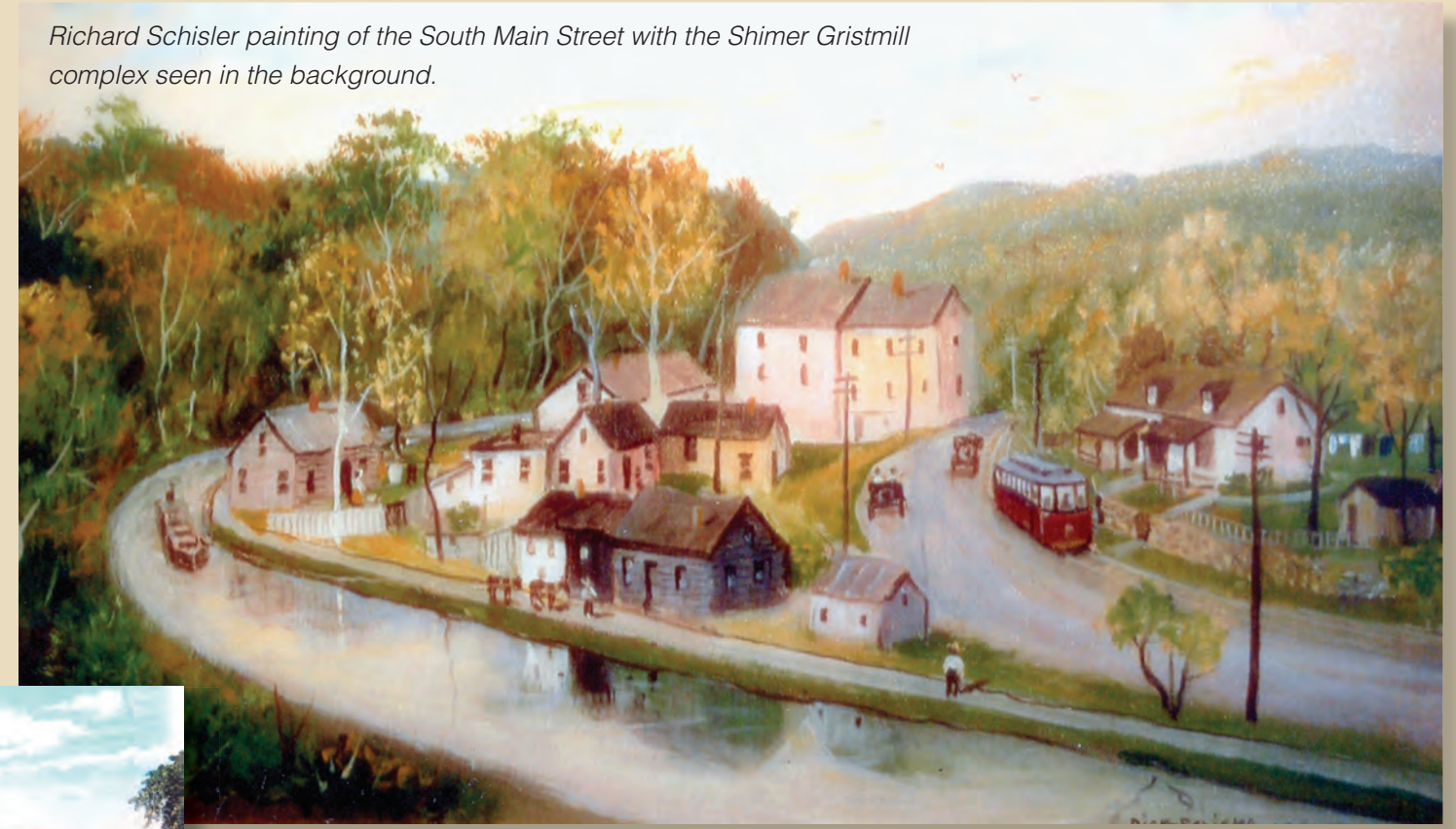
Early mills took water from Lopatcong Creek to power their operations. When the Morris Canal opened in 1831, it was combined with the creek from near Green's Bridge to Sawmill Street. The overflow was impounded in a mill pond.

The Shimer gristmill complex was later converted to a soapstone mill fed by a raceway from the Morris Canal. The discharge water went into the mill pond and was used to power other mills downstream. The present sewer plant is located on or near the site of the soapstone quarry.

After the canal was abandoned in 1924, flooding of Lopatcong Creek removed most of the remains of the canal. The grassy area of fill between South Main Street and Lopatcong creek covers the archaeological remains of the mill complex, the mill pond and the present sewer line.

In 1806 the New Brunswick Turnpike operated along what is today South Main Street. A trolley line used this route to take passengers east to and from Phillipsburg. Today the Morris Canal Trail follows the original path of the canal.

Richard Schisler painting of the South Main Street with the Shimer Gristmill complex seen in the background.



The car and trolley are traveling on what is now South Main Street. The canal and Lopatcong Creek are seen to the right.



In the picture above, Morris Canal boats are moored along the canal berm near Green's Bridge. The canal and Lopatcong Creek are joined here. South Main Street is at the right.

The Morris Canal is listed on the State and National Registers of Historic Places and is considered part of the Morris Canal Greenway. For more information, please visit our web site at www.morriscanal.org

MORRIS CANAL GREENWAY



ANDOVER-MORRIS SCHOOL

The name of the Andover-Morris School is derived from the Andover Iron Company and the Morris Canal, two former users of its site along South Main Street.

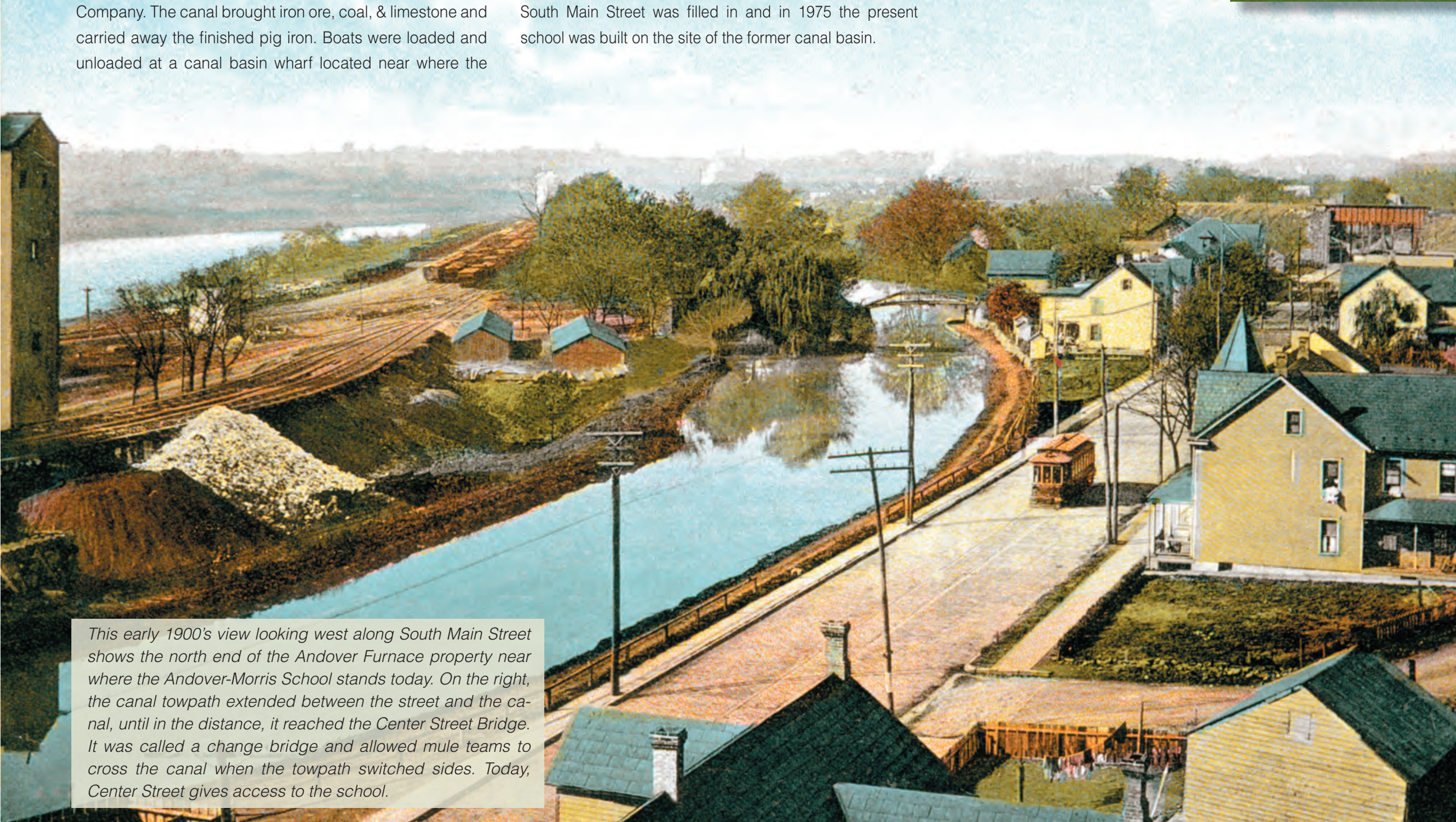
In 1847 the firm of Cooper & Hewitt acquired land between the Morris Canal and the Delaware River and erected an iron furnace to supply their rolling mills in Trenton. By 1859 this was one of the most productive furnaces in the country. In 1867 the property was sold to the Andover Iron Company. The canal brought iron ore, coal, & limestone and carried away the finished pig iron. Boats were loaded and unloaded at a canal basin wharf located near where the

school stands today. The furnace operated until 1912.

The Morris Canal, completed in 1831, extended 102 miles across New Jersey from Phillipsburg to Jersey City. The canal carried anthracite coal from mines in Pennsylvania to markets in New York and iron ore from the highlands of New Jersey to the furnace. Along its route places like Phillipsburg grew into important industrial towns.

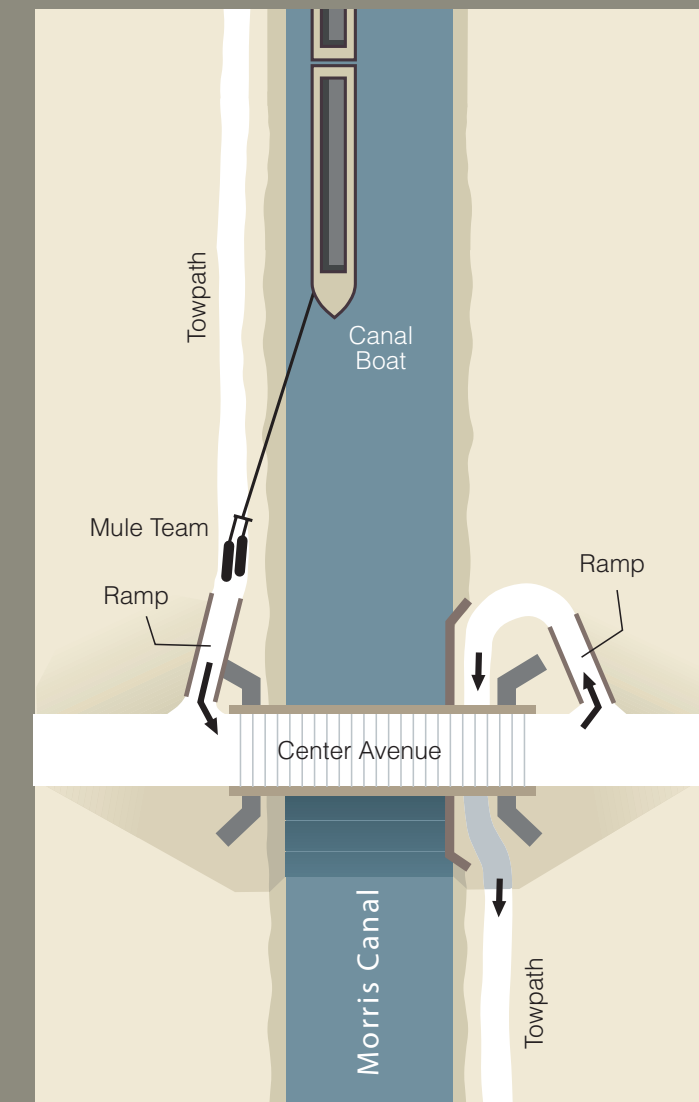
After the canal was abandoned in 1924, the area along South Main Street was filled in and in 1975 the present school was built on the site of the former canal basin.

Modern view of the Andover-Morris School. The canal prism remains buried between the school and the sidewalk along South Main Street.



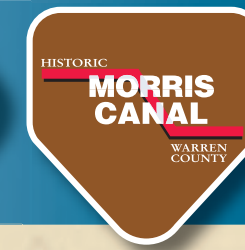
This early 1900's view looking west along South Main Street shows the north end of the Andover Furnace property near where the Andover-Morris School stands today. On the right, the canal towpath extended between the street and the canal, until in the distance, it reached the Center Street Bridge. It was called a change bridge and allowed mule teams to cross the canal when the towpath switched sides. Today, Center Street gives access to the school.

The Change Bridge



The Morris Canal is listed on the State and National Registers of Historic Places and is considered part of the Morris Canal Greenway. For more information, please visit our web site at www.morriscanal.org

MORRIS CANAL GREENWAY



EARLY INDUSTRY

SOUTH MAIN STREET

Early industry started along Lopatcong Creek between South Main Street and the Delaware River. Water, that was readily available from the creek, powered grist and sawmills. The unused water was returned to the creek which then emptied into the Delaware River.

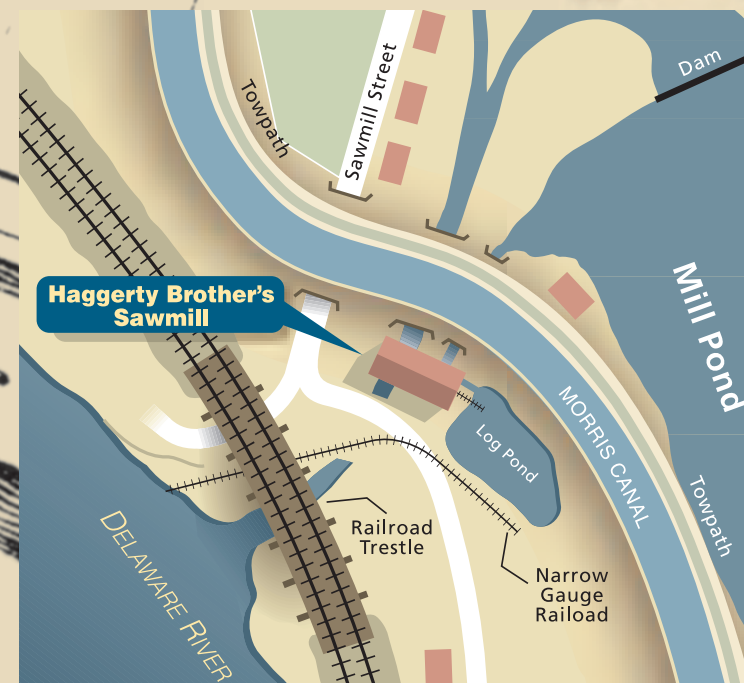
After the Morris Canal was built in 1831 it was combined with the creek near Green's Bridge and the over-flow was impounded in a mill pond. Riley-Shimer flour mill was one of several that ground rye, corn and wheat. The finished products were shipped on the canal.

The Hagerty Sawmill was located southwest of Sawmill Street. A turbine fed by a 19 foot fall of water operated the mill. Lumber rafts traveling on the Delaware River brought logs to the mill to be made into usable planks and other products which could be shipped on the canal.

The first boat on the Morris Canal to travel from Phillipsburg to Jersey City and return originated from the Greens Bridge area in 1832. It may have carried lumber and flour from this area.

After the canal was abandoned in 1924 most of the area, including the mill pond, was filled in covering up the remains of a once thriving industrial area.

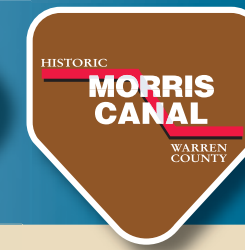
The Andover Furnace utilized the canal by receiving raw materials such as coal and iron ore as well as for shipping finished products. Sawmill Street went under the canal embankment.



Timber rafts, at the mouth of the Lopatcong Creek, were for D. W. Hagerty's lumber mill just to the right of the railroad tracks.

The Morris Canal is listed on the State and National Registers of Historic Places and is considered part of the Morris Canal Greenway. For more information, please visit our web site at www.morriscanal.org

MORRIS CANAL GREENWAY



LOCK STREET

PLANE 10 WEST TO LOCK 8 WEST

Here in the Green's Bridge section of Phillipsburg lift Locks 8,9, & 10 West and Inclined, Plane 10 West raised the canal a total of 70 feet from the Delaware River Valley to the plateau of farmland to the east. To accomplish this transition canal engineers used the route of Lopatcong Creek. However, unlike the unruly ravine cut by the creek, the canal needed to maintain an orderly route stepping uphill one level at a time to allow the passage of canal boats. Because the ravine is narrow and the drop steep, some sophisticated engineering was required. At the bottom of Inclined Plane 10 West, Lopatcong Creek flows into the canal and for a short distance they share the same channel. Just past the farm bridge they once again diverge as the

creek continues its drop while the canal maintains a level course all the way to Lock 8 West. To keep this arrangement in balance during times of high water, an overflow was built just above the lock to allow excess water to flow out of the canal and into the creek. Level tenders walked the towpath monitoring the water level and preventing washouts.

Inclined Plane 10 West is just up Lock Street to the north of the park. Canal boats were raised 44 feet from the lower level to the upper level using a railway on an incline that was powered by a water turbine.



View from Lopatcong Creek looking up at the overflow which is just across the street and canal from the home of Leffert Purcell. The overflow protected the canal from washouts during times of high water and rain. Lock Street is on the opposite side of the canal in this picture.



Lock 8 West, also known as Sharp's Lock, was across the canal from the impressive stone home of E.I.Hunt, a local landowner, for whose family Huntington, in Pohatcong Township, is named. Boats were raised 9 feet at this lock. The municipalities of Phillipsburg, Pohatcong and Lopatcong share Lock Street as a boundary.



This bridge over the canal was replaced by a concrete bridge where today Chestnut Street crosses Lopatcong Creek to the Huntington Fire Company.



The Morris Canal is listed on the State and National Registers of Historic Places and is considered part of the Morris Canal Greenway. For more information, please visit our web site at www.morriscanal.org

Map is circa 1874

LOCK STREET PARK



THE SCHOOL ON LOCK STREET

This school, known as the "Green School", was named for an early landowner who gave his name to the area from Green's Bridge on South Main Street to the Lock Street area. It was the second one built on the site. The first one being built of logs around 1800. The present Green Street School located on Green Street is also named for this person. Children from this area of Phillipsburg later went to the Brensinger School which was located on Congress Street and has since been demolished.

Students and Teachers from the Green School are shown standing on the Morris Canal Bridge which was across Lock Street from their school. This bridge led to the Paulus farm and Paulus brothers canal store in 1874. Based on their attire, it appears they were especially dressed for the occasion of an outing.

This circa 1911 photo of the school on Lock Street shows the teacher and students lined up in front of their sturdy brick one-room school house.



A view of the school and bridge from the Paulus farmstead.



The Morris Canal is listed on the State and National Registers of Historic Places and is considered part of the Morris Canal Greenway. For more information, please visit our web site at www.morriscanal.org

LOCK STREET PARK



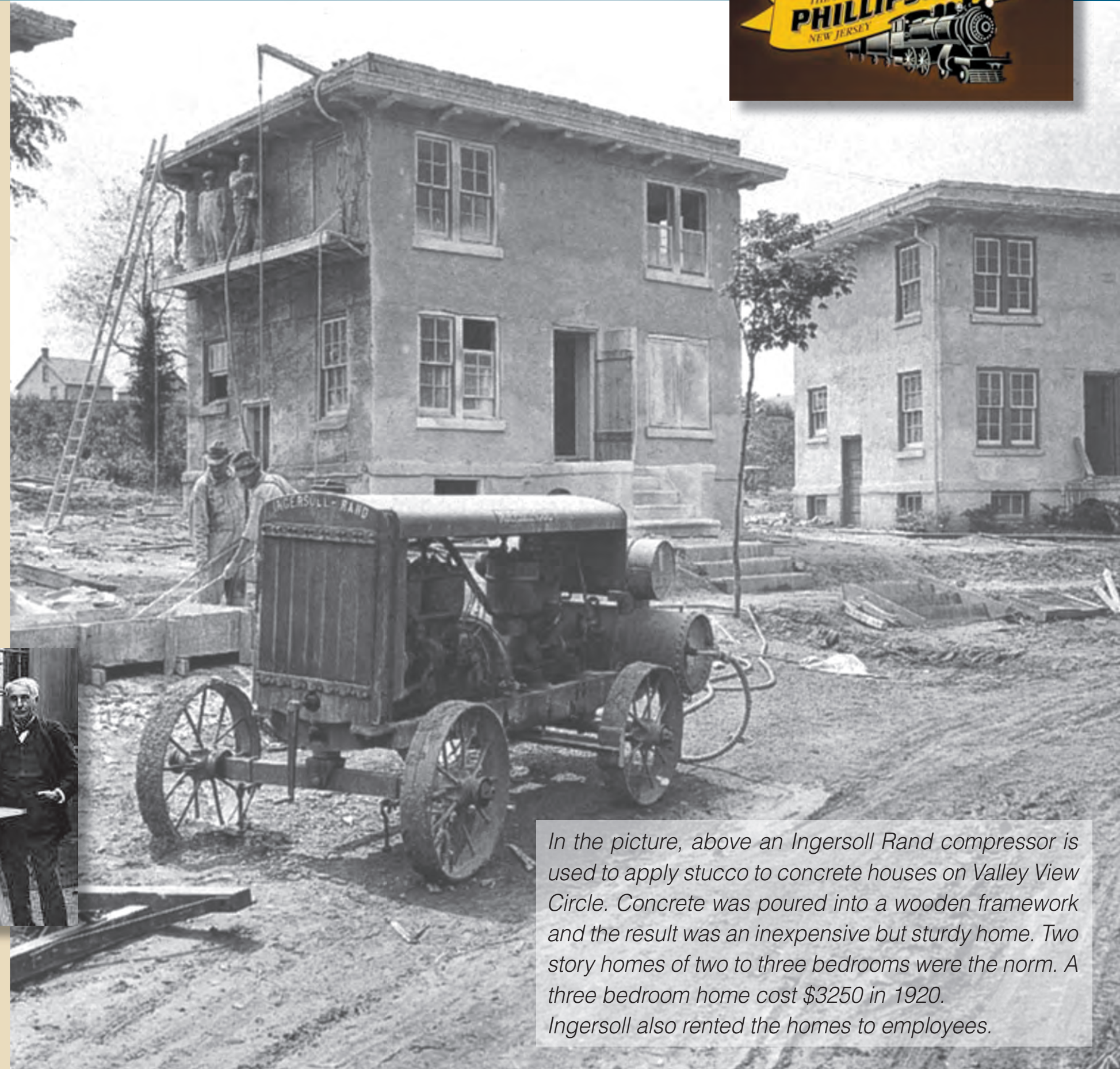
INGERSOLL-RAND'S VALLEY VIEW HOUSES

At the close of World War 1, there was a housing shortage throughout the country. In 1919-1920 Ingersoll Rand Co. built low cost workers homes in the Valley View development. The first houses built on Congress St. were ordinary wooden frames and then the rest were built using concrete. The idea to use concrete was a suggestion from Thomas Edison to Ingersoll. Ingersoll contracted with Alpha Portland Cement to create the residences. The development also included a community center and a grocery store. Residents still talk about what a nice neighborhood it is to live in.

In 1908 Thomas Edison started working on a system for building low cost houses using concrete. Edison and his team perfected a formula for mixing concrete and building re-usable steel molds to cast the walls of houses. Only a few houses were constructed before Edison realized that the scheme was not as practical as he had hoped and dropped the project.



The Morris Canal is listed on the State and National Registers of Historic Places and is considered part of the Morris Canal Greenway. For more information, please visit our web site at www.morriscanal.org



In the picture, above an Ingersoll Rand compressor is used to apply stucco to concrete houses on Valley View Circle. Concrete was poured into a wooden framework and the result was an inexpensive but sturdy home. Two story homes of two to three bedrooms were the norm. A three bedroom home cost \$3250 in 1920. Ingersoll also rented the homes to employees.

MORRIS CANAL GREENWAY



INCLINED PLANE 10 WEST

From the Delaware River the Morris Canal climbs uphill, one level at a time, towards its summit at Lake Hopatcong. Here in the Green's Bridge section of Phillipsburg lift Locks 8,9, & 10 West and Inclined Plane 10 West raised the canal a total of 70 feet.

When the canal was built in the 1830s its alignment was just to the west of its present location. The original Plane 10 was built as a Lock Plane powered by a 20 foot diameter waterwheel. Between 1845 and 1860 the canal was enlarged and the plane was moved to its present location. The new plane was 522 feet long and could raise or lower boats, carrying a 70 ton cargo, 44 feet in less than 15 minutes.

Inclined planes were huge water powered machines. Water from the upper level of the canal turned a Scotch reaction turbine at the power house. The turbine turned a drum wrapped with a two-inch diameter wrought iron cable that traveled the length of the plane. The plane tender used a clutch to change the direction the cable moved. A wheeled cradle car attached to the cable transported canal boats up and down the plane.



This site plan shows a detailed layout of the plane site. The upper canal level is on the left and the lower level on the right. In the center, a cradle car and canal boat are shown ascending the plane.



George Price was plane tender 1891 – 1913.

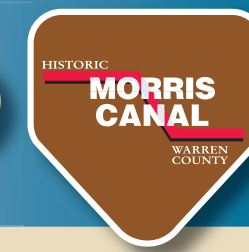


A historic view looking north up Lock Street. On the far right is the power house and in the center is the tailrace arch through which water from the reaction turbine flows back into the lower level of the canal.

The Morris Canal is listed on the State and National Registers of Historic Places and is considered part of the Morris Canal Greenway. For more information, please visit our web site at www.morriscanal.org

On the left, this historic view of Inclined Plane 10 West shows the power house and headrace flume. In the center, Lopatcong Creek joins the canal at the bottom of the inclined plane. To the right, a submerged cradle car waits to carry the next canal boat up the plane. The timber work in the foreground supports a bumper that helps guide canal boats into the cradle car.

MORRIS CANAL GREENWAY



WATER AND THE CANAL

When the Morris Canal opened for transportation in 1831, the main source of water flowed from the summit level at Lake Hopatcong. Numerous small streams and rivers entered the canal between Lake Hopatcong and Phillipsburg, helping to maintain the water level in the canal at 4 feet in 1831.

During construction of the canal, Lopatcong Creek was directed into the basin at the bottom of Inclined Plane 9 West where it combined with discharge water from the plane. But because Lopatcong Creek frequently flooded, a small water overflow and a large combined overflow-waste weir were built into the towpath between the bottom of Plane 9 and present day Strykers Road.

This was done to prevent overflowing of the canal from stream flooding, thereby reducing the danger of a breach. Such a disaster could empty a whole section of the canal leaving the boats high and dry. The cost of repairs and lost revenue could be crippling.

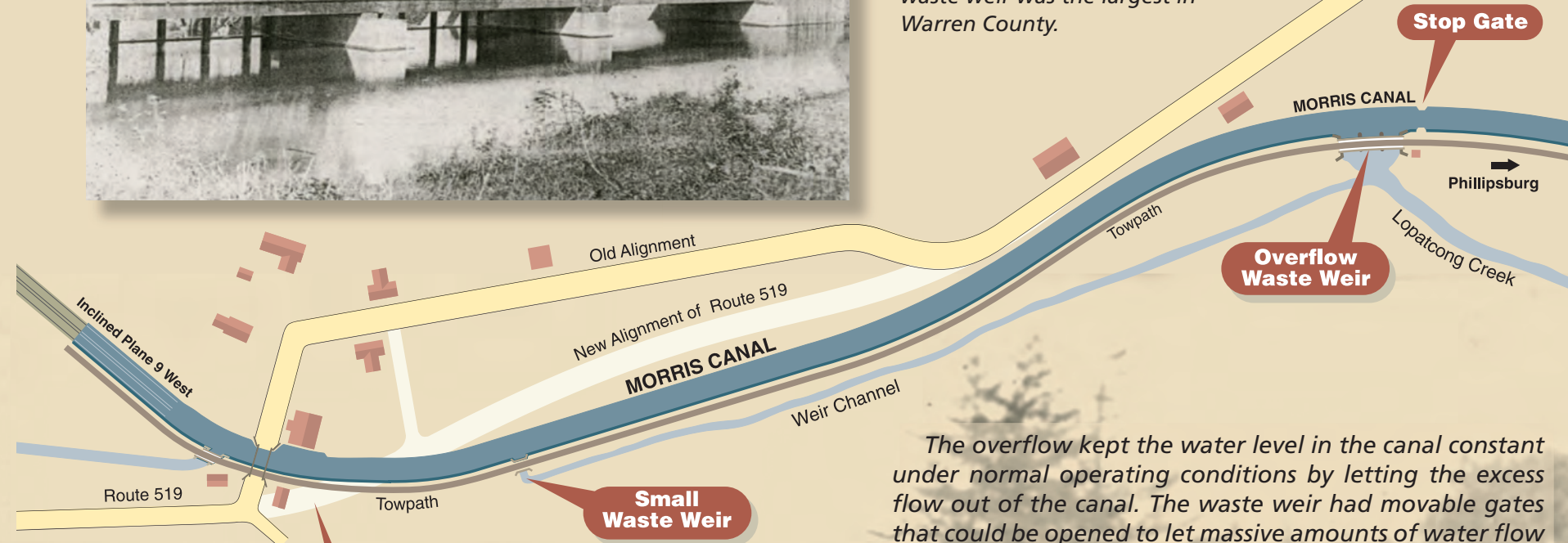
After the abandonment of the canal in the 1920s, the creek was rechanneled out of the canal bed, leaving the canal unwatered.



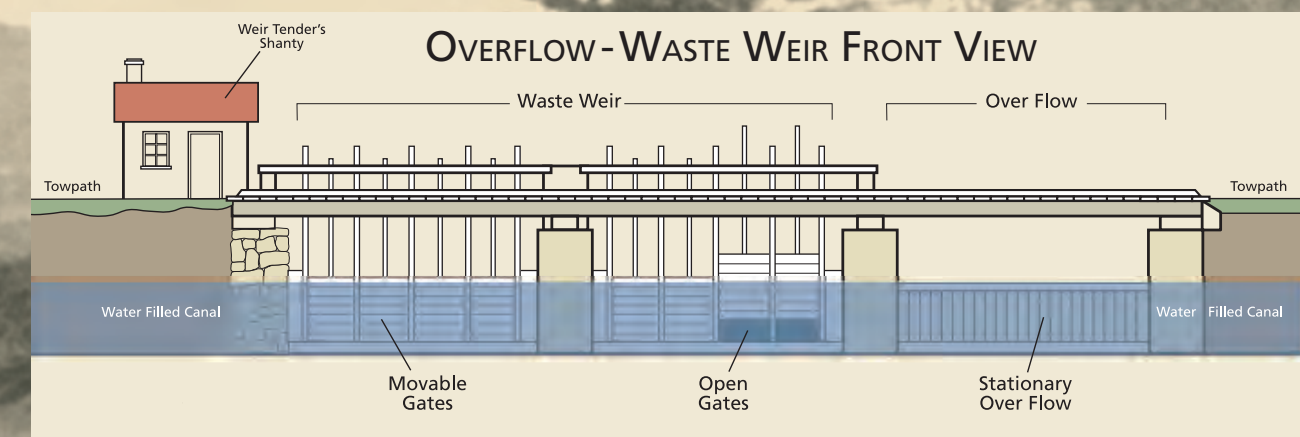
A view looking west down the towpath towards Phillipsburg and across the overflow-waste weir. On the right, in the distance, is the humpback canal bridge over what is now Strykers Road. On the left is a masonry structure where heavy planks could be dropped into a slot acting as a temporary water barrier across the canal prism in case of a break, to drain for maintenance, or to stop navigation at the end of the boating season.



A long bridge carries the canal towpath across the combination overflow-waste weir. The section on the right acted as an overflow allowing excess water to spill back into Lopatcong Creek. In the left background are part of the control mechanisms that operated the waste gates during flooding. At approximately 76 feet in length, this waste weir was the largest in Warren County.



The overflow kept the water level in the canal constant under normal operating conditions by letting the excess flow out of the canal. The waste weir had movable gates that could be opened to let massive amounts of water flow out of the canal in time of flood.



This historic view looking east down the canal towards Port Warren shows a wide sweep of Warren County countryside. On the far left is the combination overflow-waste weir. In the center, the buildings at the bottom of Inclined Plane 9 West can be seen in the background.

The Morris Canal is listed on the State and National Registers of Historic Places and is considered part of the Morris Canal Greenway. For more information, please visit our web site at www.morriscanal.org

MORRIS CANAL GREENWAY



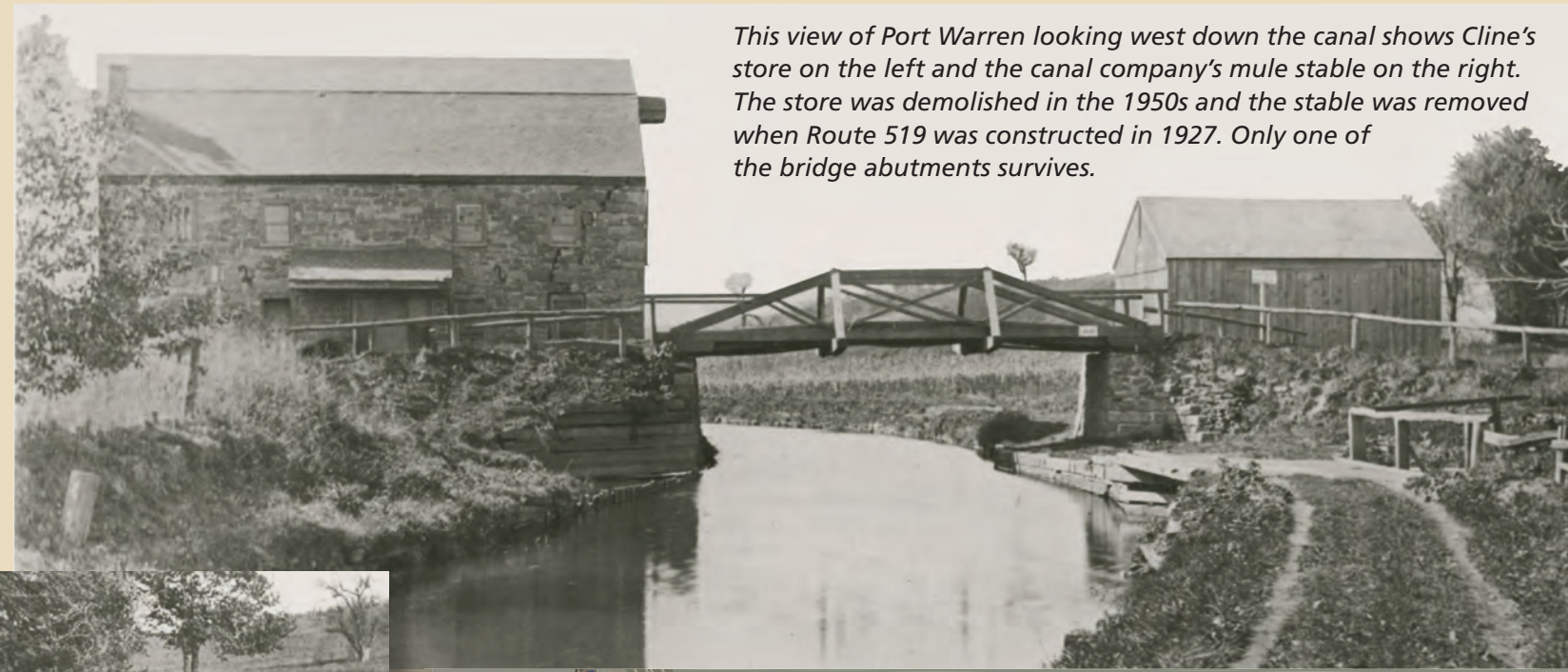
PORT WARREN HERITAGE AREA

The Port Warren Heritage Area, a focal point of the Morris Canal Greenway in Warren County, is located between Route 22 and the top of Inclined Plane 9 West. It is a preserved area along the canal right-of-way and includes some associated properties. The historic remains in this area are an important part of Warren County's transportation history and the area has been acquired to preserve, highlight and protect the Morris Canal corridor.

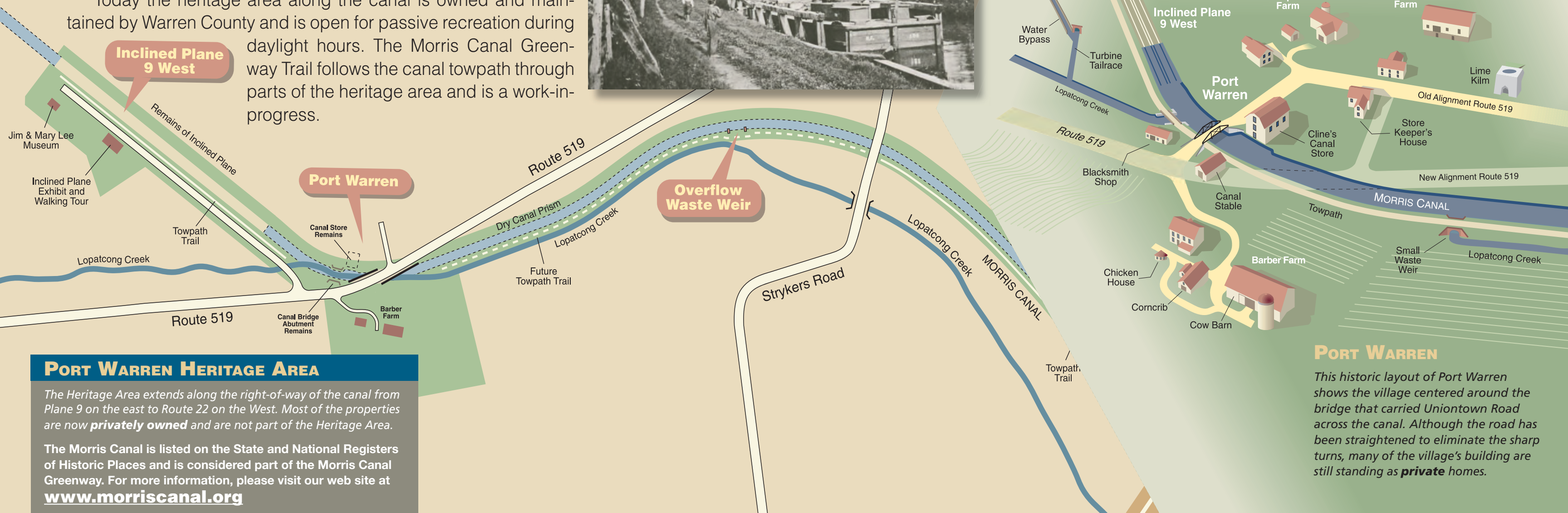
When canal operations began in 1831, coal was transported via the canal from eastern Pennsylvania to the industries in the eastern part of New Jersey. Boats traveling along the canal stopped at the bottom of the Inclined Plane waiting to traverse it. Soon a small settlement developed near the canal basin. The area became known as Port Warren and included a store, tavern, blacksmith shop and mule barn, a bridge, a lime kiln and several houses and farms. After the canal was abandoned, Route 519 was rerouted over the canal at the bottom of Plane 9.

Today the heritage area along the canal is owned and maintained by Warren County and is open for passive recreation during daylight hours. The Morris Canal Greenway Trail follows the canal towpath through parts of the heritage area and is a work-in-progress.

At Inclined Plane 9 West, canal boats were floated onto a cradle car and pulled, by water power, 100 feet up the plane to the next level of the canal.



This view of Port Warren looking west down the canal shows Cline's store on the left and the canal company's mule stable on the right. The store was demolished in the 1950s and the stable was removed when Route 519 was constructed in 1927. Only one of the bridge abutments survives.



PORT WARREN HERITAGE AREA

The Heritage Area extends along the right-of-way of the canal from Plane 9 on the east to Route 22 on the West. Most of the properties are now **privately owned** and are not part of the Heritage Area.

The Morris Canal is listed on the State and National Registers of Historic Places and is considered part of the Morris Canal Greenway. For more information, please visit our web site at www.morriscanal.org

PORT WARREN

This historic layout of Port Warren shows the village centered around the bridge that carried Uniontown Road across the canal. Although the road has been straightened to eliminate the sharp turns, many of the village's buildings are still standing as **private** homes.

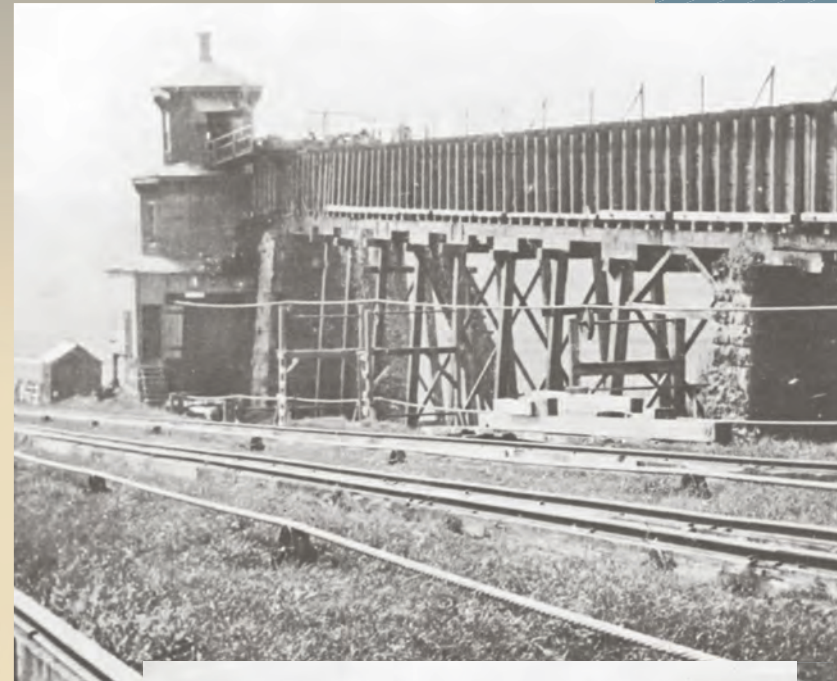
MORRIS CANAL GREENWAY



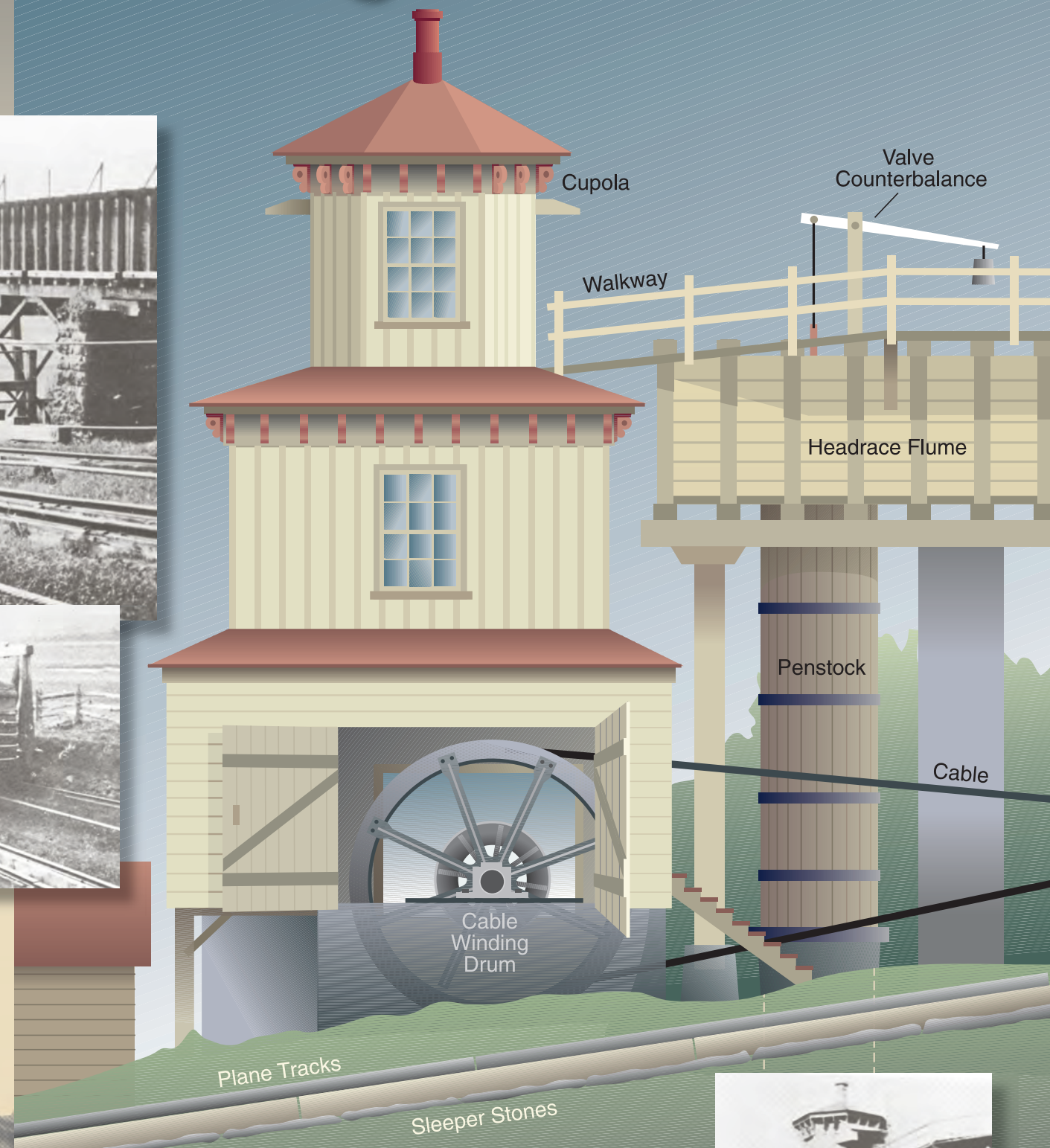
INCLINED PLANE 9 WEST POWERHOUSE

The Powerhouse contained the machinery and controls which operated the Inclined Plane. A water-powered reaction turbine located beneath the building supplied the power. A shaft and gearing transmitted the power from the turbine to a grooved cable-winding drum on the first floor of the building. From his lofty station in the cupola, the plane tender had a clear view of activities at both the top and bottom of the plane. When he saw the brakeman's signal, he opened the valve sending tones of water from the headrace flume down into the turbine below. He then engaged the winding drum, setting the cable in motion, and starting the cradle car and boat on its way either up or down the plane.

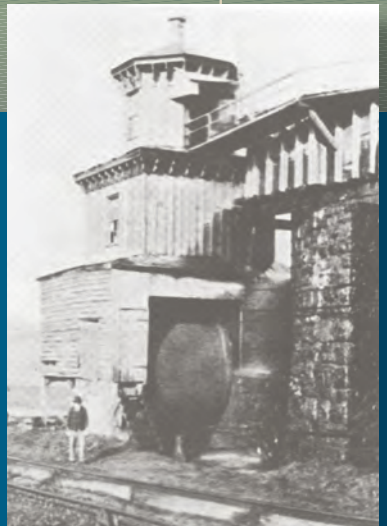
The headrace flume seen below was a wooden trough that brought water from the upper level of the canal to the powerhouse located one third of the way down the inclined plane.



This canal boat was floated into the cradle car at the lower level of the canal and is shown being pulled up the plane. The cradle car rolled on iron rails and was pulled by a cable that looped up and over the plane and back to the powerhouse.



Morris Canal Inclined Planes used water power to raise or lower canal boats up to 100 vertical feet at a time. Water was brought to the powerhouse from the upper level of the canal in a headrace flume. At the powerhouse a valve allowed the water to be dropped about 50 feet through a penstock into a reaction turbine located in a chamber below the building. A shaft and gearing transmitted the power to a 20 foot diameter grooved cable-winding drum on the first floor of the building. From the drum an approximately two-inch diameter wrought iron wire cable looped up and down the 1,788 foot incline connected the powerhouse to the cradle car and pulled the boats up and down the plane.

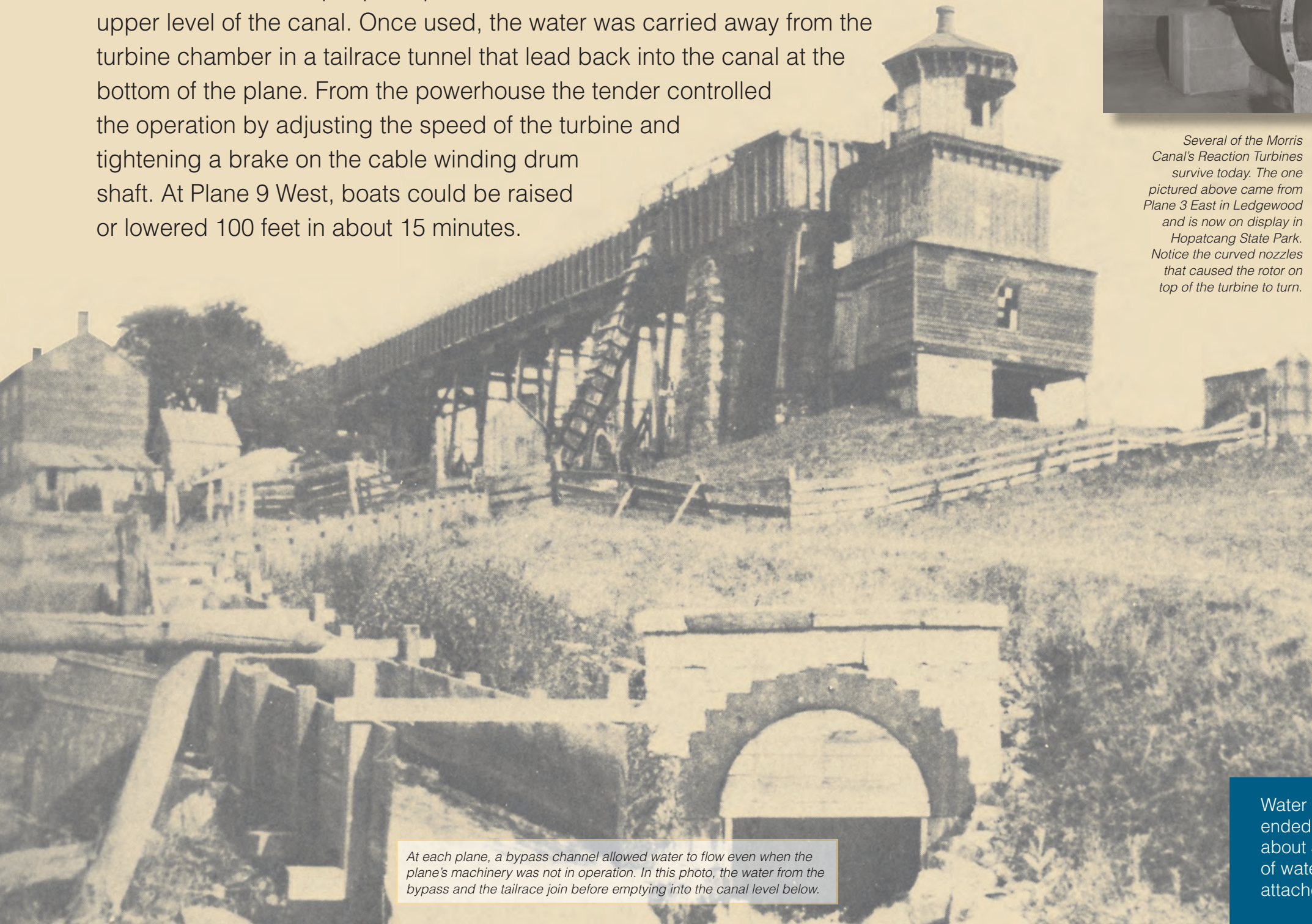


MORRIS CANAL GREENWAY



Inclined Plane 9 West TURBINE & TAILRACE

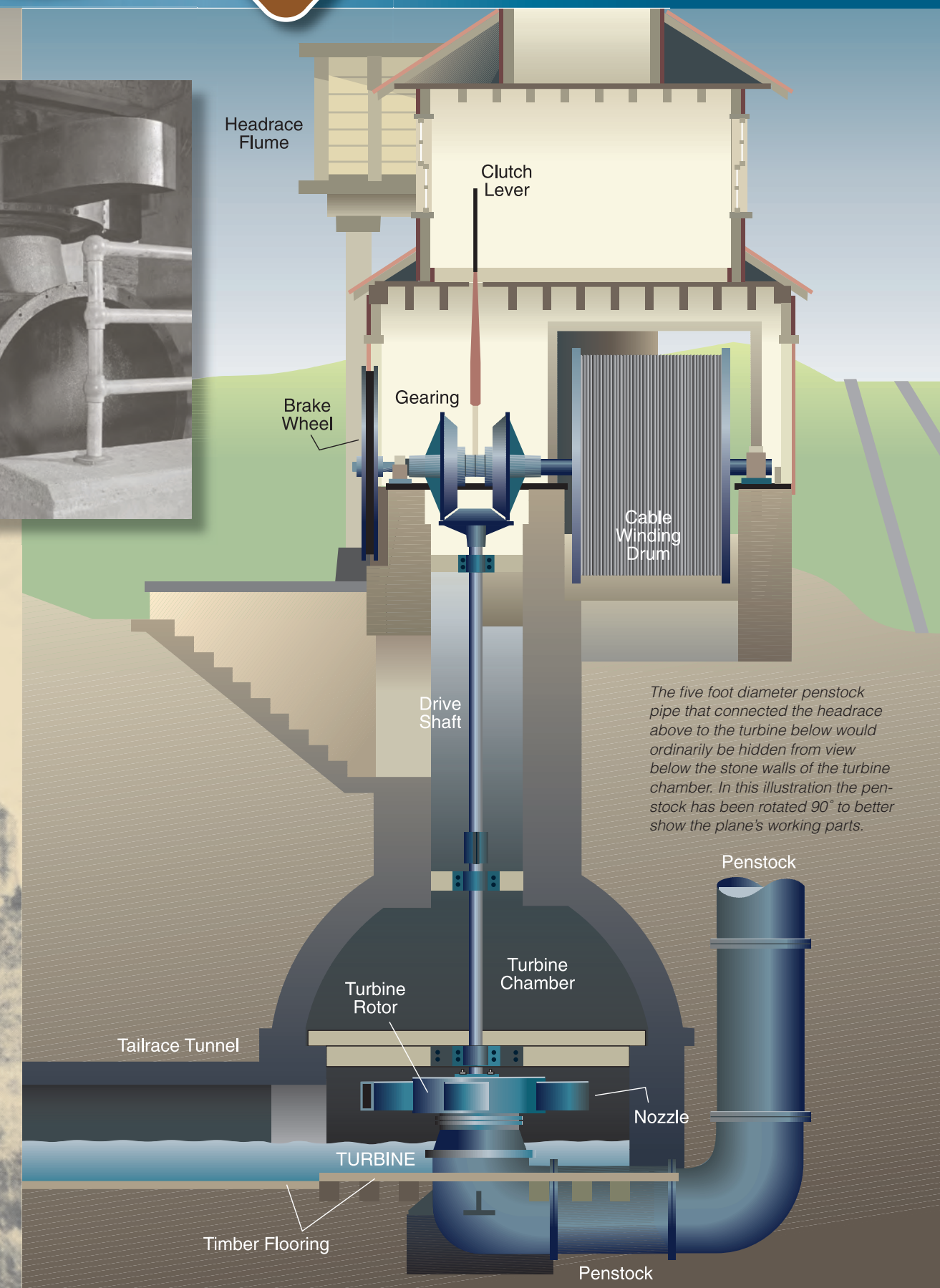
The Incline Planes were powered by using water from the upper level of the canal to run a huge reaction turbine located in a chamber beneath the power house. This powerful machine could move the wheeled cradles car and canal boat with 70 tons of coal, from a dead stop, up the plane and over the summit and down into the upper level of the canal. Once used, the water was carried away from the turbine chamber in a tailrace tunnel that lead back into the canal at the bottom of the plane. From the powerhouse the tender controlled the operation by adjusting the speed of the turbine and tightening a brake on the cable winding drum shaft. At Plane 9 West, boats could be raised or lowered 100 feet in about 15 minutes.



At each plane, a bypass channel allowed water to flow even when the plane's machinery was not in operation. In this photo, the water from the bypass and the tailrace join before emptying into the canal level below.



Several of the Morris Canal's Reaction Turbines survive today. The one pictured above came from Plane 3 East in Ledgewood and is now on display in Hopatcong State Park. Notice the curved nozzles that caused the rotor on top of the turbine to turn.



The five foot diameter penstock pipe that connected the headrace above to the turbine below would ordinarily be hidden from view below the stone walls of the turbine chamber. In this illustration the penstock has been rotated 90° to better show the plane's working parts.

Water was brought to the powerhouse from the upper level of the canal in a headrace flume that ended just behind the building at the level of the second floor. A valve allowed the water to be dropped about 50 feet through a penstock pipe to the turbine chamber and up into the turbine from below. Jets of water from the turbine rotor's four nozzles force it to turn at approximately 67 RPM. A drive shaft attached to the rotor was geared to the cable winding drum in the powerhouse overhead.

MORRIS CANAL GREENWAY



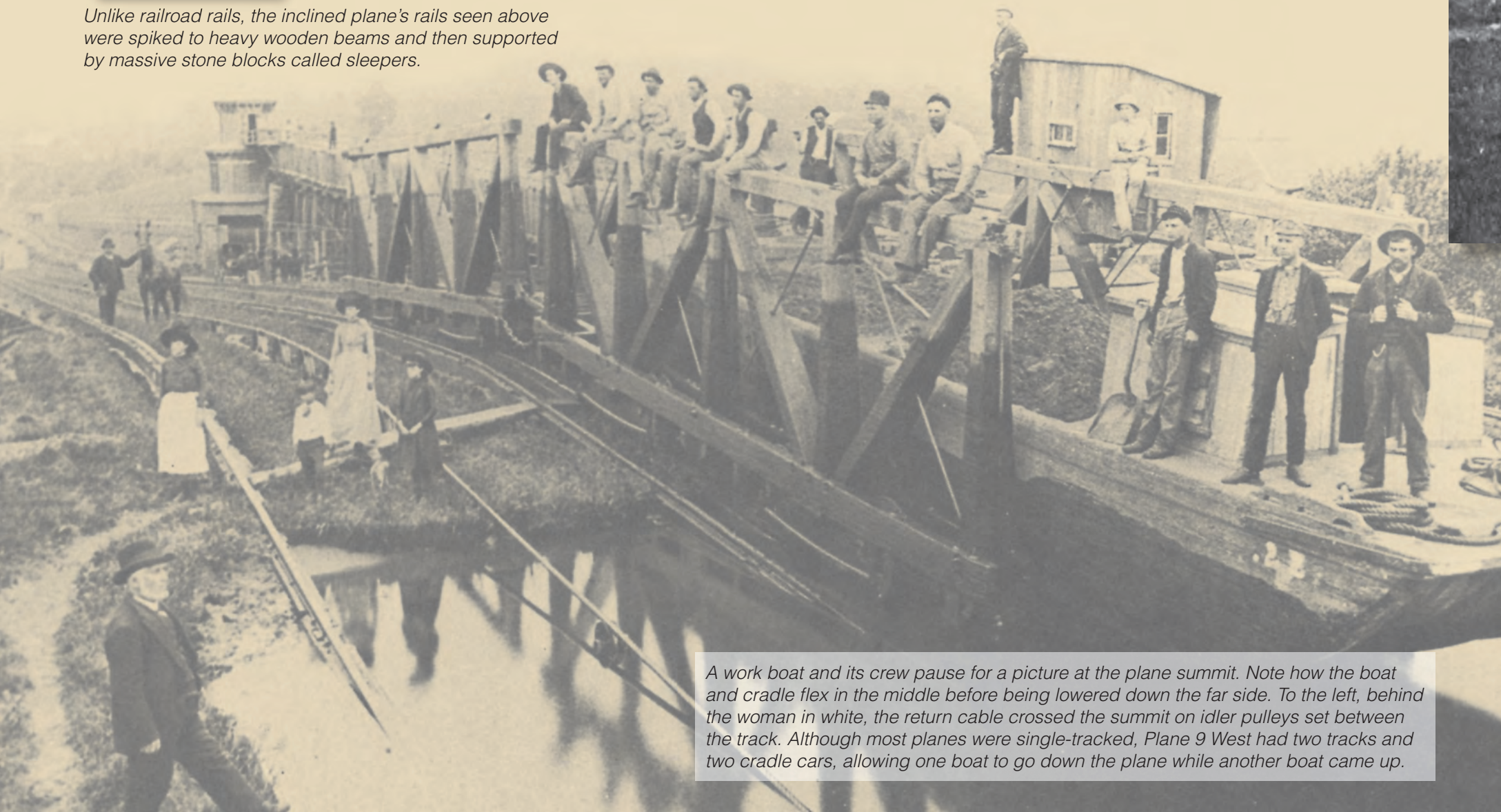
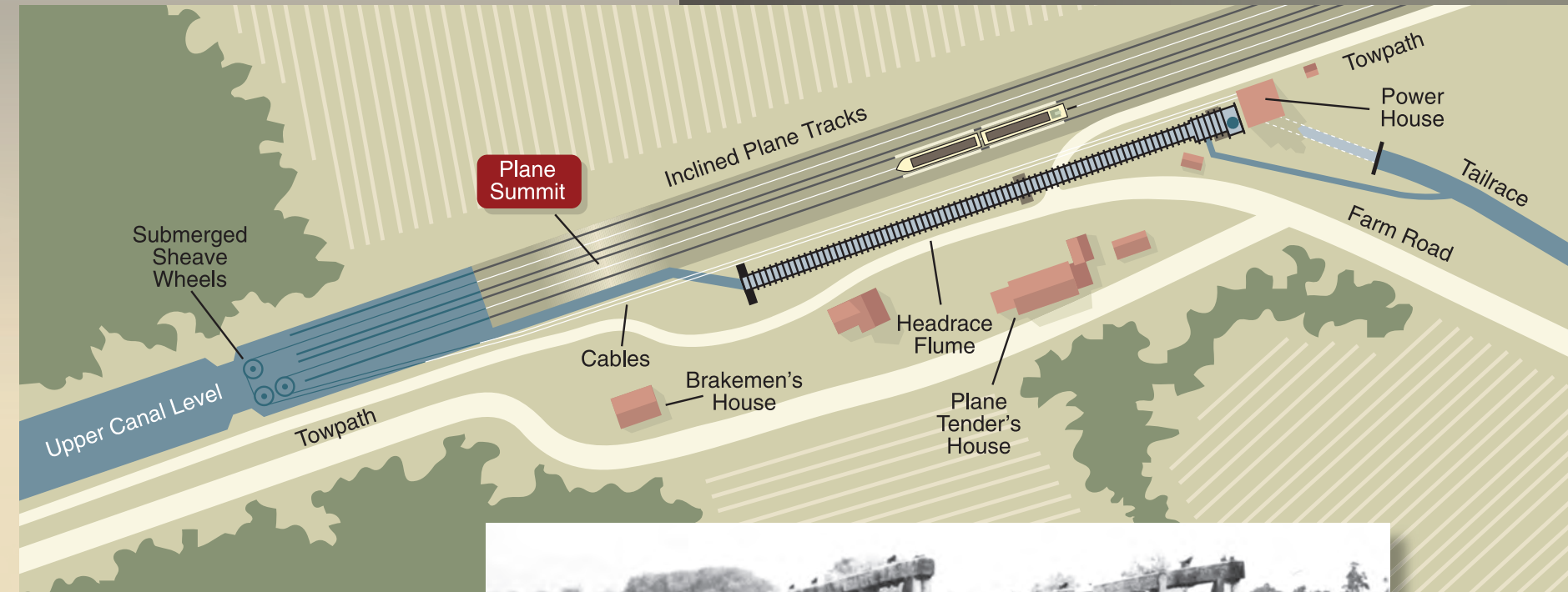
INCLINED PLANE 9 WEST PLANE SUMMIT

The Plane Summit was the point where the top of the inclined plane met the watered upper level of the canal. At that point a berm of earth acted as a dam to keep the water from running down the plane. The plane tracks came over the summit and down into the water of the canal. As boats waited their turn, the



brakeman helped each captain to jockey his ninety-foot long canal boat into or out of the cradle car submerged in the canal. Once secured, the boat and cradle were pulled out of the water, over the summit and then lowered down the plane. Because they were so long, the boats and cradle cars were built in two sections so they could bend as they crossed the summit.

Unlike railroad rails, the inclined plane's rails seen above were spiked to heavy wooden beams and then supported by massive stone blocks called sleepers.



A work boat and its crew pause for a picture at the plane summit. Note how the boat and cradle flex in the middle before being lowered down the far side. To the left, behind the woman in white, the return cable crossed the summit on idler pulleys set between the track. Although most planes were single-tracked, Plane 9 West had two tracks and two cradle cars, allowing one boat to go down the plane while another boat came up.

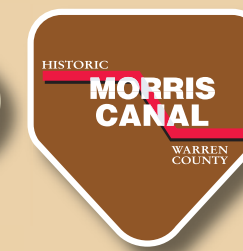


The two ladies sitting on the front of this empty cradle car help to show its massive size. The little shack attached to the car in the upper right was used by the brakeman as he rode up and down the plane with the boats.

After being pulled up the plane, the cradle car crossed the summit and descended into the canal until only the tops of the timber side showed above the water. The dark-stained water line can be seen in the photo above. When the canal boat floated free, the captain reattached the tow line and his mule team started the boat on its way. On the left, two cables disappear into the water where they are turned on huge iron sheave wheel set in the bottom of the canal. One strand connects to the front of the cradle car to pull it up the plane and the other loops down and attaches to the back of the cradle car to pull it back the other way.

BREAD LOCK PARK

A Place Where Transportation History Came Together



The Edison Concrete Mile



The Morris Canal and the trolley line along the Edison Concrete Mile



Morris Turnpike

The Edison Concrete Mile was the first concrete highway in New Jersey. The road, built in 1912, was constructed using concrete from Thomas Edison's Portland Cement plant in New Village. This historic mile is currently part of Route 57.

The Morris Canal was chartered in 1824. This engineering marvel crossed the state using locks and inclined planes to overcome changes in elevation. Boats carried coal east from Pennsylvania and provided an outlet for manufactured goods and an exchange of people and ideas. The Morris Canal is listed on the State and National Registers of Historic Places.

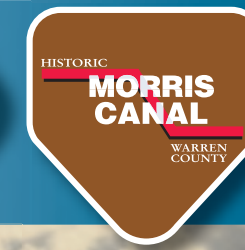
The Easton Washington Traction Company began operating in 1906 along the present Route 57. Public transportation was by electric cars, similar to railroad coaches, and were commonly called "The Trolley". The route between Phillipsburg to near Port Murray paralleled the Morris Canal and the Morris Turnpike. Operation of the trolley ceased in 1924.

The Morris Turnpike which is currently Route 57, was originally chartered by the State of New Jersey in 1806 as a toll road from Morristown to Phillipsburg. In 1924 the roadway became State Highway Route 24. Later it was renumbered as Route 57. This section of the roadway across Warren County was designated in 2011 as a state Scenic Byway.



Morris Canal is listed on the State and National Registers of Historic Places and is considered part of the Morris Canal Greenway. For more information, please visit our web site at www.morriscanal.org

MORRIS CANAL GREENWAY



Lock 7 West BREAD LOCK PARK

The Morris Canal was chartered in 1824. In 1831 the canal opened to through traffic from Phillipsburg to Newark. The first boat to travel from near Stewartsville to Newark and back passed through this lock. By 1836 the canal reached Jersey City for a total of 102 miles.

Lock 7 West near New Village was known as "Bread Lock". The store at the end of the lock sold goods to the boatmen, including homemade bread and pies. The lock was also known at various times as "Fresh Bread", or "Gardners" Lock.

Boat captains would blow a conch shell to let the lock tender know the boat was approaching and for them to ready the lock. This view of the lock shows it empty and ready for boats going east to enter, the drop gate in the foreground is up. The elevation change for this lock was 10 feet.

Since it took about ten minutes to go through the lock, mules could rest. When the canal was closed for the night, mules could be stabled in the barn adjacent to the canal.

Today this site is owned by Warren County and is open to visitors during daylight hours. The Morris Canal Greenway Trail follows the former towpath through the park.

Home Made Potato Bread

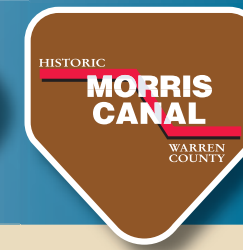


Since the canal boats had no refrigeration and almost no storage space, fresh provisions were bought every day. Locktenders often ran a store selling supplies to the boatmen waiting at the lock. At Lock 7 West, the Bread Lock, home made potato bread was offered for sale at a little shack located at the foot of the lock.

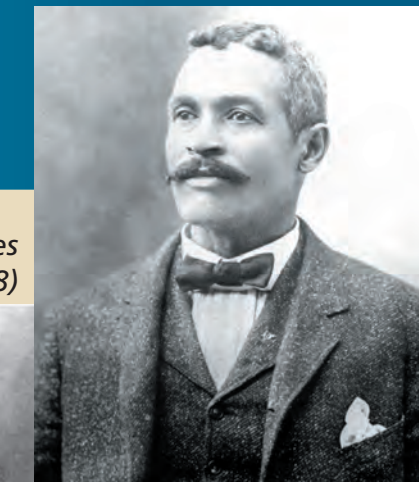
At the head of the lock the water level was controlled by a drop gate. This gate swung down into a pocket in the bottom of the lock to allow boats to enter. The winch to raise the gate into the closed position can be seen to the right in front of the locktender's house. A porch roof often covered the machinery and protected the locktender from the weather.

The Morris Canal is listed on the State and National Registers of Historic Places and is considered part of the Morris Canal Greenway. For more information, please visit our web site at www.morriscanal.org

MORRIS CANAL GREENWAY



James Campbell



JAMES CAMPBELL

CANAL BOAT CAPTAIN (1856 – 1932)

James Campbell (Camel) was born January 16, 1856. He and his wife, Hannah K. Anderson were married on October 9, 1878 and had eight children; four boys and four girls.

James was a “free” born African American who could both read and write. At the age of fifteen, he became one of only a small percentage of Black Boat Captains on the Morris Canal, following in the footsteps of other family members who had been Boatmen before him.

In 1889, James purchased his home in Washington, N.J. for \$167.98. Its location on North Lincoln Avenue, a once thriving, well-established African American district and in close proximity to the waterway, served as the family residence throughout his Boatman career of approximately forty plus years. Beside the home itself, the Campbell property featured a large barn with a haymow where mules were kept. These animals could be borrowed or left to rest there for short periods of time.

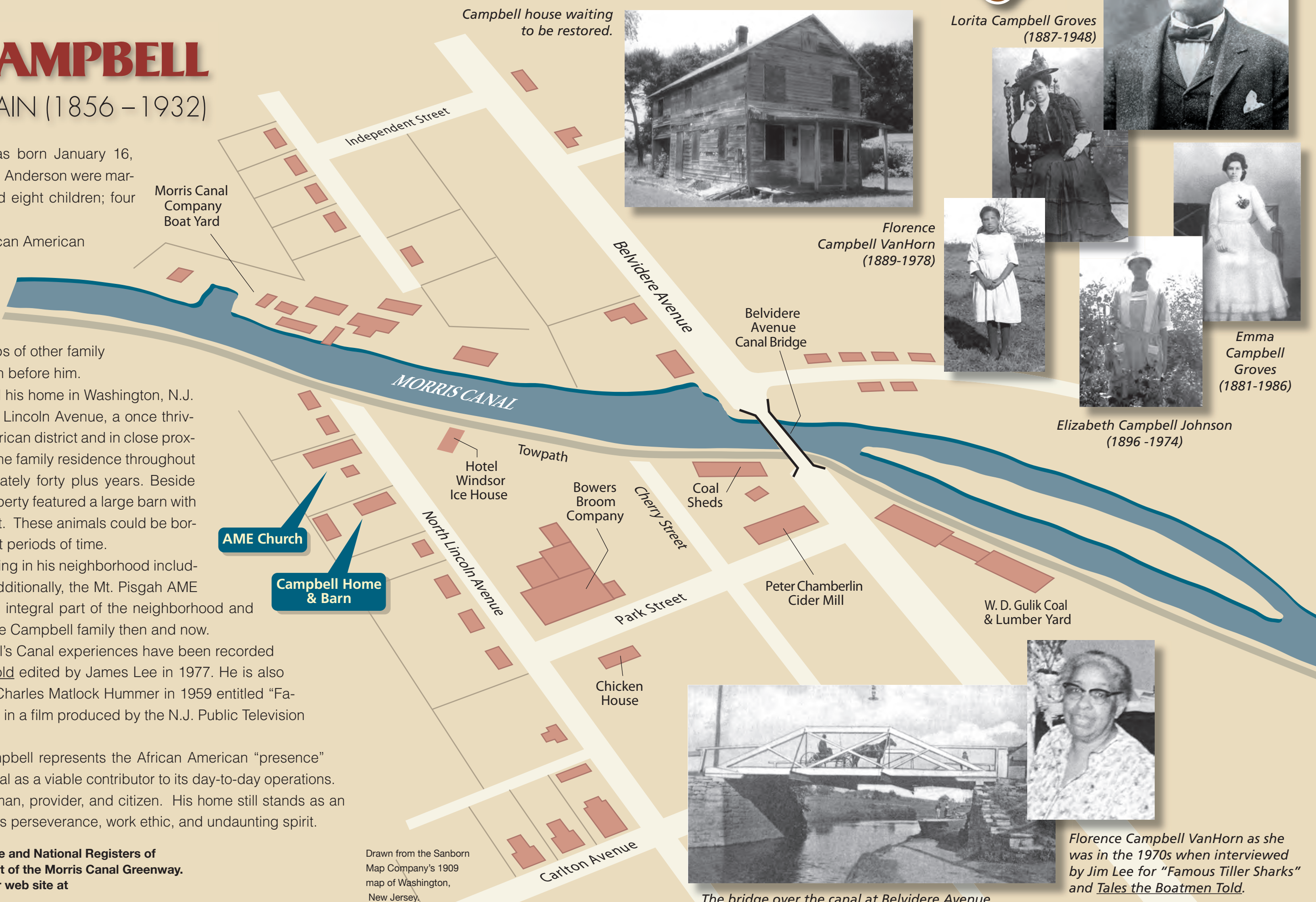
Other Black Boatmen residing in his neighborhood included Joe Taylor and Jim Haines. Additionally, the Mt. Pisgah AME Church, erected in 1877, was an integral part of the neighborhood and served as the church home for the Campbell family then and now.

Some of Captain Campbell's Canal experiences have been recorded in the book *Tales the Boatmen Told* edited by James Lee in 1977. He is also referred to in a poem written by Charles Matlock Hummer in 1959 entitled “Famous Tiller Sharks” which is sung in a film produced by the N.J. Public Television Corporation with the same title.

Boat Captain James Campbell represents the African American “presence” and experience on the Morris Canal as a viable contributor to its day-to-day operations. He felt “duty” bound as a family man, provider, and citizen. His home still stands as an authentic witness and legacy to his perseverance, work ethic, and undaunting spirit.

The Morris Canal is listed on the State and National Registers of Historic Places and is considered part of the Morris Canal Greenway. For more information, please visit our web site at www.morriscanal.org

Drawn from the Sanborn Map Company's 1909 map of Washington, New Jersey.



Campbell house waiting to be restored.

Lorita Campbell Groves (1887-1948)



Florence Campbell VanHorn (1889-1978)



Emma Campbell Groves (1881-1986)



Elizabeth Campbell Johnson (1896 -1974)

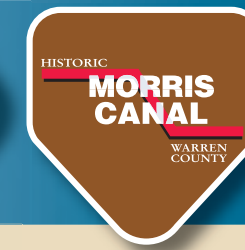
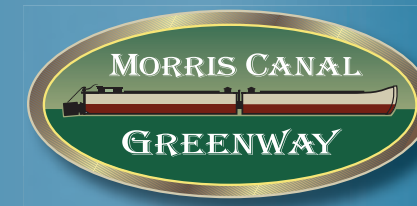


The bridge over the canal at Belvidere Avenue.



Florence Campbell VanHorn as she was in the 1970s when interviewed by Jim Lee for “Famous Tiller Sharks” and *Tales the Boatmen Told*.

MORRIS CANAL GREENWAY



DENNIS BERTLAND HERITAGE AREA

The Board of Chosen Freeholders of the County of Warren designates the Port Murray Boat Basin and Towpath Area as the "Dennis Bertland Heritage Area." The Heritage Area includes the publicly owned property between Main Street and Cherry Tree Bend Road.

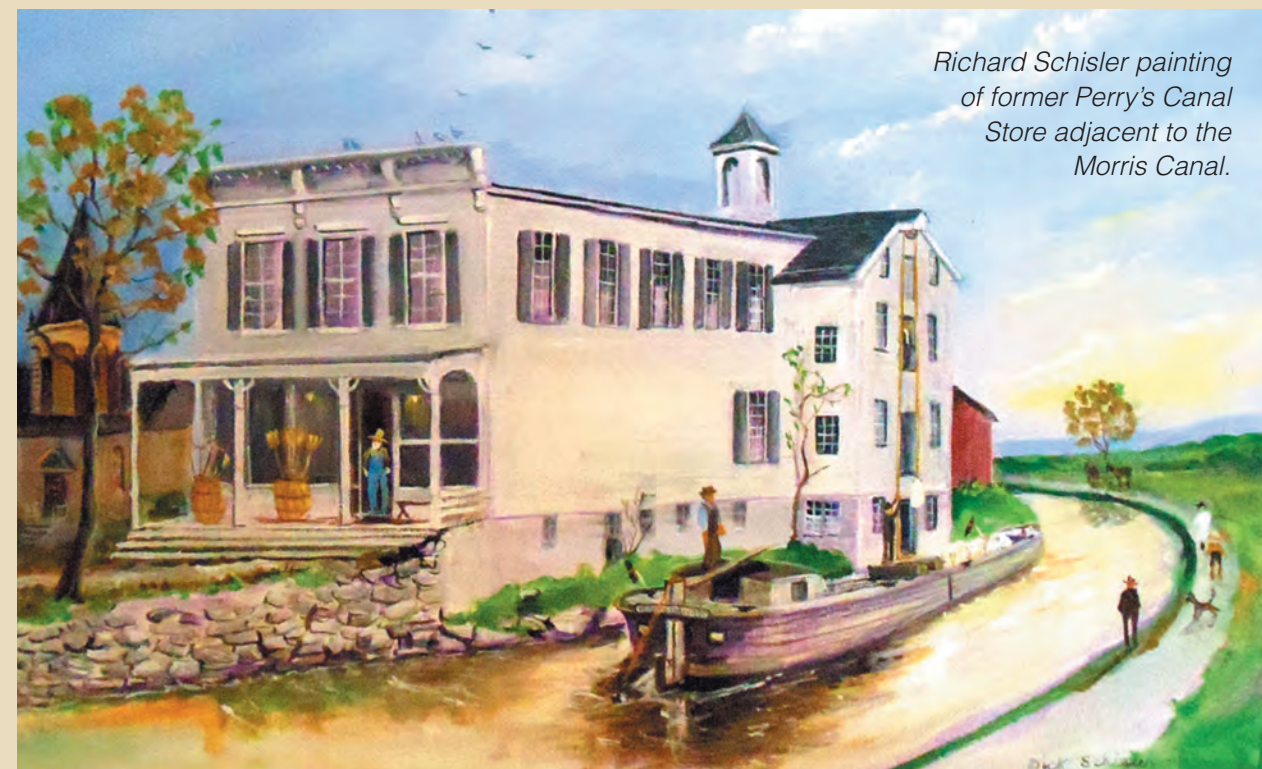
Dennis served on the Warren County Morris Canal Committee for nearly 30 years starting as an original member. He was Chairman from 1981-1995.

He was an original member of the Warren County Board of Recreation.

He also served on the Musconetcong Watershed Association Board of Directors from 1992-1996 and the Preservation New Jersey Board of Trustees from 2000-2009.

He helped to ensure that the county's first Morris Canal acquisition, Incline Plane 9 West, was accomplished in 1994. He further helped develop and encourage municipalities to adopt ordinances that would help protect the Morris Canal from new development and future deterioration.

The Heritage Area is open to the public for passive recreation during daylight hours.



Richard Schisler painting of former Perry's Canal Store adjacent to the Morris Canal.

Port Murray and the Morris Canal is listed on the State and National Registers of Historic Places and is considered part of the Morris Canal Greenway. For more information, please visit our web site at www.morriscanal.org

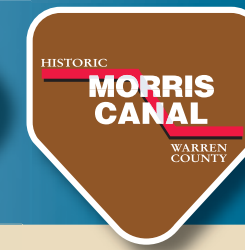


Richard Schisler painting of the canal basin.

Historic view of ice cutting and ice skating at the basin. The church and cemetery can be seen on the top of the hill.



MORRIS CANAL GREENWAY



RELIGION ON THE CANAL

Imagine being completely immersed in the water of the Morris Canal basin as part of the baptism rite. Ten persons were baptized on February 18, 1894 when a hole was cut in the ice of the canal basin near the Port Murray Baptist Church.

Boatmen, often accompanied by their wives and children, worked long hours transporting cargo along the canal. Sunday was a day of rest and the boats didn't operate. Stores were closed. Families went to church or visited with others. Religion provided a social aspect to the hard everyday activities; caring for mules, cutting and laying stone walls, repairing the canal with pick and shovel.

Many boats would tie up for the weekend at Port Delaware. Reverend Williston would preach and hand out cards containing Bible verses to the children. Revival services and camp meeting were popular events along the canal. An annual Colored Folk Camp Meeting was held the first Saturday in July in a grove of trees along the canal near Washington, New Jersey.



Baptist Church, Port Murray, New Jersey, erected in 1842. Former boatmen are now at rest in the church cemetery overlooking the old canal basin.

From 1897 until 1923, Reverend Francis S. Williston was a missionary on the Morris Canal between Phillipsburg and Washington, New Jersey.



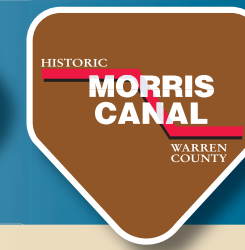
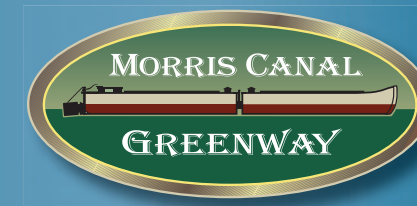
*A winter baptism in the Morris Canal at Port Murray in 1894.
Sketch by Kenneth Knauer.*



The McCrea Memorial United Methodist Church was built along Main Street in Port Murray. The bustling village was first a port on the Morris Canal and later a stop on the railroad. In this picture the canal can be seen behind the church.

Port Murray and the Morris Canal is listed on the State and National Registers of Historic Places and is considered part of the Morris Canal Greenway. For more information, please visit our web site at www.morriscanal.org

MORRIS CANAL GREENWAY



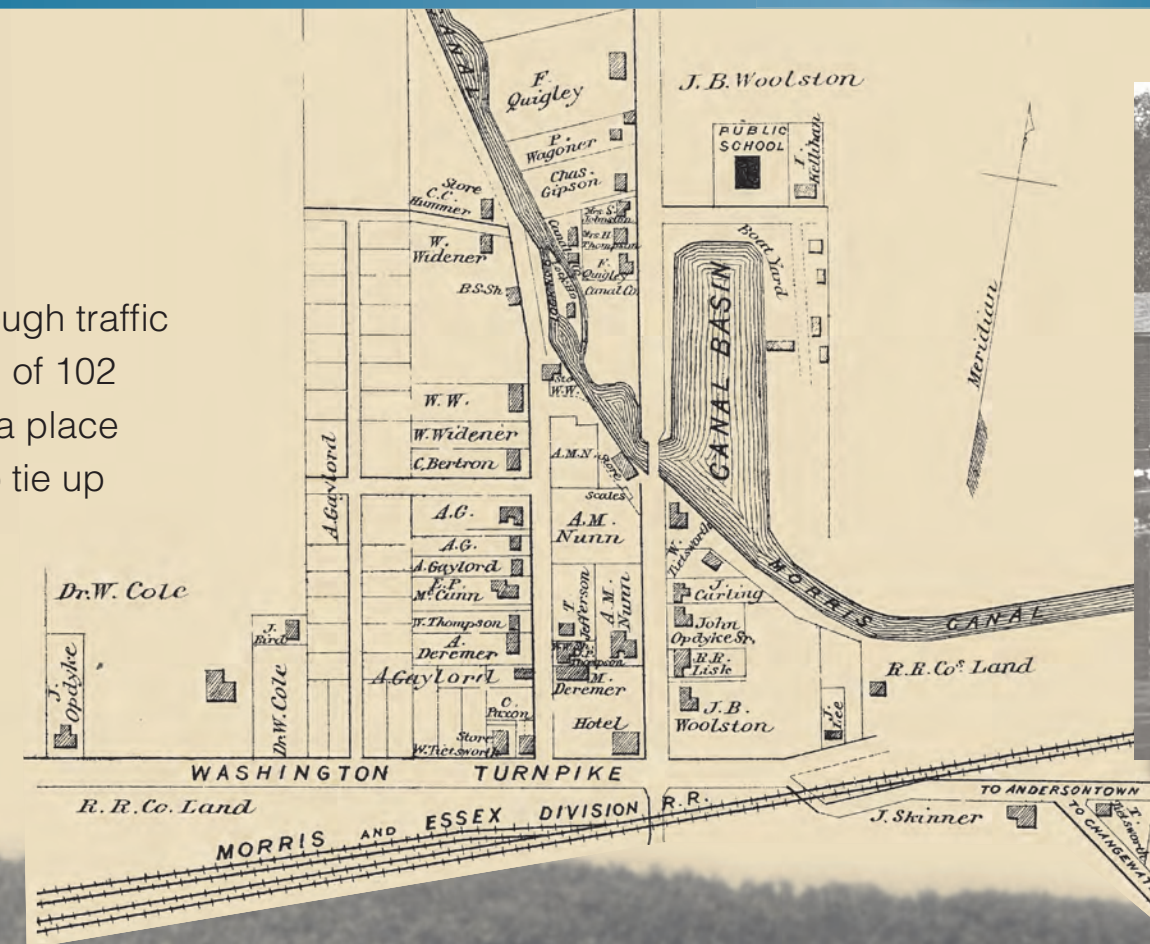
PORT COLDEN MORRIS CANAL

The Morris Canal was chartered in 1824. In 1831 the canal opened for through traffic from Phillipsburg to Newark. By 1836 the canal reached Jersey City for a total of 102 miles. A community began to develop around a canal basin that was built as a place for boats waiting to pass through the lock, as a turning spot and as a place to tie up for repairs. The area hummed with activity after the canal was built.

Operation and maintenance of the Morris Canal provided jobs for immigrants and local farmers. Some tended the lock, kept the canal repaired, or cared for the mules.

The village or "Port" was named for Caldwellader Colden, 2nd President store, boatyard, blacksmith shop and wheelright shop. Bricks from a nearby brickyard were used in 1869 to build a school. The original Port Colden school building was restored in 2003. The adjacent United Methodist church was built in 1893.

The hand dug basin at Port Colden was one of five extra-large basins built in Warren County.



Inclined Plane 6 West and a weigh station are located a short distance to the east, one of only three double tracked planes.

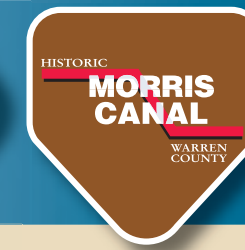


Nunn's store, built circa 1852, was typical of those built near the canal. It was nicknamed "The Wannamaker's of Warren County".

The Port Colden basin was drained in 1924 and later became the site for a new school and playground. Port Colden is now a Historic District.

The Morris Canal is listed on the State and National Registers of Historic Places and is considered part of the Morris Canal Greenway. For more information, please visit our web site at www.morriscanal.org

MORRIS CANAL GREENWAY



FLORENCE W. KUIPERS MEMORIAL PARK

“Occupy a small space in a great way”

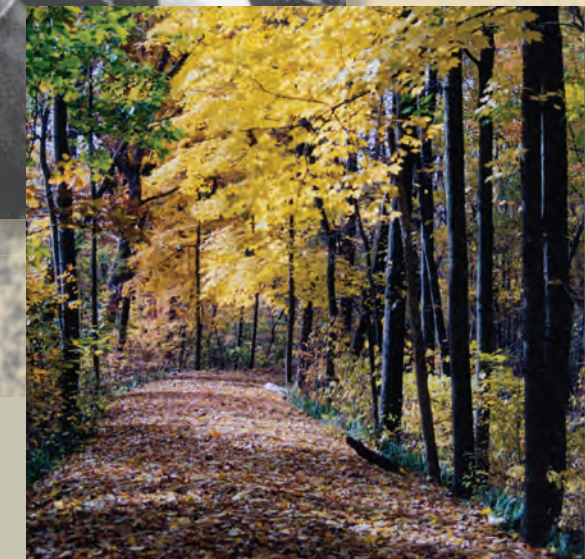
Florence Kuipers 1942 – 1999

A passion for horses and a love of riding brought Florence to the towpath of the former Morris Canal. She became an early member of the Warren County Morris Canal Committee and Board of Recreation Commissioners. She was active with the 4-H Horse Club and began to promote the vision of a greenway across Warren County so the public could enjoy using the canal towpath as a trail. While postmaster at Delaware, New Jersey, Florence would deliver mail on horseback each year on Customer Appreciation Day.

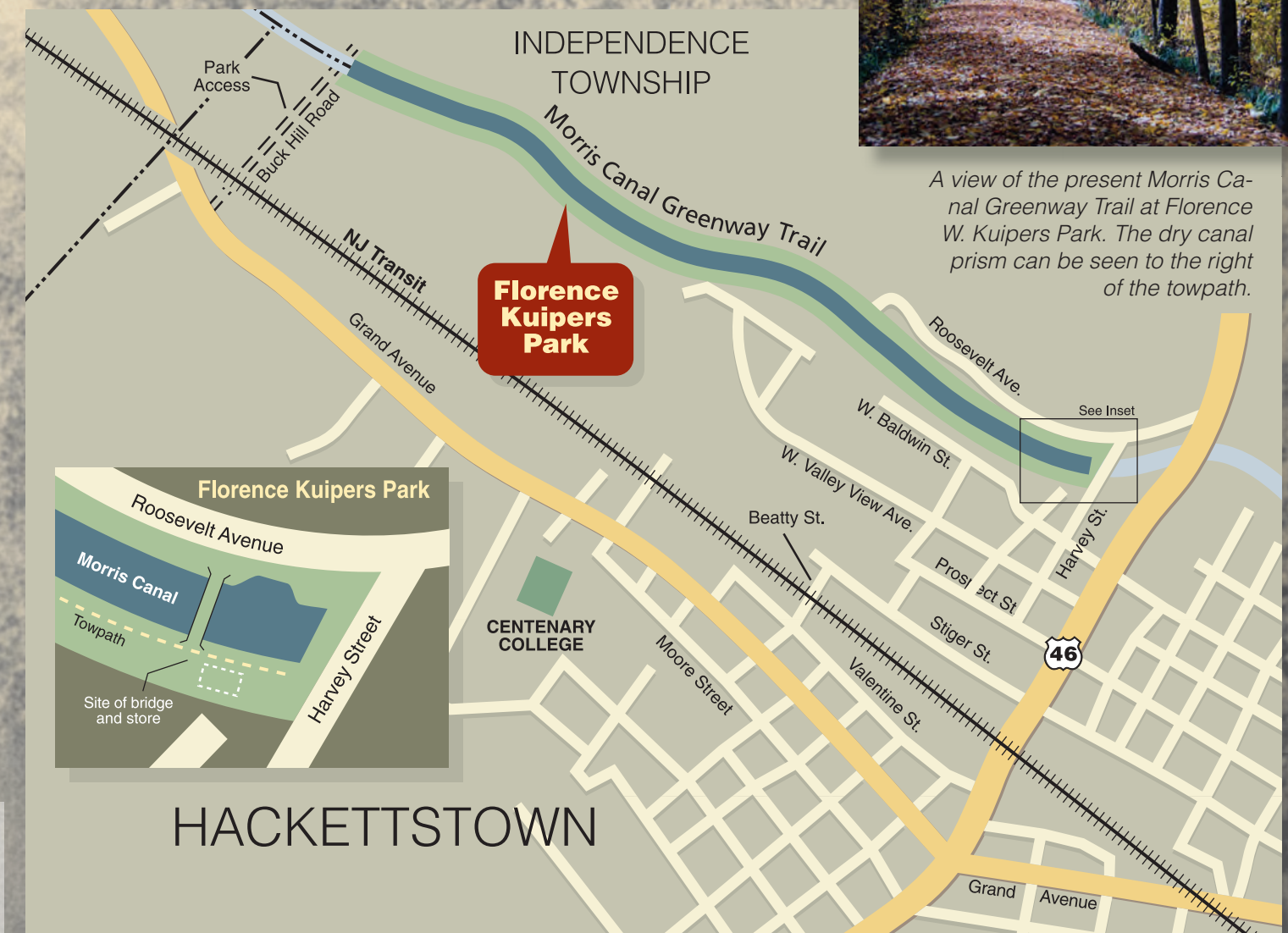
She was always positive in her thoughts of the “possibilities”.

Park open during daylight hours.

Florence enjoyed riding her horse on trails in Warren County



A view of the present Morris Canal Greenway Trail at Florence W. Kuipers Park. The dry canal prism can be seen to the right of the towpath.



The Morris Canal is listed on the State and National Registers of Historic Places and is considered part of the Morris Canal Greenway. For more information, please visit our web site at www.morriscanal.org

Typical view of the Morris Canal through Hackettstown. This section was part of the 11 mile level from Port Colden in the west to Saxton Falls in the east.