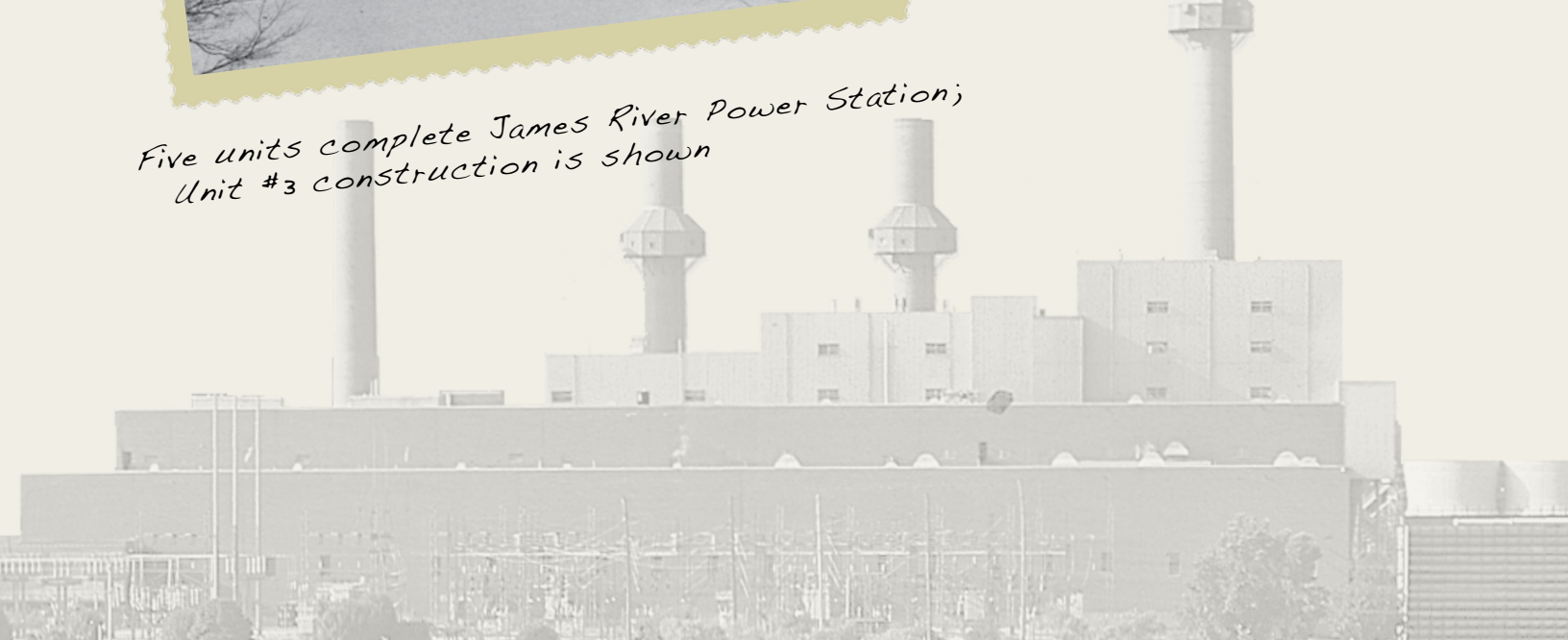
JAMES RIVER POWER STATION

A Brief History

For more than fifty years, the James River Power Plant has provided the city of Springfield with reliable, affordable and responsible power. Over the past half-decade, many employees and visitors have passed through the power plant, all witnesses to the changes and durability of the generating station.

Construction begins on two generating units at James River

Five units complete James River Power Station; Unit #3 construction is shown



Community-Owned Utility Decision Means Local Control Of Electricity

In March 1945, the city of Springfield purchased the Springfield Gas and Electric Company, previously owned by Federal Light and Traction of New York, for $6.2 million. Springfield acquired a power plant located on Main Street with a rating of 23,500 kilowatts (kW). The power plant building, built in 1892, has undergone several reconstructions.

Major equipment in the Main Street Station at the time of Springfield's purchase:

- Three identical Babcock and Wilcox boilers, installed in 1922, rated at 31,000 pounds of steam per hour at 260 pounds pressure. However, at times it was necessary for them to carry 70,000 pounds per hour on each of these boilers to provide sufficient steam for the electrical requirements.
- A 5,000 kW General Electric Generator installed in 1923.
- A 6,000 kW Westinghouse Generator installed in 1926.
- A 12,500 kW General Electric Generator built in 1916 and installed in Springfield in 1937.
- A 400 kW General Electric Generator installed in 1929. This steam turbine and generator were only used in the winter months in conjunction with the steam heating system. The generator exhausted steam to the central steam heating system at approximately 10 pounds pressure. This generator was of no use after the steam heating service was disconnected.
- A Babcock and Wilcox boiler that was rated at 45,000 pounds of steam per hour at 260 pounds of pressure. This boiler was built prior to 1920 and installed in Springfield in 1942. It was necessary, at times, for this boiler to carry 90,000 pounds of steam per hour to provide sufficient steam for the electrical requirements.

For any additional electrical power, Springfield could typically buy it from the Empire District Electric Company. Empire built a substation near the Main Street Power Station in 1912 and began selling supplemental power to Springfield. The cost for that power was high: 7.26 mils per kilowatt-hour.

Community Experience, Professional Opinions Point To Local Source: James River Power Station

In Springfield, the price and availability of electrical power was blamed for the loss of new industry. In fact, several companies did choose to build in other cities like Miami, Oklahoma, because they owned their power plant and could provide more power, at a lower cost, than Springfield.

In December 1947, Burns & McDonnell, consulting engineers from Kansas City, recommended to the Board of Public Utilities that the city of Springfield start the process of constructing a new generating station. The engineering firm estimated that a new power station could be ready a year or more before power would be available from Bull Shoals dam. They proposed a site on the James River that, at the time, was five miles from the southeastern city limits.

THE CURRENT PROBLEM by Shadburne

THEY COULD HAVE PICKED A BETTER SEASON FOR HOT ARGUMENTS by Shadburne

Sketch of proposed new power plant

1949 – 1950 Bond Election Attempts Fall Short

July 26, 1949, was the date set for the James River power plant bond election. The bond issue was for a building big enough to house two 20,000 kW generating units, but to initially install only one.

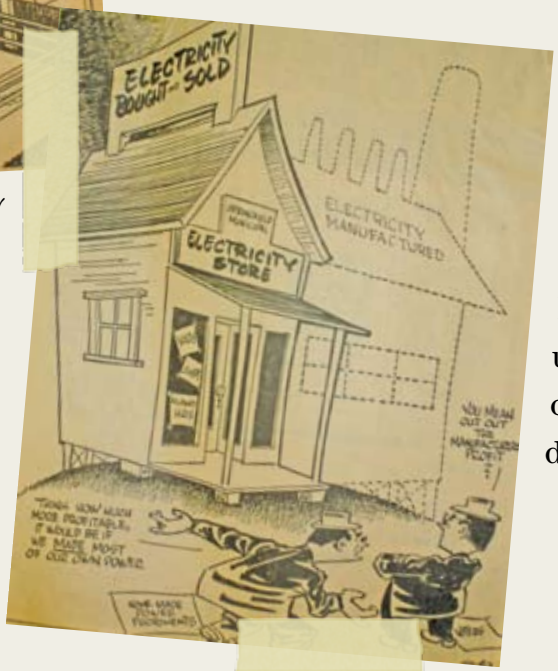
Empire District Electric planned to build a power plant on the Spring River at Riverton, Kansas, and they informed Springfield that unlimited power would be available by 1950, but at a higher rate. The first local bond issue election attempt was defeated 4,004 votes to 3,859.

ANOTHER CASE OF TIME-WILL-TELL by Shadburne

After the election, the Southwest Power Administration promised Springfield a double circuit connection with Bull Shoals dam, including all the hydropower the city of Springfield could use, by July 1, 1953. When Bull Shoals was completed, it would contain eight turbines and generators, and each generator would have a rated capacity of 42,000 kW.

HERE WE GO AGAIN by Shadburne

In June 1950, the Board of Public Utilities chairman reported to the Springfield Chamber of Commerce that Springfield was dependent for two-thirds of its local electricity supply on a turbine manufactured in 1916. He explained that the city's turbines would wear out and have to be abandoned, and that Springfield would then be completely dependent on power from governmental agencies and from companies like Empire District – unless a new, local generating station was constructed.



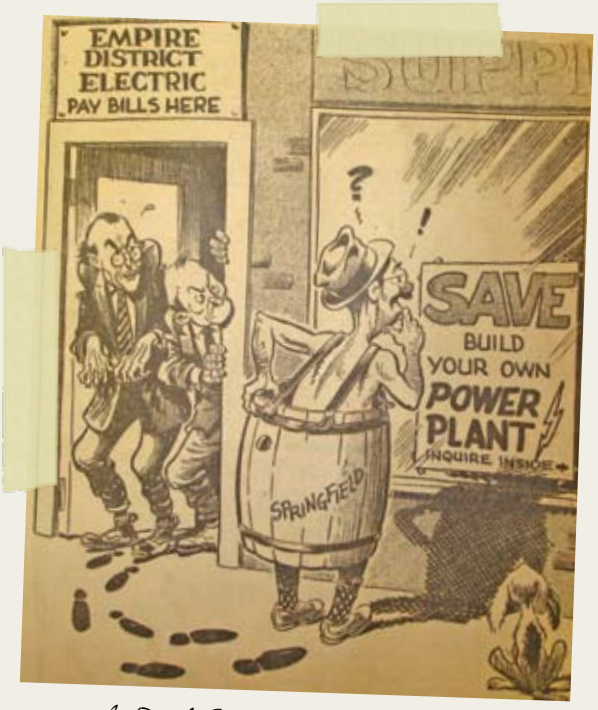
TRYING TO VISUALIZE THE EXPANSION by Shadburne

November 7, 1950, was set as the date for the second Power Plant bond election. This bond issue was identical to the first. It was for a building big enough to house two 20,000 kW generating units, but initially installing only one. The second election went down to defeat 14,061 votes to 7,120.

Community Growth, High Power Prices Impact Electricity Plan

In 1950, construction began on St. John's Hospital and the Lily Tulip Cup Company announced it would build a plant in Springfield. In 1953, Kraft announced the construction of a multipurpose dairy products manufacturing and storage plant in Springfield.

In April 1953, the U.S Congress announced funding reductions to the Southwest Power Administration, making that agency unable to carry out its contract to furnish power to Springfield. Interest was renewed in the wisdom of a new, city-owned generating station. The city-owned power plant could make it possible for Springfield to produce power at 4 to 5 mils per kilowatt compared to the 8 mil rate from Southwestern Power Administration, and 10 mils from Empire District Electric.



AND AFTER ALL WE HAVE DONE FOR HIM by Palmer

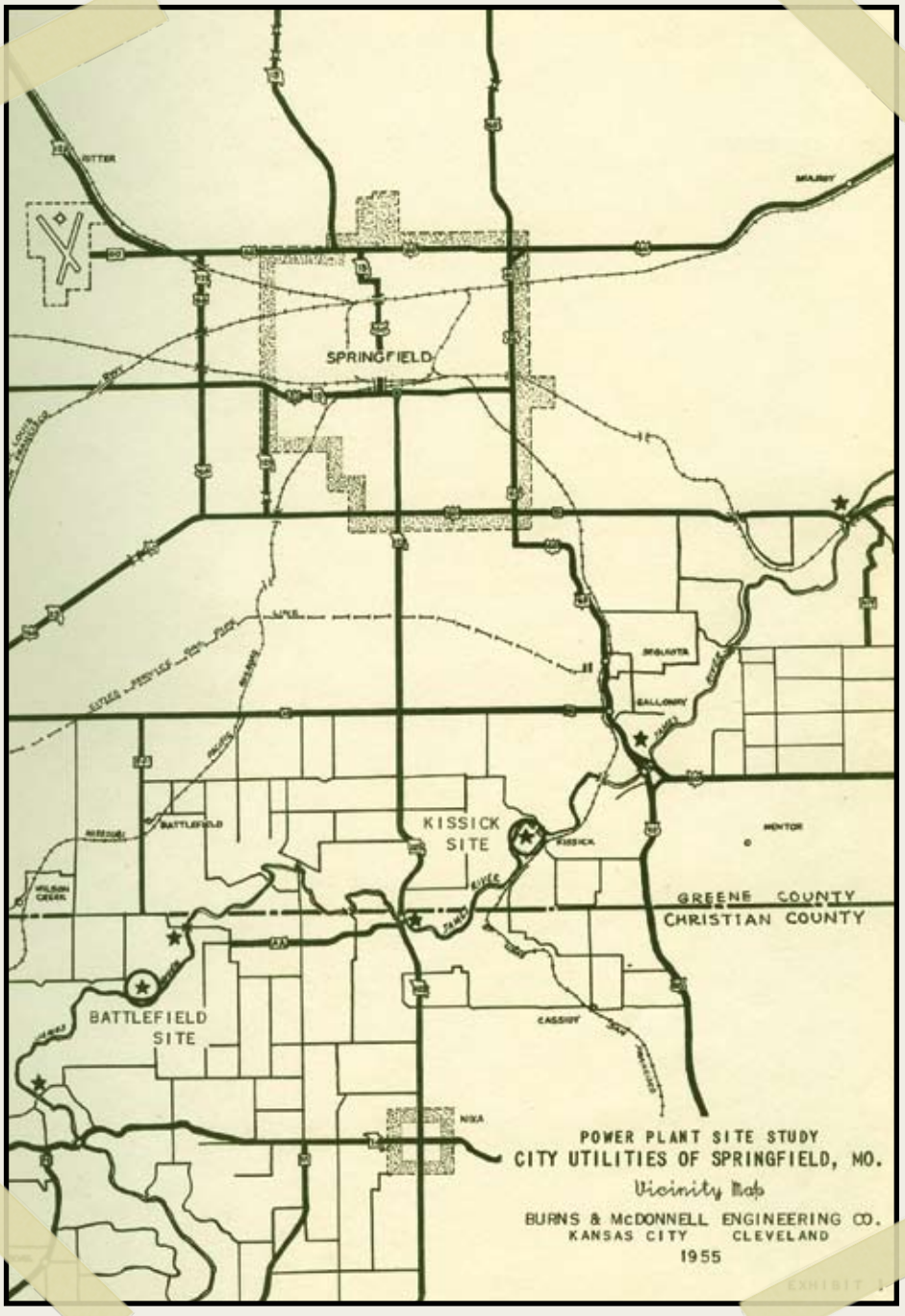
Third Time The Charm: Community Approves James River Power Station 8-to-1

A new analysis from Burns & McDonnell advised Springfield to build a community-owned power plant, starting with two 22,000 kW units in 1956, and designed so that additional units could be added to the site. They recommended that the plant be built at the Kissick site on James River, east of the Galloway Bridge, which at the time was three miles from the southeastern city limits. The peak electric use in 1953 was 36,000 kW, and it was predicted that the peak in 1958 would be 54,000 kW. The third power plant bond issue on September 14, 1954, passed 8 to 1, 10,461 votes to 1,332. It was hailed as Springfield's "independence day" from Empire District Electric.

WE WILL PROVE WE ARE SMARTER SEPT. 14 by Palmer

In-Depth Site Selection Studies Determine Location

A site study was performed by Burns & McDonnell in February 1955. The initial plant to be constructed was to have a capacity of only 44,000 kW, but the selected site would be suitable for expansion to a capacity of at least 100,000 kW. In all, seven different sites were studied, with two in great detail. Previous studies recommended the site on the James River near Kissick, but the high growth of Springfield's electrical load, together with severe drought during those years, made it desirable to re-examine other sites to determine the best options. Two potential sites studied in great detail, the Kissick site and a site south of Battlefield, revealed that the Kissick site was more cost effective, with much more effective cooling surface than the Battlefield site.



Site map for new electric generating station, February 1955

Construction Starts For Dam, Power Station

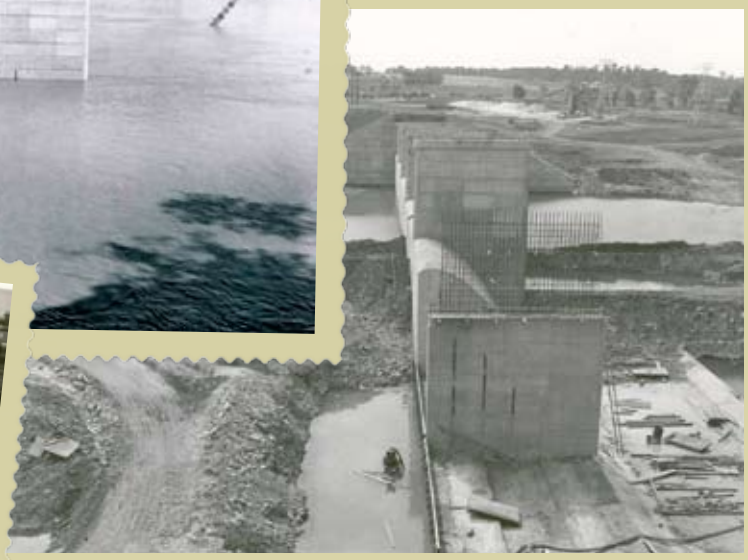
In November 1955, excavation for the dam and power station began, the same year construction started on Table Rock Dam. The construction stayed on schedule for the entire project, with one exception. In May 1956, a flood inundated two cranes, an air compressor and several pumps at the site. The setback would be about three weeks.

Excavation of the dam in February 1956

James River Power Station site October 1955

A flood in May 1956 inundates two cranes

A river runs through gap in the spillway section



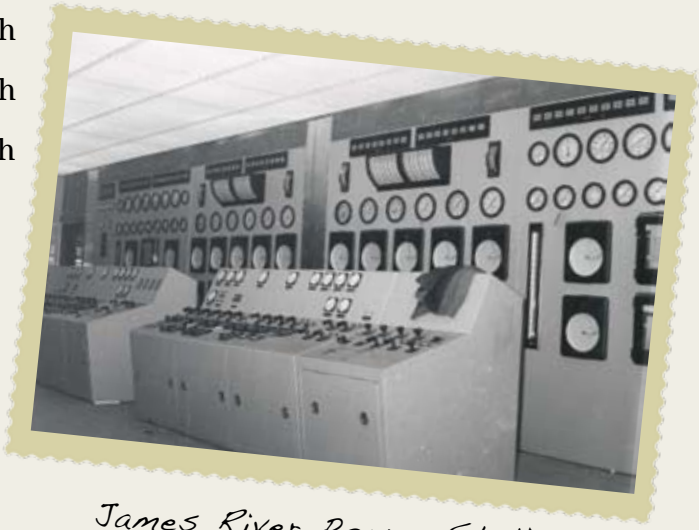
Construction of dam in August 1956

A New Plant, New Jobs, New Employees

As the plant was being readied, in October 1956 the Board of Public Utilities approved a new wage classification for employees to work at the nearly-completed power plant:

Superintendent-Power Production	$550-650 per month
Shift Supervisor	$425-500 per month
Maintenance Supervisor	$425-500 per month
Senior Control Operator	$370 per month
Control Operator	$358 per month
Auxiliary Operator	$340 per month
Operation Helpers	$255 per month
Maintenanceman-welders	$360 per month
Maintenanceman-machinist	$360 per month
Maintenanceman-helpers	$255 per month
Chemist	$370 per month

Construction of power plant in August 1956



James River Power Station control room in February 1957

In February 1957, industry professionals gathered in Springfield for the American Public Power Association's (APPA) Engineering and Operations Workshop, the first such gathering in APPA history. The bridge and roadway opened to traffic in March 1957, and Springfield Lake was stocked with 345,000 fish: 300,000 bluegill, 15,000 channel catfish, and 30,000 large mouth bass.

Before the new James River Power Station began operating, Burns & McDonnell made the recommendation to build a 44,000 kW unit to be installed and in operation by 1960. The peak electric usage at that time was 50,400 kW. Unit #2 was the first unit in service at James River on June 21, 1957; Unit #1 followed on August 13.

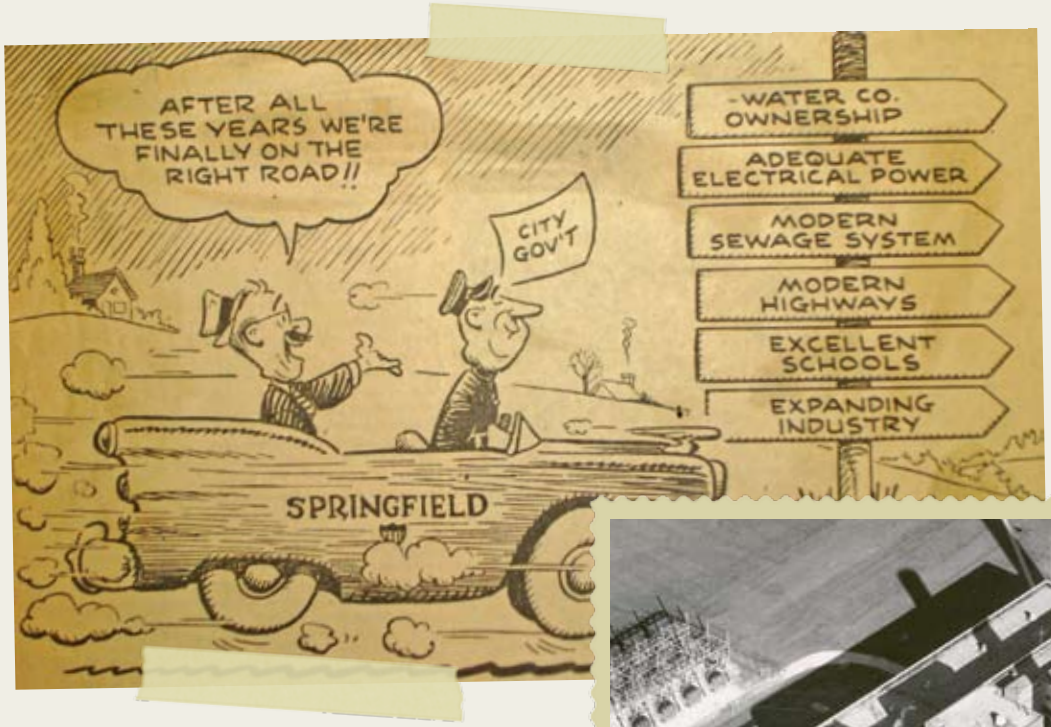
The bridge and roadway opened to traffic in March 1957

Community Visits New Station, Supports Additional Generating Units

The James River Power Plant was opened to the public on weekends in September 1957. Free bus service from Springfield was provided. The bond election for a third unit at James River on October 15, 1957, passed 8,504 votes to 635. Construction began in 1958, and Unit #3 went on-line February 22, 1960.

Burns and McDonnell recommended a fourth unit at James River in 1961. The bond election passed overwhelmingly 3,050 votes to 470, and excavation began in 1962. Unit #4 began operation on July 15, 1964.

September 1957, James River Power Station opened to the public on the weekends



THANKS TO A GOOD CHAUFFEUR
by Palmer

Aerial view of fourth unit under construction at James River Power Station

Demand For Electricity Escalates, Final Unit Approved Overwhelmingly

In 1966, Burns and McDonnell reported that the demand for electrical power would triple by 1975. To meet that need, three options were considered: 1) Build a 14,000 kW gas-fired generating unit to be installed at the Main Street Power Plant by 1968 for peaking purposes, 2) Build a 100,000 kW steam turbine-generator to be installed at the James River Power Plant by 1970. This would complete the five-unit capacity for which the site was designed, or 3) Build another 100,000 kW generating unit at a new power plant, possibly adjoining Fellows Lake, in 1974.

A cooling tower was added to the circulating water system in 1968

The bond election for the fifth generating unit at James River, and a turbine at the Main Avenue substation, passed 5,433 votes to 971. The Main Avenue turbine, which uses oil as fuel, began operation on June 20, 1968. Also in that year, a cooling tower was added to the circulating water system to lower the temperature of the water going back to Lake Springfield. The construction of Unit #5 at James River was delayed by the discovery of a hole under the foundation. The construction company working on the project worked two shifts per day to overcome the delay and get back on schedule.

Construction of unit #5 was delayed by the discovery of a hole under the foundation

Unit #5 Completes James River Power Station

After the installation of Unit #5, the capacity of the James River Power Station was 255,000 kW per hour. Originally, natural gas was the primary fuel source, with coal serving as a standby fuel. The James River Power Plant burned 3,400 tons of coal a day with all five units at full load, over one million tons annually, and generated from 1.2 to 1.7 million megawatts from steam generation. The plant used cleaner-burning Powder River Basin coal from Wyoming, one of the many environmental improvements made at the station throughout its history.

Aerial view of Unit #5 under construction

James River Power Station provides the city of Springfield with economical and reliable power...

...around the clock every day of the year

JAMES RIVER POWER STATION HISTORY TIMELINE

1947 Burns and McDonnell proposes the 900-acre site on James River at Kissick for the new Power Plant, five miles from the southeastern city limits.

1949 The first power plant bond election to construct a building to house two generating units, installing only one, is defeated 4,004 to 3,859.

1950 The second power plant bond election, identical to the first, is defeated 14,061 to 7,120.

1954 The third power plant bond issue to build two generating units passes 10,461 to 1,332, becoming Springfield's Independence Day from Empire Electric Company.

1955 Kissick site decided upon, but will depend on boring. The first tract of land, 70 acres south and east of James River, is purchased. The name "Lake Springfield" is proposed. Excavation begins for the power plant and the dam.

1956 The steel bridge over the James River on the old road is closed, torn down, and sold for scrap iron.

1957 Power engineers gather in Springfield for the American Public Power Association's Engineering and Operations Workshop, the first such gathering in APPA history.

The bridge and roadway is opened to traffic.

Burns and McDonnell recommends building a 44,000 kW (Unit #3) to be installed and in operation by 1960.

Unit #2 at the new James River Power Plant makes its first kW on June 21; Unit #1 began generating commercial power on August 13. Peak electric usage is 50,400 kW.

The James River Power Plant is opened to the public.

A bond election date for the third unit is set for October 15, passing 8,504 to 635.

1958 Erection of Unit #3's boiler structural steel is scheduled to begin.

2007

1960 Burns and McDonnell reports that Springfield will need additional power by 1963. Unit #3 goes on-line for the first time on February 22.

1961 Burns and McDonnell recommends a fourth unit at James River Power Plant. Bond election date is set for June 6, passing 3,050 to 470.

1962 Excavation begins for Unit #4.

1963 New electric peak power use of 103,000 kW is recorded.

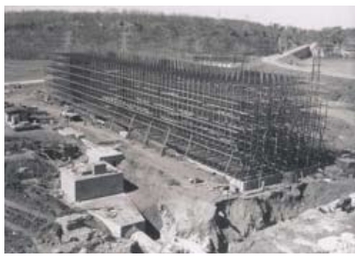
1964 Unit #4 begins commercial operation on July 15.

1966 Burns and McDonnell reports that demands for power will triple by 1975. They have three suggestions to meet that need: 1) build a 14,000 kW gas-operated generating unit to be installed at the Main Street Power Plant by 1968 for peaking purposes, 2) build a 100,000 kW steam turbine-generator to be installed at the James River Power Plant by 1970. This will complete the five unit capacity for which the plant was designed, 3) build another 100,000 kW generating unit to be installed in a new power plant, possibly adjoining Fellows Lake in 1974.

1967 The Bond election for the fifth generating unit at James River and a gas-powered turbine at the Main Street Power Plant passes 5,433 to 971.

1968 The Main Avenue turbine begins operation on June 20. New electric peak power use of 154,000 kW is recorded.

A hole under the foundation for the Unit #5 is discovered; Carpenter Brothers Construction Company starts working two shifts to overcome this delay caused by the hole.



The circulating water cooling tower is constructed.

1970 Unit #5 goes into service on May 4. A new electric peak power use of 218,000 kW is recorded.

1977 Explosion occurs in Unit #4's boiler due to a build up of propane while off-line.

1979 Started firing Unit #4 boiler after being rebuilt.

1980 Unit #4 back in service in February.

1983 Unit #4 controls upgraded from pneumatic (Hayes Republic) to electronic control.

1985 Unit #4 boiler converted to balanced draft; originally a forced draft furnace.

1989 Unit #1 combustion turbine #1 is installed.

The 161 kV switchyard is constructed.

The coal system is upgraded and moved to the west end of the power plant.

1992 Combustion turbine #2 is installed. Unit #5 upgraded from pneumatic (Bailey) to electronic control.

1994 Unit #3 controls upgraded from pneumatic (Bailey) to electronic control.

1995 Decision made to convert to Powder River Basin (PRB) coal for its lower sulfur content resulting in lower emissions.

2002 Unit #4 Atrita coal mills are replaced as part of PRB conversion.

2003 Unit #3 Atrita coal mills are replaced with bowl mills as part of PRB conversion.

2004 Unit #5 ball tube coal mills are replaced with bowl mills as part of PRB conversion.

2006 Cooling Tower addition is constructed.

Units #1 and #2 are upgraded from pneumatic (Bailey) to electronic control.

JAMES RIVER POWER STATION
City Utilities of Springfield
1957 50 2007 YEARS

2007 City Utilities celebrates the 50th anniversary of the start up of the James River Power Station.

1957 - 2018