Lock & Dam 1

(Minneapolis, Minnesota)
Mississippi River

U.S. ARMY CORPS OF ENGINEERS **BUILDING STRONG®**

Construction:

1907-1917 (Original 6-foot Channel lock)
1930-1932 (9-foot Channel lock)

Congressional District: MN-5; MN-6

Description

Lock and Dam 1 is located at Mississippi River Mile 847.9, in Minneapolis, Minnesota, six miles downstream from the famous St. Anthony Falls and two miles upstream of Fort Snelling. The original Lock construction was completed in 1917, reconstructed in 1929 with the main lock completed in May 1932. It is the only twin lock in the St. Paul District.

The main lock is located along the right descending bank and consists of a lock chamber 56 feet wide by 400 feet long with an upper pool elevation of 725.1 feet, a tailwater elevation of 687.2 feet, and a maximum vertical lift of 37.9 feet. The abandoned auxiliary lock is immediately adjacent to the main lock but has only 7.5 feet of clearance over the downstream sill.

The dam consists of an Ambursen concrete overflow structure 574 feet long with a two-foot-high inflatable rubber dam along the top and a hydro power station located at the left descending bank abutment. Under a Federal Energy Regulatory Commission agreement, Brookfield Power Company operates the hydro power facility and rubber dam located at the dam's east end.

The site has a public observation deck and comfort station open from dawn to dusk each day from April to November.

History/Significance

Congress originally authorized the project in 1899 to improve navigation on the river between Minneapolis and St. Paul by providing a 4-1/2 foot channel depth. The project included two locks and dams, the present Lock and Dam No. 1 and another one upstream, completed in 1906. By 1907, Congress authorized the 6-foot channel on the Upper Mississippi River. In 1908, Congress authorized increasing the height of the dam at Lock and Dam No. 1 to allow hydro electrical power generation.

When the present lock and dam went into operation in 1917, the Corps completely abandoned the upstream lock and dam. By 1930, Congress realized the need for a deeper channel and authorized the present 9-foot channel. When completed in 1932, the second lock at Lock and Dam No. 1 provided nine feet of channel depth up to St. Anthony Falls. By the early 1980s, Lock and Dam No. 1 reached the end of its 50-year design life and underwent a major rehabilitation from 1978 to1983 to carry on another 50 years into the future.

The lock and dam complex is also referred to as the Twin Cities (Ford) Lock and Dam.

Annual Tonnage (20-Year Historical)

Year	Tons	Year	Tons	Year	Tons	Year	Tons
1992	1,390,100	1997	1,916,450	2002	2,045,895	2007	989,706
1993	1,425,555	1998	1,974,800	2003	1,958,970	2008	964,681
1994	1,653,925	1999	2,071,900	2004	1,510,040	2009	692,530
1995	1,717,438	2000	2,257,182	2005	1,159,356	2010	673,730
1996	1,853,675	2001	1,829,855	2006	1,307,990	2011	766,898

Commodity Tonnage & Lockages (2011)

Coal	89,700
Petroleum	8
Chemicals	53,900
Crude Materials	594,000
Manufactured Goods	21,000
Farm Products	0
Manufactured Machinery	8,290
Waste Material	0
Unknown	0

Subtotals:	Grain	0
	Steel	19,500
Lockages:	Commercial Boats:	672
	Recreation Boats:	3,241
	Light Boats:	24
	Other Boats:	55
	Total Boats:	3,992
	Total Cuts:	2,113

The 9-Foot Channel Project

Lock and Dam 1 is one of 29 locks and dams on the Upper Mississippi River that provide a water stairway of travel for commercial and recreational traffic from Minneapolis to the Gulf of Mexico.

The existing 9-foot Channel Navigation Project was largely constructed in the 1930s and extends down the Upper Mississippi River from Minneapolis-St. Paul to its confluence with the Ohio River and up the Illinois Waterway to the Thomas J. O'Brien Lock in Chicago. It includes 37 Locks and approximately 1,200 miles of navigable waterway in Illinois, Iowa, Minnesota, Missouri and Wisconsin.

The maintenance needs of the aging infrastructure are increasing at a rate much greater than the operations and maintenance funding provided for the system which adversely affects reliability of the system. Long-established programs for preventive maintenance of major lock components have essentially given way to a fix-as-fail strategy, with repairs sometimes requiring weeks or months to complete. Depending on the malfunction, extended repairs can have major consequences for shippers, manufacturers, consumers, and commodities investors.

Additionally, the system's 600-foot locks do not accommodate today's modern tows without splitting and passing through the lock in two operations. This procedure requires uncoupling barges at midpoint which triples lockage times and exposes deckhands to increased accident rates.

There are more than 580 manufacturing facilities, terminals, grain elevators, and docks that ship and receive tonnage in the Upper Mississippi River basin. Grains (corn and soybeans) dominate traffic on the system. Other commodities, mainly cement and concrete products, comprise the second largest group. A modern 15-barge tow transports the equivalent of 1,050 large semi-trucks (26,250 cargo tons, 875,000 bushels, or 17,325,000 gallons). Annually, the 9-foot project generates an estimated $1 billion of transportation cost savings compared with the operation and maintenance costs of approximately $115 million.