UNITED STATES OF AMERICA

BEFORE THE FEDERAL ENERGY REGULATORY COMMISSION

DRAFT APPLICATION FOR NEW LICENSE FOR MAJOR PROJECT - EXISTING DAM

EXHIBIT A – PROJECT DESCRIPTION

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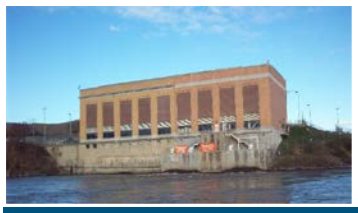
VISCHER FERRY HYDROELECTRIC PROJECT RELICENSING FERC NO. 4679




NEW YORK STATE OF OPPORTUNITY. | NY Power Authority

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1 Introduction

The Vischer Ferry Hydroelectric Project (Project) (FERC No. 4679) is an 11.8 MW conventional hydroelectric project located on the Mohawk River, approximately 14 miles upstream from its confluence with the Hudson River, and approximately 10 miles upstream of the Crescent Project (FERC No. 4678). The Vischer Ferry Project is located in Saratoga and Schenectady Counties, New York, in the towns of Clifton Park and Niskayuna and the City of Schenectady. The FERC-licensed Little Falls Project (FERC No. 3509) owned by Little Falls Hydroelectric Associates, L.P. is the closest upstream hydroelectric project (approximately 65 miles upstream) of the Vischer Ferry Project. The Vischer Ferry impoundment is 10.3 miles long and the upstream terminus of the impoundment is located at Lock E-8 in Schenectady. The Project is owned and operated by the Power Authority of the State of New York (d/b/a "New York Power Authority" and referred to as "the Power Authority").

The Vischer Ferry Project dam was originally constructed as part of the New York State Barge Canal System[1] (Barge Canal System[2]) to 'canalize' the Mohawk River from Scotia to Crescent, providing navigable conditions for barges and vessels and facilitating water level control and lock operations.

This exhibit is required under the Federal Energy Regulatory Commission (FERC) regulations which can be found in Title 18 of the Code of Federal Regulations (CFR), Sections 4.51(b) and 5.18(a)(5)(iii). The information provided herein covers the specifics prescribed for Exhibit A and serves the purpose of providing a description of the Project.

[1] The existing Barge Canal System was created following the passage of the Barge Canal Act in 1903. However, some portion of the original Erie Canal built between 1817 and 1825 still exists. For the purposes of this document, the Licensee will consistently refer to the portions of the Barge Canal or Erie Canal adjacent to the Projects as the Barge Canal System.

[2] The Barge Canal System is owned by the People of the State of New York and operated by the New York State Canal Corporation (NYSCC), which was created by the New York State Legislature in 1992 as a subsidiary of the New York State Thruway Authority (NYSTA). Prior to 1992, the operations of the Barge Canal System fell under the New York State Department of Transportation. On January 1, 2017, the NYSCC became a subsidiary of the Power Authority (N.Y. Public Authorities Law § 1005-b).

2 Project Description

The principal features of the Vischer Ferry Project are the dam, powerhouse, impoundment, and appurtenant facilities. The Vischer Ferry Dam consists of three connected spillway sections having a total length of 1,919 ft. The powerhouse is located at the northern end of the dam (Figure 2-1). The powerhouse contains four generating units. Table 2-1 provides a summary of Project components. A more detailed description of Project components is provided in the sections below.

Figure 2-1
Major Project Facilities of the Vischer Ferry Project

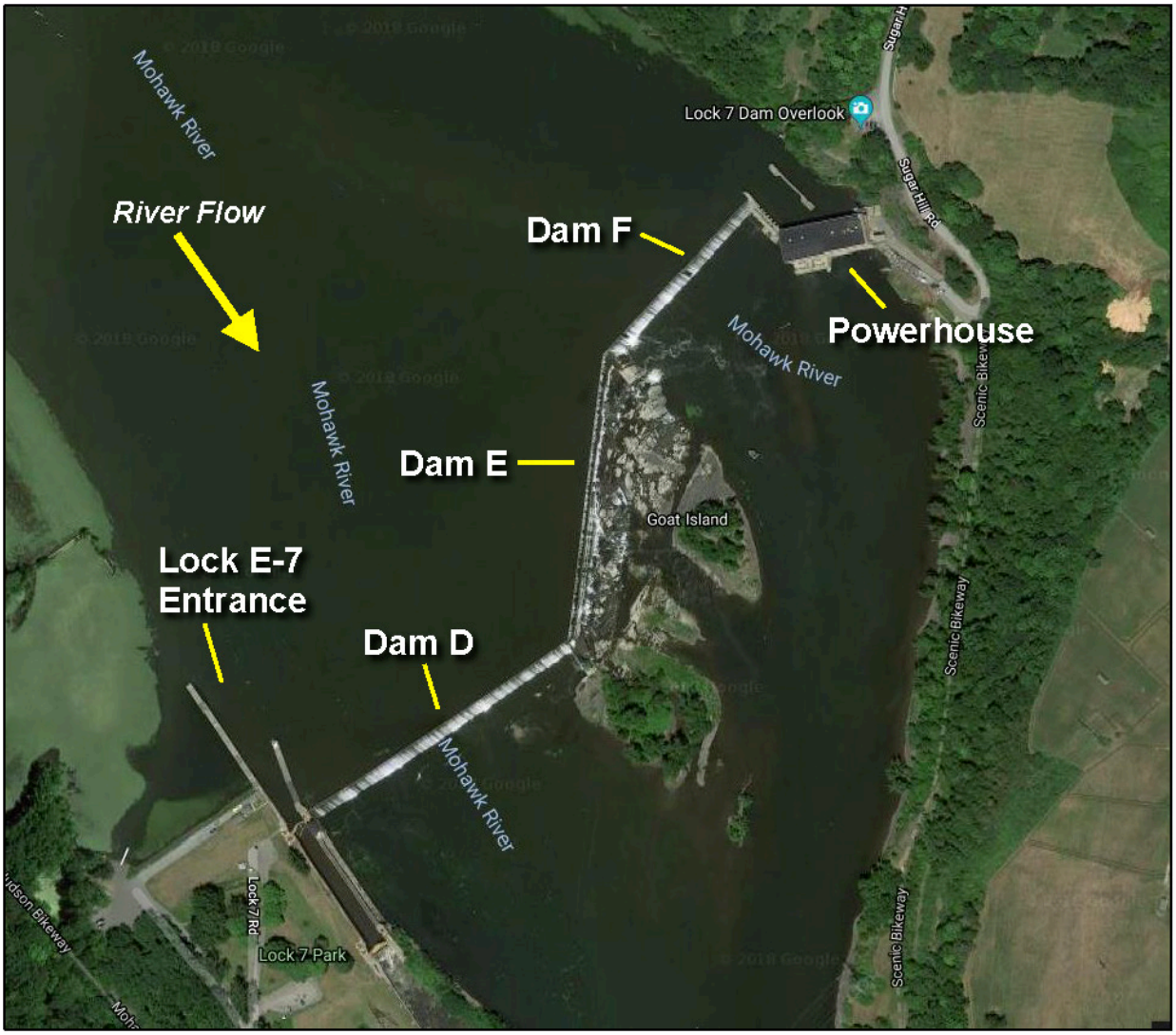

Table 2-1
Description of Vischer Ferry Project Facilities

Description	Number or Fact
General Information	
FERC Project Number	4679
License Issued	June 26, 1984
License Expiration Date	May 31, 2024
Licensed Capacity	11.8 MW
Project Location	Located on the Mohawk River in the counties of Saratoga and Schenectady, NY in the towns of Clifton Park and Niskayuna and the City of Schenectady.
Owner/Operator of Project	New York Power Authority
Total Area Encompassed by Existing Project	~1,156 acres
Federal lands within the Project boundary	None
Impoundment	
Water Surface Elevation	Elevation (El.) 211.0' (flashboards down) El. 213.25' (27 inch flashboards up)
Water Surface Area	1,144 acres at El. 213.25 ' BCD (27 inch flashboards up)
Average Depth	22 feet
Drainage Area	3,371 square miles
Usable Storage	None – operated run-of-river
Gross Storage Capacity	25,000 acre ft.
Shoreline	~20.6 miles
Maximum Depth	30 feet
Dam	
Construction Type	Concrete gravity dam
Length	Dam D – 735 ft. Dam E – 682 ft. Dam F – 502 ft.
Height at Top	Dam D – 33.0' from crest to upstream bedrock Dam E – varies from 1 to 3 ft. above the rock Dam F – 30.5' from crest to upstream bedrock
Crest Elevation	Spillway crest elevation is 211.0 ft. when flashboards are removed
Water Conveyance Structures	
Headrace Channel/Forebay	Irregularly shaped headrace channel - approximately 145 ft. at the upstream end, and increases to about 180 ft. wide at the entrance to the powerhouse.
Intake	The powerhouse includes an intake structure with trashracks, a rake, stoplogs, and gates.

Description	Number or Fact
Powerhouse	
Construction Type	Brick and concrete
Location	Northern end of dam
Dimensions	186 ft. long and 73 ft. wide
Trashracks	Trashrack bar spacing width is 3 7/8 inches
Turbines	
Type	2 Francis; 2 Vertical Kaplan
Number	4
Rating	two 2.8 MW rated Francis turbines; two 3.0 MW rated Kaplan turbines
Maximum Discharge	two Francis turbines max discharge of 1,500 cubic feet per second (cfs) each; two Kaplan turbines max discharge of 1,820 cfs each
Switchyard/Transmission Lines	
Switchyard/Transmission Lines	65 ft. by 20 ft. switchyard

* All elevations refer to Barge Canal Datum (BCD) unless stated otherwise. BCD= NAVD88 -1.67 feet or USGS Datum +0.99 feet.

2.1 Structures (18 CFR Section 4.51(b)(1))

The following existing components are included as part of the Project. The Power Authority is not proposing to install any new structures as part of the relicensing.

2.1.1 Project Dam

The Vischer Ferry Dam consists of three connected spillway sections having a total length of 1,919 ft. (Figure 2-1). The two outer sections are regular, ungated, ogee-shaped weirs with an average structural height of approximately 30 ft. above rock. A 2-foot thick concrete apron extends 40 ft. beyond the toe of the dam and is keyed into bedrock on its downstream edge. The western dam section (Dam D) is 735 ft. long, and the eastern dam section (Dam F) is 502 ft. long. The middle section (Dam E) is a broad-crested weir, 682 ft. long, that was constructed over a small bedrock island near the center of the river. The height of Dam E varies from 1 to 3 ft. above the rock. These three sections of dam are collectively known as "Dam 3 at Vischer Ferry." To aid canal navigation, flashboards are installed along the crests of all spillways seasonally from Spring (generally in April based on seasonal conditions) to the end of navigation season (generally in November based on season conditions). The flashboards are 27 inches high and are installed in sockets spaced 4 ft. apart. When the flashboards are installed the spillway is El. 213.25 ft. BCD. The spillway crest elevation is 211.0 ft. when flashboards are removed.

A gated section is located at the northern end of the spillway dams. It is constructed of reinforced concrete and consists of seven rectangular gate openings with electrically operated sluice gates. Six of the gate openings are 14 ft. high by 8 ft. wide with sills at El. 202.1 ft. BCD. The seventh opening, a trash sluice, is 12 ft. high by 8 ft. wide with a sill at El. 190 ft. BCD. The gate openings are separated by 3-foot-wide concrete piers with semi-circular noses and square tails separating each opening. The gates are locally controlled and are generally closed. A concrete apron approximately 130 ft. long and 16 ft. wide directs flow from the gates to the downstream pond.

Water is directed to the powerhouse through an irregularly shaped headrace channel. The headrace channel width is approximately 145 ft. at the upstream end, but increases to about 180 ft. wide at the entrance to the powerhouse. The bottom of the headrace channel maintains a fairly constant elevation of El. 189 ft. BCD. The Vischer Ferry headrace was once the site of the Vischer Ferry lift (lock) for the old Erie Canal. The current headrace has no controlling upstream gates. The southern side of the headrace is formed by the gate structure described in the previous paragraph; the northern side is cut from rock along the river's edge.

2.1.2 Powerhouse

The Vischer Ferry Project powerhouse is located at the northern end of the dam (Figure 2-1). The current powerhouse was built in 1925 and expanded in 1990. The powerhouse is constructed of brick and concrete, and is approximately 186 ft. long and 73 ft. wide. The powerhouse includes an intake structure with trashracks, rake, stoplogs, and gates. The trashrack bar spacing width is 3 7/8 inches. The powerhouse houses four turbine/generator units: two 2.8 MW rated Francis turbines and two 3.0 MW vertical shaft Kaplan turbines (Figure 2-1 and Table 2-2).

Table 2-2
Vischer Ferry Project Turbine and Generator Nameplate Data

Turbines				
Number of Units	4 units			
	Unit 1	**Unit 2**	**Unit 3**	**Unit 4**
Type	Vertical Francis	Vertical Francis	Vertical Kaplan	Vertical Kaplan
Design Head	26.5 ft	26.5 ft	27.5 ft	27.5 ft
Rated Capacity	4,000 hp[1]	4,000 hp	4,000 hp	4,000 hp
Minimum Discharge	400 cfs[2] per unit	400 cfs per unit	350 cfs per unit	350 cfs per unit
Maximum Discharge	1,500 cfs per unit	1,500 cfs per unit	1,820 cfs per unit	1,820 cfs per unit
Operating Speed	90 rpm[3]	90 rpm	144 rpm	144 rpm
Generators				
Type	Vertical configuration	Vertical configuration	Vertical configuration	Vertical configuration
Rated Capacity	2,800 kW[4]	2,800 kW	3,000 kW	3,000 kW
Power Factor	0.80	0.80	0.80	0.80
Phase	3 Phase	3 Phase	3 Phase	3 Phase
Voltage	2,300 V[5]	2,300 V	4,160 V	4,160 V
Frequency	60 Hz[6]	60 Hz	60 Hz	60 Hz
Synchronous Speed	90 rpm	90 rpm	144 rpm	144 rpm

[1] horsepower (hp), [2] cubic feet per second (cfs), [3] revolutions per minute (rpm), [4] kilowatt (kW), [5]volt (V), [6] hertz (Hz)

The powerhouse tailrace is an open, unlined rock cut approximately 150 ft. wide and 65 ft. long. Elbow-type draft tubes discharge water directly into the excavated tailrace channel. The tailwater is approximately El. 157 ft. BCD.

2.1.3 Impoundment

The Vischer Ferry impoundment extends upstream 10.3 miles to Lock E-8 in Schenectady, New York. At El. 213.25 ft. BCD (with 27 inch boards up), the surface area of the impoundment is approximately 1,144 acres. At El. 211.0 (with boards down), the surface area of the impoundment is approximately 1,137 acres and impounds approximately 25,000 acre-feet of water. Installation of the 27 inch flashboards raises the normal full pool 2.25 feet, and the impoundment retains an additional 2,400 acre-feet of water.

2.1.4 Other Facilities

Generator output is directed to a 65 ft. by 20 ft. outdoor switchyard. The switchyard is connected to two 34.5 kV non-Project transmission lines.

2.1.5 Single Line Diagram

The Vischer Ferry Project Single Line Diagram is located below.

Single Line Diagram

CONTAINS CRITICAL ENERGY INFRASTRUCTURE INFORMATION – DO NOT RELEASE – CUI//CEII

3 Lands of the United States

There are no Federal lands or facilities within the Project boundary.