

140 FERC ¶ 62,089
UNITED STATES OF AMERICA
FEDERAL ENERGY REGULATORY COMMISSION

Hudson River-Black River Regulating District
Erie Boulevard Hydropower L.P.
Curtis/Palmer Hydroelectric Co.
South Glens Falls Limited Partnership *et al.*
Northern Electric Power Co. *et al.*
Fort Miller Associates
Stillwater Hydro Associates
New York State Electric & Gas Corp.
Albany Engineering Corporation
Green Island Power Co.

Docket No. HB81-09-2-001

ORDER DETERMINING HEADWATER BENEFITS
IN THE HUDSON RIVER BASIN

(Issued July 31, 2012)

1. Section 10(f) of the Federal Power Act (FPA) provides that, whenever a licensee is directly benefited by the construction work of another licensee, a permittee, or the United States of a storage reservoir or other headwater improvement, the Commission shall require as a condition of the license that the licensee reimburse the owner of such reservoir or other improvement for such part of the annual charges for interest, maintenance, and depreciation thereon as the Commission may deem equitable. The benefits, commonly referred to as headwater benefits, are in the form of increased energy production (energy gains) as a result of regulated river flows by the headwater storage project. Headwater benefits are determined in accordance with the Commission's regulations at 18 C.F.R. §§ 11.10 through 11.17 (2012).

Background

2. Section 10(f) of the FPA provides that headwater benefits charges to be paid by any licensee shall be determined by the Commission. The Commission's regulations provide for the Commission to conduct an investigation to collect information for determining headwater benefits charges, but they also allow owners of downstream hydropower projects and headwater projects to negotiate a settlement for these charges and file it for Commission approval in lieu of an investigation.¹

¹18 C.F.R. §§ 11.15 and 11.14(a)(1) (2012).

3. Early in the twentieth century, the State of New York constructed a headwater project, Conklingville Dam, to create Great Sacandaga Lake on the Sacandaga River, a tributary of the Hudson River, primarily to provide flood control and other benefits to riverside communities. The Hudson River-Black River Regulating District (District), a New York state agency, is authorized to operate and maintain that dam and reservoir, among others. The District's operation of these facilities affects flow at a number of hydropower projects, industrial facilities, and municipalities downstream on the Sacandaga and Hudson Rivers.

4. Pursuant to New York's Environmental Conservation Law, the District has historically assessed downstream entities for the benefits they received from the reservoir's regulation of flows. These assessments have been based on a 1925 benefits study performed prior to construction of the Conklingville Dam.

5. In 1992, Commission staff determined that the Conklingville Dam and Great Sacandaga Lake were required to be licensed, and, on September 25, 2002, the Commission issued an original license to the District for the Great Sacandaga Lake Project No. 12252, comprising principally Great Sacandaga Lake and Conklingville Dam.² In a subsequent order, issued on February 5, 2003, addressing an offer of settlement signed by downstream licensee Erie Boulevard Hydropower, L.P. (Erie), the District, the New York Department of Environmental Conservation, and other entities, the Commission pointed out that, while its regulations allow parties to negotiate agreements as to headwater benefits assessments, including the methodology for calculating benefits, those agreements and their proposed assessments must be submitted to the Commission for approval.³

6. Albany Engineering Co., licensee for the Mechanicville Project, located on the Hudson River downstream from the confluence of the Hudson and Sacandaga Rivers, filed a complaint on July 25, 2006, alleging that the District was improperly assessing it charges under New York State Law for headwater benefits that the Mechanicville Project is receiving from the District's Great Sacandaga Lake Project.⁴ In a December 2006 Order, the Commission concluded that the District's assessments of downstream hydropower projects were clearly assessments for headwater benefits. Therefore, to the extent that the District was assessing these beneficiaries for interest, maintenance, and depreciation charges, the New York statutory scheme would be preempted by section

²*Hudson River-Black River Regulating District*, 100 FERC ¶ 61,319 (2002).

³*Erie Boulevard Hydropower, L.P.*, 102 FERC ¶ 61,133 (2003).

⁴The complaint was filed by Albany Engineering's predecessor as licensee, Fourth Branch Associates (Mechanicville), and later assumed by Albany Engineering. Neither Fourth Branch nor Albany Engineering was a signatory to the offer of settlement.

10(f) of the FPA.⁵

7. On appeal by Albany Engineering, the United States Court of Appeals for the District of Columbia Circuit, in a November 28, 2008 opinion, concluded that section 10(f) preempts all state assessments for headwater benefits, not just state assessments for interest, maintenance, and depreciation.⁶ The court remanded the proceeding to the Commission to consider the scope of its authority to provide remedies for the District's unauthorized charges.

8. In an order on remand issued on May 10, 2009, the Commission declined to order the District to refund payments it received under the New York law, but it granted a motion filed by the District to convene a proceeding before a settlement judge to assist in developing a comprehensive headwater benefits agreement in respect to benefits received by hydropower projects on the Sacandaga and Hudson Rivers from the Great Sacandaga Lake Project.⁷ The order also directed the settlement judge to refer the matter back to the Commission for disposition if the parties did not reach a comprehensive headwater benefits agreement within the time designated. The order directed the Office of Energy Projects, upon the return of the matter to the Commission, to institute a headwater benefits investigation for this river basin, in accordance with the Commission's regulations. On July 22, 2009, the settlement judge issued an order returning the matter to the Commission since the parties had reached an impasse.

9. On August 4, 2009, the Office of Energy Project's Division of Hydropower Administration and Compliance notified the District and the downstream project owners that the Commission was initiating a headwater benefits determination in the Hudson River Basin to establish headwater benefits charges due from the owners of downstream hydropower projects benefitting from the regulation of the District's Great Sacandaga Lake Project. The parties were informed that the study would be conducted under contract with Oak Ridge National Laboratory (ORNL), and ORNL would contact them for the data necessary for the study.

10. The parties were informed that, because of the complexity of the Hudson River Basin, energy gains would be determined using the Commission's Headwater Benefits Energy Gains Model (HWBEG).⁸ HWBEG computes energy gains on a daily basis by

⁵*Fourth Branch Associates (Mechanicville) v. Hudson River-Black River Regulating District*, 117 FERC ¶ 61,321 (2006), *reh'g denied* 119 FERC ¶ 61,141 (2007).

⁶*Albany Engineering Corporation v. FERC*, 548 F.3d 1071 (D.C. Cir. 2008).

⁷*Albany Engineering Corporation v. Hudson River-Black River Regulating District*, 127 FERC ¶ 61,174 (2009), *reh'g denied* 129 FERC ¶ 61,134 (2009).

⁸Energy gains can be quantified using many methods ranging from simple studies with minimal data, *e.g.*, Flow Duration Analysis, to very detailed studies requiring large amounts of daily data. Guidance to the choice of energy gains determination is provided in the Commission's regulations at 18 C.F.R. §11.13(a)(1).

simulating the operation of downstream hydropower projects with and without upstream reservoir regulation. The HWBEG model requires the calibration and verification of a large volume of data that can include generation, outflow, turbine discharge, spillage, diversions, reservoir storage, and outages on a daily basis.

11. The parties were also informed of the Commission's regulations at 18 C.F.R. §11.17(c)(2), which state that, if any owner of a headwater or downstream project requests that the Commission determine headwater benefits charges for benefits provided by non-federal headwater projects, the headwater project owners must pay 50 percent of the cost of making the determination, and the owners of downstream projects must pay the remaining 50 percent in proportion to the energy gains. The Commission staff estimated that the cost of the Hudson River Basin headwater benefits determination would be about \$360,000, assuming that the data required for the HWBEG model would be readily available in an electronic format.

Basin Description

12. The Hudson River Basin lies principally in the eastern part of New York State with small portions in New Jersey, Vermont, Massachusetts and Connecticut. The Hudson River has its source in the Adirondack Mountains, and the principal tributaries entering the main stem from the east include the Schroon River, Hoosic River, while those entering from the west include the Sacandaga River and Mohawk River. The Hudson River Basin is typically delineated as the upper and lower river, with the lower river beginning at the Federal Lock and Dam Troy, NY, just downstream of the confluence with the Mohawk River. The geographic and hydrologic scope of the headwater benefits determination is the Upper Hudson River Basin. A river basin map is shown in Figure 1.

Headwater Project

13. Great Sacandaga Lake is the largest storage facility in the basin and is impounded by the Conklingville Dam. It is located in Saratoga, Fulton, and Hamilton Counties, New York, and entirely within the boundaries of New York's Adirondack State Park. The Conklingville Dam, located on the northeastern arm of the lake, was built between 1928 and 1930 to provide flood protection and low flow augmentation for the Hudson River. The Sacandaga Lake controls a drainage area of 1,044 square miles (sq.mi.) and has a surface area of approximately 42 sq.mi.

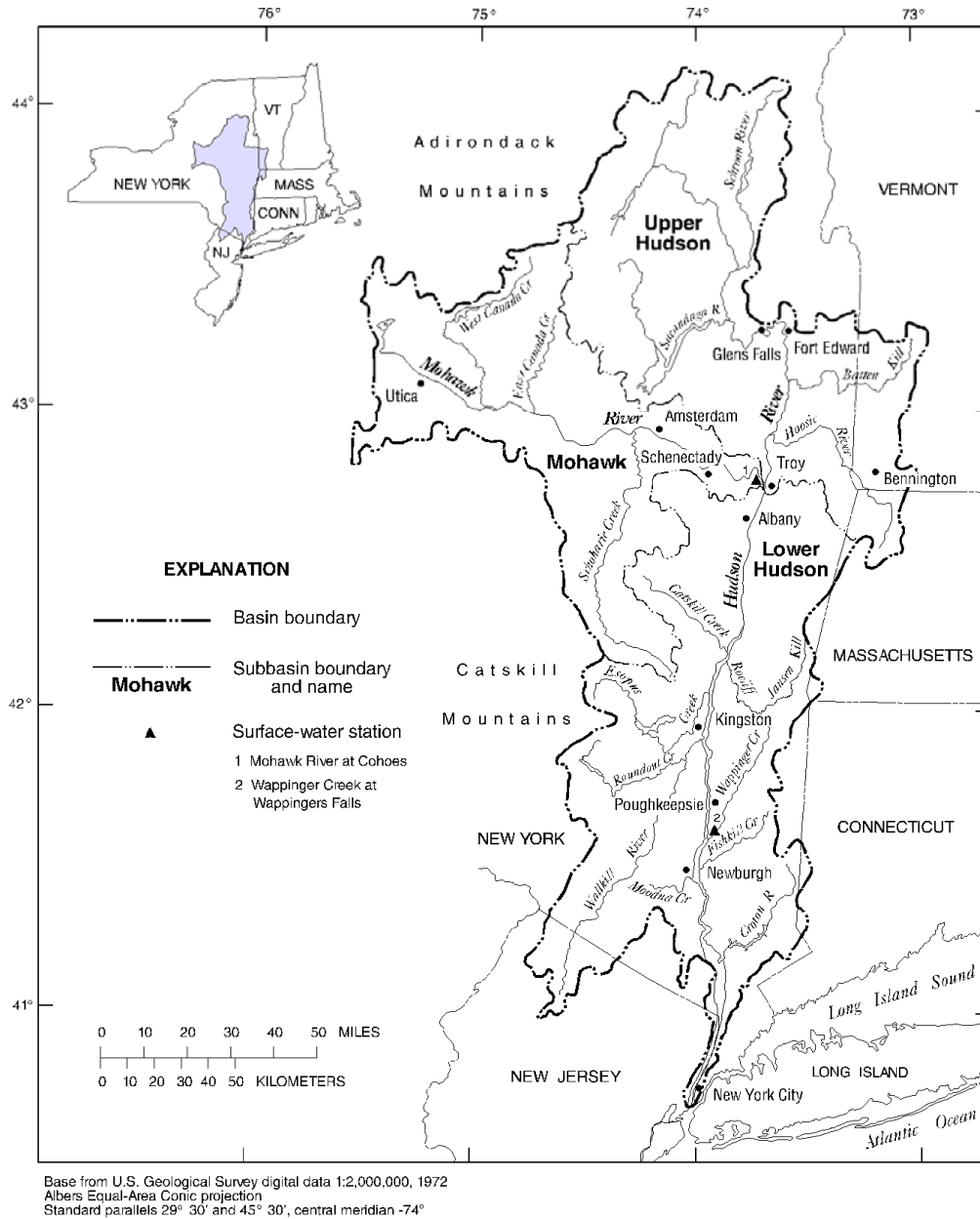


Figure 1.

Downstream Hydropower Developments

14. Hydropower projects included in the headwater benefits determination consist of only those with an installed capacity greater than 1,500 kilowatts (kW).⁹ There are 15 hydropower projects in the basin that meet these criteria and are listed in Table 1.

⁹18 C.F.R. § 11.10(b).

Table 1.

Hydroelectric Facility Name	Project No.	Licensee/Operator	Installed /Hydraulic Capacities
E. J. West	P-2318	Erie Boulevard Hydropower, L.P.	2 units @ (9.8 MW, 2,400 cfs)
Stewart's Bridge	P-2047	Erie Boulevard Hydropower, L.P.	1 unit @ 34.5 MW, 5,460 cfs
Curtis	P-2609	Curtis/Palmer Hydroelectric Co.	Units 1 and 2 @ (2.6 MW, 1,585 cfs); Unit 3 is 2.5 MW, 1500 cfs; Units 4 and 5 @ (1.1 MW, 875 cfs)
Palmer Falls	P-2609	Curtis/Palmer Hydroelectric Co.	2 units @ (24 MW, 3750 cfs)
Spier Falls	P-2482	Erie Boulevard Hydropower, L.P.	2 units (8.5 MW, 1,440 cfs) and (44 MW, 7,580 cfs)
Sherman Island	P-2482	Erie Boulevard Hydropower, L.P.	4 units @ (7.75 MW, 1,600 cfs)
Feeder Dam	P-2554	Erie Boulevard Hydropower, L.P.	5 units total to 5 MW, 5,000 cfs
Glens Falls	P-2385	Finch Hydro Holdings, LLC (Erie Boulevard L.P.) ¹⁰	5 units total to 12.2 MW, 4,400 cfs
South Glens Falls	P-5461	South Glens Falls Limited Partnership and Niagara Mohawk Power Corporation	2 units @ (7.85 MW, 2,200 cfs)
Hudson Falls	P-5276	Northern Electric Power Co. and Niagara Mohawk Power Corporation	2 units @ 22 MW
Fort Miller	P-4226	Fort Miller Associates	2 units total to 5 MW, 6,600 cfs
Stillwater	P-4684	Stillwater Associates, LLC	2 units @ (1.75 MW, 3,500 cfs)
Upper Mechanicville	P-2934	New York State Electric and Gas	2 units @ (8.7 MW, 6,000 cfs)
Mechanicville	P-6032	Albany Engineering Corp.	6 units total to 4.5 MW, 5,820 cfs (not all in service during study period)
Green Island	P-13	Green Island Power Authority	4 units total to 6 MW, 9,828 cfs

ENERGY GAINS ANALYSIS

15. Energy gains are the additional amounts of energy that a hydropower project produces as a result of the operation and regulation of streamflow by an upstream storage reservoir. Energy gains in the Hudson River Basin were determined for the 2002 to 2008 study period using the Commission's Headwater Benefits Energy Gains (HWBEG) model. The HWBEG model uses daily data as input and determines the energy gains or losses by simulating the operation of the downstream power plants with and without the flow regulation by the headwater project. Daily storage and annual cost data for the headwater project was provided by the District. Owners of the hydropower projects provided daily flow and generation data for the 2002 to 2008 study period.

16. In cases where data required for energy gains computations are unavailable, data must be revised, estimated and validated. In such cases water balance computations form the basis for data validation. A water balance computation preserves the conservation of volume relationship between aggregate inflows and outflows, changes in reservoir

¹⁰ Headwater Benefits assessments are included under Erie Boulevard L.P.

storage, and corresponding changes in pool elevations for the reservoir. To analyze intra-project and inter-project inconsistencies in water balance for the headwater and downstream projects, the RIVERWARE Computer Model was used for water balance computations.

17. On May 11, 2011, a draft Basin Scoping and Data Sufficiency Assessment report for headwater benefits determination in the Hudson River Basin was sent to the District and downstream hydropower projects for review and comment. The draft report also included preliminary relationships between flow and generation, *i.e.*, rating curves at the downstream hydroelectric projects. The report identified the adequacy of the data provided and additional data needed to determine the energy gains using the HWBEG model. Comments on the draft report were received from the District, Albany Engineering Corporation, and Northern Electric Power Co.

18. For each hydropower plant, rating curves, *i.e.*, flow vs. generation relationship, were developed based on the data provided by the owners. Using these rating curves, the HWBEG model was run with the reported streamflow to calculate energy generation. The calculated energy generation was then compared with the reported generation to determine if the model results were within the following initial error criteria: the calculated generation is within five percent of the reported monthly generation and within one percent of the reported annual generation. If the error criteria were not met, additional rating curves for shorter intervals of time, *i.e.*, seasonal or monthly, were developed to ensure that the HWBEG computer model accurately calculates the reported generation. Shorter periods for additional rating curves were based on the relationship between generation and streamflow due to events such as power outages, plant upgrades, and low/high water periods. The final rating curves were used in the model to determine energy generation with and without streamflow regulation by the upstream federal storage reservoirs.

HEADWATER BENEFITS ANALYSIS

19. Headwater benefits assessments are a function of the energy gains resulting from streamflow regulation by the headwater project and the section 10(f) costs of the headwater project. Section 10(f) costs are defined as the annual interest, depreciation, and maintenance expense portion of the joint-use costs allocated to the power function of the headwater project. These costs are apportioned among the headwater project and the downstream beneficiaries based on the energy gains calculated by the HWBEG model. Power is not an authorized function at the Conklingville Dam and Great Sacandaga Lake headwater project. If power is not an authorized function of a headwater project, the Commission's regulations, at 18 C.F.R. §11.12(b)(2), stipulate that the section 10(f) cost is the annual interest, maintenance, and depreciation portion of the headwater project costs designated as the joint-use power cost, derived by deeming a power function. The value of benefits assigned to the deemed power function (for purposes of computing the

remaining benefits of the joint-use power cost) is the total value of downstream energy gains. Under the Commission's regulations at 18 C.F.R. §11.12(b)(3), the total value of energy gains means the lesser of:

- (i) The cost of generating an equivalent amount of electricity at the most likely alternative at the time the headwater project became operational; or
- (ii) The incremental cost of installing electrical generation at the headwater project at the time the headwater project became operational.

20. The Separable Costs-Remaining Benefits method of allocating the costs among the functions at a project is the preferred method used by federal agencies engaged in water resources planning and development. Accordingly, the Commission uses the same method to allocate project costs under the Commission's regulations at 18 C.F.R. §11.12(b)(2). The portion of the cost allocated to power is a function of the average annual energy gains during the assessment period and the value of replacement energy at the time the headwater project was constructed, along with the alternative cost of a headwater project.

21. In the present case, the record does not contain sufficient information to determine the incremental cost of installing electrical generation at the headwater project at the time the project became operational. Therefore, in order to make an allocation to the power function, it is necessary to compute the value of energy gains at the downstream projects from the most likely alternative at the time the headwater project became operational. The most likely alternative at the time the Conklingville Dam-Sacandaga Lake project became operational in 1930 is assumed to be from steam electric plants. The earliest publication found from which the 1930 value of energy from steam electric plants could be extracted was the 1937 publication of the Federal Power Commission Statistics of Electric Utilities in the United States, Privately owned, Classes A and B.

22. The average value of energy from steam electric plants in 1937 for three utilities in New York State was determined to be 3.906 mills per kilowatt hour(kWh). Using the Bureau of Labor Statistics CPI calculator,¹¹ the corresponding 1930 value was computed to be 4.53 mills/kWh. The model used by staff calculated an annual average of 137,240 megawatt hours (MWh) of energy gains. At 4.53 mills/kWh, these energy gains would have resulted in \$621,697 as the cost of alternative power, which, under the Commission's regulations, as noted above, is the total value of energy gains, as well as the value of benefits assigned to the deemed power function.

23. The joint-use function cost is the annual interest, maintenance, and depreciation costs of the headwater project, which, based on the evidence that was submitted by the licensees, staff has calculated to be \$710,895. Staff has added the power benefits value

¹¹ <http://data.bls.gov/cgi-bin/cpicalc.pl>

(\$621,697) to the joint use amount to arrive at the total joint use function for the Conklingville headwater project, \$1,332,592.¹²

24. The calculations for the portion of the cost allocated to power are then as follows:

Table 2.
Allocation of Joint-Use Costs - 1930
Conklingville Dam and Sacandaga Lake Project

Interest (@4.5% on \$12,104,830 ¹³)	\$544,717
Depreciation (Economic Life 100 yrs)	\$121,048
Average Maintenance ¹⁴	\$ 45,130
Total Annual Cost	\$710,895

	Joint-Use Function	Power Function	Total
1. Benefits	<u>2/</u>	\$621,697 <u>3/</u>	
2. Alternate Costs	\$ 710,895	\$ 621,697	\$1,332,592
3. Lesser of 1& 2	\$ 710,895	\$ 621,697	\$1,332,592
4. Separable Costs	0	0	
5. Remaining Benefits	\$710,895	\$ 621,697	\$1,332,592
6. % of Remaining Benefits	53.35	46.65	100.00
7. Allocated Joint Cost	\$379,262	\$ 331,633	\$710,895

2/ Benefits were assumed to be greater than the annual joint-use cost of the project.

3/ Power benefits were based on 137,240 MWh of energy gains at 4.53 mills/kWh.

The Commission's regulations at 18 C.F.R. §11.11(b)(5) state that no final charge assessed by the Commission may exceed 85 percent of the value of the energy gains. The value of the energy gains is the cost of obtaining an equivalent amount of electricity, *i.e.*, referred to as the replacement value, from the most likely alternative source during the period for which the charge is assessed. The downstream hydropower projects provided the replacement values of energy for the years 2002 through 2008. Accordingly, the headwater benefits assessment to a beneficiary in any particular year is the lesser of 85 percent of the value of energy gains received by the beneficiary in that year and the beneficiary's portion of the joint-use cost allocated to power in that year.

¹² We do not have enough information about what the cost of the project would be with each of its individual functions (power, flood control, etc.) excluded in turn; therefore, we are assuming the separable costs to be zero.

¹³ Headwater Project Investment cost.

¹⁴ Average value of maintenance costs for the period 1930 through 2001 indexed to 1930 dollars.

REVIEW COMMENTS

25. On May 10, 2011, a draft Basin Scoping and Data Sufficiency report was sent to the District and downstream project owners for review and comment within 45 days. On January 19, 2012, a draft headwater benefits determination report, which contained a summary of the energy gains and headwater benefits assessments for the downstream hydropower projects for the years 2002 through 2008, was sent to the District and downstream hydropower project owners for review and comments within 60 days. The issues raised are summarized below.

District's Comments

Issue: The energy gains model should be revised to recognize that the hydraulic capacity of the Sacandaga and Hudson River hydroelectric facilities, in the unregulated flow scenario, would be less than the current hydraulic capacity.

26. We disagree. The Commission's regulations at 18 C.F.R. §11.10 (c)(1) define energy gains as the difference between the number of kilowatt-hours of energy produced at a downstream project with the headwater project and that which would be produced without the headwater project. In all cases of headwater benefits studies undertaken by the Commission, the actual hydraulic capacity of a beneficiary project is the only capacity parameter that is used to determine energy gains. The established methodology for the energy gains determination does not allow for any assumptions or speculation about hydraulic capacity that would have been designed and installed under alternative scenarios of river development. Accordingly, no revisions to the energy gains model are warranted.

27. In letters filed April 11, and 17, 2012, downstream project owners Erie Boulevard and Northern Electric Power Company, respectively, concurred with staff's conclusion.

Issue: The District believes that there is an added benefit derived by E.J. West and Stewart's Bridge hydropower plants' ability to establish the timing of the release of water from Great Sacandaga Lake through their two plants.

28. We do not disagree that the E.J. West and Stewart's Bridge projects may shape their releases within-the-day to maximize on-peak generation and revenue. However, analyses to resolve these benefits are outside the scope of the Commission's methodology for headwater benefits assessments. Including these analyses in headwater benefits assessments would require the Commission to undertake new rule-making in two areas: (1) hourly data and modeling, rather than daily, would be required to resolve on-peak generation each day, and (2) modeling would have to address revenue gains, rather than energy gains, arising from regulated and unregulated flow scenarios. Further, in the case of the Hudson River facilities, availability of hourly data for the 2002-2008 study period is likely to be less than that for daily data. In the absence of hourly data, the assumptions

and estimations required to formulate and complete an hourly analysis are likely to engender new arguments between parties and additional expense to reach a result. This additional effort and expense could be directed instead at bi-lateral or multi-lateral development of coordinated dispatch among Hudson River hydropower facility owners to realize greater aggregate benefits for all owners.

Issue. In the headwater benefits assessment calculation spreadsheet, the maintenance costs were transposed, i.e, 2002 maintenance costs were represented as 2008 etc.

29. The District is correct, and the headwater benefits assessment calculations are revised to reflect correct maintenance costs for the years. The corrected assessments are included in the headwater benefits assessments section of this order.

Issue: The District requests that the Commission defer consideration of whether, and how, prior payments under the New York State Environmental Conservation Law would be credited against headwater benefits charges until after the amount of those charges have been finally settled. The District states that it expressly reserves the right to raise any legal or equitable grounds for limiting the extent of credits against headwater benefits charges for payments made by licensees under color of state law prior to the court of appeals' November 28, 2008 decision.

30. The headwater benefits investigation, as finalized by this order, settles the charges for which the downstream project owners were liable beginning when the Great Sacandaga Lake Project was licensed and section 10(f) became the regulatory authority for assessing such headwater benefits and charges. Because it would not be possible to determine the amounts that the downstream licensees will actually need to pay for past and future headwater benefits unless the issue of credits is first resolved, this determination must be made in the present order. Accordingly, a later section of this order discusses the extent to which such credits will be applied and explains the approach for determining how prior payments would offset charges found here to be owed under section 10(f).

Albany Engineering Corporation's Comments

Issue: Albany Engineering Corporation expresses concern about the apparent lack of regulation that occurs in the Hudson River downstream of Feeder Dam. Albany Engineering asserts that these fluctuations have the potential to negate energy gains presumed to be provided by the releases from Great Sacandaga Lake. Albany Engineering presents and refers to sub-daily flow time series data from USGS gage 01327750 (Fort Edward) from March 5, 2012, through March 12, 2012 (hereafter referred to as the Fort Edward hydrograph) in its comments. Albany Engineering also asserts that this hydrograph represents the antithesis of a regulated river.

31. We do not agree with the general assertion that flow fluctuations within a 24-hour period have the potential to negate or diminish energy gains as computed by the Commission's daily-flow methodology for headwater benefits assessment. The concept of negating or diminishing (offsetting) benefits referred to by Albany Engineering is limited in scope to the effect of upstream fluctuations limiting the ability of a downstream powerhouse being able to utilize portions of the river flow for generation. Regardless of the cause, such fluctuations may cause operational challenges but do not necessarily affect aggregate generation amounts. Further, such negation or diminishment is possible only to the extent that fluctuations can be attributed to the existence of the headwater reservoir (Great Sacandaga Lake in this case) rather than to intervening facilities upstream of the beneficiary facilities that operate under the requirements of their licenses.

32. The potential for any negation or diminishment of headwater benefits by with-the-day flow fluctuations can only be determined through site-specific analysis of hourly flow and forebay elevation data and hourly water balance modeling to discern the source of the flow fluctuations, which may arise from tributary inflows independent of the headwater reservoir releases. In the case of the Mechanicville and Green Island facilities, it is not apparent that the fluctuations seen in the Fort Edward hydrograph would cause powerhouse capacity at downstream facilities to be exceeded differently within the day (on an hour-to-hour basis) for the regulated and non-regulated cases—such an assertion would require an analysis of within-the-day fluctuations further downstream. The study costs of developing the hourly water balance and operation model necessary to resolve this issue for each beneficiary facility would exceed the amount of the headwater benefits assessments determined for Albany Engineering.

33. We disagree with Albany Engineering's assertion that the depiction of flows in the Fort Edward gage graph represents "the antithesis of what a regulated river should look like." The daily cycle of flows seen in the Fort Edward hydrograph is typical for moderate to large rivers with ponding and run-of-river hydropower facilities in series.

34. The Commission staff investigated a similar complaint by Albany Engineering in March 2005 and found that the flow fluctuations at the Mechanicville and Green Island Projects were not caused by the operation of hydropower projects in the Upper Hudson River Basin.¹⁵

Northern Electric Company's Comments

Issue: The two facilities, South Glens Falls and Glens Falls, are separately owned and licensed hydroelectric projects. Therefore, the headwater benefits assessments and apportionment of study costs should be listed separately.

¹⁵ See July 15, 2005 letter to Albany Engineering Corporation.

35. The energy gains and headwater benefits assessments for Glens Falls and South Glens Falls were determined separately. The Glens Falls energy gains and assessments are included under Erie Boulevard, and South Glens Falls energy gains and assessments are included under South Glens Falls Partnership. Only the labeling in Table ES-1 of the draft report was incorrect.

Issue: Northern Electric Company takes issue with the shape of the rating curves for Hudson Falls shown in Figure 18 of the headwater benefits assessment report. It argues that the curves should decrease monotonically from their peak generation value at approximately 12,000 cfs and that the rating curves for the Hudson Falls facility should approximate those for the South Glens Falls facility

36. We do not disagree with the assertion that a monotonic decline from peak generation is typical for large run-of-river facilities. However, this behavior is not guaranteed for all facilities, as tailwater elevations fluctuate, and the conveyance of the tailrace can vary in non-monotonic complex ways. The shape of the rating curves is a function of the turbine capabilities, the individual shapes of turbine exit passages, and the geometry of the tailrace downstream of the turbines. Each of these factors differs among the Hudson Falls, South Glens Falls, and Glens Falls generation facilities. Thus, there is no expectation that the rating curves for these facilities must have similar shapes.

Issue: Northern Electric Company questions the accuracy of historical flow data from the Fort Edward gage. It points out that ultrasonic flow transducers are installed at the South Glens Falls facility to improve the accuracy of recorded flow data and requests clarification of and rationale for use of USGS gage data in the headwater benefits assessment.

37. The RiverWare model of the Hudson River was developed to address systemic water balance throughout the basin, including uncertainties in historical flow data from stream gages. Flow imbalances between stream gages along the river are indistinguishable from local inflows and ungaged tributary or barge canal inflow/outflows. The RiverWare model aggregates these uncertainties into barge canal inflow/outflow points upstream of Feeder Dam and downstream of the Fort Edward gage. While this methodology does not directly address discrepancies between flow monitoring points along the river, it does create a consistent set of historical flow data for use in both the regulated and unregulated flow scenarios. Thus, any uncertainty or bias in the USGS gage data affects generation calculations similarly in both the regulated and unregulated scenarios.

38. We analyzed the hydrologic representativeness of the 2002-2008 assessment period in the context of the long-term hydrologic record for the Hudson River. The figure below illustrates the position of the 2002-2008 assessed years relative to the annual flow-duration curve prepared from data from the USGS stream gage below Green Island

(01358000). Figure 2 shows that most of the assessed years are “wetter” than the median year. Interim headwater benefits assessments for future years can be extrapolated from the 2002-2008 results with reasonable confidence for “normal” to “wet” years. However, “dry” years in which annual average flow is below the 2002 annual average flow of 11,300 cfs should not be extrapolated from 2002-2008 results without additional water balance modeling and HWBEG modeling to determine that such extrapolation is reasonable.

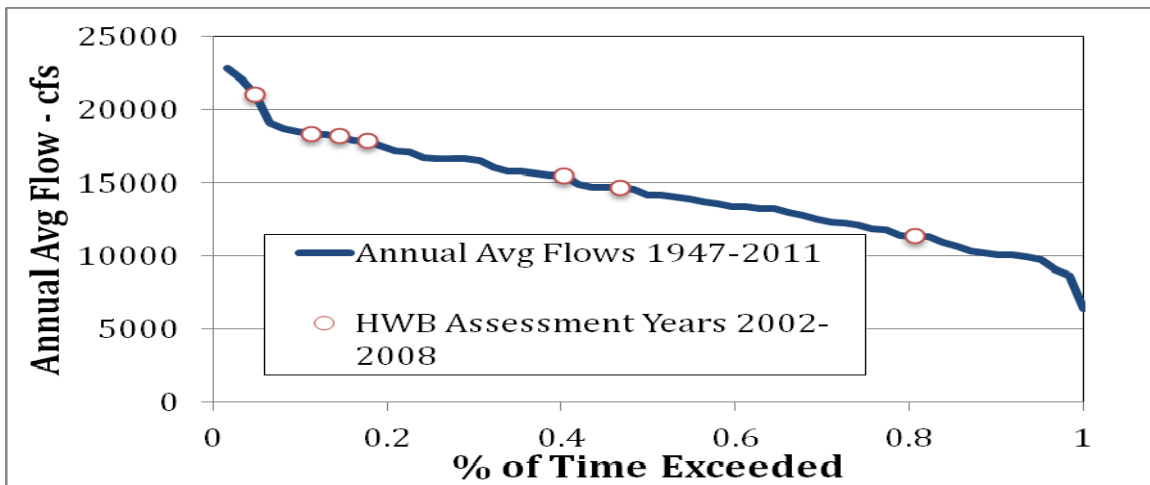


Figure 2.

HEADWATER BENEFITS ASSESSMENTS

39. The HWBEG model determined the energy gains received by the downstream project owners by the regulation of Great Sacandaga Lake during the years 2002 through 2008. The following table summarizes the energy gains.

Table 3.
Annual Energy Gains, MWh
Hudson River Basin
2002-2008

Beneficiary	Annual Energy Gains, Mh									
	2002	2003	2004	2005	2006	2007	2008	Total	Average	% Total
Erie Boulevard	72,720	41,327	87,863	90,892	79,259	93,510	43,467	509,038	72,720	52.99
Curtis/Palmer Electric Co.	25,767	17,848	30,042	30,698	26,502	29,074	20,441	180,372	25,767	18.78
South Glens Falls Partnership	14,971	10,186	16,225	16,838	17,490	16,631	12,455	104,796	14,971	10.91
Northern Electric Power Co.	14,839	7,532	15,818	17,781	17,980	20,031	9,896	103,876	14,839	10.81
Fort Miller Associates	1,301	1,080	480	1,956	1,311	1,824	1,154	9,105	1,301	0.95
Still Water Associates	598	487	401	600	407	1,196	499	4,188	598	0.44
NY State Electric & Gas Co.	4,898	4,028	6,794	7,289	0	7,088	4,191	34,289	4,898	3.57
Albany Engineering Corp.	924	0	453	1,291	869	1,996	935	6,467	924	0.67
Green Island Power Co.	1,222	853	1,069	1,624	835	2,177	774	8,552	1,222	0.89
Totals	137,240	83,340	159,143	168,969	144,652	173,526	93,812	960,683	137,240	100.00

40. Based on the District's comment concerning the transposed maintenance costs, the headwater benefits assessment calculations are revised reflecting corrected maintenance costs. The revised annual headwater benefits assessments during the period 2002 through 2008 are summarized in the table below.

Table 4.
Headwater Benefits Assessments
Hudson River Basin
2002-2008

Year	Annual 10(f) Cost	Annual 10(f) Cost Allocated to Power	Erie Boulevard	Curtis/Palmer Electric Co.	South Glens Falls Ptsp.	Northern Electric Power Co.	Fort Miller Associates	Stillwater Associates	NY State Electric & Gas Co.	Albany Engg. Corp.	Green Island Power Co.
2002	\$758,905	\$354,029	\$46,898	\$16,618	\$9,655	\$9,570	\$839	\$386	\$3,159	\$596	\$788
2003	\$863,096	\$402,634	\$199,657	\$86,229	\$49,209	\$36,387	\$5,218	\$2,354	\$19,459	\$0	\$4,120
2004	\$937,131	\$437,172	\$241,342	\$82,518	\$44,567	\$43,448	\$1,318	\$1,100	\$18,661	\$1,243	\$2,936
2005	\$1,103,280	\$514,680	\$276,858	\$93,506	\$51,290	\$54,161	\$5,958	\$1,827	\$22,203	\$3,931	\$4,947
2006	\$1,382,588	\$644,977	\$353,400	\$118,166	\$77,986	\$80,168	\$5,846	\$1,816	\$0	\$3,873	\$3,722
2007	\$1,457,450	\$679,900	\$366,385	\$113,917	\$65,162	\$78,485	\$7,145	\$4,685	\$27,773	\$7,820	\$8,528
2008	\$1,689,107	\$787,968	\$365,100	\$171,694	\$104,614	\$83,117	\$9,690	\$4,190	\$35,205	\$7,857	\$6,500
Total	\$8,191,557	\$3,821,361	\$1,849,640	\$682,647	\$402,482	\$385,336	\$36,014	\$16,358	\$126,461	\$25,321	\$31,540

Note: Assessments for 2002 are prorated for three months since the Headwater Project was licensed in September 25, 2002.

FUTURE HEADWATER BENEFITS ASSESSMENTS

41. The Commission's regulations at 18 C.F.R. § 11.17(b)(5) state that, when the Commission determines that historical data, including hydrology, development, and other characteristics of the basin, demonstrate sufficient stability to project average energy gains and section 10(f) costs, the Commission will establish final charges for future years. The prospective final charges will remain in effect until a new investigation is initiated under § 11.15(d)(2). If a final charge has not been established and an investigation is pending, the Commission will establish an interim charge. The Commission's regulations at 18 C.F.R. § 11.17(b)(ii)(A) state that an interim charge is 100 percent of the estimated final charge if the Commission has completed an investigation.

42. A comparison of the hydrology of the Hudson River Basin during the study period 2002 through 2008 and the period 1947 through 2011 found that there is no appreciable change. No changes either in the existing developments or in the operation of the Great Sacandaga Lake are anticipated. The interest on the original capital cost is fully amortized and only depreciation of \$121,048 remains until 2029. The only anticipated changes that have an impact on the headwater benefits assessments are the interest and depreciation costs of any capital improvements and maintenance costs of the headwater project, Conklingville Dam and Great Sacandaga Lake. However, the maintenance costs of the headwater project more than doubled during the assessment period 2002 through 2008. Because of the uncertainties in future capital improvements and exact maintenance costs for each year, it is appropriate to establish interim annual assessments from 2009 onwards. Accordingly, a realistic estimate of the interim charges beginning in the year 2009 should be at least same as the assessments during the year 2008. Interim headwater assessments beginning in 2009 are summarized below.

Table 5.
Interim Headwater Benefits Assessments
Hudson River Basin
2009 Onwards

Beneficiary	Interim Assessments
Erie Boulevard	\$365,100
Curtis Electric Co.	\$171,694
South Glens Falls Limited Partnership	\$104,614
Northern Electric Power Co.	\$83,117
Fort Miller Associates	\$9,690
Still Water Associates	\$4,190
NY State Electric & Gas Co.	\$35,205
Albany Engineering Corp.	\$7,857
Green Island Power Co.	\$6,500
Total	\$787,968

CREDITS FOR PRIOR PAYMENTS

43. As noted earlier, the District had been charging downstream projects for headwater benefits under New York law for many years before the Great Sacandaga Lake Project was licensed and for several years thereafter. The court of appeals made it clear that, once the Great Sacandaga Lake Project was licensed, New York law was completely preempted by section 10(f) and the collection of payments for headwater benefits pursuant to that law was unauthorized. In its order on remand, the Commission stated that, while it could not order the District to refund payments made by the downstream licensees under the New York law, it might be possible to offset headwater benefits payments by these amounts.¹⁶

44. Section 10(f) requires the Commission to ensure that downstream project owners reimburse upstream storage or headwater project owners for such part of the annual charges for interest, maintenance, and depreciation of the upstream projects as the Commission may deem equitable. To the extent that the downstream project owners have already paid the District under New York law for what were, incontestably, headwater benefits, requiring those project owners to pay the District yet again for headwater benefits for those years, this time under section 10(f), would amount to a double payment that could not be reconciled with the Commission's responsibility to ensure reimbursements that are "equitable." Moreover, to the extent that, while the Great Sacandaga Lake Project has been under license, any of the downstream project owners made payments exceeding the amounts that this order finds were owed for those years, those overpayments, equitably, should be offset against future charges.

45. The point at which the annual assessments determined in this order would be completely offset by prior payments would vary from one downstream project to another. If the Commission were to attempt to determine the "break-even" point for each downstream licensee - - that point, whether in the past or in the future, when a licensee's prior payments are "used up" and the licensee must begin reimbursing the District according to the annual headwater benefits payment tables set out in this order - - it would be necessary to elicit additional information. The amounts that have been paid by all of the downstream project owners since the Great Sacandaga Lake Project was issued its license are not of record in this proceeding.¹⁷ In addition, downstream project owners

¹⁶ *Albany Engineering Corporation v. Hudson River-Black River Regulating District*, 127 FERC ¶ 61,174 at P 3 and 23 , *reh'g denied* 129 FERC ¶ 61,134 at P 31.

¹⁷ In the complaint proceeding, Albany Engineering and Niagara Mohawk Power Corporation, doing business as National Grid, an intervenor and co-licensee of two downstream projects, provided copies of some annual assessments from the District and other billing information. In its order on remand, the Commission noted that Albany Engineering paid the District \$516,665.62 from 2003 through 2007, as evidenced by bills that it attached to its complaint or otherwise submitted to the Commission. *See Albany Engineering Corporation v. Hudson River-Black River Regulating District*, 127 FERC

may already have obtained refunds from the District through court action or other means.¹⁸

46. Rather than institute a further Commission proceeding to collect and examine this information, we will direct the downstream project owners to contact the District for the purpose of consulting to develop individual agreements that reflect these prior payments and identify when the downstream project owners are to begin reimbursing the District for headwater benefits according to the determinations in this order. As we cannot require the licensees to negotiate such agreements, this approach is intended merely to allow the parties an opportunity to reach agreement without further Commission proceedings.

47. As an example of how the downstream licensees and the District should fashion their individual agreements, the tables in this order indicate that Fort Miller Associates owed \$36,014 for headwater benefits for the Fort Miller Project from 2002 through 2008 and would owe \$9,690 for each year thereafter. If, to date, the District had collected only \$30,000 for headwater benefits for this project, it could bill Fort Miller Associates for the difference of \$6,014 and for \$9,690 for each year beginning with 2009. If, however, the District had already collected \$70,000, Fort Miller Associates would owe nothing for the years 2002-2008, and, because it had overpaid by \$33,986, the District could not begin billing it for the annual interim assessments of \$9,690 until they were completely offset by the overpayment. Dividing \$33,986 by \$9,690 shows that the District could not bill Fort Miller Associates for the years 2009 through 2011, could bill it only \$4,916 for 2012, and could begin billing it for the entire \$9,690 in 2013.

48. If the parties cannot reach agreement, they may request the assistance of a settlement judge or the Commission's Dispute Resolution Service. If none of these avenues prove fruitful, staff will request additional information from the licensees regarding the amounts that the District has collected for each downstream project since the Great Sacandaga Project was licensed and any funds that may have since been returned to the downstream licensees. Upon receipt of this information, staff will establish a headwater benefits payment schedule for each licensee that reflects the annual

¶ 61,174 at P 18 and n.15. Nevertheless, this information falls short of a comprehensive and definitive determination of all annual assessments paid to the District by all licensees for the entire period in question.

¹⁸ In its orders in the Albany Engineering proceedings, the Commission consistently stated that Albany Engineering's remedy with regard to obtaining refunds from the District was in the court system, since the Commission did not have the authority to order such refunds. The Commission also stated that, in any headwater benefits determination done for the basin, it could take into account such refunds as Albany Engineering may have obtained through court action. *See, e.g., Albany Engineering Corporation v. Hudson River-Black River Regulating District*, 127 FERC ¶ 61,174 at P 24 and 41.

amounts that staff has determined would be owed to the District and the amounts that have already been paid.

49. While the District and the downstream licensees may reach agreements, the Commission remains responsible, under section 10(f), for ensuring that the downstream project owners reimburse the District for the energy gains determined in this investigation and order. Therefore, as an agreement is reached, the parties must file it with the Commission for approval, so that the Commission will know when the District may begin billing each downstream project owner for headwater benefits and will be able to enforce any failure of a downstream project owner to make headwater benefits payments in compliance with it.

STUDY COSTS

50. The Commission's regulations at 18 C.F.R. §11.17(c)(2) state that, if any owner of a headwater or downstream project requests that the Commission determine headwater benefits charges for benefits provided by non-federal headwater projects, the headwater project owners must pay 50 percent of the cost of making the determination in proportion to the benefits provided by their projects, and the owners of downstream projects must pay a pro rata share of the remaining 50 percent in proportion to the energy gains received by their projects.

51. The cost to determine headwater benefits assessments in the Hudson River Basin is \$309,580¹⁹ of which 50%, \$154,790, is to be borne by the District. The remaining \$154,790 is apportioned among the downstream project owners in proportion to the energy gains received. The apportionment of study costs among the owners of headwater and downstream projects is shown in the following table.

¹⁹ \$304,785 for the completion of the study and \$4,795 to respond to the comments received on the draft report.

Table 6.
Apportionment of Study Costs
Hudson River Basin Headwater Benefits Study

Beneficiary	Energy Gains MWh	Study Costs
Hudson River-Black River Regulating District	NA	\$154,790
Erie Boulevard	509,038	\$82,019
Curtis Electric Co.	180,372	\$29,062
South Glens Falls Partnership	104,796	\$16,885
Northern Electric Power Co.	103,876	\$16,737
Fort Miller Associates	9,105	\$1,467
Still Water Associates	4,188	\$675
NY State Electric & Gas Co.	34,289	\$5,525
Albany Engineering Co.	6,467	\$1,042
Green Island Power Co.	8,552	\$1,378
Totals	960,683	\$309,580

The Director orders:

(A) Headwater benefits assessments to the downstream project owners in the Hudson River Basin for the energy gains benefits received from the Hudson River-Black River Regulating District's Conklingville and Great Sacandaga Lake headwater project during the period 2002 through 2008, are made final.

(B) Erie Boulevard Hydropower L.P., Curtis/Palmer Hydroelectric Company, South Glens Falls Partnership, Northern Electric Company and Niagara Mohawk Power Corporation, Fort Miller Associates, Still Water Associates, New York State Electric & Gas Company, Albany Engineering Company, and Green Island Power Company must each contact Hudson River-Black River Regulating District for the purpose of attempting to fashion an agreement on the payment for headwater benefits received by their respective projects beginning with the date of licensing of the Hudson River-Black River Regulating District's Great Sacandaga Lake Project. Each agreement must reflect the findings of this order, including the headwater benefits assessments for which each downstream project has been found responsible from 2002 through 2008, the annual interim assessments found applicable for each project beginning in 2009, and the payments made by each downstream licensee to the District pursuant to New York law for headwater benefits received beginning at the time of licensing of the Great Sacandaga Lake Project. Each agreement must also specify the year in which the amounts owed as determined by this order are entirely offset by the payments already made by the respective downstream licensee, and each agreement must specify any amounts remaining to be paid by the downstream licensee to the District for the year in which this complete offset occurs.

Each agreement must be filed with the Commission for approval within 90 days of the date of this order. In approving each agreement, the Commission will determine when the District may begin issuing bills for headwater benefits in accordance with the determinations in this order and will require each downstream licensee to make such headwater benefits payments.

If any downstream licensee is unable to reach such an agreement and submit it to the Commission within 90 days from the date of this order, the Commission will proceed to request data from that downstream licensee and the District, indicating what amounts have been paid to the District from the time the license for the Great Sacandaga Lake Project was issued, and will issue an order specifying the headwater benefits payments to be made by that licensee based on those submissions and the findings in the present order.

(C) Within 45 days from the date of this order, Hudson River-Black River Regulating District shall pay the Commission \$154,790 for its share of the costs of the study.

(D) Within 45 days from the date of this order, Erie Boulevard Hydropower L.P. shall pay the Commission \$82,019 for its share of the costs of the study.

(E) Within 45 days from the date of this order, Curtis/Palmer Hydroelectric Company shall pay the Commission \$29,062 for its share of the costs of the study.

(F) Within 45 days from the date of this order, South Glens Falls Partnership shall pay the Commission \$16,885 for its share of the costs of the study.

(G) Within 45 days from the date of this order, Northern Electric Company shall pay the Commission \$16,737 for its share of the costs of the study.

(H) Within 45 days from the date of this order, Fort Miller Associates shall pay the Commission \$1,467 for its share of the costs of the study.

(I) Within 45 days from the date of this order, Still Water Associates shall pay the Commission \$675 for its share of the costs of the study.

(J) Within 45 days from the date of this order, New York State Electric & Gas Corporation shall pay the Commission \$5,525 for its share of the costs of the study.

(K) Within 45 days from the date of this order, Albany Engineering Corporation shall pay the Commission \$1,042 for its share of the costs of the study.

(L) Within 45 days from the date of this order, Green Island Power Company shall pay the Commission \$1,378 for its share of the costs of the study.

(M) The payments to the Commission shall be remitted by check or money order, or automated clearinghouse (ACH) transfer funds listing the bill number to:

MAIL	COURIER	ACH Credit	Wire
Federal Energy Regulatory Commission P.O. Box 979010 St. Louis, MO 63197-9000	US Bank Attn: Government Lockbox 1005 Convention Plaza SL-MOC1GL St. Louis, MO 63101	Federal Reserve Bank of Richmond ABA Number 051036706 FERC's Account Number 540032 Bill Number	Federal Reserve Bank of NYC ABA Number 021030004 Beneficiary: FERC 8900004 Bill Number

Payment instructions are attached to this order.

(N) This order constitutes final agency action. Requests for rehearing by the Commission may be filed within 30 days of the date of issuance, as provided in section 313(a) of the FPA, 16 U.S.C. § 8251 (2006), and the Commission's regulations at 18 C.F.R. § 385.713 (2012). The filing of a request for rehearing does not operate as a stay of the effective date of this order, or of any other date specified in this order. The licensee's failure to file a request for rehearing shall constitute acceptance of this order.

William Guey-Lee, Chief
Engineering Resources Branch
Division of Hydropower Administration
and Compliance