UNITED STATES OF AMERICA
FEDERAL POWER COMMISSION

SETTLEMENT

Before Commissioners: John N. Nassikas, Chairman;
William L. Springer and Don S. Smith.

Power Authority of the State of New York) Project No. 2685

ORDER APPROVING SETTLEMENT AGREEMENT

(Issued July 30, 1975)

On November 5, 1973, the Towns of Fulton and Blenheim, New York (Complainants) filed a complaint, under Section 306 of the Federal Power Act, 16 U.S.C. §825e, and Section 1.6 of the Commission's Rules of Practices and Procedure, 18 C.F.R. §1.6 (1974), against the Power Authority of the State of New York, Licensee for the Blenheim-Gilboa Pumped Storage Project No. 2685. The complaint alleged that Licensee was operating the project in such a manner, with respect to flow releases, that it was violating the terms of its license by causing wild and rapid fluctuations in water levels downstream from the project.

The Blenheim-Gilboa Project No. 2685, which was licensed by a Commission order on June 6, 1969, is located on Schoharie Creek, a tributary of the Mohawk River, in the Towns of Gilboa and Blenheim, in Schoharie County, New York. Operations began in July of 1973.

The source of water for Project No. 2685 is Schoharie Creek. Directly upstream from the project is the Gilboa Dam of the Schoharie Reservoir which serves as a source of water supply for New York City.1/ The Gilboa Dam contains an uncontrolled spillway and no outlet gates or valves to control

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1/ The Gilboa Dam and Schoharie Reservoir is not a waterpower project and is not licensed by this Commission.

releases of water. Therefore, during the winter there is usually uncontrolled spill over the Gilboa Dam into Schoharie Creek. In the summer, there is little or no spill over the Gilboa Dam, so the inflow to the project is only from the 40 square miles of drainage area below Gilboa Dam. According to available records this inflow with no spill from Gilboa Dam has fallen to below 1 cfs.

The Blenheim Gilboa pumped storage project is basically a closed system, that is, after the upper and lower reservoirs have been filled to meet the capacity requirements of the project, no additional water is required on a continual basis, except for small amounts needed to replenish whatever water is depleted from the system by means of evaporation, minor seepage losses, or operating releases.

In accordance with Section 1.6 of our Rules of Practice and Procedure and the Federal Power Act, a copy of the complaint was transmitted to the Licensee for comment. The Licensee responded, denying the Complainants' allegations. Public notice of the aforementioned complaint was issued on June 5, 1974, with July 22, 1974, being the last date to file protests or petitions to intervene. On June 19, 1974 the Schoharie Valley Environmental Conservation Association filed a timely petition to intervene, which we granted on July 26, 1974.

On June 25, 1974, we issued an order granting a hearing in this matter because of the unresolved factual issues arising from the complaint. In the filing of its testimony prior to the hearing, the Licensee submitted a new plan of operation for the project with regard to controlling and monitoring flow releases.

At the hearing which was held in Albany, New York on August 5, 1974, the Licensee's testimony and exhibits were made a part of the record, and the Complainants stated that if an operational plan for the project, as indicated in the Licensee's testimony, would be implemented that this would, in effect, satisfy their complaint. Complainants then stated, pursuant to Section 1.18(e) of the Commission Rules of Practice and Procedure, that they were of the opinion that a settlement agreement could be effected in this matter. The Licensee was in agreement. The Commission Staff indicated that it did not object. The Presiding Administrative Law Judge directed that the Complainants and Licensee file a fully executed settlement agreement on or before September 16, 1974. An extension of time

for the filing was thereafter granted. On October 2, 1974, the aforesaid agreement was filed, and was certified by the Presiding Administrative Law Judge to the Commission on October 4, 1974. Notice of the certification of the settlement agreement to the Commission was issued on November 14, 1974, with December 13, 1974, being the last date to file protests or comments. One timely letter of comment was received on December 11, 1974.

The proposed settlement agreement would resolve all issues in this proceeding.

Details of the settlement agreement, which is basically a water management plan for operation for the project, may be summarized as follows:

The objectives are basically to prevent floods and fluctuations downstream from being more severe than they would be without the project and to maintain low flows as nearly as practicable to what they would be without the project. Generally these objectives can be met by keeping the total water in the upper and lower reservoirs virtually constant. Downstream releases from the lower reservoir of the project are by two means. Small flows are released through two valves which will pass up to 400 cfs each. Larger flows are released through three taintor gates.

In order to maintain constant reservoir volume, flows into the lower reservoir must be accurately determined. Over any period of time the inflow to the reservoir system must equal the outflow during the period plus the change in the volume of stored water plus evaporation and seepage losses. Capacity tables are available to determine the change in storage volume, and this method is currently in use. It is, however, subject to error for short time intervals if there are rapidly changing inflows. A second method which Licensee has recently adopted is to measure inflow directly before it enters the reservoir system by means of gages on Schoharie Creek and the main tributaries. This method is accurate for short intervals and during rapidly changing flow conditions, while the volumetric method is more accurate over longer periods. Both methods will be used by Licensee, and eventually the second will be aided by use of a small digital computer to automatically calculate and record reservoir inflows, outflows,

and storage volumes, as well as gate and valve position changes whenever necessary.

However, even after the computer becomes operational, the operator will set the outflow control works. The outflow is a function of the gate and valve positions and the lower reservoir elevation. Instrumentation enables the operator to determine rapidly and accurately the gate or valve settings required to release the proper outflow. The overall operating plan used relates generally to flood flows, moderate flows, and low flows.

A flood period is one when Schoharie Creek downstream from the project exceeds normal bank full stage (about 10,000 cfs). To maintain constant total reservoir volume during the rising flood inflows, the average outflow for a given period of time must approximatley equal the average inflow during that period. By making gate changes small and the setting periods short, outflow will closely follow inflow. Also, when these inflows initially exceed valve capacity, valves will be closed gradually and the gates opened gradually to prevent any sudden large change in outflow.

Moderate flow periods occur when the Gilboa Dam is spilling water and/or a rainstorm is in progress. Inflow is reasonably uniform and downstream flow is expected to remain within the channel banks. Outflow will be adjusted as often as necessary to maintain balanced inflow and outflow. If corrections are needed to return the reservoirs to the desired content, they will be spread over at least 24 hours to minimize downstream flow fluctuations.

Low flows are periods when Schoharie Reservoir is below spillway crest and there is no storm runoff. Generally, low flows are within the capacity of the valves in the lower reservoir dam. Inflow will be calculated at least once every 8 hours and any adjustments will be spread over a 24 hour period. When the flow at the North Blenheim gauging station is less than 5.0 cfs, the net reservoir evaporation will be withdrawn from reservoir storage and released downstream. This will result in flows comparable to those which would have occurred if the project had not been built.

Regardless of these various flow conditions, fluctuation in outflow will be controlled and minimized to the extent practicable. Since the low level outlet valves afford more

precise control of outflows than the gates, valve control will be employed during moderate and low flow periods until required outflows exceed valve capacity (800 cfs). During high flow periods, the primary consideration will be to match outflow with inflow. Needless fluctuation downstream will be avoided by use of frequent small gate adjustments.

The Settlement Agreement also provides, as requested by Complainants, that records of inflow and outflow at the project will be made available at the office at the powerhouse in Schoharie County and at the office at 10 Columbus Circle in New York City.

Turning now to the single letter of comment on this proposed settlement agreement, we can summarize its basic criticisms as follows: (1) No mention of a specified minimum release occurs in the Settlement Agreement even though the Licensee is fully aware of its desirability; (2) Attempting to match inflow and outflow during summer months is not practical, particularly when no allowance is made for seepage losses; (3) No allowance has been made for the 10-12,000 cfs entering the lower reservoir during maximum power generation. Licensee responded to these criticisms and further explained the Settlement Agreement by letter dated February 4, 1975.

The reason for the lack of a provision regarding minimum releases in the proposed Settlement Agreement is the small drainage area (40 square miles) that serves Project No. 2685 below Gilboa Dam. Gilboa Dam and Schoharie Reservoir divert substantial amounts of water from the Schoharie Creek watershed for use by New York City. The level of water in Schoharie Reservoir is generally below the crest of Gilboa Dam during the summer, fall and early winter months. Thus, the only inflows to Project No. 2685 at these times come from its limited drainage area and Licensee states "it was not practicable to design the [project] to provide for minimum releases in excess of the inflow during low flow periods." As summarized above, when the outflow is less than 5 cfs, the water management plan does provide for the release downstream of an additional volume of water equal to the net reservoir evaporation. This resulting flow would equal the flow which would have occurred if the project had not been built.

With regard to seepage losses, Licensee reports that "[a]ll tests and observations made to date indicate that there

is no substantial seepage from the upper reservoir." Generally, seepage losses from the lower reservoir would augment downstream flows.

The final criticism is that no allowance has been made in the Settlement Agreement during flood flows to provide for the 10-12,000 cfs entering the lower reservoir during maximum power generation. This criticism ignores the fact that the project is basically a closed system, as stated earlier, and thus the amount of total water in the two reservoirs remains generally constant. Water will not be released from the upper reservoir unless there is adequate storage space in the lower reservoir. Licensee states: "In fact, during a flood period it is probable that some portion of the inflow will be stored in the reservoir system. This excess water will not be released until the flood has subsided."

Although the fully executed agreement should resolve the outstanding issues of this proceeding, the total effect of the operating plan will not be known or available for evaluation until a sufficient period of project operation has been recorded.

Control of downstream releases should also be contingent upon a detailed evaluation of the project's fisheries and environmental aspects. These features are currently under Commission Staff review as part of the Licensee's application for approval of Exhibit S for the Blenheim-Gilboa Project.

Based upon our review of the settlement agreement, the comments responding thereto, and the record as a whole, it appears that the settlement agreement adequately resolves the issues raised by the filings and is in the public interest and should therefore be approved and made effective as hereinafter ordered and conditioned. The criticisms in the single letter of comment have been fully answered and do not alter our conclusion that approval of this agreement is in the public interest.

The Commission finds:

The Settlement Agreement, as executed between the Towns of Fulton and Blenheim (Complainants) and Power Authority of the State of New York (Licensee) is reasonable and appropriate and in the public interest in carrying out the provisions of the Federal Power Act and should be approved as hereinafter ordered.

The Commission orders:

(A) The Settlement Agreement certified to us by the Presiding Administrative Law Judge is incorporated herein by reference, and is hereby approved.

(B) This order is without prejudice to any finding or orders which have been made or which will hereafter be made by the Commission, and is without prejudice to any claims or contentions which may be made by the Commission, its staff, or any party or persons affected by this order, in any proceeding now pending or hereafter instituted by or against Power Authority of the State of New York or any person or party, except as provided in the settlement agreement.

(C) The Secretary shall cause prompt publication of this order in the Federal Register.

By the Commission.

(S E A L)

Kenneth F. Plumb,
Secretary.

UNITED STATES OF AMERICA
BEFORE THE
FEDERAL POWER COMMISSION

September 18, 1974

In the Matter of:	)	
	)	
POWER AUTHORITY OF THE STATE OF NEW YORK	)	Project No. 2685
	)	

SETTLEMENT AGREEMENT

The Towns of Fulton and Blenheim, New York (Complainants), filed a complaint on November 5, 1973 alleging that Power Authority of the State of New York (Authority) Licensee for the Blenheim-Gilboa Pumped Storage Project No. 2685 (Project) appeared to be violating the terms of its license with respect to releases of water from the lower reservoir of the Project located on Schoharie Creek and, in particular, had caused wild and rapid fluctuations in water levels in Schoharie Creek downstream from the Project lower reservoir. Subsequently, Complainants alleged that such fluctuations occurred during a flood on December 21, 1973 and during other days in November and December 1972, in April, May, June and July 1973 and April 1974 as set out in Complainants' letter of July 15, 1974 addressed to the Presiding Law Judge. By order issued June 25, 1974 a hearing was scheduled on the complaint to be held in Albany, New York on August 5, 1974.

At the hearing the Authority presented testimony and exhibits of Russell W. Revell, Chief Hydrologist, Harza Engineering Company, Chicago, Illinois, who was retained by Authority to investigate the complaint, to determine whether fluctuations occurred as alleged by Complainants and to make recommendations for improving the operation at the lower reservoir dam.

Mr. Revell's testimony indicated the extent of and the hours during which flood flows from the Project lower reservoir exceeded the flood flows into that reservoir on

December 21, 1973, and indicated the extent to which the flows downstream from the Project lower reservoir fluctuated on the days specified by the Complainants and the reasons for such fluctuations.

Mr. Revell recommended that in addition to the gages and other devices already installed or being installed under agreements with the United States Geological Survey, the Authority should install a water stage recorder at the Gilboa Highway Bridge on Schoharie Creek immediately downstream from Gilboa Dam to continuously report to the Control Room water level stages to the nearest one-hundredth of a foot.

In addition, Mr. Revell made recommendations regarding the processing of the data provided by the several gages and regarding the implementation of operating decisions.

John R. Davison, Associate General Counsel of the Authority, testified that the Authority would carry out the recommendations by Mr. Revell as set forth in his testimony.

Those recommendations are being implemented by the Authority and are reflected in the Operating Plan for Water Management dated September 18, 1974, attached hereto and incorporated herein as a part of this Settlement Agreement.

At the hearing it was suggested by Counsel for Complainant that this proceeding might be concluded by a Settlement Agreement in which the Authority would set forth its operating plan based on Mr. Revell's recommendations and would make available for public inspection sufficient records to enable Complainant and others to determine from time to time the flow into and the flow from the Project.

Documents recording the inflows and outflows are available at the office of Authority at the powerhouse of the Project and at Authority's office at 10 Columbus Circle, New York, New York.

The parties to this proceeding agree that upon execution of this agreement, which includes the attached Operating Plan for Water Management, by Counsel for the

Authority and Counsel for Complainants and upon approval by the Federal Power Commission this proceeding shall be concluded.

Power Authority of the State
of New York

By _____
Scott B. Lilly
General Counsel

Town of Fulton, New York
Town of Blenheim, New York, and
Schoharie Valley Environmental
Conservation Association

By _____
Robert J. Kafin
Their Attorney

Attachment:
Operating Plan for Water Management - September 18, 1974

UNITED STATES OF AMERICA
BEFORE THE
FEDERAL POWER COMMISSION

September 18, 1974

In the Matter of:	)	
	)	
POWER AUTHORITY OF THE STATE OF NEW YORK	)	Project No. 2685
	)	

OPERATING PLAN FOR WATER MANAGEMENT

1.0 Introduction

The Federal Power Commission license for Project No. 2685 states that "Licensee shall operate project reservoirs in such a manner that releases from the lower reservoir during flood flows shall be no greater than flows which would have occurred in the absence of the project."

The Blenheim-Gilboa Pumped Storage Power Project (Project) is basically a closed system. It is neither a flood control nor a water supply facility. Once the reservoirs have been filled with the required volume of water in active storage, no further water is required to be added to the system except to compensate for minor seepage and evaporation losses or to compensate for prior downstream releases from system storage.

2.0 Objectives

The objectives of water management operation are: (1) to prevent floods downstream from the lower reservoir dam from being more severe than they would be without the project, (2) to maintain low flows as nearly as practicable to what they would be without the Project, and (3) to keep fluctuations in downstream flow from being more severe than they would be without the Project. In general, these objectives can be met by keeping the total content of the two Project reservoirs virtually constant.

In some cases it may be possible to slightly improve flow conditions downstream. Because the total content of the Project reservoirs can only vary a small amount, improvement in flow conditions can never be substantial and under no conditions can improvement be assured.

3.0 Collection and Processing of Hydrologic Data

The inflow will be determined by two different methods. Over any period of time the inflow to the reservoir system must equal the outflow during that period plus the change in the volumes of stored water plus evaporation and seepage losses. Capacity tables showing the volume of water in each reservoir are now available to determine without interpolation the change in storage volume. This is the method that is presently in use. Because of the size of the storage reservoirs this volumetric approach is subject to error for short periods if the flow into the Project is changing rapidly. During floods the error is small compared to the total inflow. The inflow calculated under this method is really an average during the interval between two previous volume measurements. The method does not provide instantaneous inflow values.

The second way to determine inflow is to measure it directly before it enters the reservoir system. This method provides the inflow directly and instantaneously by converting water level at selected gaging stations to flow and then adding all such flows together. The total inflow can then be determined with an accuracy nearly comparable to that of the gages used to measure its components. To this end, continuous recording stream gages are being installed on the Platter Kill, Mine Kill and on Schoharie Creek at Gilboa Bridge. The gage elevations will be telemetered to the Control Room and displayed on adjacent strip chart recorders. United States Geological Survey rating tables will be used to convert these elevation data into discharges. This information will be current and the instrumentation designed to supply it will be reliable and accurate. The total instantaneous inflow rate to the Project lower reservoir will be determined by applying a multiplication factor to the sum of the Platter Kill and Mine Kill discharges to account for the ungaged drainage area and then adding the discharge measured at the Gilboa Bridge gage. This method for calculating inflows is more accurate for short periods and during rapidly changing flow conditions but the volumetric method described above is more accurate over long periods of time.

To insure accurate determination of inflow, both volumetric and direct inflow measurement procedures will be used. The water management data sheets presently in use are based upon the volumetric approach. These will be revised to facilitate direct manual recording of inflow data. The frequency at which the calculations must be made will depend upon the prevailing flow conditions as described below. Minor adjustments to the calculated inflows will be made as required to rectify inconsistencies between the volumetric and direct methods.

Additional hydrologic data necessary during high flow periods include the elevation of Schoharie Reservoir and discharge of Schoharie Creek at Prattsville which represents about three fourths of the flow into the Schoharie Reservoir. Simple tables will be developed which will indicate the rate of flow into Schoharie Reservoir and predict the time at which it will begin to spill based upon the elevation and flow data. This will provide some advance warning to the operators of impending flood flows. The Schoharie Reservoir elevation recorder presently in the Control Room will also be used to determine the discharge over the Gilboa Dam. The quantity thus calculated will serve as a backup for the Gilboa Bridge gage which measures most of the inflow during flood periods but will be less accurate than the Bridge gage.

The data collection procedures described above are necessarily tedious, repetitive and subject to human error. They are ideally suited for implementation by a small modern high speed digital computer. Specifications are presently being developed for such a computer which will be installed to automatically calculate and record reservoir inflows, outflows and storage volumes. Based on these calculations the computer will record the gate and valve position changes whenever and as often as such changes are necessary.

4.0 Operating Procedures to Control Outflows

Even after the computer becomes fully operational, the setting of the outflow control works will be executed by the operator. He will manually implement the changes and monitor the computer's instructions by means of independent manual calculations. The outflow rate is a function of the gate and valve positions and the lower reservoir elevation. A series of computer generated tables has recently been completed which allows the operator to determine without interpolation of data the gate or valve settings required to

release the proper outflow. Instrumentation now in the Control Room enables the operator to effect the proper control works adjustments rapidly and accurately. The operating plan which will be used to determine the proper outflows for the full flow range is described below. For ease in implementing the plan, it is divided into separate sections for (1) flood flows, (2) moderate flows and (3) low flows.

4.1 Flood Flows

A flood period is defined as a period when Schoharie Creek downstream from the Project exceeds normal bank full stage, approximately 10,000 cubic feet per second (CFS).

Flood operation procedures will commence whenever the National Weather Service bulletins or precipitation data at the weather station at the Lansing Manor Complex or at the non-recording gauge at Windham, New York, indicate the possibility of flood flows. Rapid rise in the elevation of Schoharie Reservoir or in the discharge of Schoharie Creek at Prattsville will also serve as a flood forecast.

When the flood inflow exceeds the capacity of the valves in the Project lower reservoir dam, they will be closed gradually and the gates opened gradually to prevent any sudden large change in outflow. Thereafter, during the period of increasing inflow, the gate openings will be increased frequently, as often as every five minutes, if necessary, so that outflows will approximate inflows as closely as possible.

To maintain a constant total volume in the two Project reservoirs during the rising limb of a flood, the average outflow during any particular gate setting must equal the average inflow during that period. Therefore, it will be necessary to estimate the inflow for the duration of a particular gate setting and set the gate openings to release this quantity. Therefore, at the beginning of a particular gate setting period, the outflow will be slightly greater than the inflow. The gate setting will be maintained until the inflow exceeds the outflow by a sufficient amount to make the average inflow and outflow for the periods equal or, if the peak has been reached, until the inflow begins to decline. By making the gate changes small and the gate setting periods short, the outflow will follow the inflow closely.

4.2 Moderate Flows

During moderate flow periods herein defined as periods when the Gilboa Dam is spilling water and/or a rainstorm is in progress, inflow is reasonably uniform and downstream flow is expected to remain within the channel banks, the reservoir control works will be operated such that only a very small amount of surplus water volume is stored in the system. During such periods, direct measure of inflow will be recorded hourly. Outflow will be adjusted as often as necessary to maintain balance between inflow and outflow. Inflow will also be calculated each hour based on storage volume changes to check the accuracy of the direct measure.

Outflow will not be changed on the basis of a small change in computed inflow or volume. If the change is significant, or if several consecutive determinations verify the change, then steps will be taken to return the reservoirs to the desired content. The correction will be spread over a period of at least twenty-four hours to minimize the downstream flow fluctuation.

4.3 Low Flows

See Attached §4.3

~~Low flow periods are defined herein as periods~~ when Schoharie Reservoir is below spillway crest and there is no storm runoff. In general, low flow will be well within the capacity of the vales in the Project lower reservoir dam. During such periods, outflow will be set equal to the previously determined multiplier times the sum of Platter Kill and Mine Kill recorded flows as determined by the instrumentation to be installed in the Control Room. The inflow will be calculated and recorded and adjusted, if necessary, at least once during each eight-hour shift. Adjustments will be made when it is apparent that the total reservoir volume is either increasing or decreasing. Adjustment corrections will be spread over a period of at least twenty-four hours to minimize the downstream flow fluctuation.

When the flow at the North Blenheim gauging station is less than 5.0 cfs, the net reservoir evaporation will be withdrawn from reservoir storage. Therefore, the Project will not decrease the very low flows of Schoharie Creek. The net evaporation will be taken to be:

May	0.5 cfs	September	0.5 cfs
June	0.6 cfs	October	0.3 cfs
July	0.7 cfs	November - April	0.2 cfs
August	0.6 cfs		

The stored water released to compensate for net evaporation may be restored during any period when the replacement does not cause the flow at the North Blenheim gauge to be less than 5.0 cfs.

4.4 Outflow Fluctuations

Regardless of the prevailing flow conditions, fluctuation in outflow will be carefully controlled and minimized to the extent practicable. To this end, during low and moderate flow periods, as defined above, no single valve or gate adjustment shall cause a change in the water surface elevation or Schoharie Creek as measured at the North Blenheim gauging station which exceeds 0.5 foot. Based on the USGS Rating Table for the North Blenheim gauge, dated October 12, 1972, the maximum flow adjustment in cfs for various flows would be as follows:

	New Flow	
Old Flow	Maximum	Minimum
1.3	14	0
9.9	43	1
53	130	14
110	230	43
200	370	93
505	790	292
1000	1440	670
2400	3020	1840
4900	5925	4030
8000	9500	6600
10600	12650	8900

Of course, the interval between successive gate settings will be governed by the inflow conditions.

Since the low level outlet valves afford more precise control of outflows than the gates, valve control will be employed in moderate and low flow periods in preference to gate control until the required outflows exceed the capacity of the two valves which is approximately 800 cfs. At such times the valves will be closed gradually with each reduction coincident with an equal increase in gate flow.

During high flow periods, the primary consideration will be to match outflow and inflow. It is not practical to apply a fixed rate of change limit to outflows since inflow could increase at an even faster rate. Needless fluctuation will be avoided by means of frequent small gate adjustments in preference to fewer large adjustments. When more than one gate opening must be changed to pass the required flow, only one gate is to be changed at a time with at least a five-minute delay before the next gate is changed. During periods of very rapidly increasing inflows, this delay can be reduced to one minute, if necessary, to balance inflow and outflow.

The procedures outlined in Section 4 are intended to apply for the full range of hydrologic conditions expected in the Schoharie Valley. Discretion will always be necessary in applying these guidelines since flow patterns not yet anticipated or experienced could occur. The procedures may be revised and refined as experience is gained in their application.

This Language Would be Substituted for
The Existing Language of Section 4.3 of the
Operating Plan for Water Management

4.3 Low Flows

Low flow periods are defined as periods when there is no flow past Gilboa Dan and there is no storm runoff. Whenever the water storage capacity of the project is filled, outflow will be set equal to the previously determined multiplier times the sum of Platter Kill and Mine Kill recorded flows.

During low flow periods a minumum release through the Project low level outlet of 10 cfs will be maintained whenever the amount of makeup water in storage is greater than 1500 acre-feet. When the amount of makeup water in storage is less than 1500 acre-feet, a minimum release of 7 cfs will be maintained subject to the following limitations:

a. during the period from March 15 to July 15, outflow will be set equal to the previously determined multiplier times the sum of the Platter Kill and Mine Kill recorded flows; and

b. during the period July 16 through March 14, the quantity of water which will be withdrawn from storage to augment inflow will be the difference between a 7 cfs outflow from the project and the previously determined multiplier times the sum of the Platter Kill and Mine Kill recorded flows, provided, however, that the amount of water available for

augmentation during any 7-day period commencing at 8:00 a.m., Monday morning will not exceed the amount of makeup water available in the system at 8:00 a.m. Monday in excess of the required makeup water for that date from the curve attached hereto as Exhibit A.

Storage of makeup water, if required, may take place when inflow exceeds the required minimum release.

The inflow will be calculated and recorded at least once during each eight-hour shift. The low level outlet will be operated to release the required outflow on an average daily basis.

Makeup water is needed by the project to replace, during low flow periods, losses from evaporation, seepage, or other causes. The amount of makeup water in the system is defined as the amount of usable water in the system in excess of the usable storage capacity of the lower reservior between EL860 and EL900. The usable storage capacity of the lower reservoir is approximately 12,700 acre-feet and the makeup water storage capacity is approximately 2300 acre-feet.

EXHIBIT A

Working Curve of Make-Up Storage