VII - WATER CONTROL PLAN

7-01. General Objectives. Lake Shelbyville is a flood control reservoir with multiple purposes. The purposes include: flood control, recreation, navigation, water quality, fish and wildlife conservation and water supply.

7-02. Constraints. The downstream channel capacity restricts non-damaging releases to 1,800 cfs or less during growing season while the pool is below 610.0 feet NGVD. Roads downstream of the project, used by school buses, are inundated at flows greater than 4,000 cfs.

7-03. Overall Plan for Water Control.

a. Overall Plan. Lake Shelbyville is operated utilizing guide curves (PLATE 6-1) that were developed to provide flood control benefits and other project objectives. All project objectives are benefited to some degree by regulating the reservoir elevations using the guide curves.

All dates contained within this plan have an allowable variance of plus or minus 14 days. All elevations that pertain to regulation guidelines have a variance of plus or minus 0.5 feet with two exceptions. The variance does not apply to elevations below winter guide curve (594.0 feet NGVD) and above the top of the flood control pool (626.5 feet NGVD).

The Chief of Water Control Operations is responsible and has authority for all water management decisions other than those listed in 7-15. He/she may designate others with this authority either in whole or part.

1. Growing Season. Growing season shall be considered to exist from May 1st to November 1st, but may vary depending on seasonal conditions. Beginning May 1st, the guide curve (PLATE 6-1) elevation is raised from 596.0 feet NGVD to 599.7 feet NGVD. The rate at which the guide curve elevation is reached is dependent on weather conditions and the overall assessment of the Chief of Water Control Operations.

Downstream conditions should be evaluated to determine the maximum rate of release that would be non-damaging (normally less than 1,800 cfs). The release rate may be increased at a rate (normally not to exceed 500 cfs per day) considered appropriate for overall conditions. The maximum rate of release is dependent on many factors including, but not limited to, rate of inflow, pool elevation, downstream flows and weather forecasts. Release rates should not be increased to a level that would require a rapid reduction in flows when the guide curve elevation (PLATE 6-1) is reached. When release rates are reduced too quickly, bank sloughing may occur. TABLE 6-5, the Table of Critical Releases, may be used as a guide for the recommended maximum daily cutbacks.

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Releases are limited to 1,800 cfs for a pool elevation not exceeding 610.0 feet NGVD. For pool elevations exceeding 610.0 feet NGVD, PLATE 6-4 will be used as a guide for the release rate. In general, the release rate should increase as the pool elevation increases reaching a maximum rate of 4,500 cfs at elevation 626.5 feet NGVD. Cutbacks or increases in releases from that shown as a guide on PLATE 6-4 are allowed at the discretion of the Chief of Water Control Operations based on downstream tributary flows and overall conditions while the pool elevation is less than 614.8 feet NGVD (1/2 flood control storage utilized). However, the intent is for the releases to increase as the pool elevation increases above 610.0 feet NGVD and any deviations from PLATE 6-4 should result in no increase in crest elevation or duration above 610.0 feet NGVD.

2. Dormant Season. Dormant season shall be considered to exist from November 1st to May 1st, but may vary based on seasonal conditions. During this period, the release rate may reach the maximum of 4,500 cfs independent of pool elevations. Downstream roads may be taken into consideration to limit releases below 4,000 cfs at the discretion of the Chief of Water Control Operations. TABLE 6-5, the Table of Critical Releases, may be used as a guide for the recommended maximum daily cutbacks. On December 15th, the guide curve elevation is lowered from 599.7 feet NGVD to 594.0 feet NGVD. The rate of release to accomplish the drawdown shall take into account many factors including, but not limited to, pool elevation, reservoir inflow, downstream tributaries, and temperature outlook. Releases from the project may be adjusted to lessen the impacts of ice upstream and downstream of the project. On April 1st, the guide curve (PLATE 6-1) elevation is raised from 594.0 feet NGVD to 596.0 feet NGVD.

3. Gate Setting Recommendations. Normally the sluice gates are used for releases up to a rate of 4,500 cfs. It is best to release equal amounts through each of the two sluice gates or three tainter gates (when used). (See Gated Sluice Rating Curve, PLATE 6-5 or Spillway Tainter Gate Rating Curves, PLATES 6-6 and 6-7).

b. Water Control Plan for Low Flow Regulation. A minimum release of 10 cfs will be maintained at all times for water quality purposes. Releases can be supplemented to provide adequate water for navigation on the Lower Kaskaskia and/or Middle Mississippi Rivers when natural downstream flow is insufficient. Detailed procedures for determining these releases are presented in the Kaskaskia River Navigation Project, Appendix C, Master Reservoir Regulation Manual.

PROPOSED

When the pool elevation is less than 599.7 feet NGVD, a detailed accounting of water quality releases, water supply withdrawals, reservoir inflow, precipitation on reservoir surface, and evaporation from reservoir surface is required. The Water Control Office is responsible for this low flow accounting. The productivity of the joint-use storage allocations will be shared between the Federal Government and the State of Illinois based on the proportionate shares in joint-use storage allocations. At no time, however, shall either joint-use water account exceed its allocated storage. Water in excess of the allocated storage shall be credited to the other joint-use account if available storage still exists. The proportionate shares shall be as follows for Lake Shelbyville:

Total joint-use storage (acre-feet)	180,000.0
Federal storage (acre-feet)	155,000.0
Federal proportion (percent)	86.1
State of Illinois storage (acre-feet)	25,000.0
State of Illinois proportion (percent)	13.9

c. Water Control Plan for Surcharge Regulation (Pool above 626.5 feet NGVD). In the event that the pool elevation exceeds 626.5 feet NGVD (all flood control storage has been utilized), it will be necessary to increase the release rate above 4,500 cfs up to the spillway capacity. Reservoir regulation curves (PLATES 4-7) are provided for determining release rate versus pool elevation and inflow rate.

7-04. Standing Instructions to Reservoir Personnel. Standing instructions to the reservoir personnel are given in EXHIBIT B.

7-05. Flood Control.

a. Objectives. The objective of flood control is flood damage reduction downstream of the project. Flood damage reduction benefits extend to that portion of the Middle Mississippi River Basin located between Chester, Illinois and Cairo, Illinois, as well as the Kaskaskia River Basin downstream of the project.

b. Regulation Procedure. Between November 1st and May 1st, overtopping of the downstream low flood plains is permitted to provide maximum flood storage when the planting season arrives. During this period, releases up to a maximum rate of 4,500 cfs may be made. On May 1st, a higher level of flood protection is provided to downstream interests until the pool elevation exceeds 610.0 feet NGVD. Thereafter, releases are increased using PLATE 6-4 as a guide to attempt to balance the impacts to other project purposes. Cutbacks or increases in releases from that shown as a guide in PLATE 6-4 are allowed at the discretion of the Chief of Water Control Operations based on downstream tributary flows and overall conditions while the pool elevation is less than 614.8 feet NGVD (1/2 flood control storage utilized). However, the intent is for the releases to increase as the pool elevation increases above 610.0 feet NGVD and any deviations from

PROPOSED

PLATE 6-4 should result in no increase in crest elevation or duration above 610.0 feet NGVD. Cutbacks may be necessary to balance the flood control storage utilized at Carlyle Lake with Lake Shelbyville. See section 7-03 for further details on flood damage reduction guidelines.

c. Project Office Procedures. Procedures followed by the Lake Shelbyville Project office during flood conditions are located at the Lake Shelbyville Project office.

7-06. Recreation.

a. Objective. To provide the best possible water conditions to support recreational activities such as boating, swimming, fishing, hunting, camping, etc. consistent with the procedures outlined in 7-05.

b. Regulation Procedures. The Water Control Management Office utilizes the guide curves to regulate the project. During the crop season PLATE 6-4 is used as a guide for releases when the pool exceeds 610.0 feet NGVD so as to reduce the negative impacts of high water on recreation. The Chief of Water Control Operation may choose to adjust the date, within the allowable variance (+/- 14 days), of winter drawdown to enhance the water fowl season after due consideration of all projects purposes.

c. Constraints. High water may cause the temporary halt to various recreational activities. An extremely dry year may cause pool elevations to be low enough to hinder recreational activities.

7-07. Water Quality.

a. Objective. Water quality releases of a minimum of 10 cfs are made to maintain the Dissolved Oxygen (DO) levels and enhance downstream river conditions.

b. Regulation Procedures. State standards are DO levels of 5 ppm or higher. The minimum discharge may be raised regardless of pool levels if necessary to meet state DO standards.

c. Constraints. Thermal stratification of the lake during the summer months may cause dissolved oxygen levels to fall below minimum standards in the hypolimnion. Hydrogen sulfide can be released during discharge of low dissolved oxygen water. Monitoring is increased when this condition occurs, due to the possibility of a fish kill.

PROPOSED

7-08. Fish and Wildlife.

a. Objectives. Fish and wildlife conservation is one of the objectives in the regulation of the project. The Water Control Office coordinates with the fisheries biologists from the Illinois Department of Natural Resources to provide optimum fish spawning conditions each spring.

b. Regulation Procedures. The Water Control Management Office utilizes the guide curves (PLATE 6-1) to regulate the project. The Chief of Water Control Operations taking into account all project purposes, hydrologic conditions and weather forecast may attempt to moderate pool fluctuations during critical fish spawn periods when the pool is below 602.0 feet NGVD.

c. Constraints. Stabilizing pool elevations for enhancement of fish spawn could have a negative impact on flood control, recreation and other fish and wildlife purposes of this project.

7-09. Water Supply.

a. Objective. The State of Illinois has contracted with the United States Government for joint use water to be utilized as water supply (see EXHIBIT E).

b. Regulation Procedure. The State of Illinois shall provide a written request to the Water Control Management Office for water to be taken from the State water supply account. All water taken directly from the reservoir shall be metered and a monthly accounting forwarded to the Water Control Office which will maintain records of joint use storage water released through the spillway gates in addition to the metered readings.

7-10. Hydroelectric Power. Hydroelectric Power is not a Congressionally authorized purpose of this project. There is currently no hydroelectric facility at the Lake Shelbyville Dam. Future plans may lead to the conversion of the dam to hydroelectric.

7-11. Navigation. Joint use water from Carlyle Lake and Lake Shelbyville is designated for the purpose of maintaining navigation on the Kaskaskia Navigation Project and the Middle Mississippi River between Chester, Illinois and Cairo, Illinois. Joint use water may be released from Lake Shelbyville into Carlyle Lake to balance navigation storage available in each project. The decision to release water for the navigation project purpose will be made by the Chief of Water Control Operations.

7-12. Drought Contingency Plan. The Lake Shelbyville Drought Contingency Plan is given as ADDENDUM 2.

PROPOSED

7-13. Flood Emergency Plan. The purpose of a flood emergency plan is to present procedures to be taken in the event of flood emergencies. The procedures are intended to provide safety to the public and other affected individuals. The Flood Emergency Plan is updated periodically by the Lake Shelbyville Project Office. Copies of the Plan should be located in the Water Control, Emergency Operations and Lake Shelbyville Project Offices.

7-14. Deviation From Normal Regulation. At times, engineering judgment, engineering experience and prevailing circumstances may require varying from the Water Control Plan. The USACE EM No. 1110-2-3600, Management of Water Control Systems, states that any decision to depart from specified criteria (i.e., the Water Control Plan) must be approved by the Division Commander. This EM further states that any such decision must be based upon a thorough knowledge of both current conditions and management goals as specified in the USACE ER No. 1110-2-240, Water Control Management. The MVD DIVR 1110-2-240, Preparation of Water Control Plans and Manuals, states that the MVD Commander must approve temporary deviations to the Water Control Plan. The MVD Water Control Senior Leader, acting as Commander's agent, may approve minor deviations. The MVD Engineering Division Chief, action as the Commander's agent, must approve major and significant deviations. A request for a temporary deviation must include the following information:

1) A justification for the requested deviation;
2) The implications of adhering to the Water Control Plan and of employing the requested deviation:
3) The benefits of employing the requested deviation;
4) Assurance that the deviation request has been coordinated with affected parties.

The CEMVS Commander must seek, and must receive, approval from the MVD Commander (except as noted in 7-15a) before a deviation can be implemented. Only the Chief of the Water Control Management Office, or those he designates, are authorized to be the agents of the CEMVS Commander in deviating from the Water Control Plan during emergencies (as described in 7-15a) or in making requests for deviations to the Water Control Plan.

a. Emergencies. Under emergency conditions, the CEMVS Commander may deviate from the Water Control Plan without prior approval from the MVD Commander. Water control actions necessary to abate the problem are taken immediately. This authority does not include conditions for which deviation from the Water Control Plan would create a problem of equal or greater magnitude than the deviation is intended to remedy. The CEMVS Commander must inform the MVD Commander by phone and in writing about the deviation, and the reason for employing it, as soon as possible.

PROPOSED

Emergency hazardous spill response procedures are outlined in DR 500-1-4 (Contingency Plan). CEMVS-EC-HQ must be contacted for assistance in an emergency that could affect the environmental stability of Kaskaskia Navigation pool, of the Kaskaskia River and surrounding area.

b. Unplanned Minor Deviations. There are non-emergency situations, which create the need for an unplanned, minor deviation to the Water Control Plan. For these instances, each request for a deviation from the St. Louis District's Commander to the Mississippi Valley Division's Commander must be evaluated on its own merits. In requesting and in evaluating the proposed deviation, consideration must be given to watershed conditions; to potential effects and benefits of implementing the deviation; and to potential alternatives to implementing the deviation. Requests for, and approval of, these deviations will usually be made via telephone. A written request for the deviation, and written approval of the request, must be made shortly thereafter.

c. Planned Deviations. There are situations that create the need for a planned deviation to the Water Control Plan. For these instances, each request for a deviation from the St. Louis District Commander to the Mississippi Valley Division Commander must be evaluated on its own merits.

7-15. Rate of Release Changes. The release rate may be increased at a rate (normally not to exceed 500 cfs per day) considered appropriate for overall conditions. When determining decreases in release rates, TABLE 6-5, the Table of Critical Releases, may be used as a guide.

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