

# DETAILED OPERATING PLAN FOR COLUMBIA RIVER TREATY STORAGE

1 AUGUST 2004  
THROUGH 31 JULY 2005



COLUMBIA RIVER TREATY OPERATING COMMITTEE

JUNE 2004

**COLUMBIA RIVER TREATY ENTITY AGREEMENT ON THE  
DETAILED OPERATING PLAN  
FOR COLUMBIA RIVER TREATY STORAGE  
1 AUGUST 2004 THROUGH 31 JULY 2005**

Article XIV 2.(k) of the Columbia River Treaty between Canada and the United States of America (Treaty) provides that the power and duties of the Entities includes preparation and implementation of detailed operating plans that may produce results more advantageous to both countries than those that would arise from operation under the Assured Operating Plan (AOP).

The Entities agree that Treaty storage shall be operated and electric power delivered in accordance with the attached "Detailed Operating Plan for Columbia River Treaty Storage – 1 August 2004 through 31 July 2005" (2004-05 Detailed Operating Plan), dated June 2004.

The Entities agree that the November 2003 "Principles and Procedures for the Preparation and Use of Hydroelectric Operating Plans," or its successor, will guide the Entities in implementing the 2004-05 Detailed Operating Plan.

To produce the same Treaty flows at the U.S.-Canadian border as in the 2005-06 AOP, as modified by this DOP, in implementing this Detailed Operating Plan the Entities direct the Columbia River Treaty Operating Committee to execute an agreement which, for Treaty Storage Regulation purposes, shall develop and execute procedures that assure the same power operating criteria as developed in the 2005-06 AOP as modified by this DOP.

In witness thereof, the Entities have caused this agreement to be executed.

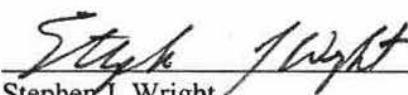
Executed for the Canadian Entity this 10<sup>th</sup> day of June, 2004.

By

  
\_\_\_\_\_  
Robert G. Elton  
Chair

Executed for the United States Entity this 25 day of June, 2004.

By

  
\_\_\_\_\_  
Stephen J. Wright  
Chairman

By

  
\_\_\_\_\_  
Brigadier General William T. Grisoli  
Member

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**DETAILED OPERATING PLAN  
FOR COLUMBIA RIVER TREATY STORAGE  
1 AUGUST 2004 THROUGH 31 JULY 2005**

**I. REFERENCES AND INTERPRETATION**

In this document:

- A. "Assured Operating Plan" (AOP06) means the document "Columbia River Treaty Hydroelectric Operating Plan - Assured Operating Plan for Operating Year 2005-06" dated August 2001."
- B. "Canadian storage" means the storage provided by Canada under Article II of the Treaty, which is a total of 19.12 cubic kilometers ( $\text{km}^3 = 10^9 \text{ cubic meter}$ ) (15.5 million acre feet (Maf)) at the Mica, Duncan, and Arrow reservoirs.
- C. "Delivery of the Canadian Entitlement" means the Entity Agreement on Aspects of the delivery of the Canadian Entitlement for 1 April 1998 through 15 September 2024 between the Canadian Entity and the United States Entity, dated 29 March, 1999, together with its Attachment B - Scheduling Guidelines as they may be subsequently modified or amended by the Operating Committee.
- D. "Detailed Operating Plan" (DOP) means a detailed operating plan prepared for the Operating Year by the Operating Committee pursuant to the guidelines provided in the Principles and Procedures and consisting of the contents of this document.
- E. "Flood Control Operating Plan" means the document "Columbia River Treaty Flood Control Operating Plan," dated May 2003.
- F. "Libby Coordination Agreement (LCA)" means the "Columbia River Treaty Entity Agreement Coordinating the Operation of the Libby Project With the Operation Of Hydroelectric Plans on the Kootenay River and Elsewhere in Canada", dated 16 February 2000.
- G. "Libby Operating Plan" means the operating plan prepared by the U.S. Army Corps of Engineers ("Corps of Engineers") on behalf of the U.S. Entity for the Libby project in accordance with Section 9 of the LCA, and incorporated as Attachment B to the LCA.
- H. "Operating Committee" means the Columbia River Treaty Operating Committee.
- I. "Operating Year" means the period from 1 August 2004 through 31 July 2005.
- J. "Principles and Procedures" (POP) means the document "Columbia River Treaty Principles and Procedures for Preparation and Use of Hydroelectric Operating Plans for Canadian Treaty Storage," dated October 2003, or any future document the Entities agree supersedes the 2003 document.

- K. "Refill Regulations" means multi-water-year hydro regulations that determine the Power Discharge Requirements used in the calculation of the Assured Refill Curves and the Variable Refill Curves. The Corps of Engineers' staff performs these regulations for the Operating Committee.
- L. "Runoff Volume Forecast Program for Canadian Columbia River Treaty Reservoirs" means the August 1997 document of that title, with subsequent modifications as agreed by the Operating Committee.
- M. "Treaty Storage Regulation" (TSR) means the Coordinated System hydro regulation study performed for the Operating Committee by Bonneville Power Administration (BPA) staff that implements the DOP operating criteria using actual and forecasted streamflow conditions.
- N. "Weekly Treaty Storage Operation Agreement" means the note electronically transferred (e-mail or Fax<sup>TM</sup>) each Friday from the U.S. Section to the Canadian Section of the Operating Committee to confirm the verbal agreement by the Operating Committee for the weekly Treaty storage changes and outflows that implement this DOP.

## **II. PREPARATION AND SCOPE**

### **A. General**

This DOP for Canadian storage is based on the operating criteria contained in the AOP06 and its supporting hydro regulation studies with agreed revisions noted in Subsection II(C) below, together with scheduling procedures and other mutually beneficial changes from the AOP data agreed to by the Entities.

This DOP incorporates the use of the International System of Units (SI, or metric); for operational purposes, reliance should be placed on measurements in the English system.

### **B. Storage Amounts**

1. The usable Canadian storage space available for power purposes during the Operating Year is 19.119 km<sup>3</sup> (15.500 Maf) in Canada distributed as follows:

#### Duncan Reservoir

1.727 km<sup>3</sup> (1.400 Maf, 705.8 thousand second-foot-days (ksfd)) between elevations 576.68 meters (m) (1892.0 feet) and 546.87 m (1794.2 feet) as measured at Duncan forebay, and based on British Columbia Hydro and Power Authority (BC Hydro) table dated 21 February 1973.

#### Arrow Reservoir

8.758 km<sup>3</sup> (7.100 Maf, 3579.6 ksfd) between elevations 440.13 m (1444.0 feet) and 419.98 m (1377.9 feet) as measured at Fauquier, B.C., and based on BC Hydro table dated 28 February 1974.

#### Mica Reservoir

8.634 km<sup>3</sup> (7.000 Maf, 3529.2 ksfd) between elevations 754.38 m

(2475.0 feet) and 707.41 m (2320.9 feet) as measured at Mica forebay, and based on BC Hydro table dated 25 March 1974. The total available storage between these elevations is 14.802 km<sup>3</sup> (12.000 Maf, 6050.0 ksfd), but only 8.634 km<sup>3</sup> (7.000 Maf, 3529.2 ksfd) of this storage is required for power purposes.

2. The requirements for flood control operations are defined in the Treaty and the Flood Control Operating Plan. In accordance with Section 6-6 of the Flood Control Operating Plan, the Canadian Entity has selected a reallocation of Mica/Arrow system flood control space to be 5.033 km<sup>3</sup> (4.080 Maf) at Mica and 4.441 km<sup>3</sup> (3.600 Maf) at Arrow for the 2004-05 Operating Year. The usable Canadian storage available for normal flood control purposes during the 2004-05 Operating Year will be 1.567 km<sup>3</sup> (1.270 Maf) in Duncan Reservoir below elevation 576.68 m (1892.0 feet), 4.441 km<sup>3</sup> (3.600 Maf) in Arrow Reservoir below elevation 440.13 m (1444.0 feet), and 5.033 km<sup>3</sup> (4.080 Maf) in Mica Reservoir. Additional storage may also be operated for flood control purposes under special circumstances, as described in Section 3-2 of the Flood Control Operating Plan.

To the extent that the flood control storage allocation differs from that included in the AOP06, the Operating Committee will develop and execute an agreement that will result in the same Treaty flows at the U.S.-Canadian border as that provided in the AOP06, as modified below, unless otherwise agreed by the Committee.

**C. Preparation of the Treaty Storage Regulation Study**

The TSR study uses DOP operating criteria for both Canadian and U.S. projects to define a Canadian storage operation. The TSR05 study shall be based on the loads, thermal and other resources, rule curves, non-power constraints, and other plant and operating data contained in the AOP06 Step I hydro regulation study (which included the Kootenay Lake 5-step logic and Brownlee operation to Coordinated System Proportional Draft Point), except for the following changes agreed to by the Entities.

1. Flood control rule curves for Canadian projects will be defined by an Operating Committee agreement as noted in subsection II(B)2 above.
2. U.S. flood control curves will include VarQ at Hungry Horse but not at Libby, and will not include shifted flood control from Brownlee and Dworshak to Grand Coulee. Flood control curves at Grand Coulee will be adjusted for additional draft below flood control levels at upstream reservoirs in accordance with the Flood Control Operating Plan. Flood control rule curves at Coeur d'Alene Lake (Post Falls) will be updated to the February 2001 Pacific Northwest Coordination Agreement (PNCA) data submittal.
3. Use of the Operating Rule Curve (ORC) for the upstream refill requirement at both Canadian and U.S. projects to calculate the variable refill curve.
4. Use of the hydro-independent generation included in the PNCA Actual Energy Regulation (AER) and the 60-year median values for hydro independents not included in the AER from the AOP06 Step I hydro regulation study.

5. Addition of a maximum January average monthly outflow limit at Arrow of 1840.6 m<sup>3</sup>/s (65,000 cfs) for the TSR only.
6. The first and second critical rule curves (CRC) for Arrow on August 31, September 30, and October 31 were raised by 122.3 cubic hectometers (hm<sup>3</sup>), 611.7 hm<sup>3</sup>, and 611.7 hm<sup>3</sup> respectively (50 thousand second-foot days (ksfd), 250 ksfd, and 250 ksfd respectively), and the August 31 CRC1 through CRC4 at Grand Coulee were each lowered to 396.2 m (1288.0 feet).
7. The hydro firm load is reduced by 300 aMW in August 16-31 and 400 aMW in September, and increased by 541.9 aMW in December.
8. Brownlee's storage operation will be based on critical rule curves and energy content curves included in the AOP06, but the project minimum outflows will be updated based on the local minimum flow requirements at Lime point.
9. Use of updated distribution factors at Libby, Hungry Horse, Grand Coulee, and Dworshak, based on the 2000 level modified flows from the Corps of Engineers and U.S. Department of Interior, Bureau of Reclamation February 1, 2004 PNCA Data Submittals. Use of updated Forecast Errors (hedges) at Libby.
10. Use of updated estimates for irrigation pumping at Grand Coulee and downstream return flows, from the February 2004 PNCA Data Submittal.
11. The plant data (physical description) at Arrow and Brilliant will be updated to the February 2004 PNCA data submittal.
12. The hydro regulation model used will be HYDSIM version 26.

The Lower Granite April-July volume runoff forecast, used to calculate Lower Granite minimum fish flow objectives during April through August, will be updated in the TSR05 studies.

The values used in the AOP studies to define the various rule curves were period-end values only. In actual operation, it is necessary to operate in such a manner during the course of each period that these period-end values can be achieved in accordance with the operating rules. Due to the normal variation of power load and streamflow during any period, straight-line interpolation between the period-end points should not be assumed. During the storage drawdown season, Canadian storage should not be drafted below its period-end point at any time during the period unless it can be conservatively demonstrated that sufficient inflow is available, in excess of the minimum outflow required to serve power demand, to refill the reservoir to its end-of-period values as required.

The TSR includes the operating guides and limits listed in Sections VI and VII of this DOP. During the operating year, the Operating Committee may agree to other mutually beneficial changes to the TSR data and model.

**D. Libby**

Libby operating limits and the expected operation of the Libby project are not included in the DOP. That information is available in the Libby Operating Plan that will be updated by the U.S. Entity when planned operations change. The operation of Libby in the TSR05 will be based on the AOP06 Step 1 operating criteria.

### **III. POWER DELIVERIES**

**A. Delivery of the Canadian Entitlement**

The obligation of the United States to return the Canadian Entitlement to Canada for operating year 2004-05 during the period 1 August 2004 through 31 July 2005 based on the AOP05 is:

$$\begin{array}{ll} \text{Dependable Capacity} & = 1176.4 \text{ MW} \\ \text{Average Annual Usable Energy} & = 537.3 \text{ aMW} \end{array}$$

Arrangement for the delivery of this Canadian entitlement power, including the point of delivery, transmission losses, and scheduling guidelines, are defined by the Entity Agreement on Aspects of the Delivery of Canadian Entitlement dated 29 March 1999, and Articles V and VIII of the Columbia River Treaty. Section 11 of Attachment B to the Entity Agreement delegates to the Operating Committee the responsibility for modifying or amending Attachment B - Scheduling Guidelines, as needed from time to time.

**B. Entitlement Purchase Agreement Compensation**

Since the sale of the downstream power benefits under the Canadian Entitlement Purchase Agreement (CEPA) expired 31 March 2003, the United States Entity is not entitled to compensation during the 2004-05 operating year for any decrease in the Canadian Entitlement that may exist from the difference between studies for optimum power generation only in the United States of America (U.S. Optimum) and studies for optimum power generation at-site in Canada and downstream in Canada and the United States of America (Joint Optimum).

**C. LCA Power**

In accordance with Section 7(b) of the LCA, the Canadian Entity shall deliver to the U.S. Entity one (1) average MW, shaped flat, during the period 1 August 2004 through 31 July 2005. In accordance with Section 10 of the LCA, the Entities shall deliver and receive power relating to the provisional draft of Arrow reservoir. Suitable arrangements will be made between BC Hydro and BPA for delivery of LCA power at the points of interconnection between B.C. Hydro and the Federal Columbia River Transmission System.

**D. Operational Agreement Power**

In accordance with subsection IV(c) of this DOP, the Entities shall deliver and/or receive power required by operational agreements entered into by the Operating Committee. Suitable arrangements will be made between BC Hydro and BPA for delivery of

Operational Agreement Power at the points of interconnection between BC Hydro and the Federal Columbia River Transmission System.

## **IV. STORAGE OPERATION**

### **A. Operation Authority**

The operation of Canadian storage by the Columbia River Treaty Operating Committee during the period 1 August 2004 through 31 July 2005 shall be in accordance with Sections I through VII of this DOP and any operational agreements signed by the Entities during the operating year. Consistent with the operating objectives in this section, the Operating Committee is authorized to enter into subsequent agreements on behalf of the Entities for mutual benefits within the period covered by this DOP.

### **B. Storage Operation to TSR Level**

The weekly Treaty Storage Operation Agreements shall be based on operating Canadian storage to the end-of-month contents contained in the current TSR study, except as allowed in subsections C and D below or the Flood Control Operating Plan.

### **C. Storage Operation Above and Below TSR Levels**

Consistent with the Flood Control Operating Plan, operating limits defined in Section VII, and the objectives and limitations defined in this Sub-Section, the Operating Committee may agree to mutually beneficial arrangements to store above or draft below the TSR levels to meet power and non-power objectives.

#### **1. Power Objectives:**

Power objectives include minimizing spill and optimizing energy production, power marketing, and purchase decisions. Operations for power objectives may be combined with non-power objectives. When appropriate, the Operating Committee will make suitable arrangements for delivery of power relating to sharing of power benefits from operational agreements.

#### **2. Non-power Objectives:**

Operations designed to help meet non-power objectives do not imply that either Entity acknowledges any obligation, domestic or international, to meet those objectives. The Entities agree that operations for non-power objectives do not set a precedent concerning any current or future dispute over Treaty rights and obligations, nor do they set a precedent for non-power objectives or flow objectives and contents.

Canadian non-power objectives contemplated include, but are not limited to, whitefish and trout spawning downstream of Arrow, dust storm avoidance upstream of Arrow, and recreation needs. U.S. non-power objectives include, but are not limited to, storage up to 1.233 km<sup>3</sup> (1.000 Maf) for anadromous fish flow augmentation, minimum flows at Vernita Bar for fish spawning, and recreation needs. Non-power objectives considered in this section do not include flood control and operating limits in Section VII.

Recognizing that it may not be possible to meet all non-power objectives, the Operating Committee shall in general attempt to share equally the risk and amount of failure. The parties shall make reasonable efforts to use available flexibility at their projects prior to requesting changes to the Treaty storage operation.

**D. Provisional Draft at Arrow**

The Canadian Section of the Operating Committee may provisionally draft from Arrow reservoir below TSR levels in accordance with Section 10 of the LCA.

**V. SCHEDULING STORAGE REGULATION**

**A. Operating Data**

The Operating Committee will exchange all current operating data necessary for the regulation of Canadian storage projects as soon as available, including the beginning and end of the flood control season.

**B. Volume Runoff Forecasts**

Seasonal runoff volume forecasts for Canadian Treaty Projects shall be made available by the Canadian Section no later than the seventh working day of each month, as required. The Operating Committee may request forecasts of seasonal runoff volume at periods other than those representing month-end conditions if hydrologic conditions warrant. Seasonal runoff volume forecasts for the Columbia River at The Dalles, Oregon, shall be made available by the U.S. Section no later than the seventh working day of each month, as required.

**C. Treaty Storage Regulation Study**

The TSR study is performed at least twice each month (within the first nine working days and the last eight working days of each month). Actual unregulated streamflows and forecasted unregulated streamflows will be updated for each TSR study. Variable energy content curves, flood control storage evacuation requirements, and variable flood control refill curves will be updated for the first TSR of the month. At the request of either section of the Operating Committee, additional TSR studies shall be performed to reflect the most current unregulated streamflow forecasts and rule curves. The Operating Committee shall agree on procedures for developing streamflow forecasts and rule curves at that time.

Errors and omissions in the TSR will be handled as follows, unless otherwise agreed:

1. All identified errors, omissions, or revisions in the TSR issued during the current operating year should be documented and reported to the Operating Committee.
2. Errors/omissions identified within two working days of the initial TSR distribution which, in the view of either Section, may affect the final TSR for the previous operation period or which may impact operations prior to issuance of the next TSR, should be corrected immediately and the TSR re-run. If such errors/omissions are identified after the two-day review period, the TSR will be corrected only if requested by either Section of the Operating Committee.

3. Errors/omissions that do not affect the final TSR for the previous period or impact operations prior to issuance of the next TSR should be corrected in the subsequent TSR.
4. Errors/omissions that affect periods previously finalized and which result in a significant impact to the TSR in future periods, should be brought to the attention of the Committee for resolution.

During the Flood Control Storage Evacuation Period and the Flood Control Refill period, project Upper Rule Curves will be determined through 30 June by the North Pacific Region, Northwestern Division, U.S. Army Corps of Engineers, in accordance with the Flood Control Operating Plan. These curves will be computed consistent with the timing of the TSR Schedule.

#### **D. Scheduling Agreements**

Unless otherwise agreed, requests by the U.S. Section of the Operating Committee for the regulation of the Canadian storage content will be made to the Canadian Section on a regular basis in accordance with the following procedures:

##### **1. Weekly Agreement for Storage Regulation unless required for Flood Control**

- a) **Timing:** A preliminary request will be made not later than noon each Thursday, followed by a final agreement by noon Friday.
- b) **Confirmation:** Confirmation of the Treaty Storage Operation Agreement will be transmitted via electronic mail or fax on Friday in accordance with the following format unless otherwise agreed:

This message confirms our verbal agreement on \_\_\_\_\_ (day, month [spell-out], and year) that the \_\_\_\_\_ (storing/drafting) of an estimated \_\_\_\_\_ ksf<sup>d</sup> \_\_\_\_\_ (in/from) the whole of Canadian storage for the Period \_\_\_\_\_ through \_\_\_\_\_ is consistent with the Detailed Operating Plan.

This agreement is based on an estimated average inflow during the above-mentioned period of \_\_\_\_\_ kcfs to Duncan Reservoir,  
\_\_\_\_\_ kcfs to Libby Reservoir,  
\_\_\_\_\_ kcfs to Mica Reservoir, an  
Estimated average regulated inflow of  
\_\_\_\_\_ kcfs to Arrow Reservoir, and an  
Estimated regulated outflow of  
\_\_\_\_\_ kcfs from the Libby Project,  
That will result in average weekly Treaty discharges of  
\_\_\_\_\_ kcfs from the Duncan Project,  
\_\_\_\_\_ kcfs from the Mica Project, and  
\_\_\_\_\_ kcfs from the Arrow Project.

This operation of the whole of Canadian storage is based on the DOP TSR expected end-of- \_\_\_\_\_ (month, except split April & August) storage level for the whole of Canadian storage of \_\_\_\_\_ ksf<sup>d</sup>.  
This operation includes expected \_\_\_\_\_ (storage above/draft below) the end-of-month (except April & August) DOP TSR level for the whole of

Canadian storage of \_\_\_\_\_ ksfd.

- c) Period Covered by Weekly Treaty Storage Operation Agreement: The period covered by the agreement shall be from 0800 hours on the Saturday following the date of weekly request to 0800 hours on the Saturday a week later.
  - d) Release Determination: The amount of water released or stored during the period of the Weekly Treaty Operation Storage Agreement will be determined by the changes in reservoir contents based on the recorded reservoir elevation and storage capacity tables for Duncan (Exhibit 9), Arrow (Exhibit 10), and Mica (Exhibit 11). The change in Arrow storage content will be determined using the recorded reservoir elevation at the gauge near Fauquier, B.C.
  - e) Delivery: Storage releases will be made effective at the Canadian-United States border. The Weekly Treaty Storage Operation Agreement will be deemed to have been fulfilled if the total amount of water agreed to is released from Treaty projects provided an amount equal to or greater than the water released from Duncan reservoir is concurrently discharged from Kootenay Lake.
  - f) Modification: If any modification to a written Weekly Treaty Storage Operation Agreement is agreed by the Operating Committee, a further written Storage Agreement superseding the original will be dispatched immediately by the U.S. Section of the Operating Committee to the Canadian Section of the Operating Committee. In accordance with Section 12 of the LCA, the Canadian Section shall implement at the request of the U.S. Section, up to five (5) mid-week requests for changes to the Canadian storage operation, consistent with this DOP and operating agreements entered into pursuant to this DOP. In addition, upon receipt of the preliminary weekly request each Thursday, the Canadian Section may request a modification to the current week's Treaty Storage Operation as may be necessary to meet flow ramping and fish salvage requirements in transitioning project releases from one Treaty week into the next, subject to agreement by the U.S. Section.
  - g) Provisional Draft: Scheduling arrangements for provisional draft from Arrow reservoir, in accordance with Section 10 of the LCA, shall be done during the Weekly Treaty Storage Operation Agreement phone call, and subsequently confirmed by e-mail.
  - h) Non-routine Operation: Any special operation that is agreed to by the Operating Committee will be suitably documented.
2. Agreement for Storage Regulation during Flood Control
- a) Forecasts: Daily time-step streamflow forecasts will be accomplished by use of computer simulation by the National Weather Service River Forecast Center. The regulation center required by the Flood Control Operating Plan

for the flood regulation will be located in the North Pacific Region, Northwestern Division, U.S. Army Corps of Engineers offices in Portland, Oregon.

- b) Requests for Project Outflows: Pursuant to the operating rules in the Flood Control Operating Plan, the outflows from individual Canadian storage projects are specified, as outlined in the Flood Control Operating Plan. Requests will be coordinated by telephone daily or on an as needed basis, by conference calls between members of the Operating Committee or their representatives. The requests will normally prescribe the requested outflows as a mean daily discharge in cubic feet per second, for the 24-hour period from noon to noon of each day. Requests for project outflows will be determined by methods as agreed upon, and documented with a confirmation agreement by a message transmitted via e-mail or Fax<sup>TM</sup> from the Corps of Engineers, in Portland, Oregon. The Canadian Section of the Operating Committee or their representative will make acknowledgment of this agreement via e-mail or Fax<sup>TM</sup>. Any modification of the documented daily request shall be agreed by the Operating Committee before being put into effect, and shall be documented immediately using the procedure described above.
- c) Regulation during Winter Floods: Daily requests for project outflows from Canadian projects are normally implemented in the flood control refill period. During the occurrence of winter floods (periods of high winter flows) in the Lower Columbia River, if a special regulation of Arrow storage becomes necessary to preserve the natural flood control storage effect, then the outflows from Arrow will be regulated on a day-to-day basis by agreement of the Operating Committee in accordance with the requests of the U.S. Section of the Operating Committee. Insofar as possible the outflows from Arrow will not exceed the calculated natural lake outflows until the space obligated for this purpose as shown on Chart 5 of the Flood Control Operating Plan is filled. The requests for such regulation will be in accordance with procedures described above. If, as a result of operation for winter flood control, a reservoir ends up above its upper rule curve, then an appropriate outflow schedule for that reservoir will be determined to ensure that the reservoir will be drafted to its upper rule curve as soon as feasible.

## **VI. OPERATING GUIDES**

### **A. Operating Rule Curve**

The ORC for the whole of Canadian storage shall be the sum of the ORC's for each of Duncan, Arrow, and Mica. The ORC for each of the Duncan, Arrow, and Mica Reservoirs during the period 1 August 2004 through 31 July 2005 is determined in accordance with the reference documents of Section I, and is defined as follows:

1. During the period 1 August 2004 through 31 December 2004, it is the higher of the First Critical Rule Curve or the Assured Refill Curve.
2. During the period 1 January 2005 through 31 July 2005, it is the higher of the First

Critical Rule Curve or the Assured Refill Curve, unless the Variable Refill Curve (VRC) is below the higher of the above two curves; then it is defined by the VRC.

3. During the period 1 January 2005 through 15 April 2005, it will not be lower than the Operating Rule Curve Lower Limit designed to protect firm loads with recurrence of 1936-37 hydro conditions unless a lower reservoir elevation is required for flood control (Exhibit 6).
4. During any month in the 2004-05 Operating Year, it will not be higher than the Upper Rule Curve, defined as the maximum elevation of each reservoir established by flood control requirements and may be modified on mutual agreement for construction and other contingency requirements.
5. Operation of Mica will be in accordance with the Mica Project Operating Criteria tabulated with specified qualifications in Section VII(C). Differences between Mica's storage operation and its ORC (or Proportional Draft Point (PDP) if different) shall be balanced with equal and opposite changes to Arrow's ORC (or PDP) to the extent possible within agreed Operating Limits. The obligation to operate Mica and Arrow to produce optimum benefits in Canada and downstream in the United States will be deemed to have been fulfilled by operating to these criteria.
6. The VRC's for Arrow, Duncan, and Mica shall be constructed based on procedures, power discharge requirements, and Variable Refill Curve Lower Limits as specified in Exhibit 7, except that the Operating Committee, in consideration of mutually beneficial operating arrangements, may agree to use an alternate procedure for Arrow which uses Arrow local inflows (Arrow Local Inflow Method) as follows.
  - a) If the current TSR study shows for the end of the current month that 1) the projected Mica Treaty storage content is lower than its ORC, and 2) the Coordinated System draft point is on the ORC, then the VRC for Arrow will be calculated as follows:
    - i) The forecast volume of inflow for Arrow will exclude the volume of inflow above the Mica project. This Arrow local inflow volume will be reduced by a forecast error such that there is a 95 percent probability that the reduced forecast is equaled or exceeded.
    - ii) The total Mica target outflow as specified in VII(C) will be added to the forecast volume described in a(i) above.
    - iii) In computing water available for refill of Arrow Reservoir the power discharge requirements for Arrow as specified in Exhibit 7 will be deducted from the volume calculated in a(ii).
  - b) During any period when the Arrow Local Inflow Method is used, the Mica/Arrow balancing (as described in subsection VI(A)5) is not used. This is implemented in BPA's hydro regulation model by setting the composite ORC for Canadian storage equal to the Mica Treaty storage content as

defined in Subsection VII(C), plus the ORC at Arrow and Duncan.

**B. Rule Curves and Operating Data**

Rule Curves and Operating data are shown in both English and SI (Metric) units. SI values are displayed with either one or two decimal places to assure consistency with English units and do not imply that level of precision.

1. Assured Refill Curve for Duncan, Arrow, and Mica. Exhibit 1
2. First Critical Rule Curve for Duncan, Arrow, Mica, and the whole of Canadian storage. Exhibit 2
3. Second Critical Rule Curve for Duncan, Arrow, Mica, and the whole of Canadian storage. Exhibit 3
4. Third Critical Rule Curve for Duncan, Arrow, Mica, and the whole of Canadian storage. Exhibit 4
5. Fourth Critical Rule Curve for Duncan, Arrow, Mica, and the whole of Canadian storage. Exhibit 5
6. Lower Limit for Operating Rule Curve based on 1936-37 Hydro Conditions. Exhibit 6
7. Variable Refill Curve Procedures. Exhibit 7
8. Coordinated System Loads and Resources Exhibit 8

**C. Rule Curves for Future Operating Years**

The Second, Third, and Fourth Year Critical Rule Curves for future operating years were not modified as part of the planning process for this DOP; therefore there is no change from the AOP06 values.

**D. Reservoir Capacity Tables**

The following tables shall be considered to be the official storage for the projects:

1. Duncan Reservoir Capacity Table (based on BC Hydro Table dated 21 February 1973). Exhibit 9
2. Arrow Reservoir Capacity Table (based on BC Hydro Combined Storage Table dated 28 February 1974). Exhibit 10
3. Mica Reservoir Capacity Table (based on BC Hydro Table dated 25 March 1974). Exhibit 11

## **VII. OPERATING LIMITS**

### **A. Duncan Project**

1. Maximum outflow is 566.34 m<sup>3</sup>/s (20,000 cfs) through outlets but limited to 283.17 m<sup>3</sup>/s (10,000 cfs) each month in the TSR model.
2. Minimum average weekly outflow is 2.83 m<sup>3</sup>/s (100 cfs).
3. Maximum rate of change in outflow is normally 113.27 m<sup>3</sup>/s (4,000 cfs) per day unless a larger change is necessary to accomplish the objectives of the Flood Control Operating Plan.
4. Normal full pool elevation is 576.68 m (1,892.0 feet).
5. Normal minimum pool elevation is 546.87 m (1,794.2 feet).
6. Normal maximum reservoir average monthly draft rate in elevation during any month is limited to 0.30 m (1 foot) per day.

### **B. Arrow Project**

1. Maximum outflow is limited to physical capability only, except during January when Attachment C to the LCA requires that outflows in actual operations be limited to a maximum of 2,265 m<sup>3</sup>/s (80,000 cfs) unless otherwise agreed or higher outflows are needed to meet flood control requirements.
2. Minimum average weekly outflow is 141.58 m<sup>3</sup>/s (5,000 cfs).
3. Maximum rate of change in outflow is normally 424.75 m<sup>3</sup>/s (15,000 cfs) per day unless a larger change is necessary to accomplish the objectives of the Flood Control Operating Plan.
4. Normal full pool elevation is 440.13 m (1,444.0 feet).
5. Normal minimum pool elevation is 419.98 m (1,377.9 feet).
6. Normal maximum reservoir average monthly draft rate in elevation during any month is limited to 0.30 m (1 foot) per day.

### **C. Mica Project**

The Mica Project Treaty storage operation in the TSR will be according to the Mica Project Operating Criteria shown in the following table except as qualified in subsections VII(C)1 through VII(C)8.

1. VRC shall be constructed according to Exhibit 7 with the 31 July Treaty storage content of 8,634.54 hm<sup>3</sup> (3,529.2 ksfd). However, the Operating Committee may agree to set Mica's VRC July refill target equal to the Mica End of Month Storage Content of 8438.6 hm<sup>3</sup> (3449.1 ksfd) indicated on the following "Mica Project

Operating Criteria" table.

2. Mica project operation will be determined by the End of Previous Month Arrow Storage Content as shown in the following table, except for the limitations or changes required by subsections VII(C)3 through VII(C)8. The End of Previous Month Arrow Storage Content shall be determined from a current TSR study, except that during January through July only the normal procedures for determining Arrow's VRC (as specified in Exhibit 7) will be included. Mica's operation will be defined either by a Target End of Month Storage Content or a Target Month Average Outflow.
3. Mica operation to the Target End-of-Month Treaty Storage Contents shall be limited by the Minimum Outflows shown in the following table and as defined in Note 2/, and by the Maximum Outflow as defined in Note 1/ when the Target End-of-Month Storage Content is below 8,634.54 hm<sup>3</sup> (3,529.2 ksfd) unless needed to accomplish the objectives of the Flood Control Operating Plan.
4. Mica operation to the Target Month Average Outflow shall be limited by the Minimum Target Treaty Content shown in the following table. Mica outflows shall be reduced as required down to a lower limit of the Minimum Outflow shown in the table below, to prevent draft below the Minimum Target Treaty Storage Content. Minimum Outflows may cause the reservoir to draft below the Minimum Target Treaty Content.
5. During July, the Mica operation to the Target Month Average Outflow shall not be less than the outflow necessary to meet the Target End-of-Month Storage Content of 8438.6 hm<sup>3</sup> (3449.1 ksfd).
6. Mica outflows will be increased during the months October through June as required to avoid violation of the Upper Rule Curve.
7. Each month, within two working days of determination of the final TSR, normally available within the first nine working days of the month, one correction to the adjusted Mica outflow may be made, consistent with subsections VII(C)3 through VII(C)6.
8. Storage releases from Mica in excess of 8.63 km<sup>3</sup> (7.000 Maf) that result from operating Mica under the criteria described in VII(C)2 through VII(C)7 above will be retained in the Arrow reservoir, subject to flood control criteria at Arrow, and Mica will be reduced to Minimum Outflow as required to minimize releases in excess of 8.63 km<sup>3</sup> (7.000 Maf). The total combined storage draft from Mica and Arrow will not exceed 17.39 km<sup>3</sup> (14.100 Maf) unless flood control criteria will not permit the additional Mica storage releases for minimum flow purposes to be retained at Arrow.

**MICA PROJECT OPERATING CRITERIA (English)**

Month	Target Operation			Target Operation Limits		
	End-of-Previous Month Arrow Storage Content (ksfd)	Month Average Outflow (cfs)	End-of-Month Storage Content 1/ (ksfd)	Minimum Target Treaty Storage Content 2/ (ksfd)	Maximum Outflow (cfs)	Minimum Outflow (cfs)
August 1-15	2,600 - FULL	-	3,499.1	-	34,000	15,000
	2,160 - 2,600	25,000	-	0.0	-	15,000
	0 - 2,160	32,000	-	0.0	-	15,000
August 16-31	3,400 - FULL	-	3,529.2	-	15,000	
	1,950 - 3,400	25,000	-	0.0	15,000	
	0 - 1,950	32,000	-	0.0	15,000	
September	3,440 - FULL	-	3,524.1	-	34,000	10,000
	1,900 - 3,440	22,000	-	0.0	-	10,000
	1,500 - 1,900	27,000	-	0.0	-	10,000
	0 - 1,500	32,000	-	0.0	-	10,000
October	3,275 - FULL	-	3,344.1	-	34,000	10,000
	2,530 - 3,275	20,000	-	0.0	-	10,000
	1,100 - 2,530	23,000	-	0.0	-	10,000
	0 - 1,100	32,000	-	0.0	-	10,000
November	3,030 - FULL	23,000	-	0.0	12,000	
	2,990 - 3,030	20,000	-	0.0	12,000	
	800 - 2,990	24,000	-	0.0	12,000	
	0 - 800	32,000	-	0.0	12,000	
December	2,780 - FULL	25,000	-	4.1	21,000	
	2,450 - 2,780	23,000	-	4.1	21,000	
	600 - 2,450	30,000	-	4.1	21,000	
	0 - 600	32,000	-	4.1	21,000	
January	2,340 - FULL	26,000	-	0.0	15,000	
	2,300 - 2,340	24,000	-	0.0	15,000	
	1,240 - 2,300	29,000	-	0.0	15,000	
	0 - 1,240	31,000	-	0.0	15,000	
February	1,260 - FULL	22,000	-	0.0	15,000	
	1,070 - 1,260	20,000	-	0.0	15,000	
	760 - 1,070	25,000	-	0.0	15,000	
	0 - 760	26,000	-	0.0	15,000	
March	700 - FULL	20,000	-	0.0	15,000	
	495 - 700	19,000	-	0.0	15,000	
	100 - 495	21,000	-	0.0	15,000	
	0 - 100	25,000	-	0.0	15,000	
April 1-15	1,550 - FULL	16,000	-	0.0	-	13,000
	995 - 1,550	-	104.1	-	29,000	13,000
	730 - 995	-	0.0	-	29,000	13,000
	0 - 730	24,000	-	0.0	-	13,000
April 16-30	1,240 - FULL	13,000	-	0.0	10,000	
	1,150 - 1,240	12,000	-	0.0	10,000	
	0 - 1,150	10,000	-	0.0	10,000	
	755 - FULL	10,000	-	0.0	8,000	
May	395 - 755	8,000	-	0.0	8,000	
	335 - 395	14,000	-	0.0	8,000	
	0 - 335	8,000	-	0.0	8,000	
	1,500 - FULL	10,000	-	0.0	8,000	
June	1,075 - 1,500	8,000	-	0.0	8,000	
	630 - 1,075	10,000	-	0.0	8,000	
	0 - 630	18,000	-	0.0	8,000	
	2,330 - FULL	-	3,449.1	-	34,000	10,000
July	1,870 - 2,330	18,000	-	0.0	-	10,000
	0 - 1,870	30,000	-	0.0	-	10,000

Notes: 1/ For end-of-month storage content target operation, a maximum outflow of 34,000 cfs will apply if the Target End-of-Period Storage Content is less than 3529.2 ksfd in every month, except April 1-15 the maximum outflow is 29,000 cfs. These maximum flows may be exceeded for flood control.

2/ For month average outflow target operation, Mica outflows will be reduced to minimum to maintain the reservoir above the Minimum Target Treaty Storage Content.

### MICA PROJECT OPERATING CRITERIA (SI)

Month	End of Previous Month Arrow Storage Content (hm <sup>3</sup> )	Target Operation		Target Operation Limits		
		Month Average Outflow (m <sup>3</sup> /s)	End-of-Month Storage Content 1/ (hm <sup>3</sup> )	Minimum Target Treaty Storage Content 2/ (hm <sup>3</sup> )	Maximum Outflow (m <sup>3</sup> /s)	Minimum Outflow (m <sup>3</sup> /s)
August 1-15	6361.2 - FULL	-	8560.9	-	962.77	424.75
	5284.7 - 6361.2	707.92	-	0.0	-	424.75
	0.0 - 5284.7	906.14	-	0.0	-	424.75
August 16-31	8318.4 - FULL	-	8634.5	-	-	424.75
	4770.9 - 8318.4	707.92	-	0.0	-	424.75
	0.0 - 4770.9	906.14	-	0.0	-	424.75
September	8416.3 - FULL	-	8622.1	-	962.77	283.17
	4648.5 - 8416.3	622.97	-	0.0	-	283.17
	3669.9 - 4648.5	764.55	-	0.0	-	283.17
	0.0 - 3669.9	906.14	-	0.0	-	283.17
October	8012.6 - FULL	-	8181.7	-	962.77	283.17
	6189.9 - 8012.6	566.34	-	0.0	-	283.17
	2691.3 - 6189.9	651.29	-	0.0	-	283.17
	0.0 - 2691.3	906.14	-	0.0	-	283.17
November	7413.2 - FULL	651.29	-	0.0	-	339.80
	7315.3 - 7413.2	566.34	-	0.0	-	339.80
	1957.3 - 7315.3	679.60	-	0.0	-	339.80
	0.0 - 1957.3	906.14	-	0.0	-	339.80
December	6801.5 - FULL	707.92	-	10.0	-	594.65
	5994.2 - 6801.5	651.29	-	10.0	-	594.65
	1468.0 - 5994.2	849.50	-	10.0	-	594.65
	0.0 - 1468.0	906.14	-	10.0	-	594.65
January	5725.0 - FULL	736.24	-	0.0	-	424.75
	5627.2 - 5725.0	679.60	-	0.0	-	424.75
	3033.8 - 5627.2	821.19	-	0.0	-	424.75
	0.0 - 3033.8	877.82	-	0.0	-	424.75
February	3082.7 - FULL	622.97	-	0.0	-	424.75
	2617.9 - 3082.7	566.34	-	0.0	-	424.75
	1859.4 - 2617.9	707.92	-	0.0	-	424.75
	0.0 - 1859.4	736.24	-	0.0	-	424.75
March	1712.6 - FULL	566.34	-	0.0	-	424.75
	1211.1 - 1712.6	538.02	-	0.0	-	424.75
	244.7 - 1211.1	594.65	-	0.0	-	424.75
	0.0 - 244.7	707.92	-	0.0	-	424.75
April 1-15	3792.2 - FULL	453.07	-	0.0	-	368.12
	2434.4 - 3792.2	-	254.7	-	821.19	368.12
	1786.0 - 2434.4	-	0.0	-	821.19	368.12
	0.0 - 1786.0	679.60	-	0.0	-	368.12
April 16-30	3033.8 - FULL	368.12	-	0.0	-	283.17
	2813.6 - 3033.8	339.80	-	0.0	-	283.17
	0.0 - 2813.6	283.17	-	0.0	-	283.17
May	1847.2 - FULL	283.17	-	0.0	-	226.53
	966.4 - 1847.2	226.53	-	0.0	-	226.53
	819.6 - 966.4	396.44	-	0.0	-	226.53
	0.0 - 819.6	226.53	-	0.0	-	226.53
June	3669.9 - FULL	283.17	-	0.0	-	226.53
	2630.1 - 3669.9	226.53	-	0.0	-	226.53
	1541.4 - 2630.1	283.17	-	0.0	-	226.53
	0.0 - 1541.4	509.70	-	0.0	-	226.53
July	5700.6 - FULL	-	8438.6	-	962.77	283.17
	4575.1 - 5700.6	509.70	-	0.0	-	283.17
	0.0 - 4575.1	849.50	-	0.0	-	283.17

Notes:

1/ For end-of-month storage content target operation, a maximum outflow of 962.77 m<sup>3</sup>/s will apply if the Target End-of-Period Storage Content is less than 8634.5 hm<sup>3</sup> in every month, except April 1-15 the maximum outflow is 821.19 m<sup>3</sup>/s. These maximum flows may be exceeded for flood control.

2/ For month average outflow target operation, Mica outflows will be reduced to minimum to maintain the reservoir above the Minimum Target Treaty Storage Content.

## EXHIBITS

### Exhibit 1 - Assured Refill Curves (English) 1/

Month	DUNCAN				MICA					ARROW								
	1931 Inflow cfs 3/	PDR cfs 4/	Water Available for Refill		1931 Inflow cfs	PDR cfs 4/	Water Available for Refill		CRC1 ksfd	ARC ksfd	1931 Inflow cfs	PDR cfs 4/	Water Available for Refill		MICA Refill ksfd 2/	ARC ksfd		
			cfs	ksfd			cfs	ksfd					cfs	ksfd				
July	7320	2750	4570	141.7	705.8	56477	50053	6424	199.1	2968.5	3529.2	88586	70098	18488	573.1	199.1	3579.6	
June	8030	183	7847	235.4	564.1	60178	24021	36157	1084.7	2028.4	3330.1	114636	52482	62154	1864.6	1084.7	3205.6	
May	5170	1560	3610	111.9	328.7	28058	3003	25055	776.7	460.3	2245.3	68098	21175	46923	1454.6	776.7	2425.7	
Apr2	981	369	612	9.2	216.8	7217	3000	4217	63.3	0.0	1468.6	20504	12138	8366	125.5	63.3	1747.8	
Apr1	981	100	881	13.2	207.6	4679	7388	-2709	-40.6	220.3	1405.4	10700	8892	1808	27.1	-40.6	1685.6	
Mar	555	100	455	14.1	194.4	3219	3001	218	6.8	534.5	1446.0	7653	7189	464	14.4	6.8	1617.8	
Feb	428	100	328	9.2	180.3	2593	8569	-5976	-167.3	771.5	1439.3	5813	8363	-2550	-71.4	-167.3	1610.2	
Jan	428	100	328	10.2	171.1	2834	3000	-166	-5.1	1364.1	1606.6	6430	5000	1430	44.3	-544.7	1514.3	
Dec	461	100	361	11.2	161.0	3533	3000	533	16.5	2151.3	1611.7	6694	5000	1694	52.5	-769.9	925.2	
Nov	684	100	584	17.5	149.8	5176	3000	2176	65.3	2921.2	1595.2	9483	5000	4483	134.5	-452.9	102.8	
Oct	1090	100	990	30.7	132.2	8751	3000	5751	178.3	3374.1	1529.9	14691	5000	9691	300.4	-155.1	0.0	
Sep	2310	100	2210	66.3	101.6	23110	3000	20110	603.3	3529.2	1351.7	39739	5000	34739	1042.2	0.0	0.0	
Aug2	4530	100	4430	70.9	35.3	38261	3000	35261	564.2	3529.2	748.4	62605	5000	57605	921.7	0.0	0.0	
Aug1	4530	100	4430	66.5	0.0	53542	3000	50542	758.1	3529.2	184.2	82249	5000	77249	1158.7	3529.2	0.0	

### Exhibit 1M - Assured Refill Curves (SI) 1/

Month	DUNCAN				MICA					ARROW								
	1931 Inflow m³/s 3/	PDR m³/s 4/	Water Available for Refill		ARC hm³	1931 Inflow m³/s	PDR m³/s 4/	Water Available For Refill		CRC1 hm³	ARC hm³	1931 Inflow m³/s	PDR m³/s 4/	Water Available For Refill		MICA Refill hm³ 2/	ARC hm³	
			m³/s	hm³				m³/s	hm³					m³/s	hm³			
July	207.28	77.87	129.41	346.6	1726.8	1599.25	1417.34	181.91	487.2	7262.7	8634.5	2508.47	1984.95	523.52	1402.2	487.2	8757.8	
June	227.38	5.18	222.20	576.0	1380.2	1704.05	680.20	1023.85	2653.9	4962.7	8147.3	3246.13	1486.12	1760.00	4562.0	2653.9	7842.9	
May	146.40	44.17	102.22	273.8	804.2	794.51	85.04	709.48	1900.3	1126.2	5493.5	1928.32	599.61	1328.71	3558.9	1900.3	5934.7	
Apr2	27.78	10.45	17.33	22.5	530.4	204.36	84.95	119.41	154.8	0.0	3593.2	580.61	343.71	236.90	307.0	154.8	4276.2	
April	27.78	2.83	24.95	32.3	508.0	132.49	209.20	-76.71	-99.4	539.0	3438.4	302.99	251.79	51.20	66.4	-99.4	4123.9	
Mar	15.72	2.83	12.88	34.5	475.7	91.15	84.98	6.17	16.5	1307.7	3537.8	216.71	203.57	13.14	35.2	16.5	3958.1	
Feb	12.12	2.83	9.29	22.5	441.1	73.43	242.65	-169.22	-409.4	1887.6	3521.3	164.61	236.81	-72.21	-174.7	-409.4	3939.5	
Jan	12.12	2.83	9.29	24.9	418.7	80.25	84.95	-4.70	-12.6	3337.4	3930.7	182.08	141.58	40.49	108.5	-1332.7	3704.8	
Dec	13.05	2.83	10.22	27.4	393.8	100.04	84.95	15.09	40.4	5263.4	3943.3	189.55	141.58	47.97	128.5	-1883.6	2263.6	
Nov	19.37	2.83	16.54	42.9	366.4	146.57	84.95	61.62	159.7	7147.0	3902.9	268.53	141.58	126.94	329.0	-1108.1	251.5	
Oct	30.87	2.83	28.03	75.1	323.6	247.80	84.95	162.85	436.2	8255.1	3743.1	416.00	141.58	274.42	735.0	-379.5	0.0	
Sep	65.41	2.83	62.58	162.2	248.5	654.40	84.95	569.45	1476.0	8634.5	3307.0	1125.28	141.58	983.70	2549.8	0.0	0.0	
Aug2	128.28	2.83	125.44	173.4	86.3	1083.43	84.95	998.48	1380.3	8634.5	1830.9	1772.77	141.58	1631.19	2255.0	0.0	0.0	
Aug1	128.28	2.83	125.44	162.6	0.0	1516.14	84.95	1431.19	1854.8	8634.5	450.6	2329.03	141.58	2187.45	2835.0	8634.5	0.0	

Notes on Exhibit 1 and Exhibit 1M:

- 1/ The Assured Refill Curve (ARC) indicates the end-of-month storage content required to assure refill of Canadian storage by 31 July based on 1931 historical monthly inflow. The monthly inflow at each reservoir is reduced by deducting the Power Discharge Requirements (PDR) and water required for refill, if any, at upstream reservoirs. The Entities may agree to revise the data upon the completion of the Refill Study by the Operating Committee.
- 2/ Upstream refill requirement: these values are computed by subtracting current month from previous month's higher of Mica's ARC or first critical rule curve (CRC1) except July value is Mica full minus previous month's higher of Mica's ARC or CRC1. CRC1 is shown in Exhibit 2.
- 3/ Inflows are from the 1990 Level Modified streamflow (Hydrosim file).
- 4/ PDRs are from the 2005-06 AOP.

## EXHIBITS

### Exhibit 1 - Assured Refill Curves (English) 1/

Month	DUNCAN				MICA				ARROW								
	1931 Inflow cfs 3/	PDR cfs 4/	Water Available for Refill		1931 Inflow cfs	PDR cfs 4/	Water Available for Refill		CRC1 ksfd	ARC ksfd	1931 Inflow cfs	PDR cfs 4/	Water Available for Refill		MICA Refill ksfd 2/	ARC ksfd	
			cfs	ksfd			cfs	ksfd					cfs	ksfd			
July	7320	2750	4570	141.7	705.8	56477	50053	6424	199.1	2968.5	3529.2	88586	70098	18488	573.1	199.1	3579.6
June	8030	183	7847	235.4	564.1	60178	24021	36157	1084.7	2028.4	3330.1	114636	52482	62154	1864.6	1084.7	3205.6
May	5170	1560	3610	111.9	328.7	28058	3003	25055	776.7	460.3	2245.3	68098	21175	46923	1454.6	776.7	2425.7
Apr2	981	369	612	9.2	216.8	7217	3000	4217	63.3	0.0	1468.6	20504	12138	8366	125.5	63.3	1747.8
Apr1	981	100	881	13.2	207.6	4679	7388	-2709	-40.6	220.3	1405.4	10700	8892	1808	27.1	-40.6	1685.6
Mar	555	100	455	14.1	194.4	3219	3001	218	6.8	534.5	1446.0	7653	7189	464	14.4	6.8	1617.8
Feb	428	100	328	9.2	180.3	2593	8569	-5976	-167.3	771.5	1439.3	5813	8363	-2550	-71.4	-167.3	1610.2
Jan	428	100	328	10.2	171.1	2834	3000	-166	-5.1	1364.1	1606.6	6430	5000	1430	44.3	-544.7	1514.3
Dec	461	100	361	11.2	161.0	3533	3000	533	16.5	2151.3	1611.7	6694	5000	1694	52.5	-769.9	925.2
Nov	684	100	584	17.5	149.8	5176	3000	2176	65.3	2921.2	1595.2	9483	5000	4483	134.5	-452.9	102.8
Oct	1090	100	990	30.7	132.2	8751	3000	5751	178.3	3374.1	1529.9	14691	5000	9691	300.4	-155.1	0.0
Sep	2310	100	2210	66.3	101.6	23110	3000	20110	603.3	3529.2	1351.7	39739	5000	34739	1042.2	0.0	0.0
Aug2	4530	100	4430	70.9	35.3	38261	3000	35261	564.2	3529.2	748.4	62605	5000	57605	921.7	0.0	0.0
Aug1	4530	100	4430	66.5	0.0	53542	3000	50542	758.1	3529.2	184.2	82249	5000	77249	1158.7	3529.2	0.0

### Exhibit 1M - Assured Refill Curves (SI) 1/

Month	DUNCAN				MICA				ARROW								
	1931 Inflow m³/s 3/	PDR m³/s 4/	Water Available for Refill		ARC hm³	1931 Inflow m³/s	PDR m³/s 4/	Water Available For Refill		CRC1 hm³	ARC hm³	1931 Inflow m³/s	PDR m³/s 4/	Water Available For Refill		MICA Refill hm³ 2/	ARC hm³
			m³/s	hm³				m³/s	hm³					m³/s	hm³		
July	207.28	77.87	129.41	346.6	1726.8	1599.25	1417.34	181.91	487.2	7262.7	8634.5	2508.47	1984.95	523.52	1402.2	487.2	8757.8
June	227.38	5.18	222.20	576.0	1380.2	1704.05	680.20	1023.85	2653.9	4962.7	8147.3	3246.13	1486.12	1760.00	4562.0	2653.9	7842.9
May	146.40	44.17	102.22	273.8	804.2	794.51	85.04	709.48	1900.3	1126.2	5493.5	1928.32	599.61	1328.71	3558.9	1900.3	5934.7
Apr2	27.78	10.45	17.33	22.5	530.4	204.36	84.95	119.41	154.8	0.0	3593.2	580.61	343.71	236.90	307.0	154.8	4276.2
April	27.78	2.83	24.95	32.3	508.0	132.49	209.20	-76.71	-99.4	539.0	3438.4	302.99	251.79	51.20	66.4	-99.4	4123.9
Mar	15.72	2.83	12.88	34.5	475.7	91.15	84.98	6.17	16.5	1307.7	3537.8	216.71	203.57	13.14	35.2	16.5	3958.1
Feb	12.12	2.83	9.29	22.5	441.1	73.43	242.65	-169.22	-409.4	1887.6	3521.3	164.61	236.81	-72.21	-174.7	-409.4	3939.5
Jan	12.12	2.83	9.29	24.9	418.7	80.25	84.95	-4.70	-12.6	3337.4	3930.7	182.08	141.58	40.49	108.5	-1332.7	3704.8
Dec	13.05	2.83	10.22	27.4	393.8	100.04	84.95	15.09	40.4	5263.4	3943.3	189.55	141.58	47.97	128.5	-1883.6	2263.6
Nov	19.37	2.83	16.54	42.9	366.4	146.57	84.95	61.62	159.7	7147.0	3902.9	268.53	141.58	126.94	329.0	-1108.1	251.5
Oct	30.87	2.83	28.03	75.1	323.6	247.80	84.95	162.85	436.2	8255.1	3743.1	416.00	141.58	274.42	735.0	-379.5	0.0
Sep	65.41	2.83	62.58	162.2	248.5	654.40	84.95	569.45	1476.0	8634.5	3307.0	1125.28	141.58	983.70	2549.8	0.0	0.0
Aug2	128.28	2.83	125.44	173.4	86.3	1083.43	84.95	998.48	1380.3	8634.5	1830.9	1772.77	141.58	1631.19	2255.0	0.0	0.0
Aug1	128.28	2.83	125.44	162.6	0.0	1516.14	84.95	1431.19	1854.8	8634.5	450.6	2329.03	141.58	2187.45	2835.0	8634.5	0.0

Notes on Exhibit 1 and Exhibit 1M:

- 1/ The Assured Refill Curve (ARC) indicates the end-of-month storage content required to assure refill of Canadian storage by 31 July based on 1931 historical monthly inflow. The monthly inflow at each reservoir is reduced by deducting the Power Discharge Requirements (PDR) and water required for refill, if any, at upstream reservoirs. The Entities may agree to revise the data upon the completion of the Refill Study by the Operating Committee.
- 2/ Upstream refill requirement: these values are computed by subtracting current month from previous month's higher of Mica's ARC or first critical rule curve (CRC1) except July value is Mica full minus previous month's higher of Mica's ARC or CRC1. CRC1 is shown in Exhibit 2.
- 3/ Inflows are from the 1990 Level Modified streamflow (Hydrosim file).
- 4/ PDRs are from the 2005-06 AOP.

**Exhibit 2 - First Critical Rule Curves (English & SI)**  
End-of-Month Usable Storage Content

Month	(English) (ksfd)				(SI) (hm <sup>3</sup> )			
	Mica	Arrow*	Duncan	Total	Mica	Arrow*	Duncan	Total
August 15	3529.2	3579.6	705.8	7814.6	8634.5	8757.8	1726.8	19119.2
August 31	3529.2	3493.3	705.8	7728.3	8634.5	8546.7	1726.8	18908.1
September	3529.2	3255.8	694.7	7479.7	8634.5	7965.6	1699.7	18299.8
October	3374.1	3050.6	702.1	7126.8	8255.1	7463.6	1717.8	17436.4
November	2921.2	2530.9	687.8	6139.9	7147.0	6192.1	1682.8	15021.9
December	2151.3	2283.5	504.1	4938.9	5263.4	5586.8	1233.3	12083.5
January	1364.1	1213.7	404.6	2982.4	3337.4	2969.4	989.9	7296.7
February	771.5	927.0	234.3	1932.8	1887.6	2268.0	573.2	4728.8
March	534.5	567.3	142.9	1244.7	1307.7	1388.0	349.6	3045.3
April 15	220.3	566.7	140.1	927.1	539.0	1386.5	342.8	2268.2
April 30	0.0	548.7	135.0	683.7	0.0	1342.4	330.3	1672.7
May	460.3	1430.2	252.5	2143.0	1126.2	3499.1	617.8	5243.1
June	2028.4	3028.2	527.3	5583.9	4962.7	7408.8	1290.1	13661.6
July	2968.5	3579.4	674.1	7222.0	7262.7	8757.4	1649.3	17669.3

\* The August 16-31, September, and October 1<sup>st</sup> year critical rule curves (CRC) at Arrow were raised by 122.3 hm<sup>3</sup>, 611.7 hm<sup>3</sup>, and 611.7 hm<sup>3</sup> respectively (50 ksfd, 250 ksfd, and 250 ksfd respectively).

Source: First-year critical rule curves from the 2005-06 AOP.

**Exhibit 3 - Second Critical Rule Curves (English & SI)**  
End-of-Month Usable Storage Content

Month	(English) (ksfd)				(SI) (hm <sup>3</sup> )			
	Mica	Arrow*	Duncan	Total	Mica	Arrow*	Duncan	Total
August 15	3529.2	3387.0	595.5	7511.7	8634.5	8286.6	1457.0	18378.1
August 31	3264.8	3493.3	656.3	7414.4	7987.7	8546.7	1605.7	18140.1
September	3063.8	3009.8	680.3	6753.9	7495.9	7363.8	1664.4	16524.1
October	2052.4	2965.4	702.1	5719.9	5021.4	7255.1	1717.8	13994.3
November	1842.0	1857.2	447.0	4146.2	4506.6	4543.8	1093.6	10144.1
December	1277.0	1151.0	457.8	2885.8	3124.3	2816.0	1120.1	7060.4
January	419.3	353.7	330.0	1103.0	1025.9	865.4	807.4	2698.6
February	348.3	255.0	164.9	768.2	852.2	623.9	403.4	1879.5
March	211.1	50.1	11.5	272.7	516.5	122.6	28.1	667.2
April 15	220.3	139.8	34.8	394.9	539.0	342.0	85.1	966.2
April 30	0.0	125.7	58.0	183.7	0.0	307.5	141.9	449.4
May	393.8	1430.2	173.0	1997.0	963.5	3499.1	423.3	4885.9
June	825.5	3028.2	374.6	4228.3	2019.7	7408.8	916.5	10345.0
July	2651.6	3052.4	500.4	6204.4	6487.4	7468.0	1224.3	15179.7

Adjusted for Crossover

\* The August 16-31, September, and October 2<sup>nd</sup> year critical rule curves (CRC) at Arrow were raised by 122.3 hm<sup>3</sup>, 611.7 hm<sup>3</sup>, and 611.7 hm<sup>3</sup> respectively (50 ksfd, 250 ksfd, and 250 ksfd respectively).

Source: Second-year critical rule curves from the 2005-06 AOP, except when higher than the first-year critical rule curve use the first-year critical curve.

**Exhibit 4 - Third Critical Rule Curves (English & SI)**  
End-of-Month Usable Storage Content

	(English) (ksfd)				(SI) (hm <sup>3</sup> )			
Month	Mica	Arrow	Duncan	Total	Mica	Arrow	Duncan	Total
August 15	2887.1	3191.6	499.7	6578.4	7063.6	7808.6	1222.6	16094.7
August 31	2895.4	3077.4	559.9	6532.7	7083.9	7529.2	1369.9	15982.9
September	2579.7	2956.8	626.2	6162.7	6311.5	7234.1	1532.1	15077.7
October	2052.4	2107.1	656.9	4816.4	5021.4	5155.2	1607.2	11783.8
November	1809.1	1787.3	404.4	4000.8	4426.1	4372.8	989.4	9788.4
December	1201.4	1151.0	258.4	2610.8	2939.3	2816.0	632.2	6387.6
January	419.3	353.7	230.0	1003.0	1025.9	865.4	562.7	2453.9
February	141.3	32.4	51.4	225.1	345.7	79.3	125.8	550.7
March	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
April 15	25.2	59.0	13.0	97.2	61.7	144.3	31.8	237.8
April 30	0.0	13.7	0.0	13.7	0.0	33.5	0.0	33.5
May	331.0	724.9	88.6	1144.5	809.8	1773.5	216.8	2800.1
June	825.5	2401.4	102.9	3329.8	2019.7	5875.3	251.8	8146.7
July	1358.9	3020.1	40.3	4419.3	3324.7	7389.0	98.6	10812.3

Adjusted for Crossover

Source: Third-year critical rule curves from the 2005-06 AOP.

**Exhibit 5 - Fourth Critical Rule Curves (English & SI)**  
End-of-Month Usable Storage Content

	(English) (ksfd)				(SI) (hm <sup>3</sup> )			
Month	Mica	Arrow	Duncan	Total	Mica	Arrow	Duncan	Total
August 15	1318.2	2935.7	20.0	4273.9	3225.1	7182.5	48.9	10456.5
August 31	1114.6	2647.3	2.0	3763.9	2727.0	6476.9	4.9	9208.8
September	829.4	2195.1	1.0	3025.5	2029.2	5370.5	2.4	7402.2
October	1030.8	1102.0	2.0	2134.8	2522.0	2696.2	4.9	5223.0
November	486.8	713.3	1.0	1201.1	1191.0	1745.2	2.4	2938.6
December	0.0	262.8	0.1	262.9	0.0	643.0	0.2	643.2
January	0.0	0.1	0.0	0.1	0.0	0.2	0.0	0.2
February	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Source: Fourth-year critical rule curves from the 2005-06AOP.

**Exhibit 6 - Operating Rule Curve Lower Limit (English & SI)**  
End-of-Month Usable Storage Content

Month	(English) (ksfd)			(SI) (hm <sup>3</sup> )		
	Mica	Arrow	Duncan	Mica	Arrow	Duncan
January	306.7	273.5	35.9	750.4	669.1	87.8
February	50.9	45.7	4.3	124.5	111.8	10.5
March	0.0	0.0	0.0	0.0	0.0	0.0
Apr-15	0.2	0.4	0.0	0.5	1.0	0.0

Source: Operating Rule Curve Lower Limits for Mica, Arrow, and Duncan are from the 2005-06 AOP.

## Exhibit 7 - Variable Refill Curve Procedures (English)

The Variable Refill Curves (VRC) indicate the end-of-month storage content required to refill Canadian storage based on forecasts of natural inflow volume. The probable forecast volume at each reservoir is reduced by deducting the 95 percent confidence forecast error, Power Discharge Requirements (PDR), and water required for refill at upstream reservoirs based on the ORC. The Entities have agreed to limit the VRC to be no lower than the Variable Refill Curve Lower Limit (VRCLL), which is defined by studies that optimize power production during the refill period. The VRCLL's are a function of the unregulated January through July runoff volume at The Dalles, Oregon. The following schedule for PDR's and VRCLL's will apply when computing the VRC's during the period January 1 through June 1, unless the Operating Committee agrees to use updated study results.

**POWER DISCHARGE REQUIREMENTS, IN CFS,  
AND VARIABLE REFILL CURVE LOWER LIMITS, IN KSFD, FOR  
JANUARY - JULY VOLUME RUNOFF OF THE COLUMBIA RIVER AT THE DALLES, OREGON**

Project	Jan	Feb	Mar	Ap1	Ap2	May	Jun	Jul
<b>Mica</b>								
ARC PDR's	3000	8569	3001	7388	3000	3003	24021	50053
80 MAF PDR's	3000	5000	5000	5000	5000	5000	18000	38000
95 MAF PDR's	3000	3000	3000	3000	5000	5000	18000	38000
110 MAF PDR's	3000	3000	3000	3000	5000	5000	18000	38000
80 MAF VRCLL's	224.9	241.3	270.8	331.0	470.1	1460.8	2823.8	3529.2
95 MAF VRCLL's	39.3	0.0	20.7	27.3	0.0	681.8	2297.2	3529.2
110 MAF VRCLL's	11.9	0.0	0.0	0.0	3.7	658.7	1809.5	3529.2
Distribution Factors	0.9750	0.9770	0.9740	0.9812	0.9650	0.7950	0.4950	N/A
Forecast Errors (ksfd)	652.9	510.3	465.3	444.4	444.4	360.4	360.4	N/A
<b>Arrow</b>								
ARC PDR's	5000	8363	7189	8892	12138	21175	52482	70098
80 MAF PDR's	5000	5000	5000	5000	5000	5000	54000	56000
95 MAF PDR's	5000	5000	5000	5000	5000	5000	54000	56000
110 MAF PDR's	5000	5000	5000	5000	5000	5000	54000	56000
80 MAF VRCLL's	138.7	211.9	378.4	553.0	833.0	2118.5	3039.6	3579.6
95 MAF VRCLL's	14.6	0.2	18.9	32.1	26.7	1164.4	2953.5	3579.6
110 MAF VRCLL's	2.0	0.0	17.2	0.0	4.7	900.0	2703.8	3579.6
Distribution Factors - Total	0.9710	0.9747	0.9691	0.9741	0.9530	0.7483	0.4631	N/A
Forecast Errors (ksfd) - Total	1233.1	987.3	825.3	715.1	715.1	501.4	501.4	N/A
Distribution Factors - Local	0.9680	0.9730	0.9640	0.9680	0.9390	0.7020	0.4270	N/A
Forecast Errors (ksfd) - Local	761.8	632.8	504.9	403.2	403.2	341.8	341.8	N/A
<b>Duncan</b>								
ARC PDR's	100	100	100	100	369	1560	183	2750
80 MAF PDR's	100	100	100	100	100	1800	2000	3500
95 MAF PDR's	100	100	100	100	100	1800	2000	3500
110 MAF PDR's	100	100	100	100	100	1800	2000	3500
80 MAF VRCLL's	190.5	40.6	62.1	81.9	114.8	323.1	555.5	705.8
95 MAF VRCLL's	27.6	18.8	16.9	0.0	33.2	204.6	522.7	705.8
110 MAF VRCLL's	5.9	0.0	0.3	4.8	2.9	105.5	444.6	705.8
Distribution Factors	0.9720	0.9790	0.9740	0.9790	0.9570	0.7580	0.4690	N/A
Forecast Errors (ksfd)	118.4	109.0	97.5	88.1	88.1	73.3	73.3	N/A

Notes:

- (1) If the forecasted natural January through July volume runoff at The Dalles is less than 80 Maf, the Power Discharge Requirement in the 80 Maf schedule will be used. For intermediate forecasted volumes, the Power Discharge Requirement will be interpolated linearly between the values shown above.
- (2) PDR's and VRCLL's are from the 2005-06 AOP. Data may be revised upon completion of the Operating Committee Refill Studies. The Canadian Entity reserves the right to request changes to the revised data.

## Exhibit 7M - Variable Refill Curve Procedures (SI)

The Variable Refill Curves (VRC) indicate the end-of-month storage content required to refill Canadian storage based on forecasts of natural inflow volume. The probable forecast volume at each reservoir is reduced by deducting the 95 percent confidence forecast error, Power Discharge Requirements (PDR), and water required for refill at upstream reservoirs based on the ORC. The Entities have agreed to limit the VRC to be no lower than the Variable Refill Curve Lower Limit (VRCLL), which is defined by studies that optimize power production during the refill period. The VRCLL's are a function of the unregulated January through July runoff volume at The Dalles, Oregon. The following schedule for PDR's and VRCLL's will apply when computing the VRC's during the period January 1 through June 1, unless the Operating Committee agrees to use updated study results.

**POWER DISCHARGE REQUIREMENTS, IN m<sup>3</sup>/s,  
AND VARIABLE REFILL CURVE LOWER LIMITS, IN hm<sup>3</sup>, FOR  
JANUARY - JULY VOLUME RUNOFF OF THE COLUMBIA RIVER AT THE DALLES, OREGON**

Project	Jan	Feb	Mar	Apr	May	Jun	Jul	
<b>Mica</b>								
ARC PDR's	84.95	242.65	84.98	209.20	84.95	85.04	680.20	1417.34
98.68 km <sup>3</sup> PDR's	84.95	141.58	141.58	141.58	141.58	141.58	509.70	1076.04
117.18 km <sup>3</sup> PDR's	84.95	84.95	84.95	84.95	141.58	141.58	509.70	1076.04
135.69 km <sup>3</sup> PDR's	84.95	84.95	84.95	84.95	141.58	141.58	509.70	1076.04
98.68 km <sup>3</sup> VRCLL	550.2	590.4	662.5	809.8	1150.1	3574.0	6908.7	8634.5
117.18 km <sup>3</sup> VRCLL	96.2	0.0	50.6	66.8	0.0	1668.1	5620.3	8634.5
135.69 km <sup>3</sup> VRCLL	29.1	0.0	0.0	0.0	9.1	1611.6	4427.1	8634.5
Distribution Factors	0.9750	0.9770	0.9740	0.9812	0.9650	0.7950	0.4950	N/A
Forecast Errors (hm <sup>3</sup> )	1597.4	1248.5	1138.4	1087.3	1087.3	881.8	881.8	N/A
<b>Arrow</b>								
ARC PDR's	141.58	236.81	203.57	251.79	343.71	599.61	1486.12	1984.95
98.68 km <sup>3</sup> PDR's	141.58	141.58	141.58	141.58	141.58	141.58	1529.11	1585.74
117.18 km <sup>3</sup> PDR's	141.58	141.58	141.58	141.58	141.58	141.58	1529.11	1585.74
135.69 km <sup>3</sup> PDR's	141.58	141.58	141.58	141.58	141.58	141.58	1529.11	1585.74
98.68 km <sup>3</sup> VRCLL	339.3	518.4	925.8	1353.0	2038.0	5183.1	7436.7	8757.8
117.18 km <sup>3</sup> VRCLL	35.7	0.5	46.2	78.5	65.3	2848.8	7226.0	8757.8
135.69 km <sup>3</sup> VRCLL	4.9	0.0	42.1	0.0	11.5	2201.9	6615.1	8757.8
Distribution Factors - Total	0.9710	0.9747	0.9691	0.9741	0.9530	0.7483	0.4631	N/A
Forecast Errors (hm <sup>3</sup> ) - Total	3016.9	2415.5	2019.2	1749.6	1749.6	1226.7	1226.7	N/A
Distribution Factors - Local	0.9680	0.9730	0.9640	0.9680	0.9390	0.7020	0.4270	N/A
Forecast Errors (hm <sup>3</sup> ) - Local	1863.8	1548.2	1235.3	986.5	986.5	836.2	836.2	N/A
<b>Duncan</b>								
ARC PDR's	2.83	2.83	2.83	2.83	10.45	44.17	5.18	77.87
98.68 km <sup>3</sup> PDR's	2.83	2.83	2.83	2.83	2.83	50.97	56.63	99.11
117.18 km <sup>3</sup> PDR's	2.83	2.83	2.83	2.83	2.83	50.97	56.63	99.11
135.69 km <sup>3</sup> PDR's	2.83	2.83	2.83	2.83	2.83	50.97	56.63	99.11
98.68 km <sup>3</sup> VRCLL	466.1	99.3	151.9	200.4	280.9	790.5	1359.1	1726.8
117.18 km <sup>3</sup> VRCLL	67.5	46.0	41.3	0.0	81.2	500.6	1278.8	1726.8
135.69 km <sup>3</sup> VRCLL	14.4	0.0	0.7	11.7	7.1	258.1	1087.8	1726.8
Distribution Factors	0.9720	0.9790	0.9740	0.9790	0.9570	0.7580	0.4690	N/A
Forecast Errors (hm <sup>3</sup> )	289.7	266.7	238.5	215.5	215.5	197.3	197.3	N/A

## Notes:

- (1) If the forecasted natural January through July volume runoff at The Dalles is less than 98.7 km<sup>3</sup>, the Power Discharge Requirement in the 98.7 km<sup>3</sup> schedule will be used. For intermediate forecasted volumes, the Power Discharge Requirement will be interpolated linearly between the values shown above.
- (2) PDR's and VRCLL's are from the 2005-06 AOP. Data may be revised upon completion of the Operating Committee Refill Studies. The Canadian Entity reserves the right to request changes to the revised data.

**Exhibit 8 - Coordinated System Loads and Resources used in the TSR  
(ENERGY in aMW)**

<b>Month</b>	<b>Total Loads 1/</b>	<b>Other Resources 2/</b>	<b>Coordinated Hydro Load 3/</b>	<b>Agreed Load Shaping 4/</b>	<b>FINAL Coordinated Hydro Load</b>
August 15	20911	9813	11097	0	<b>11097.4</b>
August 31	20833	9707	11125	-300	<b>10825.3</b>
September	20401	9592	10809	-400	<b>10408.7</b>
October	21068	11326	9742	0	<b>9742.0</b>
November	23016	12199	10817	0	<b>10816.6</b>
December	24625	11772	12853	542	<b>13394.9</b>
January	25199	12464	12735	0	<b>12735.0</b>
February	24129	12568	11561	0	<b>11560.8</b>
March	22794	11519	11275	0	<b>11274.7</b>
April 15	21566	11016	10550	0	<b>10550.5</b>
April 30	21655	7593	14061	0	<b>14061.4</b>
May	21028	6299	14729	0	<b>14728.9</b>
June	20876	6837	14039	0	<b>14039.4</b>
July	21052	8669	12383	0	<b>12382.6</b>

Notes: (Data for columns 1, 2, and 3 are from Table 1A of the 2005-06 AOP/DDPB Document).

1/ The total loads are the Pacific Northwest regional firm load plus pumping (line 1).

2/ Other resources include total flows out (line 2j), total load served by flows-in (line 3e), total load served by non-step1 resources, without coordinated resources (line 4e - 4b), total thermal installations (line 6j), and hydro maintenance (line 7a). Other resources include hydro independents (1929 for example) which will be updated from the best data available.

3/ AOP 2005-06 Coordinated Hydro Model Load, line 7b.

4/ The hydro firm load is reduced by 300 aMW in August 16-31 and 400 aMW in September, and increased by 541.9 aMW in December.

**Exhibit 9 – Duncan Reservoir Capacity Table (English)**  
ksfd

ELEVATION IN FEET											AVERAGE DIFFERENCE PER TENTH FT
	.0	.1	.2	.3	.4	.5	.6	.7	.8	.9	
1892.	705.8										0.89
1891.	696.9	697.8	698.7	699.6	700.5	701.3	702.2	703.1	704.0	704.9	0.89
1890.	688.0	688.9	689.8	690.7	691.6	692.4	693.3	694.2	695.1	696.0	0.89
1889.	679.2	680.1	681.0	681.8	682.7	683.6	684.5	685.4	686.2	687.1	0.88
1888.	670.4	671.3	672.2	673.0	673.9	674.8	675.7	676.6	677.4	678.3	0.88
1887.	661.5	662.4	663.3	664.2	665.1	665.9	666.8	667.7	668.6	669.5	0.89
1886.	652.8	653.7	654.5	655.4	656.3	657.1	658.0	658.9	659.8	660.6	0.87
1885.	644.0	644.9	645.8	646.6	647.5	648.4	649.3	650.2	651.0	651.9	0.88
1884.	635.3	636.2	637.0	637.9	638.8	639.6	640.5	641.4	642.3	643.1	0.87
1883.	626.6	627.5	628.3	629.2	630.1	630.9	631.8	632.7	633.6	634.4	0.87
1882.	617.9	618.8	619.6	620.5	621.4	622.2	623.1	624.0	624.9	625.7	0.87
1881.	609.2	610.1	610.9	611.8	612.7	613.5	614.4	615.3	616.2	617.0	0.87
1880.	600.6	601.5	602.3	603.2	604.0	604.9	605.8	606.6	607.5	608.3	0.86
1879.	592.0	592.9	593.7	594.6	595.4	596.3	597.2	598.0	598.9	599.7	0.86
1878.	583.4	584.3	585.1	586.0	586.8	587.7	588.6	589.4	590.3	591.1	0.86
1877.	574.8	575.7	576.5	577.4	578.2	579.1	580.0	580.8	581.7	582.5	0.86
1876.	566.3	567.1	568.0	568.8	569.7	570.5	571.4	572.2	573.1	573.9	0.85
1875.	557.8	558.6	559.5	560.3	561.2	562.0	562.9	563.7	564.6	565.4	0.85
1874.	549.3	550.1	551.0	551.8	552.7	553.5	554.4	555.2	556.1	556.9	0.85
1873.	540.9	541.7	542.6	543.4	544.3	545.1	545.9	546.8	547.6	548.5	0.84
1872.	532.4	533.2	534.1	534.9	535.8	536.6	537.5	538.3	539.2	540.0	0.85
1871.	524.0	524.8	525.7	526.5	527.4	528.2	529.0	529.9	530.7	531.6	0.84
1870.	515.7	516.5	517.4	518.2	519.0	519.8	520.7	521.5	522.3	523.2	0.83
1869.	507.3	508.1	509.0	509.8	510.7	511.5	512.3	513.2	514.0	514.9	0.84
1868.	499.0	499.8	500.7	501.5	502.3	503.1	504.0	504.8	505.6	506.5	0.83
1867.	490.7	491.5	492.4	493.2	494.0	494.8	495.7	496.5	497.3	498.2	0.83
1866.	482.4	483.2	484.1	484.9	485.7	486.5	487.4	488.2	489.0	489.9	0.83
1865.	474.2	475.0	475.8	476.7	477.5	478.3	479.1	479.9	480.8	481.6	0.82
1864.	466.0	466.8	467.6	468.5	469.3	470.1	470.9	471.7	472.6	473.4	0.82
1863.	457.8	458.6	459.4	460.3	461.1	461.9	462.7	463.5	464.4	465.2	0.82
1862.	449.7	450.5	451.3	452.1	452.9	453.7	454.6	455.4	456.2	457.0	0.81
1861.	441.6	442.4	443.2	444.0	444.8	445.6	446.5	447.3	448.1	448.9	0.81
1860.	433.5	434.3	435.1	435.9	436.7	437.5	438.4	439.2	440.0	440.8	0.81
1859.	425.4	426.2	427.0	427.8	428.6	429.4	430.3	431.1	431.9	432.7	0.81
1858.	417.4	418.2	419.0	419.8	420.6	421.4	422.2	423.0	423.8	424.6	0.80
1857.	409.4	410.2	411.0	411.8	412.6	413.4	414.2	415.0	415.8	416.6	0.80
1856.	401.4	402.2	403.0	403.8	404.6	405.4	406.2	407.0	407.8	408.6	0.80
1855.	393.5	394.3	395.1	395.9	396.7	397.4	398.2	399.0	399.8	400.6	0.79
1854.	385.6	386.4	387.2	388.0	388.8	389.5	390.3	391.1	391.9	392.7	0.79
1853.	377.7	378.5	379.3	380.1	380.9	381.6	382.4	383.2	384.0	384.8	0.79
1852.	369.9	370.7	371.5	372.2	373.0	373.8	374.6	375.4	376.1	376.9	0.78
1851.	362.1	362.9	363.7	364.4	365.2	366.0	366.8	367.6	368.3	369.1	0.78
1850.	354.3	355.1	355.9	356.6	357.4	358.2	359.0	359.8	360.5	361.3	0.78

**Exhibit 9 – Duncan Reservoir Capacity Table (English)**  
ksfd

ELEVATION IN FEET	.0	.1	.2	.3	.4	.5	.6	.7	.8	.9	AVERAGE DIFFERENCE PER TENTH FT
1849.	346.6	347.4	348.1	348.9	349.7	350.4	351.2	352.0	352.8	353.5	0.77
1848.	338.9	339.7	340.4	341.2	342.0	342.7	343.5	344.3	345.1	345.8	0.77
1847.	331.2	332.0	332.7	333.5	334.3	335.0	335.8	336.6	337.4	338.1	0.77
1846.	323.6	324.4	325.1	325.9	326.6	327.4	328.2	328.9	329.7	330.4	0.76
1845.	316.0	316.8	317.5	318.3	319.0	319.8	320.6	321.3	322.1	322.8	0.76
1844.	308.5	309.2	310.0	310.7	311.5	312.2	313.0	313.7	314.5	315.2	0.75
1843.	300.9	301.7	302.4	303.2	303.9	304.7	305.5	306.2	307.0	307.7	0.76
1842.	293.5	294.2	295.0	295.7	296.5	297.2	297.9	298.7	299.4	300.2	0.74
1841.	286.0	286.7	287.5	288.2	289.0	289.7	290.5	291.2	292.0	292.7	0.75
1840.	278.6	279.3	280.1	280.8	281.6	282.3	283.0	283.8	284.5	285.3	0.74
1839.	271.2	271.9	272.7	273.4	274.2	274.9	275.6	276.4	277.1	277.9	0.74
1838.	263.9	264.6	265.4	266.1	266.8	267.5	268.3	269.0	269.7	270.5	0.73
1837.	256.6	257.3	258.1	258.8	259.5	260.2	261.0	261.7	262.4	263.2	0.73
1836.	249.4	250.1	250.8	251.6	252.3	253.0	253.7	254.4	255.2	255.9	0.72
1835.	242.2	242.9	243.6	244.4	245.1	245.8	246.5	247.2	248.0	248.7	0.72
1834.	235.0	235.7	236.4	237.2	237.9	238.6	239.3	240.0	240.8	241.5	0.72
1833.	227.9	228.6	229.3	230.0	230.7	231.4	232.2	232.9	233.6	234.3	0.71
1832.	220.8	221.5	222.2	222.9	223.6	224.3	225.1	225.8	226.5	227.2	0.71
1831.	213.8	214.5	215.2	215.9	216.6	217.3	218.0	218.7	219.4	220.1	0.70
1830.	206.8	207.5	208.2	208.9	209.6	210.3	211.0	211.7	212.4	213.1	0.70
1829.	199.9	200.6	201.3	202.0	202.7	203.3	204.0	204.7	205.4	206.1	0.69
1828.	193.0	193.7	194.4	195.1	195.8	196.4	197.1	197.8	198.5	199.2	0.69
1827.	186.1	186.8	187.5	188.2	188.9	189.5	190.2	190.9	191.6	192.3	0.69
1826.	179.3	180.0	180.7	181.3	182.0	182.7	183.4	184.1	184.7	185.4	0.68
1825.	172.6	173.3	173.9	174.6	175.3	175.9	176.6	177.3	178.0	178.6	0.67
1824.	165.9	166.6	167.2	167.9	168.6	169.2	169.9	170.6	171.3	171.9	0.67
1823.	159.2	159.9	160.5	161.2	161.9	162.5	163.2	163.9	164.6	165.2	0.67
1822.	152.6	153.3	153.9	154.6	155.2	155.9	156.6	157.2	157.9	158.5	0.66
1821.	146.1	146.7	147.4	148.0	148.7	149.3	150.0	150.6	151.3	151.9	0.65
1820.	139.6	140.2	140.9	141.5	142.2	142.8	143.5	144.1	144.8	145.4	0.65
1819.	133.2	133.8	134.5	135.1	135.8	136.4	137.0	137.7	138.3	139.0	0.64
1818.	126.8	127.4	128.1	128.7	129.4	130.0	130.6	131.3	131.9	132.6	0.64
1817.	120.5	121.1	121.8	122.4	123.0	123.6	124.3	124.9	125.5	126.2	0.63
1816.	114.3	114.9	115.5	116.2	116.8	117.4	118.0	118.6	119.3	119.9	0.62
1815.	108.1	108.7	109.3	110.0	110.6	111.2	111.8	112.4	113.1	113.7	0.62
1814.	102.0	102.6	103.2	103.8	104.4	105.0	105.7	106.3	106.9	107.5	0.61
1813.	96.0	96.6	97.2	97.8	98.4	99.0	99.6	100.2	100.8	101.4	0.60
1812.	90.0	90.6	91.2	91.8	92.4	93.0	93.6	94.2	94.8	95.4	0.60
1811.	84.1	84.7	85.3	85.9	86.5	87.0	87.6	88.2	88.8	89.4	0.59
1810.	78.3	78.9	79.5	80.0	80.6	81.2	81.8	82.4	82.9	83.5	0.58

**Exhibit 9 – Duncan Reservoir Capacity Table (English)**  
ksfd

ELEVATION IN FEET	.0	.1	.2	.3	.4	.5	.6	.7	.8	.9	AVERAGE DIFFERENCE PER TENTH FT
1809.	72.5	73.1	73.7	74.2	74.8	75.4	76.0	76.6	77.1	77.7	0.58
1808.	66.9	67.5	68.0	68.6	69.1	69.7	70.3	70.8	71.4	71.9	0.56
1807.	61.3	61.9	62.4	63.0	63.5	64.1	64.7	65.2	65.8	66.3	0.56
1806.	55.8	56.3	56.9	57.4	58.0	58.5	59.1	59.6	60.2	60.7	0.55
1805.	50.4	50.9	51.5	52.0	52.6	53.1	53.6	54.2	54.7	55.3	0.54
1804.	45.1	45.6	46.2	46.7	47.2	47.7	48.3	48.8	49.3	49.9	0.53
1803.	39.9	40.4	40.9	41.5	42.0	42.5	43.0	43.5	44.1	44.6	0.52
1802.	34.8	35.3	35.8	36.3	36.8	37.3	37.9	38.4	38.9	39.4	0.51
1801.	29.8	30.3	30.8	31.3	31.8	32.3	32.8	33.3	33.8	34.3	0.50
1800.	25.0	25.5	26.0	26.4	26.9	27.4	27.9	28.4	28.8	29.3	0.48
1799.	20.3	20.8	21.2	21.7	22.2	22.6	23.1	23.6	24.1	24.5	0.47
1798.	15.7	16.2	16.6	17.1	17.5	18.0	18.5	18.9	19.4	19.8	0.46
1797.	11.3	11.7	12.2	12.6	13.1	13.5	13.9	14.4	14.8	15.3	0.44
1796.	7.1	7.5	7.9	8.4	8.8	9.2	9.6	10.0	10.5	10.9	0.42
1795.	3.0	3.4	3.8	4.2	4.6	5.0	5.5	5.9	6.3	6.7	0.41
1794.			0.0	0.4	0.8	1.1	1.5	1.9	2.3	2.6	0.37

**Exhibit 9M– Duncan Reservoir Capacity Table (SI)**  
hm<sup>3</sup>

ELEVATION IN METERS												AVERAGE DIFFERENCE PER 3/100 M
	.00	.03	.06	.09	.12	.15	.18	.21	.24	.27		
576.68	1726.8											
576.38	1705.0	1707.2	1709.4	1711.6	1713.8	1715.8	1718.0	1720.2	1722.4	1724.6		2.18
576.07	1683.3	1685.5	1687.7	1689.9	1692.1	1694.0	1696.2	1698.4	1700.6	1702.8		2.18
575.77	1661.7	1663.9	1666.1	1668.1	1670.3	1672.5	1674.7	1676.9	1678.9	1681.1		2.15
575.46	1640.2	1642.4	1644.6	1646.6	1648.8	1651.0	1653.2	1655.4	1657.3	1659.5		2.15
575.16	1618.4	1620.6	1622.8	1625.0	1627.2	1629.2	1631.4	1633.6	1635.8	1638.0		2.18
574.85	1597.1	1599.3	1601.3	1603.5	1605.7	1607.7	1609.9	1612.1	1614.3	1616.2		2.13
574.55	1575.6	1577.8	1580.0	1582.0	1584.2	1586.4	1588.6	1590.8	1592.7	1594.9		2.15
574.24	1554.3	1556.5	1558.5	1560.7	1562.9	1564.8	1567.0	1569.2	1571.5	1573.4		2.13
573.94	1533.0	1535.2	1537.2	1539.4	1541.6	1543.6	1545.8	1548.0	1550.2	1552.1		2.13
573.63	1511.8	1514.0	1515.9	1518.1	1520.3	1522.3	1524.5	1526.7	1528.9	1530.8		2.13
573.33	1490.5	1492.7	1494.6	1496.8	1499.0	1501.0	1503.2	1505.4	1507.6	1509.6		2.13
573.03	1469.4	1471.6	1473.6	1475.8	1477.7	1479.9	1482.2	1484.1	1486.3	1488.3		2.10
572.72	1448.4	1450.6	1452.5	1454.7	1456.7	1458.9	1461.1	1463.1	1465.3	1467.2		2.10
572.42	1427.3	1429.5	1431.5	1433.7	1435.7	1437.9	1440.1	1442.0	1444.2	1446.2		2.10
572.11	1406.3	1408.5	1410.5	1412.7	1414.6	1416.8	1419.0	1421.0	1423.2	1425.1		2.10
571.81	1385.5	1387.5	1389.7	1391.6	1393.8	1395.8	1398.0	1399.9	1402.1	1404.1		2.08
571.50	1364.7	1366.7	1368.9	1370.8	1373.0	1375.0	1377.2	1379.1	1381.4	1383.3		2.08
571.20	1343.9	1345.9	1348.1	1350.0	1352.2	1354.2	1356.4	1358.4	1360.6	1362.5		2.08
570.89	1323.4	1325.3	1327.5	1329.5	1331.7	1333.6	1335.6	1337.8	1339.8	1342.0		2.06
570.59	1302.6	1304.5	1306.7	1308.7	1310.9	1312.8	1315.0	1317.0	1319.2	1321.2		2.08
570.28	1282.0	1284.0	1286.2	1288.1	1290.3	1292.3	1294.3	1296.5	1298.4	1300.6		2.06
569.98	1261.7	1263.7	1265.9	1267.8	1269.8	1271.7	1273.9	1275.9	1277.9	1280.1		2.03
569.67	1241.2	1243.1	1245.3	1247.3	1249.5	1251.4	1253.4	1255.6	1257.6	1259.8		2.06
569.37	1220.9	1222.8	1225.0	1227.0	1228.9	1230.9	1233.1	1235.0	1237.0	1239.2		2.03
569.06	1200.5	1202.5	1204.7	1206.7	1208.6	1210.6	1212.8	1214.7	1216.7	1218.9		2.03
568.76	1180.2	1182.2	1184.4	1186.4	1188.3	1190.3	1192.5	1194.4	1196.4	1198.6		2.03
568.45	1160.2	1162.1	1164.1	1166.3	1168.3	1170.2	1172.2	1174.1	1176.3	1178.3		2.01
568.15	1140.1	1142.1	1144.0	1146.2	1148.2	1150.1	1152.1	1154.1	1156.3	1158.2		2.01
567.84	1120.1	1122.0	1124.0	1126.2	1128.1	1130.1	1132.0	1134.0	1136.2	1138.2		2.01
567.54	1100.2	1102.2	1104.2	1106.1	1108.1	1110.0	1112.2	1114.2	1116.1	1118.1		1.98
567.23	1080.4	1082.4	1084.3	1086.3	1088.2	1090.2	1092.4	1094.4	1096.3	1098.3		1.98
566.93	1060.6	1062.6	1064.5	1066.5	1068.4	1070.4	1072.6	1074.5	1076.5	1078.5		1.98
566.62	1040.8	1042.7	1044.7	1046.7	1048.6	1050.6	1052.8	1054.7	1056.7	1058.6		1.98
566.32	1021.2	1023.2	1025.1	1027.1	1029.0	1031.0	1033.0	1034.9	1036.9	1038.8		1.96
566.01	1001.6	1003.6	1005.6	1007.5	1009.5	1011.4	1013.4	1015.3	1017.3	1019.3		1.96
565.71	982.1	984.0	986.0	987.9	989.9	991.9	993.8	995.8	997.7	999.7		1.96
565.41	962.7	964.7	966.7	968.6	970.6	972.3	974.2	976.2	978.2	980.1		1.93
565.10	943.4	945.4	947.3	949.3	951.2	953.0	954.9	956.9	958.8	960.8		1.93
564.80	924.1	926.0	928.0	930.0	931.9	933.6	935.6	937.5	939.5	941.5		1.93
564.49	905.0	907.0	908.9	910.6	912.6	914.5	916.5	918.5	920.2	922.1		1.91
564.19	885.9	887.9	889.8	891.5	893.5	895.5	897.4	899.4	901.1	903.0		1.91
563.88	866.8	868.8	870.7	872.5	874.4	876.4	878.3	880.3	882.0	884.0		1.91

**Exhibit 9M– Duncan Reservoir Capacity Table (SI)**

hm<sup>3</sup>

ELEVATION IN METERS	.00	.03	.06	.09	.12	.15	.18	.21	.24	.27	AVERAGE DIFFERENCE PER 3/100 M
563.58	848.0	849.9	851.7	853.6	855.6	857.3	859.2	861.2	863.2	864.9	1.88
563.27	829.2	831.1	832.8	834.8	836.7	838.4	840.4	842.4	844.3	846.0	1.88
562.97	810.3	812.3	814.0	815.9	817.9	819.6	821.6	823.5	825.5	827.2	1.88
562.66	791.7	793.7	795.4	797.3	799.1	801.0	803.0	804.7	806.6	808.4	1.86
562.36	773.1	775.1	776.8	778.8	780.5	782.4	784.4	786.1	788.0	789.8	1.86
562.05	754.8	756.5	758.4	760.2	762.1	763.8	765.8	767.5	769.5	771.2	1.83
561.75	736.2	738.1	739.9	741.8	743.5	745.5	747.4	749.1	751.1	752.8	1.86
561.44	718.1	719.8	721.7	723.5	725.4	727.1	728.8	730.8	732.5	734.5	1.81
561.14	699.7	701.4	703.4	705.1	707.1	708.8	710.7	712.4	714.4	716.1	1.83
560.83	681.6	683.3	685.3	687.0	689.0	690.7	692.4	694.3	696.1	698.0	1.81
560.53	663.5	665.2	667.2	668.9	670.9	672.6	674.3	676.2	678.0	679.9	1.81
560.22	645.7	647.4	649.3	651.0	652.8	654.5	656.4	658.1	659.8	661.8	1.79
559.92	627.8	629.5	631.5	633.2	634.9	636.6	638.6	640.3	642.0	643.9	1.79
559.61	610.2	611.9	613.6	615.6	617.3	619.0	620.7	622.4	624.4	626.1	1.76
559.31	592.6	594.3	596.0	597.9	599.7	601.4	603.1	604.8	606.8	608.5	1.76
559.00	575.0	576.7	578.4	580.3	582.0	583.8	585.5	587.2	589.1	590.9	1.76
558.70	557.6	559.3	561.0	562.7	564.4	566.1	568.1	569.8	571.5	573.2	1.74
558.39	540.2	541.9	543.6	545.3	547.1	548.8	550.7	552.4	554.2	555.9	1.74
558.09	523.1	524.8	526.5	528.2	529.9	531.6	533.4	535.1	536.8	538.5	1.71
557.79	506.0	507.7	509.4	511.1	512.8	514.5	516.2	517.9	519.7	521.4	1.71
557.48	489.1	490.8	492.5	494.2	495.9	497.4	499.1	500.8	502.5	504.2	1.69
557.18	472.2	473.9	475.6	477.3	479.0	480.5	482.2	483.9	485.7	487.4	1.69
556.87	455.3	457.0	458.7	460.5	462.2	463.6	465.3	467.1	468.8	470.5	1.69
556.57	438.7	440.4	442.1	443.6	445.3	447.0	448.7	450.4	451.9	453.6	1.66
556.26	422.3	424.0	425.5	427.2	428.9	430.4	432.1	433.8	435.5	437.0	1.64
555.96	405.9	407.6	409.1	410.8	412.5	414.0	415.7	417.4	419.1	420.6	1.64
555.65	389.5	391.2	392.7	394.4	396.1	397.6	399.3	401.0	402.7	404.2	1.64
555.35	373.4	375.1	376.5	378.2	379.7	381.4	383.1	384.6	386.3	387.8	1.61
555.04	357.4	358.9	360.6	362.1	363.8	365.3	367.0	368.5	370.2	371.6	1.59
554.74	341.5	343.0	344.7	346.2	347.9	349.4	351.1	352.6	354.3	355.7	1.59
554.43	325.9	327.4	329.1	330.5	332.2	333.7	335.2	336.9	338.4	340.1	1.57
554.13	310.2	311.7	313.4	314.9	316.6	318.1	319.5	321.2	322.7	324.4	1.57
553.82	294.8	296.3	298.0	299.5	300.9	302.4	304.1	305.6	307.0	308.8	1.54
553.52	279.6	281.1	282.6	284.3	285.8	287.2	288.7	290.2	291.9	293.3	1.52
553.21	264.5	265.9	267.4	269.1	270.6	272.1	273.5	275.0	276.7	278.2	1.52
552.91	249.6	251.0	252.5	254.0	255.4	256.9	258.6	260.1	261.5	263.0	1.49
552.60	234.9	236.3	237.8	239.3	240.7	242.2	243.7	245.1	246.6	248.1	1.47
552.30	220.2	221.7	223.1	224.6	226.1	227.5	229.0	230.5	231.9	233.4	1.47
551.99	205.8	207.2	208.7	210.2	211.6	212.9	214.3	215.8	217.3	218.7	1.44
551.69	191.6	193.0	194.5	195.7	197.2	198.7	200.1	201.6	202.8	204.3	1.42

**Exhibit 9M– Duncan Reservoir Capacity Table (SI)**  
**hm<sup>3</sup>**

ELEVATION IN METERS	.00	.03	.06	.09	.12	.15	.18	.21	.24	.27	AVERAGE DIFFERENCE PER 3/100 M
551.38	177.4	178.8	180.3	181.5	183.0	184.5	185.9	187.4	188.6	190.1	1.42
551.08	163.7	165.1	166.4	167.8	169.1	170.5	172.0	173.2	174.7	175.9	1.37
550.77	150.0	151.4	152.7	154.1	155.4	156.8	158.3	159.5	161.0	162.2	1.37
550.47	136.5	137.7	139.2	140.4	141.9	143.1	144.6	145.8	147.3	148.5	1.35
550.17	123.3	124.5	126.0	127.2	128.7	129.9	131.1	132.6	133.8	135.3	1.32
	110.3	111.6	113.0	114.3	115.5	116.7	118.2	119.4	120.6	122.1	1.30
549.56	97.6	98.8	100.1	101.5	102.8	104.0	105.2	106.4	107.9	109.1	1.27
549.25	85.1	86.4	87.6	88.8	90.0	91.3	92.7	93.9	95.2	96.4	1.25
548.95	72.9	74.1	75.4	76.6	77.8	79.0	80.2	81.5	82.7	83.9	1.22
548.64	61.2	62.4	63.6	64.6	65.8	67.0	68.3	69.5	70.5	71.7	1.17
548.34	49.7	50.9	51.9	53.1	54.3	55.3	56.5	57.7	59.0	59.9	1.15
548.03	38.4	39.6	40.6	41.8	42.8	44.0	45.3	46.2	47.5	48.4	1.13
547.73	27.6	28.6	29.8	30.8	32.1	33.0	34.0	35.2	36.2	37.4	1.08
547.42	17.4	18.3	19.3	20.6	21.5	22.5	23.5	24.5	25.7	26.7	1.03
546.81			0.0	1.0	2.0	2.7	3.7	4.6	5.6	6.4	0.91

**Exhibit 10 – Arrow Reservoir Capacity Table (English)**  
**ksfd**

ELEVATION IN FEET	.0	.1	.2	.3	.4	.5	.6	.7	.8	.9	AVERAGE DIFFERENCE PER TENTH FT
1444.	3579.6										6.55
1443.	3514.1	3520.6	3527.2	3533.7	3540.3	3546.8	3553.4	3559.9	3566.5	3573.0	6.52
1442.	3448.9	3455.4	3461.9	3468.5	3475.0	3481.5	3488.0	3494.5	3501.1	3507.6	6.49
1441.	3384.0	3390.5	3397.0	3403.5	3410.0	3416.4	3422.9	3429.4	3435.9	3442.4	6.45
1440.	3319.5	3325.9	3332.4	3338.8	3345.3	3351.7	3358.2	3364.6	3371.1	3377.5	6.45
1439.	3255.2	3261.6	3268.1	3274.5	3280.9	3287.3	3293.8	3300.2	3306.6	3313.1	6.43
1438.	3191.4	3197.8	3204.2	3210.5	3216.9	3223.3	3229.7	3236.1	3242.4	3248.8	6.38
1437.	3127.8	3134.2	3140.5	3146.9	3153.2	3159.6	3166.0	3172.3	3178.7	3185.0	6.36
1436.	3064.6	3070.9	3077.2	3083.6	3089.9	3096.2	3102.5	3108.8	3115.2	3121.5	6.32
1435.	3001.7	3008.0	3014.3	3020.6	3026.9	3033.1	3039.4	3045.7	3052.0	3058.3	6.29
1434.	2939.2	2945.4	2951.7	2957.9	2964.2	2970.4	2976.7	2982.9	2989.2	2995.4	6.25
1433.	2877.0	2883.2	2889.4	2895.7	2901.9	2908.1	2914.3	2920.5	2926.8	2933.0	6.22
1432.	2815.1	2821.3	2827.5	2833.7	2839.9	2846.0	2852.2	2858.4	2864.6	2870.8	6.19
1431.	2753.5	2759.7	2765.8	2772.0	2778.1	2784.3	2790.5	2796.6	2802.8	2808.9	6.16
1430.	2692.3	2698.4	2704.5	2710.7	2716.8	2722.9	2729.0	2735.1	2741.3	2747.4	6.12
1429.	2631.5	2637.6	2643.7	2649.7	2655.8	2661.9	2668.0	2674.1	2680.1	2686.2	6.08
1428.	2570.9	2577.0	2583.0	2589.1	2595.1	2601.2	2607.3	2613.3	2619.4	2625.4	6.06
1427.	2510.7	2516.7	2522.7	2528.8	2534.8	2540.8	2546.8	2552.8	2558.9	2564.9	6.02
1426.	2450.8	2456.8	2462.8	2468.8	2474.8	2480.7	2486.7	2492.7	2498.7	2504.7	5.99
1425.	2391.2	2397.2	2403.1	2409.1	2415.0	2421.0	2427.0	2432.9	2438.9	2444.8	5.96
1424.	2331.9	2337.8	2343.8	2349.7	2355.6	2361.5	2367.5	2373.4	2379.3	2385.3	5.93
1423.	2272.8	2278.7	2284.6	2290.5	2296.4	2302.3	2308.3	2314.2	2320.1	2326.0	5.91
1422.	2214.1	2220.0	2225.8	2231.7	2237.6	2243.4	2249.3	2255.2	2261.1	2266.9	5.87
1421.	2155.7	2161.5	2167.4	2173.2	2179.1	2184.9	2190.7	2196.6	2202.4	2208.3	5.84
1420.	2097.7	2103.5	2109.3	2115.1	2120.9	2126.7	2132.5	2138.3	2144.1	2149.9	5.80
1419.	2040.1	2045.9	2051.6	2057.4	2063.1	2068.9	2074.7	2080.4	2086.2	2091.9	5.76
1418.	1982.9	1988.6	1994.3	2000.1	2005.8	2011.5	2017.2	2022.9	2028.7	2034.4	5.72
1417.	1926.1	1931.8	1937.5	1943.1	1948.8	1954.5	1960.2	1965.9	1971.5	1977.2	5.68
1416.	1869.6	1875.2	1880.9	1886.5	1892.2	1897.8	1903.5	1909.1	1914.8	1920.4	5.65
1415.	1813.5	1819.1	1824.7	1830.3	1835.9	1841.5	1847.2	1852.8	1858.4	1864.0	5.61
1414.	1757.8	1763.4	1768.9	1774.5	1780.1	1785.6	1791.2	1796.8	1802.4	1807.9	5.57
1413.	1702.4	1707.9	1713.5	1719.0	1724.6	1730.1	1735.6	1741.2	1746.7	1752.3	5.54
1412.	1647.4	1652.9	1658.4	1663.9	1669.4	1674.9	1680.4	1685.9	1691.4	1696.9	5.50
1411.	1592.7	1598.2	1603.6	1609.1	1614.6	1620.0	1625.5	1631.0	1636.5	1641.9	5.47
1410.	1538.4	1543.8	1549.3	1554.7	1560.1	1565.5	1571.0	1576.4	1581.8	1587.3	5.43
1409.	1484.5	1489.9	1495.3	1500.7	1506.1	1511.4	1516.8	1522.2	1527.6	1533.0	5.39
1408.	1430.9	1436.3	1441.6	1447.0	1452.3	1457.7	1463.1	1468.4	1473.8	1479.1	5.36
1407.	1377.7	1383.0	1388.3	1393.7	1399.0	1404.3	1409.6	1414.9	1420.3	1425.6	5.32
1406.	1324.7	1330.0	1335.3	1340.6	1345.9	1351.2	1356.5	1361.8	1367.1	1372.4	5.30
1405.	1272.1	1277.4	1282.6	1287.9	1293.1	1298.4	1303.7	1308.9	1314.2	1319.4	5.26

**Exhibit 10 – Arrow Reservoir Capacity Table (English)**  
**ksfd**

ELEVATION IN FEET											AVERAGE DIFFERENCE PER TENTH FT
	.0	.1	.2	.3	.4	.5	.6	.7	.8	.9	
1404.	1219.5	1224.8	1230.0	1235.3	1240.5	1245.8	1251.1	1256.3	1261.6	1266.8	5.26
1403.	1167.3	1172.5	1177.7	1183.0	1188.2	1193.4	1198.6	1203.8	1209.1	1214.3	5.22
1402.	1115.4	1120.6	1125.8	1131.0	1136.2	1141.3	1146.5	1151.7	1156.9	1162.1	5.19
1401.	1063.9	1069.0	1074.2	1079.3	1084.5	1089.6	1094.8	1099.9	1105.1	1110.2	5.15
1400.	1012.8	1017.9	1023.0	1028.1	1033.2	1038.3	1043.5	1048.6	1053.7	1058.8	5.11
1399.	962.5	967.5	972.6	977.6	982.6	987.6	992.7	997.7	1002.7	1007.8	5.03
1398.	912.7	917.7	922.7	927.6	932.6	937.6	942.6	947.6	952.5	957.5	4.98
1397.	863.2	868.1	873.1	878.0	883.0	887.9	892.9	897.8	902.8	907.7	4.95
1396.	814.1	819.0	823.9	828.8	833.7	838.6	843.6	848.5	853.4	858.3	4.91
1395	765.2	770.1	775.0	779.9	784.8	789.6	794.5	799.4	804.3	809.2	4.89
1394.	716.2	721.1	726.0	730.9	735.8	740.7	745.6	750.5	755.4	760.3	4.90
1393.	667.5	672.4	677.2	682.1	687.0	691.8	696.7	701.6	706.5	711.3	4.87
1392.	619.3	624.1	628.9	633.8	638.6	643.4	648.2	653.0	657.9	662.7	4.82
1391.	571.5	576.3	581.1	585.8	590.6	595.4	600.2	605.0	609.7	614.5	4.78
1390.	524.2	528.9	533.7	538.4	543.1	547.8	552.6	557.3	562.0	566.8	4.73
1389.	477.9	482.5	487.2	491.8	496.4	501.0	505.7	510.3	514.9	519.6	4.63
1388.	432.3	436.9	441.4	446.0	450.5	455.1	459.7	464.2	468.8	473.3	4.56
1387.	387.2	391.7	396.2	400.7	405.2	409.7	414.3	418.8	423.3	427.8	4.51
1386.	342.6	347.1	351.5	356.0	360.4	364.9	369.4	373.8	378.3	382.7	4.46
1385.	298.5	302.9	307.3	311.7	316.1	320.5	325.0	329.4	333.8	338.2	4.41
1384.	254.6	259.0	263.4	267.8	272.2	276.5	280.9	285.3	289.7	294.1	4.39
1383.	211.2	215.5	219.9	224.2	228.6	232.9	237.2	241.6	245.9	250.3	4.34
1382.	168.4	172.7	177.0	181.2	185.5	189.8	194.1	198.4	202.6	206.9	4.28
1381.	126.1	130.3	134.6	138.8	143.0	147.2	151.5	155.7	159.9	164.2	4.23
1380.	84.3	88.5	92.7	96.8	101.0	105.2	109.4	113.6	117.7	121.9	4.18
1379.	43.2	47.3	51.4	55.5	59.6	63.7	67.9	72.0	76.1	80.2	4.11
1378.	2.7	6.7	10.8	14.8	18.9	22.9	27.0	31.0	35.1	39.1	4.05
1377.										0.0	2.70

**Exhibit 10M – Arrow Reservoir Capacity Table (SI)**

hm<sup>3</sup>

ELEVATION IN METERS												AVERAGE DIFFERENCE PER 3/100 M
	.00	.03	.06	.09	.12	.15	.18	.21	.24	.27		
440.13	8757.8											16.03
439.83	8597.6	8613.5	8629.6	8645.6	8661.7	8677.6	8693.7	8709.7	8725.8	8741.7		
439.52	8438.1	8454.0	8469.9	8486.0	8501.9	8517.8	8533.7	8549.6	8565.8	8581.7		15.95
439.22	8279.3	8295.2	8311.1	8327.0	8342.9	8358.6	8374.5	8390.4	8406.3	8422.2		15.88
438.91	8121.5	8137.1	8153.0	8168.7	8184.6	8200.3	8216.2	8231.8	8247.7	8263.4		15.78
438.61	7964.2	7979.8	7995.7	8011.4	8027.0	8042.7	8058.6	8074.3	8089.9	8105.8		15.73
438.30	7808.1	7823.7	7839.4	7854.8	7870.5	7886.1	7901.8	7917.4	7932.9	7948.5		15.61
438.00	7652.5	7668.1	7683.5	7699.2	7714.6	7730.3	7745.9	7761.3	7777.0	7792.4		15.56
437.69	7497.9	7513.3	7528.7	7544.3	7559.7	7575.2	7590.6	7606.0	7621.6	7637.1		15.46
437.39	7344.0	7359.4	7374.8	7390.2	7405.6	7420.8	7436.2	7451.6	7467.0	7482.4		15.39
437.08	7191.0	7206.2	7221.6	7236.8	7252.2	7267.4	7282.8	7298.0	7313.4	7328.5		15.29
436.78	7038.9	7054.0	7069.2	7084.6	7099.8	7115.0	7130.1	7145.3	7160.7	7175.9		15.22
436.47	6887.4	6902.6	6917.8	6932.9	6948.1	6963.0	6978.2	6993.4	7008.5	7023.7		15.14
436.17	6736.7	6751.9	6766.8	6782.0	6796.9	6812.1	6827.2	6842.2	6857.3	6872.3		15.07
435.86	6587.0	6601.9	6616.8	6632.0	6646.9	6661.8	6676.8	6691.7	6706.9	6721.8		14.97
435.56	6438.2	6453.2	6468.1	6482.8	6497.7	6512.6	6527.5	6542.5	6557.1	6572.1		14.88
435.26	6290.0	6304.9	6319.6	6334.5	6349.2	6364.1	6379.0	6393.7	6408.6	6423.3		14.83
434.95	6142.7	6157.4	6172.0	6187.0	6201.6	6216.3	6231.0	6245.7	6260.6	6275.3		14.73
434.65	5996.1	6010.8	6025.5	6040.2	6054.8	6069.3	6084.0	6098.6	6113.3	6128.0		14.66
434.34	5850.3	5865.0	5879.4	5894.1	5908.5	5923.2	5937.9	5952.3	5967.0	5981.4		14.58
434.04	5705.2	5719.7	5734.3	5748.8	5763.2	5777.6	5792.3	5806.8	5821.2	5835.9		14.51
433.73	5560.6	5575.1	5589.5	5603.9	5618.4	5632.8	5647.5	5661.9	5676.4	5690.8		14.46
433.43	5417.0	5431.5	5445.6	5460.1	5474.5	5488.7	5503.1	5517.6	5532.0	5546.2		14.36
433.12	5274.1	5288.3	5302.8	5317.0	5331.4	5345.6	5359.8	5374.2	5388.4	5402.8		14.29
432.82	5132.2	5146.4	5160.6	5174.8	5189.0	5203.2	5217.4	5231.6	5245.8	5259.9		14.19
432.51	4991.3	5005.5	5019.4	5033.6	5047.6	5061.8	5076.0	5089.9	5104.1	5118.0		14.09
432.21	4851.4	4865.3	4879.3	4893.4	4907.4	4921.3	4935.3	4949.2	4963.4	4977.4		13.99
431.90	4712.4	4726.3	4740.3	4754.0	4767.9	4781.9	4795.8	4809.8	4823.5	4837.4		13.90
431.60	4574.2	4587.9	4601.8	4615.5	4629.5	4643.2	4657.1	4670.8	4684.7	4698.5		13.82
431.29	4436.9	4450.6	4464.3	4478.0	4491.7	4505.4	4519.4	4533.1	4546.8	4560.5		13.73
430.99	4300.6	4314.3	4327.8	4341.5	4355.2	4368.6	4382.3	4396.1	4409.8	4423.2		13.63
430.68	4165.1	4178.5	4192.2	4205.7	4219.4	4232.9	4246.3	4260.0	4273.5	4287.2		13.55
430.38	4030.5	4044.0	4057.4	4070.9	4084.4	4097.8	4111.3	4124.7	4138.2	4151.6		13.46
430.07	3896.7	3910.2	3923.4	3936.8	3950.3	3963.5	3976.9	3990.4	4003.9	4017.1		13.38
429.77	3763.8	3777.1	3790.5	3803.7	3816.9	3830.2	3843.6	3856.8	3870.0	3883.5		13.29
429.46	3632.0	3645.2	3658.4	3671.6	3684.8	3697.8	3711.0	3724.2	3737.4	3750.6		13.19
429.16	3500.8	3514.1	3527.0	3540.2	3553.2	3566.4	3579.6	3592.6	3605.8	3618.8		13.11
428.85	3370.7	3383.6	3396.6	3409.8	3422.8	3435.8	3448.7	3461.7	3474.9	3487.9		13.02
428.55	3241.0	3254.0	3266.9	3279.9	3292.9	3305.8	3318.8	3331.8	3344.7	3357.7		12.97
428.24	3112.3	3125.3	3138.0	3151.0	3163.7	3176.7	3189.6	3202.4	3215.3	3228.0		12.87

**Exhibit 10M – Arrow Reservoir Capacity Table (SI)**  
 $\text{hm}^3$

ELEVATION IN METERS											AVERAGE DIFFERENCE PER 3/100 M
	.00	.03	.06	.09	.12	.15	.18	.21	.24	.27	
427.94	2983.6	2996.6	3009.3	3022.3	3035.0	3048.0	3060.9	3073.7	3086.6	3099.4	12.87
427.64	2855.9	2868.6	2881.4	2894.3	2907.1	2919.8	2932.5	2945.2	2958.2	2970.9	12.77
427.33	2728.9	2741.7	2754.4	2767.1	2779.8	2792.3	2805.0	2817.7	2830.5	2843.2	12.70
427.03	2602.9	2615.4	2628.1	2640.6	2653.3	2665.8	2678.5	2691.0	2703.7	2716.2	12.60
426.72	2477.9	2490.4	2502.9	2515.3	2527.8	2540.3	2553.0	2565.5	2578.0	2590.5	12.50
426.42	2354.9	2367.1	2379.6	2391.8	2404.0	2416.3	2428.7	2441.0	2453.2	2465.7	12.31
426.11	2233.0	2245.2	2257.5	2269.5	2281.7	2293.9	2306.2	2318.4	2330.4	2342.6	12.18
425.81	2111.9	2123.9	2136.1	2148.1	2160.3	2172.3	2184.6	2196.6	2208.8	2220.8	12.11
425.50	1991.8	2003.8	2015.8	2027.7	2039.7	2051.7	2064.0	2075.9	2087.9	2099.9	12.01
425.20	1872.1	1884.1	1896.1	1908.1	1920.1	1931.8	1943.8	1955.8	1967.8	1979.8	11.96
424.89	1752.3	1764.2	1776.2	1788.2	1800.2	1812.2	1824.2	1836.2	1848.2	1860.1	11.99
424.59	1633.1	1645.1	1656.8	1668.8	1680.8	1692.6	1704.5	1716.5	1728.5	1740.3	11.91
424.28	1515.2	1526.9	1538.7	1550.7	1562.4	1574.1	1585.9	1597.6	1609.6	1621.4	11.79
423.98	1398.2	1410.0	1421.7	1433.2	1445.0	1456.7	1468.4	1480.2	1491.7	1503.4	11.69
423.67	1282.5	1294.0	1305.8	1317.2	1328.7	1340.2	1352.0	1363.5	1375.0	1386.7	11.57
423.37	1169.2	1180.5	1192.0	1203.2	1214.5	1225.7	1237.2	1248.5	1259.8	1271.3	11.33
423.06	1057.7	1068.9	1079.9	1091.2	1102.2	1113.4	1124.7	1135.7	1147.0	1158.0	11.16
422.76	947.3	958.3	969.3	980.4	991.4	1002.4	1013.6	1024.6	1035.6	1046.7	11.03
422.45	838.2	849.2	860.0	871.0	881.8	892.8	903.8	914.5	925.5	936.3	10.91
422.15	730.3	741.1	751.8	762.6	773.4	784.1	795.1	805.9	816.7	827.4	10.79
421.84	622.9	633.7	644.4	655.2	666.0	676.5	687.2	698.0	708.8	719.5	10.74
421.54	516.7	527.2	538.0	548.5	559.3	569.8	580.3	591.1	601.6	612.4	10.62
421.23	412.0	422.5	433.0	443.3	453.8	464.4	474.9	485.4	495.7	506.2	10.47
420.93	308.5	318.8	329.3	339.6	349.9	360.1	370.7	380.9	391.2	401.7	10.35
420.62	206.2	216.5	226.8	236.8	247.1	257.4	267.7	277.9	288.0	298.2	10.23
420.32	105.7	115.7	125.8	135.8	145.8	155.8	166.1	176.2	186.2	196.2	10.06
420.02	6.6	16.4	26.4	36.2	46.2	56.0	66.1	75.8	85.9	95.7	9.91
419.71										0.0	6.61

**Exhibit 11 – Mica Reservoir Capacity Table (English)**

ksfd

ELEVATION IN FEET											AVERAGE DIFFERENCE PER TENTH FT
	.0	.1	.2	.3	.4	.5	.6	.7	.8	.9	
2475.	10121.1										5.38
2474.	10067.5	10072.9	10078.2	10083.6	10088.9	10094.3	10099.7	10105.0	10110.4	10115.7	5.36
2473.	10014.1	10019.4	10024.8	10030.1	10035.5	10040.8	10046.1	10051.5	10056.8	10062.2	5.34
2472.	9960.8	9966.1	9971.5	9976.8	9982.1	9987.4	9992.8	9998.1	10003.4	10008.8	5.33
2471.	9907.8	9913.1	9918.4	9923.7	9929.0	9934.3	9939.6	9944.9	9950.2	9955.5	5.30
2470.	9854.8	9860.1	9865.4	9870.7	9876.0	9881.3	9886.6	9891.9	9897.2	9902.5	5.30
2469.	9802.1	9807.4	9812.6	9817.9	9823.2	9828.5	9833.7	9839.0	9844.3	9849.5	5.27
2468.	9749.5	9754.8	9760.0	9765.3	9770.5	9775.8	9781.1	9786.3	9791.6	9796.8	5.26
2467.	9697.1	9702.3	9707.6	9712.8	9718.1	9723.3	9728.5	9733.8	9739.0	9744.3	5.24
2466.	9644.8	9650.0	9655.3	9660.5	9665.7	9671.0	9676.2	9681.4	9686.6	9691.9	5.23
2465.	9592.7	9597.9	9603.1	9608.3	9613.5	9618.8	9624.0	9629.2	9634.4	9639.6	5.21
2464.	9540.8	9546.0	9551.2	9556.4	9561.6	9566.8	9571.9	9577.1	9582.3	9587.5	5.19
2463.	9489.0	9494.2	9499.4	9504.5	9509.7	9514.9	9520.1	9525.3	9530.4	9535.6	5.18
2462.	9437.4	9442.6	9447.7	9452.9	9458.0	9463.2	9468.4	9473.5	9478.7	9483.8	5.16
2461.	9386.0	9391.1	9396.3	9401.4	9406.6	9411.7	9416.8	9422.0	9427.1	9432.3	5.14
2460.	9334.8	9339.9	9345.0	9350.2	9355.3	9360.4	9365.5	9370.6	9375.8	9380.9	5.12
2459.	9283.7	9288.8	9293.9	9299.0	9304.1	9309.3	9314.4	9319.5	9324.6	9329.7	5.11
2458.	9232.8	9237.9	9243.0	9248.1	9253.2	9258.3	9263.3	9268.4	9273.5	9278.6	5.09
2457.	9182.0	9187.1	9192.2	9197.2	9202.3	9207.4	9212.5	9217.6	9222.6	9227.7	5.08
2456.	9131.4	9136.5	9141.5	9146.6	9151.6	9156.7	9161.8	9166.8	9171.9	9176.9	5.06
2455.	9081.0	9086.0	9091.1	9096.1	9101.2	9106.2	9111.2	9116.3	9121.3	9126.4	5.04
2454.	9030.8	9035.8	9040.8	9045.9	9050.9	9055.9	9060.9	9065.9	9071.0	9076.0	5.02
2453.	8980.7	8985.7	8990.7	8995.7	9000.7	9005.8	9010.8	9015.8	9020.8	9025.8	5.01
2452.	8930.8	8935.8	8940.8	8945.8	8950.8	8955.8	8960.7	8965.7	8970.7	8975.7	4.99
2451.	8881.0	8886.0	8891.0	8895.9	8900.9	8905.9	8910.9	8915.9	8920.8	8925.8	4.98
2450.	8831.4	8836.4	8841.3	8846.3	8851.2	8856.2	8861.2	8866.1	8871.1	8876.0	4.96
2449.	8782.0	8786.9	8791.9	8796.8	8801.8	8806.7	8811.6	8816.6	8821.5	8826.5	4.94
2448.	8732.8	8737.7	8742.6	8747.6	8752.5	8757.4	8762.3	8767.2	8772.2	8777.1	4.92
2447.	8683.7	8688.6	8693.5	8698.4	8703.3	8708.3	8713.2	8718.1	8723.0	8727.9	4.91
2446.	8634.8	8639.7	8644.6	8649.5	8654.4	8659.3	8664.1	8669.0	8673.9	8678.8	4.89
2445.	8586.0	8590.9	8595.8	8600.6	8605.5	8610.4	8615.3	8620.2	8625.0	8629.9	4.88
2444.	8537.5	8542.4	8547.2	8552.1	8556.9	8561.8	8566.6	8571.5	8576.3	8581.2	4.85
2443.	8489.1	8493.9	8498.8	8503.6	8508.5	8513.3	8518.1	8523.0	8527.8	8532.7	4.84
2442.	8440.8	8445.6	8450.5	8455.3	8460.1	8465.0	8469.8	8474.6	8479.4	8484.3	4.83
2441.	8392.7	8397.5	8402.3	8407.1	8411.9	8416.8	8421.6	8426.4	8431.2	8436.0	4.81
2440.	8344.8	8349.6	8354.4	8359.2	8364.0	8368.8	8373.5	8378.3	8383.1	8387.9	4.79
2439.	8297.1	8301.9	8306.6	8311.4	8316.2	8321.0	8325.7	8330.5	8335.3	8340.0	4.77
2438.	8249.5	8254.3	8259.0	8263.8	8268.5	8273.3	8278.1	8282.8	8287.6	8292.3	4.76
2437.	8202.1	8206.8	8211.6	8216.3	8221.1	8225.8	8230.5	8235.3	8240.0	8244.8	4.74
2436.	8154.8	8159.5	8164.3	8169.0	8173.7	8178.5	8183.2	8187.9	8192.6	8197.4	4.73
2435.	8107.8	8112.5	8117.2	8121.9	8126.6	8131.3	8136.0	8140.7	8145.4	8150.1	4.70

**Exhibit 11 – Mica Reservoir Capacity Table (English)**  
ksfd

ELEVATION IN FEET											AVERAGE DIFFERENCE PER TENTH FT
	.0	.1	.2	.3	.4	.5	.6	.7	.8	.9	
2434.	8060.9	8065.6	8070.3	8075.0	8079.7	8084.4	8089.0	8093.7	8098.4	8103.1	4.69
2433.	8014.1	8018.8	8023.5	8028.1	8032.8	8037.5	8042.2	8046.9	8051.5	8056.2	4.68
2432.	7967.5	7972.2	7976.8	7981.5	7986.1	7990.8	7995.5	8000.1	8004.8	8009.4	4.66
2431.	7921.1	7925.7	7930.4	7935.0	7939.7	7944.3	7948.9	7953.6	7958.2	7962.9	4.64
2430.	7874.9	7879.5	7884.1	7888.8	7893.4	7898.0	7902.6	7907.2	7911.9	7916.5	4.62
2429.	7828.8	7833.4	7838.0	7842.6	7847.2	7851.9	7856.5	7861.1	7865.7	7870.3	4.61
2428.	7782.9	7787.5	7792.1	7796.7	7801.3	7805.9	7810.4	7815.0	7819.6	7824.2	4.59
2427.	7737.2	7741.8	7746.3	7750.9	7755.5	7760.1	7764.6	7769.2	7773.8	7778.3	4.57
2426.	7691.6	7696.2	7700.7	7705.3	7709.8	7714.4	7719.0	7723.5	7728.1	7732.6	4.56
2425.	7646.2	7650.7	7655.3	7659.8	7664.4	7668.9	7673.4	7678.0	7682.5	7687.1	4.54
2424.	7600.9	7605.4	7610.0	7614.5	7619.0	7623.6	7628.1	7632.6	7637.1	7641.7	4.53
2423.	7555.9	7560.4	7564.9	7569.4	7573.9	7578.4	7582.9	7587.4	7591.9	7596.4	4.50
2422.	7511.0	7515.5	7520.0	7524.5	7529.0	7533.5	7537.9	7542.4	7546.9	7551.4	4.49
2421.	7466.2	7470.7	7475.2	7479.6	7484.1	7488.6	7493.1	7497.6	7502.0	7506.5	4.48
2420.	7421.6	7426.1	7430.5	7435.0	7439.4	7443.9	7448.4	7452.8	7457.3	7461.7	4.46
2419.	7377.2	7381.6	7386.1	7390.5	7395.0	7399.4	7403.8	7408.3	7412.7	7417.2	4.44
2418.	7333.0	7337.4	7341.8	7346.3	7350.7	7355.1	7359.5	7363.9	7368.4	7372.8	4.42
2417.	7288.9	7293.3	7297.7	7302.1	7306.5	7311.0	7315.4	7319.8	7324.2	7328.6	4.41
2416.	7245.0	7249.4	7253.8	7258.2	7262.6	7267.0	7271.3	7275.7	7280.1	7284.5	4.39
2415.	7201.3	7205.7	7210.0	7214.4	7218.8	7223.2	7227.5	7231.9	7236.3	7240.6	4.37
2414.	7157.7	7162.1	7166.4	7170.8	7175.1	7179.5	7183.9	7188.2	7192.6	7196.9	4.36
2413.	7114.3	7118.6	7123.0	7127.3	7131.7	7136.0	7140.3	7144.7	7149.0	7153.4	4.34
2412.	7071.0	7075.3	7079.7	7084.0	7088.3	7092.7	7097.0	7101.3	7105.6	7110.0	4.33
2411.	7028.0	7032.3	7036.6	7040.9	7045.2	7049.5	7053.8	7058.1	7062.4	7066.7	4.30
2410.	6985.1	6989.4	6993.7	6998.0	7002.3	7006.6	7010.8	7015.1	7019.4	7023.7	4.29
2409.	6942.3	6946.6	6950.9	6955.1	6959.4	6963.7	6968.0	6972.3	6976.5	6980.8	4.28
2408.	6899.7	6904.0	6908.2	6912.5	6916.7	6921.0	6925.3	6929.5	6933.8	6938.0	4.26
2407.	6857.3	6861.5	6865.8	6870.0	6874.3	6878.5	6882.7	6887.0	6891.2	6895.5	4.24
2406.	6815.1	6819.3	6823.5	6827.8	6832.0	6836.2	6840.4	6844.6	6848.9	6853.1	4.22
2405.	6773.0	6777.2	6781.4	6785.6	6789.8	6794.1	6798.3	6802.5	6806.7	6810.9	4.21
2404.	6731.2	6735.3	6739.5	6743.7	6747.9	6752.1	6756.3	6760.5	6764.7	6768.9	4.20
2403.	6689.5	6693.7	6697.9	6702.0	6706.2	6710.4	6714.5	6718.7	6722.9	6727.1	4.17
2402.	6648.0	6652.2	6656.3	6660.5	6664.7	6668.8	6673.0	6677.1	6681.3	6685.5	4.16
2401.	6606.7	6610.9	6615.0	6619.2	6623.3	6627.4	6631.6	6635.7	6639.9	6644.0	4.14
2400.	6565.5	6569.7	6573.8	6577.9	6582.1	6586.2	6590.3	6594.5	6598.6	6602.7	4.13
2399.	6524.6	6528.7	6532.8	6536.9	6541.0	6545.1	6549.2	6553.3	6557.4	6561.5	4.11
2398.	6483.9	6487.9	6492.0	6496.1	6500.1	6504.2	6508.3	6512.4	6516.4	6520.5	4.07
2397.	6443.5	6447.6	6451.6	6455.6	6459.6	6463.7	6467.7	6471.8	6475.8	6479.8	4.03
2396.	6403.5	6407.5	6411.5	6415.5	6419.5	6423.5	6427.5	6431.5	6435.5	6439.5	4.00
2395.	6363.9	6367.8	6371.8	6375.7	6379.7	6383.7	6387.6	6391.6	6395.6	6399.5	3.96

**Exhibit 11 – Mica Reservoir Capacity Table (English)**  
ksfd

ELEVATION IN FEET											AVERAGE DIFFERENCE PER TENTH FT
	.0	.1	.2	.3	.4	.5	.6	.7	.8	.9	
2394.	6324.5	6328.5	6332.4	6336.3	6340.2	6344.2	6348.1	6352.0	6356.0	6359.9	3.93
2393.	6285.6	6289.5	6293.4	6297.2	6301.1	6305.0	6308.9	6312.8	6316.7	6320.6	3.90
2392.	6246.9	6250.8	6254.6	6258.5	6262.4	6266.2	6270.1	6274.0	6277.8	6281.7	3.87
2391.	6208.6	6212.4	6216.2	6220.0	6223.9	6227.7	6231.5	6235.4	6239.2	6243.1	3.83
2390.	6170.6	6174.4	6178.2	6181.9	6185.7	6189.5	6193.3	6197.2	6201.0	6204.8	3.80
2389.	6132.9	6136.7	6140.4	6144.2	6147.9	6151.7	6155.5	6159.2	6163.0	6166.8	3.77
2388.	6095.5	6099.2	6103.0	6106.7	6110.4	6114.2	6117.9	6121.7	6125.4	6129.2	3.74
2387.	6058.4	6062.1	6065.8	6069.5	6073.2	6076.9	6080.6	6084.3	6088.1	6091.8	3.71
2386.	6021.7	6025.3	6029.0	6032.7	6036.3	6040.0	6043.7	6047.4	6051.0	6054.7	3.68
2385.	5985.2	5988.8	5992.5	5996.1	5999.7	6003.4	6007.0	6010.7	6014.3	6018.0	3.65
2384.	5949.0	5952.6	5956.2	5959.8	5963.4	5967.0	5970.7	5974.3	5977.9	5981.6	3.62
2383.	5913.0	5916.6	5920.2	5923.8	5927.4	5931.0	5934.6	5938.2	5941.8	5945.4	3.59
2382.	5877.4	5881.0	5884.5	5888.1	5891.7	5895.2	5898.8	5902.3	5905.9	5909.5	3.56
2381.	5842.1	5845.6	5849.2	5852.7	5856.2	5859.7	5863.3	5866.8	5870.3	5873.9	3.53
2380.	5807.0	5810.5	5814.0	5817.5	5821.0	5824.5	5828.0	5831.6	5835.1	5838.6	3.51
2379.	5772.2	5775.7	5779.1	5782.6	5786.1	5789.6	5793.0	5796.5	5800.0	5803.5	3.48
2378.	5737.6	5741.1	5744.5	5748.0	5751.4	5754.9	5758.3	5761.8	5765.3	5768.7	3.45
2377.	5703.4	5706.8	5710.2	5713.6	5717.1	5720.5	5723.9	5727.3	5730.8	5734.2	3.43
2376.	5669.3	5672.7	5676.1	5679.5	5682.9	5686.3	5689.7	5693.1	5696.5	5700.0	3.41
2375.	5635.5	5638.9	5642.3	5645.6	5649.0	5652.4	5655.8	5659.2	5662.5	5665.9	3.38
2374.	5602.0	5605.3	5608.7	5612.0	5615.4	5618.7	5622.1	5625.5	5628.8	5632.2	3.35
2373.	5568.7	5572.0	5575.4	5578.7	5582.0	5585.3	5588.7	5592.0	5595.3	5598.7	3.33
2372.	5535.6	5538.9	5542.2	5545.5	5548.8	5552.1	5555.4	5558.7	5562.1	5565.4	3.31
2371.	5502.8	5506.1	5509.3	5512.6	5515.9	5519.2	5522.5	5525.7	5529.0	5532.3	3.28
2370.	5470.2	5473.4	5476.7	5479.9	5483.2	5486.5	5489.7	5493.0	5496.3	5499.5	3.26
2369.	5437.8	5441.0	5444.3	5447.5	5450.7	5453.9	5457.2	5460.4	5463.7	5466.9	3.24
2368.	5405.6	5408.9	5412.1	5415.3	5418.5	5421.7	5424.9	5428.1	5431.4	5434.6	3.22
2367.	5373.7	5376.9	5380.1	5383.3	5386.5	5389.7	5392.9	5396.1	5399.3	5402.4	3.19
2366.	5342.0	5345.2	5348.3	5351.5	5354.7	5357.8	5361.0	5364.2	5367.4	5370.5	3.17
2365.	5310.5	5313.6	5316.8	5319.9	5323.0	5326.2	5329.3	5332.5	5335.7	5338.8	3.15
2364.	5279.1	5282.3	5285.4	5288.5	5291.6	5294.8	5297.9	5301.0	5304.2	5307.3	3.13
2363.	5248.0	5251.1	5254.2	5257.4	5260.5	5263.6	5266.7	5269.8	5272.9	5276.0	3.11
2362.	5217.1	5220.2	5223.3	5226.4	5229.5	5232.6	5235.7	5238.7	5241.8	5244.9	3.09
2361.	5186.4	5189.4	5192.5	5195.6	5198.7	5201.7	5204.8	5207.9	5211.0	5214.0	3.07
2360.	5155.9	5158.9	5162.0	5165.0	5168.0	5171.1	5174.2	5177.2	5180.3	5183.3	3.05
2359.	5125.5	5128.5	5131.6	5134.6	5137.6	5140.7	5143.7	5146.7	5149.8	5152.8	3.03
2358.	5095.4	5098.4	5101.4	5104.4	5107.4	5110.4	5113.4	5116.5	5119.5	5122.5	3.02
2357.	5065.4	5068.4	5071.4	5074.4	5077.4	5080.4	5083.4	5086.4	5089.4	5092.4	3.00
2356.	5035.6	5038.5	5041.5	5044.5	5047.5	5050.4	5053.4	5056.4	5059.4	5062.4	2.98
2355.	5005.9	5008.9	5011.9	5014.8	5017.8	5020.7	5023.7	5026.7	5029.6	5032.6	2.96

**Exhibit 11 – Mica Reservoir Capacity Table (English)**  
ksfd

ELEVATION IN FEET											AVERAGE DIFFERENCE PER TENTH FT
	.0	.1	.2	.3	.4	.5	.6	.7	.8	.9	
2354.	4976.5	4979.4	4982.4	4985.3	4988.3	4991.2	4994.1	4997.1	5000.0	5003.0	2.94
2353.	4947.2	4950.1	4953.0	4956.0	4958.9	4961.8	4964.8	4967.7	4970.6	4973.6	2.93
2352.	4918.0	4920.9	4923.9	4926.8	4929.7	4932.6	4935.5	4938.4	4941.3	4944.3	2.91
2351.	4889.1	4892.0	4894.9	4897.8	4900.6	4903.5	4906.4	4909.3	4912.2	4915.1	2.90
2350.	4860.3	4863.1	4866.0	4868.9	4871.8	4874.6	4877.5	4880.4	4883.3	4886.2	2.88
2349.	4831.6	4834.4	4837.3	4840.2	4843.1	4845.9	4848.8	4851.7	4854.5	4857.4	2.87
2348.	4803.1	4805.9	4808.8	4811.6	4814.5	4817.3	4820.2	4823.0	4825.9	4828.7	2.85
2347.	4774.7	4777.5	4780.4	4783.2	4786.0	4788.9	4791.7	4794.6	4797.4	4800.2	2.84
2346.	4746.5	4749.3	4752.1	4755.0	4757.8	4760.6	4763.4	4766.2	4769.1	4771.9	2.82
2345.	4718.4	4721.2	4724.0	4726.8	4729.6	4732.4	4735.3	4738.1	4740.9	4743.7	2.81
2344.	4690.5	4693.3	4696.1	4698.8	4701.6	4704.4	4707.2	4710.0	4712.8	4715.6	2.79
2343.	4662.7	4665.4	4668.2	4671.0	4673.8	4676.5	4679.3	4682.1	4684.9	4687.7	2.78
2342.	4635.0	4637.8	4640.5	4643.3	4646.1	4648.8	4651.6	4654.4	4657.1	4659.9	2.77
2341.	4607.4	4610.2	4613.0	4615.7	4618.5	4621.2	4624.0	4626.7	4629.5	4632.2	2.76
2340.	4580.0	4582.8	4585.5	4588.2	4591.0	4593.7	4596.5	4599.2	4602.0	4604.7	2.74
2339.	4552.7	4555.4	4558.2	4560.9	4563.6	4566.4	4569.1	4571.8	4574.6	4577.3	2.73
2338.	4525.5	4528.2	4530.9	4533.6	4536.4	4539.1	4541.8	4544.5	4547.3	4550.0	2.72
2337.	4498.3	4501.0	4503.7	4506.5	4509.2	4511.9	4514.6	4517.3	4520.0	4522.8	2.72
2336.	4471.2	4473.9	4476.6	4479.3	4482.0	4484.7	4487.5	4490.2	4492.9	4495.6	2.71
2335.	4444.2	4446.9	4449.6	4452.3	4455.0	4457.7	4460.4	4463.1	4465.8	4468.5	2.70
2334.	4417.3	4420.0	4422.6	4425.3	4428.0	4430.7	4433.4	4436.1	4438.8	4441.5	2.69
2333.	4390.4	4393.1	4395.8	4398.4	4401.1	4403.8	4406.5	4409.2	4411.9	4414.6	2.69
2332.	4363.6	4366.3	4368.9	4371.6	4374.3	4377.0	4379.7	4382.3	4385.0	4387.7	2.68
2331.	4336.9	4339.6	4342.2	4344.9	4347.6	4350.2	4352.9	4355.6	4358.2	4360.9	2.67
2330.	4310.2	4312.9	4315.6	4318.2	4320.9	4323.6	4326.2	4328.9	4331.6	4334.2	2.66
2329.	4283.7	4286.3	4289.0	4291.6	4294.3	4296.9	4299.6	4302.3	4304.9	4307.6	2.66
2328.	4257.2	4259.8	4262.5	4265.1	4267.8	4270.4	4273.1	4275.7	4278.4	4281.0	2.65
2327.	4230.8	4233.4	4236.1	4238.7	4241.3	4244.0	4246.6	4249.3	4251.9	4254.5	2.64
2326.	4204.5	4207.1	4209.7	4212.3	4215.0	4217.6	4220.2	4222.9	4225.5	4228.1	2.63
2325.	4178.2	4180.8	4183.4	4186.1	4188.7	4191.3	4193.9	4196.6	4199.2	4201.8	2.63
2324.	4152.0	4154.6	4157.2	4159.9	4162.5	4165.1	4167.7	4170.3	4173.0	4175.6	2.62
2323.	4125.9	4128.5	4131.2	4133.8	4136.4	4139.0	4141.6	4144.2	4146.8	4149.4	2.61
2322.	4099.9	4102.5	4105.1	4107.7	4110.3	4112.9	4115.5	4118.1	4120.7	4123.3	2.61
2321.	4074.0	4076.6	4079.1	4081.7	4084.3	4086.9	4089.5	4092.1	4094.7	4097.3	2.59
2320.	4048.1	4050.7	4053.3	4055.9	4058.4	4061.0	4063.6	4066.2	4068.8	4071.4	2.59
2319.	4022.3	4024.9	4027.5	4030.0	4032.6	4035.2	4037.8	4040.4	4042.9	4045.5	2.58

**Exhibit 11M– Mica Reservoir Capacity Table (SI)**  
hm<sup>3</sup>

ELEVATION IN METERS												AVERAGE DIFFERENCE PER 3/100 M
	.00	.03	.06	.09	.12	.15	.18	.21	.24	.27		
754.38	24762.3											13.16
754.08	24631.1	24644.4	24657.3	24670.5	24683.5	24696.7	24709.9	24722.9	24736.1	24749.1		13.11
753.77	24500.5	24513.5	24526.7	24539.6	24552.9	24565.8	24578.8	24592.0	24605.0	24618.2		13.06
753.47	24370.1	24383.1	24396.3	24409.2	24422.2	24435.2	24448.4	24461.4	24474.3	24487.5		13.04
753.16	24240.4	24253.4	24266.4	24279.3	24292.3	24305.3	24318.2	24331.2	24344.2	24357.1		12.97
752.86	24110.8	24123.7	24136.7	24149.7	24162.6	24175.6	24188.6	24201.5	24214.5	24227.5		12.97
752.55	23981.8	23994.8	24007.5	24020.5	24033.4	24046.4	24059.1	24072.1	24085.1	24097.8		12.89
752.25	23853.1	23866.1	23878.8	23891.8	23904.5	23917.5	23930.4	23943.2	23956.1	23968.9		12.87
751.94	23724.9	23737.6	23750.6	23763.3	23776.3	23789.0	23801.7	23814.7	23827.4	23840.4		12.82
751.64	23597.0	23609.7	23622.7	23635.4	23648.1	23661.1	23673.8	23686.5	23699.2	23712.2		12.80
751.33	23469.5	23482.2	23494.9	23507.7	23520.4	23533.4	23546.1	23558.8	23571.5	23584.2		12.75
751.03	23342.5	23355.2	23368.0	23380.7	23393.4	23406.1	23418.6	23431.3	23444.1	23456.8		12.70
750.72	23215.8	23228.5	23241.2	23253.7	23266.4	23279.2	23291.9	23304.6	23317.1	23329.8		12.67
750.42	23089.5	23102.3	23114.7	23127.5	23139.9	23152.7	23165.4	23177.9	23190.6	23203.1		12.62
750.11	22963.8	22976.3	22989.0	23001.5	23014.2	23026.7	23039.1	23051.9	23064.3	23077.1		12.58
749.81	22838.5	22851.0	22863.5	22876.2	22888.7	22901.2	22913.6	22926.1	22938.8	22951.3		12.53
749.50	22713.5	22726.0	22738.5	22750.9	22763.4	22776.1	22788.6	22801.1	22813.6	22826.0		12.50
749.20	22589.0	22601.4	22613.9	22626.4	22638.9	22651.4	22663.6	22676.1	22688.5	22701.0		12.45
748.90	22464.7	22477.2	22489.6	22501.9	22514.3	22526.8	22539.3	22551.8	22564.0	22576.5		12.43
748.59	22340.9	22353.4	22365.6	22378.1	22390.3	22402.8	22415.3	22427.5	22440.0	22452.2		12.38
748.29	22217.6	22229.8	22242.3	22254.5	22267.0	22279.2	22291.5	22303.9	22316.2	22328.7		12.33
747.98	22094.8	22107.0	22119.2	22131.7	22143.9	22156.2	22168.4	22180.6	22193.1	22205.3		12.28
747.68	21972.2	21984.4	21996.6	22008.9	22021.1	22033.6	22045.8	22058.1	22070.3	22082.5		12.26
747.37	21850.1	21862.3	21874.6	21886.8	21899.0	21911.3	21923.2	21935.5	21947.7	21959.9		12.21
747.07	21728.3	21740.5	21752.7	21764.7	21776.9	21789.2	21801.4	21813.6	21825.6	21837.9		12.18
746.76	21606.9	21619.1	21631.1	21643.4	21655.3	21667.6	21679.8	21691.8	21704.0	21716.0		12.14
746.46	21486.0	21498.0	21510.3	21522.3	21534.5	21546.5	21558.5	21570.7	21582.7	21594.9		12.09
746.15	21365.7	21377.7	21389.6	21401.9	21413.9	21425.9	21437.8	21449.8	21462.1	21474.1		12.04
745.85	21245.5	21257.5	21269.5	21281.5	21293.5	21305.7	21317.7	21329.7	21341.7	21353.7		12.01
745.54	21125.9	21137.9	21149.9	21161.9	21173.9	21185.8	21197.6	21209.6	21221.6	21233.6		11.96
745.24	21006.5	21018.5	21030.5	21042.2	21054.2	21066.2	21078.2	21090.2	21101.9	21113.9		11.94
744.93	20887.8	20899.8	20911.6	20923.6	20935.3	20947.3	20959.0	20971.0	20982.8	20994.8		11.87
744.63	20769.4	20781.2	20793.2	20804.9	20816.9	20828.6	20840.4	20852.4	20864.1	20876.1		11.84
744.32	20651.3	20663.0	20675.0	20686.7	20698.5	20710.5	20722.2	20734.0	20745.7	20757.7		11.82
744.02	20533.6	20545.3	20557.1	20568.8	20580.6	20592.5	20604.3	20616.0	20627.8	20639.5		11.77
743.71	20416.4	20428.1	20439.9	20451.6	20463.4	20475.1	20486.6	20498.3	20510.1	20521.8		11.72
743.41	20299.7	20311.4	20322.9	20334.7	20346.4	20358.2	20369.7	20381.4	20393.1	20404.6		11.67
743.10	20183.2	20195.0	20206.5	20218.2	20229.7	20241.5	20253.2	20264.7	20276.4	20287.9		11.65
742.80	20067.3	20078.8	20090.5	20102.0	20113.7	20125.2	20136.7	20148.5	20160.0	20171.7		11.60
742.49	19951.5	19963.0	19974.8	19986.3	19997.8	20009.5	20021.0	20032.5	20044.0	20055.8		11.57
742.19	19836.5	19848.0	19859.5	19871.0	19882.5	19894.0	19905.5	19917.0	19928.5	19940.0		11.50

**Exhibit 11M– Mica Reservoir Capacity Table (SI)**  
hm<sup>3</sup>

ELEVATION IN METERS	.00	.03	.06	.09	.12	.15	.18	.21	.24	.27	AVERAGE DIFFERENCE PER 3/100 M
741.88	19721.8	19733.3	19744.8	19756.3	19767.8	19779.3	19790.5	19802.0	19813.5	19825.0	11.47
741.58	19607.3	19618.8	19630.3	19641.5	19653.0	19664.5	19676.0	19687.5	19698.8	19710.3	11.45
741.28	19493.3	19504.8	19516.0	19527.5	19538.8	19550.3	19561.8	19573.0	19584.5	19595.8	11.40
740.97	19379.8	19391.0	19402.5	19413.8	19425.3	19436.5	19447.8	19459.3	19470.5	19482.0	11.35
740.67	19266.7	19278.0	19289.2	19300.7	19312.0	19323.2	19334.5	19345.8	19357.3	19368.5	11.30
740.36	19153.9	19165.2	19176.5	19187.7	19199.0	19210.5	19221.7	19233.0	19244.2	19255.5	11.28
740.06	19041.6	19052.9	19064.2	19075.4	19086.7	19097.9	19108.9	19120.2	19131.4	19142.7	11.23
739.75	18929.8	18941.1	18952.1	18963.4	18974.6	18985.9	18996.9	19008.1	19019.4	19030.4	11.18
739.45	18818.3	18829.5	18840.5	18851.8	18862.8	18874.1	18885.3	18896.3	18907.6	18918.6	11.16
739.14	18707.2	18718.2	18729.5	18740.5	18751.7	18762.7	18773.7	18785.0	18796.0	18807.3	11.11
738.84	18596.4	18607.4	18618.6	18629.6	18640.6	18651.9	18662.9	18673.9	18684.9	18696.2	11.08
738.53	18486.3	18497.3	18508.3	18519.3	18530.3	18541.3	18552.3	18563.3	18574.3	18585.4	11.01
738.23	18376.4	18387.4	18398.4	18409.4	18420.5	18431.5	18442.2	18453.2	18464.2	18475.3	10.99
737.92	18266.8	18277.8	18288.8	18299.6	18310.6	18321.6	18332.6	18343.6	18354.4	18365.4	10.96
737.62	18157.7	18168.7	18179.5	18190.5	18201.2	18212.2	18223.3	18234.0	18245.0	18255.8	10.91
737.31	18049.1	18059.8	18070.8	18081.6	18092.6	18103.4	18114.1	18125.1	18135.9	18146.9	10.86
737.01	17940.9	17951.7	17962.4	17973.5	17984.2	17995.0	18005.8	18016.5	18027.5	18038.3	10.81
736.70	17833.0	17843.8	17854.6	17865.3	17876.1	17887.1	17897.9	17908.6	17919.4	17930.2	10.79
736.40	17725.6	17736.4	17747.1	17757.9	17768.7	17779.4	17790.0	17800.7	17811.5	17822.3	10.74
736.09	17618.7	17629.5	17640.0	17650.8	17661.5	17672.3	17682.8	17693.6	17704.3	17714.9	10.69
735.79	17512.0	17522.8	17533.3	17544.1	17554.6	17565.4	17576.1	17586.7	17597.4	17607.9	10.67
735.48	17405.8	17416.4	17427.1	17437.7	17448.4	17458.9	17469.5	17480.2	17490.7	17501.5	10.62
735.18	17299.9	17310.4	17321.2	17331.7	17342.2	17353.0	17363.5	17374.0	17384.6	17395.3	10.59
734.87	17194.7	17205.2	17215.7	17226.3	17236.8	17247.3	17257.8	17268.3	17278.9	17289.4	10.52
734.57	17089.7	17100.3	17110.8	17121.3	17131.8	17142.3	17152.6	17163.1	17173.7	17184.2	10.50
734.26	16985.0	16995.6	17006.1	17016.3	17026.9	17037.4	17047.9	17058.4	17068.7	17079.2	10.47
733.96	16880.8	16891.3	16901.6	16912.1	16922.4	16932.9	16943.4	16953.7	16964.2	16974.5	10.42
733.66	16777.1	16787.3	16797.9	16808.1	16818.7	16828.9	16839.2	16849.7	16860.0	16870.5	10.37
733.35	16673.8	16684.1	16694.4	16704.9	16715.2	16725.4	16735.7	16746.0	16756.5	16766.8	10.32
733.05	16570.8	16581.1	16591.4	16601.6	16611.9	16622.4	16632.7	16643.0	16653.3	16663.5	10.30
732.74	16468.4	16478.7	16489.0	16499.2	16509.5	16519.8	16530.0	16540.3	16550.6	16560.8	10.27
732.44	16366.6	16376.8	16387.0	16397.2	16407.4	16417.6	16427.8	16438.0	16448.2	16458.5	10.21
732.13	16265.1	16275.3	16285.4	16295.6	16305.7	16315.9	16326.1	16336.3	16346.4	16356.6	10.17
731.83	16164.1	16174.2	16184.3	16194.4	16204.5	16214.6	16224.8	16234.9	16245.1	16255.2	10.13
731.52	16063.3	16073.4	16083.5	16093.6	16103.7	16113.8	16123.9	16134.0	16144.1	16154.2	10.10
731.22	15963.0	15973.1	15983.1	15993.1	16003.2	16013.2	16023.3	16033.3	16043.4	16053.4	10.05
730.91	15863.5	15873.4	15883.3	15893.3	15903.2	15913.2	15923.1	15933.1	15943.1	15953.1	9.96
730.61	15764.8	15774.6	15784.5	15794.3	15804.2	15814.0	15823.9	15833.8	15843.7	15853.6	9.87
730.30	15666.8	15676.6	15686.4	15696.2	15706.0	15715.7	15725.5	15735.3	15745.1	15755.0	9.79
730.00	15569.8	15579.5	15589.2	15598.9	15608.6	15618.2	15628.0	15637.7	15647.4	15657.1	9.70

**Exhibit 11M– Mica Reservoir Capacity Table (SI)**  
hm<sup>3</sup>

ELEVATION IN METERS	.00	.03	.06	.09	.12	.15	.18	.21	.24	.27	AVERAGE DIFFERENCE PER 3/100 M
729.69	15473.6	15483.2	15492.8	15502.4	15512.0	15521.6	15531.3	15540.9	15550.6	15560.2	9.62
729.39	15378.3	15387.8	15397.3	15406.8	15416.4	15425.9	15435.4	15445.0	15454.5	15464.1	9.53
729.08	15283.7	15293.1	15302.6	15312.0	15321.5	15330.9	15340.4	15349.9	15359.3	15368.8	9.46
728.78	15189.9	15199.3	15208.6	15218.0	15227.3	15236.6	15246.0	15255.4	15264.8	15274.3	9.37
728.47	15096.9	15106.2	15115.5	15124.8	15134.0	15143.3	15152.6	15162.0	15171.3	15180.6	9.30
728.17	15004.7	15013.9	15023.1	15032.3	15041.5	15050.7	15060.0	15069.2	15078.5	15087.7	9.22
727.86	14913.2	14922.4	14931.5	14940.6	14949.8	14958.9	14968.1	14977.3	14986.4	14995.6	9.15
727.56	14822.5	14831.6	14840.6	14849.7	14858.7	14867.8	14876.8	14885.9	14895.0	14904.1	9.07
727.25	14732.6	14741.5	14750.5	14759.5	14768.5	14777.4	14786.5	14795.5	14804.5	14813.5	8.99
726.95	14643.4	14652.3	14661.2	14670.0	14678.9	14687.8	14696.8	14705.7	14714.7	14723.6	8.92
726.64	14554.7	14563.6	14572.4	14581.3	14590.1	14599.0	14607.8	14616.7	14625.6	14634.5	8.86
726.34	14466.8	14475.6	14484.4	14493.2	14502.0	14510.7	14519.5	14528.3	14537.1	14545.9	8.79
726.04	14379.7	14388.4	14397.1	14405.8	14414.5	14423.2	14431.9	14440.7	14449.4	14458.1	8.71
725.73	14293.3	14301.9	14310.6	14319.2	14327.8	14336.4	14345.1	14353.7	14362.4	14371.0	8.64
725.43	14207.4	14215.9	14224.5	14233.1	14241.7	14250.3	14258.9	14267.5	14276.1	14284.7	8.59
725.12	14122.2	14130.7	14139.2	14147.7	14156.2	14164.7	14173.3	14181.8	14190.3	14198.8	8.51
724.82	14037.7	14046.2	14054.6	14063.0	14071.5	14079.9	14088.4	14096.8	14105.3	14113.8	8.45
724.51	13953.8	13962.2	13970.6	13979.0	13987.4	13995.7	14004.1	14012.5	14020.9	14029.3	8.39
724.21	13870.5	13878.8	13887.2	13895.5	13903.8	13912.2	13920.5	13928.8	13937.2	13945.5	8.33
723.90	13787.9	13796.1	13804.4	13812.6	13820.9	13829.1	13837.4	13845.7	13854.0	13862.2	8.26
723.60	13705.8	13714.0	13722.2	13730.4	13738.6	13746.8	13755.0	13763.2	13771.4	13779.7	8.20
723.29	13624.4	13632.5	13640.7	13648.8	13656.9	13665.1	13673.2	13681.4	13689.5	13697.7	8.14
722.99	13543.4	13551.5	13559.6	13567.6	13575.7	13583.8	13591.9	13600.0	13608.1	13616.3	8.09
722.68	13463.1	13471.1	13479.2	13487.2	13495.2	13503.2	13511.3	13519.3	13527.3	13535.4	8.03
722.38	13383.4	13391.3	13399.3	13407.2	13415.2	13423.2	13431.2	13439.1	13447.1	13455.1	7.97
722.07	13304.2	13312.1	13319.9	13327.8	13335.7	13343.6	13351.5	13359.5	13367.5	13375.4	7.92
721.77	13225.5	13233.3	13241.2	13249.0	13256.8	13264.7	13272.6	13280.5	13288.4	13296.3	7.87
721.46	13147.3	13155.1	13162.9	13170.7	13178.5	13186.3	13194.2	13202.0	13209.8	13217.6	7.81
721.16	13069.7	13077.5	13085.2	13092.9	13100.7	13108.4	13116.2	13124.0	13131.8	13139.5	7.76
720.85	12992.6	13000.3	13008.0	13015.7	13023.3	13031.0	13038.8	13046.5	13054.2	13062.0	7.71
720.55	12915.9	12923.6	12931.2	12938.9	12946.5	12954.2	12961.9	12969.5	12977.2	12984.9	7.66
720.24	12839.9	12847.4	12855.0	12862.6	12870.2	12877.8	12885.4	12893.1	12900.7	12908.3	7.61
719.94	12764.2	12771.7	12779.3	12786.9	12794.4	12802.0	12809.5	12817.1	12824.7	12832.3	7.56
719.63	12689.0	12696.5	12704.0	12711.5	12719.1	12726.6	12734.1	12741.6	12749.1	12756.7	7.52
719.33	12614.3	12621.8	12629.2	12636.7	12644.2	12651.6	12659.1	12666.6	12674.0	12681.5	7.46
719.02	12540.1	12547.5	12554.9	12562.3	12569.7	12577.2	12584.6	12592.0	12599.5	12606.9	7.42
718.72	12466.3	12473.7	12481.0	12488.4	12495.8	12503.2	12510.5	12517.9	12525.3	12532.7	7.38
718.42	12392.9	12400.2	12407.6	12414.9	12422.3	12429.6	12436.9	12444.3	12451.6	12459.0	7.34
718.11	12320.0	12327.3	12334.6	12341.9	12349.1	12356.4	12363.7	12371.0	12378.3	12385.6	7.29
717.81	12247.5	12254.8	12262.0	12269.2	12276.5	12283.7	12291.0	12298.2	12305.5	12312.7	7.25

**Exhibit 11M– Mica Reservoir Capacity Table (SI)**  
**hm<sup>3</sup>**

ELEVATION IN METERS	.00	.03	.06	.09	.12	.15	.18	.21	.24	.27	AVERAGE DIFFERENCE PER 3/100 M
717.50	12175.5	12182.7	12189.9	12197.1	12204.3	12211.5	12218.7	12225.9	12233.1	12240.3	7.20
717.20	12103.7	12110.9	12118.1	12125.2	12132.4	12139.6	12146.8	12153.9	12161.1	12168.3	7.17
716.89	12032.5	12039.6	12046.7	12053.8	12061.0	12068.1	12075.2	12082.3	12089.5	12096.6	7.13
716.59	11961.6	11968.7	11975.8	11982.8	11989.9	11997.0	12004.1	12011.2	12018.3	12025.4	7.09
716.28	11891.1	11898.2	11905.2	11912.2	11919.3	11926.3	11933.4	11940.4	11947.5	11954.5	7.04
715.98	11820.9	11828.0	11835.0	11842.0	11849.0	11856.0	11863.1	11870.1	11877.1	11884.1	7.02
715.67	11751.2	11758.2	11765.1	11772.1	11779.1	11786.0	11793.0	11800.0	11807.0	11814.0	6.97
715.37	11681.8	11688.8	11695.7	11702.6	11709.5	11716.5	11723.4	11730.4	11737.3	11744.3	6.94
715.06	11612.8	11619.7	11626.6	11633.5	11640.4	11647.3	11654.2	11661.1	11668.0	11674.9	6.90
714.76	11544.0	11550.9	11557.8	11564.7	11571.5	11578.4	11585.3	11592.2	11599.0	11605.9	6.87
714.45	11475.7	11482.5	11489.4	11496.2	11503.0	11509.8	11516.7	11523.5	11530.4	11537.2	6.83
714.15	11407.7	11414.5	11421.3	11428.1	11434.9	11441.6	11448.5	11455.3	11462.1	11468.9	6.80
713.84	11340.0	11346.8	11353.5	11360.3	11367.1	11373.8	11380.6	11387.4	11394.1	11400.9	6.77
713.54	11272.6	11279.3	11286.0	11292.8	11299.5	11306.3	11313.0	11319.8	11326.5	11333.3	6.74
712.93	11138.7	11145.4	11152.0	11158.7	11165.4	11172.1	11178.8	11185.4	11192.1	11198.8	6.68
712.62	11072.0	11078.7	11085.4	11092.0	11098.7	11105.3	11112.0	11118.7	11125.3	11132.0	6.66
712.32	11005.5	11012.2	11018.8	11025.5	11032.1	11038.8	11045.4	11052.1	11058.7	11065.4	6.65
712.01	10939.3	10945.9	10952.5	10959.1	10965.8	10972.4	10979.0	10985.6	10992.3	10998.9	6.63
711.71	10873.2	10879.8	10886.4	10893.0	10899.6	10906.2	10912.8	10919.4	10926.0	10932.7	6.61
711.40	10807.3	10813.9	10820.5	10827.0	10833.6	10840.2	10846.8	10853.4	10860.0	10866.6	6.59
711.10	10741.5	10748.1	10754.7	10761.2	10767.8	10774.4	10781.0	10787.5	10794.1	10800.7	6.58
710.80	10676.0	10682.5	10689.1	10695.6	10702.2	10708.7	10715.3	10721.8	10728.4	10734.9	6.55
710.49	10610.6	10617.1	10623.7	10630.2	10636.7	10643.3	10649.8	10656.3	10662.9	10669.4	6.53
710.19	10545.4	10552.0	10558.5	10565.0	10571.5	10578.0	10584.5	10591.1	10597.6	10604.1	6.52
709.88	10480.4	10486.9	10493.4	10499.9	10506.4	10512.9	10519.4	10525.9	10532.4	10538.9	6.50
709.58	10415.6	10422.1	10428.6	10435.1	10441.5	10448.0	10454.5	10461.0	10467.5	10473.9	6.48
709.27	10351.0	10357.5	10363.9	10370.4	10376.8	10383.3	10389.8	10396.2	10402.7	10409.2	6.46
708.97	10286.6	10293.0	10299.5	10305.9	10312.3	10318.8	10325.2	10331.7	10338.1	10344.6	6.44
708.66	10222.4	10228.8	10235.2	10241.6	10248.0	10254.4	10260.9	10267.3	10273.7	10280.2	6.43
708.36	10158.3	10164.7	10171.1	10177.5	10183.9	10190.3	10196.7	10203.1	10209.5	10215.9	6.40
708.05	10094.5	10100.9	10107.3	10113.6	10120.0	10126.4	10132.8	10139.2	10145.5	10151.9	6.38
707.75	10030.8	10037.1	10043.5	10049.9	10056.2	10062.6	10069.0	10075.4	10081.8	10088.1	6.37
707.44	9967.4	9973.7	9980.0	9986.4	9992.7	9999.0	10005.4	10011.7	10018.1	10024.4	6.34
707.14	9904.1	9910.4	9916.7	9923.1	9929.4	9935.7	9942.0	9948.4	9954.7	9961.0	6.33
706.83	9841.0	9847.3	9853.7	9859.8	9866.2	9872.5	9878.8	9885.1	9891.5	9897.8	6.31