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**ENVIRONMENTAL ASSESSMENT**

**Proposed Agreements to Resolve Revelstoke  
Filling Issues and Access Reservoir  
Storage Space in Canada**

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**Office of Power and Resources Management  
BONNEVILLE POWER ADMINISTRATION**

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ENVIRONMENTAL ASSESSMENT  
ON  
PROPOSED AGREEMENTS TO RESOLVE  
REVELSTOKE RESERVOIR FILLING  
ISSUES AND ACCESS RESERVOIR  
STORAGE SPACE IN BRITISH COLUMBIA

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### NOTE

Words and phrases that are CAPITALIZED AND UNDERLINED are commonly used when discussing the Federal Columbia River Power System and the Columbia River Treaty. They have been highlighted in this manner the first time they are used in the text to facilitate reader understanding. These words and phrases appear at the end of this document in the Glossary (Appendix E).

## Chapter 1.0

### INTRODUCTION

The British Columbia Hydro and Power Authority (B.C. Hydro) is constructing Revelstoke Dam on the Columbia River in Canada (see Figure 1 for locations of projects referenced in this document). It had proposed to fill the resulting reservoir beginning this September in a manner which the Bonneville Power Administration (BPA) believes is contrary to the Columbia River Treaty (Treaty) and which would have adversely affected BPA operations and revenues. Similar circumstances had occurred in the past with the filling of the reservoir created by Seven Mile Dam, and other such circumstances may yet occur. B.C. Hydro also controls storage space in these and other reservoirs in British Columbia. BPA's operational flexibility would be enhanced if it could secure rights to use some of this space. The two utilities chose to negotiate to resolve the conflict concerning the filling of Revelstoke and other reservoirs, and to enter into mutually beneficial arrangements regarding reservoir storage space in British Columbia. The negotiated agreement is the primary subject of this environmental assessment (EA).

Any Canadian action which affects Columbia River flows at the U.S.-Canada border, such as filling a reservoir or storing water, also affects potential generation at Columbia River Dams (the mid-Columbia projects) owned and operated by non-Federal utilities. Therefore, a second negotiated agreement was needed with those affected utilities (the mid-Columbia purchasers) to compensate them for, or allow them to participate in, actions which would occur under the agreement with B.C. Hydro. This agreement with the mid-Columbia purchasers is also addressed in this EA.

#### 1.1 PURPOSE AND NEED FOR PROPOSED ACTIONS

This section of the EA describes the purpose and need for the action; discusses legal, system operational, and power marketing issues related to the proposal; and sets forth the rationale for limitations in the EA's scope.

##### 1.1.1 B.C. Hydro Contract

BPA's purposes in negotiating an agreement with B.C. Hydro are three-fold. The first purpose is to resolve a dispute over the filling of INACTIVE STORAGE SPACE at Revelstoke, Seven Mile, and, potentially, other B.C. Hydro reservoirs. The second purpose is to provide both BPA and B.C. Hydro the ability to use storage space in reservoirs in British Columbia to produce more usable energy than is possible under existing arrangements. The third purpose is to protect both parties from harm as a consequence of each other's actions under the agreement, that is, provide financial or energy compensation for losses suffered during storage. All three purposes are discussed in the following sections.

##### 1.1.1.1 Resolve the Dispute over Filling of Inactive Storage Space

On August 10, 1982, B.C. Hydro notified BPA by letter that the Revelstoke Project would be completed in early fall of 1983 (see section 1.2.3). B.C. Hydro stated that inactive storage space at Revelstoke would be filled by

BCH shall release the requested amount of water by increasing the discharge at the affected BCH Storage Reservoir(s) above the levels which would otherwise occur as a result of operation pursuant to the Detailed Operating Plan and by increasing the flow of the Columbia River at the U.S.-Canadian border by a corresponding amount on the same day; and BPA shall schedule to BCH the energy which can be produced at Downstream U.S. Projects, based on the Daily Conversion Factor, by such releases at delivery rates and times as agreed upon in advance by the Parties. To be considered responsive to BCH's request to release water, BPA's determination shall be made and communicated to BCH promptly. BPA shall take reasonable efforts to avoid spill of storage releases and shall notify BCH with as much notice as practicable if it appears likely that released water will be subject to spill.

BPA shall take reasonable efforts to return energy hereunder; however, BPA shall not be obligated to return energy at a rate of delivery in excess of the hydro generating capacity of its system which it determines is available for that purpose, or to operate its system in such a manner as to affect adversely its sales to utilities or service to its customers. The delivery rates shall be subject to the provisions of Section 12.

BPA shall have no obligation to return to BCH energy which can be generated from release of any water remaining in the accounts referred to in Section 6(c) after the Initial Termination Date.

(c) Storage Accounts

Water stored under Section 6(a) or returned under Section 6(b) shall be accounted for in one or more of the following special storage accounts kept in units of water (kcfs-days):

(1) BCH Mica Storage Account

Water stored in this account shall be located in Treaty Storage Space in Mica.

(2) BCH Arrow Storage Account

Water stored in this account shall be located in Treaty Storage Space in Arrow.

(3) BCH Active Storage Accounts

A separate account shall be maintained for each BCH Storage Reservoir which has Active Storage Space. Water stored in these accounts shall be located in Active Storage Space as designated by BCH.

reducing the outflow at Revelstoke to capture the natural inflow. Only that water released from Mica pursuant to the Columbia River Treaty operating plan would flow out of Revelstoke during filling. This would result in a reduction of flow at the U.S.-Canada border during the fall and winter of 1983-84. This process is discussed in section 3.1, Revelstoke Initial Fill.

A similar dispute had arisen over the filling of the Seven Mile Reservoir, a Canadian project much smaller than Revelstoke. It was anticipated that similar future disputes would arise were B.C. Hydro to fill the reservoir behind the proposed Murphy Creek Dam or raise the pool elevation of Seven Mile. B.C. Hydro may take these actions during the term of the proposed agreement.

The two legal positions are described as follows. B.C. Hydro's position is that B.C. Hydro has the right to fill the inactive storage space in NON-TREATY reservoirs in British Columbia without compensating those affected in the U.S. for reducing the flow of water in the Columbia River, and without being in breach of the Treaty. BPA's position is that BPA and other downstream U.S. power producers have a right pursuant to the Treaty to be compensated by B.C. Hydro for any losses of electric power caused by B.C. Hydro as a result of any reductions in the flow of water at the U.S.-Canadian border below that which would occur as a result of natural flows being augmented by operation of TREATY storage space in accordance with the Treaty operating plans.

Rather than pursue their respective legal positions, BPA and B.C. Hydro agreed to discuss ways of settling these initial filling disputes through negotiating a contract providing a mutually acceptable method for filling Revelstoke and Murphy Creek and for raising the Seven Mile pool elevation.

#### 1.1.1.2 Access to Treaty and Non-Treaty Storage Space

The proposed agreement will give each party (BPA and B.C. Hydro) the right to store up to 1.0 MAF of water in non-Treaty storage space in Mica and to release that stored water and use the energy it can generate in both Canada and the United States for the duration of the agreement. (The duration will presumably be for 10 years although there are provisions both for extension and early termination.) The proposed agreement also will provide both parties the right to store equal amounts of water in additional non-Treaty storage space in reservoirs in British Columbia if, and to the extent that, B.C. Hydro makes such space available, and to obtain the energy generated at Canadian and U.S. dams resulting from release of such water. Further, the proposed agreement gives both BPA and B.C. Hydro some additional flexibility, which both desire, to store water in Treaty space in Mica. B.C. Hydro also obtains flexibility to store in Arrow Treaty space.

#### 1.1.1.3 Protection from Harm

The agreement is intended to protect both BPA and B.C. Hydro from harm as a consequence of each other's storage of water in the Canadian reservoirs. This will be accomplished by the storing party providing compensation for loss of energy caused by water held back for storage which would have otherwise been generated on the nonstoring party's system. Such compensation is made by delivery of energy from the storing party to the nonstoring party.

### 1.1.2 Mid-Columbia Contract

The purposes of the agreement with the mid-Columbia purchasers are:

1. To protect the mid-Columbia purchasers from power related adverse effects resulting from the initial filling of Revelstoke and other reservoirs in British Columbia.
2. To obtain from such purchasers a release and discharge from claims they might make as a result of the initial filling of Revelstoke and other reservoirs in British Columbia.
3. To provide for the use of generators at the mid-Columbia plants by B.C. Hydro such that, when B.C. Hydro stores, it will deliver energy to the mid-Columbia purchasers based on the lost generating capacity of the mid-Columbia plants, and when B.C. Hydro releases water, it will receive the generation from the mid-Columbia plants.
4. To provide for the use of generators at the mid-Columbia plants by the mid-Columbia purchasers such that, when BPA stores, the purchasers will suffer the loss of generation at their plants and, when BPA releases water, the purchasers will keep the generation from their plant.

## 1.2 BACKGROUND

The circumstances which have led to the proposed agreements relate to the fact that the United States and Canada have entered into the Treaty; and the fact that B.C. Hydro is constructing Revelstoke Dam and wishes to fill the resulting reservoir beginning this fall.

### 1.2.1 Columbia River Treaty

The Treaty between Canada and the U.S. became effective in September 1964. It increased storage capability and access to storage capacity resulting in increased operational flexibility and other benefits to the regional power system. It is important to remember that the Treaty is and will continue to remain in effect and that it takes complete precedence over the proposed agreement between BPA and B.C. Hydro. A detailed discussion of the Treaty and its related projects is contained in Appendix A.

### 1.2.2 Non-Treaty Storage

Two of the Canadian Treaty reservoirs, Mica and Arrow (the reservoir impounded by Keenleyside Dam), have storage capacity in excess of that designated under the Treaty. This storage capacity is termed non-Treaty storage and is controlled by B.C. Hydro. The amounts of inactive storage, Treaty storage, and non-Treaty storage for each of the Canadian Treaty reservoirs is shown in Appendix A. Non-Treaty storage capacity will exist in the Revelstoke reservoir when it is operational, and more non-Treaty storage may be available in other B.C. Hydro reservoirs. Under current conditions, B.C. Hydro may from



time-to-time make non-Treaty storage available for use by BPA, but BPA has no long-term rights to the use of this storage. Until some agreement is reached, a separate storage agreement must be negotiated on each occasion.

### 1.2.3 Filling of Non-Treaty Reservoirs

Other dams and reservoirs which may affect power production at downstream dams in the United States have been or are being constructed in British Columbia since the Treaty was ratified. The reservoir behind Seven Mile Dam was filled at a time when the impounded water could have been used by BPA and mid-Columbia purchasers to produce energy, and, therefore, the impoundment adversely affected hydroelectric power benefits. This problem may occur again as additional dams are constructed or as the amount of inactive storage space is increased in existing B.C. Hydro reservoirs, such as Seven Mile Reservoir. Other projects that will be covered by the proposed agreement include Murphy Creek, a dam planned for construction on the Columbia River in Canada nearest the border; and, of course, Revelstoke Dam on the Columbia River downstream of Mica Dam and about 5 kilometers north of Revelstoke, British Columbia.

B.C. Hydro has proposed in a letter dated August 10, 1982 to Mr. Charles E. Cancilla, Secretary of the United States Entity, to fill the Revelstoke reservoir beginning September 26, 1983. Its plan for filling the reservoir was "to store all local inflow above Revelstoke in the reservoir from the time of closure until the reservoir is full. During this period all requirements for storage releases from Mica will be passed through Revelstoke to the extent possible. Should the discharge facilities at Revelstoke be unable to pass all the necessary storage at any stage, the difference between the required storage release and actual release will be made up by increasing the storage release from Arrow Reservoir.

"The need to fill Revelstoke more rapidly than possible using streamflow alone means that some of the non-Treaty storage in Mica will be temporarily transferred to Revelstoke by releasing more water from Mica than required by the Treaty. This storage will be returned to Mica at the same rate as it is displaced from Revelstoke by stored streamflow."

Revelstoke Dam is essentially a run-of-river project used for power production, and the Revelstoke reservoir will contain 3.5 MAF of inactive storage (i.e., it will permanently impound 3.5 MAF of water), and only a relatively small amount of potentially active storage, 0.8 MAF. Filling the Revelstoke reservoir will cause a loss of water to downstream U.S. projects and, therefore, would adversely affect hydroelectric power benefits. If Revelstoke were filled during a 12-month period, the amount of energy which could be generated by downstream U.S. dams with this water has been estimated as approximately 356 average megawatts (MW) at Federal dams, and 160 average MW at the mid-Columbia dams.

### 1.2.4 Short-Term Storage Agreement

BPA and B.C. Hydro entered into a short-term (until August 31, 1984) storage agreement in June 1983, in anticipation of the currently proposed long-term agreement. This agreement allowed the storage of up to 0.68 MAF (345 KSF) in inactive storage space. A second agreement to allow additional storage was

prepared September, 1983. The short-term agreements were intended to enable storage of surplus water in the system to help fill the Revelstoke reservoir prior to any long-term agreement and reduce the risk of having to store at a later time when water was less abundant. Like the proposed long-term agreement, the short-term storage agreements were accompanied by an agreement with the mid-Columbia purchasers to compensate them for loss of energy they could market while flows were being reduced for storage.

BPA and B.C. Hydro stored approximately 0.430 MAF (or 215 ksfd) in B.C. Hydro reservoirs under the first short-term agreement. While the short-term storage agreements contain provisions to govern the disposition of the stored water in the event negotiations on a long-term agreement fail, the intent was and is that the stored water would be utilized in accordance with the long-term agreement now being proposed.

### 1.3 LIMITATIONS OF THE SCOPE OF THE ENVIRONMENTAL ASSESSMENT

Department of Energy guidelines (46 FR 1007-1011) relevant to proposals which have effects beyond the boundaries of the United States are discussed in Appendix B. Based on these guidelines, which implement Executive Order 12114, potential environmental impacts occurring in Canada as a result of the proposed agreement will not be evaluated.

## Chapter 2.0

### EXPLANATION OF ALTERNATIVES

This chapter will describe the alternatives, including the "no action" alternative. Each of the alternatives addresses five operational activities or aspects. These activities were combined in a single agreement since none of them, considered independently, was beneficial enough for all parties to justify a long term agreement on its own merit. Each of the activities is, however, operationally independent and results in discrete changes in the physical environment of the mainstem Columbia River. A description of each of the five aspects is presented briefly below:

#### 1. Initial Fill of Revelstoke Reservoir.

B.C. Hydro has constructed Revelstoke Dam and desires to fill the reservoir. BPA seeks to protect itself from power-related impact due to the change in water flow associated with the fill.

#### 2. Guaranteed Use of Active Storage Space.

B.C. Hydro has non-Treaty storage space available in mainstem Columbia River reservoirs. BPA desires to use a portion of this space. B.C. Hydro has had insufficient incentive to allow BPA access to this space on a guaranteed basis.

#### 3. Use of Mica Treaty Storage Space.

Under some runoff conditions, Mica Reservoir has a lesser probability of refill than U.S. COORDINATED SYSTEM reservoirs. Mica also refills later in the year. These conditions result in the need to store in Mica at times when other Coordinated System reservoirs have a 95 percent confidence of refilling and Mica does not. Refill of Mica Treaty space benefits both BPA and B.C. Hydro. Enhancement of Mica refill has occurred in the past on an as needed basis through short-term contractual arrangements between both parties.

#### 4. Use of Additional Non-Treaty Space.

From time to time B.C. Hydro has non-Treaty storage space available in addition to that discussed in No. 2. above. BPA desires to use a portion of this space. In the past, BPA and B.C. Hydro have made short-term arrangements for use of a portion of this space.

#### 5. Initial Fill of other Non-Treaty Space.

B.C. Hydro has constructed Seven Mile Dam and filled the reservoir to an elevation of 1715 feet. It intends to fill Seven Mile Reservoir to its maximum permitted operating elevation of 1730 feet. It also expects to construct Murphy Creek Dam and fill its reservoir. BPA seeks to protect itself from power-related impacts due to the change in water flow associated with future fill activities and desires redress for past actions.

## 2.1 ALTERNATIVE: NO ACTION

Under the no action alternative, there would be no agreement between B.C. Hydro and BPA to resolve the issues related to the filling of the Revelstoke reservoir. If there was no agreement, BPA would seek to have the filling of Revelstoke halted through legal means unless B.C. Hydro compensated downstream U.S. interests for their losses. If legal attempts failed to halt the filling, B.C. Hydro would proceed to fill Revelstoke in the manner presented in its August 10, 1982, letter to Mr. Cancilla (see section 1.2.3).

In this assessment, we have assumed that BPA would not continue to make short-term ad hoc agreements with B.C. Hydro for storage in Mica Treaty space or in non-Treaty storage space in other reservoirs. No agreement resolving past filling of Seven Mile Reservoir would be provided under the no action alternative. There would be no resolution of future reservoir filling issues.

## 2.2 ALTERNATIVE: FILL AGREEMENT

A possible alternative to the proposed agreement would be for B.C. Hydro and BPA to enter into an agreement whose scope would be limited to the filling of the reservoir behind the Revelstoke Dam. This "fill agreement" alternative would specify the terms and conditions under which Revelstoke would fill. Such an agreement would be structured to compensate BPA and mid-Columbia purchasers for the loss of energy. This would involve delivering to BPA electric energy generated by B.C. Hydro to mitigate the effects of a reduced flow during filling. Such an agreement would not provide BPA with long-term rights to store water in B.C. Hydro reservoirs, an essential feature that distinguishes the proposed agreement from the fill agreement alternative.

In this assessment, we have assumed that, under the fill agreement alternative, BPA would continue to enter into ad hoc short-term agreements with B.C. Hydro for storage in Treaty space in Mica and for storage in other non-Treaty space. BPA would also seek other agreements for filling new B.C. Hydro reservoirs. Compensation for past filling of Seven Mile Reservoir could be included or addressed independently.

## 2.3 ALTERNATIVE: PROPOSED AGREEMENT

The proposal is to enter into two related agreements. One, with B.C. Hydro, is the principal agreement addressed by this EA, and the one which results in changes in hydroelectric operations. The second agreement, with the mid-Columbia purchasers, provides protection for these purchasers from the potential operational consequences of the B.C. Hydro agreement. Without concurrence of the mid-Columbia purchasers, the agreement with B.C. Hydro could not be implemented.

### 2.3.1 Proposed BPA-B.C. Hydro Agreement

The following discussion summarizes the major provisions of the proposed agreement with B.C. Hydro. In general, the agreement would provide reciprocal, equal rights and obligations for BPA and B.C. Hydro. See Appendix C for a copy of the proposed agreement.

#### 2.3.1.1 Initial Fill of Revelstoke Reservoir

The actual filling of the Revelstoke reservoir will occur with water presently stored in the Mica non-Treaty space. The refilling of the space then created in Mica is the subject of this provision. In the proposed agreement, BPA and B.C. Hydro share equally the obligation to fill the Revelstoke reservoir. The space in Mica will be divided in two portions. Inactive storage of 2.3 MAF makes up the first portion. The second portion is 2.0 MAF of ACTIVE STORAGE. Each party has an obligation to fill one-half of each portion. Inactive storage must be filled by the October 1 which is at least 1-1/2 years after the inactive space has been declared available. Active storage may be filled at any time during the term of the agreement with surplus water.

Part of the 2.3 MAF obligation has already been fulfilled by the amount of water stored under the short-term storage agreement, Contract No. DE-MS79-83BP91290. This amounts to 0.43 MAF and reduces the remaining obligation to 1.87 MAF. BPA will fulfill its obligation to fill Revelstoke by requesting that B.C. Hydro reduce the flow out of Canada and store the water in Revelstoke. No energy will be scheduled in either direction. BPA will suffer any loss of energy production at U.S. projects and B.C. Hydro will suffer any loss of energy production at Canadian projects. B.C. Hydro will fulfill its obligation by reducing flow out of Canada and storing the water in Revelstoke and by delivering energy to BPA to compensate for the lost energy production at U.S. projects. BPA will then compensate each mid-Columbia purchaser based on their share of mid-Columbia generation.

This operation will fill the Revelstoke reservoir as desired by B.C. Hydro. BPA will be compensated for loss of energy associated with B.C. Hydro's obligation to fill Revelstoke. When B.C. Hydro commits stored water to inactive storage under this agreement, BPA will grant a release and discharge from any claims due to filling Revelstoke.

#### 2.3.1.2 Guaranteed Use of Active Storage Space

In return for BPA's taking on the obligation to fill one-half of the Revelstoke reservoir, B.C. Hydro has made 2.0 MAF of storage available for use during the term of the agreement. BPA and B.C. Hydro will each have the right to store in 1.0 MAF. Either party may store more than 1.0 MAF if the space is not full, but the amount of water stored in excess of 1.0 MAF is subject to being forced out (if the other party wishes to store into that space) or purchased by the other party. It is intended that the parties leave the 2.0 MAF full at the end of the 10-year term of this agreement. However, in the event either party is unable to do this, those provisions of this agreement necessary to continue storing in this space will be extended for up to 7 years. At the end of the 7 years, BPA and B.C. Hydro must leave the 2.0 MAF full. During any extension, BPA will deliver energy to B.C. Hydro in amounts equal to B.C. Hydro's reduction in energy production at Mica due to reduced HEAD resulting from BPA's fill deficiency.

Active storage space will be initially filled in the same manner as inactive storage space. After a party has stored water in active space, that party may release the water and receive the generation produced at all projects (in both



Canada and the U.S.) downstream from the storage reservoir. When that party refills that space, it must compensate the other party for the loss of energy suffered by the other party.

The proposed agreement will give B.C. Hydro assurance that the inactive storage space created by the filling of Revelstoke will be full when the agreement expires. It will give BPA the assurance of use of 1.0 MAF for the term of the agreement.

#### 2.3.1.3 Use of Treaty Storage Space

Treaty space in Mica is available at any time that Mica Reservoir's Treaty space is below its maximum flood control elevation. Each party has the right to store in one-half of the available space. If the space is not full, a party may store in more than one-half of the space. That water above one-half of the available space is subject to being forced out of the reservoir by the other party if that party wishes to fill the storage space.

B.C. Hydro may also store in Treaty space in Arrow. BPA does not require a similar right because it can store in Treaty space in Arrow up to its maximum flood control elevation under provisions of the Treaty.

Treaty space is filled in the same manner as the refilling of active storage space. When a party stores water in Treaty space, it must compensate the other party for lost energy. When the water is released, the releasing party receives the energy generated at all generating projects (in both Canada and the U.S.) downstream from the storage reservoir.

This provision allows BPA and B.C. Hydro flexibility, which they presently do not have, to fill Treaty space. BPA will use this capability to (1) improve the probability of refilling Mica Reservoir in years that inability to refill Mica will impact the ability of the Coordinated System to adopt the first year FIRM ENERGY LOAD CARRYING CAPABILITY (FELCC) and (2) store unusable SURPLUS water in the spring and summer.

Using the ability to store in Treaty space in Mica Reservoir will increase the probability of filling it (and other British Columbia reservoirs covered by the agreement) especially during average water years. (In low water years, there would be little energy to store, and in very good water years, the probability of refill is already high.)

#### 2.3.1.4 Use of Additional Non-Treaty Space

B.C. Hydro may make additional non-Treaty storage space available from time to time. This space will be shared equally between the parties. Storage of water in more than one-half of the space is allowed but water in excess of one-half the space is subject to displacement or purchase by the other party.

Storage in this space will require that the storing party compensate the other party for the loss of energy. When a party releases water from this space, it will receive all of the energy generated at all projects (in both Canada and the U.S.) downstream from the storage reservoir.

This provision puts into a long-term agreement the mechanism for use of storage space that becomes available from time to time. These actions have been handled on an ad hoc basis in the past.

#### 2.3.1.5 Initial Fill of Other Non-Treaty Space

The filling of the additional space in Seven Mile and Murphy Creek Reservoirs will be handled under this agreement if the space becomes available for filling within the term of the agreement. The parties will share the obligation to fill these spaces equally. There will be a fixed period of time in which these spaces must be filled. This space will be filled in the manner described in section 2.3.1.1, Initial Fill of Revelstoke Reservoir.

In addition, since Seven Mile has already been filled to an elevation of 1715 feet, B.C. Hydro will release an amount of water from non-Treaty storage space in Mica equal to that which was stored in Seven Mile to compensate for losses suffered at downstream U.S. projects. BPA will release and discharge B.C. Hydro from any claims on space filled under the terms of this agreement.

B.C. Hydro will benefit by securing rights to fill these reservoirs under this provision.

#### 2.3.2 Proposed Agreement with Mid-Columbia Purchasers

The proposed agreement between BPA and the purchasers of power from the five non-Federal projects on the mid-Columbia (Wells, Rocky Reach, Rock Island, Wanapum, and Priest Rapids) (see Figure 1) is a contract (see Appendix D) to account for the participation of each purchaser in the storage of water, return of water, payment of storage fees, and disbursement of generating fees. The purchasers are not permitted to store this water in Canada independently from BPA. However, when BPA chooses to store, each purchaser may elect to participate in such storage. Each participating purchaser is then credited for the amount stored. Those electing not to participate in such storage will receive energy to compensate for losses from the reduction in flow resulting from BPA's storing in Canada.

When the stored water is returned, those who elected to participate receive their share of the resulting energy and pay any associated fee. Those who elected not to participate must deliver to BPA all additional energy which can be produced at their project resulting from the return of stored water.

## Chapter 3.0

### IMPACTS OF THE ALTERNATIVES

This chapter will examine the physical changes caused by system operations and the resulting effects on power production and marketing as well as potential environmental impacts. This is done by using HYDROREGULATION STUDIES which contrast the proposed and no action alternatives against existing system conditions. For purposes of comparison, Figure 2 presents the mean and range of monthly inflow to Grand Coulee over 40 years of historical record. Grand Coulee inflow closely approximates the flow of water across the U.S.-Canadian border. Throughout this chapter where changes in flow are discussed (usually expressed in KCFS), reference levels are not given. Instead, the reader should refer to Figure 2 for the range of monthly flows against which those changes can be compared.

None of the three alternative evaluated causes flows or reservoir elevations to exceed project specific constraints. Impacts which occur within project constraints are evaluated in this chapter.

The physical changes resulting from the fill agreement alternative have not been evaluated in the same level of detail. The decision not to pursue detailed hydroregulation studies for the fill alternative results in large measure from a lack of sufficient detail concerning this alternative. While the general conditions surrounding the fill agreement alternative have been specified (section 2.2), the details have not been. These details could only have been developed through negotiation between BPA and B.C. Hydro, as has occurred under the proposed agreement. If we were to make assumptions about the details of the fill agreement alternative and use these assumptions as the basis for system modeling studies, we would have achieved extremely speculative definition of the location, magnitude, and timing of changes in system operations. For this reason, the studies have not been done. In place of studies of the fill agreement, a general assessment of the changes which would result from this agreement alternative has been made. The outcome of this assessment is used to describe the physical changes which would result from a fill agreement.

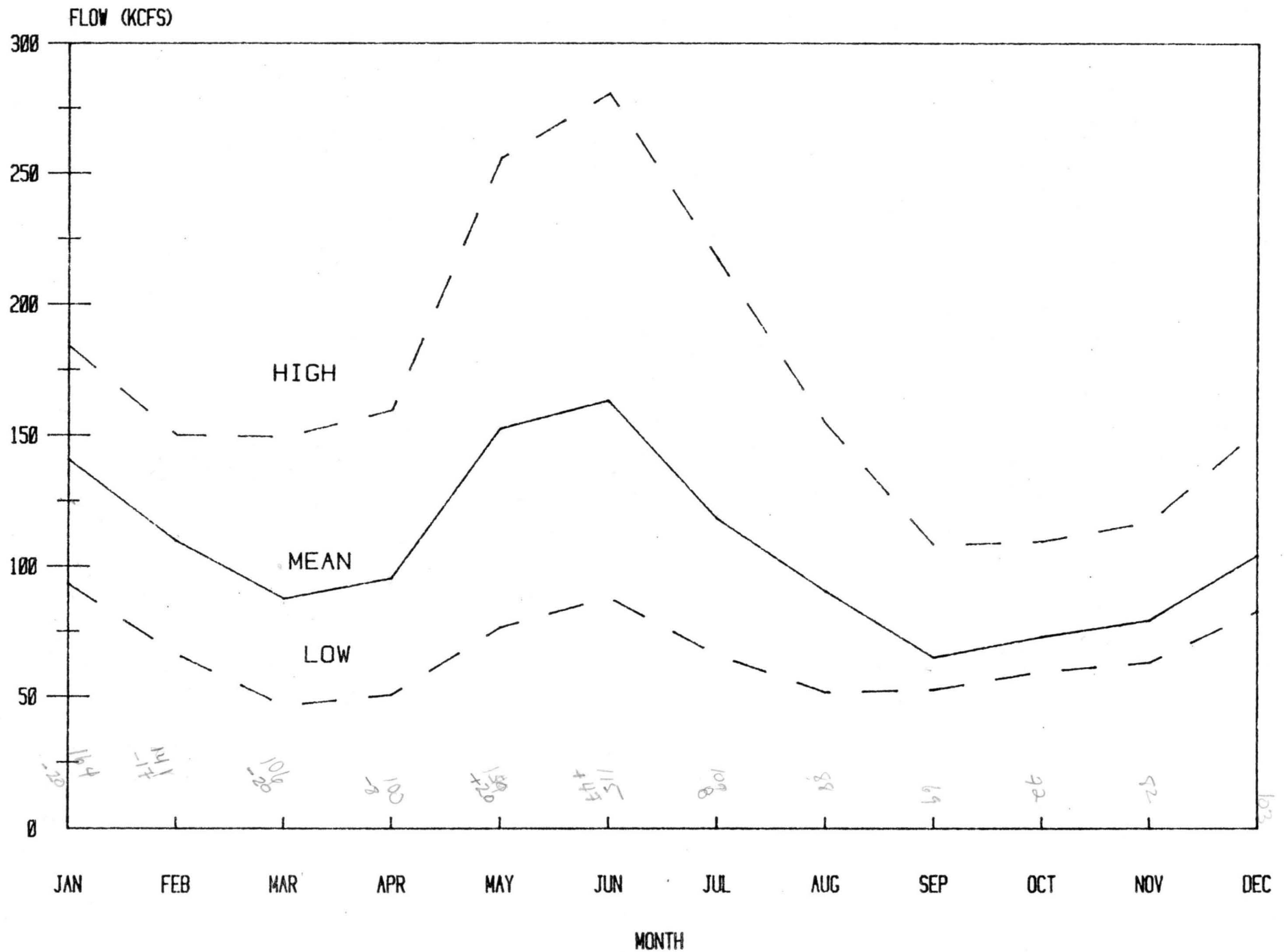
The following sections identify physical changes resulting from examination of each activity occurring under the proposed agreement. The effects on power production and marketing, as well as the effects on the environment which result from these physical changes, are evaluated.

When considering power marketing activities which affect the Columbia River and its tributaries, the primary environmental concerns addressed are those related to fish and wildlife, although minor beneficial effects on water quality are occasionally mentioned. The reason for this concentration on fish and wildlife is related to the magnitude of potential physical changes.

Most environmental impacts related to these power marketing activities are closely tied to the absolute flow or water level. Examples of such impacts are dewatering of wetlands or inundation of historic sites. Since these impacts relate directly to absolute water levels or flow, they are adequately

*Regulated*  
FIGURE 2: GRAND COULEE INFLOW

MEAN MONTHLY FLOW (40 YEARS OF RECORD)



covered by environmental documents prepared by the project operators. Those documents discuss establishment of these absolute constraints on flow and water level. These constraints are established by project operators.

The effect of power marketing activities on fish and wildlife populations differs substantially from this other category of environmental concerns since fish and wildlife often are impacted by rates of change or the amount of change over a period, which can occur within project constraints. A generic example of this occurs with small-mouth bass. These fish spawn in shallow water during the spring. Under this generic example, a significant impact to small-mouth bass populations can occur if water levels change by a certain amount over the period from spawning to hatching. In this example, absolute water levels mean very little. The amount of change during a fixed time period is the reason for concern. Project environmental documents do not thoroughly evaluate the potential for these types of impacts. For this reason, the focus of this EA is on impacts to fish and wildlife populations and not on those other environmental impacts addressed by project-specific documents. The following impact discussion analyzes each of the operational aspects explained in Chapter 2.

### 3.1 REVELSTOKE INITIAL FILL

The actual filling of the reservoir at Revelstoke will occur by moving water presently stored in the non-Treaty space of Mica Reservoir into the Revelstoke reservoir. The refilling of the space then created in Mica is the subject of this section.

#### 3.1.1 Changes in System Operation

Refilling of Mica Reservoir will withhold 4.3 MAF of water from the volume which enters the United States from the mainstem Columbia River. Under the first short-term contract between BPA and B.C. Hydro, 0.43 MAF has already been stored in Mica and Arrow and an additional amount of up to 1.87 MAF may be stored under the second short-term agreement. If the additional 1.87 MAF were withheld, this would reduce the volume covered under the proposed agreement to 2.0 MAF. This volume can be stored over varying periods of time.

Under the no action alternative, the water would be withheld between October 1983 and June or July of 1984. The exact length of this period varies with streamflow conditions. Average daily flow over the period would be reduced by 6-7 kcfs. The reduction would be greatest during June when average daily flow would be reduced by 25 kcfs. Reduction during May would average 13.5 kcfs.

Flow reductions would not necessarily be passed through the mainstem Columbia River. In dry years, operators and regulators of U.S. reservoirs would need to draft their projects to meet firm requirements such as the WATER BUDGET. Analysis of the physical changes associated with this draft was not possible. The timing and location of such draft would vary greatly with flow conditions to such an extent as to make specific analysis meaningless. The possibility for such variation is further justification for not adopting the no action alternative.



Compared to the no action alternative, the proposed action would result in BPA obtaining greater flexibility in the timing and extent of flow reductions. Under the proposed agreement, the first 2.3 MAF of Mica refill storage would be removed between October 1, 1983, and October 1, 1985, assuming that all inactive space is declared available on October 1, 1984. Depending on conditions of load and streamflow, storage could occur in as little as 2 months or could be extended to as long as 18 months.

If very high fall streamflows, similar to that which occurred in 1933-34, were to occur in 1983, all storage could be withheld between October 1983 and December 1983. This would result in a daily average flow reduction of 12.6 kcfs.

Under average water conditions, similar to those which occurred in 1948-49, storage could occur in January 1984 and February 1984. This would reduce daily average flows by 19.3 kcfs.

Under very dry conditions, like those which occurred in 1928-29 through 1930-31, storage would be filled over an extended period of time. Storage would begin in January 1985 and be complete by September 30, 1985. Water would be stored in every month excepting the last half of April and the month of May. Average flow during periods of storage would be reduced by 5.1 kcfs.

The remaining 2.0 MAF would be filled beginning as soon as the 2.3 MAF has been stored. The initial filling of this 2.0 MAF could take as little as 1 month or as long as 45 months.

The time period varies to this extent since the 2.0 MAF of space will only be filled with surplus water. After the initial filling of the space, it will be used as guaranteed active storage (see section 3.2.1). The physical changes of this filling will be very similar to those occurring under the refilling of guaranteed active storage (section 3.2.1).

Physical impacts to the hydrosystem under the fill agreement alternative would have been similar to the impacts created by the proposed agreement.

### 3.1.2 Effects on Power Production and Marketing

The filling of the Revelstoke reservoir under the no action alternative would have required Northwest utilities to reduce the FELCC of the Coordinated System by 4.5 billion kWh in the CRITICAL PERIOD which began September 1, 1983. The FELCC of the Operating Year (OY) 1984-1985 through OY 1986-1987 critical period for the Coordinated System is 551.9 billion kWh. BPA's loss of FELCC would amount to 3.1 billion kWh. This loss of FELCC would result in a reduction in the amount of firm surplus available for sale by BPA.

The initial filling of Revelstoke under the proposed agreement will reduce the FELCC of the Coordinated System by 1.0 billion kWh, of which 0.7 billion kWh is suffered by BPA. This will result in a reduction in the amount of firm surplus available for sale by BPA.

### 3.1.3 Environmental Effects

None of the flow reductions associated with any of the alternatives would significantly impact downstream migrant ANADROMOUS SALMONIDS. During the fall and winter, migratory activity is at a minimum. The Water Budget provides adequate protection for spring migrants from the effects of flow reductions (BPA, 1983). Flow reductions occurring under each of the alternatives will result in a reduction of spring flows but not to a level less than that provided by the Water Budget. Preliminary results of current studies indicate that summer migrant juvenile salmonids are not affected by reductions in flow (Sims, 1982).

Reductions in flow may also reduce spill. At projects with inadequate bypass facilities, such spill is normally needed to prevent migrating juvenile salmonids from suffering significant turbine-related mortality. Each of the alternatives has the potential to substantially reduce spill. The Northwest Power Planning Council's (Council) Fish and Wildlife Program (Program) (Section 404(a) and (b)) requires operators of hydroelectric projects without effective bypass systems to provide spill which will achieve a level of smolt survival comparable to or better than that achievable by the best available bypass system. Under the proposed agreement, BPA will mitigate the potential for significant spill reductions by incorporating such spill programs into power planning and operations and will do nothing as a result of the proposed agreement which could hinder provision of fish passage spill provided for under the annual spill program developed in accordance with Section 404(a) and (b) of the Council's Program. Therefore, no significant effects on juvenile downstream migrant anadromous salmonids should be caused by spill reduction resulting from the proposed alternative.

No information is available in the literature to show a direct relationship between impacts to resident fish or wildlife populations of the mainstem Columbia River and changes in flow and spill.

Changes in reservoir elevations associated with Revelstoke initial fill under the no action alternative have the potential to affect resident fish and wildlife populations. Without further definition through the courts of the types of changes which might be expected, analysis of these impacts is impossible.

No change in reservoir elevations will result from the proposed agreement in association with the initial fill of the reservoir at Revelstoke.

### 3.2 GUARANTEED USE OF ACTIVE STORAGE SPACE

Mica Reservoir's non-Treaty storage space is, at the present time, filled and essentially inactive. This space is kept full by B.C. Hydro and has not been made available to BPA. B.C. Hydro will use a portion of its Mica non-Treaty storage to fill the reservoir behind Revelstoke. This will leave Mica Reservoir 4.3 MAF below full of which 2.3 MAF will be filled permanently as described in section 3.1.1. The consequent use of the remaining space is the topic to be discussed in this section.

### 3.2.1 Changes in System Operation

Under the no action alternative, B.C. Hydro will refill the space as discussed under the Revelstoke Initial Fill section (3.1.1). After this fill, the space would remain full and inaccessible to BPA. This would result in no physical changes other than those addressed under Revelstoke Initial Fill. Since the fill agreement does not provide for use of non-Treaty storage space, the impact of the fill agreement will look like the no action alternative.

Under the proposed agreement, 2.0 MAF of the vacated space will remain in use, 1.0 MAF by BPA and 1.0 MAF by B.C. Hydro. The other 2.3 MAF will be filled and become inactive. The physical changes associated with the filling of this 2.3 MAF have been addressed under the Revelstoke Initial Fill section (3.1.1).

The 2.0 MAF of storage which will remain in use over the life of the agreement has been termed active storage space. Active storage space will be filled at times when surplus water is available and used largely to generate NONFIRM ENERGY. In times of low runoff, this storage could also be used to generate Firm energy or to meet firm nonpower obligations.

Analysis of how the storage space could be used by both parties indicates that storage may take place at any time of the year. Release of storage likewise may occur at any time. Flow reduction is most likely to occur between November and February and May through June. Flow reductions during times of storage on the mainstem Columbia at the U.S. border would average 11.6 kcfs for the November-February period and 10.8 kcfs for the May-June period. During June, the month when flow reductions are greatest, daily average flows may be reduced by as much as 27.6 kcfs or as little as 1.7 kcfs depending on the water year. Releases of storage will primarily increase flows between July and September. Average flow increases during periods of release are 19.4 kcfs. During July, the month when releases are greatest, daily average flows may change, depending on the water year, by as much as 32.5 kcfs or as little as 1.6 kcfs.

### 3.2.2 Effects on Power Production and Marketing

The primary purpose of this operational aspect is to improve the parties' ability to generate and market nonfirm energy. Under the terms of the proposed agreement, water will be stored when some portion of the 2.0 MAF is available, at times when it would otherwise be spilled. This reduces the amount of unmarketable energy. At a time when secondary markets become available, the previously stored water will be released and the resulting energy will be sold.

### 3.2.3 Environmental Effects

No significant adverse impacts associated with changes in flow have been identified. The discussion associated with the Revelstoke Initial Fill section (3.1.3) is applicable to this topic as well. Two potential beneficial effects have been identified. The ability to reduce spring flows in years of high runoff could assist in reducing dissolved gas supersaturation on the mainstem Columbia River. Supersaturation often causes substantial mortality in both anadromous and resident fishes. The storage may also be of benefit in

years when a wet fall is followed by a dry spring. In these cases, water saved in the fall could be used to meet firm commitments, including nonpower commitments such as the Water Budget. Although the effects produced in these situations are positive, the magnitude of change is relatively minor owing to the volume of storage involved.

Guaranteed use of active storage space will not result in alterations in reservoir elevations in the U.S.

### 3.3 USE OF TREATY STORAGE SPACE

Storage would be placed in Mica Reservoir's Treaty space in slightly submedian water years to enhance refill at Mica. These water conditions occur in approximately 10 percent of all water years.

#### 3.3.1 Changes in System Operations

Under the no action alternative BPA would not seek agreements with B.C. Hydro in years when access to Mica Treaty storage would be beneficial. Therefore, there would be no effect on river operations.

Under the proposed agreement, storage would take place in Mica Treaty space. This would reduce flows on the mainstem Columbia River starting as early as February and continuing until as late as the end of July. In 1978, a year when BPA obtained agreement to use Mica Treaty space, flows were reduced between April 27 and July 14. The average flow reduction was 6.5 kcfs with a maximum hourly flow reduction during June of 25.0 kcfs. This water was released from July 17 to August 24 of that same year. The resultant average flow increase was 13.1 kcfs with a maximum hourly flow increase during August of 30 kcfs. This use of Mica storage to enhance project refill is a typical example.

The other potential use of this storage would be to redistribute runoff within any given spring and summer. This operation would be used in high volume runoff years which occur about 1 year in every 4. Storage could begin as early as February and continue into July. This storage, unless removed, would be forced out by July 31 when Mica refilled. Due to the short period of availability of this storage, its primary use would be to provide for nonpower system considerations and short-term power marketing strategies. Storage and removal would likely occur within a short period, for example, 1 month. It is very difficult to estimate the potential for flow reduction or augmentation, since there has been no past use of storage in this manner. A best approximation of the flow reductions associated with this storage can be obtained from using the changes resulting from storage in Mica Treaty space for refill enhancement, a maximum reduction of 25 kcfs.

With regard to the use of Mica Treaty storage space, the fill agreement will produce the same physical changes as the proposed alternative in years when agreement is reached. In years when there is no agreement, there will be no change in river operations, as in the no action alternative.

### 3.3.2 Effects on Power Production and Marketing

The primary purpose for BPA's use of Treaty storage space is to assure the filling of Mica at times when other Coordinated System reservoirs are expected to fill. If Mica fails to fill when all other Coordinated System reservoirs fill, the Coordinated System parties may not be able to adopt the first year FELCC. Adopting something other than the first year FELCC reduces each Coordinated System party's right to serve load.

Use of Mica Treaty storage space to enhance the filling of Mica will result in a redistribution of generation. During the period February 1 to July 31, generation and nonfirm sales will be reduced to aid in filling. After July 31 the storage will be released, resulting in an increase in generation and potentially, if the increased flows are not spilled, increasing nonfirm sales.

If Mica Treaty storage space is used to store surplus water, a portion of the surplus water will be stored through reduced flows. Another portion of the surplus water will be used to generate energy to deliver to B.C. Hydro. There is a chance that this stored energy will become usable for sales of nonfirm energy.

### 3.3.3 Environmental Effects

The discussion of flow-related impacts associated with the Revelstoke Initial Fill section (3.1.3) is applicable to this provision as well. Use of Mica Treaty space to provide for nonpower considerations can have a beneficial effect on resident and anadromous fish. Water can be stored in Mica Treaty space during periods of high dissolved gas supersaturation, thus reducing those levels (see section 3.2.3).

Use of Mica Treaty storage space will not result in changes in reservoir elevations in the U.S.

## 3.4 USE OF ADDITIONAL NON-TREATY SPACE

From time to time, B.C. Hydro has non-Treaty space available in addition to that provided for under guaranteed active storage.

### 3.4.1 Changes in System Operations

The no action alternative would not result in use of additional non-Treaty storage and, therefore, would not change physical conditions.

The proposed agreement would result in use of storage when it is made available by B.C. Hydro. At the present time, there is no way to assess the exact amount, location, timing, or duration of such storage. Potential effects can, however, be assessed through evaluation of how this storage has occurred in the past. Examples of such storage occurred in 1980 and 1981 when access was obtained to .26 MAF of storage in Arrow reservoir. In 1981, storage space was filled in August when flow was reduced by an average of 22 kcfs over a 6-day period to fill the storage. The flow reduction ranged from 17 kcfs to 25 kcfs. Under the condition of that agreement, one-half the storage belonged to B.C. Hydro. They released their storage in September,



raising flows by an average of 5 kcfs over a 14-day period. BPA released its half of the storage in December again raising flows by 5 kcfs over 14 days. Storage and release in 1980 was very similar to that which occurred in 1981.

Under the fill alternative, physical effects would be the same as under the no action alternative in years without an agreement, and the same as the proposed agreement in years when a short-term agreement was reached for use of additional space.

#### 3.4.2 Effects on Power Production and Marketing

The impact of use of this additional non-Treaty storage space on power production and marketing will be like those discussed in Guaranteed Use of Active Storage Space (section 3.2.2) but of a lesser magnitude.

#### 3.4.3 Environmental Effects

The discussion under section 3.2.3 covers all potential effects on fish and wildlife.

### 3.5 INITIAL FILL OF OTHER NON-TREATY SPACE

B.C. Hydro has constructed Seven Mile Dam and filled the reservoir to an elevation of 1715 feet. It intends to fill Seven Mile Reservoir to its maximum permitted operating elevation of 1730 feet. It also expects to construct Murphy Creek Dam and fill its reservoir.

#### 3.5.1 Changes in System Operation

Under the no action alternative, the water which B.C. Hydro initially stored in Seven Mile would not be released; therefore, there would be no physical changes. The proposed agreement allows BPA to request the release of the 0.07 MAF any time between September 1, 1983, and March 31, 1985. The impact of this release will be an increase of flows of 2-3 kcfs if released over a 2-week period.

Filling Seven Mile from elevation 1,715 feet to 1,730 feet will require 0.02 MAF. The reduction in flows caused by this filling would be insignificant. Murphy Creek filling will require approximately 0.1 MAF. Filling this space over a 2-month period would result in a flow reduction of 0.8 kcfs. These impoundments are extremely small and, as a result, the physical changes resulting from fill will be insignificant regardless of which alternative is considered.

Under the fill agreement, physical effects would be the same as under the no action alternative in the absence of an agreement, and the same as the proposed agreement if there was an agreement.

#### 3.5.2 Effects on Power Production and Marketing

Release of the water associated with the initial filling of Seven Mile will result in increased generation at U.S. projects on the mainstem Columbia River. This increase of approximately 70,000 MWh will be sold as nonfirm energy.

The effects of filling other non-Treaty reservoirs will be of the same type as those discussed in the Revelstoke Initial Fill section (3.1.2) but of a much smaller magnitude.

Under the no action alternative, these reservoirs would be filled by B.C. Hydro with no compensation to downstream U.S. power interests. This would result in a loss of FELCC of up to 125,000 MWh, 14.3 average MW over a 12-month period, for the Coordinated System. BPA's share of this loss would be 9.9 average MW over a 12-month period.

Under the proposed agreement, the impact of BPA is sharing in the filling of these two reservoirs would be minimal.

### 3.5.3 Environmental Effects

Flow reductions and augmentation associated with the initial fill of other non-Treaty space are minimal. These changes in flow will be so minor as to have no likelihood of producing measurable impact to fish or wildlife populations.

## 3.6 SUMMARY OF ENVIRONMENTAL EFFECTS

As stated earlier in this chapter, the primary environmental concerns addressed in the EA are with potential effects on fish and wildlife. For purposes of comparison, Table 1 summarizes the environmental impacts for the five operational aspects discussed in Chapters 2 and 3 for each of the three alternatives.

No significant effects on fish and wildlife have been identified for any of the alternatives except under the no action alternative where initial fill of the reservoir behind Revelstoke potentially may affect fish and wildlife. In this case, the impacts cannot be quantified because the location, timing, and extent of drawdown at U.S. reservoirs cannot be determined. Where the potential for significant impact may exist for the other two alternatives, mitigation has been provided. This is true with regard to the effect of flow changes on downstream spring migrant anadromous salmonids, where adoption of the Water Budget provides mitigation. It is also true where reductions in spill for passage of downstream migrant juvenile salmonids provide mitigation, as described earlier in this chapter.

The proposed agreement alternative, and to a lesser extent, the fill agreement alternative may also result in minor beneficial impacts. Supersaturation of dissolved gasses may be reduced during periods of high flow. Storage may also be used during times of adverse water conditions to meet firm nonpower commitments such as the Water Budget. Neither of these alternatives will result in the potentially significant effects of the no action alternative.

Allowing the no action alternative to occur may result in potentially significant impacts to fish and wildlife because of changes in U.S. reservoir levels during Revelstoke initial fill. This is the least favorable alternative. The proposed agreement alternative appears to have the fewest adverse environmental effect and is the preferred alternative.

TABLE 1  
SUMMARY OF ENVIRONMENTAL IMPACTS FOR THE ALTERNATIVES

ACTIVITY	ALTERNATIVES		
	No Action	Fill Agreement	Proposed Agreement
Revelstoke Initial Fill	1, 2, 3	2, 3	2, 3
Guaranteed Storage	2, 3	2, 3	2, 3, 4, 5
Treaty Storage	2, 3,	2, 3, 4, 5	2, 3, 4, 5
Additional Non-Treaty Storage	2, 3	2, 3	2, 3, 4, 5
Other Initial Fill	6	6	6

Potentially Significant Impact

- 1 - Changes in U.S. reservoir elevations may affect fish and wildlife.

Fully Mitigated Potential Impact

- 2 - Changes in Flow--potential impacts mitigated by Water Budget.  
3 - Changes in Spill--Potential impacts mitigated by modification of power operations as necessary to meet Corps of Engineers Annual Spill Program.

Potential Beneficial Impact

- 4 - May reduce supersaturation of dissolved gasses thereby lessening incidence of gas bubble disease in fish during times of excessive spill.  
5 - Storage may be used to meet firm nonpower commitments including Water Budget.

No Potential for Impact

- 6 - Physical changes restricted to flow alterations. Magnitude is too small to produce significant impact.

## Chapter 4.0

### OTHER CONSIDERATIONS

In addition to their responsibilities under the National Environmental Policy Act (NEPA), Federal agencies are required to carry out the provisions of other Federal environmental laws. Most of the Federal actions related to the proposed agreement discussed in this EA do not require a detailed response with regard to the requirements in these other Federal laws. Those requirements are more concerned with specific proposals for development, and not actions such as that proposed in this EA which will merely enable different operation of existing facilities on a discretionary basis. Also, part of the effect of the proposed action will occur in Canada where these laws are not applicable.

The other Federal laws and requirements which will not be affected by the proposed agreements with B.C. Hydro and the mid-Columbia purchasers but which were considered during preparation of the EA include:

1. OMB Circular No. A-95 Review - The proposed agreement does not involve any direct Federal development.
2. The Coastal Zone Management Act of 1972 - The alternatives discussed in this EA are not included in Washington's or Oregon's list of Federal activities affecting their coastal zone programs.
3. Endangered Species Act of 1973 - The proposed agreement provides only for discretionary changes in operation of existing power resources within existing operational constraints. None of the alternatives will affect any endangered species, listed or proposed, or its critical habitat.
4. Heritage Conservation requirements - The proposed agreement provides only for discretionary changes in operation of existing power resources within existing constraints.
5. Laws or requirements to protect farmlands - None of the alternatives will convert farmlands to other uses.
6. Recreation resources - BPA's anticipated action does not adversely affect any park, designated or proposed wild and scenic rivers, the National Trail System, wilderness areas or other recreation resources.
7. Permits for structures in navigable waters - The proposed action does not include: (a) a structure or work in, under, or over a navigable water of the United States; (b) a structure or work affecting a navigable water of the United States; or (c) the deposit of fill material or an excavation that in any manner alters or modifies the course, location, or capacity of any navigable water of the United States.

8. Permits for discharges into waters of the United States - The proposed actions and its alternatives do not involve discharge of dredge or fill material into waters of the U.S.
9. Permit for right-of-way on public land - The proposed actions do not include use of public lands in a way not in accordance with the objective of the management of those lands.

#### 4.1 FISH AND WILDLIFE LAWS

There are several key Fish and Wildlife Laws that may relate to BPA actions:

- The Fish and Wildlife Coordination Act.
- The Fish and Wildlife Conservation Act of 1980.
- The fish and wildlife provisions of the Pacific Northwest Electric Power Planning and Conservation Act (Regional Act).

The Water Budget Managers for State and Federal agencies and for the Columbia Basin Tribes have been consulted informally during preparation of this EA. The Water Budget Managers for State and Federal agencies represent the U.S. Fish and Wildlife Service and National Marine Fisheries Service in matters relating to downstream migration of anadromous salmonids. To accomplish the consultation required by these laws, the Water Budget Managers, Pacific Northwest Power Planning Council, Federal and State fish and wildlife agencies and tribes will have the opportunity to comment on this EA, and BPA will take their concerns under consideration before a decision is made to implement the anticipated action. The proposed agreements with B.C. Hydro and the mid-Columbia purchasers were described at a March 22, 1983, Fish and Wildlife Consultation meeting at BPA.

The Fish and Wildlife Conservation Act of 1980, 16 U.S.C. 2901 et seq., provides for States to develop "approved conservation plans" for the conservation of fish and wildlife. The Act is primarily aimed at conservation of non-game fish and wildlife, those not ordinarily taken for sport, fur, or food. It is BPA's obligation under the Act to share scientific information and any other appropriate information with States for the purpose of assisting States in developing and revising a conservation plan. By sending a copy of this EA to State fish and game agencies, BPA is meeting its obligation of sharing information it has with the State agencies. BPA asks that State agencies keep it informed of development of conservation plans so that information can be supplied if it is available.

#### 4.2 FLOODPLAINS AND WETLANDS

Executive Order 11988, Floodplain Management, and Executive Order 11990, Protection of Wetlands, establish a national policy to protect wetlands and floodplains and requires that Federal agencies avoid, to the extent possible, long- and short-term impacts associated with occupancy and modification of floodplains and destruction or modification of wetlands.



The proposed action is indirectly related to other entities' management of Federal and non-Federal dams and reservoirs in floodplains and that management may affect wetlands adjacent to and connected to the Columbia River and its tributaries. However, such impacts will not exceed the operational parameters (flood control, navigation, irrigation, etc.) established for each facility. Therefore, effects on floodplains and wetlands will not exceed those incurred during normal operation.

#### 4.3 POLLUTION CONTROL AT FEDERAL FACILITIES

The proposal does not require procurement of goods, services, or materials, so the contract compliance provisions of the Clean Air Act, Clean Water Act, and other environmental laws do not apply. The proposed agreements with B.C. Hydro for storage will not alter the current status of any electrical generating resource with respect to compliance with environmental regulations governing air pollution, water pollution, solid waste transport and disposal, hazardous waste, drinking water standards, noise, pesticides, or polychlorinated biphenyls (PCB). Energy storage and energy recovery activities undertaken in accordance with the storage agreements may affect operations of certain resources at times, but resources would not be operated in such a manner as to violate currently applicable standards or permit conditions, nor would resources be operated to exceed a level of environmental impact that would not occur at least some time during normal operations in absence of the agreements.

#### 4.4 ENERGY CONSERVATION AT FEDERAL FACILITIES

The proposal involves operation of Federal facilities in that, at times of storage of energy in the B.C. Hydro reservoirs and recovery of such storage, operation of Federal dams and the BPA transmission system will be altered accordingly. The agreement will result in transmission losses, head losses, and varying efficiencies of resources, but energy generation will be substantially increased as a consequence of storage of unusable water and subsequent release when it is salable. Within the level of control BPA has over the system, it will continue to strive for an optimally safe, reliable, efficient, and economical power supply for the region. The proposed action will be consistent with energy conservation requirements based on the system's adherence to general operating plans.

## Chapter 5.0

### LIST OF AGENCIES AND PERSONS CONSULTED

The U.S. Army Corps of Engineers and the mid-Columbia purchasers have been involved in BPA's contract negotiations with B.C. Hydro. In addition, the Water Budget Managers for State and Federal agencies and for the Columbia Basin Tribes, have been consulted informally during preparation of this EA. The Water Budget Manager for State and Federal agencies represents the U.S. Fish and Wildlife Service and National Marine Fisheries Service in matters relating to downstream migration of anadromous salmonids.

A description of the proposed agreements with B.C. Hydro and the mid-Columbia purchasers was presented during a BPA Fish and Wildlife Consultation meeting on March 22, 1983. Representatives of many organizations listed below attended that meeting (an asterisk indicates those agencies which were represented). In addition, a summary of the meeting discussion was distributed on May 20, 1983.

This EA will be distributed to the following Federal, State, Tribal, public interest, environmental, and other types of organizations, and selected individuals for formal review and comment. In addition, others will be notified of the availability of this EA, and will be able to request copies for review and make comments if they want.

#### Federal Agencies

- \* Water Budget Manager for State and Federal Agencies  
Rural Electrification Administration, Washington, D.C.
- \* US Corps of Engineers, Portland, Oregon  
US Corps of Engineers, Seattle, Washington  
US Corps of Engineers, Walla Walla, Washington
- \* USDA, Forest Service, Portland, Oregon  
US National Park Service, Pacific NW Region, Seattle, Washington
- \* USDOC, National Marine Fisheries Service, Seattle, Washington  
USDOE, Federal Energy Regulatory Commission, San Francisco, California  
USDOE, Federal Energy Regulatory Commission, Washington, D.C.  
USDOJ, Bureau of Indian Affairs, Nespelem, Washington
- \* USDOJ, Bureau of Indian Affairs Regional Office, Portland, Oregon  
USDOJ, Bureau of Indian Affairs, Toppenish, Washington  
USDOJ, Bureau of Land Management, Portland, Oregon
- \* USDOJ, Bureau of Reclamation, Boise, Idaho
- \* USDOJ, Fish and Wildlife Service, Portland, Oregon  
USDOJ, US Attorneys Office, Portland, Oregon

#### State Agencies

- \* State of Idaho, Department of Fish and Game, Boise, Idaho
- \* State of Oregon, Department of Fish and Wildlife, Portland, Oregon  
State of Oregon, Intergovernmental Relations Division, Salem, Oregon  
State of Washington, Department of Ecology, Olympia, Washington  
State of Washington, Department of Fisheries, Olympia, Washington
- \* State of Washington, Department of Game, Olympia, Washington

State of Washington, Department of Game, Wenatchee, Washington  
 State of Washington, Energy Office, Olympia, Washington  
 State of Washington, Office of Archaeology & Historic Preservation  
 Olympia, Washington  
 State of Washington, Office of Financial Management, Olympia, Washington  
 State of Washington, Parks and Recreation Commission, Olympia, Washington  
 State of Washington, Planning and Community Affairs, Olympia, Washington

#### Tribes

- \* Water Budget Manager for the Columbia Basin Tribes  
 Affiliated Tribes of Northwest Indians, Tacoma, Washington
- \* Columbia River Inter-Tribal Fish Commission, Portland, Oregon  
 Colville Business Council, Nespelem, Washington
- \* Kalispel Business Committee, Usk, Washington  
 Kootenai Tribal Council, Bonners Ferry, Idaho
- \* Spokane Business Council, Wellpinit, Washington

#### Interest Groups

- \* Columbia Basin Fish and Wildlife Council, Portland, Oregon  
 Columbia River Citizens Compact, Hillsboro, Oregon  
 Forelaws on Board, Boring, Oregon  
 Friends of the Earth, Seattle, Washington  
 Izaak Walton League, Portland, Oregon  
 National Audubon Society, Sacramento, California  
 National Wildlife Federation, Portland, Oregon  
 Natural Resources Defense Center, San Francisco, California  
 Northwest Environmental Defense Center, Portland, Oregon  
 Northwest Indian Fisheries Commission, Olympia, Washington  
 Northwest Steelhead and Salmon Council, Olympia, Washington  
 Oregon Environmental Council, Portland, Oregon  
 Oregon Wildlife Federation, Eugene, Oregon  
 Pacific Marine Fisheries Council, Portland, Oregon  
 Trout Unlimited, East Wenatchee, Washington  
 Washington Environmental Council, Seattle, Washington

#### Customers/Others

- ASWSU, Environmental Task Force, Pullman, Washington  
 Benton-Franklin Governmental Conference, Richland, Washington  
 British Columbia Hydro and Power Authority, Vancouver, British Columbia,  
 Canada
- \* Chelan County PUD #1, Wenatchee, Washington  
 Colockum Transmission Company, Inc., Wenatchee, Washington  
 Cowlitz County PUD #1, Longview, Washington
- \* Direct Service Industries, Portland, Oregon  
 Douglas County PUD #1, East Wenatchee, Washington
- \* Eugene Water and Electric Board, Eugene, Oregon  
 City of Forest Grove, Forest Grove, Oregon
- \* Grant County PUD #2, Ephrata, Washington  
 Kittitas County PUD #1, Ellensburg, Washington  
 City of McMinnville, McMinnville, Oregon

City of Milton-Freewater, Milton-Freewater, Oregon  
 Okanogan County PUD #1, Okanogan, Washington  
 Oregon State University, Corvallis, Oregon  
 \* Pacific Northwest Utilities Conference Committee, Portland, Oregon  
 \* Pacific Northwest Power Planning Council, Portland, Oregon  
 \* Pacific Power and Light Co., Portland, Oregon  
 \* Portland General Electric Co., Portland, Oregon  
 \* Public Power Council, Vancouver, Washington  
 Puget Sound Power and Light Co., Bellevue, Washington  
 \* Seattle City Light, Seattle, Washington  
 Spokane Regional Planning Conference, Spokane, Washington  
 \* Tacoma City Light, Tacoma, Washington  
 Trico Economic Development District, Colville Washington  
 West Kootenay Power and Light Co., Trail, Canada, British Columbia  
 University of Washington, Seattle, Washington  
 Washington State University, Pullman, Washington  
 The Washington Water Power Co., Spokane, Washington

## Chapter 6.0

### CONCLUSIONS

BPA has reviewed all aspects of the proposed agreements to resolve Revelstoke Reservoir filling issues and access reservoir storage space in British Columbia with B.C. Hydro and with the mid-Columbia project participants for compliance with legislative and executive mandates adopted to safeguard the integrity of the human environment. BPA has consulted with the Water Budget managers, various fish and wildlife agencies, and, through the contract negotiation process, the Corps, the mid-Columbia project participants concerning the proposed agreements. These represent the principal interests affected by the agreements. Further consultation is being undertaken through distribution of this environmental assessment to agencies and the public for review and comment.

In review of the proposed agreements, BPA has not uncovered any unresolved conflicts over alternative uses of available resources. BPA has found that the nature and extent of the environmental consequences resulting from the agreements, which are primarily effects on river flows and fish, are not significant. No extraordinary, controversial, unique, or hazardous circumstances or conditions will be created or furthered by these agreements.

Unless public and agency review of this assessment reveals information that impacts may be more significant than BPA's analysis projected, an environmental impact statement does not appear to be needed for the proposed agreements. Preparation of a Finding of No Significant Impact is recommended.



APPENDIX F  
REFERENCES

Bonneville Power Administration, 1980, The Role of the Bonneville Power Administration in the Pacific Northwest Power Supply System, Final Environmental Impact Statement, December.

Bonneville Power Administration (BPA), 1983, Environmental Assessment on Proposed Power System Changes to Implement the Water Budget, May.

British Columbia Hydro and Power Authority, 1982, letter to Mr. Charles Cancilla re "Proposed Filling of Revelstock in September 26, 1983; August 10.

Sims, Carl W. and David R. Miller, 1982, "Effects of Flow on Migratory Behavior and Survival of Juvenile Fall and Summer Chinook Salmon in John Day Reservoir", June.

Northwest Electric Power Planning and Conservation Council, 1982, Final Fish and Wildlife Program, November 15, 1982.

U.S. Congress, 1980, Public Law 96-501, "Pacific Northwest Electric Power Planning and Conservation Act," 16 U.S.C. 839, December 5.