

**YAKIMA RIVER BASIN WATER STORAGE OPTIONS  
FEASIBILITY STUDY, WASHINGTON**

**Plan of Study**  
(Subject to Revision)

Prepared by  
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## CONTENTS

<b>1.0 Introduction</b> .....	1
<b>1.1 Study Authorization</b> .....	1
<b>1.2 Study Purpose</b> .....	1
<b>1.3 Study Area</b> .....	1
<b>1.4 Yakima Project</b> .....	2
Background.....	2
Irrigation Development.....	2
1945 Consent Decree .....	3
Water Supply Proration.....	3
Water Right Adjudication .....	4
<b>1.5 Recent Major Water Resources Planning Activities</b> .....	5
<b>1.6 Study Approach</b> .....	7
<b>2.0 Scope of Work</b> .....	8
<b>2.1 Structure</b> .....	8
<b>2.2 Index of Activities</b> .....	8
<b>2.3 Critical Technical Activities</b> .....	10
<b>3.1 Future Without Project</b> .....	12
<b>3.2 Future With Project</b> .....	13
<b>3.3 Availability of Columbia River Water</b> .....	13
<b>Attachment 1 - Map of the Yakima River Basin</b> .....	16
<b>Attachment 2 - Scope of Work Matrix</b> .....	17

# **Yakima River Basin Water Storage Options Feasibility Study, Washington**

## **Plan of Study**

### **1.0 Introduction**

#### **1.1 Study Authorization**

Section 214 of the Act of February 20, 2003 (Public Law 108-7), states “The Secretary of the Interior, acting through the Bureau of Reclamation, shall conduct a feasibility study of options for additional water storage in the Yakima River Basin, Washington, with emphasis on the feasibility of storage of Columbia River water in the potential Black Rock Reservoir and the benefit of additional storage to endangered and threatened fish, irrigated agriculture, and municipal water supply. There are authorized to be appropriated such sums as may be necessary to carry out this Act”.

#### **1.2 Study Purpose**

As guided by the Authorization, the water storage feasibility study (Storage Study) is to examine the feasibility and acceptability of storage augmentation for benefit of fish, irrigation, and municipal water supply within the Yakima River basin in two respects: (1) diversion of Columbia River water to the proposed Black Rock Reservoir for further water transfer to irrigation entities in the lower Yakima basin as an exchange supply, thereby reducing irrigation demand on Yakima River water and improving Yakima Project stored water supplies, and (2) creation of additional storage within the Yakima River basin. In considering the benefits to be achieved, study objectives will be to improve Yakima Project flow management operations to move the basin flow regime towards a normative condition for fisheries, a more reliable water supply for existing proratable water users, and additional water supply for future municipal demands.

#### **1.3 Study Area**

The Yakima River basin encompasses about 6,100 square miles. It is located in south-central Washington including Kittitas County and portions of Yakima, Benton, and Klickitat Counties. A map of the Yakima River basin is attached.

The western, forested third of the basin reaches to the crest of the Cascade Range. It is the most rugged part of the basin and provides 90 percent of the annual runoff that comes primarily from snow pack. A large portion of the annual precipitation is received during the late fall, winter, and early spring months. The eastern portion of the basin is arid to semi-arid. The cultivated areas of the basin located here are made more productive by irrigation. Rangeland generally lies between the cultivated and forested areas and usually receives sufficient precipitation to accommodate summer range for livestock grazing. The Yakima River and its tributaries are the primary sources for surface water in the basin. From its headwaters, the river flows 216 miles southeast past the City of Yakima and through the lower valley to the Columbia River at Richland. A series of Federal

reservoirs on the Yakima River and its tributaries, along with a complex system of diversions and canals provide water to about one-half million irrigated acres.

Irrigation accounts for approximately 98 percent of all water use in the basin and comprises the primary economic base. The Yakima River and its tributaries historically provided significant spawning and rearing habitat for anadromous fish. Natural streamflow conditions prevail only in the upper uncontrolled reaches of the Yakima River system because of storage development and extensive use of water for irrigation.

The Storage Study is generally confined to that area within the Yakima River basin currently served by Yakima Project water storage and distribution features. However, since the feasibility of importing Columbia River water for delivery to Yakima Project water users susceptible of receiving such water and willing to exchange it for all or part of their Yakima River water supply will also be considered, the effects of such operations on Columbia River water and on ecological and other resources will be evaluated.

## **1.4 Yakima Project**

### Background

In the Treaty of June 9, 1855, the Tribes and bands later to become the Yakama Indian Nation (YN) ceded 10.3 million acres to the United States and reserved a 1.4 million-acre homeland. The Tribes of the YN retained in this Treaty the right to hunt, fish, and gather native foods and medicines off the Reservation.

Non-Indian missionaries first came to the Yakima Valley during 1848, which was the start of major changes in the area. Miners started arriving in 1854, leading to war and the construction of Fort Simcoe in the 1860s. Cattlemen were attracted by the abundance of bunch grass, wild game, and fertile bottom lands. The first irrigation ditch of record of non-Indians was constructed in 1864. Settlement started occurring in about 1866. Private canal companies formed along the river successfully irrigated a large area. Construction of the Northern Pacific Railway through the valley in 1886 gave greater impetus to irrigation development because of aggressive land marketing by the railway company and of access to agricultural markets.

### Irrigation Development

By 1902, about 121,000 acres were irrigated in the Yakima River basin. This acreage was served by unregulated flows in the river and tributaries. Irrigation diversions exceeded the unregulated runoff during periods of low flow by the turn of the century.

Before additional irrigation developments could take place, reservoirs were needed to store early season natural runoff, which peaks in May and June. This water could subsequently be released and used during the dry summer months when natural runoff drops to its lowest point and irrigation demands are high.

A petition dated January 28, 1903, from citizens of Yakima County to the Secretary of the Interior (Secretary) requested United States involvement in irrigation. Investigations were initiated which led to the beginning of the construction of features of the Yakima Project by the Reclamation Service. The Yakima Project was authorized and the Sunnyside and Tieton Units were approved for construction in 1905. Congressional authorization followed for the Kittitas and Wapato Divisions (1910), Roza Division (1935), and the Kennewick Division (as now constructed) in 1948.

Early in 1906, investigation of storage sites was initiated. Development progressed with the construction of Bumping Dam (1910), Kachess Dam (1912), Clear Creek Dam (1914), Keechelus Dam (1917), Tieton Dam (Rimrock Lake) (1925), and Cle Elum Dam (1933). These six Federal reservoirs have a total storage capacity of 1,070,000 acre-feet and provide the water supply necessary to help meet the irrigation needs by storing and regulating a portion of the flow of the Yakima River and its tributaries. Other principal features include diversion dams, two hydroelectric generating plants, and numerous canals, laterals, and pumping plants.

#### 1945 Consent Decree

Disputes over the use of water from the Yakima River during years of low runoff resulted in litigation in the Federal court. In 1945, the District Court of Eastern Washington issued a decree under Civil Action No. 21 called the 1945 Consent Decree (Decree). The Decree is a legal document pertaining to water distribution and water rights in the basin. It established the rules under which Reclamation should operate the Yakima Project system to meet the water needs of the irrigation districts that predated the Yakima Project, as well as the rights of divisions formed in association with the Yakima Project.

The Decree determined water delivery entitlements for all major irrigation systems in the Yakima basin except for lower reaches of the Yakima River near the confluence with the Columbia River. The Decree states the quantities of water to which all water users are entitled (maximum monthly and annual diversion limits) and defines a method of prioritization to be placed in effect during water-deficient years. The water entitlements are divided into two classes—non-proratable and proratable. Non-proratable entitlements are generally held by pre-project water users, and these entitlements are to be served first from the total water supply available (TWSA). All other project water rights are proratable, which means they are of equal priority. Any shortages that may occur are shared equally by the proratable water users. The Government projects within the basin were basically constructed to manage water supplies to serve the proratable water users in the basin.

#### Water Supply Proration

TWSA represents the combined quantity of unregulated flow, return flow, and stored water available for the period of April through September upstream from the Parker gauge at Sunnyside Diversion Dam on the Yakima River. Reclamation prepares forecasts of the TWSA upstream from the Parker gauge beginning each March and

continuing through the irrigation season. These forecasts are the basis for determining the adequacy of the TWSA to meet irrigation water entitlements stipulated in the Decree and to assist in deciding the amount of prorationing, if any, that may be necessary. Any water supply deficiencies are first assessed against proratable entitlements and last against non-proratable entitlements, which has never happened. Instream flow requirements are met from TWSA prior to determining if prorationing is necessary.

Unregulated flows and return flows are generally adequate to meet irrigation diversions through June. From July through the end of the irrigation season, normally October 15, stored water is required to meet diversions. Storage releases have, however, begun as early as May in dry-years and as late as August in wet years.

When the TWSA is not adequate to meet water entitlements, prorationing is necessary. Historically, the prorationing period has not started until the date of “storage control” (the date when stored water releases begin). The amount of prorationing is determined monthly by Reclamation in consultation with the water entities. Non-proratable entitlements can divert their full entitlement. This amount is deducted from the TWSA available for irrigation, and the remainder is available for proratable entitlements.

Prorationing has been imposed in 9 years between 1970 and 2002. In the most recent dry-years, proratable water users received 58 percent of their proratable entitlements in 1992, 67 percent in 1993, and 37 percent in 1994 and 2001.

#### Water Right Adjudication

The Decree (described above) controlled distribution of Project water in the Yakima basin between 1945 and 1977. In the spring of 1977, with a drought imminent, Reclamation predicted the proratable water users would receive only 15 percent of their normal water supply. Some proratable water users brought action in the U.S. District Court for the Eastern District of Washington to modify the Decree and make all right holders proratable. The YN sought to intervene and also filed a separate action in U.S. District Court to have its treaty reserved water rights determined. In light of this dilemma, United States District Judge Marshall Neill suggested a State court general adjudication in order to finally determine water rights in the Yakima basin.

On October 12, 1977, the State filed an action in the Superior Court for Yakima County for adjudication of all rights to use of Yakima River basin surface water. This proceeding is still in progress, but nearing completion.

The relationship of the Decree to the State’s adjudication proceeding was an issue addressed by the Superior Court in 1993 (Memorandum Opinion Re: Threshold Issues). The Court held that the Decree, in and of itself standing alone, did not establish any water rights. However, it did “memorialize the appropriations thereto made” (pre-1945). Water right claimants had the burden of addressing changes in the appropriations after 1945. The Court further stated “Once this case is concluded. . .the final judgment herein would supercede that (1945) Decree”.

## 1.5 Recent Major Water Resources Planning Activities

Water resource planning activities to address irrigation “shortages” and instream flow needs have been ongoing in the Yakima River basin for many years. Some of the major activities follow:

- Yakima River Basin Water Enhancement Project (YRBWEP) -- Studies began in 1980, to structure a comprehensive plan to improve the reliability of the water supply for irrigation and fishery purposes (Act of December 28, 1979, Public Law 91-162). Fish passage and protective facilities were constructed at the major Yakima Project diversions in the late 1980s to early 1990s as Phase I of YRBWEP. A basin water conservation program was authorized by Title XII of the Act of October 31, 1994, Public Law 104-434 (Title XII) with water savings being “earmarked” for improved instream flows and irrigation water supply. The basin conservation program is commonly referred to as Phase II. Additional storage however, was not acceptable at that time. Since 1994, YRBWEP activities have been directed toward structuring and implementing the basin conservation program.
- Title XII also authorized the formation of the Conservation Advisory Group (CAG) to assist Reclamation in structuring and implementing the basin water conservation program. CAG was chartered July 13, 1995, and consists of six members. One of CAG’s primary responsibilities was the development of a Basin Conservation Plan (Plan). A draft Plan prepared by CAG was released by the Commissioner of Reclamation on August 12, 1997, for public review with the comment period closing October 31, 1997. The Secretary of the Interior authorized the Plan to be published and distributed on October 14, 1999. CAG is still functional and has been involved with activities associated with the Plan.
- Programmatic Final Environmental Statement (PEIS) -- Reclamation, in compliance with the National Environmental Policy Act (NEPA) and Reclamation NEPA procedures, prepared an overall programmatic analysis of implementing Title XII. This PEIS provides “umbrella” coverage for implementing the general provisions of Title XII; additional NEPA compliance is anticipated for specific actions. The final PEIS was published January 1999.
- Yakima River Watershed Management Plan (WMP) -- A State funded, 4-year effort by a Yakima River Watershed Planning Unit, undertaken pursuant to the Watershed Management Act (Chapter 90.82 RCW) passed by the Washington State Legislature in 1998, resulted in completion of a WMP in January 2003. This WMP is currently being considered by the County Commissioners of Benton, Kittitas, and Yakima Counties for adoption.
- Ground Water Management Study -- During the drought period of 1993, the State Department of Ecology (WDOE) approved numerous applications for groundwater permits in the lower Yakima basin. Many of the applications were

for supplemental irrigation water for farms within the Roza Irrigation District. WDOE's action was appealed by the YN on the basis of the inter-relationship of surface and groundwater (hydraulic continuity) and concerns for impairment of Yakima River water rights and instream flows.

The YN's appeals eventually centered on 27 well applications and Reclamation filed for amicus status in the litigation in 1997. Reclamation argued there were Federal concerns and interests in the basin groundwaters due to hydraulic continuity with surface water and return flows from surface irrigation.

In 1998, the DO E, YN, and Reclamation initiated settlement negotiations which resulted in two actions. First, the YN and individual permittees agreed that well development could proceed upon payment by the permittees to Reclamation of a specified amount as mitigation for purchase of replacement water under the YRBWEP. The appeals were withdrawn. Second, a three-party Memorandum of Agreement was signed August 12, 1999 (by WDOE, YN, and Reclamation) providing for a basin-wide groundwater study.

The groundwater supply study is in progress and is being conducted by the U.S. Geological Survey. The initial budget estimate was \$6 million over a 5-year study period. The purpose of the study is stated as: To develop a conceptual framework report and appropriate numerical groundwater model (including surface water/groundwater interactions) to be used in future groundwater management, water allocation and mitigation decisions in the basin. The study Scope of Work describes the product to be transient and steady state numerical models with the capability to assess the effects of groundwater pumping upon stream flow and water levels.

WDOE is withholding further decisions on pending groundwater applications until completion of the study.

- Yakima River Basin Storage Enhancement Initiative (Storage Initiative) -- Early in 2001, the Benton Board of County Commissioners committed funding to facilitate the development of new storage to benefit the Yakima River basin. A major product of the Storage Initiative is a reconnaissance report which addresses importation of water from the Columbia River, water storage in a new, large reservoir located between the Columbia River and the Yakima River basin, and the delivery of water from the reservoir to the Roza Canal in the Yakima River basin. This plan would enable Columbia River water to be exchanged for Yakima River water to benefit anadromous fish and irrigation entities with proratable water.
- Columbia River Regional Initiative (CRI) -- The purpose of the CRI is to develop an integrated Washington State program for managing Columbia River water resources to allow access to new water withdrawals while providing support for salmon recovery. The CRI will result in adoption of a "rule" in the Washington



State Administrative Code that defines how the WDOE will carry out its dual obligations to allocate water and preserve a healthy environment. Activities leading up to rulemaking are a National Academy of Science review of existing science relating to fish survival and hydrology in the Columbia River and a study of regional economics in the Columbia Basin on how water use is related to economic productivity. The target date for completion of the study activities and rulemaking is mid-2004.

## **1.6 Study Approach**

Management of the Storage Study is the responsibility of the Upper Columbia Area Office, Pacific Northwest Region of the Bureau of Reclamation. The Storage Study will be conducted pursuant to the “Economic and Environmental Principles and Guidelines for Water and Related Land Resources Implementation Studies, March 10, 1983.” For management purposes the Storage Study is divided into four phases. A brief description of the phases follows:

- **Phase 1 -- Organize and Develop a Plan of Study**

This is the start-up activity for the overall study. It contains two priority components. Simultaneous activities were undertaken to (1) identify priority activities that are fundamental to the Storage Study that can be immediately initiated in fiscal year 2003, and (2) define the Scope of Work, the schedule, and the budget for accomplishment of the Storage Study.

- **Phase 2 -- Pre-Plan Formulation**

Basic data and information generally common to storage alternatives will be collected, compiled and analyzed. This includes: conducting studies to define irrigation and normative instream flow criteria; the identification of water supply needs for agriculture, fisheries, and municipal purposes; a determination of the current shortage of water supply to meet these needs; and the availability of water for additional use from the Yakima and Columbia Rivers.

Yakima River basin entities capable of receiving their irrigation water supply from the Black Rock Project will be identified. A conceptual plan for transporting water from Black Rock Reservoir to these entities, including modifications, if any, to their existing works will be developed and cost estimates prepared. Conceptual plans will be screened for cost effectiveness and the most viable discussed with potential exchange participants as to their willingness to participate.

- **Phase 3 -- Plan Formulation**

Potential plan elements for consideration in “future without project” and “future with project” scenarios will be identified in this phase and alternative plans will be formulated, evaluated, and compared. A viable alternative plan(s) will be selected to carry forward for further analysis into the more detailed feasibility phase.

- **Phase 4 -- Feasibility Analysis and Environmental Impact Statement Activities**

The viable alternative plan(s) will be analyzed at the more detailed feasibility level. The Feasibility Report/Environmental Impact Statement will be prepared.

## **2.0 Scope of Work**

### **2.1 Structure**

Details of the Scope of Work are presented in the attached matrix document. For each phase of the Scope of Work specific work activities are identified. Activities are denoted by the “hundred series,” 100, 200, etc. For each activity a matrix is provided which is segregated into items, sub-items, objectives, tasks, and primary data base.

The “items” are the primary subjects being addressed; “sub-items” generally indicate whether it pertains to the Yakima River or the Columbia River; “objectives” reflect what is to be accomplished; “tasks” describes the work required to accomplish the objectives; and the “primary data base” indicates the data source for the task.

The Scope of Work is flexible so that emphasis could first be placed on matters related to the diversion and delivery of Columbia River water. This can be done by addressing Columbia River sub-items. It is also possible to concurrently address both Yakima River and Columbia River sub-items.

### **2.2 Index of Activities**

For reference purposes an index of activities and related activity numbers was developed. This index is shown in table 2-1 on page 9.

<b>Table 2-1. Index of Activities</b>	
<b>Phase 1 -- Plan of Study and Priority Activities</b>	100
Organize Study Implementation Team	101
Develop Plan of Study	102
Implement Priority Activities	103
Black Rock Topographic Mapping	103.1
Black Rock Geologic Mapping	103.2
Black Rock Seismotectonic Evaluation	103.3
Black Rock Groundwater Evaluation	103.4
Exploratory Drilling	103.5
Geology Liaison	103.6
Modeling Capability	103.7
Black Rock Project Review	103.8
Fish and Wildlife Resources	103.9
Cultural Resources	103.10
Public Involvement	103.11
Informational Meeting	104
Status Report	105
<b>Phase 2 -- Pre-Plan Formulation</b>	200
Define Water Supply Needs Criteria	201
Quantify Water Supply Needs	202
Inventory of Primary Water and Land Resource Conditions	203
Water Supply Deficiency	204
Quantify Surface Water Supply Available	205
Data Collection and Evaluation	206
Interim Report	207
Public Involvement	208
<b>Phase 3 -- Plan Formulation</b>	300
Potential Plan Elements	301
Alternative Plans	302
Data Collection	303
Evaluation, Comparison and Selection of Alternative(s)	304
Plan Formulation Report	305
Public Involvement	306
<b>Phase 4 -- Feasibility Analysis and Environmental Impact Statement Activities</b>	400
Feasibility and NEPA Activities	401
Feasibility Report/Environmental Impact Statement	402
Public Involvement	403

### 2.3 Critical Technical Activities

While every activity is critical to the successful completion of the Storage Study, there are several which should be emphasized as they are the “base” upon which alternative plans are formulated. It is imperative that these be addressed early in the process to enable the timely completion of the Storage Study. A discussion of these activities follows:

**Activity 201.1, Irrigation Dry-Year Water Shortage Criteria** -- Recent watershed planning activities (Watershed Council, 1997; Watershed Planning Unit, 2003) adopted an irrigation water supply goal for proratable water users as providing a minimum of 70 percent of an entities “entitlement” in proration years. The “entitlement” number is linked to the Decree. The justification for this goal was that this is a shortage most farmers considered they could endure and recover from in a drought year.

As described herein (1.4 Water Right Adjudication), the Yakima County Superior Court Decree in the adjudication will supercede the (1945) Decree. Adjudicated water rights will replace the entitlements as the measure of the water an entity is authorized to receive. In many cases the water right will be less than the entitlement. Further, the technical justification for selecting the 70 percent should be reviewed.

For these reasons an early task is to conduct a study to define dry-year water shortage criteria which includes consideration of economic impacts on the agricultural economy.

**Activity 201.2, Instream Flow Criteria** -- Equally important to quantifying agricultural water supply needs is the question of an adequate water supply for instream flows to benefit the fisheries resources. Recent planning studies in the Yakima basin have primarily relied upon use of the Instream Flow Incremental Methodology to define instream flows. However, Reclamation recognizes that the Title XII legislation (1994) required the evaluation of the concept of biologically based target flows for the Yakima River basin. This evaluation was conducted by the System Operations Advisory Committee (SOAC) and a report to the Secretary of the Interior was issued in 1999. This report contains recommendations for a multi-year study program which would result in an Adaptive Environmental Assessment and Management Program for the basin.

Through studies implementing the 1999 SOAC Report, the concept of managing a flow regime to more closely resemble natural (normative) conditions has emerged. In this context, biologically based and normative flows have common objectives for fisheries needs in the Yakima basin.

Although considerable research is ongoing on biologically based and normative flows in the Yakima and Snake River basins, specific scientific criteria have not been established for quantifying such flows in targeted Yakima River reaches. For purposes of the Storage Study the current Yakima basin work will be extended to identify the criteria for defining a normative flow regime and the quantification of the flows necessary to

establish such a regime. This is a priority activity which is crucial to identifying “needs” for formulating alternative plans in the Storage Study.

**Activity 202.1.2, Potential Water Exchange Participants** -- The preliminary Black Rock Project design by Washington Infrastructure Services (WIS) proposed delivery of water to the Roza Canal at approximate mile post 22. Roza Canal capacity at this point is about 1,000 cfs. An irrigation demand from the canal of about 150 cfs exists above this point.

Alternative water conveyance scenarios from Black Rock Reservoir to the Roza Canal were considered by WIS under assumptions of 1,000 cfs and 2,000 cfs conveyance capacity. For capacities in excess of 1,000 cfs (approximate Roza demand), WIS did not identify what other irrigation entities might be served from the Black Rock Project.

Although not addressed in the WIS project design, the most obvious recipients of Black Rock water would be the Roza and Sunnyside Divisions.

Based on pending water right adjudication activities, the authorized maximum water deliveries for the two divisions for April through October are estimated as follows:

<b>Division</b>	<b>Proratable</b>	<b>Non-proratable</b>	<b>Total</b>
	(acre -feet per year)		
Roza	375,000	0	375,000
Sunnyside	119,000	316,000	435,000
Total	494,000	316,000	810,000

Solely for illustration purposes, assume Sunnyside and/or Roza are fully served from a Black Rock Project and their Yakima River water is exchanged for other Yakima basin uses in the following sequence: (1) for instream flow purposes in wet and average years; and (2) for irrigation purposes to all other proratables (which total 790,000 acre-feet) to provide a maximum 70 percent supply in dry-years. Given these assumptions, the following would result in a dry-year such as 2001:

<b>Item</b>	<b>Roza Only</b>	<b>Roza and Sunnyside</b>
	(acre -feet)	
Exchange water available in a dry-year at 37% supply	140,000 <sup>1</sup>	500,000 <sup>2</sup>
Other proratables at 70% supply requirement <sup>3</sup>	260,000	260,000
Deficit for other proratables	120,000	0
Residual available for non-irrigation uses in a dry-year	0	240,000

<sup>1</sup> Roza exchange supply is 375,000 acre-feet x 37% = 140,000 acre-feet.

<sup>2</sup> Sunnyside exchange supply is 119,000 acre-feet x 37% acre-feet = 44,000 acre-feet + 316,000 acre-feet (non-proratable) = 360,000 acre-feet.

<sup>3</sup> Total of 790,000 acre-feet x 33% (70% - 37%)

The above general analysis indicates in a dry-year such as 2001, a Roza only exchange under the stated assumption would not meet the 70 percent proratable supply criterion or any other needs. A Roza and Sunnyside exchange would meet the 70 percent criterion plus make 240,000 acre-feet available for non-irrigation uses. In wet and average water years, an additional 810,000 acre-feet would be available for non-irrigation uses.

The viability of meeting irrigation and instream flow needs through importation of Columbia River water is contingent on the willingness of Roza, Sunnyside, and possibly other lower Yakima basin irrigation entities to participate in the water exchange proposal. An early need in the study process is to identify potential participants, their willingness to participate, and the technical, legal, and institutional considerations of the water exchange concept.

### **3.0 Special Considerations**

#### **3.1 Future Without Project**

The “future without project” condition is the baseline from which all other alternatives are compared. This is the condition expected to prevail if no action is taken. The “future without project” condition should not be identical to existing conditions because future changes may occur regardless of whether any of the “future with project” alternatives are implemented.

With regard to anadromous fishery habitat, an important component is the flow regime. An underlying assumption is that the natural, unaltered (i.e., historic) flow regime produced the ecosystem conditions necessary to sustain abundant anadromous salmonid populations, and that human alterations of this flow regime impacted the ecosystem resulting in reductions in these populations. Thus, in a river basin with extensive flow regulations such as the Yakima, managing aspects of the flow regime to more closely resemble natural conditions may recover some ecosystem functions and offer the potential to improve salmonid populations.<sup>4</sup>

For the Storage Study, the “future without project” condition includes implementation of water conservation measures provided for in the “Basin Conservation Program” of Title XII. While Title XII indicates that water savings from such measures shall be used to increase instream target flows over Sunnyside and Prosser Diversion Dams, it is proposed that such water savings be used to move the current Yakima Project operations toward a flow regime that represents estimated unregulated flow conditions (a “normative” flow) to the greatest extent possible given the cultural, legal, contractual, and operational constraints associated with river basin development. The use of such water savings may depend on the capability to manage them to approach the desired “normative” flow.<sup>5</sup>

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<sup>4</sup> Report on Biologically Based Flows for the Yakima River Basin, System Operations Advisory Committee, May 1999 (page 3-1)

<sup>5</sup> The Title XII program also provides that water acquired through the voluntary purchase or lease of land, water or water rights is to be used for meeting instream flow objectives.

In effect, the “future without project” condition will represent the extent of what can be accomplished in meeting normative flow conditions through water conservation and other Title XII activities. This will define the additional water supply, if any, that may be necessary to further achieve normative flow conditions.

### **3.2 Future With Project**

Federal legislation (2003) authorizing the Storage Study and appropriation of Federal funds and the State legislation (2003) appropriating State study funds both provide for examination of additional water storage options in the Yakima River basin and both place study emphasis on the Black Rock Project. The Black Rock Project includes pumping of water from the Columbia River in the vicinity of Priest Rapids Dam to a new storage reservoir (Black Rock) for further delivery to irrigation entities in the lower Yakima River basin. The irrigation water supply provided would be in lieu of and “free-up” current use of Yakima River water for other Yakima basin needs.

Opportunities for storage augmentation within the Yakima River basin must also be considered and compared to the proposed Black Rock Project. Extensive investigations of such storage projects have taken place in the past under YRBWEP planning activities. Based upon a 1986 Reclamation “Plan Formulation” report, the most viable options have been identified as the enlargement of Bumping Reservoir, construction of the Wymer Dam and reservoir project, and construction of a pipeline from Keechelus to Kachess reservoirs. These three storage augmentation alternatives were also identified in the 2003 WMP prepared by the Yakima River Basin Watershed Planning Unit.<sup>6</sup>

In identifying, examining, and comparing alternate “future with project” plans it is considered that previous work has adequately screened and identified the most viable storage augmentation alternatives. This work will not be repeated in the Storage Study. Instead, the previous work will be updated and extended as necessary with respect to Black Rock Project and the four Yakima River basin options referenced above.

### **3.3 Availability of Columbia River Water**

In the May 2002 Black Rock Reservoir Study report, WIS assumed Columbia River water was available for pumping whenever flows at Priest Rapids exceeded 130,000 cfs or spill occurred. On this basis WIS concluded diversion could take place only in April, May, and June. Sizing of the Columbia River Pumping Plant and Black Rock Reservoir was based on these criteria plus various assumptions on water demand in the Yakima River basin.

A State water right will be required for the proposed Black Rock diversion/appropriation. The conditions of the permit (if allowed) may influence the sizing of the reservoir and the overall viability of the Black Rock Project.

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<sup>6</sup> A fourth alternative, Cle Elum Reservoir enlargement was authorized by Title XII and will be included in the “future without project.”

Recent litigation over Columbia River water rights prompted WDOE to undertake a planning process which will result in a rewrite of current administrative rules for Columbia River water management and use. The process is termed the Columbia River Initiative (CRI). The CRI has two primary study components discussed below.

Salmon Survival -- This component focuses on an independent review of existing scientific data related to instream flows and salmon survival. The review is being conducted by the National Academy of Sciences/National Research Council and includes the following activities:

1. Review and evaluate existing scientific data and analyses related to fish species listed under the Endangered Species Act in the Columbia River Basin, as necessary to accomplish tasks 2 and 3.
2. Review and evaluate environmental parameters critical to the survival and recovery of listed fish species as they relate to the hydrology of the Columbia River in the context of the continued operation of the Federal Columbia River Power System and other main stem power generation facilities. This will include instream flows sufficient for fish and wildlife as well as the potential effects of decreased natural storage capacity on river hydrology.
3. In light of existing withdrawals, describe the risks to salmonid survival of a range of water withdrawals, and the cumulative effects of other factors, during critical times of the salmon life cycle (Note: WDOE suggests an appropriate range of water withdrawals to consider is 250,000 acre-feet to 1.3 million acre-feet).
4. Evaluate the effects of proposed management criteria, diversion quantities, and features of potential water management alternatives (such management information will be provided by the State of Washington).
5. Identify gaps in the knowledge and scientific information that are needed to develop comprehensive strategies for recovering and sustaining listed species and managing water resources to meet human needs.

The Council is to report its findings in March 2004.

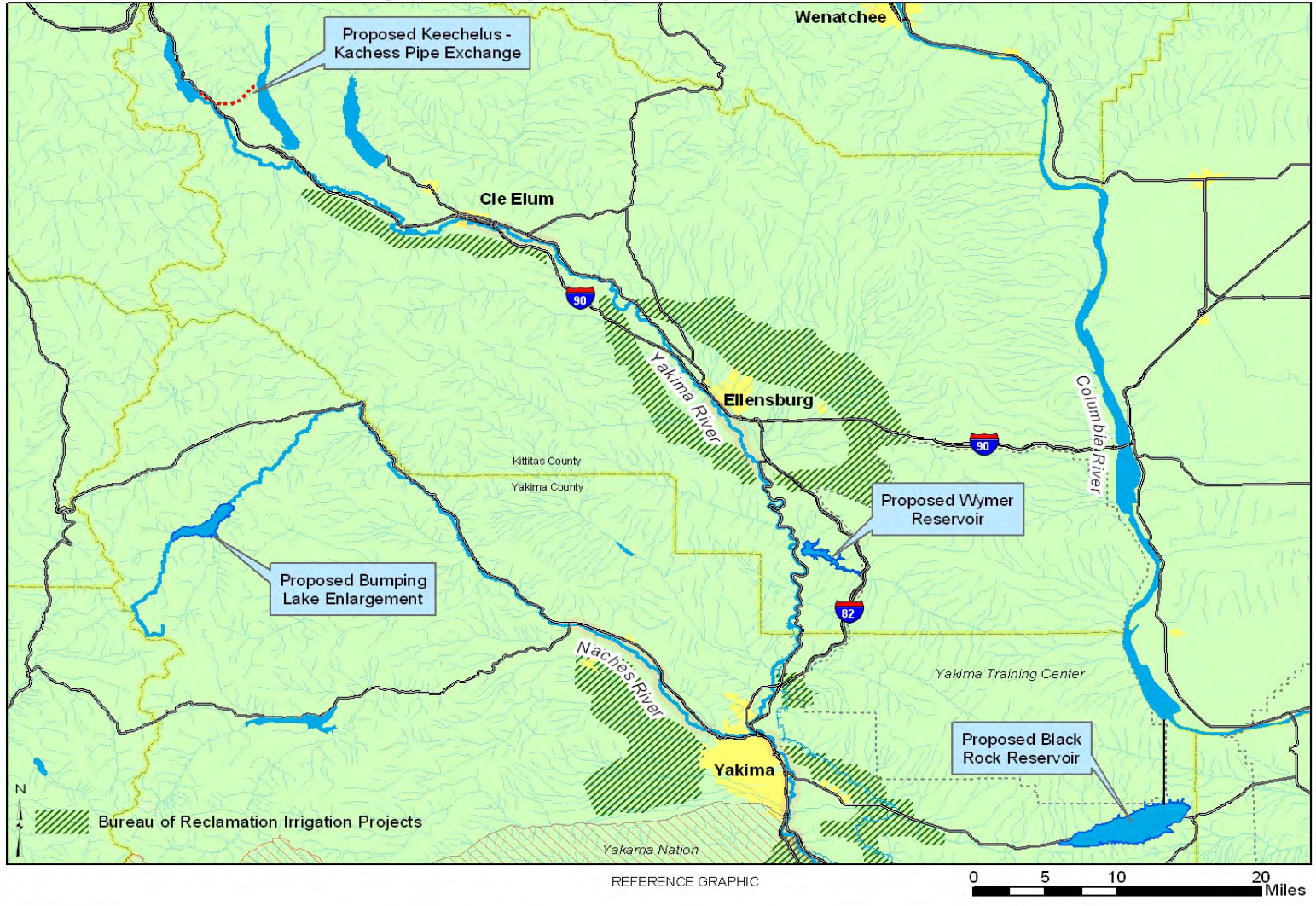
Economics -- The University of Washington is conducting a study of regional economics in the Columbia River and how water use is related to economic productivity. This review will provide guidance on how economic benefits are maximized by allocating water among competing uses.

This Plan of Study recognizes that the availability of water/water rights question will not be resolved until at least the spring of 2004. Rather than delay any Black Rock Project study activity until that time, the Plan of Study provides for a preliminary determination of water availability based on current Columbia River flow objectives at Priest Rapids



Dam, as recognized by Bonneville Power Administration and other Federal agencies. In essence, this will be a review of the WIS work regarding the preliminary sizing of the Black Rock Project components. It is recognized that WDOE decisions under the CRI process may result in this work being re-visited.

**Yakima River Basin Water Storage Feasibility Study**



**Attachment 1 - Map of the Yakima River Basin**

**YAKIMA RIVER BASIN WATER STORAGE FEASIBILITY STUDY SCHEDULE OF STUDY ACTIVITIES\***

No.		FY03		FY04				FY05				FY06				FY07				FY08					
		Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4		
<b>100</b>	<b>Phase 1 -- Plan of Study and Priority Activities</b>																								
101	Organize Study Implementation Team																								
102	Develop Plan of Study																								
103	Implement Priority Activities																								
103.1	Black Rock Topography																								
103.2	Black Rock Geologic Mapping																								
103.3	Black Rock Seismotectonic Evaluation																								
103.4	Black Rock Groundwater Evaluation																								
103.5	Black Rock Exploratory Drilling																								
103.6	Geology Liaison																								
103.7	Modeling Capability																								
103.8	Black Rock Project Review																								
103.9	Fish and Wildlife Resources																								
103.10	Cultural Resources																								
103.11	Public Involvement																								
104	Informational Meeting																								
105	Status Report																								

\* The timelines shown are general to quarters within Federal fiscal years. (October 1 to September 30)

Activities may start or end within a quarter rather than at the beginning or end date of the indicated quarter.

**YAKIMA RIVER BASIN WATER STORAGE FEASIBILITY STUDY SCHEDULE OF STUDY ACTIVITIES\***

No.		FY03		FY04				FY05				FY06				FY07				FY08			
		Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4
200	<b>Phase 2 -- Pre-Plan Formulation</b>																						
201	Define Water Supply Needs Criteria																						
202	Quantify Water Supply Needs																						
203	Inventory of Primary Water and Land																						
204	Resource Conditions Water Supply Deficiency																						
205	Quantify Surface Water Supply Available																						
206	Data Collection and Evaluation																						
207	Interim Report																						
208	Public Involvement																						

\* The timelines shown are general to quarters within Federal fiscal years. (October 1 to September 30)

Activities may start or end within a quarter rather than at the beginning or end date of the indicated quarter.

**YAKIMA RIVER BASIN WATER STORAGE FEASIBILITY STUDY SCHEDULE OF STUDY ACTIVITIES\***

No.		FY03		FY04				FY05				FY06				FY07				FY08				
		Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	
<b>300</b>	<b>Phase 3 -- Plan Formulation</b>				—————				—————															
301	Potential Plan Elements				—————																			
302	Alternative Plans					—————																		
303	Data Collection				—————																			
304	Evaluation, Comparison, and Selection																							
305	of Alternative(s) Plan Formulation Report																							
306	Public Involvement				—————				—————															

\* The timelines shown are general to quarters within Federal fiscal years. (October 1 to September 30)

Activities may start or end within a quarter rather than at the beginning or end date of the indicated quarter.

YAKIMA RIVER BASIN WATER STORAGE FEASIBILITY STUDY SCHEDULE OF STUDY ACTIVITIES\*

No.		FY03		FY04				FY05				FY06				FY07				FY08			
		Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4
<b>400</b>	<b>Phase 4 -- Feasibility Analysis and Environmental Impact Statement Activities</b>																						
401	Feasibility and NEPA Activities																						
402	Feasibility Report/Environmental																						
403	Impact Statement Public Involvement																						

\* The timelines shown are general to quarters within Federal fiscal years. (October 1 to September 30)

Activities may start or end within a quarter rather than at the beginning or end date of the indicated quarter.

<b>Phase I - - Plan of Study and Priority Activities</b>				
<b>Activities 100 - - Plan of Study and Priority Activities</b>				
<b>Item</b>	<b>Sub-Item</b>	<b>Objectives</b>	<b>Tasks</b>	<b>Primary Data Base</b>
101. Organize Study Implementation Team		101. Establish a core group to develop the Plan of Study (POS)	1. Upper Columbia Area Office (UCAO) Area Manager will appoint a team to develop a POS and identify and expeditiously implement priority work activities in FY 2003.	
102. Develop the POS		102. Describe the study approach and process, including a detailed POS, budget, and schedule.	1. Develop the overall study framework and define the major study activities and key policy questions and issues.  2. Develop the detailed POS.	

Item	Sub-Item	Objectives	Tasks	Primary Data Base
103. Implement Priority Activities	103.1 Black Rock Topography	103.1 Create a topographic base map suitable for feasibility grade study of the Black Rock Project.	<p>1. Acquire contractor for aerial photography, photogrammetry, and LiDAR mapping. Reclamation acquires access to project site.</p> <p>2. Conduct work including establishing survey control network for aerial photo-control panels, stereo aerial photographs for use in geologic mapping, preparation of digital orthophotographs, data processing, and development of digital terrain model with sufficient resolution for 2-foot contour maps.</p>	



Item	Sub-Item	Objectives	Tasks	Primary Data Base
	103.2 Black Rock Geologic Mapping	103.2 Expand work completed by Washington Infrastructure Services (WIS) to feasibility grade study level.	<ol style="list-style-type: none"> <li>1. Acquire contractor and Reclamation access to project site.</li> <li>2. Conduct field mapping at alternate dam site and scope future geologic mapping activities for the Black Rock Project area.</li> <li>3. Prepare report describing work conducted and conclusions.</li> </ol>	Black Rock Reservoir Study, Final Report, WIS, May 2002.
	103.3 Black Rock Seismotectonic Evaluation	103.3.1 Update Reclamation's 1990 work on earthquake risk of project area.	<ol style="list-style-type: none"> <li>1. Further evaluate the seismicity and earthquake risk of the complex series of folds and associated faults within the area.</li> <li>2. Conduct an enhance literature evaluation to develop more extensive data from previous studies, including work at the Hanford site.</li> </ol>	

Item	Sub-Item	Objectives	Tasks	Primary Data Base
			3. Prepare report on the results of the evaluation.	
		103.3.2 Conduct additional seismotectonic activities.	<p>1. Augment Hanford/Pacific Northwest Labs existing seismic network to provide coverage in Black Rock Project area. Annual operation and maintenance would be required to carry this activity into post-construction monitoring.</p> <p>2. Conduct geophysical work (reflection and surface-to-borehole shear wave tests) in area between WIS dam site and possible alternate site to determine extent of possible fault. This will require drilling of 15-20 five foot deep “shot” holes.</p>	

Item	Sub-Item	Objectives	Tasks	Primary Data Base
	103.4 Black Rock Groundwater Evaluation	103.4.1 Analyze existing data to assess the storage capability of the reservoir basin.	<p>1. Compile available groundwater data, identify data gaps, assemble well logs, analyze extent and characteristics of aquifer, and review borehole pressure and water test data of WIS work.</p> <p>2. Prepare report of findings on groundwater database, aquifer characteristics, and storage capability of reservoir basin.</p>	

Item	Sub-Item	Objectives	Tasks	Primary Data Base
	103.5 Black Rock Exploratory Drilling	103.5 Determine depth to bedrock at possible alternate dam site.	<p>1. Following geologic mapping of the possible alternate dam site, drill one hole to determine depth to bedrock and composition of materials. Record physical description of geologic units from core loggings. Install instrumentation equipment for groundwater monitoring.</p> <p>2. Evaluate findings from drill hole and those from prior drilling by WIS at downstream dam site and develop recommendations on further drilling and geological exploration program as may be required for feasibility study.</p>	

Item	Sub-Item	Objectives	Tasks	Primary Data Base
	103.6 Geology Liaison	103.6 Coordinate and facilitate Black Rock Project geology-related activities.	1. A Reclamation staffer will coordinate and monitor geology, seismotectonic and topography activities.	
	103.7 Modeling Capability	103.7 Enhance Reclamation modeling capability for assessing hydrologic operations and fish production.	1. Upgrade RiverWare model.  2. Develop data management interface (linkage) between RiverWare and Range of Variability Approach (RVA) models.  3. Select an existing model (EDT or SALMOD) or develop a new fish production model and interface with RiverWare.	

Item	Sub-Item	Objectives	Tasks	Primary Data Base
	103.8 Black Rock Project Review	103.8 Review WIS reconnaissance work and conduct site review.	<p>1. Review recent reconnaissance level study for use in plan formulation. Document findings in a Letter Report.</p> <p>2. Form Technical Site Review Team and conduct field review to assess Black Rock Project dam and reservoir sites, alternate pumping plant sites, and alternate inlet and outlet works alignments. Prepare summary report of findings and recommendations concerning technical evaluations prerequisite to feasibility designs and cost estimates.</p>	WIS “Black Rock Reservoir Study Final Report, May 2002” and supporting appendices.

Item	Sub-Item	Objectives	Tasks	Primary Data Base
	103.9 Fish and Wildlife Resources.	103.9 Initiate FWS activities with early emphasis on review of documents and ongoing fish and wildlife work in the Hanford Reach, the Black Rock Project area, and the Yakima River basin.	<p>1. Through conjunctive arrangements with the FWS and WDFW, assemble and review fish and wildlife documents and ongoing work associated with potential storage sites. Identify resource aspects surrounding the siting, construction, and operation of potential storage facilities. These aspects include anadromous fish and other aquatic, riparian/wetland, and terrestrial aspects.</p> <p>2. Prepare summary report on prior work of what has been done and additional fish and wildlife resources work which may be required for the feasibility study. Prepare draft Scope(s) of Work.</p>	<p>Public Utility District No. 2 of Grant County Draft License Application for Priest Rapids.</p> <p>Sub-basin planning and salmon recovery documents for Yakima River basin.</p>

Item	Sub-Item	Objectives	Tasks	Primary Data Base
	103.10 Cultural Resources	103.10 Review of prior cultural resources work (Class I Survey).	<p>1. Review cultural resources reports and ongoing work associated with (a) Priest Rapids Dam and Hanford Reach in vicinity of Black Rock Project alternate pumping plant and intake facilities, and (b) Black Rock Project alternate inlet works alignments, reservoir area, and alternate outlet works alignments.</p> <p>2. Review cultural resources reports associated with Yakima basin potential projects.</p> <p>3. Prepare summary report indicating what has been done and additional work which may be required for feasibility study. Prepare draft Scope(s) of Work.</p>	<p>Public Utility District No. 2 of Grant County Draft License Application for Priest Rapids.</p> <p>Prior Yakima basin cultural resources reports.</p>



Item	Sub-Item	Objectives	Tasks	Primary Data Base
	103.11 Public Involvement (PI) Plan and Program	103.11 Design PI Plan and implement PI Program.	<ol style="list-style-type: none"> <li>1. Select a contractor to (a) review related past public involvement program activities, and (b) develop a Scope of Work for a PI Plan and Program for the Storage Study which can be used for soliciting a contractor.</li> <li>2. Solicit and select a contractor to prepare a PI Plan and assist in the PI Program.</li> <li>3. Prepare PI Plan and initiate PI Program.</li> </ol>	

Item	Sub-Item	Objectives	Tasks	Primary Data Base
104 Informational Meeting		104 Conduct informational meeting.	1. Develop agenda, schedule, and prepare for meeting to inform congressional delegation and staff; Federal, State, and local entities; organizations, and the public of status of feasibility study and work activities.  2. Conduct meeting.	
105 Status Report		105 Provide status report on Phase 1.	1. Prepare report describing what activities are underway, what has been completed, and what is scheduled for initiation. For completed activities describe findings and conclusions.	

<b>Phase 2 - - Pre-Plan Formulation</b>				
<b>Activity No. 201 - - Define Water Supply Needs Criteria</b>				
<b>Item</b>	<b>Sub-Item</b>	<b>Objectives</b>	<b>Tasks</b>	<b>Primary Data Base</b>
201.1 Irrigation Dry-Year Water Shortage Criteria	201.1.1 Yakima River	201.1.1 For planning purposes, define dry-year water shortage criteria to be applied to established proratable rights while sustaining the agricultural economy of the Yakima River basin.	<p>1. Develop a Scope of Work of activities to define (1) the water supply required for full crop production, and (2) water shortages (%) that can reasonably be applied to established proratable rights in a dry-year, and a sequence of dry years, without significant economic impact on the direct and indirect beneficiaries of irrigated agricultural production.</p> <p>2 Using a consultant or Reclamation’s Technical Services Center conduct the study.</p>	
201.2 Instream Flow Assessment	201.2.1 Yakima River	201.2.1 Obtain consultant services for instream flow assessment.	1. Following the Request For Proposal process, select a consultant and adopt a Scope of Work for the instream flow assessment.	

<b>Phase 2 - - Pre-Plan Formulation</b>				
<b>Activity No.202 - - Quantify Water Supply Needs</b>				
		Note: In all of the following, a full water supply for non-proratable Project users is to be maintained in all years. The dry-year water supply criteria for proratable authorized rights are to be determined in activity No. 201.1.		
<b>Item</b>	<b>Sub-Item</b>	<b>Objectives</b>	<b>Tasks</b>	<b>Primary Data Base</b>
202.1 Irrigated Agriculture	202.1.1 Yakima River	202.1.1 Increase the proratable water supply to all Yakima Project users to a minimum of ___% of established rights in years of proration.	<p>1. Determine the irrigation and related purpose needs of those entities entitled to Project water as best evidenced by the January 2003 Watershed Management Plan (WMP) and more recent <u>Acquavella</u> Court records.</p> <p>2. Tabulate each entity's needs as to proratable and non-proratable. Further tabulate the proratable component to represent a ___% supply.</p>	WMP, January 2003 <u>Acquavella</u> Court records

Item	Sub-Item	Objectives	Tasks	Primary Data Base
202.1 Irrigated Agriculture	202.1.2 Columbia River	<p>Note: This analysis assumes all water rights (non-proratable and proratable) of participating irrigation entities will be served from the Columbia River in all years. This assumption is on the premise that even in non-proration years in the Yakima River basin, exchange water will be required to meet instream flow objectives. Should it be determined through the quantification of instream flow needs that this assumption is incorrect, further analysis will be required of the viability of considering the Columbia River only as an alternate water supply for dry-year needs.</p>		
		<p>202.1.2 Determine the water supply required to provide a full supply to those Yakima Project irrigation entities susceptible of receiving Columbia River water and willing to participate in a water exchange program. A full water supply consists of the sum of all authorized non-proratable water and (a) all proratable water in wet and normal water years, and (b) a minimum of __% of proratable water in all years of proration.</p>	<ol style="list-style-type: none"> <li>1. Based on the preliminary configuration of Black Rock Project, identify Yakima River entities capable of receiving their irrigation supply (entire or partial) from the Black Rock Project.</li> <li>2. For each identified entity, prepare a conceptual plan for irrigation service. Consult with each entity as to willingness to participate in the water exchange program.</li> </ol>	<p>WIS “Black Rock Reservoir Study Final Report, May 2002”</p>

Item	Sub-Item	Objectives	Tasks	Primary Data Base
			<p>3. For each “willing participant,” (a) prepare monthly maximum diversion demand schedules as currently exist for Yakima River water and as estimated for Columbia River water, and (b) prepare appraisal level design and cost estimates for water transmission works from the discharge end of the Black Rock Reservoir transmission line to the service area, including modifications to the participants delivery system as may be necessary.</p> <p>4. Identify and generally analyze for “fatal flaws” potential issues and impacts on water service contracts and water rights of the exchange participants and/or other existing water rights in the Yakima basin and Columbia River Basin.</p> <p>5. Prepare a ranking analysis of the cost-effectiveness of serving the various potential participants.</p>	

Item	Sub-Item	Objectives	Tasks	Primary Data Base
			6. Prepare a recommended appraisal-level plan for service from Black Rock Reservoir.	
202.2 Instream Flow Assessment	202.2.1 Yakima River	202.2.1 For planning purposes, develop hydrographs which define flow thresholds (volume and duration) for normative flows for the main stem Yakima and Naches Rivers.	<p>1. For planning purposes, determine and confirm the exterior boundaries of the five major floodplains under the conditions of (a) current floodplain development, and (b) floodplain expansion by selective removal of encroachments.</p> <p>2. Develop hydrographs for habitat and ecosystem restoration for each floodplain.</p> <p>3. Evaluate the relationship of the hydrographs developed for the five floodplains and recommend adjustments as may be required for compatibility of flows throughout the basin corridor. Recommend a normative flow regime for the Yakima River system.</p>	“The Reaches Project,” Stanford, et al, 2002

Item	Sub-Item	Objectives	Tasks	Primary Data Base
			4. Prepare a report of the work conducted and conclusions reached.	
202.3 Municipal	202.3.1 Yakima River	202.3.1 Maintain a full supply for existing users and provide additional water supply for population growth, consistent with State and local land use objectives to the year 2050.	<p>1. Review and summarize the rationale and methodology contained in the WMP for determining municipal, industrial, and rural domestic water supply needs.</p> <p>2. Either adopt the WMP analysis or justify the need to make modifications related to municipal use and future demands.</p> <p>3. Quantify the additional water supply needs through the year 2050.</p>	WMP, 2003



<b>Phase 2 - - Pre-Plan Formulation</b>				
<b>Activity No. 203 (Step 2) - - Inventory of Primary Water and Land Resource Conditions<sup>7</sup></b>				
<b>Item</b>	<b>Sub-Item</b>	<b>Objective</b>	<b>Tasks</b>	<b>Primary Data Base</b>
203.1 Surface Water Supply	203.1.1 Yakima River	203.1.1 Identify total annual current surface water supply.	<p>1. Review prior reports pertaining to total current surface water supply.</p> <p>2. Prepare draft narrative of total current surface water supply conditions.</p>	<p>Watershed Assessment, June 2000 and technical report “Reliability of Surface Water Supply for Irrigation, January 2002,” MWG.</p> <p>YRBWEP Programmatic EIS</p> <p>Biological Assessment, Yakima Project Operations and Maintenance, August 2000.</p> <p>Interim Basin Operating Plan, November 2002.</p> <p>Black Rock Reservoir Study Final Report, May 2002.</p>

<sup>7</sup> This is an inventory of resource conditions related to primary needs as identified in PL 108-7 (February 20, 2003).

<b>Item</b>	<b>Sub-Item</b>	<b>Objective</b>	<b>Tasks</b>	<b>Primary Data Base</b>
	203.1.2 Columbia River	203.1.2 Identify total annual current surface water supply at Priest Rapids.	Same as tasks 1 and 2.	
203.2 Irrigated Agriculture Lands	203.2.1 Yakima River	203.2.1 Identify current irrigated agriculture lands.	1. Review prior reports and prepare narrative description of the total Yakima Project irrigated lands.	Same as 203.1.1 “Primary Data Base”
203.3 Anadromous Fishery	203.3 .1 Yakima River	203.3.1 Identify current anadromous fishery by species and habitat conditions.	1. Review prior reports and prepare narrative description of anadromous fishery and habitat conditions by “the reaches” identified in the 2002 Stanford report.	Same as 203.1.1 “Primary Data Base”  Technical report “Maintain and Enhance Habitat,” April 2002, R.C. Bain & Associates.  “The Reaches Report,” Jack Stanford et al, 2002
	203.3.2 Columbia River	203.3.2 Identify current anadromous fishery by species and the habitat in the Hanford Reach.	1. Review prior reports and prepare narrative description of anadromous fishery and habitat conditions in the Hanford Reach.	Public Utility District No. 2 of Grant County Draft License Application for Priest Rapids, April 2003.

Item	Sub-Item	Objective	Tasks	Primary Data Base
203.4 Municipal Supply	203.4.1 Yakima River	203.4.1 Determine and describe the current use of Yakima River basin surface water for municipal purposes.	1. Review prior reports and identify those cities and towns currently receiving all or part of their municipal supply from surface water and quantify the current peak day and annual use.	WMP, January 2003.

<b>Phase 2 - - Pre-Plan Formulation</b>				
<b>Activity No. 204 - - Water Supply Deficiency</b>				
<b>Item</b>	<b>Sub-Item</b>	<b>Objectives</b>	<b>Tasks</b>	<b>Primary Data Base</b>
204.1 Irrigated Agriculture	204.1.1 Yakima River	204.1.1 Determine the amount of water supply shortage to proratable water users in proration years.	<p>1. Using information compiled in 202.1, tasks 1 and 2, identify the individual entity and aggregate water needs of proratable users based on the dry-year criteria determined in 201.1.</p> <p>2. Assume the historic proration of 67% (37% supply received in years 1994 and 2001) of established rights as the indicator of the maximum supply deficit. Calculate individual entity and total system supply deficiencies as the difference between a ___% and 37 % supply.</p>	<p>WMP, January 2003</p> <p>Acquavella Court records</p>

Item	Sub-Item	Objectives	Tasks	Primary Data Base
	204.1.2 Columbia River	204.1.2. Determine the extent to which the block of exchange water resulting from the Black Rock Project could offset the Yakima basin irrigation water supply deficiency in proration years on the assumption that proratable rights have a first priority to use of the exchange water.	<p>1. Based on the identification in 202.1, of those irrigation entities potentially participating in the exchange program, quantify the block of Yakima Project water that would be available for irrigation use by others in proration years.</p> <p>2. Compare the irrigation supply “deficiency” as determined in 204.1.1 (excluding the proratable component of the rights of those entities receiving Black Rock water) with the block of Yakima Project exchange water determined in task 1. Determine extent which the exchange supply meets the Yakima basin dry-year irrigation supply objectives.</p>	

<b>Item</b>	<b>Sub-Item</b>	<b>Objectives</b>	<b>Tasks</b>	<b>Primary Data Base</b>
204.2 Instream Flows	204.2.1 Yakima River	204.2.1 Determine the increment of additional water supply required to provide normative flows under the conditions of (a) current floodplain development, and (b) floodplain expansion through selective removal of encroachments.	1. Based upon the hydrograph comparison conducted in 202.2, determine the annual deficiency in supply for providing normative flows under the two flow regime scenarios of described in 202.2.	.
204.3 Municipal	204.3.1 Yakima River	204.3.1 Quantify the additional surface water supply required to meet municipal needs to the year 2050.	1. Note: This quantification/determination is a product of 202.3.1, tasks 1 thru 3. No further work is required.	

<b>Phase 2 - - Pre-Plan Formulation</b>				
<b>Activity No. 205 - - Quantify Surface Water Supply Available</b>				
<b>Item</b>	<b>Sub-Item</b>	<b>Objectives</b>	<b>Tasks</b>	<b>Primary Data Base</b>
205.1 Available Supply	205.1.1 Yakima River	205.1.1.1 Quantify the amount of surface water physically available for additional use at proposed storage augmentation sites under (1) current operating conditions, and (2) future operating conditions as defined in activity 302.1 as the “Future Without Project.”	<p>1. Identify the primary components of operational practices; i.e. how the system is operated and managed for current and proposed future operating conditions.</p> <p>2. Through model simulation operations, estimate the monthly and annual water available for storage augmentation at the Bumping and Wymer Dam sites, and for transfer by a Keechelus to Kachess pipeline. Conduct the analysis individually and collectively for the sites/projects for current and future operating conditions.</p>	<p>Interim Operating Plan, CAG, 2002.</p> <p>RiverWare and RVA Models</p>

Item	Sub-Item	Objectives	Tasks	Primary Data Base
			3. Conduct sizing studies based on the determination of availability of water for storage to either confirm prior reservoir capacities or develop new alternate capacities.	
		205.1.1.2 Determine the extent to which waters currently available for additional storage/use are (a) already appropriated by Reclamation, or (b) subject to appropriation by Reclamation under existing authorities, or (c) where new authority may be required.	<p>1. Conduct an analysis of existing Federal water rights and the pending withdrawal of Yakima River unappropriated water for applicability to new storage alternatives.</p> <p>2. Based on results of 205.1.1, tasks 1 and 2, (a) quantify availability of water for additional storage, and (b) identify water right requirements necessary to authorize the appropriation and use of additional water.</p>	State and Reclamation records.



Item	Sub-Item	Objectives	Tasks	Primary Data Base
	205.1.2 Columbia River	205.1.2.1 Determine the extent waters are available at Priest Rapids Dam to meet the WIS alternate Black Rock Project proposals of (a) a diversion rate of 4,000 cfs and storage of 1,700,000 af/yr, (b) 2,000 cfs and storage of 860,000 af/yr, and (c) 2,000 cfs and no storage.	<p>1. Identify and document current (a) flow objectives and criteria recognized by Federal agencies and by the Grant County Public Utility District at Priest Rapids Dam, and (b) flows (quantity and time) in excess of 1(a).</p> <p>2. Using information from 202.2.1, determine total diversion requirements of potential exchange participants at the Columbia River.</p> <p>3. Conduct sizing studies to either confirm WIS alternate Black Rock Project proposals or develop new alternates as may be required to provide Columbia River water to potential exchange participants.</p>	<p>Black Rock Reservoir Study Final Report, 2002.</p> <p>Public Utility District No. 2 of Grant County Draft License Application for Priest Rapids, April 2003.</p>

Item	Sub-Item	Objectives	Tasks	Primary Data Base
		<p>205.1.2.2 Determine the appropriate action and procedure for acquiring rights to appropriate and store sufficient water from the Columbia River to operate a potential Black Rock Project.</p>	<p>1. Define (a) State policies, rules, and regulations, including mitigation requirements for acquiring water rights authorization for a Black Rock Project, and (b) objectives of the Columbia River Initiative as it may effect future appropriations.</p> <p>2. Estimate the nonconsumptive “water budget” of the proposed Black Rock Project; i.e. the quantity and time sequence of (a) water returned to the Columbia River via Yakima River return flows, and (b) increase in Yakima River discharge to the Columbia River due to the “exchange” and its use for instream flows.</p>	

Item	Sub-Item	Objectives	Tasks	Primary Data Base
			<p>3. Evaluate the potential of acquiring State water rights through the Federal withdrawal provisions of 90.40 RCW.</p> <p>4. Summarize findings and provide recommendations for acquiring water right authorization.</p>	

<b>Phase 2 - - Pre-Plan Formulation</b>				
<b>Activity No. 206 - - Data Collection and Evaluation</b>				
<b>Item</b>	<b>Sub-Item</b>	<b>Objectives</b>	<b>Tasks</b>	<b>Primary Data Base</b>
206.1 Economic Benefits		206.1.1 Develop monetary unit values for irrigated agriculture, fishery, municipal, recreation, and other benefits which may be associated with potential water storage projects.	<ol style="list-style-type: none"> <li>1. Conduct literature survey (primarily anadromous fishery).</li> <li>2. Gather and analyze data and develop unit values.</li> <li>3. Prepare documentation of information.</li> </ol>	
206.2 Water Quality		206.2.1 Assess water quality characteristics of potential water storage projects.	<ol style="list-style-type: none"> <li>1. Review existing water quality information and determine data gaps.</li> <li>2. Collect additional data as necessary.</li> <li>3. Evaluate data and document conclusions.</li> </ol>	<p>“Watershed Assessment, June 2000.”</p> <p>Reclamation and USGS data.</p>

Item	Sub-Item	Objectives	Tasks	Primary Data Base
206.3 Biological and Environmental Support		206.3.1 Determine and collect data necessary for plan formulation associated with the defined resource aspects identified in 103.9, task 2.	<ol style="list-style-type: none"> <li>1. Identify those specific actions/studies necessary to evaluate the defined resource aspects in 103.9, task 2.</li> <li>2. Initiate the specific actions and collect and conduct analyzes of data related to the defined resource aspects.</li> <li>3. Determine the appropriate methodologies/models to use to address the defined resource aspects.</li> </ol>	

<b>Phase 2 - - Pre-Plan Formulation</b>				
<b>Activity No. 207 - - Interim Report</b>				
<b>Item</b>	<b>Sub-Item</b>	<b>Objectives</b>	<b>Tasks</b>	<b>Primary Data Base</b>
207.1 Prepare Interim Report		207.1.1 Provide interim report on pre-plan formulation activities and status of other activities.	1. Prepare report on (a) pre-plan formulation activities and findings and conclusions (activities 201 through 206), and (b) status of other ongoing and proposed activities.	

<b>Phase 2 - - Pre-Plan Formulation</b>				
<b>Activity No. 208 - - Public Involvement</b>				
<b>Item</b>	<b>Sub-Item</b>	<b>Objectives</b>	<b>Tasks</b>	<b>Primary Data Base</b>
208.1 Public Involvement (PI) Program		208.1.1 Conduct PI Program activities related to Phase 2.	1. Identify appropriate activities for implementation from the PI Plan developed in 103.11.  2. Conduct appropriate activities.	

<b>Phase 3 - - Plan Formulation</b>				
<b>Activity No. 301 - - Potential Plan Elements</b>				
<b>Item</b>	<b>Sub-Item</b>	<b>Objectives</b>	<b>Tasks</b>	<b>Primary Data Base</b>
301.1 Water Conservation	301.1 Irrigated agriculture	301.1.1 Implement water conservation activities and projects under Title XII to the extent allowed within the current authorization of Federal and State funds.	<p>1. Determine amount of funds available from existing Federal and State authorizations (indexed as appropriate) for construction of irrigation conservation projects under Title XII.</p> <p>2. Utilizing Basin Conservation Program rating criteria or other appropriate means, develop a list of priority projects identifying the entity, plan elements, estimated construction cost, and annual water savings which could be implemented within the task 1 authorization ceiling.</p>	<p>YRBWEP staff.</p> <p>Title XII and Reclamation accounts.</p> <p>YRBWEP staff.</p> <p>WMP, 2003.</p>



Item	Sub-Item	Objectives	Tasks	Primary Data Base
		<p>301.1.2 Same as objective 301.1.1 except expand the scope of analysis to consider a new authorization ceiling and/or other funding sources.</p> <p>301.1.3 Estimate the annual irrigation diversion reductions if water conservation projects were implemented under either objectives 301.1.1 or 301.1.2.</p>	<p>1. Develop list of “second priority” projects identifying the entity, plan elements, estimated construction cost, and annual water savings which could be implemented within the expanded authorization ceiling.</p> <p>1. For planning purposes, define policies and procedures for applying diversion reductions during proration and non-proration years. Adjust conclusions of 202.1 and 204.1.</p>	<p>YRBWEP staff.</p> <p>YRBWEP staff. WMP, 2003.</p>

Item	Sub-Item	Objectives	Tasks	Primary Data Base
301.2 Water Banking		301.2.1 Determine viability of water banking as a plan element for meeting water supply needs.	<p>1. Consult with WDOE regarding ongoing activities related to structuring a Yakima River Water Bank pursuant to ESHB 1640 (2003 regular session).</p> <p>2. Working in conjunction with WDOE, determine viability of water banking as a plan element, its structure, estimated administrative costs, and estimated annual water transactions.</p>	ESHB 1640 and water banking reports.

Item	Sub-Item	Objectives	Tasks	Primary Data Base
301.3 Water Acquisition		301.3.1 Determine viability of permanent acquisition of water rights as a plan element for meeting water supply needs.	<p>1. Consult with YRBWEP staff regarding ongoing activities related to opportunities of acquiring water rights on a permanent basis.</p> <p>2. Working in conjunction with YRBWEP staff and others, determine viability of permanent acquisition of water rights as a plan element, its structure, estimated administrative costs, and estimated permanent acquisition.</p>	<p>Basin Conservation Program Plan, April 1998.</p> <p>YRBWEP staff.</p>

Item	Sub-Item	Objectives	Tasks	Primary Data Base
301.4 Storage	301.4.1 Yakima River	The following work would proceed only if activity 205.1.1 indicates there is water available and if so, resizing of the following facilities may be necessary [see 205.1.1, task 3]		
	301.4.1.A Cle Elum Lake	301.4.1.A Estimate current cost of increasing storage capacity by 15,000 acre-feet for instream flow purposes.	<ol style="list-style-type: none"> <li>1. Determine extent of current and potential additional shoreline erosion and relocation needs with increased storage.</li> <li>2. Formulate policy for resolving current and potential shoreline erosion.</li> <li>3. Prepare preliminary designs and cost estimates of dam modifications and shoreline erosion control and OM&amp;R costs.</li> </ol>	<p>Reclamation report _____, dated _____.</p> <p>UCAO staff.</p>

Item	Sub-Item	Objectives	Tasks	Primary Data Base
	301.4.1B Bumping Lake Enlargement	301.4.1B Estimate current cost of increasing storage capacity to a total of 250,000, 400,000, and 450,000 acre-feet.	1. Prepare current construction and OM&R cost estimate.	Prior work by TSC.  Technical report by Montgomery Water Group, Inc., “Storage Strategies, January 2002.”
	301.4.1.C Wymer Dam and Reservoir	301.4.1.C Estimate current cost of developing 142,000 acre-feet of storage capacity.	1. Prepare current construction and OM&R cost estimate.	Prior work by TSC.  Technical report by Montgomery Water Group, Inc., “Storage Strategies, January 2002” and “Wymer Dam and Reservoir Project Review, November 2002.”
	301.4.1.D Keechelus to Kachess Pipeline	301.4.1.D Estimate current cost of constructing a pipeline to convey Keechelus inflow in excess of storage capacity to Kachess for storage.	1. Prepare current construction and OM&R cost estimate.	Prior YRBWEP work.

Item	Sub-Item	Objectives	Tasks	Primary Data Base
	301.4.2 Columbia River	Note: The analysis in 301.4 and 301.5 assumes that a water right can be obtained for diversion of Columbia River waters. Further, in the WIS Final Report several alternate locations of pumping plants and reservoir inlet and outlet structures, and alignments of inlet and outlet conduits were developed.		
		301.4.2.A Estimate current cost of Black Rock Dam, Reservoir, Pumping Plant, Inlet and Outlet Conduits and Structures, Transmission Lands, and Rights-of-Way alternate WIS project proposals. [Note: If 205.1.2.1, task 3 results in development of new alternates then these should be used in lieu of the above.]	1. Prepare current construction and OM&R and power costs as appropriate.	“Black Rock Reservoir Study Final Report, May 2002.” WIS.
		301.4.2.B Identify most viable alternate storage project proposal.	1. Evaluate and compare alternate storage project proposals and identify most viable to carry into formulation of alternative plans, activity 302.	

Item	Sub-Item	Objectives	Tasks	Primary Data Base
301.5 No Black Rock Storage	301.5.1 Columbia River	Note: See note in 301.4.2.		
		305.5.1.1 Estimate current cost of delivering water from the Columbia River directly to Yakima Project entities susceptible to receiving Columbia River water and willing to exchange.	<ol style="list-style-type: none"> <li>1. Review recent reconnaissance level study work for use in plan formulation. Identify and address deficiencies if any.</li> <li>2. Prepare current construction and OM&amp;R cost estimates as appropriate.</li> </ol>	Washington Infrastructure, Inc, "Black Rock Reservoir Study Final Report, May 2002."
301.6		Identify most viable Columbia River alternate project proposals.	1. Evaluate and compare Columbia River alternate project proposals and identify most viable to carry into formulation of alternative plans, activity 302.	

<b>Phase 3 - - Plan Formulation</b>				
<b>Activity 302 - - Alternative Plans</b>				
<b>Item</b>	<b>Sub-Item</b>	<b>Objectives</b>	<b>Tasks</b>	<b>Primary Data Base</b>
302.1 Future Without Project	302.1.1 Yakima River and Columbia River	302.1.1 Structure “Future Without Project” alternative plan.	1. Identify those Federal, State, and local water supply activities that will be implemented and are to be included in the “Future Without Project” alternative. These could include, among others, Cle Elum Lake Enlargement, Wapatox Power Plant acquisition, change in points of diversion of Kennewick and Columbia Irrigation Districts, water banking, water acquisition, and Title XII Conservation Program.	Wapatox Power Plant acquisition agreement(s).  Draft Feasibility Study Reports of Kennewick and Columbia Irrigation Districts change in points of diversion.  YRBWEP staff.



Item	Sub-Item	Objectives	Tasks	Primary Data Base
			<p>2. For the project elements selected in task 1 above, determine the water supply relationships to the extent necessary for operations modeling.</p> <p>3. Conduct operation study of “Future Without Project” to illustrate extent water needs met and to provide a baseline to evaluate effects of “With Project” alternative plans.<sup>8</sup></p>	<p>RiverWare Operation Model and possibly Range of Variability Approach (RVA).</p>

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<sup>8</sup> See POS narrative for discussion of “Future Without Project ” operations.

Item	Sub-Item	Objectives	Tasks	Primary Data Base
302.2 “Future With Project” NED “Core”	302.2.1 Yakima River	302.2.1 Determine if a NED “core” should be included in all Yakima River alternative plans. If so, define “core.”	<ol style="list-style-type: none"> <li data-bbox="1224 352 1568 423">1. Select potential element(s).</li> <li data-bbox="1224 462 1568 643">2. Conduct operation studies to illustrate extent water supply needs met by aggregate element(s).</li> <li data-bbox="1224 682 1568 899">3. Determine net benefits (annual equivalent benefits greater than annual equivalent costs) of core element(s).</li> <li data-bbox="1224 938 1568 1008">4. Define a NED “core,” if any.</li> </ol>	

Item	Sub-Item	Objectives	Tasks	Primary Data Base
302.3 “Future With Project” Alternative Plans	302.3.1 Yakima River	302.3.1 Determine potential NED alternative plan(s).	<ol style="list-style-type: none"> <li data-bbox="1232 360 1560 574">1. Establish operating criteria which define the water supply goals for irrigation, instream flows, and municipal purposes.</li> <li data-bbox="1232 613 1560 792">2. Conduct operation studies to illustrate extent water needs are met by each alternative plan.</li> <li data-bbox="1232 831 1560 1045">3. Determine net benefits (annual equivalent benefits greater than annual equivalent costs) of each alternative plan.</li> <li data-bbox="1232 1084 1560 1149">4. Determine potential NED alternative plan(s).</li> </ol>	

Item	Sub-Item	Objectives	Tasks	Primary Data Base
	302.3.2 Columbia River	302.3.2 Determine potential NED alternative plan(s).	1. Reiterate 302.3.1 tasks.	
302.4 “Future With Project” Other Alternative Plans	302.4.1 Yakima River and/or Columbia River	302.4.1 Determine if there are other alternative plans, while of lesser NED net benefits, are of significant importance in addressing Federal, State, and local interests.	1. Reiterate 302.3.1 tasks but not constrained by net benefits.	

<b>Phase 3 - - Plan Formulation</b>				
<b>Activity No. 303 - - Data Collection</b>				
<b>Item</b>	<b>Sub-Item</b>	<b>Objectives</b>	<b>Tasks</b>	<b>Primary Data Base</b>
303. Data Collection	303.1 Seismotectonic Information	303.1.1 Conduct additional seismotectonic activities.	1. Conduct geologic and geophysical seismotectonic characterization studies involving geomorphic and Quaternary field work for assessing fault activity and regional seismicity analysis.  2. Determine characterization of regional structure for input to ground motion models.	

Item	Sub-Item	Objectives	Tasks	Primary Data Base
	303.2 Resource Information	303.2.1 Identify and collect data to assess possible effects of alternative plans on the aquatic, riparian/wetland, terrestrial, and human resources of the Yakima River basin and the Columbia River.	<p>1. Select and refine impact indicators for aquatic, riparian/wetland, and terrestrial resource effects for evaluation.</p> <p>2. Identify other resource areas such as:</p> <ul style="list-style-type: none"> <li>ESA listings</li> <li>Cultural resources</li> <li>Ecological resources</li> <li>Aesthetic attributes</li> <li>Indian Trust Assets</li> <li>Water quality</li> <li>Hydropower supplies</li> <li>Other</li> </ul> <p>3. Identify and collect data related to tasks 1 and 2.</p>	

<b>Phase 3 - - Plan Formulation</b>				
<b>Activity No. 304 - - Evaluation, Comparison, and Selection of Alternative(s)</b>				
<b>Item</b>	<b>Sub-Item</b>	<b>Objective</b>	<b>Tasks</b>	<b>Primary Data Base</b>
304.1 Evaluation of Alternatives		304.1 Show effectiveness of each alternative in addressing needs, monetary, and non-monetary impacts.	<p>1. Display resource conditions for “Future Without Project” alternative.</p> <p>2. For each “Future With Project” alternative display measures including NED effects, effectiveness of meeting needs, and effects on the aquatic, riparian/wetland, terrestrial, and human resources of the Yakima River basin and the Columbia River.</p>	

<b>Item</b>	<b>Sub-Item</b>	<b>Objective</b>	<b>Tasks</b>	<b>Primary Data Base</b>
304.2 Comparison of Alternatives		304.2 Facilitate selection of viable alternatives for feasibility analysis.	1. Prepare narrative comparison among alternatives describing the extent of net economic benefits realized, effectiveness in addressing needs, and tradeoffs in the aquatic, riparian/wetland, terrestrial, and human resources.	
304.3 Selection of Viable Alternative(s)		304.3 Determine viable alternative(s) for feasibility analysis.	1. Fully document basis for selection of viable alternative(s).	
304.4 Preliminary Cost Allocation		304.4 Preliminary indication of costs by project purpose for viable alternative(s).	1. Prepare appraisal-level cost estimates and benefits for preliminary Separable Cost-Remaining Benefits cost allocation.  2. Allocate project costs among reimbursable and nonreimbursable project purposes.	



Item	Sub-Item	Objective	Tasks	Primary Data Base
304.5 Preliminary Repayment Analysis		304.5 Preliminary indication of repayment requirements for viable alternatives.	1. Prepare preliminary repayment analysis of reimbursable project costs.	

<b>Phase 3 - - Plan Formulation</b>				
<b>Activity No. 305 - - Plan Formulation Report</b>				
<b>Item</b>	<b>Sub-Item</b>	<b>Objectives</b>	<b>Tasks</b>	<b>Primary Data Base</b>
305 Plan Formulation Report		305 Provide Plan Formulation Report.	1. Prepare report of plan formulation activities and findings. This will include alternative plans, benefits costs, their effectiveness in meeting water needs, and their environmental, ecological, and other effects. The viable alternative plan(s) will be identified and a preliminary cost allocation and illustration of possible repayment requirements presented.	

<b>Phase 2 - - Pre-Plan Formulation</b>				
<b>Activity No. 306 - - Public Involvement</b>				
<b>Item</b>	<b>Sub-Item</b>	<b>Objectives</b>	<b>Tasks</b>	<b>Primary Data Base</b>
306.1 Public Involvement (PI) Program		306.1.1 Conduct PI Program activities related to Phase 3.	1. Identify appropriate activities for implementation from the PI Plan developed in 103.11.  2. Conduct appropriate activities.	

<b>Phase 4 - - Feasibility Analysis and Environmental Impact Statement Activities</b>				
<b>Activity No. 401 - - Feasibility and NEPA Activities</b>				
Note: The Feasibility Analysis and the Environmental Impact activities occur simultaneously.				
<b>Item</b>	<b>Sub-Item</b>	<b>Objectives</b>	<b>Tasks</b>	<b>Primary Data Base</b>
401.1 Feasibility Analysis	401.1.1 Detailed studies	401.1.1 Conduct detailed studies of viable “Future With Project” alternative plan(s); confirm/revise “Without Project” alternative as appropriate.	<ol style="list-style-type: none"> <li>1. Engineering</li> <li>2. Geology</li> <li>3. Hydrology</li> <li>4. Economic</li> <li>5. Environmental</li> <li>6. Social Analysis</li> <li>7. Regional Analysis</li> <li>8. Environmental Justice</li> <li>9. Indian Trust Assets</li> <li>10. Other</li> </ol>	
	401.1.2 Comparison of viable alternative plan(s).	401.1.2 Compare tradeoffs among viable alternative plan(s).	<ol style="list-style-type: none"> <li>1. Four account evaluations: National Economic Development (NED), Environmental Quality (EQ), Regional Development (RD, Social Well Being (SWB).</li> </ol>	

Item	Sub-Item	Objectives	Tasks	Primary Data Base
Note: Selection of the preferred plan occurs after the four accounts are developed. The EQ account is, in actuality, a summary of the affected environment and environmental consequences which are developed in the EIS process (see items 401.2.3 and 401.2.4).				
	401.1.3 Preferred plan	401.1.3 Select plan.	Note: The plan with the greatest net economic benefit consistent with protecting the environment (NED plan) is to be selected unless the Secretary of the Interior grants an exception.	
			1. Document reasons for selection of preferred plan.	

Item	Sub-Item	Objectives	Tasks	Primary Data Base
401.2 NEPA Activities	401.2.1 Organize and Conduct Preliminary Scoping	401.2.1 Implement EIS activities	<ol style="list-style-type: none"> <li>1. Form inter-disciplinary team if different than planning team.</li> <li>2. Conduct review of additional data needs, etc. [Note: See activity 303 for prior data collection.]</li> <li>3. Prepare draft Plan of Study.</li> <li>4. Prepare and issue Notice of Intent to prepare EIS.</li> </ol>	
	401.2.2 EIS Public Scoping	401.2.2 Obtain public input on issues, concerns, and possible impacts of viable alternative plan(s).	<ol style="list-style-type: none"> <li>1. Prepare for public meeting(s).</li> <li>2. Conduct public meetings.</li> <li>3. Prepare final Plan of Study.</li> </ol>	

Item	Sub-Item	Objectives	Tasks	Primary Data Base
	401.2.3 Section 7 ESA consultation	401.2.3 Initiate Section 7 consultation with USFS and NOAA.	Note: Section 7 consultation activities should be initiated with USFS and NOAA once the plan is selected.	
	401.2.4 Affected Environment	401.2.4 Describe resources that would be affected by viable alternative(s) plans.	<ol style="list-style-type: none"> <li>1. Surface water resources</li> <li>2. Current irrigated agricultural lands</li> <li>3. Fishery resources</li> <li>4. Threatened, Endangered, and Special Status Species</li> <li>5. Vegetation</li> <li>6. Wildlife resources</li> <li>7. Cultural resources</li> <li>8. Hydropower supply</li> <li>9. Recreation resources</li> <li>10. Indian Trust Assets</li> <li>11. Environmental Justice</li> <li>12. Other</li> </ol>	
	401.2.5 Environmental Consequences	401.2.5 Describe impacts of viable “Future With Project” alternative plan(s) compared to “Without Project” alternative.	<ol style="list-style-type: none"> <li>1. Describe impacts on 1 thru 12 of 401.2.3 tasks.</li> <li>2. Describe cumulative impacts.</li> </ol>	

[Note: Cumulative impacts are the impacts on the environment which results from the incremental impact of the proposed action when added to other past, present, and reasonably foreseeable future actions, irregardless of what Federal or non-Federal agency or person undertakes the action.]



<b>Phase 4 - - Feasibility Analysis and Environmental Impact Statement Activities</b>				
<b>Activity No. 402 - - Feasibility Report/Environmental Impact Statement</b>				
<b>Item</b>	<b>Sub-Item</b>	<b>Objectives</b>	<b>Tasks</b>	<b>Primary Data Base</b>
402.1 Draft Feasibility Report/Environmental Impact Statement (FR/EIS)		402.1.1 Prepare Draft FR/EIS	1. Prepare preliminary Draft FR/EIS for internal review.  2. Prepare Draft FR/EIS.	
		402.1.2 Public process	1. File Draft FR/EIS with EPA and publish notice of public hearing in Federal Register.  2. Prepare for public hearing(s).  3. Conduct hearing(s).  4. Consider and respond to comments.	

Item	Sub-Item	Objectives	Tasks	Primary Data Base
402.2 Final FR/EIS		402.2.1 Prepare Final FR/EIS	<ol style="list-style-type: none"> <li data-bbox="1228 354 1575 456">1. Prepare preliminary Final FR/EIS for internal review.</li> <li data-bbox="1228 500 1575 537">2. Prepare Final FR/EIS.</li> <li data-bbox="1228 573 1575 643">3. File Final FR/EIS with EPA.</li> <li data-bbox="1228 686 1575 824">4. Prepare and submit Record of Decision to Commissioner of Reclamation.</li> </ol>	

<b>Phase 4 - - Feasibility Analysis and Environmental Impact Statement Activities</b>				
<b>Activity No. 403 - - Public Involvement</b>				
<b>Item</b>	<b>Sub-Item</b>	<b>Objectives</b>	<b>Tasks</b>	<b>Primary Data Base</b>
403.1 Public Involvement (PI) Program		403.1.1 Conduct PI Program activities related to Phase 4.	1. Identify appropriate activities for implementation from the PI Plan developed in 103.11.  2. Conduct appropriate activities.	